This is to certify that the

dissertation entitled

THE SUASORY EFFECT OF AFFECTIVE AND COGNITIVE MESSAGES:
A TEST OF CONFLICTING HYPOTHESES

presented by

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has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Communication

Major professor

Date 07 August 1998

THE SUASORY EFFECT OF AFFECTIVE AND COGNITIVE MESSAGES: A TEST OF CONFLICTING HYPOTHESES

By

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A DISSERTATION

Submitted to

Michigan State University

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

Department of Communication

1998

ABSTRACT

THE SUASORY EFFECT OF AFFECTIVE AND COGNITIVE MESSAGES: A TEST OF CONFLICTING HYPOTHESES

By

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An experiment was devised to assess the suasory effect of affective and cognitive arguments on attitudes that are affectively or cognitively based. Conflicting hypotheses regarding such effects include the mismatch hypothesis, suggesting that a persuasive message will be more effective if the arguments employed in the message are mismatched to one's attitude type, and the match hypothesis, which suggests that a persuasive message will be more effective if it is matched to one's underlying attitudinal base. Affectively based and cognitively based attitudes toward a fictitious attitude object (a Xenon light bulb) were induced by means of written messages that were either affect- or cognition-laden. Following initial responses to this attitudinal induction, independent groups of subjects were exposed to one of four counterattitudinal messages: (1) an affective message, (2) a cognitive message, (3) a message containing both affective and cognitive arguments, or (4) a control message, discussing a topic irrelevant to the attitudinal object. Analyses of variance and contrast analyses were employed to test the conflicting hypotheses. Results indicate that neither the mismatch nor the match hypotheses were consistent with the data. A three-way interaction was observed. In the absence of cognitive arguments, there is a main effect for the presence (versus absence) of an

affective counterattitudinal message, and in the presence of cognitive arguments, there is a main effect for the type of attitudinal induction and no effect of affective arguments. These results let to the construction and subsequent testing of the Cognitive Argument Primacy (CAP) Model, which was found to be consistent with the data. Theoretical explanations of the CAP model are discussed.

This dissertation is dedicated to my parents, Jule and E. Alan Cameron, my brother, Bain Cameron, my Great Aunt, Jean Makepeace, and to the memory of my Great Uncle, Charlie Makepeace. Their constant love and belief in me is a continual source of strength and inspiration. Thank you for everything.

ACKNOWLEDGMENTS

I would like to thank my adviser, Dr. Franklin J. Boster, who gave of his time, his ideas, his insight, and his humor in countless ways during my years here at Michigan State. He always seemed to know the right time to call me out of the blue, to give me the encouragement that I needed, or to give me a brief therapy session, consisting of the words "Kenzie, stop it!" when I was overwhelmed or desperately bent on finding the non-existent perfect way of presenting something. I am truly honored to have been able to study with such a great mentor, a man who demands, and deserves, the best from his students. In addition, I thank Frank and Linda Boster for their friendship and their support.

I am also indebted to Dr. Kim Witte, who, in addition to being a committee member for my dissertation, was my Masters' adviser. Working with Kim on her research team for my first two years in the program provided me with invaluable research experience, and incredible exposure to the field of Communication.

Another thank you goes to my committee members, Dr. Charles T. Salmon, Dr. Sandi W. Smith, and Dr. Michael Burgoon. Their questions and comments were a continual source of knowledge and insight, challenging me to think beyond the scope of each project. In addition, I would like to thank my entire committee for their graciousness and willingness to adapt their already demanding schedules to ensure that I could meet the necessary deadlines.

Although the first project intended to be my dissertation did not reach completion, I want to acknowledge Dr. Jon A. Krosnick of Ohio State University, who provided me with materials that he had used in his study.

Furthermore, there are numerous colleagues and friends who deserve special recognition. I'll always remember working at the coffeeshops with Shelly Campo, as we both grappled with our dissertations and with filling those lacunas that we could find; being fed by Esther Baker, whose meals seem to appear magically out of nowhere at just the right times; having Chinese food with Gwen Wittenbaum, who always took the time to find out just how I was doing; and hunting Easter eggs with Julie Burgess and her family as well as being forever grateful for Julie's friendship. Additional thanks go to Alice Chan, Lisa Cutler, Pam Lannutti, Mindy Mershon, Sandra Metts, and Don Moorhead, who continually cheered me on from afar via e-mail. I also want to recognize my cohort members: Shelly Campo, Hui-Jung Chang, Betty LaFrance, Janet Lillie, Ren-He Huang, and Brian Downey. Completing the program here at MSU would not have been as rewarding nor as much fun without them.

My research assistants, Craig Hanger and Phil Shipley, deserve a resounding round of applause for all of their help during this project. Anne Hubbell also deserves a thank you, for her friendship, as well as her willingness to hold spots for me in her classes to ensure that I would have subjects for this dissertation.

I am grateful for the assistance of Diane and Matt Golzynski, Jennifer Heisler, Rie Ohashi, and Cynthia Zuckerman for their help in coding, tallying, numbering, and entering data; I truly could not have completed this work without their selfless and willing help at

times when they were busy themselves. An additional thank you is extended to Diane Golzynski. Her friendship, her help, and her belief in me and my ability to complete the dissertation kept me going when it seemed as though things would never fall into place.

Deb Tigner, Marge Barkman, Ann Wooten, Rachel Miller, Cathy Gladstone, Arnetta Cage, and Jenny Springs went above and beyond the call of duty over the years and for that I am grateful.

In addition, I want to thank Dr. David Wright, Barbara Decker, Amy Hirshman, Molly Lauck, and Julie Reyes of the University Committee on Research Involving Human Subjects office. They came to know me over the years because of my frequent trips to their office, and they bent over backwards to help me when I needed it.

I also want to thank the Michigan State University Graduate School for awarding me a University Distinguished Fellowship (1994-1998), which funded my graduate studies. Specifically, I extend my thanks to Dean Gerard Crawley, Dr. Les Manderscheid, Dean Karen Klomparens, and Jo Trahan. Cathie Allison, Debra Conlin, and Mikala Keating are also recognized for their guidance regarding this finished product.

Finally, I offer my heartfelt thanks, and my love, to my family -- Mom, Dad, and Bain. No matter the day, the hour, or the need, they are always there for me to give me encouragement, support, ideas, assistance, and most of all love. Put simply, I would not be where I am today if it were not for my family.

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Chapter 1

INTRODUCTION

In order to ascertain the suasory effects of messages in attitude formation and change, researchers often analyze the base or type of the attitude that the messages are designed to influence. It has been suggested that influence attempts need to "make contact with an attitude's origin" (Edwards, 1990, p. 202) in order to obtain the maximum possible attitude change. An attitude may have its origin in, or may be based upon the function the attitude serves for the individual. Much work has been done focusing on the underlying functions of attitudes, work that was spurred by that of Smith, Bruner and White (1956) and Katz (1960). The functional bases of attitudes has spawned much research as scholars have attempted to determine what function or functions that attitudes we hold serve (c.f. Herek, 1987; Katz, 1960; Shavitt, 1990; Smith, Bruner, & White, 1956). Another path that researchers have traveled is one focused upon defining an attitude type as being either affectively or cognitively based (Edwards, 1990; Millar & Millar, 1990; Millar & Tesser, 1986, 1989).

Researchers using the functional approach, as well as those who define attitudes as being affectively or cognitively based, have concentrated on the match or mismatch of a persuasive argument to the underlying attitude toward an object (see also Petty & Wegener, 1998). Scholars have attempted to discern when and under what conditions an affective or cognitive argument will affect one's attitude toward an object. Researchers have studied the effects of such messages based on cognitions about an object (i.e.,

cognitive, rational, or non-emotional messages) or based on feelings about or emotions aroused by an object (i.e., affective or emotional messages) and have arrived at differing and conflicting conclusions (Edwards, 1990; Millar & Millar, 1990).

Current studies present both a mismatch hypothesis, proposing that a message will be more persuasive if it is of a type other than the existing attitude the influence attempt is trying to change (Millar & Millar, 1990), as well as a match hypothesis, which suggests that a persuasive message will be more effective if it matches the underlying base of the attitude in question (Edwards, 1990). This study was developed in order to explore the effects of affective and cognitive arguments on affectively based and cognitively based attitudes in order to test these conflicting hypotheses.

Chapter 2

AFFECT AND COGNITION IN ATTITUDE FORMATION AND CHANGE

When engaging in the study of attitudes, the results of numerous studies have been consistent with a theoretical distinction between affect and cognition. The distinction between affective and cognitive components of attitudes has been described such that the emotions and feelings about an attitude object constitute the affective components, and the perception one has about the attitude object, derived from information and beliefs, constitutes the cognitive component (Fleming, 1967; McGuire, 1969; Millar & Millar, 1990). Breckler (1984) and Breckler and Wiggins (1989) investigated affect and cognition as separate elements of an attitude and found their data to be consistent with such a distinction.[1] Zajonc (1980) posits that affective judgments not only may be independent of, but may actually occur prior to cognitive judgments regarding an attitude object. Katz (1960) proposes that some attitudes may contain multiple components (i.e., affective, cognitive, conative), while others may be primarily composed of one of the components.

It is important to note that, although there is considerable research consistent with the existence of multiple dimensions of attitude, these dimensions exist in conjunction with, and not in the absence of, each other. Becker (1963) warns of the simplification of these dimensions, and the resulting weakness of oversimplifying. Much research has used messages that have been characterized as emotional and rational. In reading these studies, it is possible to view these characterizations as constituting a single continuum, anchored

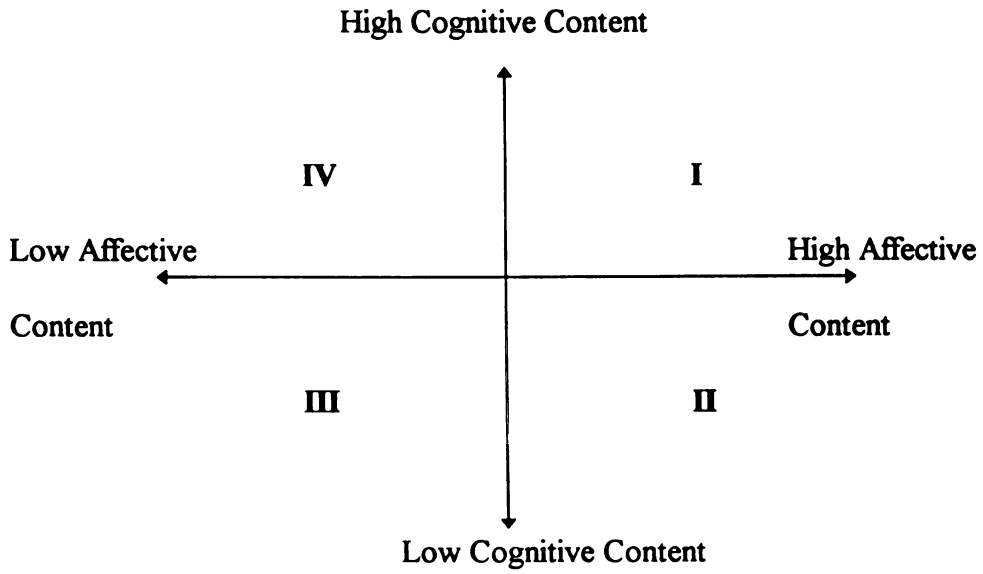
on one end by emotion, and on the other end by rationality, or logic. Becker (1963) argues that such a simplified distinction is a misnomer, for rational (as cognitive messages are often characterized) and emotional (a common characterization of affective messages) do not lie at opposite ends of a single continuum. A message filled with emotion is not necessarily devoid of logic. Similarly, a message that is heavily affect-laden is not necessarily without a cognitive element. Further, a message may lack both elements of emotion and logic; a message that is not emotional is not automatically a logical message. Although the messages and attitude types investigated in this study will be referred to as being affective or cognitive, it is recognized that affect and cognition, like emotion and logic, are not inherently incompatible. "The distinction between affect- and cognition-based attitudes is not a dichotomous one. It is unlikely that we ever form pure affect-based or pure cognition-based attitudes. More often than not, affect and cognition jointly determine the course of attitude acquisition, albeit in varying degrees and scenarios" (Edwards, 1990, p. 204).

In this study efforts were made to develop and use messages that were of high affective content/low cognitive content, and high cognitive content/low affective content (see Chapter 3). None of the messages are considered to be "pure" messages (i.e., purely affective or purely cognitive). Figure 1 depicts a representation of the multidimensionality of an attitude or message, when viewed as having an affective and cognitive component. Messages could be developed to fit any of the four quadrants. Two quadrants were selected to be represented in this study: the quadrant containing high affective content/low

cognitive content (quadrant II in Figure 1) and the quadrant containing high cognitive content/low affective content (quadrant IV in Figure 1).

Figure 1:

Affective and Cognitive Dimensions of Attitudes



Conflicting Hypotheses Regarding the Suasory Effect of Affective and Cognitive Messages on Attitudes

Recent studies have investigated the interaction of argument type (affective or cognitive) and attitude type (affectively based or cognitively based attitudes) and have provided inconsistent results. Millar and Millar (1990) presented a mismatch hypothesis, and found that their data were consistent with their hypothesis. If one holds an affective attitude toward an object, one is persuaded to a greater degree when one encounters a

cognitive counterattitudinal message, and vice versa. Contrary to Millar and Millar's (1990) findings, Edwards (1990) found her data to be consistent with a match hypothesis. Specifically, if one has an affective attitude toward an object, one will be persuaded to a greater degree when one encounters an affective counterattitudinal message, than one would were one to encounter a cognitive counterattitudinal message.

Millar and Millar (1990) proposed that the suasory effectiveness of rational or emotional appeals would be dependent on the base of the attitude these messages attempted to influence. Specifically, Millar and Millar (1990) suggested that cognitively based attitudes, those attitudes formed through consideration of attributes and beliefs about the object, would be more susceptible to emotional arguments (that is, those arguments that are affectively based, using emotional appeals) than to rational arguments.[2] Further, Millar and Millar (1990, p. 218) hypothesized that those attitudes that are affectively based (formed though the consideration of emotions and feelings about the attitude object) would be more susceptible to rational arguments (informational attacks focused on beliefs and judgments about the attitude object). Millar and Millar (1990) proposed that this mismatch of attitude type and argument type would be more effective because such a mismatch would lessen the counterarguing process that individuals engage in when presented with new information. Specifically, if one has a cognitively based attitude toward an object, a cognitive counterattitudinal message may well attack the very way that one has thought about the object, which may motivate one to counterargue (Brehm, 1966; Millar & Millar, 1990). Alternatively, if an emotional counterattitudinal message is presented, the information contained in the emotional argument will not

threaten the way one has thought previously about the object and thus will not promote counterarguing (Millar & Millar, 1990). Similarly, Millar and Millar (1990) hypothesized that if one holds an affective attitude, one will be more persuaded by a cognitive counterattitudinal argument than by an affective counterattitudinal argument.

To test their mismatch hypothesis Millar and Millar (1990) designed a series of studies in which subjects' attitude toward an object (in Studies 1 and 2, a beverage; in Study 3, analytical problems) was assessed as being either affectively based or cognitively based. Then, the subjects were presented with counterattitudinal messages about the attitude objects. The counterattitudinal message contained either rational or emotional arguments. Results from two of their three studies indicated that the data were consistent with their hypothesis. In Study 1, when Ss' initial attitude was classified as affective, the rational counterattitudinal message produced more agreement with the counterattitudinal argument ($M = 2.97$) than did the emotional counterattitudinal message ($M = 2.39$), $F(1,64) = 5.23$, $p = .02$.[3,4] When Ss' initial attitude was classified as cognitive, the affective counterattitudinal message produced more agreement with the counterattitudinal argument ($M = 3.14$) than did the rational counterattitudinal message ($M = 2.68$), $F(1,64) = 4.65$, $p = .03$. In Study 2, when Ss' initial attitude was classified as affective, the rational counterattitudinal message produced more agreement with the counterattitudinal argument ($M = 4.88$) than did the affective counterattitudinal message ($M = 3.96$), $F(1,90) = 10.41$, $p = .01$. When Ss' initial attitude was classified as cognitive, the counterattitudinal arguments did not influence the amount of agreement with the counterattitudinal message ($F > 1$).[5] In the third study, where the attitude object was a

series of analytical puzzles, and the Ss' initial attitude was induced (as opposed to classified, as had been done in Studies 1 and 2), when Ss' initial attitude was classified as affective, the rational counterattitudinal message produced more agreement with the counterattitudinal argument (M = 4.68) than did the emotional counterattitudinal message (M = 3.42), $F(1,46) = 5.62$, $p = .02$. When Ss' initial attitude was classified as cognitive, the affective counterattitudinal message produced more agreement with the counterattitudinal argument (M = 4.41) than did the rational counterattitudinal message (M = 2.86), $F(1,46) = 5.65$, $p = .02$.

In Studies 2 and 3, Millar and Millar (1990) asked subjects to list the thoughts they had while they viewed the counterattitudinal messages. In Study 2, upon analysis of the valence of the thoughts listed, they found that when Ss with affective attitudes were presented with emotional messages, Ss listed more negative thoughts (M = 1.27) than when they were presented with rational messages (M = .71), $F(1,90) = 4.56$, $p = .05$. When Ss with cognitive attitudes were presented with rational messages, Ss tended to list more negative thoughts (M = 1.52) than when they were presented with emotional messages (M = 1.04), $F(1,90) = 1.91$, $p = .17$. In Study 3, when Ss with affective attitudes were presented with emotional messages, Ss tended to list more negative thoughts (M = 1.95) than when they were presented with rational messages (M = 1.28), $F(1,38) = 2.68$, $p = .12$. When Ss with cognitive attitudes were presented with rational messages, Ss listed more negative thoughts (M = 2.32) than when they were presented with emotional messages (M = 1.32), $F(1,38) = 6.84$, $p = .02$.

Arguing from a cognitive response approach, Millar and Millar (1990) conclude that when Ss are exposed to arguments that do not match the base of their attitude (cognitive or affective), the Ss will counterargue less and will therefore exhibit more attitude change, when measured by agreement with the counterattitudinal message. When a counterattitudinal message emphasizes the same component (affective or cognitive) that forms the base of the Ss' attitude, Ss will be motivated to counterargue, will produce more counterarguments, and thus will not be as influenced by the counterattitudinal message.

Relating her arguments to the functional approach, Edwards (1990) argues that there are various reasons for which people form and modify attitudes. She draws on Zajonc (1980) and Zajonc and Markus (1982) to assert her position that affect and cognition combine to form an attitude toward an object, and, depending on the attitudinal basis (affective or cognitive) created, the attitude may be differentially affected by affective and cognitive counterattitudinal messages. Specifically, she hypothesizes that affective arguments will be more persuasive than cognitive arguments when the Ss' initial attitudes are affectively based (Edwards, 1990). Her underlying argument for this hypothesis arises from Zajonc (1980), and she states that an implication of his view that affect may be primary for specific preferences is "that attitudes with affective origins may be relatively impervious to influence attempts that rely on rational argumentation and might be more responsive to persuasive appeals that tap their affective bases" (Edwards, 1990, p. 203; Zajonc, 1980). Thus, she presents what could be termed a match hypothesis, specifically when viewing affectively based attitudes.

To test her hypothesis, Edwards (1990) conducted two studies in which Ss were exposed to both affective and cognitive messages about an attitude object (in Study 1 the object was a Chinese ideograph, in Study 2 the object was a sport drink called *Power Plus*). She held the content of the induction and suasory messages constant, as she exposed all Ss to both cognitive and affective messages. Her focus, then, was on the variation of the sequence of the presentation of the cognitive and affective messages. In Study 1 those Ss in the affective induction condition first were exposed to a subliminal affective prime (either a happy or an angry face), then to a supraliminal image of a Chinese ideograph, then were asked to read a short passage about the ideograph (either favorable or unfavorable information, consistent with the affective induction), then to another supraliminal image of the same ideograph, and finally were asked to complete ratings about the ideograph. Those Ss in the cognitive induction condition first were presented with a supraliminal image of the ideograph, were asked to read about the ideograph, then were exposed to the subliminal affective prime, were exposed to another supraliminal image of the ideograph, and finally were asked to complete ratings.

After the attitude induction, the Ss were exposed to either affective or cognitive persuasive conditions. As in the attitude induction, all Ss were exposed to both affective and cognitive messages, the order of these messages varying among conditions. The Ss were presented with counterattitudinal information about the ideographs that they had viewed and read about in the induction trials.

Edwards (1990) computed difference scores as to the degree of liking the Ss had for each of the ideographs. Consistent with her hypothesis, those Ss with attitudes that

were affectively based (Ss who had first been exposed to the subliminal slides), reported more attitude change when the persuasion was affective than when it was cognitive $F(1,60) = 6.6$, $p = .02$.[6] Those Ss whose attitudes were cognitively based reported an equal amount of attitude change under both conditions $F(1,60) = 1.0$, ns.

In her second study Edwards (1990) used supraliminal messages for both the affect and the cognition variables. Subjects in the affective induction condition first tasted *Power Plus*, the fictitious sport drink that was the attitude object. They then read a passage (cognitive message) about *Power Plus,* and were asked to rate the degree to which they liked the product. Those Ss in the cognitive induction condition first read the passage, then sampled the drink, and then provided their ratings of the beverage. For those Ss who were then exposed to Edwards' (1990) affective persuasion appeal, they smelled a liquid that they were told was *Power Plus* (the liquid had an unfavorable smell), read another passage about the beverage (the passage was unfavorable toward the beverage), and then completed their ratings. Those Ss in the cognitive persuasion appeal condition first read the passage, then smelled the beverage, then completed their ratings. Consistent with her hypothesis and the results of Experiment 1, Edwards (1990) reported that those subjects in the affectively based attitude condition reported a greater amount of change when they were exposed to affective persuasion than when they were exposed to cognitive persuasion $F(1,103) = 4.3$, $p < .05$. Those subjects with cognitively based attitudes reported an equal amount of change in both persuasion conditions.

Edwards (1990) notes that in her experiment the procedure used to classify whether or not an attitude induction or means of persuasion was affective or cognitive was

based upon the sequence of the messages. Those messages that had an affective element presented first followed by a cognitive element were classified as affective induction/persuasion; those messages that had a cognitive element presented first followed by an affective element were classified as cognitive induction/persuasion. Thus, Edwards (1990) varied the sequence of the elements, and not the absolute contribution of each process (p. 210). "The design, therefore, provides a strong test of the importance of the sequence of affect and cognition in attitude formation and change" (Edwards, 1990, pp. 210-211).

In this study an experiment designed to test the competing hypotheses of Millar and Millar (1990) (identified in this paper as the mismatch hypothesis) and Edwards (1990) (identified in this paper as the match hypothesis) is offered. Subjects will be exposed to one of two initial attitude inductions (cognitively based or affectively based attitudinal induction) (see Table 1). That is, they will be presented with a message regarding an object (a new product to which the subjects have never been exposed) that offers either a cognitively based description of this object (e.g., providing information regarding the attributes and others' beliefs about the product) or an affectively based description of the product (e.g., a message that emphasizes feelings and emotions about the product). This initial description of the product, whether cognitive or affective, will be positive. In addition, the instructions provided to the subjects will attempt to focus their responses either cognitively or affectively (described further below).

Independent groups of each of these Ss (cognitively based attitudinal induction, affectively based attitudinal induction) will, after completion of a questionnaire, be

exposed to a second message (cognitive argument condition x affective argument condition). This second message will contain either the presence or absence of cognitive and affective arguments (i.e., cognitive/affective present, cognitive present/affective absent, cognitive absent/affective present, cognitive absent/affective absent). This second message regarding the product, regardless of condition, will be a negative description of the product and will therefore be counterattitudinal. The full design of the study is presented in Table 1.

Table 1

Study Design

	Absence of Cognitive (unfavorable) Arguments		Presence of Cognitive (unfavorable) Arguments	
	Absence of Affective (unfavorable) Arguments	Presence of Affective (unfavorable) Arguments	Absence of Affective (unfavorable) Arguments	Presence of Affective (unfavorable) Arguments
Affective Induction (favorable)				
Cognitive Induction (favorable)				

The mismatch hypothesis predicts that cognitively based attitudes will be more vulnerable to affective arguments and that affectively based attitudes will be more vulnerable to cognitive arguments (Millar & Millar, 1990). Therefore, if the mismatch hypothesis is consistent with the data, results should indicate a main effect for cognitive arguments when attitudes are affectively based, such that the presence of cognitive

arguments produces attitude change and the absence of cognitive arguments results in little to no attitude change. Similarly, results should indicate a main effect for affective arguments when attitudes are cognitively based, such that the presence of affective arguments produces attitude change and the absence of affective arguments results in little to no attitude change. In those conditions when Ss are exposed to joint messages, that is, messages containing both cognitive and affective arguments, we would expect attitude change because the Ss are being exposed to the mismatched arguments. Table 2 illustrates the predictions of the mismatch hypothesis.

Table 2

Predictions of the Mismatch Hypothesis

	Absence of Cognitive (unfavorable) Arguments		Presence of Cognitive (unfavorable) Arguments	
	Absence of Affective (unfavorable) Arguments	Presence of Affective (unfavorable) Arguments	Absence of Affective (unfavorable) Arguments	Presence of Affective (unfavorable) Arguments
Affective Induction (favorable)	No change (control group)	Little to no attitude change	Attitude change	Attitude change
Cognitive Induction (favorable)	No change (control group)	Attitude change	Little to no attitude change	Attitude change

Alternately, the match hypothesis predicts that affectively based attitudes will be more vulnerable to affective arguments (Edwards, 1990). For this study, the match hypothesis has been extended to include cognitively based attitudes, such that cognitively formed attitudes are hypothesized to be more vulnerable to cognitive arguments.

Therefore, if the data can be explained by the match hypothesis, results should indicate a main effect for affective arguments when attitudes are affectively based, and a main effect for cognitive arguments when attitudes are cognitively based. Extending the argument for the match hypothesis as was done for the mismatch hypothesis, it would indicate that there should be an absence of change when attitudinal bases and arguments are mismatched: we should observe no attitude change when affectively based attitudes are exposed to cognitive counterattitudinal arguments, as well as a lack of effect when Ss with cognitively based attitudes are presented with affective counterattitudinal arguments. Table 3 illustrates the predictions of the match hypothesis.

Table 3

Predictions of the Match Hypothesis

	Absence of Cognitive (unfavorable) Arguments		Presence of Cognitive (unfavorable) Arguments	
	Absence of Affective (unfavorable) Arguments	Presence of Affective (unfavorable) Arguments	Absence of Affective (unfavorable) Arguments	Presence of Affective (unfavorable) Arguments
Affective Induction (favorable)	No change (control group)	Attitude change	Little to no attitude change	Attitude change
Cognitive Induction (favorable)	No change (control group)	Little to no attitude change	Attitude change	Attitude change

In this 2 x 2 x 2 design there are four cells that are central to testing the conflicting hypotheses. Those four cells are the pure cells, that is, the cells where the Ss are exposed to either an affective or cognitive message during the attitude induction, and then are

exposed to either an affective or cognitive persuasive message (see Table 4). When these four central cells are viewed, one can see the direct contradiction of the two hypotheses.

Table 4

Cells Central to the Test of Conflicting Hypotheses*

	Presence of Affective Arguments	Presence of Cognitive Arguments
Affective induction	**M&M: Little to no attitude change** E: Attitude change	**M&M: Attitude change** E: Little to no attitude change
Cognitive induction	**M&M: Attitude change** E: Little to no attitude change	**M&M: Little to no attitude change** E: Attitude change

*Note: Predictions of the Mismatch hypothesis are preceded by "M&M" and are in bold text; predictions of the Match hypothesis are preceded by "E" and are in regular text.

Chapter 3

METHODS

An experiment was conducted to test the conflicting match and mismatch hypotheses of Edwards (1990) and Millar and Millar (1990), respectively. Specifically, the effects of matched versus mismatched counterattitudinal messages, provided to the subjects after an initial favorable attitudinal induction using either a cognitive or affective message, was assessed by viewing the dependent variables of the difference in attitude, and Ss' confidence in their judgment, as per Millar and Millar's (1990) and Edwards' (1990) studies. Pilot tests were undertaken to obtain induction check items to be included in the final questionnaire as well as to obtain the messages used in each condition.

The Xenon Light Bulb

For this study, an attitude toward an unfamiliar object was induced in the subjects. The decision to induce an attitude, as opposed to identifying a preexisting attitude, was made so that there would be control over what information and emotional content was available to the subjects regarding the attitude object. Edwards (1990) noted the difficulty in identifying the attitudinal base of a preexisting attitude as the origins of such an attitude are often unknown (p. 204).

For this study, then, a relatively neutral object, a light bulb, was chosen as the attitude object. In order to ensure that both types of messages (affective and cognitive) presented to Ss contained novel information, a new type of light bulb was invented, the Xenon light bulb. The Xenon light bulb, to my knowledge, does not exist, but was determined to be a believable attitudinal object, especially as subjects are often familiar

with halogen bulbs and neon lights. Xenon is a gas similar to neon (a non-reactive element with a full outer shell of valence electrons) so that if any subjects were well acquainted with the periodic table of elements, they would recognize this element as an actual element and one that potentially could be used in the development of lighting sources. In the pilot tests of the messages, a random sub-sample of subjects was asked to complete a short questionnaire that queried how important they thought light bulbs were to them, asked them to comment on the study, and asked them to comment on Xenon light bulbs. The respondents overwhelmingly noted that light bulbs were not a central focus in their lives, although many noted that they use and purchase light bulbs for their dorm rooms and homes, so that the messages were relevant to them. Of the 13 students surveyed, none questioned the existence or the possibility of existence of a Xenon light bulb.

Pilot Tests

Two rounds of pilot tests were conducted. Both rounds consisted of two questionnaires; one focused on assessing the cognitive and affective content of a variety of statements (pilot testing of induction check items), another focused on assessing the cognitive and affective content of short messages (pilot testing of messages to be used in the final experiment). All subjects received both questionnaires, although the second questionnaire (the messages) differed between the first and second rounds of pilot testing. The two rounds of pilot tests were conducted because the results of the first pilot test indicated that the affective negative messages (described further below) needed to be revised and retested. Reported below are the sample, data collection procedure, instrumentation, and analysis procedure for each pilot questionnaire.

Pilot Testing of Induction Check Items

Participants. Participants consisted of 73 college students (28 males and 45 females) from a large, midwestern university.[7] The students were enrolled in a variety of communication classes, and they received extra credit for their participation in this study. Responses were anonymous.

Procedure and instrumentation. A 35-item questionnaire containing statements about light bulbs was distributed to the participants. The 35 items had been precoded by two coders (kappa = 1.00) as being either positive or negative statements about the Xenon light bulb. The researcher informed the students that they were to read carefully each statement and to judge it both for cognitive content and for affective content. The Ss were instructed that something that is cognitive can be factual and provides one with information or knowledge about a product (e.g., a light bulb), and something that is affective is something that appeals to emotions, moods, or feelings. The subjects were asked to rank each statement on both scales, and were provided with an example. Further, Ss were allowed to ask any questions to clarify the distinction between cognitive and affective statements. Subjects were informed that they were not judging the truth or falsity of each statement; rather, they were to judge the degree to which they believed each statement to be cognitive and the degree to which they believed each statement to be affective. Their responses were assessed on a Likert-type scale, where 1 was "not at all cognitive (affective)" and 5 was "extremely cognitive (affective)." This portion of the pilot testing procedure took Ss approximately 5-10 minutes to complete. Following their completion of this first task, the Ss were given a second task, discussed below.

Data analysis. Two sets of means were computed for each of the 35 items, a mean indicating the degree to which Ss thought the item was cognitive, and a mean indicating the degree to which the Ss believed the item was affective. T-tests for paired samples were computed for each item so that those items that were judged as high in cognitive content and low in affective content, as well as those items that were judged as high in affective content and low in cognitive content could be ascertained.

Results of pilot testing for cognitive and affective statements. A total of sixteen items were desired for inclusion on the final questionnaire. These sixteen statements were selected from the 35 items in the pilot test to fit four categories: affective positive, affective negative, cognitive positive, and cognitive negative. The statements chosen were ones that Ss rated as being high in cognitive content and low in affective content (cognitive statements) and as being high in affective content and low in cognitive content (affective statements). The selected items and their means on the cognitive and affective dimensions are reported in Appendix A. T-tests for each of the items between their affective and cognitive ratings were performed. The t-tests of all of the items selected indicated that their ratings on the two dimensions (affective and cognitive) were significantly different. The t-test results for each item are also reported in Appendix A.

These 16 items were then included in the final questionnaire. The section comprised of these sixteen items was used as an induction check for the experimental study.

Pilot Testing of Affective and Cognitive Messages

Two rounds of this second pilot questionnaire were completed. The goal of this sequence of pilot testing was to determine those messages to be used as the attitude induction messages (one affective induction message, favorable toward the attitude object, and one cognitive induction message, also favorable toward the attitude object) and the counterattitudinal persuasion messages (one affective counterattitudinal message, unfavorable toward the attitude object, and one cognitive counterattitudinal message, also unfavorable toward the attitude object). Two rounds were necessary as the results from the first round of pilot testing indicated that the message options that were intended to be affective negative (the affective counterattitudinal messages) messages were not perceived as such by subjects during the pilot testing. Therefore, a second round of pilot testing was undertaken in order to test other messages to be used in this condition.

Message development. Messages were written so as to be favorable toward the Xenon light bulb (induction, positive condition) or unfavorable toward the Xenon light bulb (persuasion, negative condition). A total of eight messages were initially written for pilot testing, two for each of the four conditions. As noted later, additional pilot testing was necessary; therefore, an additional four messages for the negative affective condition were written and pilot tested. To prepare the messages for pilot testing, a random numbers table was used to determine the order of each packet of messages to be given to each subject. For the first round of pilot testing a total of 56 packets were developed, each of which had a unique, random order of the 8 messages. For the second round of pilot testing, the preparation procedure was the same, that is, the messages were ordered

using a random numbers table so that the order in which the subjects read the messages was random and varied by subject.

Participants - Round 1. The sample for round 1 consisted of 50 college students from a large, midwestern university who were enrolled in communication classes. There were 21 male and 29 female participants.

Participants - Round 2. The sample for round 2 consisted of 22 college students from a large, midwestern university who were enrolled in a communication class. There were 7 male and 15 female participants.

Procedure. Subjects were again reminded of the distinction between cognitive and affective messages. They were informed that they would read a series of eight messages, and complete a thought listing task and a short questionnaire after each message. Prior to each message, Ss were given a set of directions, asking them to think carefully about what was being presented in each message. They were informed that they would be asked to write down each argument that they read in the message, and to identify whether or not the argument was a cognitive argument or an affective argument. The Ss were provided time to ask any questions, and then they began the study. They read a series of eight messages and listed the arguments made in each message as well as answered some questions about each message. This part of the pilot testing took approximately 30-40 minutes. After completing the questionnaires, the Ss were thanked, debriefed, and dismissed.[8] The same procedure was followed for round two of the pilot testing; however, subjects were only presented with five messages. The second round of the pilot testing took approximately 20-30 minutes to complete.

Instrumentation/Measurement. Following their reading of each message, Ss were asked to write down any thoughts that crossed their mind as to whether the message that they just read presented affective (emotional) arguments, or cognitive arguments. Ss were asked to write down the arguments they believed to have been presented in the message, and were also asked to indicate whether or not they believed those arguments to be positive, negative, or neutral. The Ss were allowed to reread the message if they needed to do so. Following this instructed thought-listing task, Ss were asked to answer a series of questions about the content of the message. They were asked to rate the message as a whole, and, if they were forced to choose between labeling the message as an affective message or a cognitive message, to indicate in which category they would place the message they had just read. Then, they were asked to evaluate the message on both an affective and a cognitive dimension. For this response, Ss were asked to indicate the degree to which they believed the message they had read was affective and the degree to which they believed the message was cognitive. These items were answered on seven-point Likert-type scales ranging from "message is not at all affective (cognitive)" to "message is completely affective (cognitive)." Ss responded to these items after each of the eight messages with which they were presented. In round 2 of the pilot testing the instrumentation was identical, but Ss only were asked to read five messages about the Xenon bulb.

Data analysis. These pilot data were analyzed by running frequencies on responses to the overall message type and degree of affect in the message/degree of cognition in the message.

Results of pilot testing for affective and cognitive messages. Results indicated that three of the four messages in the first round of pilot testing satisfied the conditions for inclusion in the study. The chosen cognitive positive, cognitive negative, and affective positive messages were messages that an overwhelming majority of subjects identified as being of the specific type (cognitive or affective) and messages that were not only rated as being high in the primary dimension, but as being low in the secondary dimension. The messages intended to fill the affective negative condition were unsatisfactory, as Ss were divided as to whether or not they believed the messages to be cognitive or affective. Thus, the fourth message (affective negative condition) was chosen from those messages tested in the second round of pilot testing. Table 5 presents Ss' ratings as to the degree to which they believed each of the messages to be cognitive or affective.

Table 5

Overall Ratings of Degree of Cognition and Affect for Messages (Induction and Persuasion)*

	High Cognitive (Low Affective) Message	High Affective (Low Cognitive) Message
Positive message (Induction)	M = 1.96 (1.34) **M = 6.10 (1.05)**	M = 6.30 (0.74) **M = 1.92 (0.78)**
Negative message (Argument/Persuasion)	M = 2.42 (1.62) **M = 5.94 (1.30)**	M = 5.27 (1.78) **M = 2.91 (1.66)**

*Note: Affective ratings are in regular text, cognitive ratings are in bold text. Standard deviations are noted in parentheses.

Test of Perceived Message Strength

A separate sample of Ss (N = 123) was used to perform a post hoc test of perceived message strength. Forty-six males and 77 females at the same large midwestern

university participated in this test. Subjects ranged in age from 18 to 35 (M = 22.29, SD = 4.12). The ethnic background of the Ss is as follows: 5.7% Asian, 16.7% Black/African American, 0.8% Hispanic, 2.4% Native American, 66.7% White, and 5.7% indicated "other."

Independent groups were asked to complete a short questionnaire that presented one of the four messages and then asked Ss to respond to three Likert-type items assessing the perceived strength of the message. The three-item scale had a reliability of $\alpha = .89$.

Results indicated that the strength of the cognitive and affective messages did not differ in either the positive (induction) or negative (persuasion) conditions.[9] Table 6 presents the results of the assessment of perceived strength of the messages.

Table 6

Perceived Strength of Messages*

	High Cognitive Message	High Affective Message
Positive Message (induction)	M = 14.24 SD = 3.94 n = 29	M = 13.06 SD = 2.97 n = 33
Negative Message (argument/persuasion)	M = 10.40 SD = 4.45 n = 30	M = 10.61 SD = 4.67 n = 31

*Note: Means reflect the combined score on the three-item scale, where 1 = weak and 21 = strong.

ANOVA results indicated that there was a main effect for valence such that the positive messages were perceived as being stronger than the negative messages ($F = 18.25$, $p < .001$). There was no interaction effect between argument type and valence (F ,

1.00, ns). The differential perception of the strength of the messages in the two valence conditions is not a threat to this study as this study's focus was on the persuasive effects of affective and cognitive arguments on affective and cognitive attitudes.

The four messages that were selected for the study, then, were those that met the above criteria. The messages are presented in Appendix B. The two positive/favorable messages were used as the attitude induction (message 1; Ss received one of these two messages). The two negative/unfavorable messages were used as the counterattitudinal persuasive messages [message 2; independent groups of Ss received messages that were one of the following four types: (1) affective only, (2) cognitive only, (3) both affective and cognitive, or (4) a filler/control message that gave information on a non-related product (chair fabric)].

The Study

Using the messages selected by the above means, a study was undertaken to test the conflicting match and mismatch hypotheses regarding the effectiveness of affective and cognitive messages (arguments) on changing attitudes that are affectively or cognitively based.

Design

An independent groups design with three factors (attitude induction, cognitive argument condition, and affective argument condition) was used. The attitude induction category refers to the type of attitude induced by the first message (either cognitive or affective).

The second set of messages was presented to the Ss after they had been exposed to the initial message and had completed the initial questionnaire. These messages comprised counterattitudinal statements that contained either cognitive arguments, affective arguments, a combination of the two, or absence of both. The cognitive argument factor had two conditions: either the presence or absence of a cognitive argument. The cognitive argument presented information addressing beliefs and judgments about the attitude object. The affective argument factor had two conditions: the presence or absence or affective arguments. The affective argument focused on feelings and emotions about the attitude object. Thus, the design is a 2 x 2 x 2 independent groups design.

Participants

The sample consisted of 607 college students at a large, midwestern university. All students were enrolled in undergraduate communication courses. Fourteen Ss were deleted from the sample because they had participated in the pilot test (in another course). One subject was deleted from the sample because he was suspicious of the research hypotheses. Another seven Ss were deleted, three because they turned in virtually blank questionnaires, and four who were hostile Ss, evident by their responses to the thought-listing questions and other written remarks they made throughout the questionnaire. The final sample, then, was 585 students. Two hundred and forty-five males and 326 females participated in this study. The ages of participants ranged from 16 to 31 (M = 19.92, SD = 1.72). Thirty-four percent of the subjects were freshmen, 30.4% were sophomores, 18.8% were juniors, 12.8% were seniors, 2.1% were fifth-year seniors, and 0.5% of the

participants were graduate students or those enrolled in lifelong education. The ethnic background or race of the subjects is as follows: 3.1% Asian, 13.3% Black/African-American, 1.7% Hispanic, 0.2% Native American, 74.7% White, 2.7% indicated "other," and 4.3% left this item blank.

Procedure

Subjects were told that they were engaging in a study, the goal of which was to determine how they viewed message readability, or how easy or hard they believed the message was to read. The directions with which they were presented on the questionnaires themselves varied as to the condition in which the subjects were placed. Instructions that served to focus their reading of the message and their subsequent responses to questionnaire items in either a cognitive or an affective direction were presented. Those Ss in the affective condition were instructed to "...analyze how you feel about what you are reading. That is, go over in your mind how you are feeling while you read the message." Those Ss in the cognitive induction condition were instructed to "...analyze why you think the way you do about the product. That is, go over in your mind what it is about the information that you are presented that makes you think why you would like the product or not. As you are reading, think of reasons that make you like or dislike the product." These instructions were designed to focus the Ss' responses in either a cognitive or affective direction. Such instructions have been used successfully by others to focus the direction of Ss' attitudes (Millar & Tesser, 1986, 1989; see Appendix C).

After reading these directions, the Ss were presented with a short written message that contained either cognitive or affective information about the Xenon light bulb

(attitude induction). This first message, regardless of attitude type, was favorable toward the Xenon light bulb. After reading the message, the Ss were again primed so as to interpret the message either cognitively or affectively. The same directions as noted above were used in the repeat prime. The Ss were then instructed to list either their reasons for liking or disliking the product (cognitive induction) or the feelings they experienced while reading the message (affective induction). Ss also were instructed to indicate the valence of the reasons or feelings they listed, by circling either -, 0, or + signs.

Following this directed thought-listing procedure, Ss were asked to respond to a series of eight items that dealt with the cover story. The remainder of the questionnaire included items to check the inductions, items to measure Ss' attitudes toward the Xenon light bulb, and items to measure their confidence in their judgment.

Following their completion of the first part of the questionnaire, Ss were again given instructions to focus their reading, and were presented with a second message. This second message either contained counterattitudinal information about the Xenon light bulb (three variants) or was a control message. Specifically, the second message was composed of one of the following: (1) affective information only (affective argument present/cognitive argument absent), (2) cognitive information only (affective argument absent/cognitive argument present), (3) affective and cognitive information (affective argument present/cognitive argument present), or (4) a control message with information about another, irrelevant attitudinal object (affective argument absent/cognitive argument absent) (chair fabric, see Appendix B).

After reading the second message Ss were presented with further instructions, again intended to prime them to respond to the message (1) affectively, (2) cognitively, or (3) both affectively and cognitively. Those Ss in the control group were merely instructed to "write down any comments that you had as you were reading this message." Following completion of a thought-listing task identical to that after the first (induction) message, Ss completed the questionnaire a second time. Those Ss in the control group were instructed to complete the thought-listing procedure and the readability items thinking of the message about chair fabric that they had just read. Ss in the control group answered six questions related to chair fabric, and were then instructed to think back to their reactions to the Xenon bulb (without turning back in the questionnaire), and they then completed the remainder of the questionnaire which focused on their attitudes toward the Xenon light bulb and their confidence in their judgments. The final section of the questionnaire contained demographic questions. Upon completion of the questionnaire, Ss were debriefed, thanked, pledged to secrecy about the study, and dismissed.

Instrumentation/Measurement

Induction check. Those 16 statements that were chosen from the results of the first pilot test were presented to the subjects. Subjects were instructed to place a checkmark next to the three statements that best represented their reaction to the Xenon bulb.

Attitude. In order to assess subjects' attitudes toward the attitude object, 15 items intended to measure attitude were included in the questionnaire. The items that Millar and Millar (1990) and Edwards (1990) used in their studies were included, as were additional

items that have been used to assess attitudes in attitudinal research (c.f., Osgood, Suci, & Tannenbaum, 1957; Petty & Wegener, 1998). Likert-type response scales, as well as semantic differential items (Osgood, Suci, & Tannenbaum, 1957) were included to assess Ss attitude toward the Xenon light bulbs. The same items were used after both messages.

Confidence in judgment. As Edwards (1990) also hypothesized that those Ss who had affective attitudes would be more confident in their judgment than those Ss with cognitive attitudes, confidence was also measured in this study. Four Likert-type items were included in the questionnaire to measure Ss' confidence in their judgment about the Xenon bulbs. These confidence items followed the attitudinal items in the questionnaire.

Counterarguing. Counterarguing was measured by coding the thoughts and feelings listed by the Ss after each message. Individual coders rated the thoughts as either "message-relevant" or "message irrelevant." Ss themselves indicated the valence of each statement, coding statements that were favorable or positive toward the Xenon bulbs (+), negative toward Xenon bulbs (-), or irrelevant or neutral toward Xenon bulbs (0). Those thoughts that were coded as message relevant and were in opposition to the valence advocated by the message were considered to be counterarguments. Thus, those thoughts after the first message, which was favorable toward the Xenon light bulb, that were message relevant and negative were considered to be counterarguments. Similarly, those thoughts listed after the second message that were message relevant and positive (as the second message was unfavorable toward the Xenon bulb) were considered as counterarguments. This procedure parallels that of Millar and Millar (1990).

Analyses

Data were analyzed using a number of methods. The thoughts listed by each subject were coded twice, using two separate coding schemes and two separate sets of coders. The first coding scheme sought to identify the type of thoughts and emotions that were listed by each subject. Two independent coders coded all of the thoughts as being affective, cognitive, both, or neither. Initially, only the two categories of affect and cognition were to be included in the coding scheme. Coders were instructed to code feelings and emotions as being affective (e.g., makes me feel warm and cozy, I'm bored) and to code non-emotional information, reasons given for liking or disliking the objects as cognitive (e.g., economical product, light bulb is recyclable). It was discovered, however, that, as the statements listed by the subjects were brief and may have only consisted of one word, there were occasions when it was not possible to determine whether the subject was implying something that would be coded as affective, or that would be coded as cognitive. Such comments (e.g., suspicious, dangerous) were coded as being both. In addition, some comments listed by the Ss were either irrelevant to the study, or did not fit in any of the three categories described above. Thus, the category (to be used infrequently) "neither" was added. The comments that were coded in this category included statements irrelevant to the attitude object (e.g., extra credit is good, I like extra credit)[10]. Interrater reliability for this coding task was calculated using Cohen's kappa, and equaled .93. Disagreements were resolved by discussion of the two coders.

The second coding scheme was established in order to determine the relevance of each comment. Two independent coders coded each statement as being either message

relevant or message irrelevant. Those statements coded as message relevant were statements having to do with the attitude object, repetition of information provided in the message, or statements that the coders judged would not have been listed had the Ss not read the message (e.g., suggesting the message was too long, remarking on their distaste for the name of the fictitious company, Reyovan, etc.). Message irrelevant statements included those that were not directly linked to the message and were deemed to arise from forces other than the message itself (e.g., I'm bored, I'm hungry). Interrater reliability for this second coding task was calculated using Cohen's kappa and equaled .87. Disagreements were resolved by a third coder.

The results of the induction check analysis were analyzed using Millar and Millar's (1990) procedure. Ss' attitudes toward the Xenon bulb were classified as being either affective or cognitive by a majority rule. Thus, if a subject checked two items (out of three items checked) that were previously determined to be affective positive, then the subject was considered to have a favorable affective attitude toward the Xenon bulb.

Confirmatory factor analysis was used in order to test the fit of the attitude and confidence scales. ANOVA procedures and contrast analysis were employed to test the match and the mismatch hypotheses.

Chapter 4

RESULTS

Overview

Results will be presented in order to parallel the analyses. Factor analyses of the attitude items are presented, followed by the results of the induction checks and cover story analyses. ANOVA results then are presented, followed by results of the contrast analyses employed to test the mismatch and match hypotheses. An alternate explanation, the Cognitive Argument Primacy Model, is presented and tested with contrast analyses. Finally, analyses of Edwards' (1990) confidence hypothesis and Millar and Millar's (1990) counterarguing hypothesis are presented.

Preliminary analyses

In order to test the dimensionality of the attitude factor, confirmatory factor analyses were employed (Hunter & Gerbing, 1982). Upon examination of the observed correlation matrices and factor loadings, as well as the predicted correlation matrices and subsequent error values, the 15 items intended to measure attitude were inconsistent with a unidimensional factor solution (items, means, and standard deviations are listed in Appendix D). Upon inspection of the observed correlation matrices and factor loadings, three distinct, yet highly correlated factors emerged. The three factors identified using confirmatory factor analysis were labeled attitude, value/worth, and dependability.[11] Each subject responded to the 15 items twice, once after the induction message, and again following the persuasion message. Thus, two confirmatory factor analyses were performed to ensure that the three-factor model held for both sets of responses.

Confirmatory factor analyses indicated that the three-factor model was consistent with the data after both messages. The inter-item correlations with their factor loadings on the three-factors following each message, as well as the predicted and residual matrices, are presented in Appendix E.

Attitude. Attitude was measured using a 5-item scale with a reliability of $\alpha = .92$ following the induction message and a reliability of $\alpha = .97$ following the persuasion message. The five items composing the attitude scale were Likert-type scales, upon which the subjects' responses ranged from 1, indicating a dislike or lack of favor toward the Xenon bulb, to 7, indicating a liking or favorability toward the Xenon bulb.

Value/Worth. Subjects' perceptions of the value or worth of the Xenon light bulb were measured on a five-item semantic differential scale with a reliability of $\alpha = .88$ following the induction message and a reliability of $\alpha = .93$ following the counterattitudinal persuasion message. Subjects' responses were assigned values from 1, indicating a belief that the light bulb was bad and worthless, to 7, indicating that the light bulb was good and valuable.

Dependability. Subjects' perceptions of the dependability of the Xenon light bulb were measured with two semantic differential items with reliabilities of $\alpha = .81$ and $\alpha = .82$. Subjects' responses ranged from 1, indicating undependable or unreliable, to 7, indicating dependable or reliable.

Induction Checks

In order to ensure that the messages induced the type of attitude (affective or cognitive) that was intended, an item on the questionnaire asked Ss to check the three (out

of a possible 16) statements with which they most agreed. For those Ss in the affective (positive) condition, 83.3% indicated an affective positive attitude. For those Ss in the cognitive induction condition, 89.8% indicated their attitude conformed to a cognitive positive attitude.

In addition, the mean number of affective positive and cognitive positive thoughts that were coded indicated success of the attitude induction. Those Ss receiving an affective induction (and primes in the instructions) listed more affective positive thoughts ($M = 1.00$, $SD = 1.3$) than those in the cognitive induction ($M = .00$, $SD = .06$), $F(1, 583) = 173.31$, $p < .001$, $\eta^2 = .23$, $r = .48$. Those Ss receiving a cognitive induction (and cognitive primes) listed more cognitive positive thoughts ($M = 2.61$, $SD = 1.31$) than those Ss in the affective induction condition ($M = .73$, $SD = 1.04$), $F(1, 583) = 356.30$, $p < .001$, $\eta^2 = .38$, $r = .62$. Induction type did not produce any effect on the total number of thoughts that the Ss listed, $F(1, 583) = 1.23$, ns, $\eta^2 = .00$, $r = .05$.

Cover Story Analysis of Induction Messages

Three items were used to measure the ease of comprehension of the message ($\alpha = .93$). When responding to items assessing the ease or difficulty of understanding the message they read, Ss in the cognitive induction condition rated that induction message as being slightly more difficult to understand or comprehend ($M = 2.24$, $SD = 1.28$, $n = 294$) than did those Ss who were exposed to the affective induction message ($M = 1.99$, $SD = 1.10$, $n = 291$), $F(1, 583) = 6.55$, $p < .02$, $\eta^2 = .01$, $r = .11$.[12]

Initial Dependent Variable Analyses

Change scores were computed for each of the three factors identified by the confirmatory factor analysis. The attitudinal induction (message 1) was always favorable and the persuasive message (message 2) was always unfavorable. The Ss' first evaluations were subtracted from their second evaluations to obtain a difference score for the difference in attitude, difference in perceptions of value/worth, and difference in perception of dependability. The absolute value of these change scores was used for all further analyses.

Separate analyses of variance were performed on each of the three factors. For the attitude factor, ANOVA indicated main effects for induction type (cognitive or affective), $F(1, 541) = 6.06$, $p<.02$, $\eta^2 = .01$, $r = .08$, such that those Ss whose attitudes were cognitively induced were more persuaded by the persuasive arguments than were those Ss whose attitudes were affectively induced; for the presence or absence of affective arguments (in the persuasion message), $F(1, 541) = 64.23$, $p<.001$, $\eta^2 = .07$, $r = .27$, such that the presence of affective arguments was more persuasive than if there were no affective arguments; and for the presence or absence of cognitive arguments (in the persuasion message), $F(1, 541) = 203.93$, $p<.001$, $\eta^2 = .23$, $r = .48$, indicating that the presence of cognitive arguments was more persuasive than if there were no cognitive arguments present.[13] These main effects were qualified by two interactions. Analyses indicated an affective argument by cognitive argument interaction, $F(1, 541) = 63.82$, $p<.001$, $\eta^2 = .07$, $r = .27$, such that when cognitive arguments were absent, the presence of affective arguments was more persuasive than if there were no affective arguments, and

when cognitive arguments were present, the amount of attitude change was equal, regardless of the presence or lack of affective arguments. In addition, there was a cognitive argument by attitude induction interaction effect, $F(1, 541) = 8.31$, $p<.005$, $\eta^2 = .01$, $r = .10$, such that when cognitive arguments were absent, the amount of attitude change was equal, regardless of the induction type, and when cognitive arguments were present, they were more persuasive in the cognitive induction condition. Analysis of variance indicated that the three-way interaction was neither significant nor substantial, $F(1, 541) = .208$, ns, $\eta^2 = .00$, $r = .02$. Table 7 presents the obtained means, standard deviations, and cell sizes for each condition on the attitude change variable.

Table 7

Obtained Means, Standard Deviations, and Cell Sizes for Difference in Attitude

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	M = .14 SD = .85 n = 69	M = 2.16 SD = 1.59 n = 73	M = 2.52 SD = 1.52 n = 63	M = 2.55 SD = 1.38 n = 71
Cognitive Attitudinal Induction (+)	M = .24 SD = 1.02 n = 65	M = 1.97 SD = 1.46 n = 69	M = 3.18 SD = 1.52 n = 66	M = 3.15 SD = 1.48 n = 73

For the value/worth factor, ANOVA indicated no main effect for induction type (cognitive or affective), $F(1, 548) = 3.18$, ns, $\eta^2 = .00$, $r = .06$. Main effects were observed for affective arguments, $F(1, 548) = 104.96$, $p<.001$, $\eta^2 = .12$, $r = .35$, such that

the presence of affective arguments were more persuasive than the lack of affective arguments; and for cognitive arguments, $\underline{F}(1, 548) = 141.14$, $\underline{p}<.001$, $\eta^2 = .17$, $\underline{r} = .41$, such that cognitive arguments were more persuasive than the lack of cognitive arguments. These main effects were qualified by an affective argument by cognitive argument interaction, $\underline{F}(1, 548) = 46.11$, $\underline{p}<.001$, $\eta^2 = .05$, $\underline{r} = .23$, such that when cognitive arguments were absent, the presence of affective arguments caused greater change in perceptions of value/worth than did the lack of affective arguments, and when cognitive argument were present, the amount of change was equal, regardless of the presence or absence of affective arguments. In addition, there was a cognitive argument by attitude induction interaction effect, $\underline{F}(1, 548) = 6.23$, $\underline{p}<.02$, $\eta^2 = .01$, $\underline{r} = .09$, such that when cognitive arguments were absent the amount of value/worth change was equal, regardless of the type of induction, but when cognitive arguments were present, they led to greater change in perceptions when attitudes had been cognitively induced than when attitudes had been affectively induced. Analysis of variance indicated that the three-way interaction was neither significant nor substantial, $\underline{F}(1, 548) = 2.22$, ns, $\eta^2 = .00$, $\underline{r} = .05$. Table 8 presents the obtained means, standard deviations, and cell sizes for each condition on the value/worth change variable.

Table 8

Obtained Means, Standard Deviations, and Cell Sizes for Difference in Value/Worth

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	M = -.05 SD = .43 n = 67	M = 2.34 SD = 1.69 n = 69	M = 2.18 SD = 1.66 n = 68	M = 2.52 SD = 1.56 n = 74
Cognitive Attitudinal Induction (+)	M = .11 SD = .90 n = 64	M = 1.99 SD = 1.49 n = 71	M = 2.58 SD = 1.73 n = 67	M = 3.14 SD = 1.63 n = 76

For the dependability factor, ANOVA indicated main effects for induction type (cognitive or affective), $F(1, 561) = 8.12$, $p<.01$, $\eta^2 = .01$, $r = .11$, such that those Ss whose perceptions of dependability had been cognitively induced changed more than did those Ss whose perceptions had been affectively induced; for affective arguments, $F(1, 561) = 33.03$, $p<.001$, $\eta^2 = .05$, $r = .22$, such that the presence of affective arguments were more persuasive than the lack of affective arguments; and for cognitive arguments, $F(1, 561) = 42.45$, $p<.001$, $\eta^2 = .06$, $r = .25$, such that cognitive arguments were more persuasive than the lack of cognitive arguments. These main effects were qualified by an affective argument by cognitive argument interaction, $F(1, 561) = 24.54$, $p<.001$, $\eta^2 = .04$, $r = .19$, such that when cognitive arguments were absent, the presence of affective arguments caused greater change in the perceptions of dependability than did the lack of affective arguments, and when cognitive arguments were present, the amount of change was equal, regardless of the presence or absence of affective arguments. In addition, there

was a cognitive argument by attitude induction interaction, $F(1, 561) = 6.48$, $p<.02$, $\eta^2 = .01$, $r = .10$, such that there was no effect of the attitude induction when cognitive arguments were absent, but when cognitive arguments were present, Ss' perceptions of the dependability of Xenon bulbs changed to a greater extent when cognitively induced than when affectively induced. Analysis of variance indicated that the three-way interaction was neither significant nor substantial, $F(1, 561) = .27$, ns, $\eta^2 = .00$, $r = .02$. Table 9 presents the obtained means, standard deviations, and cell sizes for each condition on the dependability change variable.

Table 9

Obtained Means, Standard Deviations, and Cell Sizes for Difference in Dependability

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	M = -.03 SD = .57 n = 68	M = 1.55 SD = 1.69 n = 74	M =1.28 SD = 1.79 n = 68	M = 1.38 SD = 1.72 n = 75
Cognitive Attitudinal Induction (+)	M = .14 SD = .89 n = 66	M = 1.47 SD = 1.72 n = 72	M = 1.99 SD = 2.09 n = 69	M = 2.12 SD = 1.73 n = 77

The Mismatch Hypothesis

Attitude change. Contrast analysis was employed to test Millar and Millar's (1990) mismatch hypothesis. They hypothesized that, if the attitude and argument type were matched, in the absence of other messages, we would see little to no attitude change,

for subjects would tend to counterargue the messages that matched their attitudinal base. Thus, Millar and Millar predict that there should be a main effect for cognitive arguments when attitudes are affectively based, and a main effect for affective arguments when attitudes are cognitively based. Further, there should be a lack of effect when the attitudinal bases match the argument type. To examine the mismatch hypothesis, a statistical model was constructed, using contrasts to indicate the specific predictions of the mismatch hypothesis. These contrasts are presented in Appendix F.

Data were inconsistent with the constructed model; although there was a nontrivial effect for the contrast, $F(1, 541) = 90.23$, $p < .01$, $\eta^2 = .10$, $r = .32$, the residual explained was substantial $F(6, 541) = 43.61$, $p < .01$, $\eta^2 = .29$. Predictions of Millar and Millar's (1990) mismatch hypothesis accounted for merely 25.6% of the explained sum of squares.

As noted earlier, there was a main effect of the induction such that those Ss whose attitudes were cognitively induced demonstrated a greater amount of attitude change than those Ss whose attitudes were affectively induced. Millar and Millar would neither have expected nor hypothesized this main effect for induction. Thus, a second contrast analysis was performed, allowing for this main effect of induction (see Appendix F for contrast coefficients). Again there was an effect for this contrast $F(1, 541) = 100.82$, $p < .01$, $\eta^2 = .11$, $r = .34$, yet the residual explained was substantial $F(6, 541) = 41.84$, $p < .01$, $\eta^2 = .28$, and a mere 28.7% of the explained sum of squares were explained using these adjusted contrasts. Thus, Millar and Millar's (1990) mismatch hypothesis was inconsistent with the data.

Focusing on the four cells that are central to the test of the mismatch hypothesis (i.e., the four pure cells where Ss received (1) either an affective or cognitive induction and (2) either an affective or cognitive persuasive argument), when attitude type and argument type are matched, the mismatch hypothesis predicts little to no attitude change. In this study there was attitude change in both of those cells (M = 2.16 for affective induction/affective persuasion and M = 3.18 for cognitive induction/cognitive persuasion). Indeed, when Ss with a cognitively induced attitude received cognitive persuasive arguments, their attitude changed to a greater extent (M = 3.18) than in any other of the pure categories. The attitude change in these cells, then, accounts for the large residual and the failure of the contrast model developed from the mismatch hypothesis.

Difference in Evaluation of Value/Worth. As confirmatory factor analyses indicated the existence of a value/worth factor, contrast analyses were performed on this factor as well.[14] Contrast analysis was employed to test the precise hypothesis. Data were again inconsistent with the constructed model. Contrast analysis indicated that although there was a nontrivial effect for the contrast, $F(1, 548) = 94.56$, $p<.01$, $\eta^2 = .11$, $r = .33$ (explaining 30.9% of the explained sum of squares), the residual explained variance was substantial, $F(6, 548) = 35.30$, $p<.01$, $\eta^2 = .25$. Thus, the predictions of the mismatch hypothesis were inconsistent with the data for the difference in judgments of value and worth of the Xenon bulb. Again, viewing the four pure cells, results indicate that in those cells where the mismatch hypothesis predicted little to no attitude change, attitude change was evident (M = 2.34 for affective induction/affective persuasion, and M = 2.58 for cognitive induction/cognitive persuasion).

Difference in Evaluation of Dependability. The mismatch hypothesis was again tested through contrast analysis for the third factor, that of the dependability of the Xenon bulb. The effect was minimal, $F(1, 561) = 22.48$, $p<.01$, $\eta^2 = .03$, $r = .18$ (explaining a mere 19.4% of the explained sum of squares); the residual explained was substantial, $F(6, 561) = 15.60$, $p<.01$, $\eta^2 = .14$. Contrasts allowing for the unanticipated main effect of the induction were also tested and were inconsistent with the data: $F(1, 561) = 30.97$, $p<.01$, $\eta^2 = .05$, $r = .21$(explaining 26.7% of the explained sum of squares), with residual explained $F(6, 561) = 14.19$, $p<.01$, $\eta^2 = .13$. Again, the four pure cells show where the predictions failed: those Ss whose induced attitude type matched the persuasion type reported a change in attitude where the mismatch hypothesis would have predicted little to no attitude change ($M = 1.55$ for affective induction/affective persuasion and $M = 1.99$ for cognitive induction/cognitive persuasion).

Thus, on all three factors identified in this study, difference in attitude, difference in value/worth, and difference in dependability, predictions of the mismatch hypothesis were inconsistent with the data. Therefore, the results of this study indicate that the mismatch hypothesis, that one will be more persuaded by a message that is opposite in argument type to one's underlying attitude type, was not consistent with the data.

The Match Hypothesis.

Attitude change. Contrast analysis was employed to test the match hypothesis proposed by Edwards (1990). She hypothesized that, in order to attain attitude change, it is necessary that the attitude type and the argument type match, that is, if one were to hold an affective attitude, a persuasive message, in order to be successful, would have to

include affective arguments. The match hypothesis was extended in this study to predict that if one holds a cognitive attitude toward an object, then it is necessary that the persuasive message includes cognitive arguments in order for attitude change to occur. In addition, there should also be a lack of change when the attitude type and argument type are mismatched, that is, an affective argument alone will not be persuasive for one who holds a cognitive attitude, and a cognitive argument alone will not be persuasive for one who holds an affective attitude.

To examine the match hypothesis, a statistical model was constructed, using contrasts assigned to fit the predictions of the match hypothesis. The contrast coefficients used are give in Appendix G.

Results of contrast analysis indicate that the data were inconsistent with the constructed match model. The test produced a strong effect for the contrast, $F(1, 541) = 172.51$, $p<.01$, $\eta^2 = .19$, $r = .44$; however, the residual explained was substantial, $F(6, 541) = 29.89$, $p<.01$, $\eta^2 = .20$, and only 49% of the explained sum of squares from the ANOVA analysis were explained. Contrasts were assigned to account for the unexpected main effect of the induction (see Appendix G for contrast coefficients). This test produced a strong effect for the contrast, $F(1, 541) = 195.64$, $p<.01$, $\eta^2 = .22$, $r = .47$, yet the residual explained was substantial at $F(6, 541) = 26.04$, $p<.01$, $\eta^2 = .18$, and only explained 55.6% of the explained sum of squares.

Viewing the four pure cells allows us to ascertain where the predictions of the match hypothesis and its corresponding model failed. When attitude type and argument type are mismatched, the match hypothesis predicts little to no attitude change. In this

study there was attitude change in both of those cells (M = 2.52 for affective induction/cognitive persuasion and M = 1.97 for cognitive induction/affective persuasion).

Difference in Evaluation of Value/Worth. Edwards' match hypothesis was also tested on the factor that assessed the difference in the evaluation of the value or worth of the Xenon light bulb after being exposed to both messages (favorable and unfavorable). Again a strong effect for the contrast was produced, $F(1, 548) = 159.59$, $p<.01$, $\eta^2 = .19$, $r = .43$ (explaining 52.1% of the explained sum of squares), yet the residual explained was substantial as well $F(6, 548) = 24.45$, $p<.01$, $\eta^2 = .17$. The four pure cells again allow us to see where the predictions of the match hypothesis were inconsistent with the data (M = 2.18 for affective induction/cognitive persuasion and M = 1.99 for cognitive induction/affective persuasion).

Difference in Evaluation of Dependability. The final variable, the difference in dependability of the Xenon bulb, presented here as a change score, fared as did the other factors. There was a nontrivial effect for the contrast $F(1, 561) = 58.17$, $p<.01$, $\eta^2 = .09$, $r = .29$ (explaining 50.1% of the explained sum of squares); however, the residual explained was nontrivial as well, $F(6, 561) = 9.65$, $p<.01$, $\eta^2 = .09$. Employing contrasts that accounted for the unexpected main effect of induction did not change these results: the effect of the contrast was nontrivial at $F(1, 561) = 69.29$, $p<.01$, $\eta^2 = .10$, $r = .32$ (explaining 59.7% of the explained sum of squares), yet the residual was nontrivial as well, $F(6, 561) = 7.79$, $p<.01$, $\eta^2 = .07$. The large residual can be explained by viewing the pure cells and the amount of attitude change that occurred where the match hypothesis would

have predicted little to no attitude change (M = 1.28 for affective induction/cognitive persuasion and M = 1.47 for cognitive induction/affective persuasion).

Thus, on all three factors identified in this study, difference in attitude, difference in value/worth, and difference in dependability, predictions of the match hypothesis were inconsistent with the data. Therefore, the results of this study indicate that the match hypothesis, that one will be more persuaded by a message containing an argument that is consistent with the one's attitudinal basis, was not consistent with the data.

The Cognitive Argument Primacy Model

As neither the match nor the mismatch hypotheses were consistent with the data, the means were inspected to determine if an alternate explanation of the data could be found. Upon inspection, a three-way interaction was evident. Initial ANOVA analyses had indicated the lack of a three-way interaction. Because the three-way interaction that was observed in these data was not the crossover interaction that an ANOVA would have predicted, a contrast analysis was employed to test the observed interaction.

When cognitive arguments were absent (in the second message the Ss received) there was a main effect for affective arguments such that those Ss who received affective arguments indicated a greater amount of attitude change (M = 2.07, SD = 1.53, n = 142) than those Ss who did not receive affective arguments (M = .19, SD = .93, n = 134), F(1, 272) = 150.03, p <.001, η^2 = .35, r = .60. In addition, when cognitive arguments were absent there was no effect of the type of induction, such that Ss with an affectively induced attitude indicated an equal amount of attitude change (M = 1.18, SD = 1.63, n =

142) as did those Ss with a cognitively induced attitude (M = 1.13, SD = 1.53, n = 134), $F(1, 272) = .10$, ns, $\eta^2 = .00$, $r = .02$.

When cognitive arguments were present, a main effect for the type of induction was observed such that those Ss whose attitude was cognitively induced indicated a greater amount of attitude change (M = 3.16, SD = 1.50, n = 139) than those Ss whose attitude was affectively induced (M = 2.54, SD = 1.44, n = 134), F (1, 269) = 12.33, p <.002, $\eta^2 = .04$, $r = .21$. In addition, when cognitive arguments were present there was no effect for the presence or absence of affective arguments: Ss indicated an equal amount of attitude change when affective argument were present (M = 2.85, SD = 1.46, n = 144) as they did when affective argument were absent (M = 2.86, SD = 1.55, n = 129), $F(1, 269) = .001$, ns, $\eta^2 = .00$, $r = .00$.

Such results indicate that cognitive arguments are more important and effective in changing attitudes toward a novel object, particularly when the attitude has been cognitively induced. This importance of the cognitive arguments overrode any effect of the affective arguments. When cognitive arguments were present there was no effect for the presence or absence of affective arguments, regardless of induction condition. Affective arguments were only effective in changing attitudes when they were presented in the absence of cognitive arguments. When Ss had no cognitive arguments presented to them, they did attend to the affective arguments and were persuaded by the affective arguments, to a lesser extent than by the cognitive arguments. Therefore, it is hypothesized that cognitive arguments are primary in attitude change processes when Ss are presented with persuasive messages. Contrast coefficients were assigned to test the

observed interaction, and the resulting model was named the Cognitive Argument Primacy (CAP) model (contrast coefficients are presented in Appendix H). This test provided a strong effect for the contrast $F(1, 541) = 343.13$, $p<.01$, $\eta^2 = .38$, $r = .62$, and the residual explained was trivial, $F(6, 541) = 1.46$, ns, $\eta^2 = .01$. This Cognitive Argument Primacy Model explained 97.5% of the explained sum of squares.

Contrast analyses were also employed to test the factors of value/worth and dependability, using the change scores calculated for the above analyses. Results were consistent with those of the attitude factor. Contrast analysis indicated that the CAP model was consistent with the data for the difference in value/worth, $F(1, 561) = 114.39$, $p<.01$, $\eta^2 = .17$, $r = .41$, with a trivial residual, $F(6, 561) = .28$, ns, $\eta^2 = .00$. The CAP model explained 98.5% of the explained sum of squares. The difference in dependability (again, using the change scores) produced parallel results for the CAP model: $F(1, 548) = 295.62$, $p<.01$, $\eta^2 = .35$, $r = .59$; residual again was trivial, $F(6, 548) = 1.79$, ns, $\eta^2 = .01$. The CAP model explained 96.5% of the explained sum of squares for the difference in judgments of dependability of the Xenon light bulb after reading both messages.

Confidence in Judgment.

The questionnaire completed by subjects also included items designed to assess their confidence in the judgments that they made. A four-item scale was used to assess Ss' confidence in their judgments, $\alpha = .93$. Edwards (1990) hypothesized that subjects with affective attitudes would be more confident in their judgments. Of the two studies she performed, one study produced results consistent with her hypothesis. Edwards' confidence hypothesis was tested using ANOVA. Analyses indicate that there was a main

effect for the attitude induction; however, it was in the opposite direction of that predicted by Edwards (1990). Cognitively based attitudes were expressed with greater confidence ($M = 4.83$, $SD = 1.24$) than were affectively based attitudes ($M = 4.38$, $SD = 1.30$), $F(1, 580) = 18.27$, $p<.001$, $\eta^2 = .03$, $r = .17$ following the attitude induction. Thus, Edwards' (1990) hypothesis regarding confidence in judgment was inconsistent with these data.[15]

Counterarguing Explanation

Millar and Millar (1990) indicated that their mismatch hypothesis was based upon a cognitive response approach. In particular, they hypothesized that those subjects who were exposed to counterattitudinal messages that matched their attitudinal base of the attitude would be more likely to counterargue the message presented to them, and would thus profess a lesser degree of attitude change. Millar and Millar (1990) assessed counterarguments in their study by utilizing a thought-listing procedure, and tabulating the positive and negative thoughts listed after the counterattitudinal message. A similar process was employed here. As the attitudes in this study were induced, and not preexisting, as they were in Millar and Millar's study, the thoughts were coded to be not only positive or negative (neutral was also an option), but were also coded message relevant or message irrelevant. By using such a coding scheme, those thoughts that were listed that were either outside the realm of the study (e.g., students writing down their thoughts that they were stressed for finals, that they were tired, etc.) or those that were triggered by the study but were not relevant to the messages provided (e.g., in the affective conditions, subjects were asked to list the feelings that they experienced while reading the message, a number of students noted that they were hungry or tired) were

eliminated. Thus, the following analyses used those messages that were coded by independent coders as being message relevant.

In order to assess the extent of counterarguing, those relevant thoughts listed that were opposite in valence to the information presented in the message were tallied. Analyses were performed following the first message (attitude induction) in order to determine a baseline of counterarguing, and following the second (persuasive) message. Results indicated a lack of effect for the induction with regard to counterarguing. Those Ss receiving the affective favorable induction recorded an equal number of negative thoughts ($M = .56$, $SD = .88$, $n = 291$) as did those receiving the cognitive favorable induction ($M = .70$, $SD = 1.10$, $n = 294$), $F(1, 583) = 3.21$, ns, $\eta^2 = .01$, $r = .07$.

In order to test Millar and Millar's counterarguing hypothesis after the second (persuasive) message, only those cells where there was a distinct match (affective induction/affective persuasive argument, cognitive induction/cognitive persuasive argument) or a distinct mismatch (affective induction/cognitive persuasive argument, cognitive induction/affective persuasive argument) were assessed.[16]

Those subjects with an affectively induced attitude produced more relevant positive thoughts after receiving the negative affective counterattitudinal message (match condition) ($M = .26$, $SD = .58$, $n = 74$) than those who were exposed to negative cognitive counterattitudinal messages (mismatch condition) ($M = .10$, $SD = .35$, $n = 70$), $t(142) = 1.92$, $p = .05$. Those Ss with cognitively induced attitudes also produced more relevant positive thoughts after the negative affective counterattitudinal message (mismatch condition) ($M = .30$, $SD = .64$, $n = 74$) than those who were exposed to

negative cognitive counterattitudinal messages (match condition) ($\underline{M}$ = .11, $\underline{SD}$ = .46, $\underline{n}$ = 71), $\underline{t}(143) = 1.99$, $\underline{p}<.05$. Results indicate that those who were exposed to negative affective counterattitudinal arguments consistently produced more positive thoughts than those exposed to negative cognitive counterattitudinal arguments, a finding that is inconsistent with Millar and Millar's (1990) hypothesis that subjects will consistently counterargue more with argument types that match their attitudinal base.

Chapter 5

DISCUSSION

Overview

This experiment served to test the conflicting hypotheses regarding the effect of affective and cognitive arguments on affectively based and cognitively based attitudes. Results indicated that neither the existing mismatch hypothesis of Millar and Millar (1990), nor Edwards' (1990) match hypothesis, were consistent with the data. Inspection of the means led to the proposal of a Cognitive Argument Primacy Model, and contrasts were assigned and tested and the proposed CAP model was found to be consistent with the data when the differences in attitudes, perceptions of value and worth of the attitude object (the Xenon bulb), and perceptions of the dependability of the bulb were assessed.

The Mismatch Hypothesis

Millar and Millar (1990), arguing from a cognitive response approach, postulated that if a counterattitudinal argument of the same type (i.e., affective or cognitive) as one's attitudinal base is presented, this "counterattitudinal argument will challenge the adequacy of the person's appraisal of the object either by a direct contradiction of his or her beliefs (feelings) or by pointing out aspects of the object that he or she has failed to consider" (Millar & Millar, 1990, p. 217-218). Further, they suggest that this challenge will lead one to counterargue the information that is presented. As such, Millar and Millar (1990) expect that if an argument threatens the way one has thought about an object, one will be motivated to counterargue, and thus there would be little to no attitude change in such a condition. Citing Petty, Ostrom, and Brock (1981), Millar and Millar (1990) suggest that,

if one is motivated to counterargue, the counterarguments generated may well overwhelm the persuasive information presented.

The data in this study were inconsistent with Millar and Millar's (1990) mismatch hypothesis. In the absence of a mismatched argument type, Millar and Millar (1990) hypothesize that there will be little or no attitude change. Nevertheless, data indicate that when Ss with affectively induced attitudes were presented with affective counterattitudinal persuasive messages, not only was there attitude change, contrary to Millar and Millar's prediction, but also the amount of this attitude change was equal to that observed when the Ss were presented with cognitive (mismatched) counterattitudinal arguments.

Similarly, when Ss with cognitively induced attitudes were presented with cognitive counterattitudinal persuasive messages, attitude change was observed again. Indeed, when cognitive counterattitudinal arguments were present, for Ss who received a cognitive induction, there was no difference between the amount of attitude change Ss indicated when those cognitive counterattitudinal arguments were paired with an affective counterattitudinal arguments and when the cognitive arguments were presented in the absence of affective arguments. Further, when Ss who held a cognitively induced attitude were presented with an affective counterattitudinal argument only (in the absence of a cognitive argument), there was significantly less change than when those Ss received cognitive counterattitudinal arguments, a result that is directly contradictory to Millar and Millar's mismatch hypothesis. Finally, the amount of attitude change expressed by subjects was equal in all of the following conditions: (1) affective induction/affective and cognitive persuasion (counterattitudinal arguments), (2) affective induction/cognitive

persuasion, (3) affective induction/affective persuasion, and (4) cognitive induction/affective persuasion (see Table 6 in Chapter 3 to review the cell means). When Ss received a cognitive induction and either (1) affective and cognitive persuasion, or (2) cognitive persuasion only, their attitudes changed to an even greater extent than those four options listed in the previous sentence.[17] Ergo, the mismatch hypothesis of Millar and Millar (1990) is inconsistent with the data and, particularly because of the attitude change in those cells for which Millar and Millar would have predicted no change, fails to provide an explanation for these data.

Results were also inconsistent with Millar and Millar's counterarguing hypothesis. Although those subjects with an affective attitude did produce more relevant positive thoughts following the negative affective counterattitudinal messages than did those Ss who were exposed to a negative cognitive counterattitudinal message, the same pattern was found for those Ss with a cognitive attitude (i.e., that, when presented with negative affective counterattitudinal arguments, they listed a greater number of positive thoughts than those Ss presented with negative cognitive counterattitudinal arguments). Therefore, the negative affective counterattitudinal arguments appear to elicit (or, perhaps, failed to overwhelm) more relevant positive thoughts (coded as counterarguments) than did the negative cognitive counterarguments. Analyses in this study were performed to parallel those used by Millar and Millar (1990) in their assessment of counterarguments. Such a categorization led to all statements that were message relevant and coded positive by the subjects (following the persuasive message) being coded as counterarguments. For example, after receiving the negative message, if a subject noted that he was "confident --

I have information to make a judgment" (ID# 133), this response was considered message relevant (as it related to the message and the attitude object) and was positive. This response is not necessarily a counterargument, but is counted as one per the coding scheme. Categories that specify the type of thought listed more precisely would be able to separate those comments that are message relevant and opposite in valence to the information presented in the message from those comments that advocate a position opposite to that advocated in the message.

A more developed coding scheme could include categories such as (1) counterargument (i.e., a statement that clearly advocates a position in opposition to the position presented in the message), (2) information seeking (e.g., wanting to know more about the Xenon bulb), (3) message repetition/message agreement (i.e., statements that either repeat information presented in the message or that indicate the Ss' agreement with the message, e.g., "bulb is long lasting," "I'm scared"), (4) irrelevant/ambivalent (i.e., statements that are not directly related to the message, such as "I'm hungry," or statements indicating ambivalence, such as "I don't care"), and (5) ambiguous/unknown (e.g., "message was kind of corny").

An important difference between this study and that which was undertaken by Millar and Millar (1990) is that the development of the counterattitudinal argument messages was substantially different between studies. Millar and Millar developed their cognitive and affective counterattitudinal messages for Study 1 by selecting cognitive and affective statements that were obtained during pretests, and incorporating these statements into messages that suggested that a majority (or minority) liked (or disliked) a particular

beverage. No further pilot testing of these constructed messages is indicated, thus it is impossible to determine how Ss viewed the arguments. For Study 2, Millar and Millar (1990) chose advertisements that had been published in the popular press, and had 17 students identify the advertisements as being ones that "primarily dealt with attributes of the product" (rational) or "primarily dealt with feelings generated by the product" (emotional) (p. 221). Again, no information is presented as to the Ss' assessment of the strength of the messages selected. In their third study, Millar and Millar used statements that they identified as being either cognitive arguments or affective arguments, but no details as to how these statements were developed or categorized are provided.

In contrast, the counterattitudinal messages used in this study were pilot tested to ensure that Ss perceived them to include either high affective/low cognitive content or high cognitive/low affective content. Further, the strength of each message also was evaluated in this study and results indicated that there was no difference in the strength of the message across induction or argument type (i.e., affective and cognitive).

The Match Hypothesis

Edwards (1990) presented a match hypothesis, specifically regarding affective attitudes and the subsequent influence of affective counterattitudinal arguments on these attitudes. She suggests that affective attitudes are likely to be resistant to persuasive messages that tap a cognitive dimension, for such a message may not serve to alter the underlying affective base of the attitude, much like a persuasive message focusing on a function other that that which is the basis of one's attitude (from a functional perspective) may fail in an influence attempt (Katz, 1960; Shavitt, 1990; Smith, Bruner, & White,

1956). Although Edwards only tested and discussed her match hypothesis for affectively based attitudes, for this study, the match hypothesis was extended to include cognitively based attitudes. Edwards (1990) also noted conditions where she would expect to see little or no attitude change - those conditions where the attitude and argument type did not match.

The data in this experiment were inconsistent with Edwards' (1990) match hypothesis. In the absence of a matched attitude and argument type, Edwards hypothesizes that there will be little to no change in attitude. In this study, data indicate when Ss with affectively induced attitudes were exposed to cognitive counterattitudinal arguments, not only was there attitude change, contrary to Edwards' prediction, but this attitude change was equal to the attitude change observed when Ss were presented with affective (matched) counterattitudinal arguments (see Table 6 in Chapter 3 to review the means).

Similarly, when Ss with cognitively induced attitudes were presented with affective counterattitudinal messages, they reported attitude change. More in line with the match hypothesis (although Edwards did not extend her arguments to a match of cognitive attitudes and arguments; rather, that extension was done in this study), a greater degree of change was observed when Ss with cognitively induced attitudes were presented with cognitive counterattitudinal messages than when they were presented with affective counterattitudinal messages. Therefore, based upon the results of this experiment, Edwards' match hypothesis, although appearing to hold for the cognitively induced

attitudes condition, is inconsistent with the data, as results in the affectively induced attitude condition are inconsistent with the match hypothesis.

Edwards (1990) also hypothesized that those Ss with an affectively induced attitude would hold that attitude with greater confidence than those Ss with a cognitively based attitude. Results were in direct contradiction to her hypothesis; those Ss with cognitively induced attitudes indicated greater confidence in their judgments than did those Ss with affectively induced attitudes. Edwards (1990) argued for her confidence hypothesis on the basis that affectively based attitudes are often expressed with "particularly great conviction" (Edwards, 1990, p. 204), drawing upon Zajonc's (1980) work that suggests that affectively based attitudes may, in some cases, be irrevocable. It is possible that this same conviction was lacking in this study because the affective attitudes that were induced were induced by means of a written message describing an attitude object in emotional and affect-laden terms. Edwards' affective attitudes were induced either subliminally (Study 1) or through direct experience (Study 2). Research indicates that those attitudes formed through direct experience are held with more confidence and more conviction than those attitudes formed through indirect experience (Fazio & Zanna, 1981; Wu & Shaffer, 1987). In Edwards' Study 2, the only study where her confidence hypothesis was consistent with her data, her subjects had sampled a pleasant tasting drink (the attitude object) and then smelled what was ostensibly the same drink, to find that it had a "mildly aversive smell" (Edwards, 1990, p. 209). Thus, Edwards' Ss had a greater amount of affective direct experience with the attitude object in her study than did the Ss

in this study. The Ss in this study relied on reading affect-laden or cognitively laden passages about the Xenon light bulb in order to form and change their opinion.

In both Edwards' study and the one described here, attitudes toward fairly novel objects were induced, albeit by different methods. Edwards' study differed in another way. Her subjects, in both the induction and persuasion processes, were exposed to both affective and cognitive messages. In this study, only a subset of participants was exposed to each parallel message, and this occurrence was constrained to the persuasion message. Further study is needed to assess the impact of the sequence of cognitive and affective messages in influence attempts.[18]

The Cognitive Argument Primacy Model

Upon discovery that neither the match nor the mismatch hypotheses were consistent with the data, the means were inspected to determine if there was an alternate explanation for the results. This inspection of the means led to the construction of a statistical model, named the Cognitive Argument Primacy Model. The contrasts assigned took into consideration that, in the absence of cognitive arguments, there was a main effect for affective arguments (and no effect of the attitude induction), and in the presence of cognitive arguments, there was a main effect for the induction, with the cognitive induction producing a greater amount of change on all three dependent variables than did the affective induction, and the presence or absence of affective arguments not affecting the amount of attitude change in either induction condition. The CAP model, when tested using contrast analysis, was consistent with the data for each dependent variable,

explaining from 96.5% to 98.5% of the explained sum of squares, and the residual in each case was trivial.

In this study, the measurement of attitude was more comprehensive than the measurement of either Millar and Millar (1990) or Edwards (1990). All of their studies used single-item measures to assess attitude. In Millar and Millar's studies this item was the degree to which Ss liked the attitude object (dislike -- like) and in Edwards' studies the item used was also a liking measure (did not like at all -- liked very much). This study measured attitudes toward the object using a five-item scale that assessed one's favorability toward and liking of the attitude object (α = .92, .98). In addition, this study also measured Ss' perceptions of the value and worth of the Xenon bulb, as well as their perceptions of the dependability of the bulb. The CAP model was consistent with the data across all three variables.

Edwards (1990) noted that it is important to ascertain the underlying base of an attitude if the goal is to alter that attitude. The results of this study are consistent with that need, for there was a difference as to how Ss responded to the attitude object (measured by their amount of attitude change) whether they received an affective or a cognitive induction. Although these data are inconsistent with Edwards' match hypothesis, there is agreement in the need to ascertain the attitudinal base of one's attitude in order to change that attitude more effectively. This study indicated that the presence of an argument, whether affective or cognitive, regardless of one's attitudinal basis would promote attitude change. Results also indicated that there were varying degrees of attitude change.

In the absence of cognitive counterattitudinal arguments if one is presented with an affective argument (when compared to a no argument control group) equal amounts of attitude change toward a novel attitude object will be observed in both affective and cognitive attitude induction conditions.

In the presence of cognitive counterarguments, attitude change will be observed in both affective and cognitive attitude induction conditions. This attitude change, however, will be greater if one holds a cognitive attitude (as opposed to an affective attitude). Further, in the presence of cognitive counterattitudinal arguments, whether or not one is also presented with affective counterattitudinal arguments appears to be inconsequential when assessing attitude change.

The presence of cognitive counterattitudinal arguments appears to override or even nullify any effect of affective counterattitudinal arguments when viewing differences in attitudes, perceptions of value and worth, and perceptions of dependability of a novel attitude object. This presence of cognitive counterattitudinal arguments interacts with attitude type (induction) such that greater persuasion exists when the induction type is matched (cognitive induction/cognitive argument) than when it is mismatched (cognitive induction/affective arguments). There are three potential explanations for these results: (1) the cognitive induction serves to enhance the effects of the cognitive counterattitudinal arguments, (2) the effect of the cognitive counterattitudinal arguments is attenuated by the affective induction, or (3) both processes (enhancement and attenuation) are occurring simultaneously.

The next step needed is to include a control group that receives no attitudinal induction. By including this control group, one could ascertain which of these three potential explanations is consistent with the data. If the cognitive induction serves to enhance the effects of the cognitive counterattitudinal arguments, then the amount of attitude change observed in the cognitive induction/cognitive persuasion condition should be greater than that observed in a control group (no induction)/cognitive persuasion condition. Alternately, if the effect of the cognitive counterattitudinal arguments is attenuated by the affective induction, the amount of attitude change observed in the affective induction/cognitive persuasion condition should be less than that observed in a control group/cognitive persuasion condition. Finally, if both processes of enhancement and attenuation are occurring simultaneously, then both of the above predictions should be observed.

Processing Capacity as a Function of Task Difficulty

One model that attempts to explain subjects' processing of persuasive messages is Kahneman's (1973) Capacity Model of Attention [also referred to as the Elastic Capacity Model (Stiff, 1986)]. This parallel processing model postulates that the capacity available to process a given task (although having an upper limit) expands to fit the difficulty of the task (Kahneman, 1973; Stiff, 1986). Further, this model suggests that people are able to process multiple stimuli simultaneously, and that they will divide their overall processing capacity between primary and secondary tasks. Those persons who are engaged in processing a task of greater difficulty will not only exert more effort, leading to a larger available amount of processing capacity, but also will focus more of that capacity on the

primary task, leaving little capacity available to process a secondary task (Kahneman, 1973; Stiff, 1986).[19]

Applying the premise of the Elastic Capacity Model (i.e., expansion of processing capacity as a function of task difficulty) to the results of this study engenders a potential explanation of these results. If the cognitive induction triggers subjects to believe that they are encountering a task of greater difficulty than those Ss in the affective induction condition, the Elastic Capacity Model would propose that those subjects presented with a cognitive induction would have a greater capacity available to them to process future messages about the attitude object. As the cover story for this study dealt with the readability and the ease of comprehension of the messages, items are available to determine whether or not Ss perceived a difference in the difficulty of the cognitive and affective messages. As reported in the results, subjects in the cognitive induction condition rated that induction message as being more difficult to understand or comprehend than did those subjects who were exposed to the affective induction message

In addition, a cognitive induction may trigger Ss to attend primarily to further cognitive information (i.e., consider the processing of cognitive information to be the primary task, and the processing of affective information to be the secondary task). Therefore, perhaps those Ss with a cognitively induced attitude had a greater amount of processing capacity available to them when they encountered the persuasive message (counterattitudinal arguments). Those subjects who received cognitive counterattitudinal arguments then may have used up their available processing capacity in evaluating the cognitive arguments. If this scenario were true, then the presence of affective

counterattitudinal arguments in conjunction with cognitive counterattitudinal arguments would not have altered the amount of attitude change (as was the case in this study) because there would be no processing capacity left over to process those secondary affective messages. Those subjects, then, with a cognitively induced attitude, when exposed to affective arguments in the absence of cognitive arguments, will focus on the affective arguments, but have substantial processing capacity available to them and subsequently determine that the affective counterattitudinal argument is not as persuasive (as the cognitive argument).

When the attitudinal induction is affective, Ss may be triggered to believe that the task is less complex, and thus less processing capacity is allotted for future messages about the attitude object. This decreased capacity may serve to place a ceiling effect on the processing of future messages. Therefore, when Ss with affectively induced attitudes are presented with counterattitudinal arguments, they may process to the full extent of the capacity that has been allocated for processing. Perhaps this capacity is not sufficient to process all of the information they receive in the counterattitudinal message, and therefore a ceiling is reached, resulting in equal amount of attitude change, regardless of the type (affective or cognitive) of counterattitudinal arguments presented (as was observed in this study). The Elastic Capacity Model indicates that one reason for failure of a persuasive message is that the demand for capacity exceeds the available processing capacity. Perhaps those Ss in the affective induction condition who were then exposed to cognitive counterattitudinal arguments were unable to process these arguments completely, due to a lack of available capacity.

Scrutiny of Persuasive Messages

As cognition and affect are considered to be separate dimensions (Becker, 1963), and it has been argued that they may be independent of each other (Zajonc, 1980), perhaps each induction is serving to prime Ss to be more attentive, or more motivated, to process similar messages that follow. Petty and Wegener (1998) would suggest that this difference can be attributed to variable levels of scrutiny. They assert that receipt of a message that matches one's attitudinal base serves to enhance message scrutiny (p. 227). Specifically, they hypothesize that subjects will pay more attention to a message if it matches their attitudinal base, and will consequently distinguish between strong and weak matching messages. Therefore, a matched message is not necessarily more persuasive than a mismatched message, as Ss are more likely to scrutinize a message matching their attitudinal base. Such scrutiny will uncover the strength of the message; thus, if a matched message is weak, it will be seen as such and will be less persuasive than a strong or weak mismatched message that has received less scrutiny (Petty & Wegener, 1998). When a message does not match one's attitudinal base, then the effects of message strength are not as pronounced.

Although Petty and Wegener (1998) assessed matches and mismatches of attitudes and arguments using a functional approach (matching high self-monitors to image appeals, and matching low self-monitors to quality appeals), in their discussion they extend their theorizing to address the conflicting results of Millar and Millar (1990) and Edwards (1990). Petty and Wegener's (1998) ad hoc explanation of the conflicting results suggests that the messages in Edwards' study were strong messages and were difficult to

counterargue, whereas the messages used by Millar and Millar were weaker messages that were easier to counterargue. Petty and Wegener conclude that message strength may account for the conflicting findings, the strong messages of Edwards being persuasive in a matched condition, and the weak messages of Millar and Millar being persuasive in a mismatched condition (where they encountered less scrutiny).

This ad hoc explanation, although one that could explain the conflicting results of prior research, fails to explain the results of this study. Post hoc tests of the perceived strength of the cognitive and affective messages used in this study indicated that there was no difference in the perceived message strength of the cognitive and affective inductions, nor was there a difference in perceived message strength of the cognitive and affective counterattitudinal persuasive (argument) messages. Thus, the scrutiny model, although it provides an ad hoc explanation for the conflicting results of Millar and Millar (1990) and Edwards (1990), fails to explain the data in this study.

Limitation

Attitudes in this study were formed by Ss reading a message that was designed to be either high in affective content and low in cognitive content or high in cognitive content and low in affective content. This study cannot claim that these affective attitudes were formed by the "primacy of affect in the formation of certain preferences" (Edwards, 1990, p. 203; Zajonc, 1980). We cannot demonstrate that affect preceded cognition in this study (Zajonc, 1980). The induction checks demonstrate that Ss in the affective induction conditions did emerge with an attitude that was primarily affective. As has been argued, affect and cognition are not at opposite ends of one continuum, and thus it is likely that

both are present to some extent during attitude formation. What this study demonstrates, if not the primacy of affect, per Zajonc (1980) and Edwards (1990) in attitude formation (induction) is the primary influence of affect (or cognition). When Ss were exposed to a high affective content/low cognitive content message they emerged with an attitude that was primarily based on affect, and when Ss were exposed to a high cognitive content/low affective content message they emerged with an attitude that was primarily based on cognition.

Practical Application

It is recognized that, when engaging in persuasive communication, a communicator may be unaware of, or unable to ascertain, the underlying base of the attitude (i.e., affective or cognitive) of the person s/he is attempting to persuade. Results from this study indicate the primacy of cognitive arguments. Regardless of the type of attitude held, cognitive arguments produced attitude change, and they produced a greater amount of attitude change when presented to Ss with cognitive attitudes than when presented to Ss with affective attitudes. Therefore, in the absence of knowledge of a person's underlying attitudinal type it is recommended that a communicator present cognitive arguments, as opposed to affective arguments.

Future Directions

The CAP model presented in this study leads to further questions about the effects of affective and cognitive arguments upon attitudes that are either affectively or cognitively based. Results from this study indicate the primacy of cognitive arguments,

but future study is needed in order to better understand the persuasive effects of affective and cognitive messages.

Other questions that remain include whether or not this CAP model will be consistent with the data when influence attempts are directed at preexisting attitudes, as opposed to attitudes induced during the experiment. This study focused on a fictitious attitude object in order to eliminate effects arising from previous knowledge about or experience with the attitude object. Research indicates differences in subjects' reactions to persuasive attempts when attitudes arise from direct experience or indirect experience (Fazio & Zanna, 1981; Wu & Shaffer, 1987). Specifically, Wu and Shaffer (1987) found that attitudes that were formed through direct experience were more resistant to change, when exposed to counterattitudinal arguments, than were those attitudes formed through indirect experience. Future research could seek to ascertain if the CAP model is consistent with the data when attitudes are formed through either indirect or direct experience.

Conclusion

The purpose of this investigation was to test conflicting hypotheses regarding the effect of affective and cognitive persuasive messages on attitudes that are either affectively or cognitively based. Specifically tested were Millar and Millar's (1990) mismatch hypothesis, which predicts that a persuasive message will be more effective if the arguments employed in the message are counter (or mismatched) to one's attitude type, and Edwards' (1990) match hypothesis, which predicts that a persuasive message will be more effective if it is matched to one's underlying attitudinal base. Contrast analyses

indicated that neither the mismatch nor the match hypotheses were consistent with the data. Inspection of the means led to the construction of the CAP model, which was then tested through contrast analyses and found to be consistent with the data. A three way interaction was observed. In the absence of cognitive arguments, there is a main effect for the presence (versus absence) of an affective counterattitudinal message, and in the presence of cognitive arguments, there is a main effect for the type of attitudinal induction. Theoretical explanations of the CAP model are discussed, including an explanation of the results using premises of Kahneman's (1973) Elastic Capacity Model. Future studies should investigate whether or not the CAP model tested here is consistent with the data when preexisting attitudes or those formed through direct or indirect experience are employed as the initial attitude.

ENDNOTES

1. Breckler (1984) also investigated the function of behavior in attitudes as well, presenting the tripartite model of attitudes (p. 1191).

2. Millar and Millar identified affectively based attitudes as being emotional and cognitively based attitudes as being rational. Their terms are used in this section to describe their results.

3. Higher means indicate greater agreement with the counterattitudinal message.

4. Millar and Millar (1990) did not provide effect sizes.

5. Means were not reported for the cognitively based attitude condition.

6. Edwards (1990) did not provide effect sizes.

7. The number of participants reported here is from both rounds of pilot tests, as all subjects received the same questionnaire regarding the induction check items. Fifty students were involved in the first round of pilot testing; 23 students were involved in the second round of pilot testing.

8. A random subsample of participants ($\underline{n} = 13$) in the first round of pilot testing also were asked to fill out an open-ended questionnaire that asked for their reaction to the study (the two pilot tests) as well as their reaction to the topic of study (the Xenon light bulb). As noted earlier, none of the Ss expressed any suspicion about the existence of a Xenon light bulb. This open-ended questionnaire took students about 5 minutes to complete. Those Ss who participated were thanked, debriefed, and dismissed *after* they had completed the open-ended questionnaire.

9. A t-test of the means in the positive message condition was performed and revealed that the difference between the means in the cognitive and affective conditions was not significant, $t(60) = 1.32$.

10. One group of Ss who participated in the study were seated in a particularly warm room with little ventilation. As a result, many of these Ss wrote statements such as "I'm hot," "This room is hot." These statements also were placed in the neither category.

11. Three of the initial 15 items, were dropped from the final three-factor model as factor analysis indicated that the three items did not measure attitudes, value/worth, or dependability.

12. Subjects responded to Likert-type items, where 1 indicated that the message was "extremely easy to read/comprehend/understand" and 7 indicated that the message was "extremely difficult to read/comprehend/understand."

13. Data were analyzed to determine if there were any order effects on the dependent variables for those Ss who received both the affective and cognitive persuasion messages (message 2). The only combination to approach statistical significance was when Ss who had a cognitively induced attitude were presented with the combined persuasive message: Those Ss who read the cognitive part of the message first expressed a greater amount of attitude change ($M = 3.48$, $SD = 1.46$, $n = 37$) than those who read the affective part of the message first ($M = 2.81$, $SD = 1.45$, $n = 36$), $F(1, 71) = 3.87$, $p<.06$, $\eta^2 = .05$, $r = .23$. This effect did not alter the pattern of results described and was thus not a threat to the findings of this study.

14. Millar and Millar did not include a value/worth factor in their analysis. It is unknown as to whether or not Millar and Millar would have predicted the same results when assessing value/worth of an object. The possibility that they would have hypothesized the same effect is, however, not inconsistent with their argument. If attitudinally inconsistent information is presented to you about an object, you are more likely to counterargue that information that matches your evaluation of that object, that is, information that is of the same type as your attitudinal base.

15. Recall that Edwards (1990) also induced either an affective or cognitive attitude in her subjects, i.e., she did not measure confidence in a preexisting attitude. As this study also induced an attitude, such analyses regarding confidence in judgment were warranted and were parallel to those analyses performed by Edwards (1990).

16. The other four conditions were eliminated because two of them were control conditions, whose Ss did not receive a counterattitudinal message, and the remaining two conditions were those in which Ss received both affective and cognitive counterattitudinal arguments, so that a test of matching versus mismatching of attitude and argument type was not possible.

17. This result approaches being described better by a match hypothesis for the cognitive induction condition, although we have seen that the match hypothesis also failed to explain the data sufficiently.

18. In this study, when Ss in the affective induction condition were exposed to both counterattitudinal messages, the order effect was neither substantial nor significant, $F(1, 69) = 1.09$, ns, $\eta^2 = .02$, $r = .12$.

19. Involvement is also considered to be a variable in effect when testing the Elastic Capacity Model. As all Ss in this experiment were exposed to messages about the same object and undertook the experiment under the same conditions, involvement may be considered equal across conditions.

APPENDICES

APPENDIX A

Items Selected for Use in Induction Check Analyses

Item	Affective Dimension M (SD)	Cognitive Dimension M (SD)	t-value (71)
Affective Positive			
Xenon light bulbs can be soothing.	3.90 (1.16)	1.90 (.95)	10.64
Xenon light bulbs are exciting.	4.08 (1.36)	1.60 (1.00)	11.46
Xenon light bulbs sound comforting.	3.47 (1.42)	1.89 (1.16)	8.05
Xenon light bulbs could be invigorating.	3.50 (1.40)	1.94 (1.03)	7.17
Cognitive Positive			
Xenon light bulbs are recyclable.	2.07 (.56)	4.38 (.91)	-11.31
Xenon light bulbs are economical.	2.04 (1.14)	4.03 (1.14)	-9.10
Xenon light bulbs seldom break.	1.65 (.89)	4.07 (1.11)	-13.84
Xenon light bulbs are long lasting.	1.66 (.93)	4.17 (1.09)	-13.55
Affective Negative			
Xenon light bulbs would make me feel uneasy.	4.03 (1.36)	1.74 (1.05)	11.50
Xenon light bulbs scare me.	4.03 (1.34)	1.72 (1.12)	10.80
I'm afraid to use Xenon light bulbs.	4.08 (1.26)	1.72 (1.02)	12.04
Xenon light bulbs make me feel anxious.	4.08 (1.27)	1.61 (.83)	13.25
Cognitive Negative			
Xenon light bulbs are hard to find in stores.	1.68 (.87)	3.74 (1.28)	-10.39
You need special equipment in order to use a Xenon light bulb.	1.40 (.80)	4.04 (1.35)	-13.52
Xenon light bulbs can only be purchased in large quantities.	1.38 (.85)	4.10 (1.30)	-14.57
Xenon light bulbs are extremely expensive.	2.10 (1.25)	3.80 (1.31)	-7.20

*Note: In the pilot tests, these statements were presented to the Ss without the word "Xenon" included in the statement.

APPENDIX B

Messages

Affective Positive (Induction)

REYOVAN is marketing a new light bulb called the Xenon bulb. When installed in lighting fixtures, the Xenon bulb creates a warm and cozy atmosphere, providing a delightful luminescence to the lighted area. The bulb emits a soft glow that is not hard on the eyes, making it easy to spend hours in its comforting glow. People who installed the Xenon bulb in their home have commented on the charming radiance the bulb gives the rooms. Furthermore, they note the welcoming warmth they feel upon entering a room lit by the Xenon bulb.

Cognitive Positive (Induction)

REYOVAN is marketing a new light bulb called the Xenon bulb. The Xenon bulb lasts up to 10 times as long as a regular incandescent light bulb, providing up to 10,000 hours of illumination. Not only does the Xenon bulb last, but it has been shown to be the most energy efficient bulb in its class, due to precise manufacturing standards at REYOVAN. When the Xenon bulb expires, you can return it to the point of purchase, and it will be returned to REYOVAN so that those reusable parts may be remanufactured for future bulbs.

Affective Negative (Argument/Persuasion)

A few people are worried about potential averse effects of the Xenon bulb. They feel squeamish about installing the bulb in their homes because they are uncertain as to any potential negative side effects that the bulb may cause over time. They are worried that the bulb may have negative effects, such as causing headaches or violent illness. These people are scared that there may be harmful effects of the Xenon bulb on their small household animals or their children. They feel apprehensive about using Xenon bulbs as lighting in their homes.

Cognitive Negative (Argument/Persuasion)

The Xenon bulb will only work in common household lights with a special adapter, which can be purchased only through REYOVAN for $169.99. When installing the Xenon bulb in lights in your home, you should be careful not to overload any one circuit, as there is a possibility that the energy required of the Xenon bulb may dominate your voltage output, which could lead to a blown fuse. Care should be taken in installing the bulb and adapter in your lighting sockets; be sure to follow the 20-page booklet of directions included with each bulb.

Filler Message (absence affective/absence cognitive argument condition)

HARLAN FABRIC, INC. is marketing a new chair fabric for release in early 1999. This luxurious fabric is manufactured specifically to cover office chairs, restaurant chairs, airline seats, easy chairs, and couches. HARLAN FABRIC, INC. intends to market this new fabric to homeowners, professional restaurateurs, office supply stores, and the airline industry. Industry executives have been told about the release of this new fabric. The makers of this fabric intend to display fabric samples at upcoming trade shows across the nation. A full description of the fabric will be released early this summer.

APPENDIX C

Instructions for Focused Reading of Messages (Millar & Tesser, 1986, 1989)

Cognitive Focus

As you read this paragraph, analyze WHY you think the way you do about the [attitude object]. That is, go over in your mind what it is about the information that you are presented that makes you think why you would like the product or not. As you are reading, think of reasons that make you like or dislike the product.

Affective Focus

As you read this paragraph, analyze HOW you feel while reading the paragraph. That is, go over in your mind how you are feeling as you read through the paragraph.

APPENDIX D

Items, means, SD of the 15 attitude items following the Induction Message

Item		Mean (SD)
1.	After reading the message, what is your reaction to the Xenon bulb? (strongly unfavorable -- strongly favorable)	5.06 (1.45)
2.	After reading the message, what is your reaction to the Xenon bulb? (strongly dislike Xenon bulb -- strongly like Xenon bulb)	5.08 (1.39)
3.	How much do you think that you would like the Xenon bulb? (not at all --- absolutely)	5.07 (1.27)
4.	How do you feel about the Xenon bulb? (strongly unfavorable -- strongly favorable)	4.98 (1.31)
5.	How would you evaluate the Xenon light bulb? (not at all favorably -- extremely favorably)	5.10 (1.23)
The Xenon light bulb is:		
6.	bad -- good	5.57 (1.26)
7.	useful -- useless (R)	5.48 (1.52)
8.	negative -- positive	5.54 (1.32)
9.	beneficial -- harmful (R)	5.50 (1.45)
10.	worthless -- valuable	5.32 (1.37)
11.	nice -- awful (R)	5.55 (1.32)
12.	pleasant -- unpleasant (R)	5.46 (1.40)
13.	dependable -- undependable (R)	5.20 (1.40)
14.	boring -- interesting	4.64 (1.58)
15.	unreliable -- reliable	5.17 (1.30)

(R) Item was reflected for analysis. N = 570.
Attitude Factor: items 1, 2, 3, 4, 5.
Value/Worth Factor: items 6, 7, 8, 9, 10.
Dependability Factor: items 13, 15.

Items, means, SD of the 15 attitude items following the Persuasion Message

Item		Mean (SD)
1.	After reading the message, what is your reaction to the Xenon bulb? (strongly unfavorable -- strongly favorable)	3.04 (1.73)
2.	After reading the message, what is your reaction to the Xenon bulb? (strongly dislike Xenon bulb -- strongly like Xenon bulb)	3.11 (1.69)
3.	How much do you think that you would like the Xenon bulb? (not at all --- absolutely)	3.08 (1.76)
4.	How do you feel about the Xenon bulb? (strongly unfavorable -- strongly favorable)	3.04 (1.70)
5.	How would you evaluate the Xenon light bulb? (not at all favorably -- extremely favorably)	3.11 (1.73)
The Xenon light bulb is:		
6.	bad -- good	3.24 (1.84)
7.	useful -- useless (R)	4.06 (1.89)
8.	negative -- positive	3.25 (1.82)
9.	beneficial -- harmful (R)	3.69 (1.86)
10.	worthless -- valuable	3.90 (1.72)
11.	nice -- awful (R)	3.78 (1.72)
12.	pleasant -- unpleasant (R)	3.71 (1.78)
13.	dependable -- undependable (R)	3.99 (1.71)
14.	boring -- interesting	4.16 (1.64)
15.	unreliable -- reliable	3.92 (1.60)

(R) Item was reflected for analysis. N = 544.
Attitude Factor: items 1, 2, 3, 4, 5.
Value/Worth Factor: items 6, 7, 8, 9, 10.
Dependability Factor: items 13, 15.

APPENDIX E

Results of the Confirmatory Factor Analysis for the Dependent Variables

The Observed Correlations and Factor Loading Matrix for the Three-Factor Model Following the Attitude Induction*

	1	2	3	4	5	6	7	8	9	10	13	15	ATT	V/W	DEP
1	56														
2	63	60													
3	60	65	73												
4	69	68	79	81											
5	65	67	80	79	78										
6	56	56	64	62	69	59									
7	43	47	49	53	53	54	54								
8	56	60	64	63	69	73	61	75							
9	41	42	45	47	48	48	60	56	49						
10	51	54	58	59	64	64	57	71	59	67					
13	42	45	51	49	56	54	58	59	58	63	68				
15	41	42	41	46	50	51	49	52	43	58	68	68			
ATT	**75**	**77**	**86**	**90**	**89**	74	59	75	53	69	58	53	100	85	67
V/W	64	67	72	73	78	77	**74**	**86**	**70**	**82**	75	65	85	100	85
DEP	50	53	56	58	64	64	65	67	61	73	**82**	**82**	67	85	100

*The numbers used to identify the items are from Appendix D. The underlined numbers in the diagonals show the reliabilities for each item (without decimals). The factor loadings complete the matrix, bolded loadings indicate an item is part of a factor where ATT = attitude, V/W = Value/Worth, and DEP = Dependability.

The Expected and Error Correlation Matrix for the Three-Factor Model Following the Attitude Induction*

	1	2	3	4	5	6	7	8	9	10	13	15
1		5	-5	1	-2	7	-4	1	-4	-1	1	0
2	58		-1	-1	-2	6	-1	4	-4	0	3	0
3	65	66		2	3	8	-5	1	-6	2	4	-6
4	68	69	77		-1	3	-4	-3	-7	-4	0	-3
5	67	69	77	80		11	-3	4	-5	2	7	1
6	49	50	56	59	58		-3	7	-6	1	0	-3
7	47	48	54	57	56	57		-3	8	-4	6	-3
8	55	56	63	66	65	66	64		-4	0	-1	-8
9	45	46	51	54	53	54	52	60		2	9	-6
10	52	54	60	63	62	63	61	71	57		6	1
13	41	42	47	49	49	54	52	60	49	57		1
15	41	42	47	49	49	54	52	60	49	57	67	

*The numbers used to identify the items are from Appendix D. In this matrix, the lower diagonal presents the expected/predicted correlations (without decimals) for items of the four factors; the upper diagonal presents the residuals.

The Observed Correlations and Factor Loading Matrix for the Three-Factor Model Following the Persuasive (Counterattitudinal Argument) Message*

	1	2	3	4	5	6	7	8	9	10	13	15	ATT	V/W	DEP
1	83														
2	89	89													
3	85	89	91												
4	85	90	94	92											
5	85	86	89	89	86										
6	81	85	84	83	83	80									
7	57	59	61	59	58	65	61								
8	80	84	84	84	84	82	89	65	81						
9	68	71	72	71	69	77	70	77	74						
10	58	61	64	62	60	69	71	70	68	65					
13	52	55	55	54	53	56	61	56	60	61	70				
15	52	52	53	53	52	55	53	54	51	59	70	70			
ATT	**91**	**94**	**95**	**96**	**93**	89	63	88	75	65	57	56	100	89	68
V/W	81	85	86	85	83	**89**	**78**	**90**	**86**	**81**	69	64	89	100	80
DEP	62	64	65	64	63	66	68	66	66	72	**84**	**84**	68	80	100

*The numbers used to identify the items are from Appendix D. The underlined numbers in the diagonals show the reliabilities for each item (without decimals). The factor loadings complete the matrix, bolded loadings indicate an item is part of a factor where ATT = attitude, V/W = Value/Worth, and DEP = Dependability.

The Expected and Error Correlation Matrix for the Three-Factor Model Following the Persuasive (Counterattitudinal Argument) Message*

	1	2	3	4	5	6	7	8	9	10	13	15
1		3	-1	-2	0	9	-6	7	-2	8	0	0
2	86		0	0	-1	11	-6	9	-1	-7	1	-2
3	86	89		3	1	9	-5	8	-1	-4	1	-1
4	87	90	91		0	7	-8	7	-2	-7	-1	-2
5	85	87	88	89		9	-7	8	-2	-7	0	-1
6	72	74	75	76	74		-4	9	0	-3	-4	-6
7	63	65	66	67	65	69		-5	3	8	9	1
8	73	75	76	77	74	80	70		0	-3	-4	-6
9	70	72	73	73	71	77	67	77		-2	2	-7
10	66	68	68	69	67	72	63	73	70		7	5
13	52	54	54	55	53	60	52	60	58	54		1
15	52	54	54	55	53	61	52	60	58	54	71	

*The numbers used to identify the items are from Appendix D. In this matrix, the lower diagonal presents the expected/predicted correlations (without decimals) for items of the four factors; the upper diagonal presents the residuals.

APPENDIX F

Contrast coefficients employed to test the predictions of the Mismatch hypothesis (Millar & Millar, 1990)

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	-1	-1	+1	+1
Cognitive Attitudinal Induction (+)	-1	+1	-1	+1

Contrast coefficients employed to test the predictions of the Mismatch hypothesis with allowance for the main effect of attitude induction

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	-1	-1	+1	+1
Cognitive Attitudinal Induction (+)	-2	+2	-2	+2

APPENDIX G

Contrast coefficients employed to test the predictions of the Match hypothesis (Edwards, 1990)

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	-1	+1	-1	+1
Cognitive Attitudinal Induction (+)	-1	-1	+1	+1

Contrast coefficients employed to test the predictions of the Match hypothesis with allowance for the main effect of attitude induction

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	-1	+1	-1	+1
Cognitive Attitudinal Induction (+)	-2	-2	+2	+2

APPENDIX H

Contrast coefficients employed to test the fit of the Cognitive Argument Primacy Model

	Absence of Cognitive Persuasive Arguments (-)		Presence of Cognitive Persuasive Arguments (-)	
	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)	Absence of Affective Persuasive Arguments (-)	Presence of Affective Persuasive Arguments (-)
Affective Attitudinal Induction (+)	-1	0	0	0
Cognitive Attitudinal Induction (+)	-1	0	1	1

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