THE ROLE OF THE AFFECTIVE AND COGNITIVE BASES OF ATTITUDES IN SUSCEPTIBILITY TO AFFECTIVELY AND COGNITIVELY BASED PERSUASION

DISSERTATION

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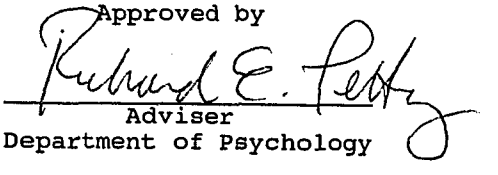

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To My Parents

Carmelo and Pauline Fabrigar

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CHAPTER I

INTRODUCTION

Overview

Persuasion is among the most pervasive forms of social interaction. Every day countless attempts are made to change our attitudes on a host of different topics. Advertisers attempt to convince us of the value of their products. Politicians try to influence our views on social policy. And, even our friends and family debate us on the merits of our favorite books, movies, and sports teams.

Given the pervasive nature of persuasion, it is not at all surprising that this topic has been of continuing interest to social psychologists in both academic and applied settings. One abiding concern of researchers in this area has been understanding what aspects of a persuasive message enhance or inhibit its ability to change attitudes. Although a number of features have been identified, one intuitively obvious feature is the extent to which the message targets the underlying basis of a person's attitude. Social psychologists have long speculated that people might hold similar attitudes but these evaluations might be based on very different psychological foundations. For example, some attitudes might be based on a person's feelings or emotions (i.e., affect) about an attitude object. Other attitudes might be based on a person's beliefs about attributes (i.e., cognition) of an attitude object. Social psychologists have suggested that depending on whether an attitude is based on affect or cognition, persuasive appeals that are primarily affective or cognitive in nature might be particularly effective.

In this introduction, past literature relevant to the issue of whether persuasion is enhanced by matching persuasive appeals to the underlying affective or cognitive bases of attitudes is discussed. This review begins by providing a very brief introduction to the constructs of affect and cognition. The role of these constructs in research on attitude structure is then discussed. In this discussion, traditional perspectives are reviewed and then contrasted with more contemporary conceptualizations of the role of affect and cognition in attitude structure. Empirical findings on the role of affect and cognition in attitude structure are then outlined. The introduction continues with a discussion of the affect/cognition distinction as a means of classifying persuasive communications. Next, the literature specifically addressing the matching and mismatching of affective and cognitive persuasive appeals to affective and cognitive attitudes is reviewed and critiqued. The introduction concludes with a statement of the purpose and underlying assumptions of the research to be presented.

The Affect/Cognition Distinction

The distinction between affect and cognition is one of the most enduring and widely used frameworks in social psychology to classify psychological constructs and processes. As with any set of constructs that have enjoyed widespread popularity among researchers, social psychologists have defined affect and cognition in a variety of ways. However, broadly speaking, the term affect has generally been used to refer to psychological constructs and processes involving the experience of emotions, feelings, and moods. In contrast, the term cognition has typically been used to refer to psychological constructs and processes involving the acquisition, storage, and retrieval of attributes of social stimuli.

The use of affect and cognition as a means of classifying human experience has a long tradition dating back to ancient times. McGuire (1968, 1985) noted that the distinction between feeling and knowing can

be traced back to the ancient Greek philosophers as well as to the religious teachings of Hinduism and Zoroastrianism. In more contemporary times, the distinction can also be found in many of the earliest writings of social psychologists such as McDougall (1908) and Bogardus (1920). The affect/cognition distinction continues to enjoy widespread popularity in social psychology having been applied in a variety of domains including the self-concept (e.g., Swann, Griffin, Predmore, & Gaines, 1987), personality (e.g., Mischel & Shoda, 1995), person perception (e.g., Fiske & Taylor, 1991), and attribution (e.g.,Fiske & Taylor, 1991).

The Affect/Cognition Distinction in Attitude Research

One of the domains of social psychology in which the distinction between affect and cognition has been particularly popular is the area of attitudes and persuasion. Within this literature, the affect/cognition distinction has primarily been applied to attitudes and persuasion research in two ways. Most notably, these constructs have been used to classify or understand the underlying structure of attitudes. In addition, these constructs have been used as a framework for classifying different types of persuasive communication.

Affect and Cognition in Attitude Structure

As much as any construct in social psychology, researchers have long debated a variety of definitions of attitudes (see Breckler & Wiggins, 1989a). For example, in their classic paper on attitude structure and change, Katz and Stotland (1959) defined an attitude as, "an individual's tendency or predisposition to evaluate an object or symbol of that object in a certain way." They went on to define evaluation as the assignment of qualities which can be mapped onto a dimension ranging from good to bad. Thus, evaluation is at the heart of Katz and Stotland's conceptualization of attitudes. More contemporary discussions of the attitude construct have continued to stress the

evaluative nature of attitudes. For example, Fishbein and Ajzen (1975) defined an attitude as, "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object." Similarly, Petty and Cacioppo (1981) defined an attitude as, "a general and enduring positive or negative feeling about some person, object, or issue." Thus, although these definitions differ in certain respects, the common feature in these and many other definitions is that attitudes are evaluative in nature. That is, attitudes reflect some overall positive or negative orientation towards an object or concept.

This view of attitudes as positive or negative evaluations of an object has dominated attitude research for decades. Perhaps nowhere is this more clearly illustrated than in the attitude measurement literature. As Ostrom (1989) noted, psychological theory and measurement are closely intertwined. Whenever a researcher adopts a particular set of measures, he or she is implicitly adopting the measures' assumptions about the underlying nature of the construct being assessed (see also Crites, Fabrigar, & Petty, 1984). A careful examination of traditional methods of attitude measurement confirms the prominence of the evaluative dimension of attitudes in research. For instance, the Thurstone Equally Appearing Interval (EAI) method (Thurstone, 1928) assesses attitudes by having respondents indicate agreement or disagreement with statements reflecting varying levels of positivity or negativity toward the attitude object. Similarly, the semantic differential method (Osgood, Suci, & Tannenbaum, 1957) has respondents rate an attitude object using bipolar scales anchored by adjectives that are highly evaluative in meaning (e.g., good/bad, positive/negative, desirable/ undesirable). Thus, most common measures of attitudes characterize attitudes in terms of their valence (i.e., positivity versus negativity) and extremity (i.e., the magnitude of deviation from neutrality).

However, if one considers this view of attitudes even on an intuitive level, it is easy to imagine that characterizing attitudes solely in terms of their valence and extremity fails to capture the full complexity of the attitude construct. That is, it seems intuitively plausible that two individuals might hold attitudes that are identical to one another in terms of their valence and extremity (e.g., two people who hold strongly negative attitudes towards nuclear power), yet these individuals could arrive at these similar evaluations for very different reasons. Consistent with this, despite most researchers' focus on the evaluative dimension of attitudes, social psychologists have long speculated that attitudes are multidimensional constructs. For instance, Thurstone (1928) noted the complexity of attitudes when he stated:

> It will be conceded at the outset that an attitude is a complex affair which cannot be wholly described by any single numerical index. For the problem of measurement this statement is analogous to the observation that an ordinary table is a complex affair which cannot be wholly described by any single numerical index.

Similarly, early theoretical discussions of attitudes hypothesized that attitudes were multicomponent constructs (e.g., Katz & Stotland, 1959; Rosenberg & Hovland, 1960; Insko & Schopler, 1967) and that attitudes varied in the underlying functions they served (e.g., Katz, 1960; Katz & Stotland, 1959). Thus, although focussing on the evaluative dimension of attitudes, theorists have long conceded that such a focus provides an incomplete understanding of attitudes.

Of the various dimensions of attitudes other than evaluation that have received attention in the literature, two of the most widely recognized have been the affective and cognitive properties of attitudes. Researchers have long speculated that, to some degree, attitudes consist of or are based on affect and cognition. Affect has typically been used in contemporary attitude literature to refer to the positive or negative feelings and emotions that an individual associates with an attitude object (e.g., Breckler, 1984; Crites et al., 1994;

Ostrom, 1969). In contrast, the term cognition has generally been used in contemporary attitude literature to describe the beliefs about positive and negative attributes or characteristics of an attitude object (e.g., Breckler, 1984; Crites et al., 1994; Ostrom, 1969).

The constructs of affect and cognition have a long history in research on attitude structure. Probably the first theorist to make use of these constructs in the context of attitude structure was M. Brewster Smith (1947). In his classic paper, Smith presented a descriptive analysis of Americans' attitudes toward Russia. He argued that the "anatomy" of attitudes towards Russia could be best understood by thinking of these attitudes as composed of several components. Among the components he discussed were affect and cognition.[1] Smith defined affect as a person's feelings about Russia. He proposed that affect could be characterized in terms of its direction (i.e., approval/disapproval of Russia) and intensity (i.e., degree of concern about Russia). Thus, in this early conceptualization, affect was very similar to evaluation. In contrast, he defined cognition as a person's thoughts about Russia. He argued that cognition could be described in terms of its informational context (i.e., structure of beliefs and knowledge about Russia) and time perspective (i.e., expectations of future developments with regard to Russia).

This view that affect and cognition were two components of attitudes towards Russia was quickly adopted as a more general perspective of attitude structure by many social scientists (e.g., Harding, Kutner, Proshansky, & Chein, 1954; Kramer, 1949; Krech & Crutchfield, 1948). And later, this multicomponent perspective of attitudes was incorporated as a central feature of a number of well known theoretical discussions of attitude structure that appeared in the late 1950's and throughout the 1960's (Katz & Stotland, 1959; Rosenberg & Hovland, 1960; Insko & Schopler, 1967). These various theoretical discussions, though differing in some respects, all presented views of

attitude structure that incorporated affect and cognition as components of attitudes. Within these frameworks, affect was defined as the positive and negative feelings or evaluations about the attitude object. Cognition was defined as the beliefs about and perceptions of the attitude object. These models of attitudes proposed that affect and cognition were generally consistent with one another (Katz & Stotland, 1959; Rosenberg & Hovland, 1960; Insko & Schopler, 1967). However, some advocates of this perspective also suggested that the magnitude or strength of each component could vary from attitude to attitude (Katz & Stotland, 1959). For example, some attitudes might have a relatively weak cognitive component whereas others might have a strong cognitive component. According to some of these perspectives, attitudes that differed from one another in the strength of a particular component might function differently. For instance, Katz and Stotland (1959) hypothesized that the effectiveness of different types of persuasion would vary depending on which components were strongest.

More recent discussions of attitude structure have continued to emphasize the role of affect and cognition (e.g., Cacioppo, Petty, & Geen, 1989; Petty & Cacioppo, 1986; Zajonc & Markus, 1982; Zanna & Rempel, 1988). However, as theories of attitude structure have been refined, certain traditional theoretical notions concerning the nature of affect and cognition as well as their role in attitude structure have been challenged or modified. One major change has been in the way in which affect has been defined. Early discussions of the affective and cognitive components of attitudes conceptualized affect as relatively global and undifferentiated positive or negative feelings about the attitude object (e.g., Katz & Stotland, 1959; Insko & Schopler, 1967; Rosenberg & Hovland, 1960). Thus, there was no clear distinction between the evaluative and affective dimensions of an attitude. Although some researchers have continued to define affect either theoretically or operationally in this manner (e.g., Bagozzi &

Burnkrant, 1979; Chaiken & Baldwin, 1981; Granberg & Brown, 1989; Norman, 1975), researchers have increasingly come to view affect in a more differentiated fashion. These attitude researchers have explicitly or implicitly (i.e., via the measures utilized) conceptualized attitude-relevant affect as consisting of discrete and qualitatively distinct emotions (e.g., anger, sadness, joy) associated with an object (e.g., Abelson, Kinder, Peters & Fiske, 1982; Breckler, 1984, Breckler & Wiggins, 1989b; Crites et al., 1994; Eagly, Mladinic, & Otto, 1994; Kothandapani, 1971; Ostrom, 1969; Stangor, Sullivan, & Ford, 1991). This newer conceptualization more clearly distinguishes affect from evaluation. It also conceptualizes affect in a manner more comparable with traditional definitions of attitude-relevant cognition which has typically been defined in terms of distinct attributes of an attitude object.

A second major shift in recent theoretical discussions of the role of affect and cognition in attitude research has been researchers' assumptions concerning the underlying cognitive structure of attitudes. In early discussions of attitude structure, the attitude was viewed as consisting of affect and cognition. For example, Rosenberg and Hovland (1960) defined an attitude as a predisposition to respond to an attitude object in a particular fashion and proposed that many of these responses could be classified as affective or cognitive in nature. Thus, the attitude was not viewed as having an existence separable from its components. Instead, the components were the attitude.

More recently, some theorists have argued that attitudes are distinct psychological entities that are related to but separable from the affect and cognition relevant to the attitude object (Cacioppo et al., 1989; Petty & Cacioppo, 1986; Zanna & Rempel, 1988). For instance, Petty and Cacioppo (1986) and Zanna and Rempel (1988) defined an attitude as a categorization of a stimulus object along an evaluative dimension and proposed that this evaluation could be derived from or

based upon affect and cognition. Similarly, Cacioppo et al. (1989) have argued that attitudes are global and enduring evaluations of an attitude object that may be connected by associative links to affect and cognition. In short, these perspectives conceptualize the attitude as the global or summary positive/negative evaluation of the object and postulate that this evaluation is stored separately from the affect and cognition that led to the evaluation.[2] Like the older conceptualizations, however, these theoretical perspectives acknowledge the importance of understanding the nature of affect and cognition related to the attitude object. For example, these perspectives suggest that attitudes that are primarily based upon or most closely linked to affect may function differently than attitudes that primarily based upon or most closely linked to cognition.

Empirical Research on Bases of Attitudes

Explorations of the role of affect and cognition in attitude structure have not been confined to theoretical discussions. A substantial body of empirical research has accumulated over the years supporting the conceptual utility of distinguishing between the affective and cognitive bases of attitudes. Broadly speaking, this research has focussed on two major issues. First, some research has examined if individuals clearly distinguish between attitude-relevant affect and cognition. A second body of research has examined the consequences of affective and cognitive structure on how attitudes influence behavior and information processing.

One of the first questions that researchers grappled with in the attitude structure literature was whether individuals clearly differentiate between attitude-relevant affect and cognition. Some of this research was conducted within the context of tests of multicomponent models of attitude structure. For example, Ostrom (1969) and Kothandapani (1971) used the multitrait-multimethod approach advocated by Campbell and Fiske (1959) to establish that different

measures of the same component tended to be more highly correlated with one another than with measures of different components. Thus, affect and cognition appeared to be distinct constructs. Later tests employed structural equation modeling to assess the viability of the multicomponent perspective (Bagozzi, 1978; Breckler, 1984). For instance, Breckler (1984) used a variety of different methods of measurement including verbal rating scales and overt behavior to assess the components of attitudes towards snakes. He then used structural equation modeling to test a multicomponent model and a single evaluative component model. He found that the multicomponent model better accounted for the data and the correlation between the affective and cognitive components was .378. This confirmed that individuals did distinguish between their affect and cognition relevant to snakes.

Other research has attempted to empirically establish the distinction between affect and cognition by examining the impact of these constructs on global attitudes and/or social judgments in a number of social domains. These studies have demonstrated that although affect and cognition are correlated with one another, both constructs do have some independent influence on attitudes and social judgments. These findings have been demonstrated for attitudes and social judgments related to political candidates (Abelson et al., 1982; Granberg & Brown, 1989), social groups (Eagly et al., 1994; Stangor et al., 1991), social issues (Breckler & Wiggins, 1989b; Crites et al., 1994; Eagly et al., 1994), health behaviors (Breckler & Wiggins, 1989b), and product advertisements (Batra & Ray, 1985, 1986). Thus, there is considerable empirical support for the utility of differentiating between affect and cognition (however, for opposing evidence see Woodmansee & Cook, 1967).

Some research has also demonstrated the value of distinguishing between affect and cognition by showing that attitudes with different underlying affective and cognitive structure vary in their underlying strength. For example, some research has examined the consequences of

the amount of affect-attitude consistency and cognition-attitude consistency. Chaiken, Pomerantz, and Giner-Sorolla (1995) have shown that these two types of consistency are relatively independent of one another (r=.07 to .14). And, they have demonstrated that when both of these types of consistency are low, attitudes are relatively inaccessible in memory and have little stability over time. Similarly, Strathman (1992) has found that low levels of these two types of consistency leads to low attitude-behavior consistency.

Other research has demonstrated the utility of the affect/ cognition distinction by investigating the impact of the affective and cognitive bases of attitudes on different types of behavior. Millar and Tesser (1986, 1989, 1992) have postulated that behaviors can be divided into at least two categories: instrumental and consummatory. Instrumental behaviors are behaviors that are performed to accomplish a goal independent of the behavior itself. For example, a person might choose to play tennis not because he or she enjoys the game but as means of exercising to reduce his or her weight. Consummatory behaviors, on the other hand, are behaviors that are performed to accomplish a goal dependent on the behavior itself. For example, a person might eat ice cream not to accomplish an external goal but simply because the behavior itself is enjoyable. Millar and Tesser have shown that when attitude-relevant affect and cognition are inconsistent with one another, attitudes that are primarily affective predict consummatory behavior better than attitudes that are primarily cognitive. In contrast, when attitude-relevant affect and cognition are inconsistent, cognitive attitudes predict instrumental behavior better than affective attitudes.

Research has also suggested that the affective and cognitive bases of attitudes differentially influence people's cognitive responses to persuasive messages. For instance, Breckler and Wiggins (1991) have provided empirical evidence suggesting that the affective basis of attitudes strongly influences cognitive responses to persuasive messages

whereas the cognitive basis of attitudes is primarily a consequence rather than determinant of cognitive responses. Batra and Ray (1985) obtained evidence that suggested that the cognitive basis of attitudes toward an advertisement was a stronger determinant of purchasing intentions than the affective basis when involvement during the processing of the advertisement was high. In contrast, when involvement was low, the affective component appeared to be a stronger predictor of purchasing intentions than the cognitive component.

Affective and Cognitive Persuasive Communications

Although the affect versus cognition distinction has a long theoretical and empirical tradition in attitude structure research, it has not been confined to this area of attitude research. The affect/cognition distinction has also been used in attitude research as a means of classifying types of persuasive communication. This literature, though less extensive and well known than the affect/cognition attitude structure literature, nonetheless has a long intellectual tradition.

McGuire (1968) traced the use of the affect/cognition distinction in persuasive communication back to Aristotle. In the Rhetoric, Aristotle proposed a typology of persuasive communication. Among the categories he proposed were "pathos" and "logos". Pathos referred to appeals that involved the creation of feelings or emotions in the receiver. Logos, in contrast, involved appeals that used logical argumentation. This distinction has continued in present research with various researchers distinguishing between affective and cognitive persuasion using a variety of terminologies. Most commonly researchers have referred to these two types of communications as emotional appeals and rational appeals (e.g., Cronkhite, 1964; Hartman, 1936; Millar & Millar, 1990; Pallak, Murroni, & Koch, 1983; Roselli, Skelly, & Mackie, 1995; Weiss, 1960). However, others have used terms such as emotional/logical (e.g., Chen, 1933), motive/reasoned (e.g., Knepprath &

Clevenger, 1965), and emotional/intellectual (e.g., Ruechelle, 1958).

Empirical research examining the distinction between emotional and rational appeals has addressed several major questions. First, some researchers have been interested in investigating the extent to which the content of persuasive appeals could be classified as affective or cognitive in nature (Becker, 1963; Knepprath & Clevenger, 1965; Ruechelle, 1958). For example, Knepprath and Clevenger (1965) content analyzed the 1956 presidential campaign speeches of Dwight D. Eisenhower and Adlai Stevenson to determine the extent to which they were affective or cognitive in nature. They found that between 37% to 41% of the content of these speeches could be classified as rational arguments. In contrast, between 85% and 87% were classified as emotional arguments (some of the content was classified as both rational and emotional).

Other researchers have focussed on examining the relative impact of affective versus cognitive persuasive appeals on attitudes, behaviors, and memory. Most of these studies have found no overall difference in the impact of affective versus cognitive persuasive appeals (Chen, 1933; Eldersveld, 1956; Knower, 1935; Matthews, 1947; Weiss, 1960). For instance, Weiss (1960) compared the impact of affective and cognitive appeals arguing for harsher punishment of criminals. The affective persuasive appeal provided emotionally evocative descriptions of various cases of violent and offensive crimes whereas the cognitive persuasive appeal used data, arguments, and principles to support harsher penalties. Although manipulation checks indicated that subjects found the affective appeal to be more emotional than the cognitive appeal, both appeals produced comparable levels of willingness to endorse items reflecting harsher punishment of criminals.

A few studies, however, have found evidence that affective appeals are more powerful than cognitive appeals (Hartmann, 1936; Menefee & Granneberg, 1940). For example, Hartmann (1936) distributed two versions of a campaign leaflet supporting the socialist party that 6

psychologists had agreed were either primarily affective or cognitive in nature. Some polling stations received no leaflets, some received the affective appeal, and some received the cognitive appeal. He found that although the number of people voting for socialist candidates increased from the previous election for precincts where no leaflets were distributed (24% increase), there was a 35% increases for precincts where the cognitive appeal was distributed and a 50% increase where the affective appeal was distributed. Obviously, however, such comparisons are problematic because it is difficult to be certain that differences in the impact of appeals can be attributed to some fundamental difference in the power of affect versus cognition and not to a difference in the strength of the operationalization of affect and cognition.

In more recent years, researchers comparing affective and cognitive persuasive appeals have shifted their attention to understanding the different processes by which these two types of persuasion change attitudes. Pallak et al. (1983), for example, conducted an experiment in which they manipulated the attractiveness of the message source, the credibility of the message source, and the type of persuasive appeal (i.e., affective or cognitive appeal). The nature of the persuasive appeal was manipulated by creating a version of the message that provided facts to support the arguments and used neutral language (cognitive appeal) and a version of the message that replaced the facts with general statements and used emotionally charged language (affective appeal). They found that when subjects were exposed to emotional appeals, the message produced more attitude change when attributed to an attractive source than an unattractive source. In contrast, when subjects were exposed to the cognitive appeal, source attractiveness had no influence on attitude change. They interpreted these findings as suggesting that emotional appeals changed attitudes via peripheral cues of the persuasion context (i.e., source

attractiveness) whereas cognitive appeals changed attitudes via effortful processing of the content of the message.

Edell and Burke (1987) examined the hypothesis that attitudes toward affective advertisements were primarily determined by the feelings they produced whereas attitudes toward cognitive advertisements were predominantly determined by perceptions of characteristics of the advertisement. Edell and Burke exposed subjects to advertisements that judges had rated as either predominantly affective or cognitive. Consistent with their predictions, they found that for affective advertisements, positive and negative feelings were the most important determinants of attitudes towards the message. However, their predictions were not supported for the cognitive advertisement where they found that only negative feelings predicted attitudes toward the message.

Finally, Roselli, Skelly, and Mackie (1995) investigated the extent to which affective and cognitive persuasive appeals produce attitude change via affective and cognitive responses to the messages. Based on pretesting, they constructed an affective version and a cognitive version of a persuasive message concerning animal research. After exposing subjects to one of these types of persuasive appeals, they had subjects list the thoughts and feelings that occurred to them while reading the message. Their analyses revealed that persuasion in response to cognitive based arguments was mediated by cognitive responses to the message. In contrast, they found that persuasion in response to affective based arguments was mediated by both cognitive and affective responses to the message.

Thus, research on affective and cognitive persuasive appeals suggests that this distinction is meaningful. That is, these two types of persuasion appear change attitudes in somewhat different ways. However, research on affective and cognitive persuasion has never been integrated into a well developed theoretical perspective nor has a

clearly defined set of fundamental empirical questions emerged.

Affective/Cognitive Bases and Susceptibility To Persuasion

As outlined in the preceding sections, the affect/cognition distinction has been utilized primarily as a conceptual framework in attitude research within two contexts: classifying the bases of attitudes and classifying types of persuasive communication. Recently, however, these two distinct research traditions have become linked. Social psychologists have become increasingly interested in whether the affective and cognitive bases of attitudes influence susceptibility to different types of persuasion (Edwards, 1990; Edwards & von Hippel, in press; Millar & Millar, 1990).

Researchers have long hypothesized that some attitudes can be predominantly affective in nature whereas other attitudes can be predominantly cognitive in nature. Importantly, theorists have also argued that the underlying nature of these attitudes should make them more susceptible to some types of persuasion than to other types of persuasion. For example, Katz and Stotland (1959) distinguished between affective attitudes (i.e., attitudes with a strong affective component but a weak cognitive component) and intellectualized attitudes (i.e., attitudes with strong affective and cognitive components). They speculated that the susceptibility of these two types of attitudes to persuasion would depend on the type of persuasion used. For example, they argued that an affective attitude would be relatively impervious to cognitive persuasion but highly vulnerable to affective persuasion. In contrast, they speculated that an intellectualized attitude would be highly vulnerable to a persuasive appeal that focussed on altering cognitive structure. Similarly, Zajonc and Markus (1982) suggested that some attitudes could be formed predominantly based on affect and other attitudes could be formed predominantly on cognition. They argued that affective attitudes should be susceptible to affective persuasion but

relatively resistant to cognitive persuasion. In contrast, they speculated that cognitive attitudes should be quite susceptible to cognitive persuasion.

The Matching Hypothesis

Most social psychologists have advanced a "matching" hypothesis for how the affective and cognitive bases of attitudes should influence susceptibility to affectively and cognitively based persuasion (Edwards, 1990; Edwards & von Hippel, in press; Zajonc & Markus, 1982). That is, these researchers have proposed that persuasive appeals should be most effective when the appeal matches the underlying nature of the attitude. Thus, persuasion that is based primarily on affect should be more effective against affectively based attitudes than cognitively based attitudes. Similarly, persuasion based predominantly on cognition should be more effective when directed against cognitively based attitudes than affectively based attitudes.

Advocates of the matching hypothesis have generally supported this view based on the long-held assumption that if the psychological basis of an attitude is altered, there will be no mechanism in place to maintain the pre-existing general evaluation. Thus, the evaluation should then shift to come in line with the new affect or cognition. In contrast, if the persuasive message does not directly target the underlying basis of the attitude, the original basis may remain intact. This would result in an attitude in which the new information (either affective or cognitive) is inconsistent with the evaluation but the old information (either affective or cognitive) is consistent with the evaluation. Thus, there would still be some basis for maintaining the pre-existing evaluation.

The matching hypothesis in persuasion is not unique to the affect/cognition literature. Most notably, researchers interested in the functionalist approach to attitudes have argued that attitudes should be particularly susceptible to persuasive appeals that directly

target the underlying function that the attitude serves (e.g., Katz, 1960; Snyder & DeBono, 1985). For example, if an attitude serves a utilitarian function (i.e. assists in obtaining rewards and avoiding punishment), persuasion focussing on utilitarian aspects of the attitude object should be especially effective.

However, there are theoretical reasons to expect that matching effects might be particularly strong for affective/cognitive matching. Zajonc and his colleagues (Zajonc, 1980; Zajonc & Markus, 1982) have argued that affect and cognition represent related but partially independent psychological systems. If affect and cognition do represent independent psychological systems, it seems reasonable to expect that changes in one system would not necessarily produce changes in the other system. Thus, in the case of affect and cognition, there is a particularly compelling rationale to expect that failing to directly target the basis of the attitude might leave that basis relatively unchanged.

Empirical Evidence for Matching Effects

To date, the only evidence for affective/cognitive matching effects comes from a series of experiments reported by Edwards and her colleagues (Edwards, 1990; Edwards & von Hippel, in press). In these experiments, Edwards first attempted to create an attitude toward a novel attitude object that was either affective or cognitive in nature. She then attempted to change this initial attitude via persuasion that was either predominantly affective or cognitive in nature.

In her first experiment, Edwards (1990) accomplished this by creating affectively or cognitive based attitudes towards a Chinese ideograph. For those assigned to the affectively based attitude condition, subjects were subliminally presented with affective information (i.e., a smiling face or frowning face) and then supraliminally presented the Chinese ideograph. Subjects then read cognitive information about the ideograph that was evaluatively

consistent with the affective information and were once again presented supraliminally with the ideograph. Edwards reasoned that this procedure should produce affectively based attitudes because the affective information was presented first. She argued that the first information presented should have the greatest impact on the formation of the attitude.

Those in the cognitively based attitude condition also were subliminally exposed to the smiling or frowning face and also read the information about the ideograph. However, for these subjects, the information about the ideograph was presented first and the subliminally presented face was presented second. Thus, she argued these subjects should have cognitively based attitudes because cognitive information was presented first. Following the attitude formation procedure, subjects in both conditions completed measures of their attitude towards the ideograph.

After having established an attitude that was presumably either affective or cognitive in nature, she then attempted to change this initial attitude by exposing subjects to counter-attitudinal persuasive appeals. This was done by pairing the ideograph with a subliminally presented affective information (i.e., a smiling or frowning face) and by having subjects read negative or positive information about the ideograph. Once again, the affective or cognitive nature of the persuasion was manipulated by varying the order of information. In the affective persuasion condition, subjects were first subliminally presented a face and then supraliminally presented with the ideograph. They then read information about the ideograph and were once again supraliminally presented with the ideograph. In the cognitive persuasion condition, the procedure was the same except subjects first read the information and were exposed to the subliminal face second. Following the persuasion treatment, all subjects again reported their attitudes towards the ideograph.

Edwards found a significant interaction such that the impact of persuasive appeals was greater when the affective and cognitive appeals were presented in the same order that they had been presented during the attitude formation phase. In other words, if the attitude was formed presenting affect followed by cognition, persuasion was greater if the affective persuasion was presented prior to cognitive persuasion. In contrast, if the attitude was initially formed by presenting cognition and then affect, there was a non-significant tendency for greater attitude change when the cognitive persuasion was presented prior to the affective persuasion.

These findings were also obtained in a second experiment conducted by Edwards (1990). In this conceptual replication, Edwards brought subjects into her laboratory under the cover story that they were participating in market research. She then created a positive attitude toward a fictitious beverage by having subjects taste a pleasant tasting beverage (affective information) and read positive information about health benefits of the beverage (cognitive information). The affective/cognitive nature of the initial attitude was manipulated by having some subjects taste the beverage first and then read the information. Others read the information first and then tasted the beverage. In the persuasion phase, subjects were then asked to smell the beverage (i.e., affective information), which was made to smell bad, and to read more information about health features of the beverage (i.e., cognitive information), which was negative. The affective/cognitive nature of the persuasion was again manipulated by varying if subjects smelled the beverage first or if they read the information first. As with the first experiment, Edwards obtained a significant interaction between order at formation and order at persuasion suggesting support for the matching hypothesis (see Figure 1). Attitudes based on the affect/cognition order were changed more by persuasion in the affect/cognition order than in the cognition/affect order. In contrast, there was a non-significant

tendency for attitudes based on the cognition/affect order to be changed more by persuasion in the cognition/affect order than in the affect/ cognition order.

Edwards interpreted these data as providing partial support for the matching hypothesis. She concluded that these experiments demonstrated that affective attitudes were more susceptible to affectively based persuasion than to cognitively based persuasion. In contrast, she concluded that cognitive attitudes were equally susceptible to affectively and cognitively based persuasion, although there was a non-significant tendency for cognitively based persuasion to produce more attitude change than affectively based persuasion.

In two subsequent experiments, Edwards and von Hippel (in press) obtained results similar to those in the original Edwards' (1990) experiments. In the first experiment, apparent evidence for the matching hypothesis was obtained in a person perception paradigm using the same type of order manipulation of affective and cognitive information both at formation and persuasion. In the second experiment also conducted in a person perception paradigm, the bases of attitudes was manipulated by varying the order of information about the person that was either affective or cognitive in nature. However the affective or cognitive basis of persuasion was manipulated by asking subjects to focus on their feelings or on their thoughts in response to the same persuasive message. This experiment obtained the significant interaction between order at formation and type of focus that suggested support for the matching hypothesis.

Unfortunately, there are potential methodological problems with all four of these experiments that make it difficult to be certain that Edwards' interpretation of her data is correct. At the heart of this problem is Edwards' use of an order manipulation as a means of manipulating the affective and cognitive nature of attitudes and persuasion. The interpretation provided by Edwards rests on the

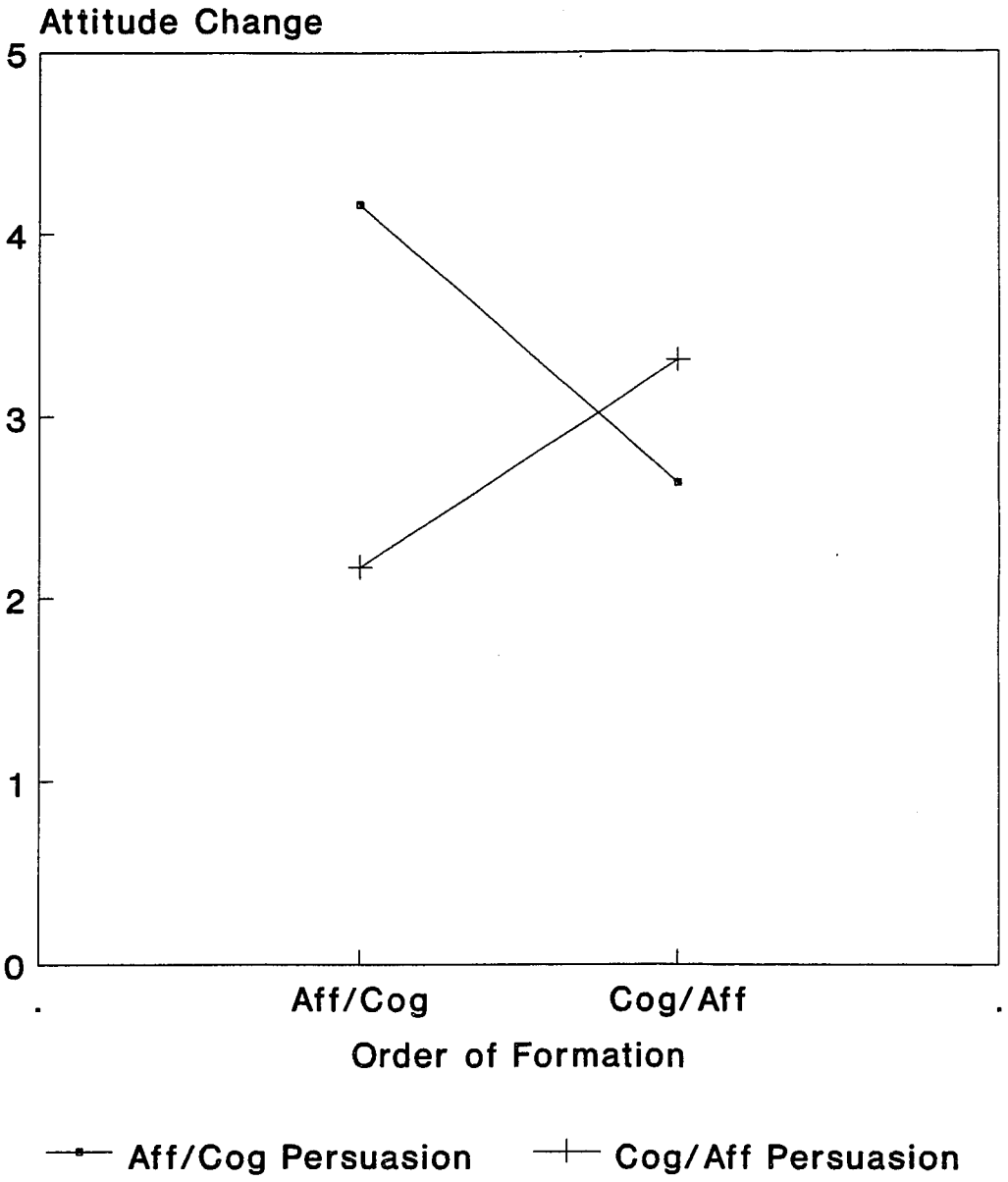


Figure 1: Attitude Change as a Function of Basis of Attitude and Type of Persuasion (Edwards, 1990)

assumption that these order manipulations produced primacy effects. That is, this interpretation assumes that whatever is presented first should have the greatest impact during both the formation and persuasion phases of the experiments. Although primacy effects have been demonstrated in persuasion paradigms as well as other contexts, recency effects have also sometimes been demonstrated (e.g., Cromwell, 1950; Haugtvedt & Wegener, 1994; Hovland & Mandell, 1957; Lana, 1961, 1963). In other words, some experiments have found that information presented last has the greatest impact. Because there were no manipulation checks of affect and cognition following these order manipulations, there is no empirical evidence to determine if the order manipulations produced primacy effects, recency effects, or no effects on the affective and cognitive bases of attitudes.

The possibility of recency effects presents possible problems for interpreting the data advanced as supporting the matching hypothesis. If the order manipulation actually produced recency effects, then Edwards' labeling of her experimental conditions should be completely reversed (see Figure 2). Thus, the recency effect interpretation also provides evidence for the matching hypothesis but unlike the primacy interpretation, this interpretation suggests that matching effects are greatest for cognitive attitudes and that affective attitudes are equally susceptible to affectively and cognitively based persuasion.

Unfortunately, the situation might be more complicated than either the primacy or recency explanations. There is no compelling theory or evidence that requires the assumption that the order manipulation must have the same influence at both the formation and persuasion phases of the experiments. For example, it is possible that the very first piece of information that a person receives about an attitude object may be particularly impactful. Thus, a primacy effect could occur at the attitude formation phase. However, as additional pieces of information are encountered, information that has been presented recently may come

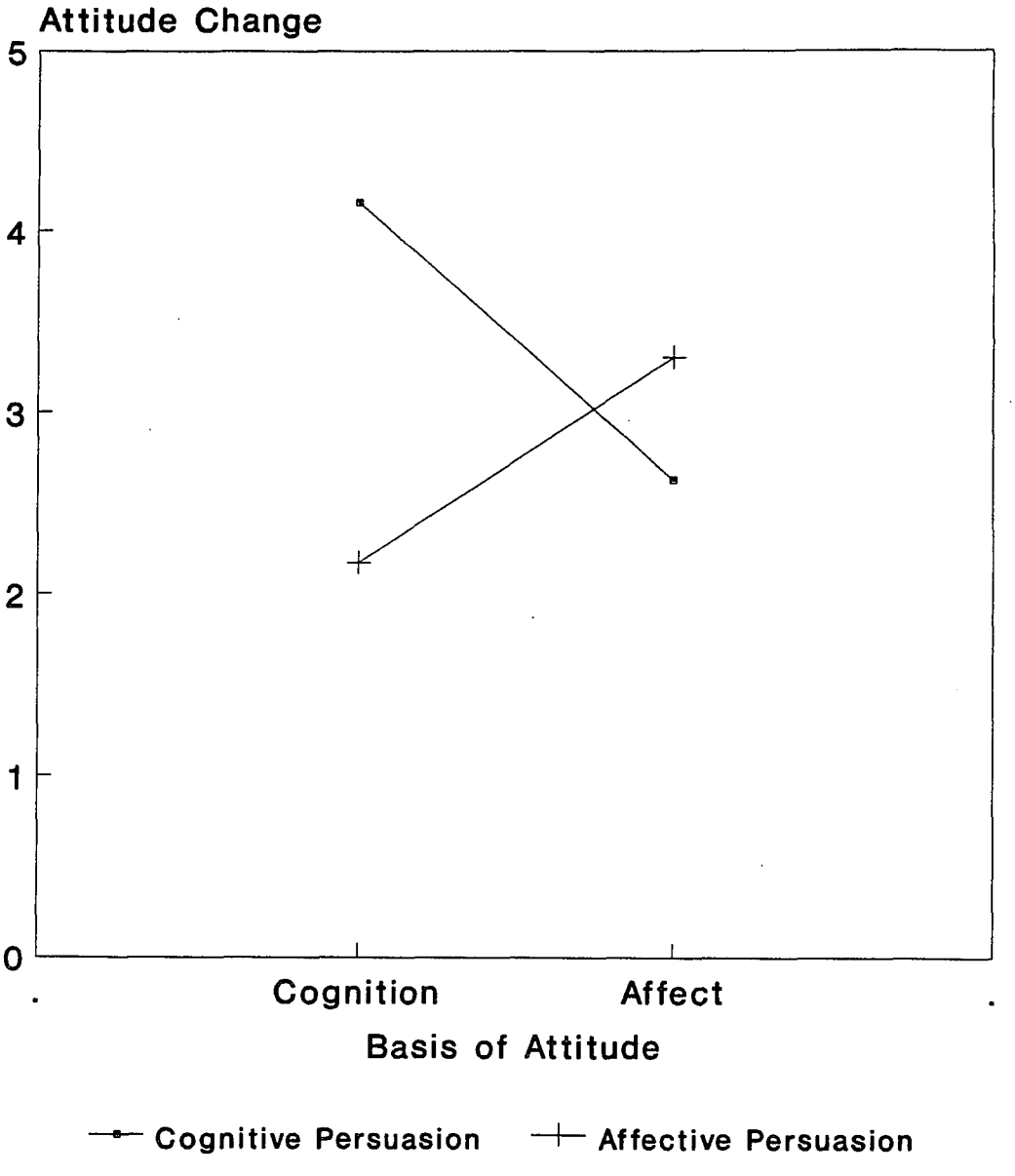


Figure 2: Recency Effect Interpretation of Edwards (1990)

to be increasingly impactful. This would result in a recency effect at persuasion. Such a scenario would be analogous to memory effects that have been demonstrated in cognitive psychology in which words presented early and late in a list are remembered better than words presented in the middle of the list (e.g., Glanzer & Cunitz, 1966).

If primacy effects occur at formation and recency effects occur at persuasion, an even more dramatic revision of the interpretation of the Edwards (1990) data is necessary (see Figure 3). In this interpretation, the labels of the bases of attitudes would remain the same but the labels of the types of persuasion would be reversed. Thus, the Edwards data would actually provide evidence for the mismatching hypothesis.

Finally, it is not clear that the attitude change results have anything to do with affective/cognitive matching or mismatching per se. Instead, it is possible that persuasion might be enhanced not by a matching of bases to persuasion but due to a matching of order. Such an order matching effect independent of affect/cognition might occur for a variety of reasons. For example, it is possible that the order of information at formation might create expectations concerning the order or sequence in which subsequent information will be presented or processed. Persuasive appeals that violate such expectations (either in the order of presentation or in instructions on what to focus on) might interfere with the processing of persuasive appeals and thus decrease persuasion.

The Mismatching Hypothesis

Although the matching hypothesis has been the dominant perspective of how the affective and cognitive bases of attitudes should moderate susceptibility to affectively and cognitively based persuasion, Millar and his colleagues have advanced and provided evidence for a competing hypothesis (Millar & Millar, 1990; Millar & Tesser, 1992). The "mismatching" hypothesis predicts that attitudes should be most

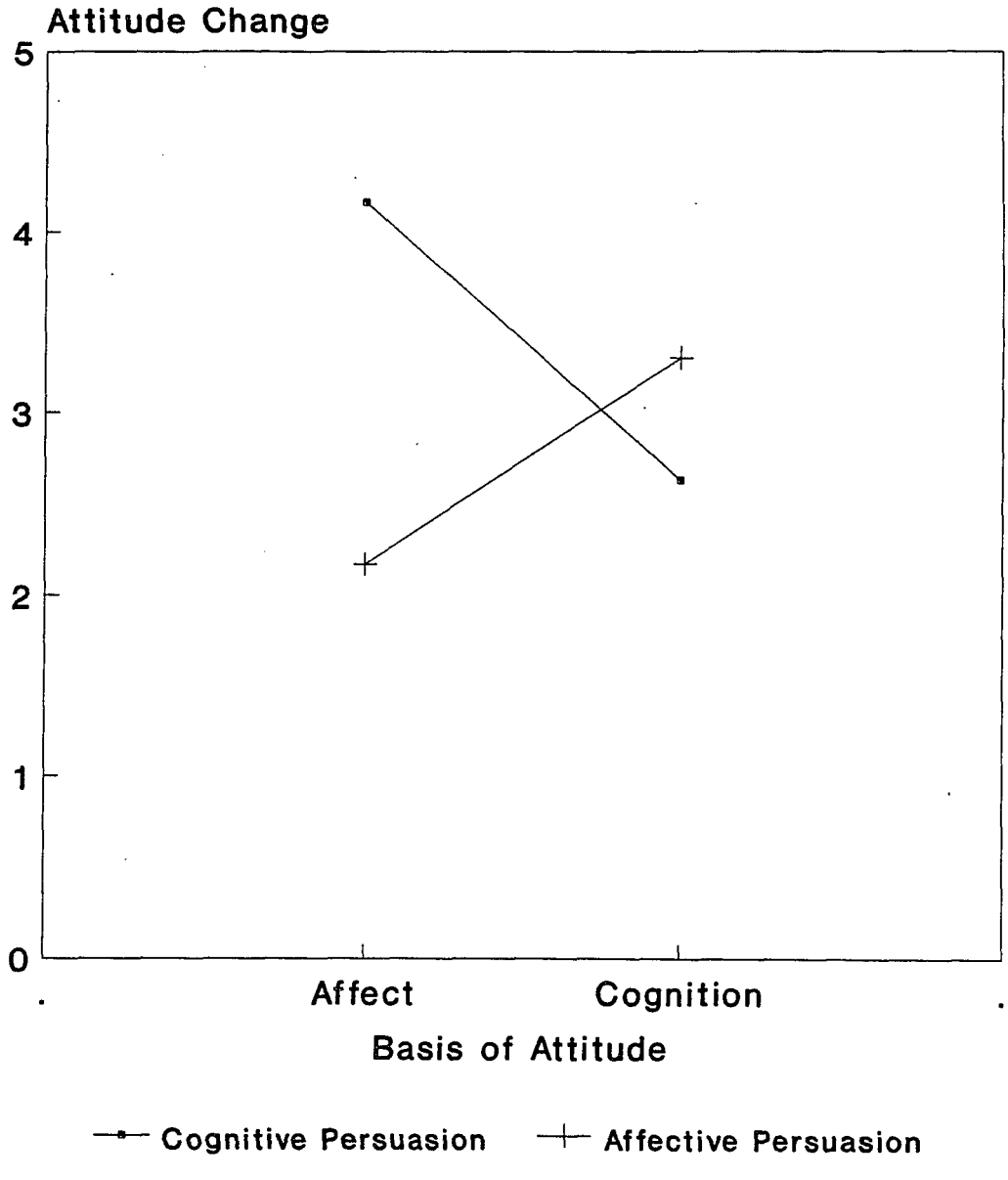


Figure 3: Combined Primacy and Recency Effect Interpretation of Edwards (1990)

susceptible to persuasive appeals that do not match (i.e., mismatch) the underlying nature of the attitude. In other words, affective attitudes should be most susceptible to cognitively based persuasion whereas cognitive attitudes should be most susceptible to affectively based persuasion.

Advocates of this hypothesis have advanced two explanations for why mismatching effects might occur. One explanation is based on the notion of counterarguing (Millar & Millar, 1990). They propose that when a persuasive appeal directly matches the underlying nature of the attitude, this threatens the way in which the person has typically thought about the object and thus challenges the adequacy of the person's evaluation. This perception of threat is likely to motivate the person to counterargue the persuasive message. That is, the person is likely to actively generate responses to resist the implications of the message. This counterarguing should lead to relatively little attitude change. In contrast, when the persuasive appeal does not directly match the underlying nature of the attitude, the appeal will not directly threaten or challenge the way in which the person has generally thought about the attitude object. Thus, there will be little motivation to counterargue the appeal and this should allow for substantial attitude change.

More recently, Millar and Tesser (1992) have offered a second explanation for mismatching effects in persuasion which they have referred to as the differential salience explanation. According to Millar and Tesser, at any point in time, a person potentially has a number of different attitudes toward an attitude object (e.g., an affective attitude and a cognitive attitude). The particular attitude that is expressed at a specific point in time depends on whether features of the situation make either the affective or cognitive component of the attitude salient. One situational factor that might influence the salience of an attitude component is a persuasive appeal.

If the appeal is predominantly affective in nature, this should make the affective component of the attitude more salient. A persuasive appeal that is cognitive in nature, on the other hand, should enhance the salience of the cognitive component. If the cognitive and affective components of an attitude are somewhat inconsistent with one another (e.g., cognition is relatively positive but affect is relatively negative), the attitude reported could be quite different depending on which component is salient at the time of measurement. Thus, when affect and cognition are inconsistent, presenting a message that mismatches the basis of the attitude might result in very different attitude than previously reported simply because the other component has been made salient. In contrast, presenting a message that matches the basis of the attitude might result in a very similar attitude because it has made the same component salient. This would result in an apparent mismatching effect such that attitude change was greatest when the persuasive appeal mismatched the basis of the attitude.

For example, when an attitude is affective in nature, presenting an affective persuasive appeal should only enhance the salience of the affective component and thereby produce an attitude report very similar to the attitude reported prior to presentation of the message. This would appear as relatively little attitude change. In contrast, if a cognitive persuasive appeal is used to change an affective attitude, this should increase the salience of the cognitive component at the expense of the affective component. Thus, the attitude reported after the message might be quite different because it is based on cognition rather than affect. This would result in what would appear to be a relatively substantial amount of attitude change. In short, this explanation postulates the existence of mismatching effects not as a function of "true" persuasion per se but as a result of accessing different attitudes towards the same object.

However, this second explanation for mismatching effects seems to be based on several questionable assumptions. First, this explanation seems to rest on the assumption that other than being sensitive to the affective or cognitive nature of the message, people ignore the actual content of the message. That is, this explanation requires that one accept the assertion that the only impact a message has is on influencing the salience of pre-existing affect or cognition and that people ignore the content of the new affect or cognition being presented. This does not seem particularly likely. As the past research on affective and cognitive messages has revealed, individuals do seem to generate cognitive and affective responses to the content of these two types of messages (e.g., Roselli et al., 1995). Indeed, the counterarguing explanation for mismatching effects rests on the assumption that people actively respond to message content.

The differential salience explanation also seems implausible in that it requires affect and cognition to be inconsistent with one another. Although this undoubtably sometimes occurs, it seems more reasonable to expect that affect and cognition will more often be consistent with one another than inconsistent. The differential salience explanation would seem to have a particularly difficult time in accounting for large attitude shifts given that it would require the assumption that most people had affect and cognition with dramatically different evaluative implications.

Finally, the differential salience explanation rests on the assumption that attitudes (i.e., global evaluations) are extremely transitory and unstable. Once again, this is probably true in some cases. However, in other cases, attitudes may be quite strong (see Petty & Krosnick, 1995). In these cases, it is difficult to imagine that well established attitudes could be substantially changed simply by shifts in the salience of components. And, when attitudes are strong, one would expect high levels of consistency among components (Chaiken et

al., 1995). Interestingly, Millar and Millar (1990) have speculated that the attitudes they have examined in their mismatching research have been relatively strong and well established attitudes.

Evidence for Mismatching Effects

Empirical support for affective/cognitive mismatching effects comes from a series of three experiments conducted by Millar and Millar (1990). In the first experiment, Millar and Millar first attempted to classify subjects' attitudes towards different beverages as primarily affective or cognitive in nature. This was done by having subjects respond to a set of 16 statements that pre-testing suggested reflected positive and negative feelings or beliefs about the target beverages. Subjects were asked to indicate the three statements that best reflected their reaction to each target beverage. Attitudes were later classified as affective if the subject endorsed statements of feeling for at least two of their three responses (e.g., the beverage makes me feel relaxed). Cognitive attitudes were defined as those attitudes in which the subject endorsed statements of belief for at least two of the their three responses (e.g., the beverage is expensive).

In a separate session, subjects returned to the laboratory where they were exposed to counterattitudinal messages for each of the target beverages. For each beverage, half of the subjects received a persuasive message that was affective in nature. This message contained emotional reasons for liking or disliking the beverage and was constructed from written comments that a separate sample of subjects had provided in a pre-testing session. The other half of the subjects received a persuasive message that was cognitive in nature. This message consisted of rational reasons for liking or disliking the beverage and were also derived from the sample of pre-test subjects. After completing the message, subjects reported their attitudes towards each of the beverages.

Millar and Millar found that this experiment provided evidence for the mismatching hypothesis. That is, when attitudes were classified as affective in nature, rational arguments produced greater attitude change than emotional arguments. In contrast, when attitudes were classified as cognitive in nature, emotional arguments tended to result in more attitude change than rational arguments.

In a second experiment, Millar and Millar replicated the basic procedure of the first experiment. However, following exposure to the message, they also had subjects list their cognitive responses to the persuasive message. This second experiment also found evidence for the mismatching effect. Importantly, consistent with a counterarguing explanation of mismatching effects, analyses of thought listings revealed that matching persuasive messages produced more negative cognitive responses than mismatching persuasive messages. Additionally, negative responses to the message were particularly predictive of post-message attitudes when the persuasive message matched the underlying nature of the attitude. In contrast, when the persuasive message mismatched the underlying nature of the attitude, there were fewer negative responses to the message and positive responses to the message more strongly predicted post-message attitudes.

In a final experiment, Millar and Millar (1990) provided evidence for mismatching effects using a somewhat different methodology. Millar and Millar had subjects solve a variety of different analytic puzzles. While completing the puzzles, half of the subjects were asked to focus on WHY they felt the way they did about each puzzle. This focus condition was designed to make the cognitive component of subjects' attitudes more salient. The other half of the subjects' were asked to focus on HOW they felt while performing each puzzle. This was designed to increase the salience of the affective component. Following completion of the puzzles, subjects completed measures of their attitudes towards the puzzles and then received persuasive messages

about the puzzles that contained cognitive arguments or affective arguments. Subjects then completed attitude measures for the puzzles.

Evidence for the mismatching hypothesis was once again obtained. When subjects were asked to focus on why they felt the way they did (i.e., cognitive focus), affective arguments produced more change than cognitive arguments. For subjects who focussed on how they felt about the puzzles (i.e., affective focus), cognitive arguments produced more change than affective arguments. Analyses of cognitive responses were also consistent with mismatching. When arguments matched the focus, more negative responses were generated and negative responses were more predictive of post-message attitudes than positive responses.

The data obtained by Millar and Millar provide consistent support for the mismatch hypothesis. However, like the evidence for the matching hypothesis, these data are not without their limitations. One limitation is the method of determining if attitudes are affective or cognitive in nature. In the first two experiments, this was done by having subjects respond to statements that raters judged to be affective or cognitive in nature and then using these responses to classify attitudes. Although raters showed high inter-rater reliability, there was no other evidence presented concerning the psychometric properties of these measures. Crites et al. (1994) have shown that some measures of attitude-relevant affect and cognition which were highly reliable and had apparent face validity nonetheless lacked other important psychometric properties (e.g., convergent validity, discriminant validity). Thus, whether the Millar and Millar measures accurately differentiate the affective and cognitive bases of attitudes or some other property of attitudes has not been clearly established.

Similarly, the validity of the focus manipulation as a means of manipulating the affective and cognitive bases of attitudes has not been fully demonstrated. To date, the validity of this focus manipulation has rested on analyses of thought listings in response to the focus

manipulation (see also Millar & Tesser, 1986, 1989). After having focussed on the attitude object, subjects who receive the cognitive focus are asked to list their reasons for liking or disliking the attitude object. In contrast, subjects in the affective focus are asked to list their feelings in response to the attitude object. Analyses have indicated that more reasons tend to be listed in the cognitive focus condition than in the affective focus condition. Similarly, more feelings tend to be listed in the affective focus condition than in the cognitive focus condition.

Interpreting these findings, however, is problematic because the wording of the thought listing measure is confounded with the focus manipulation. That is, in the cognitive focus condition, subjects are only explicitly asked to list reasons, whereas in the affective focus condition, subjects are only explicitly asked to list feelings. Thus, observed differences in the number of reasons and feelings listed across conditions could be due to the focus or to the wording of the thought listing measure. It is possible that subjects produce similar numbers of reasons and feelings in response to both focus instructions but that they tend to list more reasons or feelings across conditions because they have been explicitly instructed in the measure to list one or the other. Consistent with this explanation, Rosselli et al. (1995) have argued that the wording of thought listing instructions could bias subjects to primarily list cognition or affect even though subjects generated both types of responses. Additionally, simply demonstrating that more thoughts or feelings are listed does not mean that these responses are actually being used as the basis of the attitude. For example, an individual might list more reasons but still weight their feelings more strongly in reaching an attitude.

A second limitation of the data supporting the mismatching hypothesis is the manner in which the affective or cognitive nature of persuasive messages have been manipulated. In these experiments,

arguments were constructed by selecting reasons for liking or disliking the attitude object that, based on face validity, seemed to be either cognitive or emotional in nature. However, no evidence for the validity of these argument manipulations was provided. More importantly, based on the descriptions of affective arguments, it is not clear that these arguments can actually be defined as affective arguments in the strictest sense of the term. The affective arguments used in these experiments stated that the attitude object should cause people to feel certain affective states (e.g., happiness, nervousness). However, telling someone that an attitude object will cause them to feel a certain way is not necessarily the same as presenting an argument that actually causes them to experience an affective state related to the attitude object. For example, telling someone that the taste of a beverage will make them feel happy is not the same as having them taste the beverage and actually experience happiness in response to the beverage. Thus, if one defines an affective argument as one that produces affect toward the attitude object, it is not at all clear that the Millar and Millar (1990) persuasive messages should be considered affective arguments and not another form of cognitive arguments. Instead, both the affective and cognitive arguments used by Millar and Millar may be cognitive in nature but simply tap different dimensions of cognition related to the object.

Conclusions

Interpreting the existing evidence for affective/cognitive matching and mismatching is extremely difficult. Experiments advanced in support of both hypotheses have potential methodological limitations that render interpretations of their meaning problematic. Alternatively, if one accepts the findings of these studies at face value, one is confronted with two sets of results suggesting exactly opposite conclusions.

There are several possible resolutions to the inconsistency between these experiments. One resolution is that the evidence for either matching or mismatching is valid and that the evidence in support of the other hypothesis is due to methodological problems. However, given the problems with the evidence supporting both hypotheses, it is impossible to know which finding is the valid one. Another potential resolution is that the evidence for both matching and mismatching is valid and that there are certain conditions, not yet identified, under which matching or mismatching will occur. Millar and Millar (1990) and Edwards (1990) have speculated that matching effects may occur when the attitude is newly formed and thus relatively easy to overwhelm with a direct attack on its underlying basis. In contrast, well formed attitudes may be difficult to directly undermine because of a person's ability to draw upon extensive experience or information to effectively counterargue the message. Similarly, Petty, Gleicher, and Baker (1991) have proposed that matching effects might occur when the argument is particularly strong and can thus directly undermine the basis of the attitude. When the argument is relatively weak, however, they reason that a less direct strategy (i.e., mismatching) may be more effective, especially if the type of argument is novel to the person. Finally, it should be acknowledged that given the methodological limitations of both sets of findings, it is possible that neither evidence for matching or mismatching can be attributed to the affective/cognitive distinction per se. Thus, at this point one can not rule out the possibility that the affective and cognitive bases of attitudes have no impact on susceptibility to affectively based persuasion and cognitively based persuasion.

Overview of Dissertation

Purpose

Previous empirical research on the role of the affective and cognitive bases of attitudes in susceptibility to persuasion is

inconsistent in its findings and possibly flawed in its methodology. Thus, the purpose of the present dissertation is to clarify the role of the affective and cognitive bases of attitudes in susceptibility to affectively and cognitively based persuasion. In attempting to accomplish this goal, the experiments presented in this dissertation addressed several major research issues. First, building upon recent developments in the measurement of the affective and cognitive bases of attitudes (Crites et al., 1994), these experiments attempted to assess the validity of past manipulations of the affective and cognitive nature of attitudes. Second, using new methodologies, these experiments provided more definitive tests of the matching and mismatching hypotheses of the impact of affectively and cognitively based persuasion on affective and cognitive attitudes. Finally, these experiments explored potential moderators of when affective/cognitive matching or mismatching should occur.

Definitions and Assumptions

In addressing these research issues, these dissertation experiments are predicated on several definitions and assumptions concerning the nature of affect, cognition, and attitude. First, throughout the experiments, an attitude is defined as a relatively global and enduring evaluation of an object or concept along a dimension ranging from positive to negative. Attitude-relevant affect is defined as qualitatively distinct emotions that vary along a positive/negative evaluative continuum that are associated with the attitude object. These emotions are assumed to be, at least in part, accessible to the verbal system. Attitude-relevant cognition is conceptualized as traits or attributes of an attitude object that vary along a positive/negative evaluative continuum. These cognitions are also assumed to be, to some degree, accessible to the verbal system (see Crites et al., 1994 for similar definitions of affect and cognition).

Like Cacioppo et al. (1989), Petty and Cacioppo (1986), and Zanna and Rempel (1988), the assumption underlying these experiments is that an attitude is stored or represented separately from the affect and cognition to which it is related. Similarly, affect and cognition are separable from each other although all three constructs (i.e., attitude, affect, and cognition) are likely to have associative links with one another. Based on this view of attitude structure, an attitude that is affective in nature is assumed to be a global positive or negative evaluation to which attitude-relevant affect is more closely linked or associated than is attitude-relevant cognition. Alternatively, an affective attitude can also be a global positive or negative evaluation closely linked to attitude-relevant affect and for which little or no attitude-relevant cognition exists. In contrast, a cognitive attitude is a global positive or negative evaluation that is more closely linked to attitude-relevant cognition than attitude-relevant affect. Alternatively, positive or negative evaluations closely linked to attitude-relevant cognition and for which little attitude-relevant affect exists are also cognitively based attitudes.

Within the context of these experiments, affectively based persuasion will refer to persuasive appeals that convey relatively little information about attributes of the attitude object but attempt to alter attitudes by causing a person to experience positive or negative emotions in response to the attitude object. Thus, persuasive appeals that have emotional content (e.g., discuss emotions associated with the attitude object) but do not actually produce those emotions in a person are not considered affectively based persuasive appeals. Cognitively based persuasion will be used to refer to persuasive appeals that attempt to change beliefs about positive or negative attributes of the attitude object but create little or no emotional response to the attitude object.

CHAPTER II

EXPERIMENT ONE

Introduction

Purpose

As discussed in Chapter One, previous investigations of the role of the affective and cognitive bases of attitudes in susceptibility to persuasion have demonstrated clear differences in the magnitude of attitude change as a function of the basis of attitude and type of persuasion. The interpretation of these effects, however, has been difficult because of methodological limitations. These limitations have made it unclear as to whether effects in past research can be attributed to the affective/cognitive dimensions of attitudes per se or some other dimension(s). Additionally, even granting that the affect/cognition distinction was responsible for past results, evidence for whether this effect was a matching or mismatching effect remains inconsistent. Because of these problems, it seems sensible to begin an investigation of the affective/cognitive bases of attitudes with an assessment of the validity of past research methods used in this literature. Investigating the validity of these research methods can potentially clarify interpretations of past results and provide a basis for determining the viability of these methods for future research.

The first step in conducting Experiment One was to determine which of the past methods should be investigated. In selecting one of the past research methods to investigate affective/cognitive matching and mismatching, it was important to first clarify what attributes were desirable in a research method. In previous experiments, researchers

have taken one of two approaches to determining whether attitudes were affective or cognitive in nature. Some researchers have taken a measurement approach that assessed affect and cognition and used responses to these measures to classify attitudes (Millar & Millar, 1990). Other researchers have attempted to experimentally manipulate the affective and cognitive bases of attitudes (Edwards, 1990; Edwards & von Hippel, in press; Millar & Millar, 1990). Of these two approaches, the later rather than the former seemed most desirable. This was because the measurement approach does not allow for random assignment of subjects to affective or cognitive attitudes. Thus, any classification made according to affective and cognitive scores could be confounded with other variables. The experimental manipulation approach, on the other hand, avoids this.

Within this experimental approach, researchers have utilized two techniques. One technique has been to attempt to alter the affective and cognitive bases of existing attitudes (Millar & Millar, 1990). The second technique has been to create affective or cognitive attitudes toward a novel attitude object (Edwards, 1990; Edwards & von Hippel, in press). Although both techniques are potentially useful, the second technique seems likely to be easier to effectively implement in practice. That is, it is likely that it is easier to regulate the affective and cognitive bases of attitudes for novel attitude objects than it is for attitude objects for which individuals have pre-existing attitudes. Such pre-existing attitudes might already have both affect and cognition strongly associated with them and thus be difficult to alter in way that results in relatively pure affective or cognitive attitudes. In contrast, for novel attitude objects, the experimenter can more precisely control what, if any, affective information or cognitive information forms the basis of the attitude.

In summary, the ideal method for investigating the role of the affective and cognitive bases of attitudes in susceptibility to

persuasion was deemed to be an experimental manipulation of the bases of attitudes that could be used for novel attitude objects. Of the past methods used in this literature, the order manipulation method used by Edwards (1990) best meets these criteria. Thus, the purpose of Experiment One was to assess the validity of the Edwards' order manipulation.

Overview

Experiment One was a conceptual replication of the two experiments reported in Edwards (1990). In addition to conceptually replicating these experiments, it closely followed the specific methodology used in the second experiment reported by Edwards (1990). In this experiment, Edwards attempted to manipulate the affective and cognitive bases of attitudes during formation by varying the order in which subjects received positive affective information (i.e., tasting a pleasant tasting beverage) and positive cognitive information (i.e., written information about health benefits of a beverage). Later, in the persuasion phase, Edwards attempted to manipulate the affective and cognitive nature of persuasion by varying the order in which subjects received negative affective information (i.e., smelling an unpleasant smelling beverage) and negative cognitive information (i.e., written information about negative health attributes of a beverage).

Experiment One of this dissertation replicated this basic procedure with two modifications. First, following each phase of the experimental procedure (i.e., the formation and persuasion phases), subjects completed measures of attitude-relevant affect and cognition as well as measures of attitude. In the Edwards experiment, subjects only completed measures of attitude toward the beverage. Adding measures of affect and cognition allowed for empirical tests of whether the order manipulation influenced the affective and cognitive bases of attitudes, and if so, whether this influence was a primacy effect (as proposed by Edwards) or recency effect. A second difference was that in the

persuasion phase of Experiment One, subjects re-tasted the beverage at a different temperature rather than smelling the beverage. This made the affective information at persuasion more comparable to the affective information at formation than was the case in the Edwards experiment which paired taste against smell.

Method

Subjects

Subjects were 116 undergraduate students enrolled in an introductory psychology course at the Ohio State University. They participated in partial fulfillment of a course requirement. All participants were told that the experiment involved testing of new products currently under consideration for marketing by their manufacturers. Due to suspicion concerning the cover story, 3 subjects were excluded from analysis.[3]

Measures

Proper assessment of the validity of Edwards' order manipulation required that reliable and valid measures of affect and cognition be used. Unfortunately, until recently, relatively little attention has been directed to developing and validating measures of attitude-relevant affect and cognition (for critiques see Crites et al., 1994; Eagly et al., 1994). However, Crites et al. (1994) have recently reported evidence from two studies investigating the reliability and validity of multiple item scales that assess attitudes, attitude-relevant affect, and attitude-relevant cognition. These scales have been designed to be relatively general measures of attitudes, affect, and cognition that can be applied across a wide range of attitude objects. Because of this, these scales contain a wide range of evaluative terms, emotions, and attributes to insure that at least some subset of items for each scale will be appropriate for most attitude objects. Obviously, however, the particular evaluative terms, emotions, and attributes that are most applicable is likely to vary among different attitude objects.

The research by Crites et al. (1994) has supported the conclusion that the scales provide adequate and comparable quality of measurement of attitudes, affect, and cognition across a wide range of attitude objects including types of animals (e.g., snakes), social issues (e.g., capital punishment), and academic topics (e.g., literature). In addition, their data have indicated that each of the three scales has high and comparable levels of reliability across attitude objects. Exploratory factor analyses also provided evidence of good convergent and discriminant validity across attitude objects. Finally, the scales were found to successfully detect experimental manipulations of the affective and cognitive bases of attitudes.

Building upon the work of Crites et al. (1994), Experiment One used modified versions of their attitude, affect, and cognition scales (see Appendix A). These measures were identical to the Crites et al. (1994) multi-response checklist versions of their scales with the exception that a 7-point response format was used rather than the original 3-point response format. Analyses by Crites et al. (1994), however, have found no appreciable influence of response format on the reliability or validity of these scales.

Affect measure. Attitude-relevant affect was measured using a 16 item scale. This scale asked respondents to indicate the extent to which 16 different emotions described how the attitude object made them feel. Half of the emotions were positive emotions (e.g., happy, excited) and the other half were negative emotions (e.g., tense, angry). Subjects recorded their responses on a 1 to 7 scale with verbal labels of "not at all" for 1 and "definitely" for 7. Affect scores were computed by reverse coding negative items and then summing the item responses. This score was then divided by the number of scale items to produce a score ranging from 1 to 7 with higher numbers reflecting greater positivity.

Cognition measure. Attitude-relevant cognition was assessed using a 14 item scale. This scale asked respondents to indicate the extent to which 14 different traits or characteristics described the attitude object. Half of the traits were positive traits (e.g., useful, safe) and the other half were negative traits (e.g., harmful, worthless). Subjects recorded their responses on a 1 to 7 scale with verbal labels of "not at all" for 1 and "definitely" for 7. Cognition scores were computed by reverse coding negative items and then summing the item responses. This score was then divided by the number of scale items to produce a score ranging from 1 to 7 with higher numbers reflecting greater positivity.

Attitude measure. Attitudes were measured using an 8 item scale consisting of different words reflecting general and undifferentiated positive or negative evaluation. Subjects were asked to indicate the extent to which each of the words described their overall evaluation of the attitude object. Half of the words implied positive evaluations (e.g., good, positive) and the other half implied negative evaluations (e.g., dislike, undesirable). Subjects recorded their responses on a 1 to 7 scale with verbal labels of "not at all" for 1 and "definitely" for 7. Attitude scores were computed by reverse coding negative items, summing the item responses, and dividing the summed score by the number of scale items. This created a score ranging from 1 to 7 with higher numbers reflecting greater positivity.

Cognitive responses. Cognitive responses were obtained by asking subjects to list all thoughts and feelings that occurred to them while evaluating the product (see Appendix A). These responses were later coded by two independent raters. Each rater coded these responses according to whether they were attitude object relevant/irrelevant, positive/negative/neutral, and affective/cognitive. For each subject, the number of responses within each category as well within each combination of the categories (e.g., relevant-positive-cognition) was

computed. Overall indices for categories of cognitive responses for each subject were then computed by averaging the coding results for each subject across the two raters.

Need for Cognition. Subjects' motivation to effortfully process persuasive messages was assessed using the 18 item need for cognition scale (see Appendix A). The need for cognition scale was designed to measure the extent to which people enjoy thinking (Cacioppo & Petty, 1982). Empirical research has indicated that this individual difference is a strong predictor of people's likelihood of effortfully and carefully processing persuasive messages (for a review see Cacioppo, Petty, Feinstein, & Jarvis, in press). Inclusion of the scale allowed for tests of whether the amount of effortful processing that subjects engaged in influenced the impact of matching order on the amount of attitude change. Need for cognition scores were computed by reverse coding negative items and summing responses. Subjects were divided into high and low groups based on a median split.

Presentation of measures. After the attitude formation phase, all subjects completed measures of attitude, affect, and cognition. Although all subjects completed the attitude scale first, the order of the affect and cognition scales was counterbalanced. After completing the attitude, affect, and cognition measures, all subjects then completed a series of filler questions concerning past consumer behavior related to beverages (see Appendix A).

Following the persuasion phase of the experiment, each subject completed measures of attitude, affect, and cognition in the same order that he or she completed the scales following the attitude formation phase. Subjects were then asked to provide cognitive responses. Finally, subjects completed the short form of the need for cognition scale (Cacioppo, Petty, & Kao, 1984).

Procedure

The design of Experiment One was a 2 (order of affect and cognition at formation: affect/cognition vs. cognition/affect) x 2 (order of affect and cognition at persuasion: affect/cognition vs. cognition/affect). Subjects participated in groups ranging from 1 to 4 people. Upon arriving at the laboratory, all participants were verbally informed that they were participating in an experiment being jointly conducted by a team of market researchers and psychologists (see Appendix A). They were told that the purpose of the experiment was to find out peoples' opinions concerning several new products currently being considered by their manufacturer for public marketing. Subjects were informed that they would be evaluating a new brand of beverage and a new brand of cookie. The first product that subjects evaluated was the beverage. This product was the target product for the purpose of the experiment and was given the same name used in the original Edwards experiment, "Power-Plus".

In the attitude formation phase, half of the subjects were randomly assigned to first taste a pleasant tasting beverage (affective information) and then read positive information about health benefits of the beverage (cognitive information). For the taste portion of the formation phase, subjects were first asked to cleanse their palettes for purposes of taste testing. This was done by instructing them to sip from a small cup of water that was provided. This minimized the aftertaste of any previously consumed beverage or food and enhanced the realism of the cover story. They then were instructed to taste an extremely cool sample of 50 ml of the commercially marketed beverage, "Hawaiian Punch Blue". Subjects were led to believe that they were tasting a sample of Power-Plus cooled to a temperature of 35 degrees Fahrenheit (see Appendix A for taste instructions). Subjects were told that this temperature was slightly colder than that maintained by the average refrigerator. The beverage was served in a covered container

labeled "Product A". The sides of each container were completely covered by the label and the opening of the container was covered with a lid containing a straw. This prevented subjects from seeing the beverage. For the written information portion of the experiment, subjects were instructed to carefully read a passage containing positive background information about the beverage (see Appendix A for cognitive information). This passage stressed the purity of the beverage and the fact that it was made entirely with natural ingredients. It also mentioned that the beverage contained essential minerals and vitamins. Subjects in the cognition/affect order condition tasted the same beverage and read the same information, but merely did so in the opposite order. After having tasted the beverage and read information, all subjects completed measures of attitude, affect, and cognition.

In the second phase of the experiment, the persuasion phase, subjects were exposed to negative affective information (re-tasting the beverage but with an unpleasant taste) and exposed to negative cognitive information (negative written information about the beverage's chemical properties; see Appendix A). In the taste portion of the persuasion phase, subjects once again rinsed their mouth with water prior to sampling the beverage. They then tasted another sample of Hawaiian Punch Blue. However, to make the beverage unpleasant tasting, the 50 ml of the beverage was mixed with 10 ml of vinegar (reduced with water to 5% acidity) and 1/3 ml of table salt. The beverage was served at a temperature slightly colder than room temperature. Subjects were told that they were sampling Power-Plus at a temperature of 41 degrees Fahrenheit and that 41 degrees was the temperature of a typical beverage a few minutes after it had been removed from the refrigerator.[4] For the written information part of the persuasion phase, subjects read a passage discussing chemical properties of the beverage (see Appendix A). This passage discussed the fact that the ingredients of the beverage were temperature sensitive and that the drink rapidly spoiled as it

warmed. The passage stated that as the beverage spoiled, the process could be detected by its unusual color and the presence of impurities. The passage mentioned that the only way to avoid having the beverage spoil was to store it at a temperature colder than that of the typical refrigerator.

Half of the subjects were randomly assigned to taste the beverage first and then read the information. The other half were randomly assigned to read the information and then taste the beverage. All subjects completed measures of attitude, affect, and cognition following the persuasion phase. They then provided cognitive responses and completed the need for cognition scale.

After evaluating the beverage, subjects were then asked to evaluate an ostensibly new brand of cookie called "Bunch O'Chips". Subjects rinsed their mouth with water and then sample tasted the cookie (i.e., a commercially marketed chocolate chip cookie). They then completed measures of attitudes towards the cookie. Because the evaluation of the cookie was only a filler task, no experimental manipulations were conducted for this part of the experiment and no analyses were conducted on evaluations of the cookie. After evaluating the cookie, all subjects were thoroughly debriefed about the purpose and procedures of the experiment.

Results

Hypotheses

There were two major hypotheses tested in Experiment One. First, Edwards' assumption that presenting affective information prior to cognitive information creates affective attitudes and presenting cognitive information prior to affective information creates cognitive attitudes was assessed. Second, matching hypothesis that affective attitudes should be most susceptible to affective persuasion and cognitive attitudes to cognitive persuasion was examined.

Descriptive Statistics

Before examining the major hypotheses of Experiment One, the mean, standard deviation, and Cronbach alpha for the attitude, affect, and cognition scales within the two attitude formation conditions were computed (see Table 1). This was done primarily to establish that both orders created comparable attitudes but also establish the reliability of the scales across conditions. An examination of columns one and four in row one reveals that the mean attitude following the formation phase of the experiment was identical across the two order conditions, $t(1, 111) = 1.00$, $p = .32$. Thus, the attitudes in the two conditions were indistinguishable from one another in terms of their valence and extremity. Additionally, the variance in attitude scores (see columns two and five) across formation conditions was of similar magnitude although there was a weak tendency for greater variance when subjects encountered affective information first, $F = 1.61$, $p = .08$.

The comparison of the mean affect score across conditions was not significant, $t(1, 111) = .99$, $p = .33$, nor was the comparison of the variance of these scores significant, $F = 1.04$, $p = .90$. Similarly, the mean cognitive scores were identical, $t(1, 111) = .60$, $p = .55$, as was the variance in both scores, $F = 1.02$, $p = .96$. Finally, an examination of columns three and six reveals that the reliabilities of the three scales as indexed by Cronbach alpha were of comparable magnitude across conditions.

Analyses of Affective/Cognitive Bases of Attitudes

To test the hypothesis that the order of presentation of affective information and cognitive information influenced the affective and cognitive bases of attitudes, two types of analyses were undertaken (for a similar approach, see Crites et al., 1994). The first approach computed discrepancy scores between affect and attitude scores and between cognition and attitude scores. Differences in these mean scores across attitude formation conditions were then examined. The second

Table 1

Experiment 1: Means, standard deviations, and Cronbach alphas for attitude, affect, and cognition scales by attitude formation condition

	Affect/Cognition Order			Cognition/Affect Order		
Scale	Mean	SD	Alpha	Mean	SD	Alpha
Attitude Scale	5.92	1.16	.89	6.12	0.91	.94
Affect Scale	5.43	0.82	.87	5.58	0.84	.85
Cognition Scale	5.59	0.87	.89	5.69	0.87	.88

analysis employed multiple regression to use the affect and cognition scales to predict attitudes.

Analysis of discrepancy scores. The first analysis conducted to assess the viability of the primacy hypothesis was an analysis of discrepancy scores. In this analysis, two sets of discrepancy scores were examined. First, the discrepancy between the attitude score and the affect score was obtained. This was done by computing the absolute value of the difference between each subjects' attitude and affect scores. This created a score that could range from 0 to 6. The second discrepancy score was a discrepancy between the attitude score and the cognition score. This score was also created by computing the absolute value of the difference between the two scores and also produced a score with a possible range from 0 to 6. These two types of discrepancy scores provided an index of the consistency between each of the bases of the attitude and the overall attitude. Small numbers indicated that there was little discrepancy (i.e., high consistency) between the attitudinal basis and the overall attitude. If the Edwards' hypothesis that the basis of the attitude should be determined by what is presented first is correct, one would expect that when the affective information (i.e., taste) was presented prior to cognitive information (i.e., written information about health aspects of the beverage), the discrepancy between affect and attitude should have been lower than the discrepancy between cognition and attitude. In contrast, when the cognitive information was presented prior to the affective experience, one would predict that the discrepancy between cognition and attitude should have been lower than the discrepancy between affect and attitude. In other words, one would expect a significant interaction between the order of presentation and the type of discrepancy score.

Table 2 shows that this hypothesis was not supported by the analysis of discrepancy scores. An examination of the mean discrepancy scores across the two orders indicated that the means were in the

Table 2

Experiment 1: Mean affect-attitude discrepancy scores and mean cognition-attitude discrepancy scores by attitude formation condition

Type of Score	Affect/Cognition Order	Cognition/Affect Order
Affect-Attitude	.74	.66
Cognition-Attitude	.73	.63

direction of a larger affect-attitude discrepancy score than a cognition-attitude discrepancy score in both orders. These means were tested in a 2 (type of discrepancy score: affect-attitude vs. cognition-attitude) x 2 (attitude formation order: affect/cognition vs. cognition/affect) mixed design ANOVA. This analysis revealed that the interaction between type of discrepancy scores and attitude formation order was not significant, $F(1, 111) = .02$, $p = .88$. Additionally, a comparison of the affect-attitude scores across orders was not significant, $t(1, 111) = -.76$, $p = .45$. A comparison of the cognition-attitude scores across orders was also not significant, $t(1, 111) = -.85$, $p = .40$. Finally, contrasts between the affect-attitude and cognition-attitude discrepancy scores within each order condition revealed that scores were the same within the affect/cognition order, $F(1, 111) = .11$, $p > .20$, and within the cognition/affect order, $F(1, 111) = .01$, $p > .20$. In short, the various analyses of the discrepancy scores suggested that the order manipulation had no impact on the affective and cognitive bases of attitudes. Furthermore, these analyses also suggested that both bases were equally consistent with the attitude.

Multiple regression analyses. The second set of analyses used to assess the impact of the order manipulation on the affective and cognitive bases of attitudes was a series of multiple regression analyses. Subjects were divided into two separate samples based on whether their initial attitude had been formed in the affect/cognition order or the cognition/affect order. Next, within each sample, a multiple regression analysis was conducted in which scores on the affect and cognition scales were used to predict scores on the attitude scale. If Edwards' primacy assumption is correct, when the affective information (i.e., taste) preceded cognitive information (i.e., written information about health aspects of the drink), the ability of the affective scale relative to the cognitive scale to predict attitudes

should have been enhanced. In contrast, when cognitive information preceded the affective information, the primacy hypothesis predicts that the ability of the cognitive scale relative to the affective scale to predict attitudes should have been enhanced. On the other hand, if order had no effect on the underlying bases of attitudes, the ability of the scales to predict attitudes relative to one another should not vary across the two order conditions.

There were two types of comparisons in Table 3 that were undertaken to assess the viability of the hypothesis that the order manipulation influenced the affective and cognitive bases of attitudes. The first of these involved an examination of the coefficients within each condition. If order influenced the bases of attitudes as Edwards expected, the affect scale should have been a better predictor of attitudes than the cognition scale within the affect/cognition order. In contrast, within the cognition/affect order, the cognition scale should have predicted attitudes better than the affect scale. In other words, the difference between the affective and cognitive coefficients should have reversed across the two order conditions.

An examination of Table 3 shows that this pattern of coefficients was not obtained. The unstandardized regression coefficient for the affect scale in both orders was a large positive coefficient that was highly significant. The unstandardized coefficient for the cognitive scale within both orders was also statistically significant but it was of a somewhat smaller magnitude. Thus, there was no apparent reversal in the magnitude of the affect coefficient relative to the cognitive coefficient across the two orders. Nonetheless, to statistically test this possibility, separate tests of the difference between the affect and cognition coefficients within each of the orders were conducted (for a description of this test, see Cohen & Cohen, 1983; Kenny, 1979). The effect size for the difference tests within each order was then computed. This indicated that the effect size of the difference between

Table 3

Experiment 1: Unstandardized regression coefficients for affect and cognition predicting attitude by attitude formation condition

	Affect/Cognition Order	Cognition/Affect Order
Predictor	Coefficient	Coefficient
Affect Scale	.71***	.60***
Cognition Scale	.35*	.32**
R^2	.49	.60
N	56	57

* p < .05
** p < .01
*** p < .001

the affect and cognition coefficients was r=.18 for the cognition/affect order (with a positive effect size indicating a larger affect than cognition coefficient) and r=.15 for the affect/cognition order. The difference in these two effect sizes was then tested across orders to determine if the relative difference in coefficients reversed across the two orders (see Rosenthal, 1990). This test was not significant, $\underline{Z}$ = .19, $\underline{p}$ = .85.

A second comparison in Table 3 that was relevant to whether order influenced the bases of attitudes was to compare the coefficient for the same scale across the two orders. This comparison provided a test of a relative effect. That is, it assessed whether the ability of the same scale (e.g., affect) to predict attitudes changed depending on the order in which affective information and cognitive information was presented. These across condition comparisons also failed to demonstrate evidence of a primacy effect. Turning first to the affect scale (row 1 of Table 3), a test of the difference between the magnitude of the unstandardized coefficients across the two orders was not significant, $\underline{Z}$ = .14, $\underline{p}$ = .89 (for a description of this test, see Cohen & Cohen, 1983). The cognitive coefficient also did not significantly differ across the two orders, $\underline{Z}$ = .50, $\underline{p}$ = .62. Thus, there was no evidence that order had any influence, either primacy or recency, on the affective and cognitive bases of attitudes.[5]

Attitude Change Results

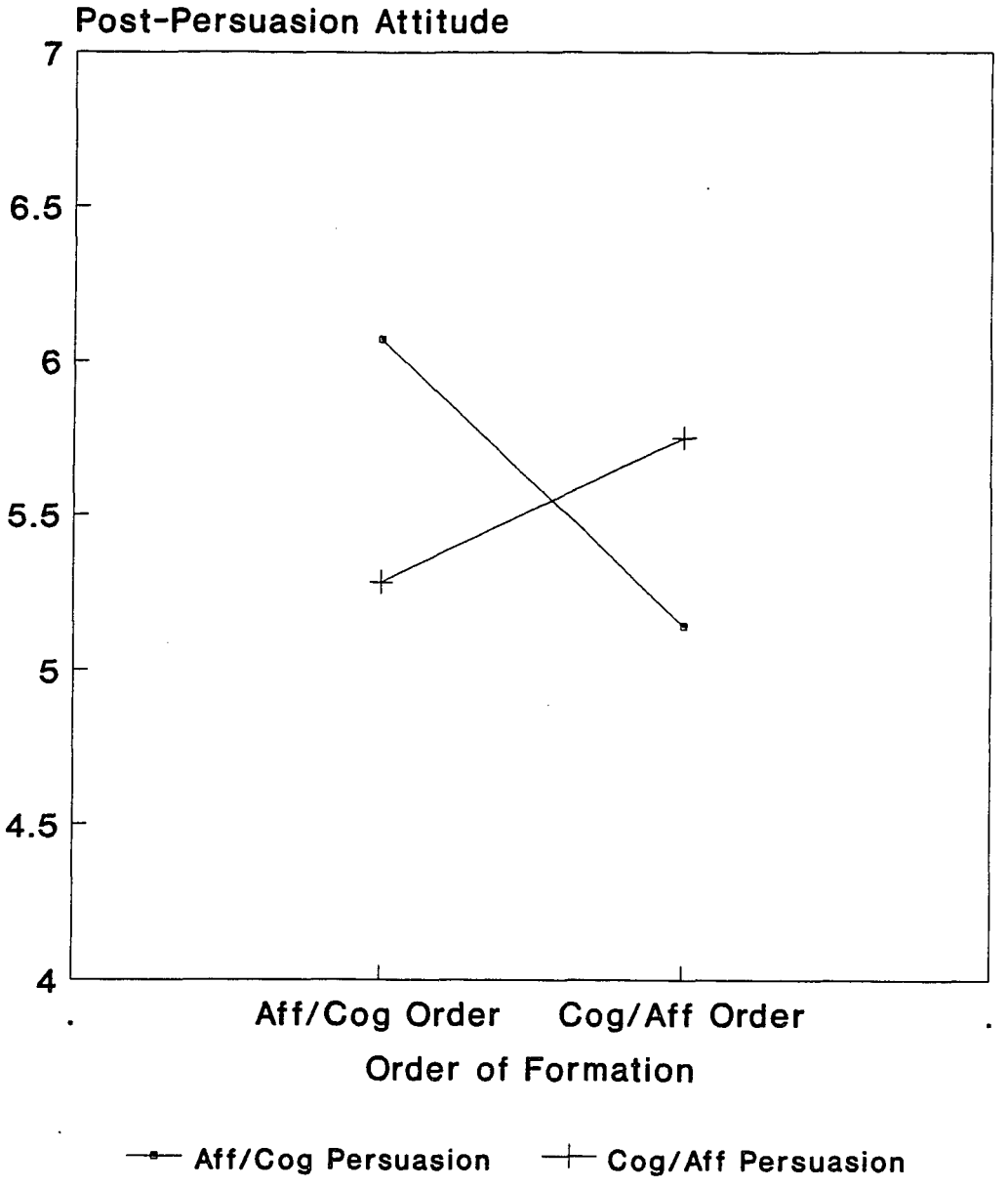
The matching hypothesis predicts that attitude change should have been greatest when the underlying nature of the persuasion (i.e., affective or cognitive) matched the underlying nature of the attitude (i.e., affective or cognitive). However, the previous analyses revealed that the order manipulation was not successful in altering the affective and cognitive bases of attitudes. Thus, if Edwards' past attitude change results were due to affective/cognitive matching, one might have expected that the current experiment should have failed to show any

effect of order of formation and order of persuasion on the magnitude of attitude change. However, if Edwards' results were not due to affective/cognitive matching but some order effect independent of these dimensions, one would expect that order of formation and order of persuasion might still have influenced attitude change in the present experiment.

To examine this, subjects' post-persuasion attitudes were analyzed using a 2 (order of formation: affect/cognition vs. cognition/ affect) x 2 (order of persuasion: affect/cognition vs. cognition/ affect) x 2 (need for cognition: high vs. low) ANCOVA with pre-persuasion attitudes serving as the covariate. This analysis indicated that the only significant effect was a two-way interaction between order of formation and order of persuasion, $\underline{F}(1, 104) = 8.42$, $\underline{p} < .01$.[6]

Figure 4 shows the post-persuasion attitude means adjusted for the covariate and broken down by order of formation and order of persuasion. These means have been reverse coded so that large numbers reflect more negative attitudes (i.e., greater attitude change in the direction of the persuasive appeals). As can be seen, the pattern of these means was very similar to that reported by Edwards (1990). Initial attitudes formed in the affect/cognition order were more susceptible to persuasion presented in the affect/cognition order than in the cognition/affect order. In contrast, initial attitudes formed in the cognition/affect order were more susceptible to persuasion presented in the cognition/ affect order than in the affect/cognition order.

Unlike, Edwards' original findings, however, these analyses produced a more symmetrical crossover interaction. A contrast between the means in the affect/cognition formation condition indicated that the affect/cognition order of persuasion produced significantly more attitude change than the cognition/affect persuasion order, $\underline{F}(1, 104) = 5.84$, $\underline{p} < .05$. Similarly, a contrast between the means in the cognition/affect formation condition revealed marginally greater



F (1, 104) = 8.42, p = .005

Figure 4: Post-Persuasion Attitudes as a Function of Order at Attitude Formation and Order at Persuasion

attitude change for the cognition/affect persuasion order than the affect/cognition order, $F(1, 104) = 3.48$, $p < .07$. These findings differed from Edwards' results in that in the present experiment showed evidence of a complete crossover interaction. In Edwards' experiment, although there was tendency for a matching effect in both attitude formation orders, this difference was only significant for the affect/cognition formation order. Nevertheless, the overall pattern presents a fairly close replication of the Edwards' attitude change results (see Figure 1 on page 19).

Discussion

The results of Experiment One replicated the attitude change matching effect of order of persuasion with order of attitude formation. As with the experiments reported by Edwards (1990) and Edwards and von Hippel (in press), attitude change was found to be greatest when the order of affective and cognitive persuasive appeals matched the order in which affect and cognition was presented at attitude formation. However, the hypothesis that these order matching effects could be attributed to the impact of order manipulations on the affective and cognitive bases of attitudes was not supported. Using two different analytical approaches, no evidence was found that manipulating order of affect and cognition influenced the affective and cognitive bases of attitudes. Instead, it appeared that attitudes were based on both affect and cognition in both orders. These results potentially undermine the past evidence that has been advanced as supporting affective/cognitive matching in persuasion.

There are several possible explanations for why the order of presenting affect and cognition failed to influence the bases of attitudes yet matching the order at formation with order of persuasion enhanced attitude change. One particularly intriguing possibility is that the persuasion matching effect demonstrated in this experiment and in Edwards (1990) had nothing to do with affect/cognition per se but

instead was an order effect independent of these dimensions. This is especially interesting in that existing attitude theories have never hypothesized that matching order of types of information at formation and persuasion should regulate the magnitude of attitude change. Thus, this account suggests that previous data interpreted as demonstrating affective/cognitive matching may have instead demonstrated a new kind of attitude change effect. The present data do not allow for tests of the nature of such an order effect. However, one possibility is that the order in which information is received at formation may create expectations of how subsequent attitude-relevant information will be sequenced and processed. Violations of such expectations in subsequent persuasive appeals may create confusion and interfere with processing of persuasive information thereby leading to less persuasion.

A second possibility is that the order of affect and cognition at formation did alter the affective and cognitive bases of attitudes but that the measures used were not sensitive enough to detect these changes. Although there is no way to definitively rule out such an explanation for any null effect, this explanation does not seem particularly compelling in this case. First, analyses of the scales in Experiment One indicated that they were highly reliable with Cronbach alpha's ranging from .85 to .94. And, past studies reported by Crites et al. (1994) have provided evidence of the high reliability, convergent validity, and discriminant validity of the scales. Crites et al. (1994) have also demonstrated that the scales are capable of detecting experimental manipulations of the affective and cognitive bases of attitudes. Thus, there is considerable evidence to support the utility of these scales.

The lack of any sort of previous validity evidence of the order manipulation as a means of influencing the affective and cognitive bases of attitudes also undermines the argument that the failure to find changes in the bases of attitudes must be due to measurement problems.

If the order manipulations had previously been validated or at least had face validity sufficient to derive clear a priori predictions, one might be more inclined to attribute null results to measurement error. However, as outlined in the introduction, there is no compelling a priori rationale to confidently predict a particular form of order effect (i.e., primacy or recency) on the affective and cognitive bases of attitudes. Furthermore, there is really no compelling reason to assume that order must influence the bases of attitudes. The present results simply demonstrate that when individuals are given two types of information about the attitude object, they rely on both types of information regardless of order. This can hardly be regarded as a surprising finding. Thus, given the fact that the measures have been validated and the order manipulation has not, it does sensible to hold the measures responsible for the null effects.

Finally, it should be acknowledged that these findings should not be generalized too broadly. Clearly, the failure to find changes in the affective and cognitive bases of attitudes challenges the interpretations provided by Edwards (1990) and Edwards and von Hippel (in press). They suggest that using methods identical or very similar to those used by Edwards are probably not an effective means of manipulating the affective and cognitive bases of attitudes. However, they do not necessarily imply that under any set of conditions, order of presentation will not influence the bases of attitudes.

CHAPTER III

EXPERIMENT TWO

Introduction

Purpose

Experiment One demonstrated that the although the order of affective information and cognitive information at formation and persuasion influenced the magnitude of attitude change, there was no evidence that it influenced the affective and cognitive bases of attitudes. These results raised questions concerning the utility of this order manipulation as a method for investigating the affective and cognitive bases of attitudes. It also potentially undermined the interpretation of previous evidence that had been advanced as proof of affective/cognitive matching effects in persuasion.

Experiment Two was designed to provide a more definitive test of the viability of the affective/cognitive matching and mismatching hypotheses. As demonstrated in Experiment One, the evidence presented as having supported the affective/cognitive matching hypothesis has been far from definitive. Additionally, as outlined in Chapter 1, evidence for the mismatching hypothesis also has its limitations. Thus, more definitive tests of the matching and mismatching hypotheses are clearly needed.

In accomplishing this goal, however, it was necessary to have an effective methodology for manipulating the bases of attitudes and the nature of persuasion. The results of Experiment One suggested that the order manipulation method was not a particularly promising procedure upon which to base future research. Thus, it seemed necessary to

develop a new method. As discussed in the introduction to Experiment One, it was deemed important to have a method that involved experimental manipulations of the affective and cognitive bases of attitudes and that could be used to create attitudes towards novel attitude objects. A method using experimental manipulations allows for stronger causal inferences. And, by using a method that allows for the creation of new attitudes, it is possible to provide more sensitive manipulations of affect and cognition.

Overview

Experiment Two assessed the viability of the matching and mismatching hypotheses by using a methodology that combined features of the procedure used in Experiment One with procedural features used in Crites et al. (1994). Like Experiment One, Experiment Two used the cover story of market testing and used the fictitious attitude object, Power-Plus. Additionally, the same attitude formation and persuasion stimulus materials were used. Unlike Experiment One, however, an order manipulation was not used. Instead, similar to Crites et al. (1994), the affective and cognitive nature of attitudes and persuasion was manipulated by presenting subjects with only one type of information (i.e., affective or cognitive) at each phase of the experiment.

Method

Subjects

Subjects were 63 undergraduate students enrolled in an introductory psychology course at Ohio State University. They participated in partial fulfillment of a course requirement. All subjects were told that the experiment involved market testing of new products currently under consideration for marketing by their manufacturers. Due to suspicion concerning the cover story, 4 subjects were excluded from analysis.

Measures

Experiment Two utilized the same measures and coding procedures used in Experiment One (see Appendix A). Following the attitude formation phase, all subjects completed the attitude scale first and then the affect and cognition scales in one of the two counterbalanced orders. Subjects then answered the same filler questions used in Experiment One. At the conclusion of the persuasion phase, each subject completed the attitude, affect and cognition measures a second time in the same order that he or she had completed them following the attitude formation phase. Subjects then provided cognitive responses and completed the need for cognition scale.

Procedure

The design of Experiment Two was a 2 (basis of attitude: affect vs. cognition) x 2 (type of persuasion: affect vs. cognition). Subjects participated in groups ranging from 1 to 4 people. Upon arriving at the laboratory, all participants were verbally informed that they were participating in an experiment being jointly conducted by a team of market researchers and psychologists (see Appendix A). They were told that the purpose of this experiment was to find out peoples' opinions about several new products currently being considered by their manufacturer for public marketing. Subjects were informed that they would be evaluating a new brand of beverage and a new brand of cookie. The first product evaluated was the beverage. This was the target product and was once again given the name, Power-Plus.

In the attitude formation phase, half of the subjects were randomly assigned to only taste the beverage (affective attitude). Prior to tasting the beverage, these subjects were asked to rinse their mouth by sipping from a small cup of water that was provided. They were then instructed to taste the beverage. As with Experiment One, this was an extremely cool sample of 50 ml of the commercially marketed beverage, Hawaiian Punch Blue. Subjects were again led to believe that they were

tasting the beverage, Power-Plus, cooled to a temperature of 35 degrees Fahrenheit (see Appendix A for taste instructions). Subjects were also told that this temperature was slightly colder than that maintained by the average refrigerator. The beverage was served in a covered container labeled "Product A". The sides of each container were completely covered by the label and the opening of the container was covered with a lid containing a straw. This prevented subjects from seeing the beverage.

The other half of the subjects were randomly assigned to read information about health aspects of the product (cognitive attitude) instead of tasting the beverage. Subjects were instructed to carefully read a passage containing background information about the beverage (see Appendix A). This passage was the same passage used in the attitude formation phase of Experiment One. After having either tasted the beverage or read information about the beverage, all subjects completed measures of attitude, affect, and cognition.

In the second phase, the persuasion phase, half of the subjects were randomly selected to be asked to (re)taste the beverage (affective persuasion) at a warmer temperature (see Appendix A for taste instructions). This taste procedure was similar to that used in the persuasion phase of Experiment One. Subjects began by rinsing their mouth with water prior to sampling the beverage. They then tasted another 50 ml sample of Hawaiian Punch Blue. This sample was mixed with 10 ml of vinegar (reduced with water to 5% acidity) and 1/3 ml of table salt to make it unpleasant tasting. The beverage was served at a temperature slightly colder than room temperature. Subjects were told that they were sampling Power-Plus at a temperature of 41 degrees Fahrenheit and that 41 degrees was the temperature of a beverage a few minutes after it had been removed from the typical refrigerator.

For the half of the subjects randomly assigned the cognitive persuasion condition, subjects were asked to read the same cognitive

persuasion passage used in Experiment One (see Appendix A). This passage discussed the fact that the beverage rapidly deteriorates as it warms. The passage mentioned that the only way to avoid having the beverage spoil was to store it at a temperature colder than that of the typical refrigerator. All subjects completed measures of attitude, affect, and cognition following the persuasion phase.

After evaluating the beverage, subjects were then asked to evaluate an ostensibly new brand of cookie called "Bunch O'Chips". Subjects rinsed their mouth with water and then sample tasted the cookie (i.e., a commercially marketed chocolate chip cookie). They then completed measures of attitudes towards the cookie. Because the evaluation of the cookie was only a filler task, no experimental manipulations were conducted for this part of the experiment and no analyses were conducted on evaluations of the cookie. After evaluating the cookie, all subjects were thoroughly debriefed about the purpose and procedures of the experiment.

Results

Hypotheses

Two major sets of hypotheses were tested in Experiment Two. First, it was hypothesized that when subjects' initial attitude toward the beverage was formed by tasting it (i.e., affective information), the overall evaluation of the beverage should be based predominantly on affect. In contrast, when subjects' initial attitude toward the beverage was formed by reading information about it (i.e., cognitive information), the overall evaluation should be based predominantly on cognition. The second major set of hypotheses tested in this experiment were the affective/cognitive matching and mismatching persuasion hypotheses. Because evidence for both hypotheses has been potentially flawed, there was no clear reason to identify one of these competing hypotheses as more likely to be supported than the other.

Descriptive Statistics

Before examining the major hypotheses of Experiment Two, the mean, standard deviation, and Cronbach alpha for the attitude, affect, and cognition scales within the two attitude formation conditions were computed (see Table 4). This was done primarily to confirm that the affective attitude condition and cognitive attitude condition created comparable attitudes and to examine the reliability of the scales across conditions. An examination of columns one and four in row one reveals that the mean attitude following the formation phase of the experiment was identical across the two conditions, $t(1, 58) = 1.18$, $p = .24$. Thus, the attitudes in the two conditions were indistinguishable from one another in terms of their valence and extremity. Additionally, the variance in attitude scores (see columns two and five) across formation conditions was of similar magnitude although there was a weak tendency for greater variance in the affective attitude condition, $F = 1.98$, $p = .07$.

The comparison of the mean affect score across conditions indicated that there was a marginally significant tendency for affect being more positive in the cognitive attitude condition than the affective attitude condition, $t(1, 57) = 1.82$, $p = .07$. The test of variances in affect revealed a significant tendency for more variance in the affective attitude condition, $F = 2.60$, $p = .01$. The mean cognitive score was significantly more positive in the cognitive attitude condition than in the affective attitude condition, $t(1, 58) = 4.17$, $p < .01$. And, there was a marginally significant tendency for more variance in cognition in the affective attitude condition, $F = 1.96$, $p = .07$. Finally, an examination of columns three and six reveals that the reliabilities of the three scales as indexed by Cronbach alpha showed only modest fluctuations across conditions.

Table 4

Experiment 2: Means, standard deviations, and Cronbach alphas for attitude, affect, and cognition scales by attitude formation condition

	Affective Attitude			Cognitive Attitude		
Scale	Mean	SD	Alpha	Mean	SD	Alpha
Attitude Scale	5.56	1.18	.95	5.87	0.84	.83
Affect Scale	5.10	0.92	.87	5.46	0.57	.71
Cognition Scale	4.93	0.92	.88	5.79	0.66	.83

Analyses of Affective/Cognitive Bases of Attitudes

As in Experiment One, two types of analyses were undertaken to assess the efficacy of this new method for creating affective and cognitive attitudes. The first approach computed discrepancy scores between affect and attitude and between cognition and attitude. Differences in these mean scores across attitude formation conditions were then examined. The second analysis employed multiple regression to use affect and cognition scales to predict attitudes.

Analysis of Discrepancy Scores. As in Experiment One, the first analysis used to assess the effectiveness of the attitude formation manipulation was an analysis of discrepancy scores. The discrepancy between the attitude score and the affect score was obtained by computing the absolute value of the difference between each subject's attitude and affect scores. This produced a possible score ranging from 0 to 6. The discrepancy between the attitude score and the cognition score was obtained by computing the absolute value of the difference between each subject's attitude and cognition score. This also produced a possible score ranging from 0 to 6.

As in Experiment One, small numbers indicated that there was little discrepancy (i.e., high consistency) between the attitudinal basis and the overall attitude. Thus, if the attitude was based on affect, one would expect the discrepancy between affect and attitude to be particularly small. Similarly, if the attitude was based on cognition, one would predict the discrepancy between attitude and cognition to be especially small.

Table 5 shows that the discrepancy score analyses confirmed that the attitude formation manipulation was successful in creating affective or cognitive attitudes. As expected, the 2 (type of discrepancy score: affect-attitude vs. cognition-attitude) x 2 (attitude formation condition: affective vs. cognition) mixed design ANOVA revealed a significant crossover interaction between type of discrepancy scores and

Table 5

Experiment 2: Mean affect-attitude discrepancy scores and mean cognition-attitude discrepancy scores by attitude formation condition

Type of Score	Affective Attitude	Cognitive Attitude
Affect-Attitude	.75	.66
Cognition-Attitude	.96	.44

attitude formation condition, $F(1, 57) = 7.17$, $p = .01$. An examination of the means within the affective attitude condition indicated that the affect-attitude discrepancy score was smaller than the cognition-attitude discrepancy score. A contrast of this difference was marginally significant, $F(1, 57) = 3.74$, $p = .06$. In contrast, within the cognitive attitude condition, the means were in the direction of a smaller cognition-attitude discrepancy score than an affect-attitude discrepancy score. This contrast was also marginally significant, $F(1, 57) = 3.42$, $p = .07$. Additionally, the mixed design ANOVA also indicated a significant attitude formation condition main effect such that discrepancy scores were greater in the affective condition than in the cognitive condition, $F(1, 57) = 6.88$, $p = .01$.

A comparison of the affect-attitude scores across attitude formation conditions was not significant, $t(1, 57) = -.63$, $p = .53$. A comparison of the cognition-attitude scores across conditions, however, was significant, $t(1, 58) = -3.52$, $p < .01$. This comparison indicated that, consistent with the notion that the cognitive attitude formation condition produced cognitively based attitudes, cognition-attitude discrepancy was smaller in the cognitive attitude condition (M=.44) than in the affective attitude condition (M=.96). Thus, taken together, the discrepancy score analyses provided strong evidence that the attitude formation manipulation was successful in altering the affective and cognitive bases of attitudes.[7]

Multiple regression analysis. These analyses were identical to the multiple regression analyses in Experiment One. Subjects were divided into two separate samples based on whether their initial attitude had been formed by tasting the beverage (i.e., affective attitude condition) or by reading information about the beverage (i.e., cognitive attitude condition). Next, within each sample, a multiple regression analysis was conducted in which scores on the affect and cognition scales were used to predict scores on the attitude scale. If

the attitude formation manipulation was successful, the ability of the affective scale relative to the cognitive scale to predict attitudes should have been enhanced in the affective attitude condition. In contrast, in the cognitive attitude condition, the ability of the cognitive scale relative to the affective scale to predict attitudes should have been enhanced.

An examination of Table 6 shows that this pattern of coefficients was obtained. Within the affective attitude condition, the unstandardized regression coefficient for the affect scale was a large positive coefficient that was highly significant. In contrast, the cognitive unstandardized regression coefficient was small and did not reach statistical significance. Within the cognitive attitude condition, the unstandardized coefficient for the cognitive scale was a large positive coefficient that was highly significant. The coefficient for the affective scale, however, was small and was not statistically significant. Thus, the predicted reversal in the magnitude of the affect coefficient relative to the cognitive coefficient across the two attitude formation conditions was evident. As in Experiment One, this reversal was assessed by separately testing the difference between the affect and cognition coefficients within each of the orders. The effect size for the difference tests within in each order was then computed. This indicated that the effect size of the difference between the affect and cognition coefficients was r=-.24 for the cognitive attitude condition (with a positive effect size indicating a larger affect than cognition coefficient) and r=.26 for the affective attitude condition. The difference in these two effect sizes was then tested across attitude formation conditions to determine if the relative difference in coefficients reversed across the two orders (see Rosenthal, 1990). This test was marginally significant, $\underline{Z}$ = 1.86, $\underline{p}$ = .06.

The second comparison in Table 6 that was relevant to assessing the success of the present method in influencing the bases of attitudes

Table 6

Experiment 2: Unstandardized regression coefficients for affect and cognition predicting attitude by attitude formation condition

	Affective Attitude	Cognitive Attitude
Predictor	Coefficient	Coefficient
Affect Scale	.79**	.20
Cognition Scale	.21	.76**
R^2	.53	.49
N	30	29

* p < .05
** p < .01
*** p < .001

was a comparison of the coefficients for the same scale across the two orders. This comparison assessed whether the ability of the same scale to predict attitudes was enhanced or decreased depending on whether the attitude was formed by tasting the beverage or by reading information about its health properties. These across condition comparisons provided support for the utility of the manipulation. Concentrating first on the affect scale (row 1), the size of the coefficient in the affective attitude condition was more than three times the size of the coefficient in the cognitive attitude condition. The test of the difference between the magnitude of these unstandardized coefficients indicated that this difference was marginally significant, $Z = 1.67$, $p = .09$. A comparison of the cognitive scale across conditions (row 2), on the other hand, indicated that the coefficient in the cognitive attitude condition was more than three times the size of the coefficient in the affective attitude condition. A test of this difference was also marginally significant, $Z = -1.69$, $p = .09$.[8]

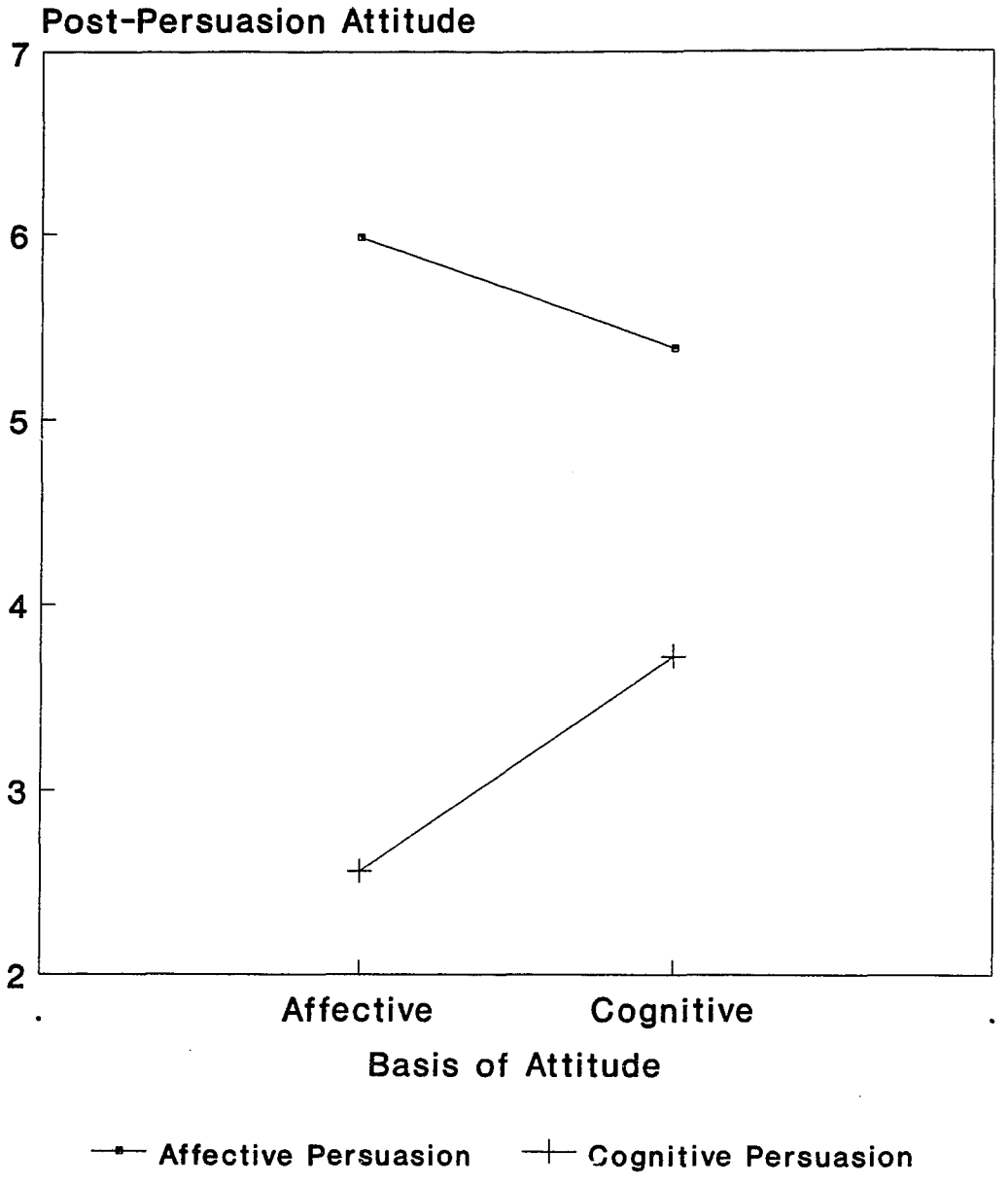
Taken together, these regression analyses suggested that the attitude formation manipulation was successful in creating attitudes that were either predominantly affective or cognitive in nature.[9] These results are particularly striking when they are compared to the failure in Experiment One to find any indication of shifts in the affective and cognitive bases of attitudes.

Attitude Change Results

The matching hypothesis predicts that attitude change should be greatest when the underlying nature of the persuasive appeal (i.e., affect or cognition) matches the underlying nature of the attitude (i.e., affect or cognition). The mismatching hypothesis, on the other hand, predicts that attitude change should be greater when the underlying nature of the persuasive appeal mismatches the underlying nature of the attitude. To test these hypotheses, subjects' post-persuasion attitudes were analyzed using a 2 (basis of attitude: affect

vs. cognition) x 2 (type of persuasion: affect vs. cognition) x 2 (need for cognition: high vs. low) ANCOVA with pre-persuasion attitudes serving as the covariate. This analysis indicated that there were three significant effects. First, a significant main effect of type of persuasion was obtained, $F(1, 50) = 63.24$, $p < .01$. An examination of the adjusted means, reverse coded so that large numbers indicated attitude change in the direction of the persuasive appeals, revealed that affective persuasion was more effective (M=5.68) than cognitive persuasion (M=3.14).

Of greater interest was the significant two-way interaction between basis of attitude and type of persuasion, $F(1, 50) = 7.54$, $p = .01$. This interaction provided a test of the matching and mismatching hypotheses. Figure 5 shows the means adjusted for the covariate and broken down by basis of attitude and type of persuasion. Like Experiment One, these means have been reverse coded so that large numbers reflect more negative attitudes (i.e., greater attitude change in the direction of the persuasive appeals). As can be seen in Figure 5, post-persuasion attitude means were generally consistent with the matching hypothesis. The pattern of these means showed that the significant two-way interaction can be interpreted as demonstrating that although affective persuasion was more powerful than cognitive persuasion for both affective and cognitive attitudes, the advantage of affective persuasion over cognitive persuasion was particularly strong when matched against affective attitudes. This provided support for a relative matching effect. Also consistent with the matching hypothesis was the tendency to see a relative improvement of the cognitive persuasive appeal when it was matched against a cognitive attitude (M=3.72) compared to when it was matched against an affective attitude (M=2.56). The contrast of these two means was statistically significant, $F(1, 50) = 6.94$, $p < .05$. Similarly, the impact of the affective appeal showed a tendency to increase when matched against an



F (1, 50) = 7.54, p = .008

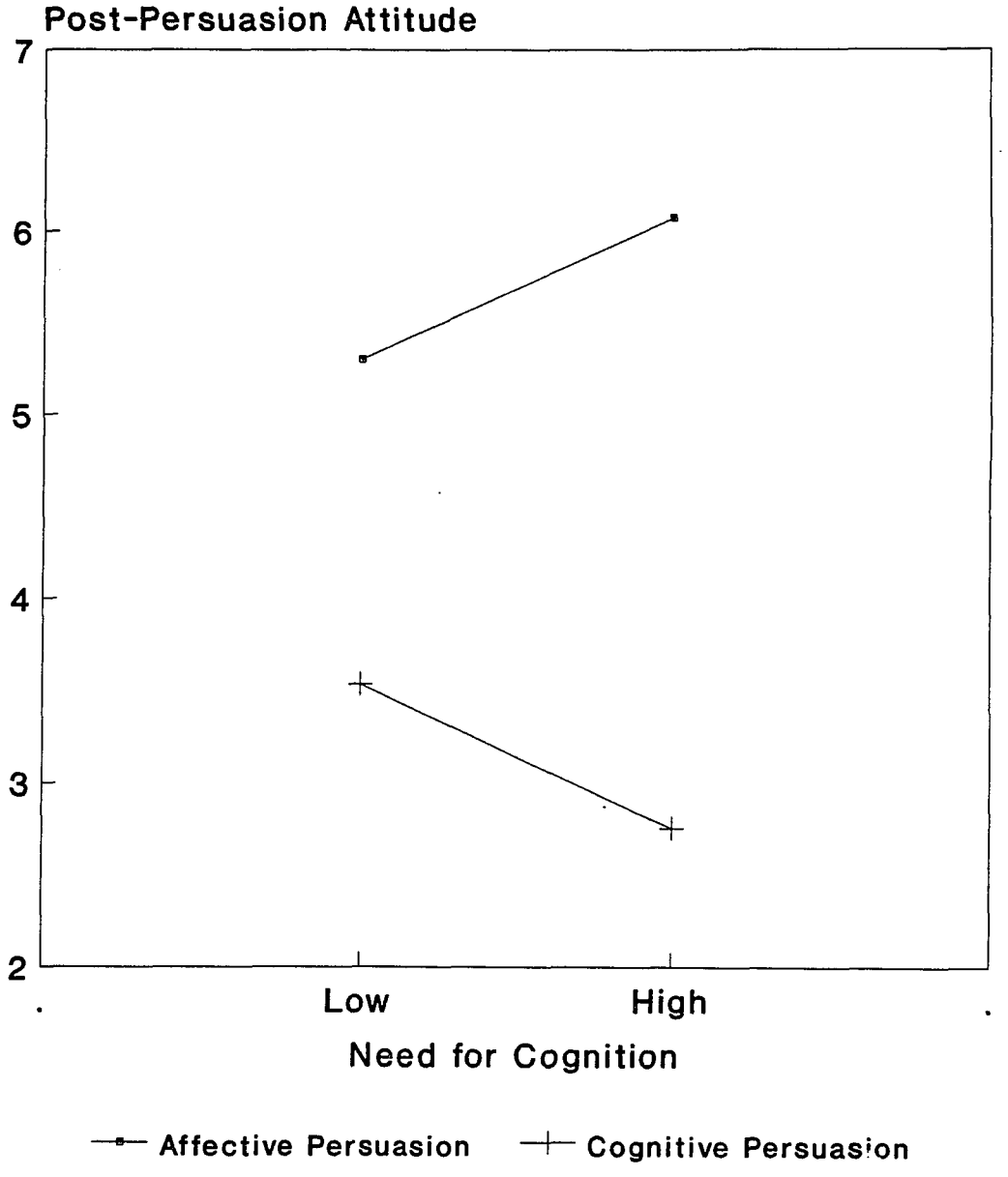
Figure 5: Post-Persuasion Attitudes as a Function of Basis of Attitude and Type of Persuasion

affective attitude (M=5.98) compared to when matched against a cognitive attitude (M=5.38). This difference, however, did not reach significance, $F(1, 50) = 1.86$, $p < .20$.

Finally, the third significant effect obtained in the ANCOVA was a two-way interaction between type of persuasion and need for cognition, $F(1, 50) = 5.86$, $p = .02$. Figure 6 shows that this interaction can be interpreted as having demonstrated that affective persuasion produced more attitude change in high need for cognition subjects than low need for cognition subjects. In contrast, cognitive persuasion produced more change in low need for cognition subjects than in high need for cognition subjects. Alternatively, this interaction could be interpreted as showing that the advantage of affective persuasion over cognitive persuasion was more pronounced among high need for cognition subjects than low need for cognition subjects.[10]

Discussion

The primary goal of Experiment Two was to provide a more definitive test of the matching and mismatching hypotheses than has been previously conducted. Discrepancy score analyses and multiple regression analyses both strongly suggested that the attitude formation manipulation was successful in regulating the affective and cognitive bases of attitudes. These results are encouraging in that they support the utility of the present procedure as a methodology for future research into the affective and cognitive bases of attitudes. These findings also supported the plausible, but until now untested, assumption made by Edwards (1990) that basic perceptual experiences such as taste are primarily affective in nature whereas processing of written information about attributes of an object are primarily cognitive in nature. Finally, the success of the present methodology provides a firmer basis for reaching conclusions about the matching and mismatching hypotheses.



F (1, 50) = 5.86, p = .02

Figure 6: Post-Persuasion Attitudes as a Function of Need for Cognition and Type of Persuasion

Despite these encouraging results, there are several objections one might raise concerning our interpretation of both the regression and discrepancy score analyses. One potential objection might be that the differences observed across conditions was simply due to fluctuations in the reliability of the scales across conditions. However, an examination of the scale reliabilities reported in Table 4 does not support this interpretation. Within the affective attitude condition, the reliability of the cognition scale was actually higher than the reliability of the affect scale. Yet, the affective scale significantly predicted the attitude whereas the cognitive scale did not. This runs contrary to a reliability explanation of the results. Additionally, even within the cognitive attitude condition where the cognitive scale was more reliable than the affective scale, the differences were too small to be responsible for the differences in coefficients. The cognition scale's reliability was only 1.17 times larger than the affective scale's reliability. However, the cognitive scale's coefficient was 3.80 times larger than the affective scale's coefficient. It seems unlikely that such small shifts in reliability could be responsible for such large shifts in coefficients.

However, even had the scale reliabilities shown shifts that were in the proper direction and of a larger magnitude, it is not clear that this would have invalidated the interpretation that the manipulation was successful in influencing the bases of attitudes. If a person forms an attitude based primarily on affect with very little cognition, it seems reasonable to expect that a person's responses to questions assessing cognition might be particularly error prone given that they have no cognition to serve as the basis for answers. Similarly, for attitudes that are cognitive in nature, it would not be surprising if subjects had problems responding to questions about affect.

Another potential objection to the interpretation of the regression analyses is that differences might be due to differences

across conditions in the affective and cognitive scales' variances. Once again, the results of Table 4 demonstrated that this explanation is not particularly compelling. Within the affective attitude condition, the variances in the affective and cognitive scales were identical. However, only the affective scale significantly predicted overall attitude. Although the cognitive scale had more variance than the affective scale within the cognitive attitude condition, this difference was relatively small and thus unlikely to explain the large differences in coefficients. Finally, as with reliability, had larger differences in variance been observed, it is not at all clear that they should have been treated as artifactual. It seems reasonable that when individuals lack affect towards an object, their responses to questions about affect should show relatively low variance. Similarly, lacking cognition about an object, might lead to responses to questions about cognition that have little variance.

The second important finding in Experiment Two was the evidence in support of the affective/cognitive matching hypothesis. These results showed that although there was no evidence for an absolute matching effect (i.e., a complete reversal in the effectiveness of affective and cognitive persuasion depending on the basis of attitude), there was evidence for a relative matching effect. Affective persuasion enjoyed a significantly greater advantage over cognitive persuasion when matched against affective attitudes compared to when it was targeted against cognitive attitudes. Additionally, although cognitive persuasion was not as effective as affective persuasion, it had a relatively enhanced impact when matched against cognitive attitudes compared to when it was targeted against affective attitudes.

These attitude change results have a number of important implications. First, these results provide the most definitive data to date in support of the matching hypothesis. Past experiments supporting the matching hypothesis have used manipulations of the affective and

cognitive bases of attitudes that are conceptually ambiguous and that never have been empirically validated. Indeed, the results of Experiment One raised questions concerning the validity of previous evidence advanced as supporting the matching hypothesis. Also worth noting is that previous data in support of the mismatching hypothesis have also failed to provide compelling support for the validity of the procedures used. In contrast, the present results were obtained using a methodology that empirical tests confirmed was successful in altering the affective and cognitive bases of attitudes. Thus, these data not only more convincingly confirm the matching hypothesis but they also raise further questions concerning whether mismatching effects were a result of the affective and cognitive dimensions of attitudes.

However, these data also leave a number of interesting unanswered questions. One particularly interesting question is why was affective persuasion so much more powerful than cognitive persuasion? One obvious possibility is that the affective persuasive appeal was simply a more extreme or powerful operationalization than the cognitive persuasive appeal. Thus, the main effect of type of persuasion might not have represented a basic process of any sort but instead was idiosyncratic to this particular operationalization.

Another possibility is that this main effect was attitude object specific. That is, it may be that beverages are attitude objects that people more typically evaluate based on affect. This seems plausible when one considers that fact drinking a beverage is probably a behavior that is consummatory in nature (i.e., a behavior performed for its own rewards) rather than instrumental in nature (i.e., a behavior performed to accomplish a specific goal beyond the behavior itself). Millar and Tesser (1986, 1989) have argued that consummatory behaviors are more affectively driven than cognitively driven.

A third potential explanation for the general advantage of affective persuasion is that the advantage was not due to the affect

dimension per se but instead due to the taste versus health dimensions. In Experiment Two, the affective persuasion involved tasting the beverage whereas the cognitive persuasion involved reading information about health aspects of the product. Thus, the taste versus health dimensions were to some degree confounded with the affective versus cognitive dimensions of the beverage. It is possible that taste is a dimension that may be a more central dimension of beverages than health for most people and that this caused the main effect of affective persuasion.

However, there is reason to doubt each of these three explanations. If the main effect was due to the fact that affect or taste are particularly strong dimensions upon which beverages are assessed, one would expect that the same main effect would occur at the attitude formation phase. The attitude formation materials involved similar types of manipulations yet pre-persuasion attitudes were not significantly different from one another. Thus, affect and taste do not appear to be intrinsically more powerful dimensions. Similarly, the explanation that the operationalizations of the two persuasive messages differed in their strength does not withstand empirical scrutiny. Prior to conducting Experiment Two, a small pilot study was conducted in which 25 subjects received the persuasive appeals without receiving the attitude formation materials. This allowed for tests of the strength of the persuasive appeals in isolation. This analysis indicated that the mean attitudes following the appeals were of similar levels and actually in the direction of the cognitive persuasion producing a more negative attitude ($M=3.29$) than the affective persuasion ($M=3.49$), $\underline{t}(1, 23) = -.40$, $\underline{p} = .69$.[11]

These analyses suggest that the large advantage of affective persuasion does not occur when there is no pre-existing attitude but does when a positive attitude has been established. This raises the possibility that when individuals have an existing attitude (either

affective or cognitive in nature), they are much more influenced when subsequent affect is inconsistent than when subsequent cognition is inconsistent. Perhaps individuals expect objects that they evaluate positively to make them feel good but do not necessarily expect such objects to have only positive attributes. Future tests of this explanation and whether the effect occurs when a negative evaluation precedes positive persuasive appeals would be interesting.

Regardless, it is important to note that the existence of the type persuasion main effect does not threaten the validity of the present data as a test of the matching and mismatching hypotheses. These hypotheses are relative hypotheses. That is, matching or mismatching only require relative increases or decreases in attitude change as a function of basis of attitude and type of persuasive appeal. Such relative effects were clearly obtained in Experiment Two.

Finally, the interaction between type of persuasion and need for cognition is also of conceptual interest. This interaction revealed that affective persuasion produced more attitude change in high need for cognition subjects than low need for cognition subjects. In contrast, cognitive persuasion produced more change in low need for cognition subjects than in high need for cognition subjects. Alternatively, this interaction could be interpreted as showing that the advantage of affective persuasion over cognitive persuasion was more powerful for high need for cognition subjects than low need for cognition subjects. Given that this finding was unexpected and that there is no obvious existing theory for why such an pattern should occur, it seems wise to treat this finding with caution pending future replications.

CHAPTER IV

EXPERIMENT THREE

Introduction

Purpose

Experiment Two provided the first clear evidence for an affective/cognitive matching effect in persuasion. Analyses indicated that the taste versus health information manipulation at the attitude formation phase was successful in creating attitudes that were predominantly affective or cognitive in nature. And, analyses of post-persuasion attitudes demonstrated a relative matching effect such that the advantage of affective persuasion over cognitive persuasion was greater when matched against affective attitudes than when mismatched against cognitive attitudes. These data improved on previous tests because they provided the first evidence of matching effects where it was possible to confirm that affect and cognition had been manipulated successfully.

However, although the evidence presented in Experiment Two represented an advance over previous evidence offered in support of the matching hypothesis, there were nonetheless some limitations to these data. Perhaps the most important of these was alluded to at the end of the discussion of Experiment Two. In this discussion, the possibility that the affective/cognitive persuasion main effect was due to the affective and cognitive manipulations being confounded with the taste and health dimensions of the beverage was suggested. This possibility has implications that go beyond its relevance as a potential explanation for the affective/cognitive persuasion main effect.

The fact that the taste and health dimensions of the beverage were confounded with the affective and cognitive dimensions could have been responsible for the persuasion matching effect. That is, the persuasion matching effect in Experiment Two might have been a matching of taste/health rather than affect/cognition. For example, for attitudes based on tasting the beverage (i.e., affective attitudes), re-tasting the beverage (i.e., affective persuasion) may have been more effective than reading health information (i.e., cognitive persuasion) because the taste dimension of the beverage was undermined rather than the affect dimension. Similarly, health information persuasion (i.e., cognitive persuasion) could have been more effective against attitudes based on health information (i.e., cognitive attitudes) than attitudes based on taste (i.e., affective attitudes) because the health dimension was undermined rather than the cognitive dimension. Experiment Three was designed to explore this possibility.

The purpose of Experiment Three was to unconfound other dimensions of the attitude object from affect/cognition by experimentally crossing these dimensions with the affective and cognitive dimensions of attitudes and persuasion. Examining the crossing of the affective and cognitive dimensions with attribute dimensions of attitude objects (e.g., taste and health) has the potential to provide interesting insights into persuasion processes. First, disentangling affect/cognition from attribute dimensions of attitude objects allows for stronger tests of an affect/cognition persuasion matching effect per se. Examinations of affective/cognitive matching when other dimensions have been held constant can demonstrate that the matching of affect/cognition is sufficient in its own right to produce persuasion matching effects.

Second, and more interestingly, investigating cases where affect and cognition match but other dimensions mismatch presents an opportunity for exploring the strength of affective/cognitive matching

and potential moderators of matching effects. If the affect/cognition distinction is a very fundamental and powerful distinction for a particular attitude, one might expect to observe affective/cognitive persuasion matching effects even when attribute dimensions of the object mismatch. Specifically, a pure affective/cognitive matching effect predicts that if an attitude is formed through acquiring affective information regarding taste, any other affective information (e.g., smell) should do better relative to any cognitive information in changing the attitude. This should occur even if the cognitive appeal matches the attribute dimensions of the object (e.g., cognitive information about the taste of the beverage) and the affective appeal does not (e.g., smelling the beverage).

In contrast, if attribute dimension matching effects occur, affective/cognitive matching effects might weaken or reverse when attribute dimensions mismatch. Specifically, the attribute dimension matching hypothesis predicts that matching attribute dimensions of the object should enhance persuasion above and beyond the increase due to affective/cognitive matching. Such attribute dimension matching effects might even be greater than affective/cognitive matching effects. For example, an attitude formed through affect arising from tasting the beverage might actually be more susceptible to a cognitive appeal focussing on the taste properties of the beverage than an affective appeal using affective information other than taste (e.g., smell). Thus, this would result in an apparent affective/cognitive mismatching effect. This might explain the findings of Millar and Millar (1990). Because their methods of classifying and manipulating the affective/cognitive bases of attitudes did not allow for control of specific attribute dimensions of the object, it is possible that although affect and cognition were being matched, other attribute dimensions of the object might have been mismatched.

Overview

Experiment Three used a paradigm that was similar to that used in Experiment Two. Like Experiment Two, the affective and cognitive bases of attitudes were manipulated by having subjects either taste the beverage or read information about the beverage. However, the written information presented in Experiment Three differed from that in Experiment Two. This information did not deal with health properties of the beverage but instead focussed on discussing the taste of the beverage. Thus, the taste dimension was held constant across the affective and cognitive attitude formation conditions.

At the persuasion phase of the experiment, two types of affective persuasion and two types of cognitive persuasion were used. For the affective persuasion manipulations, a persuasive appeal using taste as the affective information and a persuasive appeal using smell as the affective information were used. For the cognitive persuasion manipulations, a persuasive appeal discussing the taste properties of the beverage and a persuasive appeal discussing the smell properties of the beverage were used. These four persuasive appeals allowed for tests of complete matching with the attitude (i.e., affective-taste attitude with affective-taste persuasion and cognitive-taste attitude with cognitive-taste persuasion), affective/cognitive matching only (i.e., affective-taste attitude with affective-smell persuasion and cognitive-taste attitude with cognitive-smell persuasion), attribute dimension matching only (i.e., affective-taste attitude with cognitive-taste persuasion and cognitive-taste attitude with affective-taste persuasion), and complete mismatching (i.e., affective-taste attitude with cognitive-smell persuasion and cognitive-taste attitude with affective-smell persuasion).

Method

Subjects

Subjects were 79 undergraduate students enrolled in either an introductory psychology course or an introductory marketing course at Ohio State University. Psychology students participated in partial fulfillment of a course requirement. Marketing students participated in order to obtain extra credit for their course. All subjects were told that the experiment involved market testing of new products currently under consideration for marketing by their manufacturers. Due to suspicion concerning the cover story, 3 subjects were excluded from analysis.

Measures

Experiment Three utilized the same measures and coding procedures used in Experiment One and Experiment Two with the exception that several new measures were added (see Appendix B). Following the attitude formation phase, all subjects completed the attitude scale first. Subjects then completed the affect and cognition scales in one of the two counterbalanced orders. Subjects were then asked to answer two questions assessing their perceptions of the beverage's taste and smell (see Appendix B). Subjects responded to these questions on a 1 to 10 scale with 1 labeled "Very Bad Tasting (Smelling)" and 10 labeled "Very Good Tasting (Smelling)". Subjects then answered the same filler questions used in Experiments One and Two.

At the conclusion of the persuasion phase, each subject completed the attitude, affect and cognition measures a second time in the same order that he or she had completed them following the attitude formation phase. Subjects then provided cognitive responses. Following the cognitive response task, subjects were asked two questions in which they were asked to estimate the extent to which their initial attitudes towards Power-Plus were based on emotions and based on knowledge about the beverage (see Appendix B). Subjects responded to these two

questions on a 10-point scale with 1 labeled "None At All" and 10 labeled "A Great Deal". These questions were similar to the affect and cognition self-report questions used by Crites et al. (1994, Study 2). Finally, subjects completed the need for cognition scale.

Procedure

The design of Experiment Three was a 2 (basis of attitude: affect vs. cognition) x 2 (type of persuasion: affect vs. cognition) x 2 (attribute dimension in persuasion treatment: taste vs. smell). Subjects participated in groups ranging from 1 to 4 people.

In the orientation phase of the experiment, all participants were verbally informed that they were participating in an experiment being conducted jointly by a team of market researchers and psychologists (see Appendix B). They were told that the purpose of this experiment was to find out peoples' opinions about several new products currently being considered by their manufacturer for public marketing. Subjects were informed that they would be evaluating a new brand of beverage and a new brand of cookie. The first product evaluated was the beverage. This was the target product and was once again given the name, Power-Plus.

In the attitude formation phase, half of the subjects were randomly assigned to only taste the beverage (affective-taste attitude). Before tasting the beverage, however, subjects were told that the researchers were first interested in getting a sense of their expectations about Power-Plus. Subjects were then asked to answer a set of questions concerning Power-Plus based on their expectations of how they thought they would feel about the beverage (see Appendix B). The set of questions that subjects were asked to complete was the 16 item affect scale used in the previous two experiments. The purpose of having subjects complete this scale prior to tasting the beverage was to prime the affective dimension of attitudes and thus further enhance the likelihood that tasting the beverage would create an attitude based on affect.

Upon completion of the affect scale, subjects were asked to rinse their mouth by sipping from a small cup of water that was provided. They were then instructed to taste the beverage. As with the first two experiments, this was an extremely cool sample of 50 ml of the commercially marketed beverage, Hawaiian Punch Blue. Subjects were led to believe that they were tasting the beverage, Power-Plus, cooled to a temperature of 35 degrees Fahrenheit (see Appendix B for taste instructions). Subjects were informed that this temperature was slightly colder than that maintained by the average refrigerator. The beverage was served in a covered container labeled "Product A". The sides of each container were completely covered by the label and the opening of the container was covered with a lid containing a straw. This prevented subjects from seeing the beverage.

The other half of the subjects were randomly assigned to read information about the taste of the beverage (cognitive-taste attitude) instead of actually tasting the beverage. Before reading about the beverage, however, subjects were told that the researchers were first interested in getting a sense of their expectations about Power-Plus. Subjects were then asked to answer a set of questions concerning Power-Plus based on their expectations of what they thought the beverage would be like (see Appendix B). The set of questions that subjects were asked to complete was the 14 item cognition scale used in the previous two experiments. The purpose of having subjects complete this scale prior to reading about the beverage was to prime the cognitive dimension of attitudes and thus further enhance the likelihood that reading about the beverage would create an attitude based on cognition.

Subjects were instructed to carefully read a passage containing background information about the beverage (see Appendix B). This passage discussed how the ingredients and manufacturing processes used to make the beverage guaranteed its excellent flavor. It also mentioned that market research had found that most consumers considered the taste

of the beverage to be extremely pleasant. After having either tasted the beverage or read information about the taste of the beverage, all subjects completed measures of attitude, affect, and cognition. They also completed measures assessing their perceptions of the taste and smell of the beverage.

In the third phase, the persuasion phase, one fourth of the subjects were randomly selected to be asked to (re)taste the beverage (affective-taste persuasion) at a warmer temperature (see Appendix B for taste instructions). This taste procedure was similar to that used in the previous two experiments. Subjects began by rinsing their mouth with water prior to sampling the beverage. They then tasted a 50 ml sample of Hawaiian Punch Blue. This sample was mixed with 10 ml of vinegar (reduced with water to 5% acidity) and 1/3 ml of table salt to make it unpleasant tasting. The beverage was served at a temperature slightly colder than room temperature. Subjects were told that they were sampling Power-Plus at a temperature of 41 degrees Fahrenheit and that 41 degrees was the temperature of a beverage a few minutes after it had been removed from the typical refrigerator.

Another fourth of the subjects were randomly assigned to smell the beverage (affective-smell persuasion). This was done by providing each subject with a scent container. Each plastic bottle was filled with a liquid containing 15 ml of Hawaiian Punch Blue, 15 ml of vinegar (reduced with water to 5% acidity), and 30 ml of "Bo-Peep" brand cloudy ammonia. All containers were covered with a label with the words, "Product A". The bottles were covered with lids containing a tube from which subjects could smell the beverage. Subjects were instructed to smell it by first placing the opening of the tube one inch from their noses and then giving the bottle a quick firm squeeze to produce an air puff. The beverage was presented at a temperature slightly colder than room temperature. Subjects were told that they were smelling Power-Plus at a temperature of 41 degrees Fahrenheit and that 41 degrees was the

temperature of a beverage a few minutes after it had been removed from the typical refrigerator.

Another fourth of the subjects were randomly assigned to read information about how the beverage's temperature influenced its taste (cognitive-taste persuasion). This passage discussed the fact that as the beverage warmed, its taste became increasingly unpleasant (see Appendix B). The passage mentioned that the effect of temperature on taste was completely harmless and that it affected no other properties of the beverage. The passage also mentioned that the only way to maintain the pleasant taste of the beverage was to store it at a temperature colder than that of the typical refrigerator.

The final fourth of the subjects were randomly assigned to read a passage about how the temperature of the beverage influenced its smell (cognitive-smell persuasion). This passage discussed the fact that as the beverage warmed, its smell became increasingly unpleasant (see Appendix B). The passage mentioned that the effect of temperature on smell was completely harmless and that it affected no other properties of the beverage. The passage also mentioned that the only way to maintain the pleasant aroma of the beverage was to store it at a temperature colder than that of the typical refrigerator.

All subjects completed measures of attitude, affect, and cognition following the persuasion phase. They also performed a cognitive response task, completed measures in which they estimated the extent to which their attitudes were based on emotions and knowledge, and completed the need for cognition scale. After completing these measures, subjects were then asked to evaluate an ostensibly new brand of cookie called "Bunch O'Chips". Subjects rinsed their mouth with water and then sample tasted the cookie (i.e., a commercially marketed chocolate chip cookie). They then completed measures of attitudes towards the cookie. Because the evaluation of the cookie was only a filler task, no experimental manipulations were conducted for this part

of the experiment and no analyses were conducted on evaluations of the cookie. After evaluating the cookie, all subjects were thoroughly debriefed about the purpose and procedures of the experiment.

Results

Hypotheses

There were several sets of hypotheses tested in Experiment Three. First, as in Experiment Two, it was hypothesized that when subjects' initial attitude toward the beverage was formed by tasting it (i.e., affective information), the overall evaluation of the beverage should be based predominantly on affect. In contrast, when subjects' initial attitude toward the beverage was formed by reading information about its taste (i.e., cognitive information), the overall evaluation should be based predominantly on cognition. Additionally, it was also hypothesized that both the affective information and the cognitive information should have led to the perception that the beverage had a pleasant taste.

The second major set of hypotheses tested in this experiment were related to the affective/cognitive and attribute dimensions matching effects. Two major hypotheses were explored. The first of these hypotheses, the affective/cognitive matching hypothesis, predicts that matching persuasive appeals to attitudes along the affective and cognitive dimensions of attitudes should enhance persuasion regardless of whether attribute dimensions of the attitude object match or mismatch. Thus, this hypothesis would predict a significant two-way interaction between basis of attitude (affect vs. cognition) and type of persuasion (affective vs. cognitive).

In contrast, the second of these hypotheses, the attribute matching hypothesis, predicts that affective/cognitive matching effects should be weakened or reversed when attribute dimensions of the attitude object mismatch. This hypothesis predicts a significant three-way interaction among basis of attitude (affect vs. cognition), type of

persuasion (affective vs. cognitive), and attribute dimension of attitude object persuasion (taste vs. smell).

Descriptive Statistics

Before examining the major hypotheses of Experiment Three, the mean, standard deviation, and Cronbach alpha for the attitude, affect, and cognition scales within the two attitude formation conditions were computed (see Table 7). Once again, this was done primarily to confirm that the affective attitude condition and cognitive attitude condition created comparable attitudes and to examine the reliability of the scales across conditions. An examination of columns one and four in row one reveals that the mean attitude following the formation phase of the experiment was statistically equivalent across the two conditions, $t(1, 74) = 1.34$, $p = .19$. Thus, the attitudes in the two conditions were similar in terms of their valence and extremity. A test of the difference in variance of the attitude scores (see columns two and five) across formation conditions revealed that there was significantly greater variance in the affective attitude condition than the cognitive attitude condition, $F = 4.14$, $p < .01$.

The comparison of the mean affect score across conditions indicated that there was no difference in these scores across attitude formation conditions, $t(1, 74) = .77$, $p = .44$. Similarly, the test of variances in affect revealed no tendency for a difference in variance across conditions, $F = 1.46$, $p = .26$. The mean cognitive score was found to be significantly more positive in the cognitive attitude condition than in the affective attitude condition, $t(1, 74) = 3.65$, $p < .01$. There was no difference in the variance of the cognitive score across the two attitude formation conditions, $F = 1.04$, $p = .91$. Finally, an examination columns three and six reveals that the reliabilities of the three scales as indexed by Cronbach alpha showed only modest variations across conditions.

Table 7

Experiment 3: Means, standard deviations, and Cronbach alphas for attitude, affect, and cognition scales by attitude formation condition

	Affective Attitude			Cognitive Attitude		
Scale	Mean	SD	Alpha	Mean	SD	Alpha
Attitude Scale	5.27	1.56	.97	5.65	0.77	.80
Affect Scale	5.20	0.91	.89	5.35	0.76	.83
Cognition Scale	4.83	0.87	.87	5.57	0.89	.92

Perceptions of Taste

To confirm that both the affective and cognitive attitude conditions were successful in creating perceptions that the beverage had a pleasant taste, the mean taste ratings following the attitude formation condition were compared (see Appendix B). These analyses revealed that the cognitive condition actually produced more positive taste ratings (M=7.89) than the affective condition (M=6.41), $t(1, 74) = 3.34$, $p < .01$. Nonetheless, given the fact that the scale midpoint was 5.5, both conditions clearly produced perceptions that the beverage had a pleasant taste.

Analyses of Affective/Cognitive Bases of Attitudes

As in the previous two experiments, a variety of analyses were undertaken to assess the efficacy of the attitude formation manipulation for creating affective and cognitive attitudes. The first analysis computed discrepancy scores between the affect and attitude scales and between the cognition and attitude scales. Differences in these mean scores across attitude formation conditions were then examined. The second approach used multiple regression to assess the ability of the affect and cognition scales to predict attitudes. Finally, subjects' self-reports of how much their attitudes were based on affect and cognition were compared across attitude formation conditions.

Analysis of Discrepancy Scores. As in previous experiments, the first analysis used to assess the effectiveness of the attitude formation manipulation was an analysis of discrepancy scores. The discrepancy between the attitude score and each basis was once again obtained by computing the absolute value of the difference between each subject's attitude and the affect or cognition scores. This produced two scores with a possible range from 0 to 6. Small numbers indicated that there was little discrepancy (i.e., high consistency) between the attitudinal basis and the overall attitude.

Table 8 shows that the attitude formation condition was successful in creating affective or cognitive attitudes as indexed by the discrepancy scores. When these means were tested in a 2 (type of discrepancy score: affect-attitude vs. cognition-attitude) x 2 (attitude formation condition: affective vs. cognition) mixed design ANOVA, the predicted crossover interaction between type of discrepancy scores and attitude formation order was significant, $F(1, 74) = 8.18$, $p = .01$. This interaction indicated that the reversal between the two discrepancy scores across the attitude formation conditions was significant.

An examination of the mean discrepancy scores within the affective attitude condition indicated that as expected, the mean scores were in the direction such that the affect-attitude discrepancy score was smaller than the cognition-attitude discrepancy score. A contrast of this difference was highly significant, $F(1, 74) = 6.31$, $p < .02$. Also consistent with predictions, within the cognitive attitude condition, the means were in the direction of a smaller cognition-attitude discrepancy score than an affect-attitude discrepancy score. This contrast, however, did not reach significance, $F(1, 74) = 2.31$, $p < .20$. The mixed design ANOVA also indicated a significant attitude formation condition main effect such that discrepancy scores were greater in the affective condition than in the cognitive condition, $F(1, 74) = 13.51$, $p < .01$.

A comparison of the affect-attitude scores across attitude formation conditions was not significant, $t(1, 74) = -1.44$, $p = .15$. A comparison of the cognition-attitude scores across conditions, however, was significant, $t(1, 74) = -4.85$, $p < .01$. This comparison indicated that, consistent with the notion that the cognitive attitude formation condition produced cognitively based attitudes, cognition-attitude discrepancy was smaller in the cognitive attitude condition (M=.38) than in the affective attitude condition (M=.92). Thus, taken together, the

Table 8

Experiment 3: Mean affect-attitude discrepancy scores and mean cognition-attitude discrepancy scores by attitude formation condition

Type of Score	Affective Attitude	Cognitive Attitude
Affect-Attitude	.69	.52
Cognition-Attitude	.92	.38

discrepancy score analyses suggested that the attitude formation manipulation was successful in altering the affective and cognitive bases of attitudes.

Multiple regression analysis. These analyses were identical to the multiple regression analyses in Experiments One and Two. Subjects were divided into two separate samples based on whether their initial attitudes had been formed by tasting the beverage (i.e., affective attitude condition) or by reading information about the taste of the beverage (i.e., cognitive attitude condition). A multiple regression analysis in which scores on the affect and cognition scales were used to predict scores on the attitude scale was then conducted within each condition. If the attitude formation manipulation was successful, the ability of the affective scale relative to the cognitive scale to predict attitudes should have been enhanced in the affective attitude condition. In contrast, in the cognitive attitude condition, the ability of the cognitive scale relative to the affective scale to predict attitudes should have been enhanced.

There were two types of comparisons in Table 9 that were conducted to assess the efficacy of the attitude formation manipulation. The first of these involved an examination of the coefficients within each condition. An examination of column 1 (i.e., the affective attitude condition) shows that the pattern of coefficients was generally consistent with the conclusion that the attitude formation manipulation was successful. The affect scale was a strong and statistically significant predictor of overall attitude. The coefficient for the cognitive scale was also significant but it was of a slightly smaller magnitude. This suggested that subjects in this condition were relying on both affect and cognition in forming their attitudes toward Power-Plus but that there might have been a slight tendency to rely more on affect. An examination of the coefficients in the cognitive attitude condition provided stronger support for the success of the attitude

Table 9

Experiment 3: Unstandardized regression coefficients for affect and cognition predicting attitude by attitude formation condition

	Affective Attitude	Cognitive Attitude
Predictor	Coefficient	Coefficient
Affect Scale	.96***	.24
Cognition Scale	.62**	.57***
R^2	.74	.73
N	39	37

* p < .05
** p < .01
*** p < .001

formation manipulation (see column 2). In this condition, a pattern opposite to the affective attitude condition was evident. That is, the cognitive scale was a strong and significant predictor of overall attitudes. The coefficient of the affective scale, on the other hand, was less than half of the size of the cognitive coefficient and it was not statistically significant. This tendency for a reversal in the relative magnitude of the affective and cognitive coefficients across conditions was assessed by testing the differences between the coefficients within each manipulation condition. The effect size for the two tests was then computed. This analysis indicated that the effect size of the difference between coefficients within the cognitive condition was r=-.25 and within the affective condition was r=.13. The contrast between effect sizes to assess the reversal of differences was marginally significant, $\underline{Z} = 1.61$, $\underline{p} = .11$.

The second comparison in Table 9 that was relevant to assessing the utility of the present paradigm was a comparison of the coefficients for the same scale across the two orders. These across condition comparisons provided some support for the success of the manipulation. Concentrating first on the affect scale (row 1), the size of the coefficient in the affective attitude condition was four times the size of the coefficient in the cognitive attitude condition. The test of the difference between the magnitude of these unstandardized coefficients across the two orders indicated that this difference was highly significant, $\underline{Z} = 2.77$, $\underline{p} < .01$. A comparison of the cognitive scale across conditions (row 2), on the other hand, revealed that there was no difference in the size of the coefficients across conditions, $\underline{Z} = .19$, $\underline{p} = .85$.[12]

Taken together, these regression analyses suggested that the attitude formation manipulation was generally successful in creating attitudes that were either predominantly affective or cognitive in nature. The results indicated that the cognitive attitude condition

produced attitudes that were based predominantly on cognition. In contrast, the affective attitude condition produced attitudes based on both affect and cognition. However, relative to the cognitive attitude condition, the affective attitude condition produced attitudes that were more affective in nature.

Affect and cognition self-reports. The final set of analyses conducted to assess the impact of the attitude formation manipulation was an analysis of subjects' self-reports of how much their attitudes were based on affect and how much they were based on cognition. These analyses assessed whether subjects are aware of the bases of their attitudes. If subjects were aware of the bases of their attitudes, one would expect the affect self-report score to have been larger than the cognition self-report score within the affective attitude condition. In contrast, within the cognitive attitude condition, the cognitive self-report score should have been greater than the affect self-report score.

An examination of Table 10 revealed that there was only weak support for the awareness hypothesis. When the crossover pattern across the two conditions was tested with a 2 (basis of attitude: affect vs. cognition) x 2 (type of self-report score: affect vs. cognition) mixed design ANOVA, the two-way interaction was not significant, $F(1, 74) = 1.48$, $p = .23$. Within the affective attitude condition, the mean affect self-report was higher than the mean cognition self-report. The contrast of this difference, however, was not significant, $F(1, 74) = .08$, $p > .20$. Within the cognitive attitude condition, there was a non-significant tendency for the mean cognition self-report to be higher than the mean affect self-report, $F(1, 74) = 2.05$, $p < .20$.

A comparison of the affect self-report scores across attitude formation conditions was not significant, $t(1, 74) = .81$, $p = .42$. A comparison of the cognition-attitude scores across conditions, however, was significant, $t(1, 74) = 2.50$, $p = .02$. This comparison indicated that, consistent with the notion that subjects were aware that the

Table 10

Experiment 3: Mean affect self-report and cognition self-report scores by attitude formation condition

Type of Score	Affective Attitude	Cognitive Attitude
Affect Self-Report	5.64	6.14
Cognition Self-Report	5.49	6.92

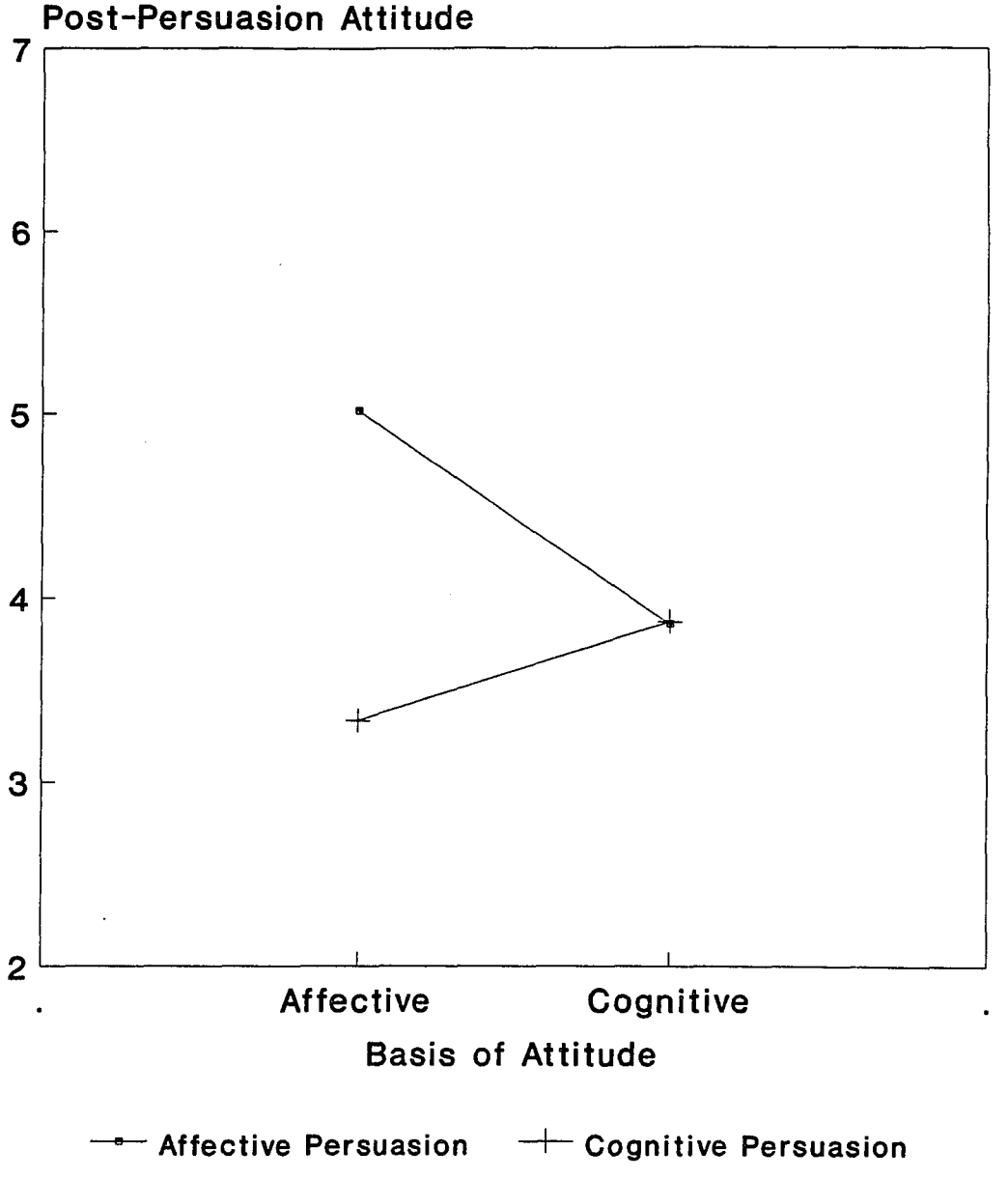
cognitive attitude formation condition produced cognitively based attitudes, cognition self-report score was higher in the cognitive attitude condition (M=6.92) than in the affective attitude condition (M=5.49). Thus, taken together, the self-report score analyses revealed that the pattern of means was generally in the predicted direction of awareness but these differences were relatively weak. This is not particularly surprising, given that subjects provided self-reports after the persuasion phase. Having subjects estimate the basis of their initial attitudes with such a long delay after the formation phase probably contributed substantially to errors in their estimates. Additionally, having subjects attempt to directly estimate the extent to which their attitudes are based on affect and cognition may be a particularly difficult judgment for most subjects.

Attitude Change Results

The affective/cognitive matching hypothesis predicts that attitude change should be greatest when the underlying affective or cognitive nature of the persuasive appeal matches the underlying affective or cognitive nature of the attitude. This matching effect should occur regardless of whether attribute dimensions of object match or mismatch. The attribute dimension matching hypothesis, on the other hand, predicts that the affective/cognitive matching effect should be moderated by whether attribute dimensions of the attitude object are also matched or mismatched in the persuasive appeal. Thus, the affective/cognitive matching hypothesis predicts a two-way interaction between basis of attitude (affect vs. cognition) and type of persuasion (affect vs. cognition). The attribute dimension matching hypothesis, on the other hand, predicts that there should be a significant three-way interaction among basis of attitude (affect vs. cognition), type of persuasion (affect vs. cognition), and attribute dimension of persuasion (taste vs. smell).

To test these hypotheses, subjects' post-persuasion attitudes were analyzed using a 2 (basis of attitude: affect vs. cognition) x 2 (type of persuasion: affect vs. cognition) x 2 (dimension of attitude object persuasion: taste vs. smell) x 2 (need for cognition: high vs. low) ANCOVA with pre-persuasion attitudes serving as the covariate. This analysis indicated that there were two significant main effects. First, as was found in Experiment Two, a significant main effect of type of persuasion was obtained, $\underline{F}(1, 59) = 8.70$, $\underline{p} = .01$. An examination of the adjusted means, reverse coded so that large numbers indicated attitude change in the direction of the persuasive appeals, revealed that affective persuasion was again more effective (M=4.44) than cognitive persuasion (M=3.60). Second, a significant main effect of attribute dimension of attitude object was also found, $\underline{F}(1, 59), = 3.90$, $\underline{p} = .05$. An examination of the reverse coded adjusted means revealed that persuasive appeals focussing on taste were more effective (M=4.30) than persuasive appeals focussing on smell (M=3.74).

More importantly, the critical two-way interaction between basis of attitude and type of persuasion was highly significant, $\underline{F}(1, 59) = 8.80$, $\underline{p} < .01$. An examination of the means in Figure 7 demonstrated that the significant interaction provided evidence of a relative affective/cognitive matching effect. As with the previous experiments, the means in Figure 7 are adjusted means reverse coded so that large numbers reflect attitudes consistent with the direction of the persuasive message (i.e., large numbers indicate greater negativity). The significant interaction indicated that when attitudes were affective in nature, affective persuasion produced more attitude change than cognitive persuasion. The contrast between these means was highly significant, $\underline{F}(1, 59) = 20.48$, $\underline{p} < .01$. In contrast, when attitudes were cognitive in nature, the advantage of affective persuasion over cognitive persuasion disappeared. The contrast between these means was not reliable, $\underline{F}(1, 59) < .01$, $\underline{p} > .20$. Also relevant to the matching



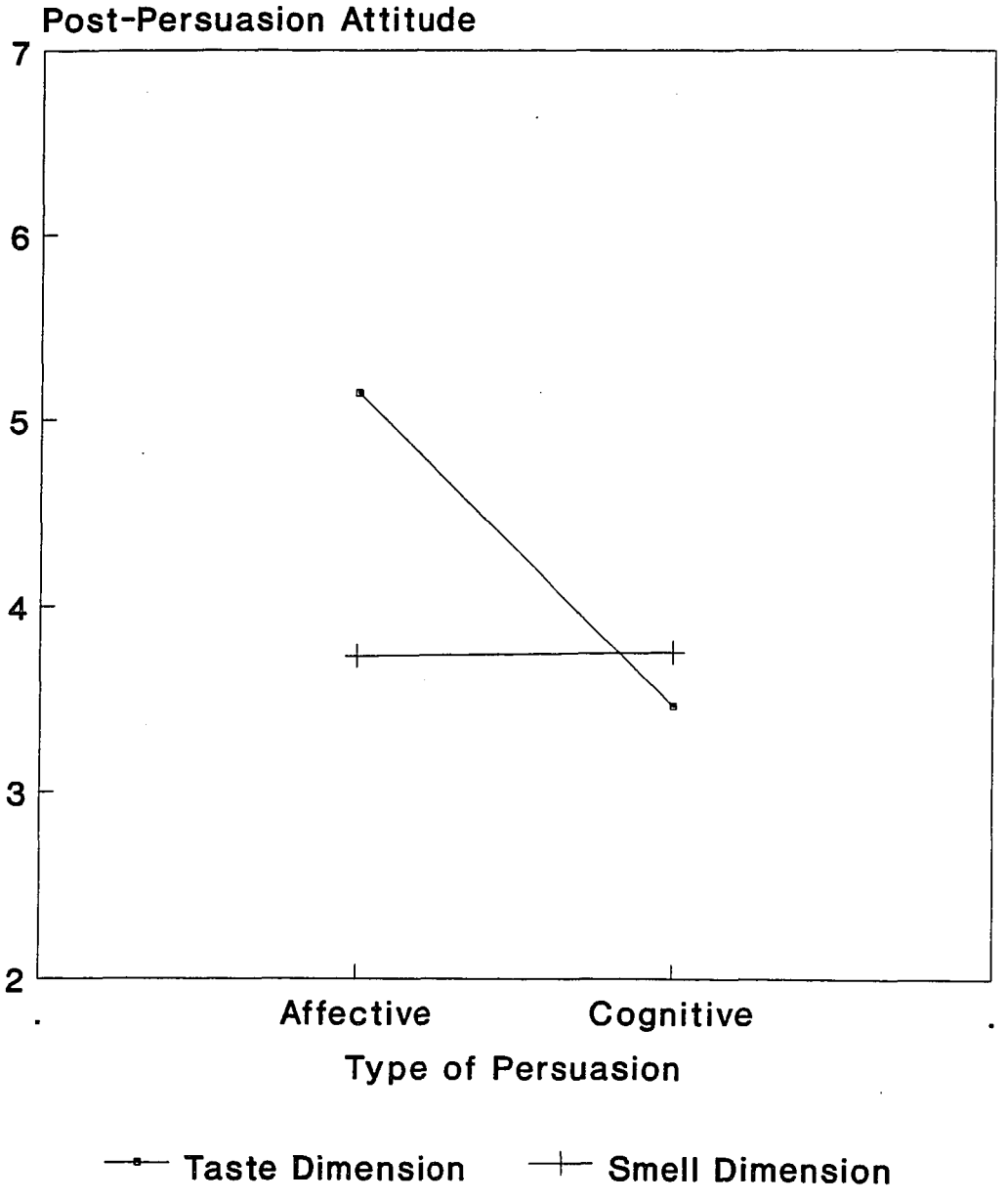
F (1, 59) = 8.80, p = .004

Figure 7: Post-Persuasion Attitudes as a Function of Basis of Attitude and Type of Persuasion

hypothesis was the contrast between the affective persuasion in the cognitive attitude and affective attitude conditions. This contrast indicated a significant relative increase in effectiveness of affective persuasion when matched against affective attitudes compared to when matched against cognitive attitudes, $F(1, 59) = 12.48$, $p < .01$. Similarly, cognitive persuasion showed a marginally significant tendency to have relatively greater impact when matched against a cognitive attitude compared to when matched against an affective attitude, $F(1, 59) = 2.75$, $p = .10$.

Importantly, contrary to what the attribute dimension matching hypothesis would predict, this two-way interaction was not qualified by a three-way interaction among basis of attitude, type of persuasion, and attribute dimension of persuasion, $F(1, 59) = .04$, $p = .85$. Thus, these results indicated that the affective/cognitive persuasion matching effect occurred even when attribute dimensions of the attitude object mismatched.

There were two other significant effects obtained in the ANCOVA analysis. One of these effects was a two-way interaction between type of persuasion and attribute dimension of persuasion, $F(1, 59) = 9.09$, $p < .01$. Figure 8 shows the pattern of the means associated with this interaction. As with previous figures, these means have been reverse coded such that large numbers indicated attitudes consistent with direction of the persuasive message. Figure 8 shows that the cognitive-taste, cognitive-smell, and affective-smell persuasive appeals all produced comparable levels of attitude change. However, the affective-taste appeal produced substantially more change than these other appeals. This finding suggests that when an attitude is derived from taste either through reading about it or tasting it, actually tasting the beverage has the greatest impact on changing the attitude. If this explanation is correct, one might expect that if the initial attitude had been based on smell rather than taste, the affective-smell would



F (1, 59) = 9.09, p = .004

Figure 8: Post-Persuasion Attitudes as a Function of Attribute Dimension of Persuasion and Type of Persuasion

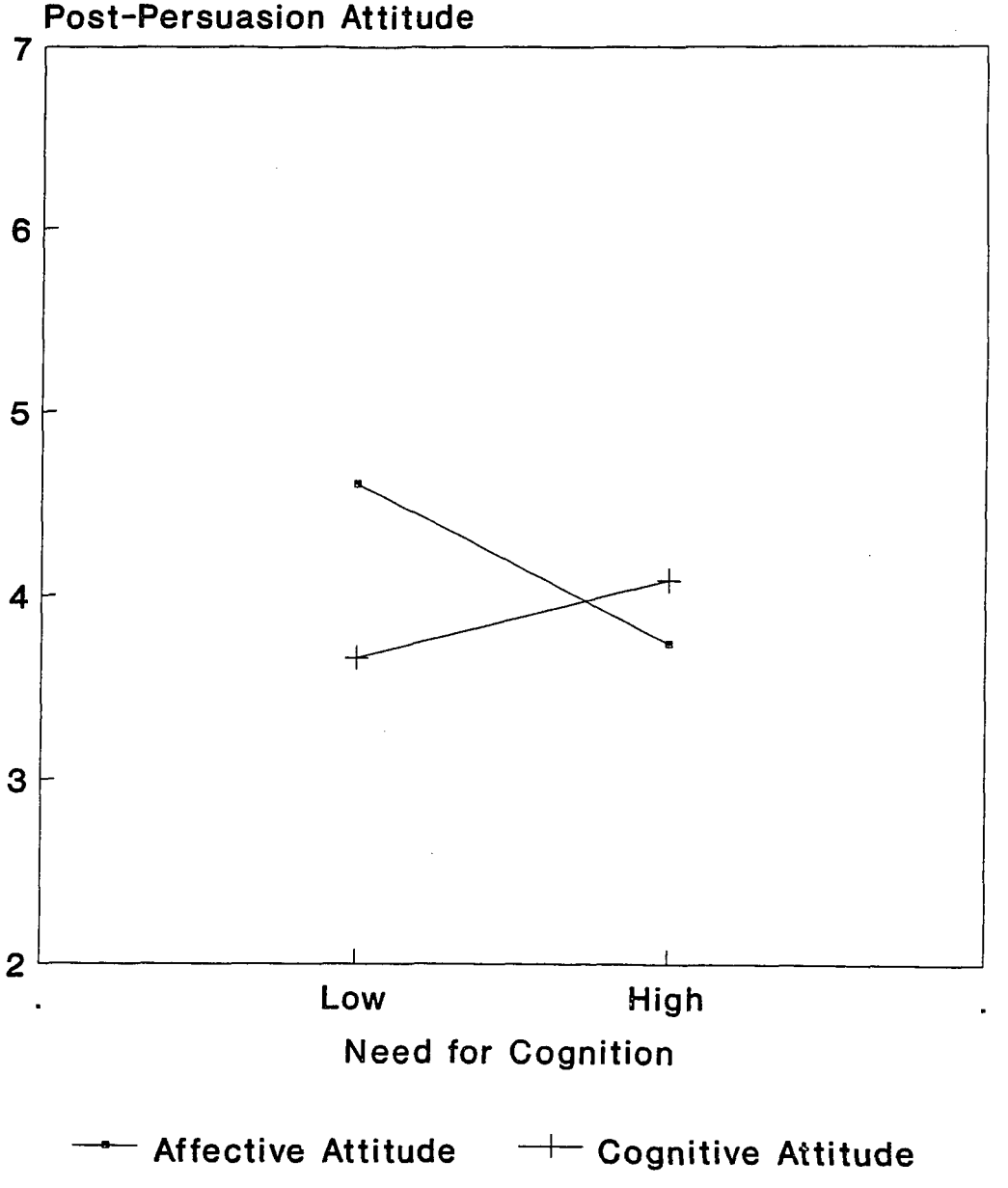
have been particularly impactful.

The final significant effect was a two-way interaction between basis of attitude and need for cognition, $F(1, 59) = 5.15$, $p = .03$. This interaction indicated that for low need cognition subjects with affective attitudes were most susceptible to change. However, low need for cognition subjects with cognitive attitudes and high need for cognition subjects with either type of attitude were all comparably less susceptible to persuasion (see Figure 9). These findings indicate that regardless of the type of information they receive, high need for cognition subjects generate strong attitudes. In contrast, when low need for cognition subjects rely on their basic affective responses as a means of forming their attitudes, these attitudes are relatively weak. However, when provided with a compelling cognitive basis for the attitude, low need for cognition subjects also generate strong attitudes. Despite the intriguing nature of this interaction, it should be remembered that this interaction was not obtained in Experiment Two. Thus, at this point it seems premature to place too much confidence in the reliability of this interaction effect.

Finally, it is worth noting that the two-way interaction between type of persuasion and need for cognition that was obtained in Experiment Two was not significant in Experiment Three, $F(1, 59) = .22$, $p = .64$. Given the lack of a theoretical rationale for this effect and the fact that it failed to replicate, it seems sensible to remain skeptical of the existence this effect.[13]

Discussion

There were two major sets of hypotheses tested in Experiment Three. The first set of hypotheses focussed on confirming the success of the attitude formation manipulation in creating affective and cognitive attitudes. Analyses of discrepancy scores and multiple regression analyses generally supported the conclusion that the manipulation was successful. The success of the attitude formation



F (1, 59) = 5.15, p = .027

Figure 9: Post-Persuasion Attitudes as a Function of Need for Cognition and Basis of Attitude

manipulation was particularly interesting because it suggested that it is possible to create attitudes relevant to taste that are affective or cognitive in nature. The success of the cognitive-taste attitude condition indicates that telling subjects about affective information (e.g., taste) does not necessarily create an affective attitude. This is important because in some past experiments (i.e., Millar & Millar, 1990), affective persuasion was operationalized as persuasive appeals that provided information about affective stimuli/reactions rather than as persuasive appeals causing affective reactions. The results of Experiment Three, suggest that the later rather than the former is the more defensible operationalization.

The second important set of hypotheses tested in Experiment Three were the affective/cognitive matching and attribute dimension matching hypotheses. Results were generally supportive of the affective/cognitive matching hypothesis. Regardless of whether the taste/smell dimensions matched or mismatched the initial attitude, affective persuasion was more effective than cognitive persuasion when matched against affective attitudes compared to when matched against cognitive attitudes.

These attitude change results have a number of important implications. First, these results provided data in support of the affective/cognitive matching hypothesis that was even more definitive than that obtained in Experiment Two. Even after holding attribute dimensions of the attitude object constant across affect and cognition, the affective/cognitive matching effect occurred. Thus, the interpretation of the results of Experiment Two as an affective/cognitive matching effect per se was supported. The finding that affective/cognitive matching occurs even when attribute dimensions of the object mismatch is also important in that it implies that the affective/cognitive distinction might be a particularly fundamental distinction in the attitude domain. As outlined in the introduction,

the affect/cognition distinction has a long tradition in the attitude and persuasion literature. However, the power of this distinction has seldom if ever been directly pitted against other dimensions of attitudes.

Despite the value of the data in Experiment Three, as with any experiment, these data also have their limitations. In this experiment, the affective and cognitive dimensions of attitudes were crossed with the taste and smell dimensions of the attitude object. The taste versus smell distinction, however, does not constitute the strongest attribute dimension distinction that might be crossed with the affective/cognitive distinction. This is because taste and smell are properties of an attitude object that although separable, are likely to be perceived by most people as closely related to one another. Thus, future tests using dimensions that are even more clearly distinct from one another would be desirable.

CHAPTER V

EXPERIMENT FOUR

Introduction

Purpose

Although the data presented in Experiments Two and Three provide more convincing evidence of affective/cognitive matching than has previously been available, there is one fundamental objection that one might raise concerning the manipulations of affect and cognition in these experiments. The manipulations of affect and cognition in these experiments have confounded the affect/cognition distinction with direct and indirect experience. Specifically, the affect operationalizations in both Experiments Two and Three involved direct experience with the attitude object (i.e., tasting or smelling the beverage) whereas the cognition operationalizations involved indirect experience with the attitude object (i.e., reading about the beverage). Research has indicated that the distinction between attitudes based on direct versus indirect experience is useful in determining the underlying strength of an attitude (e.g., Fazio, 1995; Fazio & Zanna, 1978, 1981).

Given past research demonstrating the utility of the direct/indirect experience distinction, one might argue that the persuasion matching effect observed in Experiments Two and Three was not due to affective/cognitive matching but direct/indirect experience matching. Despite the apparent plausibility of this explanation, careful consideration of the nature of the direct/indirect experience distinction and an examination of the data obtained in Experiments Two and Three seem inconsistent with this alternative interpretation.

First, research on direct/indirect experience has conceptualized this distinction as a determinant of attitude strength. That is, attitudes based on direct experience have been found to be stronger than attitudes based on indirect experience (e.g., Fazio, 1995; Fazio & Zanna, 1978, 1981). This suggests that attitudes derived from direct experience should be more difficult to change. Thus, the direct/indirect experience interpretation predicts a main effect of basis of attitude on persuasion. Additionally, although there has been no previous empirical evidence for such an effect, one might also predict a main effect of type of persuasion such that direct experience persuasion produces more change than indirect experience persuasion. This is because information derived from direct experience is presumed to have greater impact than information derived from indirect experience.

The data from Experiments Two and Three revealed only partial support for these predictions. The strongest prediction that can be derived from the direct/indirect experience interpretation, the main effect of basis of attitude on attitude change, was not obtained in either Experiment Two or Three. This effect even failed to reach significance when the main effects were combined in a meta-analysis, $\underline{Z}$ = -.13, $\underline{p}$ = .90. However, there was a significant main effect of type of persuasion in the predicted direction in the two experiments.

Most problematic for the direct/indirect experience interpretation is its need to account for the significant two-way interaction between basis of attitude and type of persuasion found in Experiments Two and Three. This interaction revealed enhanced persuasion when persuasive appeals matched the basis of attitudes compared to when they mismatched. In order to accommodate these findings, one would need to account for two effects. The first is that indirect experience persuasion is more effective against attitudes based on indirect experience than on attitudes based on direct experience. This certainly seems sensible

given that indirect experience is presumed to be weaker than direct experience and thus should be better at overcoming previous indirect experience than previous direct experience. Second, however, one also needs to account for the fact that direct experience persuasion is more effective against attitudes derived from direct experience than against attitudes derived from indirect experience. This prediction does not appear particularly sensible. That is, it does not seem plausible that direct experience should be less effective in overcoming previous indirect experience (which is presumed to be a relatively weak basis for attitudes) than previous direct experience (which is presumed to be a strong basis of attitudes). Yet, the contrasts conducted in Experiment Two and Three found a non-significant tendency for this in one experiment and a highly significant tendency for this in the other. When the contrasts were combined in a meta-analysis, the effect was highly significant, $\underline{Z} = 3.32$, $\underline{p} < .01$. Thus, the interaction is inconsistent with the commonly accepted view of how the direct/indirect experience distinction influences attitudes. However, it is quite consistent with the affect/cognition interpretation.

Despite the problems of the direct/indirect experience interpretation in accounting for the data, it seems desirable to attempt to test the affective/cognitive matching hypothesis in an experimental context where this confound is eliminated. One benefit of doing so is that however compelling the arguments against the direct/indirect experience interpretation might be, empirical tests specifically designed to refute this interpretation are even more compelling. A second benefit is that other confounds related to but somewhat different from the traditional direct/indirect experience distinction also exist in the previous manipulations of affect and cognition. For instance, the affective operationalization involved sensory information whereas the cognitive operationalization involved semantic information. Similarly, the manipulations could be mapped on to Tulving's (1972)

distinction between episodic and semantic memory. Episodic memory refers to memory for events and episodes that have been personally experienced (e.g., such as tasting a beverage) whereas semantic memory refers to impersonal memories of facts (e.g., such as reading about health benefits of a beverage). Although these distinctions have never been extensively integrated in attitude theory and research, they nonetheless constitute potential confounds that seem worth controlling. A final benefit of controlling the direct/indirect experience confound is that it would demonstrate the robustness of the affective/cognitive matching effect across different methodologies.

Overview

Experiment Four used manipulations of basis of attitude and type of persuasion that unconfounded the direct/indirect experience dimension from the affect/cognition distinction. The method used in this experiment involved a modification of the materials and procedures used by Crites et al. (1994) to create affective and cognitive attitudes. In their experiment, they created affective or cognitive attitudes toward a fictitious animal by having subjects read an emotionally evocative passage about the animal or a passage containing factual information about the animal. Experiment Four used a similar procedure to create initially positive affective or cognitive attitudes. However, unlike Crites et al. (1994), subjects were then exposed to a passage that evoked negative emotional reactions (i.e., affective persuasion) or a passage that contained negative factual information (i.e., cognitive persuasion). In addition to providing a control for direct/indirect experience, these materials allowed a test of the affective/cognitive matching hypothesis with a new attitude object and stimulus materials.

Method

Subjects

Subjects were 76 undergraduate students enrolled in an introductory marketing course at Ohio State University. Subjects

participated in order to obtain extra credit for their course. All subjects were told that the experiment was for the purpose of obtaining ratings of the readability of different samples of writing. Due to suspicion concerning the cover story, 1 subject was excluded from analysis.

Measures

Experiment Four utilized the same measures and coding procedures as in the previous experiments with the exception that the target attitude object for the measures was changed and a set of filler questions more consistent with the new cover story was used (see Appendix C). Following the attitude formation phase, all subjects completed the attitude scale first. Subjects then completed the affect and cognition scales in one of the two counterbalanced orders. Subjects finished by answering a set of filler questions in which they rated various aspects of the writing style.

At the conclusion of the persuasion phase, each subject completed the attitude, affect and cognition measures a second time in the same order that he or she had completed them following the attitude formation phase. Subjects then provided cognitive responses. Following the cognitive response task, subjects were asked two questions in which they were asked to estimate the extent to which their initial attitudes towards lemphurs were based on emotions and based on knowledge about the animal (see Appendix C). Subjects responded to these two questions on a 10-point scale with 1 labeled "None At All" and 10 labeled "A Great Deal". These questions were similar to the affect and cognition self-report questions used in Experiment Three. Finally, subjects completed the same set of filler questions used in the formation phase and then they completed the need for cognition scale.

Procedure

The design of Experiment Four was a 2 (basis of attitude: affect vs. cognition) x 2 (type of persuasion: affect vs. cognition).

Subjects participated in groups ranging from 1 to 10 people. Subjects were told that the purpose of the experiment was to obtain ratings of the readability of different samples of writing.

In the attitude formation phase, half of the subjects were randomly assigned to read a positive emotionally evocative passage about a fictitious animal called a "lemphur" (affective attitude). Before reading the passage, however, subjects were told that they would be reading a passage about an animal called a lemphur. They were told that this animal might be unfamiliar to some of them and that the researchers were interested in getting a sense of subjects' feelings towards lemphurs. Subjects were asked to complete a series of questions about their feelings towards lemphurs. They were instructed that if they were unfamiliar with the animal, they should answer the questions based on their expectations about lemphurs. Subjects then answered the 16 item affect scale used in the previous experiments (see Appendix C). The purpose of having subjects complete this scale prior to reading the emotional passage was to prime the affective dimension of attitudes and thus further enhance the likelihood that the passage would create an attitude based on affect.

Upon completion of the affect scale, subjects were asked to complete a second booklet containing the positive emotional passage followed by a series of questions. The positive emotional passage described a person's encounter with a lemphur (see Appendix C). In the passage, the lemphur was depicted as a friendly marine animal that frolicked with a swimmer. The passage provided relatively little information about the animal but did describe the positive feelings experienced by the person when meeting the lemphur. Based on previous work by Crites et al. (1994), it was expected that reading this passage would induce positive feelings that would become associated with the attitude object. The passage was followed by the measures of attitude, affect, and cognition. The last page of the booklet contained a set of

filler questions.

The other half of the subjects were randomly assigned to read a passage containing positive information about the same fictitious animal, the lemphur (cognitive attitude). Before reading the passage, however, subjects were told that they would be reading a passage about an animal called a lemphur. They were told that this animal might be unfamiliar to some of them and that the researchers were interested in getting a sense of subjects' beliefs about lemphurs. Subjects were asked to complete a series of questions about their beliefs about lemphurs. They were instructed that if they were unfamiliar with the animal, they should answer the questions based on their expectations about lemphurs. Subjects then answered the 14 item cognition scale used in the previous experiments (see Appendix C). The purpose of having subjects complete this scale prior to reading the informational passage was to prime the cognitive dimension of attitudes and thus further enhance the likelihood that the passage would create an attitude based on cognition.

Upon completion of the cognition scale, subjects were asked to complete a second booklet containing the positive informational passage followed by a series of questions. The positive informational passage was presented as an excerpt from an encyclopedia of marine life (see Appendix C). In the passage, several positive attributes of lemphurs were discussed. The lemphur was described as an animal that was highly intelligent and could be readily trained. The practical uses of lemphurs as a source of food and for making products were also discussed. The passage was followed by the measures of attitude, affect, and cognition. The last page of the booklet contained a set of filler questions.

In the persuasion phase, half of the subjects were randomly assigned to complete a third booklet containing a negative emotionally evocative passage (affective persuasion). This passage described a

lemphur brutally killing a swimmer (see Appendix C). This passage provided relatively little information about the lemphur but did present a graphic description of the lemphur hunting and then eating a swimmer. Following the passage, subjects completed measures of attitude, affect, and cognition. They also performed a cognitive response task, completed measures in which they estimated the extent to which their attitudes were based on emotions and knowledge, answered filler questions, and completed the need for cognition scale.

The other half of the subjects in the persuasion phase were randomly assigned to complete a third booklet containing a negative informational passage about lemphurs (cognitive persuasion). This passage was presented as excerpts from an encyclopedia of marine life (see Appendix C). This passage provided information about a number of negative attributes of lemphurs. The passage discussed lemphurs' unpredictable temperament in the wild. It also mentioned their adverse impact on the fishing industry as well as the fact that products derived from lemphurs are extremely expensive. Additionally, lemphurs were describe as a source of food high in cholesterol. Following the passage, subjects completed measures of attitude, affect, and cognition. They also performed a cognitive response task, completed measures in which they estimated the extent to which their attitudes were based on emotions and knowledge, answered filler questions, and completed the need for cognition scale.

Results

Hypotheses

There were several sets of hypotheses tested in Experiment Four. First, it was hypothesized that when subjects' initial attitudes toward lemphurs were formed by reading the positive emotionally evocative passage (i.e., affective information), the overall evaluation of lemphurs should be based predominantly on affect. In contrast, when subjects' initial attitudes toward lemphurs were formed by reading the

positive informational passage about desirable features of lemphurs (i.e., cognitive information), the overall evaluation should be based predominantly on cognition. The second major set of hypotheses tested in this experiment was related to the affective/cognitive matching hypothesis. It was predicted that when persuasion was affective in nature, it should have greater impact when targeted against an affective attitude than when targeted against a cognitive attitude. In contrast, cognitive persuasion was hypothesized to have a greater impact when targeted against cognitive attitudes than when targeted against affective attitudes.

Descriptive Statistics

Before examining the major hypotheses of Experiment Four, the mean, standard deviation, and Cronbach alpha for the attitude, affect, and cognition scales within the two attitude formation conditions were computed (see Table 11). Once again, this was done primarily to examine the comparability of attitudes and scale reliabilities across attitude formation conditions. An examination of columns one and four in row one reveals a small tendency for attitudes in the cognitive condition to be more positive than attitudes in the affective condition, $t(1, 74) = 2.11$, $p = .04$. A test of the difference in variance of the attitude scores (see columns two and five) across formation conditions revealed that there was no difference in variance between the affective attitude condition and the cognitive attitude condition, $F = 1.43$, $p = .28$.

The comparison of the mean affect score across conditions indicated that there was no difference in these scores across attitude formation conditions, $t(1, 74) = -.85$, $p = .40$. The test of variances in affect revealed a marginally significant tendency for greater variance in the affective attitude condition, $F = 1.84$, $p = .07$. The mean cognitive score was found to be significantly more positive in the cognitive attitude condition than in the affective attitude condition, $t(1, 71) = 5.53$, $p < .01$. There was no difference in the variance of

Table 11

Experiment 4: Means, standard deviations, and Cronbach alphas for attitude, affect, and cognition scales by attitude formation condition

	Affective Attitude			Cognitive Attitude		
Scale	Mean	SD	Alpha	Mean	SD	Alpha
Attitude Scale	5.71	0.88	.91	6.10	0.74	.83
Affect Scale	5.55	0.90	.92	5.39	0.67	.79
Cognition Scale	5.07	0.68	.81	5.85	0.52	.76

the cognitive score across the two attitude formation conditions, F = 1.70, p = .12. Finally, an examination of columns three and six reveals that the reliabilities of the three scales as indexed by Cronbach alpha showed only modest variations across conditions.

Analyses of Affective/Cognitive Bases of Attitudes

As in the previous experiments, several analyses were undertaken to assess the efficacy of the attitude formation manipulation for creating affective and cognitive attitudes. The first analysis computed discrepancy scores between the affect and attitude scales and between the cognition and attitude scales. Differences in these mean scores across attitude formation conditions were then examined. The second approach used multiple regression to assess the ability of the affect and cognition scales to predict attitudes. Finally, subjects' self-reports of how much their attitudes were based on affect and cognition were compared across attitude formation conditions.

Analysis of Discrepancy Scores. As in previous experiments, the first analysis used to assess the effectiveness of the attitude formation manipulation was an analysis of discrepancy scores. The discrepancy between the attitude score and each basis was once again obtained by computing the absolute value of the difference between each subject's attitude and the respective affect or cognition scores. This produced two scores with a possible range from 0 to 6. Small numbers indicated that there was little discrepancy (i.e., high consistency) between the attitudinal basis and the overall attitude.

Table 12 shows that the attitude formation condition was successful in creating affective or cognitive attitudes as indexed by the discrepancy scores. When these means were tested in a 2 (type of discrepancy score: affect-attitude vs. cognition-attitude) x 2 (attitude formation condition: affective vs. cognition) mixed design ANOVA, the predicted crossover interaction between type of discrepancy scores and attitude formation order was significant, $F(1, 71) = 50.31$, p

Table 12

Experiment 4: Mean affect-attitude discrepancy scores and mean cognition-attitude discrepancy scores by attitude formation condition

Type of Score	Affective Attitude	Cognitive Attitude
Affect-Attitude	.24	.78
Cognition-Attitude	.76	.49

< .01. This interaction indicated that the reversal between the two discrepancy scores across the attitude formation conditions was significant.

An examination of the mean discrepancy scores within the affective attitude condition indicated that as expected, the mean scores were in the direction such that the affect-attitude discrepancy score was smaller than the cognition-attitude discrepancy score. A contrast of this difference was highly significant, $F(1, 71) = 41.00$, $p < .01$. Also consistent with predictions, within the cognitive attitude condition, the means were in the direction of a smaller cognition-attitude discrepancy score than an affect-attitude discrepancy score. The contrast of this difference was also significant, $F(1, 71) = 12.75$, $p < .01$. The mixed design ANOVA also indicated a significant type of discrepancy score main effect such that affect-attitude discrepancy scores were smaller than cognition-attitude discrepancy scores, $F(1, 71) = 3.86$, $p = .05$.

A comparison of the affect-attitude scores across attitude formation conditions was significant, $t(1, 74) = 4.79$, $p < .01$. This comparison revealed that as expected, the affective attitude condition produced smaller affect-attitude discrepancy scores (M=.24) than the cognitive attitude condition (M=.77). A comparison of the cognition-attitude scores across conditions was also significant, $t(1, 71) = -3.12$, $p < .01$. This comparison indicated that, consistent with the notion that the cognitive attitude formation condition produced cognitively based attitudes, cognition-attitude discrepancy was smaller in the cognitive attitude condition (M=.49) than in the affective attitude condition (M=.76). Thus, taken together, the discrepancy score analyses provide compelling evidence that the attitude formation manipulation was successful in altering the affective and cognitive bases of attitudes.

Multiple regression analysis. These analyses were identical to the multiple regression analyses in the previous experiments. Subjects were divided into two separate samples based on whether their initial attitudes had been formed by reading the emotionally evocative passage (i.e., affective attitude condition) or by reading the informational passage (i.e., cognitive attitude condition). A multiple regression analysis in which scores on the affect and cognition scales were used to predict scores on the attitude scale was then conducted within each condition. If the attitude formation manipulation was successful, the ability of the affective scale relative to the cognitive scale to predict attitudes should have been enhanced in the affective attitude condition. In contrast, in the cognitive attitude condition, the ability of the cognitive scale relative to the affective scale to predict attitudes should have been enhanced.

There were two types of comparisons in Table 13 that were conducted to assess the efficacy of the attitude formation manipulation. The first of these involved an examination of the coefficients within each condition. An examination of column 1 (i.e., the affective attitude condition) shows that the pattern of coefficients was consistent with the conclusion that the attitude formation manipulation was successful. The affect scale was a strong and statistically significant predictor of overall attitude. The coefficient for the cognitive scale was close to zero and was not statistically significant. This suggested that subjects in this condition were relying on affect in forming their attitudes toward lemphurs. An examination of the coefficients in the cognitive attitude condition also provided strong support for the success of the attitude formation manipulation (see column 2). In this condition, a pattern opposite to the affective attitude condition was evident. The cognitive scale was a strong and significant predictor of overall attitudes. The coefficient of the affective scale, however, was close to zero and it was not statistically

Table 13

Experiment 4: Unstandardized regression coefficients for affect and cognition predicting attitude by attitude formation condition

	Affective Attitude	Cognitive Attitude
Predictor	Coefficient	Coefficient
Affect Scale	.92***	.04
Cognition Scale	.02	.76**
R^2	.89	.41
N	35	38

* p < .05
** p < .01
*** p < .001

significant. This tendency for a reversal in the relative magnitude of the affective and cognitive coefficients across conditions was assessed by testing the differences between the coefficients within each manipulation condition. The effect size for the two tests was then computed. This analysis indicated that the effect size of the difference between coefficients within the cognitive condition was r=-.32 and within the affective condition was r=.58. The contrast between effect sizes to assess the reversal of differences was significant, $\underline{Z}$ = 4.10, $\underline{p} < .01$.

The second comparison in Table 13 that was relevant to assessing the utility of the present paradigm was a comparison of the coefficients for the same scale across the two orders. These across condition comparisons provided strong support for the success of the manipulation. Concentrating first on the affect scale (row 1), the size of the coefficient in the affective attitude was significantly greater in the affective attitude condition than in the cognitive attitude condition, $\underline{Z}$ = 4.46, $\underline{p} < .01$. A comparison of the cognitive scale across conditions (row 2), on the other hand, revealed that the cognitive scale coefficient was significantly greater in the cognitive attitude condition than in the affective attitude condition, $\underline{Z}$ = -3.00, $\underline{p} < .01$. Taken together, these regression analyses provide strong evidence that the attitude formation manipulation was successful in creating attitudes that were either predominantly affective or cognitive in nature.[14]

Affect and cognition self-reports. The final set of analyses conducted to assess the impact of the attitude formation manipulation was an analysis of subjects' self-reports of how much their attitudes were based on affect and how much they were based on cognition. These analyses assessed whether subjects were aware of the bases of their attitudes. If subjects were aware of the bases of their attitudes, one would expect the affect self-report score to have been larger than the cognition self-report score within the affective attitude condition. In

contrast, within the cognitive attitude condition, the cognitive self-report score should have been greater than the affect self-report score.

An examination of Table 14 revealed that there was modest support for the awareness hypothesis. When the pattern across the two conditions was tested with a 2 (basis of attitude: affect vs. cognition) x 2 (type of self-report score: affect vs. cognition) mixed design ANOVA, the expected two-way interaction was significant, $F(1, 71) = 8.51$, $p < .01$. Within the affective attitude condition, the mean affect self-report was much higher than the mean cognition self-report. The contrast of this difference was significant, $F(1, 71) = 28.99$, $p < .01$. Within the cognitive attitude condition, however, there was no difference between the affect self-report and the cognition self-report, $F(1, 71) = 1.56$, $p > .20$.

A comparison of the affect self-report scores across attitude formation conditions was not significant, $t(1, 71) = -1.44$, $p = .16$. A comparison of the cognition-attitude scores across conditions, however, was significant, $t(1, 71) = 2.75$, $p < .01$. This comparison indicated that, consistent with the notion that subjects were aware that the cognitive attitude formation condition produced cognitively based attitudes, cognition self-report score was higher in the cognitive attitude condition (M=5.31) than in the affective attitude condition (M=3.47). Thus, taken together, the self-report score analyses revealed that the pattern of means was generally in the predicted direction of awareness. However, the results indicated that even in the cognitive condition, there was a non-significant tendency for subjects to see their attitudes as more affective than cognitive. This was despite the fact that the discrepancy score and regression analyses indicated that their attitudes were actually strongly based on cognition. Thus, subjects awareness of the basis of their attitudes was somewhat imperfect.

Table 14

Experiment 4: Mean affect self-report and cognition self-report scores by attitude formation condition

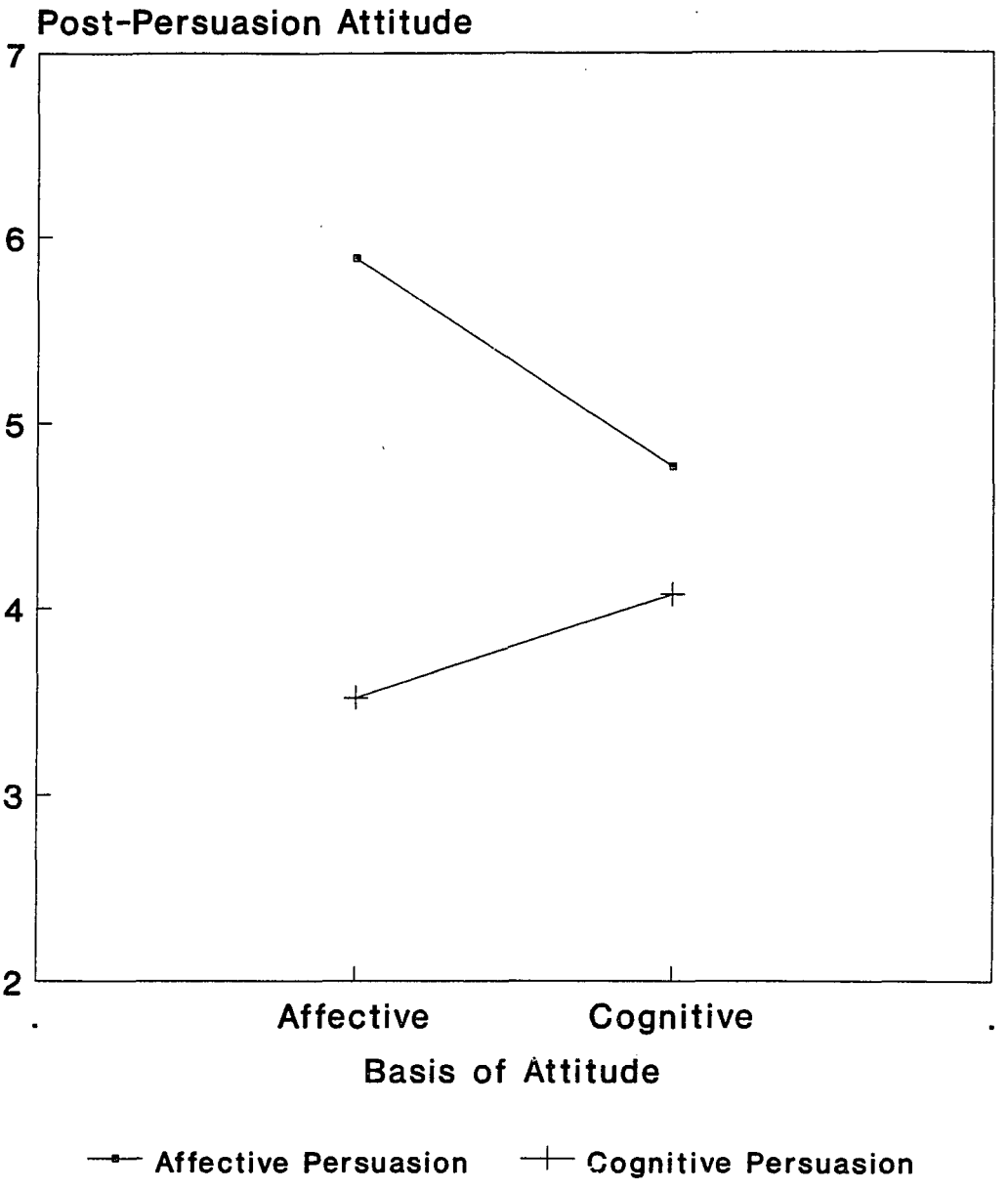
Type of Score	Affective Attitude	Cognitive Attitude
Affect Self-Report	7.00	6.13
Cognition Self-Report	3.47	5.31

Attitude Change Results

The affective/cognitive matching hypothesis predicts that attitude change should be greatest when the underlying affective or cognitive nature of the persuasive appeal matches the underlying affective or cognitive nature of the attitude. Thus, the affective/cognitive matching hypothesis predicts a two-way interaction between basis of attitude (affect vs. cognition) and type of persuasion (affect vs. cognition).

To test this hypothesis, subjects' post-persuasion attitudes were analyzed using a 2 (basis of attitude: affect vs. cognition) x 2 (type of persuasion: affect vs. cognition) x 2 (need for cognition: high vs. low) ANOVA. This analysis indicated that there were two significant effects. First, as was found in Experiments Two and Three, a significant main effect of type of persuasion was obtained, $F(1, 64) = 27.95$, $p < .01$. An examination of the means, reverse coded so that large numbers indicated attitude change in the direction of the persuasive appeals, revealed that affective persuasion was again more effective (M=5.29) than cognitive persuasion (M=3.81).

More importantly, the critical two-way interaction between basis of attitude and type of persuasion was highly significant, $F(1, 64) = 7.68$, $p = .01$. An examination of the means in Figure 10 demonstrated that the significant interaction provided evidence for a relative affective/cognitive matching effect. As with the previous experiments, the means in Figure 10 are reverse coded so that large numbers reflect attitudes consistent with the direction of the persuasive message (i.e., large numbers indicate greater negativity). The significant interaction indicated that when attitudes were affective in nature, affective persuasion produced more attitude change than cognitive persuasion. The contrast between these means was highly significant, $F(1, 64) = 36.50$, $p < .01$. In contrast, when attitudes were cognitive in nature, the advantage of affective persuasion over cognitive persuasion was not



F (1, 64) = 7.68, p = .007

Figure 10: Post-Persuasion Attitudes as a Function of Basis of Attitude and Type of Persuasion

reliable, $F(1, 64) = 3.12$, $p < .10$. Also relevant to the matching hypothesis was the contrast between the affective persuasion in the cognitive attitude and affective attitude conditions. This contrast indicated a significant relative increase in effectiveness of affective persuasion when matched against affective attitudes compared to when matched against cognitive attitudes, $F(1, 64) = 8.22$, $p < .01$. Similarly, cognitive persuasion showed a non-significant tendency to have relatively greater impact when matched against a cognitive attitude compared to when matched against an affective attitude, $F(1, 64) = 1.98$, $p < .20$.[15]

Discussion

There were two major sets of hypotheses tested in Experiment Four. The first set of hypotheses focussed on confirming the success of the attitude formation manipulation in creating affective and cognitive attitudes. Analyses of discrepancy scores and multiple regression analyses provided strong support for the conclusion that the manipulation was successful. The success of the attitude formation manipulation was particularly useful because it replicated the Crites et al. (1994) finding that it is possible to create affective and cognitive attitudes after having held the direct/indirect experience distinction constant. It was also interesting that subjects were not entirely aware of the bases of their attitudes in the present Experiment or in Experiment Three. This suggests that manipulation checks asking subjects to directly infer the bases of their attitudes may not be particularly accurate. This is certainly consistent with the notion that individuals are poor at introspecting about the causes of their attitudes (e.g., Nisbett & Wilson, 1977). And, it implies that the bases of attitudes are better assessed by measuring affect and cognition and then examining the extent to which these constructs are actually associated with attitudes.

The second important set of hypotheses tested in Experiment Four were the affective/cognitive matching and mismatching hypotheses. Results generally supported the affective/cognitive matching hypothesis. Thus, the affect/cognition distinction produced the persuasion matching effect even when direct/indirect experience and other related distinctions such as sensory/semantic information and episodic/semantic memory were held constant. This finding suggests that the results of Experiments Two and Three are probably most parsimoniously interpreted as affective/cognitive matching. It also demonstrates that the affective/cognitive persuasion matching effect can be obtained using methodologies other than the taste/written information method and for diverse attitude objects ranging from beverages to unfamiliar animals.

CHAPTER VI

GENERAL DISCUSSION

Summary of Findings

The four experiments reported in this dissertation demonstrated several basic findings. In Experiment One, the assumption made in Edwards (1990) and Edwards and von Hippel (in press) that varying the order of affective information and cognitive information at attitude formation influences the affective and cognitive bases of attitudes was examined. The results of Experiment One found no evidence that order impacted on the bases of attitudes. However, Experiment One did replicate the Edwards (1990) and Edwards and von Hippel (in press) finding that persuasion is enhanced when the order of affective information and cognitive information at persuasion matches the order in which affective information and cognitive information was presented at attitude formation.

In Experiment Two, the affective/cognitive matching and mismatching hypotheses were assessed using a different methodology. This methodology involved manipulating the affective and cognitive bases of attitudes by presenting either affective information or cognitive information. This experiment revealed that the new methodology was successful in creating attitudes that were either predominantly affective or predominantly cognitive in nature. Importantly, the results of Experiment Two found evidence of a relative affective/ cognitive persuasion matching effect. That is, affective persuasion was found to be more effective against affective attitudes than cognitive attitudes. Conversely, cognitive persuasion was found to be more

successful against cognitive attitudes than affective attitudes.

Experiment Three examined if the affective/cognitive matching effects were moderated by whether the attribute dimensions of the attitude object targeted in persuasive appeals matched or mismatched the attribute dimension upon which the attitude was based. This was done by creating affective and cognitive attitudes towards a beverage based on the taste attribute dimension. Affective or cognitive persuasive appeals that were crossed with the taste and smell attribute dimensions were then presented. The results of this experiment indicated that affective/cognitive matching enhanced persuasion regardless of whether the persuasive message matched or mismatched the taste attribute dimensions of the attitude object. Thus, Experiment Three showed that even when attribute dimensions were held constant, the matching of affect/cognition was capable in and of itself of producing enhanced persuasion. It also demonstrated that this affective/cognitive matching effect was sufficiently strong to overcome mismatches of attribute dimensions of the attitude object.

Experiment Four explored whether the persuasion matching effect observed in Experiments Two and Three could be attributed to a matching of direct/indirect experience rather than affect/cognition. This was done by creating affective or cognitive attitudes towards a fictitious animal using only written information. Additionally, affective and cognitive persuasion also involved the use of written information in both cases. The results of this experiment revealed that the attitude formation manipulation was successful in creating affective and cognitive attitudes. Experiment Four also demonstrated evidence of a relative affective/cognitive persuasion matching effect. Thus, Experiment Four showed that affective/cognitive matching effects occurred even after controlling for the direct/indirect experience distinction.

Implications of Findings and Directions for Research

Taken together, the results of these four experiments have a number of implications for attitude research and suggest a variety of interesting directions for additional research. Some of these implications and future directions are directly related to the affective/cognitive matching and mismatching hypotheses. However, these findings also have broader theoretical and methodological implications for understanding the role of attitude structure in attitudinal processes.

Implications for Affective/Cognitive Matching

The most obvious implications of these data are for the affective/cognitive persuasion matching hypothesis. These experiments provide the strongest data to date in support of this hypothesis. Theorists have long speculated that attitudes with different underlying affective and cognitive bases are particularly susceptible to different types of persuasion (e.g., Katz & Stotland, 1959). However, this speculation went untested for over 30 years.

Empirical status of affective/cognitive matching. Recent empirical data advanced by Edwards (1990) and Edwards and von Hippel (in press) as evidence of affective/cognitive persuasion matching have been potentially flawed. Most notably, there has been no evidence that the order manipulation of affect and cognition used in these experiments actually produced affective or cognitive attitudes. Thus, other plausible interpretations of these data are clearly possible. The finding in Experiment One of this dissertation that there was no evidence that varying the order of affect and cognition influenced the affective and cognitive bases of attitudes has only served to further question the plausibility of the affective/cognitive interpretation. Finally, the fact that other experiments have proported to provide evidence for affective/cognitive mismatching persuasion effects also

brings into question evidence presumed to support the affective/cognitive matching hypothesis (Millar & Millar, 1990). Thus, despite its intuitive plausibility, the viability of affective/cognitive matching hypothesis in persuasion has remained very much in doubt.

In light of past evidence, Experiments Two, Three, and Four of the present dissertation provide the most convincing evidence to date in support of the affective/cognitive persuasion matching hypothesis. These data showed that in all three experiments, the attitude formation manipulation was successful in creating attitudes that were either predominantly affective or cognitive in nature. It also showed that the underlying basis of these attitudes moderated the effectiveness of affectively and cognitively based persuasive appeals such that matching the nature of persuasion to the basis of the attitude enhanced persuasion.

Beyond the broader theoretical implications of the matching hypothesis which will be discussed later, this evidence supporting the matching hypothesis has important applied implications. It suggests that practitioners in settings such as advertising and politics need to consider the underlying affective and cognitive nature of attitudes and persuasive appeals if they are to maximize their chances of successfully changing attitudes. By understanding the extent to which attitudes are based on affect and cognition, individuals in applied settings can construct messages that vary in their affective or cognitive content so as to specifically target the underlying bases of attitudes.

Mediational data. Although the data presented in this dissertation provide the most convincing evidence of affective/cognitive matching, one potential objection that one might raise to the affective/cognitive explanation of the matching effect in Experiments Two, Three, and Four is that there have been no demonstrations of the mediational role of affect and cognition in attitude change. In the experiments presented in this dissertation, clear evidence was presented

demonstrating that the affective and cognitive bases of attitudes were successfully manipulated. And, the affective/cognitive matching effect on persuasion was shown. What was not examined was the underlying psychological processes of the matching effect. That is, it would have been interesting to examine the extent to which changes in the underlying affective and cognitive bases of attitudes mediated changes in attitudes as a function of subjects' basis of attitudes and type of persuasion. For instance, did attitudes that were changed using persuasive appeals that matched the basis of the attitude occur solely as a function of changes in the basis targeted by the persuasive appeal. And, to what extent did attitudes that were changed using mismatching persuasive appeals occur as a function of changes in both affect and cognition. Such analyses have the potential to provide a more sophisticated understanding of the nature of affective/cognitive matching effects. And these analyses would provide further evidence that matching effects were due to the affect/cognition distinction.

Unfortunately, there were methodological and conceptual problems that made such analyses impractical in the current experiments. One practical problem was that such analyses would require path analyses within each experimental condition. This would result in analyses based on extremely small sample sizes (N = 15 to 19). Obtaining significant effects and precise parameter estimates from such small sample sizes is quite difficult.

However, more problematic for such analyses is the tendency for consistency among affect, cognition, and attitude. As many theorists have discussed and in some cases demonstrated, there tend to be high levels of consistency among these constructs (e.g., Breckler, 1984; Insko & Schopler, 1967; Kothandapani, 1971; Ostrom, 1969). Additionally, pressure toward consistency can also result in changes in one basis leading to changes in another basis (e.g., Rosenberg, 1960). Such consistency effects make it difficult to disentangle the role of changes

in the bases of attitudes in affective/cognitive matching effects. For example, one might predict that an affective attitude that is changed by affective persuasion should occur because of changes in affect. However, even if changes in affect cause changes in attitudes in this case, consistency effects might also result in changes in cognition. Indeed, in cases where there is conflicting affect, one might expect people to actually generate cognition to help explain the inconsistent affective experiences. Similarly, although cognitive matching might produce changes in attitudes due to changes in cognition, consistency effects might also change affect. And, inconsistent cognition might produce unpleasant affective reactions due to dissonance effects (e.g., Festinger, 1957) or disconfirmed positive expectancies. Thus, it seems likely that even in cases of relatively pure matching, it will be difficult to find clear distinct mediational patterns across experimental conditions.

To test this possibility, the data from Experiments Two, Three, and Four were combined to provide sufficient sample size for analyses. Affect-attitude and cognition-attitude discrepancy scores following the persuasive appeals were analyzed as a function of basis of attitude, type of persuasion, and type of discrepancy score (see Appendix D). These analyses found no indication that the differences between type of discrepancy scores were moderated by basis of attitude and type of persuasive appeal. Thus, the affective and cognitive bases of attitudes following persuasion were comparable across conditions in this analysis. Regression analyses produced a slightly different pattern of results (see Appendix D). These analyses suggested that attitudes initially based on affect were based on both affect and cognition following persuasion regardless of the type of persuasive message. Attitudes initially based on cognition were based on affect following affective persuasion. And, attitudes initially based on cognition were based on cognition following cognitive persuasive messages. Thus, taken together

the two analyses did not provide a coherent picture of the bases of attitudes following persuasion.

Because of consistency effects, the methods used in these experiments seem unlikely to provide data for which mediational analyses will be able to provide insights into the processes underlying matching effects. Even testing alternative path analysis models specifying different directional relations among variables seems less than promising given the fact that these models are likely to be mathematically equivalent (see MacCallum, Wegener, Uchino, & Fabrigar, 1993). Instead, future experiments of affective/cognitive matching for which mediational analyses are the primary goal will need to use measures and procedures that allow for more on-line assessment of changes in affect, cognition, and attitude. Such on-line assessments may provide the data necessary to establish more precise time sequencing of changes in the affective and cognitive bases of attitudes. Nonetheless, given the success of the manipulations in these dissertation experiments and the lack of convincing alternative explanations, it seems reasonable to attribute the persuasion matching effect to affect/cognition.

Why affective/cognitive matching works. Having established an affective/cognitive matching effect in persuasion, the next obvious step is to attempt to understand why matching the affective/cognitive nature of persuasive appeals to the underlying affective and cognitive bases of attitudes enhances persuasion. Surprisingly, advocates of the matching hypothesis have never articulated a detailed explanation for this effect. However, if one considers this effect from an attitude structure perspective, it is possible to construct plausible explanations.

When an attitude is based primarily on affect or on cognition, the attitude is assumed to be a global evaluation that has a strong associative link in memory with either affective reactions towards or

cognitions about the object. The other basis of the attitude is presumed to be either non-existent or to have an extremely weak link such that it does not substantially influence the global evaluation.

Targeting the attitude with a persuasive appeal that matches the basis of the attitude should directly undermine the existing basis. For example, if an attitude is closely associated with a set of positive affective reactions to the object, a persuasive appeal using strong negative affective information could overwhelm the pre-existing positive affect and replace it with a set of negative affective reactions. Similarly, matching a strong negative cognitive persuasive appeal to a positive cognitive attitude should undermine pre-existing positive beliefs about the object and replace them with a set of negative beliefs concerning attributes of the object. Thus, in both cases, matching could replace the pre-existing basis with a new basis thus changing the attitude.

In contrast, in the case of mismatching, the underlying basis of the attitude is never directly challenged. Instead, a new type of information is presented. Such a mismatching strategy is unlikely to replace the pre-existing basis but it is likely to create a new linkage with a second basis. For example, in the case of a positive affective attitude, a negative cognitive appeal is likely to result in an attitude linked to both positive affective reactions and beliefs about negative traits of the object. These differing bases should counteract one another resulting in an attitude somewhere in between the two bases. Similarly, a positive cognitive attitude targeted with negative affective persuasion should result in an attitude linked to both bases and falling somewhere in between the two when integrated on the evaluative continuum. Thus, matching is a process of replacement whereas mismatching is a process of addition.

Another slightly different conceptualization of matching and mismatching can be derived from a cognitive consistency perspective. In

this view, matching establishes a strong linkage between the new information and the attitude and serves to weaken the pre-existing basis and/or linkage between the pre-existing basis and the attitude. For example, take the case of a positive affective attitude. When strong negative affective information is presented, a strong linkage between the attitude and the negative affective reactions is likely to be established. Additionally, a strong linkage is also likely to be established between the positive and negative affective reactions. This results in an imbalanced cognitive system (e.g., see Abelson, 1959; Festinger, 1957). Assuming that the new negative affective information is sufficiently strong, imbalanced will need to be reduced by changing the attitude and pre-existing affect to be evaluatively consistent with the negative affect. Alternatively, balance might be established by changing the attitude and denying the linkage of the pre-existing positive affect to the attitude and negative affect (see Abelson, 1959). Similar processes of establishing cognitive consistency would also be likely to occur in the case of a cognitive attitude being changed via cognitive persuasion.

In the case of mismatching, however, pressures towards consistency among bases are likely to be less extreme. This is because different types of information are likely to be more weakly associated with one another. For instance, positive affect is more likely to be strongly associated with negative affect than negative cognition. Similarly, positive cognition is likely to be more strongly associated with negative cognition than negative affect. Thus, the pressures towards resolving inconsistency among the same basis are likely to be greater than among two different bases. Because imbalance between two different bases is likely to be more tolerable due to the weaker linkage, there will be less likelihood of substantial changes in elements of the cognitive system.

Moderators of affective/cognitive matching. The first view of affective/cognitive matching articulated in the previous section conceptualizes matching versus mismatching persuasive appeals as leading to two different structural outcomes. Matching is a process of replacement whereas mismatching is a process of addition. What is particularly valuable about this view is that it suggests when matching might or might not enhance persuasion. Specifically, it predicts that matching effects should be most effective when it is possible to directly overwhelm or replace the basis of the attitude. Alternatively, the cognitive consistency view, predicts that matching effects should be strongest when the new matching information is sufficiently strong that imbalance can only be resolved by changing the pre-existing basis or denying the linkage of the pre-existing basis with the attitude. In either view, success should be dependent on two things: the strength of the pre-existing basis and the strength of the persuasive appeal.

When the underlying basis of the attitude is extremely strong, it is likely to be difficult to completely overwhelm it with a persuasive appeal. Indeed, a strong basis might serve as a resource for counterarguing or resisting the appeal. In such cases, matching persuasion to bases could prove relatively ineffective. Thus, it might be more promising to use a mismatched persuasive appeal that only requires linking a new basis to the attitude rather than replacing a basis. Additionally, such mismatched persuasion might be hard to counterargue because of its novelty. Consistent with this view, both Edwards (1990) and Millar and Millar (1990) have speculated that the strength of the attitude might determine when matching versus mismatching leads to enhanced persuasion. Similarly, the cognitive consistency view also predicts that if the basis of the attitude is strong, it will be difficult to accomplish matching. This is because, it should presumably be easier to establish balance by changing the new information rather than the well established pre-existing basis.

For similar reasons, the strength of the persuasive appeal should also moderate matching and mismatching. When the persuasive appeal is extremely strong, it is likely to be successful in replacing the pre-existing basis. However, when it is weak, it will be unlikely to produce much change because of the ease of resisting it. In contrast, if weak persuasive appeals are mismatched, it could still produce some change because there is little pre-existing basis to serve as a resource and motivation for resisting the message. Petty et al. (1991) used just such a rational when they speculated that argument strength might be a moderator of affective/cognitive matching and mismatching. Similarly, the cognitive consistency view predicts that high levels of argument strength should also lead to matching. When the new information is particularly strong, imbalance is most easily resolved by changing the weaker pre-existing basis.

These proposed moderators of matching and mismatching seem consistent with the data presented in this dissertation. In these experiments, the persuasive appeals were designed to be particularly strong. And, the attitudes targeted for persuasion were newly formed attitudes that were unlikely to be well established. Thus, in light of these proposed moderators, it is not surprising that a matching effect was obtained.

Future research should explore the role of these and other moderators of affective/cognitive matching and mismatching. This research would have two important benefits. First, by determining the limiting conditions of matching and mismatching effects, insights can be gained into the underlying mechanisms of these effects. Indeed, until more on-line assessments of affective and cognitive change can be developed, testing moderators of matching and mismatching effects appears to be the most promising approach for understanding the psychological mechanisms of affective/cognitive matching and mismatching.

Second, by examining moderators, the inconsistency in past literature can be resolved. Establishing or refuting the affective/cognitive mismatching hypothesis is important to fully understanding the role of the affective and cognitive bases of attitudes in susceptibility to persuasion. As noted in the introduction, there are three possible resolutions for the inconsistency in the literature. One possibility is that past demonstrations of matching effects were spurious and that affective/cognitive mismatching is valid. However, the compelling evidence for the matching hypothesis presented in Experiments Two, Three, and Four, refute this explanation. A second possibility is that matching effects occur and that mismatching effects have been due to methodological artifact. The methodological problems with past mismatching evidence and the strong evidence for matching effects in the current experiments certainly indicate that this remains a viable explanation. However, the third possibility is that both matching and mismatching effects occur but these effects occur under different conditions. Explorations of such moderators would provide the evidence necessary to determine which resolution is correct.

Broader Implications for Attitude Structure Research

Beyond the specific implications of these findings for the affective/cognitive matching and mismatching hypotheses, the results of these experiments also have broader implications for understanding attitude structure. In recent years, social psychologists have become increasingly sensitive to the importance of investigating issues related to attitude structure as a means of better understanding the processes by which attitudes are formed and changed as well as the processes by which attitudes influence behavior and cognition (see Pratkanis, Breckler, & Greenwald, 1989). This research has demonstrated that a variety of features of the underlying structure of attitudes can influence the manner in which attitudes influence and are influenced by other psychological constructs. The present data represent yet another

illustration of this fact. These data demonstrate that the underlying affective and cognitive bases of attitudes influence the extent to which different types of persuasion will be effective.

Utility of the affect/cognition distinction. These data also have both theoretical and methodological implications for understanding the role of affect and cognition in attitude structure. As discussed in the introduction, affect and cognition have been assumed at least since the 1940's to play an important role in the underlying structure of attitudes (e.g., Smith, 1947). And, the affect/cognition distinction has continued to enjoy widespread popularity in attitude research in particular and social psychology more generally (e.g., see Fiske & Taylor, 1991). Surprisingly, however, empirical evidence demonstrating the utility of this distinction within the attitude domain has been relatively modest.

To date, the bulk of this evidence has been confined to merely demonstrating the people seem to distinguish between affect and cognition (e.g., Abelson et al., 1982; Breckler, 1984; Kothandapani, 1971; Ostrom, 1969). Comparatively less work has examined the consequences of the affect/cognition distinction for attitudinal processes. This work has been confined to a small number of studies investigating the role of the affect/cognition distinction in attitude strength (Chaiken, Pomerantz, & Giner-Sorolla, 1995; Strathman, 1992), attitude-behavior consistency (Millar & Tesser, 1986, 1989), and persuasion (Breckler & Wiggins, 1991; Edwards, 1990; Edwards & von Hippel, in press; Millar & Millar, 1990). Importantly, as was discussed in the introduction, these previous studies have often relied on measures and methodologies that have never been validated as means of assessing or manipulating the affective and cognitive bases of attitudes (for other criticisms of past methods, see Crites et al., 1994; Eagly et al., 1994). Thus, it is not entirely clear that all of these studies can be regarded as demonstrations of the consequences of the

affect/cognition distinction. In short, despite the enduring popularity of the affect/cognition distinction in attitude structure theory, the empirical evidence in support of its utility has been far from overwhelming.

The present data provide a clear example of how identifying the underlying affective and cognitive bases of attitudes can provide insight into the extent to which different types of persuasive messages will influence attitudes. That is, by supporting the affective/ cognitive matching hypothesis, these experiments constitute one of the strongest empirical confirmations of the conceptual utility of distinguishing between affective and cognitive bases of attitudes. In addition, they also support the utility of this distinction as a means of classifying persuasive messages.

The experiments presented in this dissertation also have methodological implications for understanding the role of the affect/ cognition distinction in attitudes and persuasion. One problem with past research in this area has been a lack of clearly validated methods for measuring and experimentally manipulating the affective and cognitive bases of attitudes. In contrast to the extensive literature on attitude measurement that has accumulated over the years, relatively little attention has been devoted to developing and validating measures of attitude-relevant affect and cognition. Crites et al. (1994) and Eagly et al. (1994) have both noted that past measures of affect and cognition used in attitude research have often failed to be empirically validated and have potential design flaws. Recently, however, Crites et al. (1994) presented empirical evidence assessing the reliability and validity of measures of attitude-relevant affect and cognition. The current data suggest that their measures are highly reliable, have convergent validity, and have discriminant validity across a wide range of attitude objects. Additionally, Crites et al. demonstrated that these scales were also capable of detecting an experimental manipulation

of the affective and cognitive bases of attitudes. They found that when people formed attitudes towards a novel animal by reading an emotionally evocative story, the affective scale was more strongly associated with global attitudes than the cognitive scale. In contrast, when other people formed attitudes towards the same animal by reading an informational passage, the cognitive scale was more strongly associated with global attitudes than the affective scale.

The present data provide further support for the soundness of the Crites et al. (1994) measures. Using a slightly modified version of their scales, the present data showed that these scales were highly reliable for yet another attitude object (i.e., a beverage). Even more important, in Experiments Two and Three, these scales were once again found to successfully detect a manipulation of the affective and cognitive bases of attitudes. This was particularly striking because this taste/information manipulation was quite different from the manipulation used in Crites et al. (1994). And, of course, Experiment Four replicated the success of the scales in detecting a manipulation of affect and cognition similar to that used in the original Crites et al. (1994) experiment.

The success of the scales in these experiments suggests that they may be useful in basic and applied settings in which researchers wish to use a measurement approach to categorize attitudes as affective or cognitive in nature. Depending on the goals of the researcher, either of the two analytical strategies employed in these experiments as a means of assessing the bases of attitudes (i.e., the discrepancy score analysis or the multiple regression analysis) might be useful as means of using the scales to classify attitudes.

In cases where the researcher wishes to classify individuals according to whether their attitudes are affective or cognitive in nature, the discrepancy score approach seems most useful. This is because this approach allows for the computation of discrepancy scores

for each individual. In contrast, the regression approach does not readily allow for individual level scores.

In other cases, however, a researcher might wish to classify attitudes towards specific attitude objects or attitudes of specific groups of people as primarily affective or cognitive in nature. In these situations, either approach is potentially useful. The primary difference between the two methods is the fact that the regression approach examines the association of affect and cognition with attitudes controlling for the correlation between affect and cognition. This prevents one basis from appearing to be highly associated with an attitude simply by virtue of the fact that it is correlated with the basis which is actually associated with the attitude. The use of affect-attitude and cognition-attitude discrepancy scores, on the other hand, does not take into account the correlation between affect and cognition. Thus, in situations where affect and cognition are highly correlated, the regression approach might be more useful. However, in the experiments presented in this dissertation, both approaches produced comparable results. This is not particular surprising given the fact that affect-attitude and cognition-attitude discrepancy scores are typically only moderately correlated with one another. Chaiken et al. (1995) reported correlations ranging from .07 to .14. Analyses of the data in the four experiments reported in this dissertation produced correlations of .38, .34, .42, and .15 respectively. Thus, even in the most extreme case, the two discrepancy scores shared only 17% of their variance. This suggests that the discrepancy score and regression approaches will generally produce similar results.

The results of these experiments are also valuable in that they present evidence for the validity of different methodologies of manipulating the affective and cognitive bases of attitudes. As discussed in the introduction, past manipulations proported to influence the affective and cognitive bases of attitudes such as focus

instructions (Edwards & von Hippel, in press; Millar & Millar, 1990) and order manipulations (Edwards, 1990; Edwards & von Hippel, in press) have not been convincingly validated. Indeed, the results of Experiment One illustrate the danger of failing to validate such manipulations. This experiment found no evidence that the order manipulation successfully altered the affective and cognitive bases of attitudes. Even more importantly, however, the data presented in Experiments Two, Three, and Four showed that the taste/information manipulation and the emotional passage/informational passage manipulation were successful in creating affectively or cognitively based attitudes. Thus, these manipulations provide promising approaches for creating affective and cognitive attitudes in future research investigating other issues related to the role of affect and cognition in attitude structure.

Alternative classifications of attitudes. These data also have interesting implications beyond the affect/cognition distinction in attitude structure. One particularly promising direction for future inquiry suggested by these data is to explore the generalizability of matching and mismatching effects across other dimensions of attitudes. In the research presented in this dissertation, attitudes and persuasion were classified on the basis of affect and cognition. However, there are numerous other potential dimensions by which attitudes might be classified. Although the dimensions by which attitudes might be classified are virtually limitless, the are several classification schemes that have been particularly useful and popular in past theory and research. Research relating these distinctions to the affective/cognitive distinction has the potential to provide a basis for constructing a more general theoretical framework for understanding the role of attitude structure in attitudinal processes.

One obvious classification scheme to explore more fully is the tripartite model of attitude structure (e.g., Breckler, 1984; Insko & Schopler, 1967; Katz & Stotland, 1959; Ostrom, 1969; Rosenberg &

Hovland, 1960). This view of attitude structure proposes that attitudes are composed of affective, cognitive, and behavioral components. The behavioral component refers to an individuals' past behaviors and behavioral intentions related to the attitude object. The present research only explored two of these three components. However, it would be interesting to investigate issues related to matching and mismatching effects for the behavioral dimension of attitudes. Among some of the interesting questions that might be addressed are whether it is possible to create attitudes based on behavior with minimal affect and cognition or whether behavior only influences attitudes via affect and cognition. Another interesting question would be if and under what conditions persuasion matching or mismatching effects occur for the behavioral dimension. It would also be valuable to examine if affective and cognitive persuasion differ in their ability to change behavioral attitudes and whether affective or cognitive attitudes differ in their susceptibility to behavioral persuasion.

Another extremely influential classification scheme used in attitude research has been the functionalist approach to attitudes (e.g., see Shavitt, 1989; Snyder & DeBono, 1989). This view of attitudes postulates that attitudes can serve different functions. A number of different functions that attitudes might serve have been proposed. For example, some attitudes serve a utilitarian function by maximizing rewards and minimizing punishments. Other attitudes serve a value-expressive function by allowing individuals to demonstrate their commitment to core values. Interestingly, within this literature, social psychologists have proposed and demonstrated persuasion matching effects. That is, researchers have found that an attitude is most susceptible to persuasion that directly targets the function that attitude serves.

Future research integrating the affective/cognitive distinction with the functionalist approach has the potential to provide insights

into the role of attitude structure in attitudinal processes. For example, it would be interesting the examine if moderators of affective/cognitive matching and mismatching also moderate function matching and mismatching. It would also be useful to examine the extent to which the affect/cognition distinction crosscuts the distinction between different attitude functions. For example, is it possible to create affective-utilitarian and cognitive-utilitarian attitudes? If so, do function matches and mismatches moderate affective/cognitive matching effects? Alternatively, are certain functions inherently affective or cognitive in nature? By integrating the affect/cognition distinction with the functionalist view, it might be possible to establish whether these different matching effects constitute distinctly different psychological processes or a common set of psychological mechanisms.

Finally, it is worth noting that it would also be useful to examine matching and mismatching within affect and cognition. Both the affective and cognitive dimensions of attitudes are relatively broad distinctions that can be further divided. For example, the affective basis of attitudes has been assumed to consist of discrete emotions such as anger, sadness, and joy. Similarly, cognition has been defined as discrete attributes of an object such as value, usefulness, and safety. It would be potentially informative to investigate whether attitudes based on a particular dimension of affect (e.g., anger) are more or less susceptible to affective persuasion that matches or mismatches that specific dimension of affect. Some research on this topic has already been conducted but the results have been inconsistent (Roseman, Abelson, & Ewing, 1986). Similarly, examining matches and mismatches of specific dimensions of cognition would also be informative. Examining potential moderators of within component effects can also be useful for establishing the extent to which within bases and between bases matches represent common psychological mechanisms.

Understanding Order Matching Effects

In closing, it is also important to note that the results in this dissertation suggest that further investigations into order persuasion matching effects might prove fruitful. It was shown in Experiment One that matching the order of information at persuasion to the order of information at attitude formation enhanced persuasion. However, there was no evidence that this order matching effect could be attributed, as Edwards had done, to differences in the affective and cognitive bases of attitudes. Although these data suggest a mechanism that is not responsible (i.e., affect/cognition matching), they do not provide insights into what is responsible for the effect. Current theories of attitude change provide few clues as to what this mechanism might be. No existing theory of persuasion explicitly predicts that the order of information at formation should moderate the effectiveness of persuasive appeals with different orders of information. Thus, Edwards' order matching results and those obtained in Experiment One may constitute a new type of persuasion effect.

Future investigations attempting to understand the processes underlying this effect seem desirable. One explanation proposed earlier was that order manipulations at formation might create expectancies about the order in which subsequent information will be presented and processed. When such expectancies are violated, this may interfere with the processing of the persuasive appeal. Experiments assessing expectancies following such order manipulations might help to assess the viability of this explanation. It would also be useful to examine the generalizability of the effect. Experiments testing if the order of different types of cognitive information produces the order matching effect would provide valuable information about whether the affect/cognition distinction is needed for these order effects.

APPENDIX A

MATERIALS FOR EXPERIMENT ONE AND EXPERIMENT TWO

Introductory Instructions

This study is being jointly conducted by a group of marketing researchers and psychologists from the Ohio State University. In this study, we are interested investigating your reactions to various products. During the course of this session, you are going to be asked to evaluate a new brand of beverage and a new brand of cookie. Each of these products is currently under consideration for public marketing next year.

In order to your facilitate your ability to evaluate each product, we are going to provide you with information about each product and allow you a chance to examine each product. While evaluating these products, please do not vocalize or otherwise communicate your reactions to other participants in the study. We are interested in getting each person's personal reactions free of influence from other participants. Because of this, we have placed partitions between you and other participants in order to minimize the degree to which you might influence others' reactions.

(Affective Information at Attitude Formation)

Power-Plus: Initial Taste Instructions

The first product you will be evaluating is a new beverage called **Power-Plus**. We will start by having each of you taste **Power-Plus**. First, before you taste this beverage, I would like each of you to now take a brief sip of water to cleanse your palate (wait). Ok, I am going to provide each of you with a sample of **Power-Plus** cooled to a temperature of approximately 35 degrees. This temperature is just above freezing so it is somewhat colder than the temperature maintained by a typical refrigerator. Thus, it is somewhat cooler than the temperature at which most beverages are typically served. When you receive your container, briefly taste the beverage to determine your reactions to it. Please sample the beverage immediately before it begins to warm.

(Cognitive Information at Attitude Formation)

Power-Plus: Initial Background Information

The first product you will be evaluating is a new beverage called **Power-Plus**. We would like to start by first providing you with some background information concerning **Power-Plus**.

One of the most important means by which individuals can maintain good health is through sound dietary practices. A daily diet based on natural sources of nutrition such as fruits and vegetables can contribute significantly to a longer and healthier life. In contrast, a diet containing high levels of artificial preservatives and additives can lead to a variety of health problems including higher incidence of illness, heart disease, and decreased energy levels.

Power-Plus is a newly developed fruit beverage aimed at providing consumers with a wholly natural alternative to the many artificial and chemical laden beverages currently on the market. The carefully controlled process of making this beverage begins with 100% pure natural spring water. The source of this water is from several springs in Northwestern Colorado that contain several minerals essential for good health including calcium. Before using this spring water, it is extensively tested to insure that it has not been tainted by unnatural impurities during transit to the facility where the beverage is mixed.

Next, various natural flavorings are added to this spring water. This process involves no artificially induced chemical reactions but instead relies on a safe organic mixing process. The source of these natural flavorings are vitamin rich extracts from various fruits that have been organically grown without the use of chemical fertilizers or pesticides. Furthermore, all fruits used are rigorously inspected according to a set of quality control guidelines that exceed current U.S. Food and Drug Administration requirements. This insures that the fruit extracts are free of any sort of contamination.

Finally, the finished product is carefully sealed in beverage containers that insure its purity during and after transit to local grocery stores. These containers are then stored at 35 degrees Fahrenheit (slightly above freezing) to prevent the beverage from spoiling.

(Affective Information at Persuasion)

Power-Plus: Mildly Cooled Taste Instructions

We would now like to have you (again) taste **Power-Plus.** Before you taste it, however, you should now take the opportunity to take a sip of water to cleanse your palate. Ok, I will now provide each of you with a sample of **Power-Plus** cooled to a temperature of approximately 41 degrees, a common serving temperature for beverages. This temperature is slightly warmer than the temperature maintained by the typical refrigerator and thus simulates the temperature of a beverage two to three minutes after it has been removed from the refrigerator. When you receive your container, briefly taste the beverage to determine your reactions to it.

(subjects will now receive moderately cooled sample of Hawaiian punch in a solid container that does not allow them to see the beverage - this beverage will be the same as the first taste session except it will have a small amount of vinegar and salt added - 10 ml vinegar/50 ml punch)

(Cognitive Information at Persuasion)

Power Plus: Information Concerning Appearance

Like some other common beverages, **Power-Plus** contains ingredients that are temperature sensitive. That is, the physical properties of the ingredients change with variations in temperature.

Because **Power-Plus** contains no artificial preservatives, it must be stored at a temperature of 35 degrees or less in order to prevent the beverage from spoiling. Although this temperature is colder than that produced by most refrigerators, the temperature maintained by the typical refrigerator will greatly slow the deterioration of the beverage (much as refrigerators slow the spoiling of meat, dairy products, etc.). Unfortunately, the deterioration of the beverage is greatly accelerated once it is removed from the refrigerator even for two or three minutes. This deterioration does not affect the taste of the beverage but can be detected by examining its appearance.

For example, formal studies of the beverage reveal that when the beverage is examined at a temperature of 41 degrees (the temperature of a beverage two to three minutes after it has been removed from the typical refrigerator), both professional food inspectors and average consumers can observe changes in the appearance of the beverage. At this temperature, people usually judge its color to be both unusual and artificial looking. Indeed, people often express their concern that such a color could only be a result of some sort of chemical reaction. People also notice other aspects of the appearance of the beverage. Many indicate that the beverage has the appearance of being tainted with impurities. Some people even indicate their belief the beverage has been contaminated with some foreign substance.

Thus, **Power-Plus** has a distinctly unnatural and impure appearance two or three minutes after it is removed from the refrigerator.

(Pre-Persuasion Measures)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of **Power-Plus**. If the word "definitely" describes your evaluation of **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **Power-Plus** makes you feel. If the word "definitely" describes how **Power-Plus** makes you feel, then circle the number "7". If you decide that the word does not at all describe how **Power-Plus** makes you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe **Power-Plus**. If the word "definitely" describes **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

Beverage Questionnaire

Approximately how many different brands of beverage do you drink on a regular basis?

_____

Approximately how often do you drink a beverage other than water every day?

_____

Do you regularly drink a beverage other than water with your meals?

Yes No

After strenuous exercise, do you regularly drink a beverage other than water?

Yes No

Would you be more likely to purchase a beverage if it was endorsed by a well known celebrity?

Yes No

Approximately how often every day do you see television commercials advertising beverages?

_____

Are you more likely to a try a beverage that your friends and/or family regularly drink?

Yes No

Approximately how many different beverages have you tried in the past month?

_____

(Post-Persuasion Measures)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of **Power-Plus**. If the word "definitely" describes your evaluation of **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **Power-Plus** makes you feel. If the word "definitely" describes how **Power-Plus** makes you feel, then circle the number "7". If you decide that the word does not at all describe how **Power-Plus** makes you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe **Power-Plus.** If the word "definitely" describes **Power-Plus,** then circle the number "7". If you decide that the word does not at all describe **Power-Plus,** then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

We are interested in what thoughts and feelings you had as you were evaluating Power-Plus. That is, you might have had some thoughts and feelings that were prompted by Power-Plus. You might also have had thoughts and feelings that had little to do with Power-Plus. We are interested in any and all thoughts and feelings that you remember coming to mind while evaluating this beverage.

On the blank lines below, please list what you were thinking and feeling while evaluating this product. Do not worry about grammar or even making complete sentences -- just report the gist of each thought or feeling that you remember coming to mind.

Please take a couple of minutes to write down your thoughts and feelings (but please take no more than 3 minutes or so).

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), please place a "1" on the line to the left of the statement. If the statement is extremely characteristic of you (very much like you), please place a "5" on the line to the left of the statement. You should use the following scale as you rate each of the statements below.

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

_____ 1. I prefer complex to simple problems.

_____ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.

_____ 3. Thinking is not my idea of fun.

_____ 4. I would rather do something that requires little thought than something that is sure to challenge my abilities.

_____ 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

_____ 6. I find satisfaction in deliberating hard for long hours.

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

_____ 8. I prefer to think about small daily projects rather than long-term ones.

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

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

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

_____ 12. Learning new ways to think doesn't excite me much.

_____ 13. I prefer my life to be filled with problems that I must solve.

_____ 14. The notion of thinking abstractly is appealing to me.

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

_____ 16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.

_____ 17. It's enough for me that something gets the job done; I don't care how or why it works.

_____ 18. I usually end up deliberating about issues even when they do not affect me personally.

APPENDIX B

MATERIALS FOR EXPERIMENT THREE

Introductory Instructions (Affective Attitude Condition)

The study you will be participating in today is a study that is being jointly conducted by a group of marketing researchers and psychologists from the Ohio State University. In this study, we are interested investigating your reactions to various products. To facilitate your evaluations of each product, we are going to provide you with background information about each product and allow you to sample each product.

In this particular session, you will be evaluating a new brand of beverage and a new brand of cookie. Both of these products are currently under consideration for public marketing by their manufacturer sometime late next year.

Throughout the session, we do ask that you not vocalize or otherwise communicate your reactions to other participants in the study. We are interested in getting each person's personal reactions free of influence from other participants. Are there any questions before we begin?

The first product that you will be evaluating is a new beverage called Power-Plus. Before we have you sample the beverage and read about it, we are interested in finding out what your expectations are about the beverage. To do this, we are going to pass out a questionnaire about the beverage. Please answer these questions based on your expectations of how your think you will feel about Power-Plus.

Introductory Instructions (Cognitive Attitude Condition)

The study you will be participating in today is a study that is being jointly conducted by a group of marketing researchers and psychologists from the Ohio State University. In this study, we are interested investigating your reactions to various products. To facilitate your evaluations of each product, we are going to provide you with background information about each product and allow you to sample each product.

In this particular session, you will be evaluating a new brand of beverage and a new brand of cookie. Both of these products are currently under consideration for public marketing by their manufacturer sometime late next year.

Throughout the session, we do ask that you not vocalize or otherwise communicate your reactions to other participants in the study. We are interested in getting each person's personal reactions free of influence from other participants. Are there any questions before we begin?

The first product that you will be evaluating is a new beverage called Power-Plus. Before we have you sample the beverage and read about it, we are interested in finding out what your expectations are about the beverage. To do this, we are going to pass out a questionnaire about the beverage. Please answer these questions based on your expectations of what you think Power-Plus will be like.

(Affective Information at Attitude Formation)

Power-Plus: Extremely Cooled Taste Instructions

The first product you will be evaluating is a new beverage called **Power-Plus**. We will start by having each of you taste **Power-Plus**. First, before you taste this beverage, I would like each of you to now take a brief sip of water to cleanse your palate (wait). The purpose of this is to rinse your mouth to insure that you get a relatively pure taste of the beverage. Ok, I am going to provide each of you with a sample of **Power-Plus** cooled to a temperature of about 35 degrees. This temperature is just above freezing so it is somewhat colder than the temperature maintained by most refrigerators. Thus, it is probably a bit cooler than what you drink most beverages at. When you receive your container, briefly taste the beverage to determine your reactions to it. Please sample the beverage immediately before it begins to warm.

(Cognitive Information at Attitude Formation)

Power-Plus: Information Concerning Taste

The first product you will be evaluating is a new beverage called **Power-Plus**. We would like to start by first providing you with some background information concerning **Power-Plus**. **Power-Plus** is a newly developed fruit beverage aimed at providing consumers with a delicious alternative to the array of nondescript soft drinks and sports drinks currently on the market.

Based on nearly 2 years of product development, **Power-Plus** is intended to provide a beverage that derives its flavor from entirely natural ingredients rather than from less authentic artificial flavors so often used in soft drinks and sports beverages. The carefully controlled process of making this beverage begins with 100% pure natural spring water. Natural spring water is used because it is typically considered to have purer taste than common tap water which is chlorinated. The source of this spring water comes from several springs in Northwestern Colorado known for their natural purity. Furthermore, before use, the spring water is carefully tested to insure its flavor has not been compromised by unnatural impurities during transit to the facility where it is mixed.

Next, various natural fruit flavorings are added to this spring water. The fruit flavorings used in **Power-Plus** are derived from real fruit extracts. These fruit extracts give **Power-Plus** a richer and more authentic taste than many current fruit beverages which use artificial flavorings. Importantly, these fruit extracts are derived from fruit that has been grown without the use of chemical fertilizers and pesticides which can sometimes adversely impact on the natural rich taste of fruits. Furthermore, all fruits are rigorously inspected using inspection procedures that exceed current FDA guidelines. This careful inspection process insures that only fresh and untainted fruits are used and thus guarantees that the fruit extracts will be particularly flavorful.

Finally, the manufacturing process used to make **Power-Plus** is based on a natural organic mixing procedure that has been carefully developed to preserve the authentic flavors of the fruits. This is in contrast to many current fruit beverages which are made with artificial procedures involving heat pasteurization processes that often alter fruit flavors. **Power-Plus** is then carefully sealed in airtight containers and stored by the manufacturer at a temperature of 35 degrees to insure the freshness of its flavor.

Market research has confirmed that **Power-Plus** is an extremely flavorful beverage. Taste tests at a temperature of 35 degrees (slightly warmer than freezing and thus a bit cooler than the average refrigerator) indicate that professional taste-testers rate its taste as extremely pleasant. Furthermore, studies of representative samples of Americans reveal that results are generalizable to the average consumer. Nearly 82% of consumers who tasted the beverage at a temperature of 35 degrees rated **Power-Plus** as more pleasant tasting than most beverages they drink. A full 71% of the sample reported that they considered it (at 35 degrees) to be one of the best tasting beverages they had tried.

Thus, **Power-Plus** is clearly a beverage with a pleasant taste that sets it apart from most beverages.

(Affective-Taste Information at Persuasion)

Power-Plus: Mildly Cooled Taste Instructions

We now would like each of you to (re)taste **Power-Plus**. First, before you taste the beverage, I would like each of you to (once again) take a brief sip of water to cleanse your palate (wait). (As I mentioned), the purpose of this is to rinse your mouth to insure that you get a relatively pure taste of the beverage. Ok, I will now provide each of you with a sample of **Power-Plus** cooled to a temperature of approximately 41 degrees. This temperature is slightly warmer than the temperature maintained by the typical refrigerator and thus is a fairly common serving temperature for beverages because it is the temperature of something two to three minutes after it has been removed from the refrigerator. When you receive your container, briefly taste the beverage to determine your reactions to it.

(Cognitive-Taste Information at Persuasion)

Power Plus: Background Information

Like some other common beverages, **Power-Plus** contains ingredients that are temperature sensitive. That is, the physical properties of the ingredients change with variations in temperature. Although these changes are completely harmless and do not alter any other properties of the beverage, they do adversely affect its taste.

Studies have shown that the taste of **Power-Plus** tends to deteriorate considerably as it gets warmer. For example, when **Power-Plus** is sampled at a serving temperature of 41 degrees (i.e., the temperature of a beverage that has been removed from a typical refrigerator for about two to three minutes), studies have indicated that professional taste-testers rate its taste as extremely unpleasant.

Similar studies conducted using average consumers reveal that their ratings are nearly identical to those of professional taste-testers. Nearly 87% of a random sample of average consumers who tasted the beverage two minutes after it had been removed from a refrigerator reported that they considered **Power-Plus** to be less pleasant tasting than most beverages they usually drink. A full 74% of the sample reported that they considered **Power-Plus** (at 41 degrees) to be one of the two or three worst tasting commercially marketed beverages they had ever tasted.

Thus, **Power-Plus** is a poor tasting beverage once it has been removed from the refrigerator for two to three minutes.

(Affective-Smell Information at Persuasion)

Power-Plus: Mildly Cooled Smell Instructions

We would now like to give you an opportunity to smell **Power-Plus**. In a moment, I will provide each of you with a sample of **Power-Plus** cooled to a temperature of approximately 41 degrees. This temperature is slightly warmer than the temperature maintained by the typical refrigerator and thus is a fairly common serving temperature for beverages because it is the temperature of something two to three minutes after it has been removed from the refrigerator. When you receive your container, hold the opening of the container's tube approximately 1 inch from your nose, squeeze the container gently but firmly, and inhale deeply. This should produce a puff of air that will allow you to sample the beverage's aroma. You may squeeze the container several times if you wish to guarantee that you have had an adequate opportunity to form an impression of the beverage's aroma.

(Cognitive-Smell Information at Persuasion)

Power Plus: Background Information

Like some other common beverages, **Power-Plus** contains ingredients that are temperature sensitive. That is, the physical properties of the ingredients change with variations in temperature. Although these changes are completely harmless and do not alter any other properties of the beverage, they do adversely affect its aroma.

Studies have shown that the smell of **Power-Plus** tends to deteriorate considerably as it gets warmer. For example, when **Power-Plus** is at a serving temperature of 41 degrees (i.e., the temperature of a beverage that has been removed from a typical refrigerator for about two to three minutes), studies have indicated that professional food-evaluators rate its aroma as extremely unpleasant.

Similar studies conducted using average consumers reveal that their ratings are nearly identical to those of professional food-evaluators. Nearly 87% of a random sample of average consumers who smelled the beverage two minutes after it had been removed from a refrigerator reported that they considered **Power-Plus** to be less pleasant smelling than most beverages they are familiar with. A full 74% of the sample reported that they considered **Power-Plus** (at 41 degrees) to be one of the two or three worst smelling commercially marketed beverages they had ever experienced.

Thus, **Power-Plus** is a poor smelling beverage once it has been removed from the refrigerator for two to three minutes.

(Pre-Attitude Formation Measures for Affective Attitude)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **Power-Plus** makes you feel. If the word "definitely" describes how **Power-Plus** makes you feel, then circle the number "7". If you decide that the word does not at all describe how **Power-Plus** makes you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

(Pre-Attitude Formation Measures for Cognitive Attitude)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe **Power-Plus.** If the word "definitely" describes **Power-Plus,** then circle the number "7". If you decide that the word does not at all describe **Power-Plus,** then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

(Pre-Persuasion Measures)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of **Power-Plus**. If the word "definitely" describes your evaluation of **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **Power-Plus** makes you feel. If the word "definitely" describes how **Power-Plus** makes you feel, then circle the number "7". If you decide that the word does not at all describe how **Power-Plus** makes you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe **Power-Plus**. If the word "definitely" describes **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

If you were to taste **Power-Plus**, how good do you think it would taste?

1	2	3	4	5	6	7	8	9	10
Very Bad Tasting								Very Good Tasting	

If you were to smell **Power-Plus**, how good do you think it would smell?

1	2	3	4	5	6	7	8	9	10
Very Bad Smelling								Very Good Smelling	

Beverage Questionnaire

Approximately how many different brands of beverage do you drink on a regular basis?

_____

Approximately how often do you drink a beverage other than water every day?

_____

Do you regularly drink a beverage other than water with your meals?

Yes No

After strenuous exercise, do you regularly drink a beverage other than water?

Yes No

Would you be more likely to purchase a beverage if it was endorsed by a well
known celebrity?

Yes No

Approximately how often every day do you see television commercials advertising beverages?

_____

Are you more likely to a try a beverage that your friends and/or family regularly drink?

Yes No

Approximately how many different beverages have you tried in the past month?

_____

(Post-Persuasion Measures for Affective Attitude)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of **Power-Plus**. If the word "definitely" describes your evaluation of **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **Power-Plus** makes you feel. If the word "definitely" describes how **Power-Plus** makes you feel, then circle the number "7". If you decide that the word does not at all describe how **Power-Plus** makes you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe **Power-Plus**. If the word "definitely" describes **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

We are interested in what thoughts and feelings you had as you were evaluating Power-Plus. That is, you might have had some thoughts and feelings that were prompted by Power-Plus. You might also have had thoughts and feelings that had little to do with Power-Plus. We are interested in any and all thoughts and feelings that you remember coming to mind while evaluating this beverage.

On the blank lines below, please list what you were thinking and feeling while evaluating this product. Do not worry about grammar or even making complete sentences -- just report the gist of each thought or feeling that you remember coming to mind.

Please take a couple of minutes to write down your thoughts and feelings (but please take no more than 3 minutes or so).

When you first learned about **Power-Plus** by tasting it, to what extent would you say your initial opinion of the beverage was based on the feelings and emotions the beverage produced?

1	2	3	4	5	6	7	8	9	10
None At All									A Great Deal

When you first learned about **Power-Plus** by tasting it, to what extent would you say your initial opinion of the beverage was based on your knowledge and beliefs about the beverage?

1	2	3	4	5	6	7	8	9	10
None At All									A Great Deal

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), please place a "1" on the line to the left of the statement. If the statement is extremely characteristic of you (very much like you), please place a "5" on the line to the left of the statement. You should use the following scale as you rate each of the statements below.

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

_____ 1. I prefer complex to simple problems.

_____ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.

_____ 3. Thinking is not my idea of fun.

_____ 4. I would rather do something that requires little thought than something that is sure to challenge my abilities.

_____ 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

_____ 6. I find satisfaction in deliberating hard for long hours.

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

_____ 8. I prefer to think about small daily projects rather than long-term ones.

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

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

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

_____ 12. Learning new ways to think doesn't excite me much.

_____ 13. I prefer my life to be filled with problems that I must solve.

_____ 14. The notion of thinking abstractly is appealing to me.

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

_____ 16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.

_____ 17. It's enough for me that something gets the job done; I don't care how or why it works.

_____ 18. I usually end up deliberating about issues even when they do not affect me personally.

(Post-Persuasion Measures for Cognitive Attitude)

_____

Please Write The Last Four Digits

Of Your SSN On The Line Above

Please Complete the Questions in this Booklet

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of **Power-Plus**. If the word "definitely" describes your evaluation of **Power-Plus**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **Power-Plus**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **Power-Plus** makes you feel. If the word "definitely" describes how **Power-Plus** makes you feel, then circle the number "7". If you decide that the word does not at all describe how **Power-Plus** makes you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe **Power-Plus.** If the word "definitely" describes **Power-Plus,** then circle the number "7". If you decide that the word does not at all describe **Power-Plus,** then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

We are interested in what thoughts and feelings you had as you were evaluating Power-Plus. That is, you might have had some thoughts and feelings that were prompted by Power-Plus. You might also have had thoughts and feelings that had little to do with Power-Plus. We are interested in any and all thoughts and feelings that you remember coming to mind while evaluating this beverage.

On the blank lines below, please list what you were thinking and feeling while evaluating this product. Do not worry about grammar or even making complete sentences -- just report the gist of each thought or feeling that you remember coming to mind.

Please take a couple of minutes to write down your thoughts and feelings (but please take no more than 3 minutes or so).

When you first learned about **Power-Plus** by reading about it, to what extent would you say your initial opinion of the beverage was based on the feelings and emotions the beverage produced?

1	2	3	4	5	6	7	8	9	10
None At All									A Great Deal

When you first learned about **Power-Plus** by reading about it, to what extent would you say your initial opinion of the beverage was based on your knowledge and beliefs about the beverage?

1	2	3	4	5	6	7	8	9	10
None At All									A Great Deal

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), please place a "1" on the line to the left of the statement. If the statement is extremely characteristic of you (very much like you), please place a "5" on the line to the left of the statement. You should use the following scale as you rate each of the statements below.

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

_____ 1. I prefer complex to simple problems.

_____ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.

_____ 3. Thinking is not my idea of fun.

_____ 4. I would rather do something that requires little thought than something that is sure to challenge my abilities.

_____ 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

_____ 6. I find satisfaction in deliberating hard for long hours.

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

_____ 8. I prefer to think about small daily projects rather than long-term ones.

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

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

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

_____ 12. Learning new ways to think doesn't excite me much.

_____ 13. I prefer my life to be filled with problems that I must solve.

_____ 14. The notion of thinking abstractly is appealing to me.

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

_____ 16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.

_____ 17. It's enough for me that something gets the job done; I don't care how or why it works.

_____ 18. I usually end up deliberating about issues even when they do not affect me personally.

APPENDIX C

MATERIALS FOR EXPERIMENT FOUR

(Pre-Attitude Formation Affective Booklet)

Last 4 Digits of SSN

Instructions

In this study, we are interested in having people evaluate the readability of different samples of writing. In the first sample of writing, you will be reading a passage about a lemphur, an animal that may be unfamiliar to you (although some of you may know something about it). Before you read this passage, however, we are interested in finding out about your feelings towards lemphurs.

Please complete the following questions about lemphurs. If you are unfamiliar with lemphurs, answer these questions based on your expectations of how you think lemphurs will make you feel.

You may now turn the page and begin answering the questions.

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **lemphurs** make you feel. If the word "definitely" describes how **lemphurs** make you feel, then circle the number "7". If you decide that the word does not at all describe how **lemphurs** make you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

(Pre-Attitude Formation Cognitive Booklet)

Last 4 Digits of SSN

Instructions

In this study, we are interested in having people evaluate the readability of different samples of writing. In the first sample of writing, you will be reading a passage about a lemphur, an animal that may be unfamiliar to you (although some of you may know something about it). Before you read this passage, however, we are interested in finding out about your beliefs concerning lemphurs.

Please complete the following questions about lemphurs. If you are unfamiliar with lemphurs, answer these questions based on your expectations of what you think lemphurs will be like.

You may now turn the page and begin answering the questions.

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe lemphurs. If the word "definitely" describes **lemphurs**, then circle the number "7". If you decide that the word does not at all describe **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

(Affective Attitude Formation Booklet)

_____

Last 4 Digits of SSN

Instructions

Articles, essays, and stories are often given "readability" index scores. In this study, we are interested in assessing the validity of these scores for college student populations.

In this particular booklet, you will be reading a brief passage about an animal that may be unfamiliar to you (although some of you may know something about it). Your task in this study is to read the passage carefully and form an impression of this animal.

The passage you will be reading is a description of an individual's encounter with a lemphur. While reading the passage, you should think about how you would feel if you encountered a lemphur.

You may now turn the page and begin reading the passage about an encounter with a lemphur.

An encounter with a lemphur

Ernestine was only a baby lemphur the last time I had seen her over 10 years ago. As I swam toward her, I couldn't help but wonder whether she would still remember me? Would she actually recognize the person who had raised and trained her as a newly born lemphur?

I told myself she wasn't really smiling: that happy look was just an accident of jaw formation, indicating nothing more than lines of bone and muscle. But looking at her made me feel happy just the same.

She was so beautiful. From a distance, the lemphur had looked simple, uncomplicated. But up close, everything about Ernestine was astonishing. The black pupil in the center of her red-brown eye seemed to radiate emotion. Six inches back from the eye was a fold of skin with an opening the size of a pinhole in it, the opening to her ear. Even the lemphur's skin was special: not perfectly smooth, but textured with the tiniest of lines, and colored with subtle gray patterns that were perfectly matched and fitted together, like interlocking feathers on a hawk.

Ernestine had pectoral fins to steer with and tailflukes for power. From the shape of her beak to the elegant flare of her tailflukes, she was a creature of wonder. I felt I could study her for a thousand years and not see everything.

Ernestine nuzzled in beside me and laid her pectoral fin on my back.

This amazed me. A lemphur I had not seen in over 10 years swam up and touched me!

I couldn't resist her. Without conscious thought, my hands reached up and stroked her side. It felt smooth, soft, and firm, like the inside surface of a hard-boiled egg.

Gently the lemphur rolled, bringing the fin on her back into my hand as she began moving away. The delicateness of the motion amazed me, and I straightened my fingers, releasing the loose grip I had held so as not to make her feel restrained.

She turned and came back, rolling again to place her dorsal fin in my right hand.

Why fight it, I thought, as I grasped Ernestine's fin more tightly.

This time, when Ernestine took off, I went along.

I left my human clumsiness behind. For glorious seconds I knew what it was to be the swiftest swimmer in the sea. She towed me, and I tried not to get in the way. I was conscious of my body's shape as an obstruction and tried to narrow myself.

We soared. The water rushed past my face and swirled around my body, and I felt the streaking lines of speed.

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of **lemphurs**. If the word "definitely" describes your evaluation of **lemphurs**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **lemphurs** make you feel. If the word "definitely" describes how **lemphurs** make you feel, then circle the number "7". If you decide that the word does not at all describe how **lemphurs** make you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe lemphurs. If the word "definitely" describes **lemphurs**, then circle the number "7". If you decide that the word does not at all describe **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

Please answer the following questions on the passage that you just finished reading.

How readable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Readable								Extremely Readable

How enjoyable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Enjoyable								Extremely Enjoyable

How easy was the passage to understand?

1	2	3	4	5	6	7	8	9
Not At All Easy								Extremely Easy

How interesting was the writer in presenting the information?

1	2	3	4	5	6	7	8	9
Not At All Interesting								Extremely Interesting

How clear and concise was the author in the use of language?

1	2	3	4	5	6	7	8	9
Not At All Clear & Concise								Extremely Clear & Concise

(Cognitive Attitude Formation Booklet)

Last 4 Digits of SSN

Instructions

Articles, essays, and stories are often given "readability" index scores. In this study, we are interested in assessing the validity of these scores for college student populations.

In this particular booklet, you will be reading a brief passage about an animal that may be unfamiliar to you (although some of you may know something about it). Your task in this study is to read the passage carefully and form an impression of this animal.

The passage you will be reading is an excerpt from an encyclopedia of marine life. While reading the passage, you should concentrate on learning as much as you can about lemphurs.

You may now turn the page and begin reading the encyclopedia excerpt on lemphurs.

Lemphur

Description: The lemphur is a powerful marine animal approximately six feet in length and weighing nearly 400 pounds. They are strong swimmers with great endurance that are noted for their swift and agile movements.

Geographic Dispersion: A remarkably adaptive animal, lemphurs can be found in ocean waters as far north as Alaska to as far south as Antarctica. Because of the insulating properties of their skin, these creatures are capable of maintaining constant body temperature in the cold waters of the Antarctic ocean as well as in warm equatorial waters.

Behavior in Captivity: Lemphurs are extremely intelligent creatures that are capable of being trained to perform complex behaviors. In fact, when born in captivity or captured at an early age, lemphurs adapt well to life in captivity and are noted for their tame demeanor. These traits have made them particularly helpful to marine biologists interested in studying basic marine physiology and behavior in controlled laboratory settings.

Diet: The lemphur feeds on a variety of sea plants and sea animals. One advantage of these animals' diet is their tendency to feed on barnacles, which can damage boats and docks, and on sea plants that frequently block vents and pipes opening into the sea.

Physiology: Lemphurs usually produce 4 to 6 young each year. Because young lemphurs are relatively large and well developed at birth, most young lemphurs are able to fend for themselves and thus survive to adulthood. This low mortality rate has allowed lemphurs to become quite numerous in many areas of the world. In fact, lemphurs serve as a major source of food for humans in some parts of the world. The widespread availability of lemphurs, their excellent flavor, and the high levels of protein and vitamins they contain make them a nourishing part of the diet of many costal communities. Additionally, many parts of the lemphur can be quite utilized for a variety of purposes. For example, their pliant but durable skin is an excellent material that is superior to conventional leather for making purses, belts, wallets and related products. Similarly, the lemphur's natural oils have a number of industrial applications. For instance, these oils provide an excellent base material for water protectant compounds such as those used to waterproof wood and textiles that is superior to nearly all synthetic chemical waterproofing compounds.

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of lemphurs. If the word "definitely" describes your evaluation of **lemphurs**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **lemphurs** make you feel. If the word "definitely" describes how **lemphurs** make you feel, then circle the number "7". If you decide that the word does not at all describe how **lemphurs** make you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe lemphurs. If the word "definitely" describes **lemphurs**, then circle the number "7". If you decide that the word does not at all describe **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

Please answer the following questions on the passage that you just finished reading.

How readable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Readable								Extremely Readable

How enjoyable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Enjoyable								Extremely Enjoyable

How easy was the passage to understand?

1	2	3	4	5	6	7	8	9
Not At All Easy								Extremely Easy

How interesting was the writer in presenting the information?

1	2	3	4	5	6	7	8	9
Not At All Interesting								Extremely Interesting

How clear and concise was the author in the use of language?

1	2	3	4	5	6	7	8	9
Not At All Clear & Concise								Extremely Clear & Concise

(Affective Persuasion Booklet)

Last 4 Digits of SSN

Instructions

In this second booklet, you will be reading another passage about a lemphur. Once again, your task is to read the passage carefully and continue to form an impression of lemphurs.

The passage you will be reading is a description of an individual's encounter with a lemphur. While reading the passage, you should think about how you would feel if you encountered a lemphur.

You may now turn the page and begin reading the passage about an encounter with a lemphur.

An encounter with a lemphur

A hundred yards offshore, the lemphur sensed a change in the sea's rhythm. It did not see the woman, nor yet did it smell her. Running within the length of its body were a series of thin canals, filled with mucus and dotted with nerve endings, and these nerves detected vibrations and signaled the brain. The lemphur turned toward shore.

The vibrations were stronger now, and the lemphur recognized prey. The sweeps of its tail quickened, thrusting the giant body forward with a speed that agitated the tiny phosphorescent animals in the water and caused them to glow, casting a mantle of sparks over the lemphur.

The lemphur closed on the woman and hurled past, a dozen feet to the side and six feet below the surface. The woman felt only a wave of pressure that seemed to lift her up in the water and ease her down again. She stopped swimming and held her breath. Feeling nothing further, she resumed her lurching stroke.

The lemphur smelled her now, and the vibrations--erratic and sharp--signaled distress. The lemphur began to circle close to the surface.

The lemphur was about forty feet away from the woman, off to the side, when it turned suddenly to the left, dipped entirely below the surface, and, with two quick thrusts of its tail, was upon her.

At first, the woman thought she had snagged her leg on a rock or a piece of floating wood. There was no initial pain, only one violent tug on her right leg. She reached down to touch her foot, treading water with her left leg to keep her head up, feeling in the blackness with her left hand. She could not find her foot. She reached higher on her leg, and then she was overcome by a rush of nausea and dizziness. Her groping fingers had found a nub of bone and tattered flesh. She knew that the warm, pulsing flow over her fingers in the chill water was her own blood.

Pain and panic struck together. The woman threw her head back and screamed a guttural cry of terror.

The lemphur had moved away. It swallowed the woman's limb without chewing. Bones and meat passed down the massive gullet in a single spasm. Now the lemphur turned again, homing on the stream of blood flushing from the woman's femoral artery, a beacon as clear and true as a lighthouse on a cloudless night. This time the lemphur attacked from below. It hurtled up under the woman, jaws agape. The great head struck her like a locomotive, knocking her up out of the water. The jaws snapped shut around her torso, crushing bones and flesh and organs into a jelly. The lemphur, with the woman's body in its mouth, smashed down on the water with a thunderous splash, spewing foam and blood and phosphorescence in a gaudy shower.

Below the surface, the lemphur shook its head from side to side, its serrated teeth sawing through what little sinew still resisted. The corpse fell apart. The lemphur swallowed, then turned to continue feeding. Its brain still registered the signals of nearby prey. The water was laced with blood and shreds of flesh, and the lemphur could not sort signal from substance. It cut back and forth through the dissipating cloud of blood, opening and closing its mouth, seining for a random morsel. But by now, most of the pieces of the corpse had dispersed. A few sank slowly, coming to rest on the sandy bottom, where they moved lazily in the current. A few drifted away just below the surface, floating in the surge that ended in the surf.

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of lemphurs. If the word "definitely" describes your evaluation of **lemphurs**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **lemphurs** make you feel. If the word "definitely" describes how **lemphurs** make you feel, then circle the number "7". If you decide that the word does not at all describe how **lemphurs** make you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe lemphurs. If the word "definitely" describes **lemphurs**, then circle the number "7". If you decide that the word does not at all describe **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

We are interested in what thoughts and feelings you had as you were reading about **lemphurs**. That is, you might have had some thoughts and feelings that were prompted by **lemphurs**. You might also have had thoughts and feelings that had little to do with **lemphurs**. We are interested in any and all thoughts and feelings that you remember coming to mind while reading about this animal.

On the blank lines below, please list what you were thinking and feeling while reading about this animal. Do not worry about grammar or even making complete sentences -- just report the gist of each thought or feeling that you remember coming to mind.

Please take a couple of minutes to write down your thoughts and feelings (but please take no more than 3 minutes or so).

When reading the first passage, to what extent would you say your opinion of lemphurs was based on the feelings and emotions they produced in you?

1 2 3 4 5 6 7 8 9 10

None at all A great deal

When reading the first passage, to what extent would you say your opinion of lemphurs was based on your knowledge and beliefs about lemphurs?

1 2 3 4 5 6 7 8 9 10

None at all A great deal

Please answer the following questions on the passage that you just finished reading.

How readable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Readable								Extremely Readable

How enjoyable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Enjoyable								Extremely Enjoyable

How easy was the passage to understand?

1	2	3	4	5	6	7	8	9
Not At All Easy								Extremely Easy

How interesting was the writer in presenting the information?

1	2	3	4	5	6	7	8	9
Not At All Interesting								Extremely Interesting

How clear and concise was the author in the use of language?

1	2	3	4	5	6	7	8	9
Not At All Clear & Concise								Extremely Clear & Concise

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), please place a "1" on the line to the left of the statement. If the statement is extremely characteristic of you (very much like you), please place a "5" on the line to the left of the statement. You should use the following scale as you rate each of the statements below.

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

_____ 1. I prefer complex to simple problems.

_____ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.

_____ 3. Thinking is not my idea of fun.

_____ 4. I would rather do something that requires little thought than something that is sure to challenge my abilities.

_____ 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

_____ 6. I find satisfaction in deliberating hard for long hours.

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

_____ 8. I prefer to think about small daily projects rather than long-term ones.

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

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

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

_____ 12. Learning new ways to think doesn't excite me much.

_____ 13. I prefer my life to be filled with problems that I must solve.

_____ 14. The notion of thinking abstractly is appealing to me.

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

_____ 16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.

_____ 17. It's enough for me that something gets the job done; I don't care how or why it works.

_____ 18. I usually end up deliberating about issues even when they do not affect me personally.

(Cognitive Persuasion Booklet)

_____

Last 4 Digits of SSN

Instructions

In this second booklet, you will be reading another passage about a lemphur. Once again, your task is to read the passage carefully and continue to form an impression of lemphurs.

The passage you will be reading is an excerpt from an encyclopedia of marine life. While reading the passage, you should concentrate on learning as much as you can about lemphurs.

You may now turn the page and begin reading the encyclopedia excerpt on lemphurs.

Lemphur

Appearance: The lemphur is similar in appearance and basic body structure to other marine animals such as fish and whales. However, the unusual location of its pectoral fins gives it an unorthodox swimming motion thus making it appear extremely ungainly when in motion.

Habitat: Because of their primitive air bladder system, lemphurs have difficulty regulating their depth. Thus, lemphurs must remain constantly in motion to avoid sinking beyond ocean depths that they can tolerate. This attribute causes them to typically confine their activities to shallow costal waters rather than the open sea.

Behavior in the Wild: Lemphurs are usually found in groups numbering between 15 to 20 adults and 40 or more young. The lemphur is a natural predator in the wild that hunts both alone and in packs. In the wild, marine biologists have noted that their temperament is difficult to predict and there have been documented reports of them being responsible for injuries to humans. Thus, lemphurs can pose a problem for costal communities where recreational water activities are popular.

Impact on Local Economies: The lemphur has a voracious appetite, spending nearly 67% of its time feeding. This attribute has caused them to damage the local economies of many costal communities which rely on fishing and related industries. Economic impact studies have indicated that in some major fishing regions such as Newfoundland, lemphurs have depleted nearly 19.2% of the total supply of fish and other aquatic foods (e.g., oysters, clams). By one estimate, the cost of fish and other aquatic foods is 8.3% higher due to lemphurs depleting populations of aquatic animals.

Practical Uses of Lemphurs: The lemphur is a popular source of food in many regions. Unfortunately, lemphurs contain relatively high levels of cholesterol and polysaturated fats thus making them a dietary determinant of certain cardio-vascular ailments. A number of byproducts can also be made with parts of the lemphur. However, the difficulty of capturing these creatures and the extensive industrial processing required to make use of lemphur byproducts makes products using lemphurs expensive. Products using ingredients derived from lemphurs are typically 17% to 22% more expensive than products using alternative ingredients.

Below is a list of words that could be used to describe your overall evaluation of an object. Please use the list below to describe your evaluation of lemphurs. If the word "definitely" describes your evaluation of **lemphurs**, then circle the number "7". If you decide that the word does not at all describe your evaluation of **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1	2	3	4	5	6	7
Not At All						Definitely

Good:

1	2	3	4	5	6	7
Not At All						Definitely

Negative:

1	2	3	4	5	6	7
Not At All						Definitely

Undesirable:

1	2	3	4	5	6	7
Not At All						Definitely

Bad:

1	2	3	4	5	6	7
Not At All						Definitely

Like:

1	2	3	4	5	6	7
Not At All						Definitely

Positive:

1	2	3	4	5	6	7
Not At All						Definitely

Desirable:

1	2	3	4	5	6	7
Not At All						Definitely

Below is a list of feelings or moods that could be caused by an object. Please use the list below to describe how **lemphurs** make you feel. If the word "definitely" describes how **lemphurs** make you feel, then circle the number "7". If you decide that the word does not at all describe how **lemphurs** make you feel, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Hateful:

1	2	3	4	5	6	7
Not At All						Definitely

Delighted:

1	2	3	4	5	6	7
Not At All						Definitely

Happy:

1	2	3	4	5	6	7
Not At All						Definitely

Tense:

1	2	3	4	5	6	7
Not At All						Definitely

Bored:

1	2	3	4	5	6	7
Not At All						Definitely

Angry:

1	2	3	4	5	6	7
Not At All						Definitely

Acceptance:

1	2	3	4	5	6	7
Not At All						Definitely

Sorrow:

1	2	3	4	5	6	7
Not At All						Definitely

Joy:

1	2	3	4	5	6	7
Not At All						Definitely

Love:

1	2	3	4	5	6	7
Not At All						Definitely

Annoyed:

1	2	3	4	5	6	7
Not At All						Definitely

Calm:

1	2	3	4	5	6	7
Not At All						Definitely

Relaxed:

1	2	3	4	5	6	7
Not At All						Definitely

Excited:

1	2	3	4	5	6	7
Not At All						Definitely

Disgusted:

1	2	3	4	5	6	7
Not At All						Definitely

Sad:

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Not At All						Definitely

Below is a list of traits or characteristics that could be used to describe an object. Please use the list below to describe lemphurs. If the word "definitely" describes **lemphurs**, then circle the number "7". If you decide that the word does not at all describe **lemphurs**, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Useful:

1	2	3	4	5	6	7
Not At All						Definitely

Foolish:

1	2	3	4	5	6	7
Not At All						Definitely

Safe:

1	2	3	4	5	6	7
Not At All						Definitely

Harmful:

1	2	3	4	5	6	7
Not At All						Definitely

Valuable:

1	2	3	4	5	6	7
Not At All						Definitely

Perfect:

1	2	3	4	5	6	7
Not At All						Definitely

Wholesome:

1	2	3	4	5	6	7
Not At All						Definitely

Useless:

1	2	3	4	5	6	7
Not At All						Definitely

Wise:

1	2	3	4	5	6	7
Not At All						Definitely

Beneficial:

1	2	3	4	5	6	7
Not At All						Definitely

Unsafe:

1	2	3	4	5	6	7
Not At All						Definitely

Worthless:

1	2	3	4	5	6	7
Not At All						Definitely

Imperfect:

1	2	3	4	5	6	7
Not At All						Definitely

Unhealthy:

1	2	3	4	5	6	7
Not At All						Definitely

We are interested in what thoughts and feelings you had as you were reading about **lemphurs**. That is, you might have had some thoughts and feelings that were prompted by **lemphurs**. You might also have had thoughts and feelings that had little to do with **lemphurs**. We are interested in any and all thoughts and feelings that you remember coming to mind while reading about this animal.

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1 2 3 4 5 6 7 8 9 10

None at all A great deal

When reading the first passage, to what extent would you say your opinion of lemphurs was based on your knowledge and beliefs about lemphurs?

1 2 3 4 5 6 7 8 9 10

None at all A great deal

Please answer the following questions on the passage that you just finished reading.

How readable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Readable								Extremely Readable

How enjoyable was the passage?

1	2	3	4	5	6	7	8	9
Not At All Enjoyable								Extremely Enjoyable

How easy was the passage to understand?

1	2	3	4	5	6	7	8	9
Not At All Easy								Extremely Easy

How interesting was the writer in presenting the information?

1	2	3	4	5	6	7	8	9
Not At All Interesting								Extremely Interesting

How clear and concise was the author in the use of language?

1	2	3	4	5	6	7	8	9
Not At All Clear & Concise								Extremely Clear & Concise

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), please place a "1" on the line to the left of the statement. If the statement is extremely characteristic of you (very much like you), please place a "5" on the line to the left of the statement. You should use the following scale as you rate each of the statements below.

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

_____ 1. I prefer complex to simple problems.

_____ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.

_____ 3. Thinking is not my idea of fun.

_____ 4. I would rather do something that requires little thought than something that is sure to challenge my abilities.

_____ 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.

_____ 6. I find satisfaction in deliberating hard for long hours.

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

_____ 8. I prefer to think about small daily projects rather than long-term ones.

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

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

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

_____ 12. Learning new ways to think doesn't excite me much.

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_____ 17. It's enough for me that something gets the job done; I don't care how or why it works.

_____ 18. I usually end up deliberating about issues even when they do not affect me personally.

APPENDIX D

DESCRIPTION OF SUPPLEMENTARY ANALYSES

Introduction

The analyses reported in the chapters of the dissertation constitute the analyses most central to assessing the affective/cognitive matching and mismatching hypotheses. However, a number of other more exploratory analyses were undertaken. These analyses, although related to affective/cognitive matching, did not directly address the major questions of interest so they are briefly described and reported in Appendix D and Appendix E. The analyses reported in the appendices focussed on three major issues. The first set of analyses examined the role of changes in affect and cognition as mediators of attitude change. The second set of analyses explored the influence of the affective and cognitive bases of attitudes on cognitive responses. Finally, the third set of analyses examined the independence of positivity and negativity toward the attitude object. To enhance the sensitivity of these analyses, the data from Experiments Two, Three, and Four were combined. Experiment One was not included because it failed to demonstrate evidence of a successful manipulation of the affective and cognitive bases of attitudes.

Affect and Cognition as Mediators of Attitude Change

As mentioned in the introduction, there are a number of practical problems with assessing the role of affect and cognition as mediators of attitude change. Most notably, pressures towards consistency make it likely that changes in one of the bases of attitudes will result in changes in the other (e.g., see Rosenberg, 1960). Thus, to establish a clear understanding of the causal mechanisms of matching effects through analyses of mediators, it is likely to be necessary to have on-line measures that allow for establishing if changes in one basis precede changes in the other. The simple pre-persuasion and post-persuasion assessments used in the present experiments do not provide such data. Nonetheless, three types of analyses were undertaken to explore the role

of changes in affect and cognition as a function of basis of attitude and type of persuasion.

Analysis of Discrepancy Scores

To examine if matching and mismatching persuasive appeals to the initial basis of attitudes influenced the underlying affective and cognitive bases of post-persuasion attitudes, affect-attitude and cognition-attitude discrepancy scores were computed from the post-persuasion measures. If matching leads to persuasion by primarily changing the basis directly targeted, one might expect post-persuasion attitudes to be based on affect when affect is matched, be based on cognition when cognition is matched, and be based on both affect and cognition when the bases are mismatched.

This hypothesis was tested by a 2 (type of discrepancy score: affect-attitude vs. cognition-attitude) x 2 (basis of attitude: affect vs. cognition) x 2 (type of persuasion: affective vs. cognitive) mixed design ANOVA. If the affective and cognitive bases of attitudes differed across experimental conditions, the type of discrepancy score should have interacted with other independent variables. This was not the case (see Table 15 in Appendix E). Type of discrepancy score did not significantly interact with basis of attitude, $F(1, 205) = .05$, $p = .82$, or with type of persuasion, $F(1, 205) = .12$, $p = .73$. Additionally, the three-way interaction among type of discrepancy score, basis of attitude, and type of persuasion was only marginally significant, $F(1, 205) = 2.97$, $p = .09$. Unfortunately, an examination of the cell means in Table 15 revealed the three-way pattern of obtained results was not readily interpretable. Thus, it seems wise to treat this very weak three-way interaction with caution.

Regression Analyses Following Persuasion

The second method of assessing the bases of attitudes was a series of regression analyses. In these analyses, subjects were divided into separate samples as a function of the basis of their attitudes and the

type of persuasion they received. Regression analyses were then conducted within each group in which post-persuasion affect scores and post-persuasion cognition scores were used to predict post-persuasion attitudes. As can be seen in Table 16 (see Appendix E), these analyses did not yield a pattern of results that could be directly related to any obvious psychological mechanisms. These analyses indicated that when initial attitudes were based on affect, post-persuasion attitudes were based on both affect and cognition regardless of the type of persuasion used. However, when initial attitudes were based on cognition, the basis of post-persuasion attitudes was the same as the type of persuasion. That is, affective persuasion produced affective attitudes and cognitive persuasion produced cognitive attitudes. Thus, these analyses provide a somewhat different picture than the discrepancy score analysis which suggested no variation in the bases of attitudes across conditions.

Regression Analyses of Change Scores

The final method of assessing the role of affect and cognition in attitude change was a series of regression analyses on change scores. In these analyses, difference scores between subjects' affect, cognition, and attitude at pre-persuasion and post-persuasion were computed. Subjects were then once again divided into separate samples as a function of the basis of their attitudes and the type of persuasion they received. Regression analyses were then conducted within each group in which affect change scores and cognition change scores were used to predict attitude change scores.

Table 17 (see Appendix E) shows that these analyses produced yet a different pattern of results. In these analyses, both the affect-affect and cognition-cognition matching produced attitude change as a result of both changes in affect and cognition. However, in both cases of mismatching, attitude change was predicted by changes in affect. Thus,

once again, the results did not replicate other analyses nor did they yield a pattern of findings the matched a priori predictions.

Conclusions

Taken together, the three preceding analyses produced conflicting findings that were not readily interpretable. Although it is possible to provide a plausible interpretation of any one of these analyses in isolation, the fact that they are inconsistent with one another makes it difficult to provide a compelling explanation that can account for all three sets of findings. Given these inconsistencies and the limitations of the current methodology, it seems prudent to treat these results with skepticism.

Analyses of Cognitive Responses

The second set of supplementary analyses examined the role of the affective and cognitive bases of attitudes in influencing cognitive responses to persuasive messages. Breckler and Wiggins (1991) have argued that pre-persuasion affect is a stronger determinant of cognitive responses than is pre-persuasion cognition. They also suggested that post-persuasion cognition is more strongly influenced by cognitive responses than is post-persuasion affect.

The present experiments were not explicitly designed to examine the impact of affect and cognition on cognitive responses to persuasion. And, there were a number of methodological difference between the current experiments and the study reported by Breckler and Wiggins (1991). Most notably, Breckler and Wiggins measured affect and cognition prior to presenting any messages. They then presented a message followed by the cognitive response task and then measures of affect and cognition. In the second phase, they presented a second message (inconsistent with the first) once again followed by the cognitive response task and then the measures of affect and cognition. In the present experiments, only one cognitive response task was administered and this task was done following the collection of post-

persuasion measures of affect, cognition, and attitude. The cognitive response task was done towards the end of the present experiments in order to avoid the task enhancing elaboration and obscuring differences in affect and cognition. Despite these differences, analyses were conducted examining if the bases of attitudes or type of persuasion influenced the extent to which affect and cognition influenced cognitive responses.

The Impact of Basis of Attitude

To assess whether the impact of affect and cognition on cognitive responses varied as a function of basis of attitude, cognitive responses were coded by two independent raters according to whether the thoughts were relevant/irrelevant to the attitude object and positive/negative with respect to the attitude object (see methods section of Experiments Two, Three, and Four for additional details).[10] The proportions of each subject's total thoughts that were relevant positive thoughts and relevant negative thoughts were then computed for each rater. The inter-rater reliability was r=.83 for the positive thoughts and r=.89 for the negative thoughts indices. The coding of thoughts was then averaged across the two raters. As was done by Breckler and Wiggins, the proportion of negative thoughts was subtracted from the proportion of positive thoughts to get an overall valenced index of cognitive responding. Prior to computing the difference score, an arcsin transformation was applied to the proportions.

Subjects were then divided according to whether their initial attitudes were based on affect or cognition. Within each group, a regression analysis in which pre-persuasion affect and cognition were used to predict the overall index of cognitive responding was conducted. The results of these analyses (see Table 18 in Appendix E) indicated that neither affect or cognition predicted cognitive responding in either attitude formation condition. A parallel set of analyses using post-persuasion affect and cognition to predict cognitive responses

indicated a weak tendency for the cognitive scale to be a better predictor of cognitive responses in both attitude formation conditions (see Table 19 in Appendix E). However, the only coefficient that achieved statistical significance was for the cognitive scale in the affective attitude condition. Thus, although it seems sensible that the cognitive scale should be a better predictor of cognitive responses (which are primarily cognitive rather than affective responses), these effects are too weak to regard with much confidence.

The Impact of Type of Persuasion

To assess the impact of type of persuasion, subjects were divided into two groups based on the type of persuasive appeal they received (see Table 20 in Appendix E). Regression analyses were then conducted within each group using post-persuasion affect and cognition to predict cognitive responses. Consistent with the previous analyses, there was a weak tendency for the cognitive scale to be a better predictor than the affective scale in both persuasion conditions. However, only the coefficient for the cognitive scale in the affective persuasion condition reached statistical significance.

Joint Effects of Basis of Attitude and Type of Persuasion

A third set of analyses used post-persuasion affect and cognition in a regression analysis to predict cognitive responses within each combination of basis of attitude and type of persuasion (see Table 21 in Appendix E). The results of these analyses were similar to the previous analyses with a tendency for the cognitive scale to be a better predictor than the affective scale. However, none of the coefficients in these analyses were statistically significant.

Mean Cognitive Response Scores as a Function of Condition

The final analysis examined if the mean overall cognitive response index varied as a function of basis of attitude, type of persuasion, and need for cognition. The three-way ANOVA of these scores revealed one significant main effect and one marginally significant main effect.

There was a significant main effect of need for cognition such that cognitive responses were more negative for low need for cognition subjects (M=-.49) than high need for cognition subjects (M=-.09), $F(1, 197) = 4.21$, $p = .04$. There was also a marginally significant effect of type of persuasion such that cognitive responses were more negative to affective persuasion (M=-.44) than to cognitive persuasion (M=-.09), $F(1, 197) = 3.23$, $p = .07$. This was consistent with the finding reported in the main text that attitude change was greater for affective persuasion than cognitive persuasion.

Conclusions

The cognitive response analyses provide some coherent patterns of results. Although experimental manipulations had no influence on the role of affect and cognition in cognitive responses, there was weak evidence that cognition was a stronger predictor of cognitive responses than was affect. Additionally, consistent with the attitude change main effects observed in Experiments Two, Three, and Four, there was weak evidence that affective persuasion produced more negative cognitive responses than cognitive persuasion.

Independence of Positivity and Negativity

The final set of analyses examined the extent to which positive and negative affect as well as positive and negative cognition were independent. These analyses examined the extent to which independence of positivity and negativity varied as a function of time of measurement. The analyses also examined the extent to which positive and negative affect and cognition were the bases of attitudes.

Independence of Positivity and Negativity

To examine the extent to which positive and negative affect as well as positive and negative cognition were independent, four new subscales were constructed. This was done by dividing positive and negative items into separate subscales within the affect and cognition scales. The correlations between the two subscales for each construct

were then assessed. Table 22 (see Appendix E) shows that prior to persuasion, positive and negative affect were independent of one another. In contrast, positive and negative cognition were negatively correlated with each other. Column two of Table 22 reveals that following persuasion, positivity and negativity became more consistent with one another. After persuasion, the correlation between positive and negative affect tripled in size. Similarly, the correlation between positive and negative cognition almost doubled in magnitude. Thus, presenting persuasive messages probably served to enhance elaboration concerning the attitude object and thereby increased consistency.

Positivity and Negativity as Bases of Attitudes

Table 23 (see Appendix E) shows the results of an analysis in which the positive and negative subscales at the pre-persuasion phase were used via regression analyses to assess the bases of attitudes across the two attitude formation conditions. Given that the attitude formation manipulation was designed to create positive affective attitudes or positive cognitive attitudes, one might expect positive affect to be strongest in the affect condition and positive cognition in the cognitive condition. The results are generally consistent with this. For the affective attitude, positive affect is a powerful predictor. However, negative affect is also a strong predictor which is not surprising given the independence of the two affect scales at the pre-persuasion phase. Negative cognition also predicted attitudes although this effect is somewhat weaker. In the cognitive attitude condition, positive cognition is, as expected, the strongest predictor. However, negative affect is also a significant predictor.

Table 24 (see Appendix E) shows the results of an analysis in which the positive and negative subscales at the post-persuasion phase were used in regression analyses to assess the bases of attitudes across the two attitude formation conditions. Given that other post-persuasion analyses of the bases of attitudes did not yield readily interpretable

results, it is not surprising that these results do not present a particularly coherent pattern. Within the affective attitude condition, all four subscales significantly predicted post-persuasion attitudes. However, within the cognitive attitude condition, positive affect, negative affect, and negative cognition predicted post-persuasion attitude.

Table 25 (see Appendix E) shows the positive and negative subscales for post-persuasion affect and cognition predicting post-persuasion attitude. These analyses are split according to the type of persuasive message subjects received. These analyses indicated that when subjects received affective persuasion, positive affect, negative affect, and negative cognition predicted post-persuasion attitudes. However, when subjects received cognitive persuasion, all four subscales significantly predicted post-persuasion attitudes.

The final set of analyses examined the four post-persuasion subscales' ability to predict attitudes as a function of basis of attitude and type of persuasion. Consistent with other post-persuasion analyses of basis of attitude, no readily interpretable pattern emerged (see Table 26 in Appendix E). Positive affect and negative cognition significantly predicted attitudes in the affect-affect matching condition. Both cognition scales significantly predicted attitudes in the cognition-cognition matching condition. And, when affective persuasion was matched against cognitive attitudes, positive affect and negative affect predicted attitudes. Finally, mismatches of cognitive persuasion against affective attitudes produced attitudes based on positive affect, negative affect, and negative cognition.

Conclusions

The analyses of affect and cognition subscales indicated that positivity and negativity were somewhat independent at formation but that consistency increased with exposure to a subsequent persuasive appeal. Regression analyses of the subscales ability to predict

attitudes at formation generally revealed sensible patterns. However, these patterns became less interpretable following persuasion.

APPENDIX E

TABLES FOR SUPPLEMENTARY ANALYSES

Table 15

Mean discrepancy scores as a function of type of discrepancy score, basis of attitude, and type of persuasion.

	Affective Attitude		Cognitive Attitude	
Type of Score	Affective Persuasion	Cognitive Persuasion	Affective Persuasion	Cognitive Persuasion
Affect-Attitude	1.16	.79	.89	.70
Cognition-Attitude	1.08	.86	1.02	.61

Table 16

Unstandardized regression coefficients for post-persuasion affect and cognition predicting post-persuasion attitude as a function of basis of attitude and type of persuasion

	Affective Attitude		Cognitive Attitude	
Predictor	Affective Persuasion	Cognitive Persuasion	Affective Persuasion	Cognitive Persuasion
Affect Scale	.46**	.66***	1.17***	.24
Cognition Scale	.53**	.59**	.09	.67***
R^2	.57	.59	.66	.67
N	51	52	53	53

* p < .05
** p < .01
*** p < .001

Table 17

Unstandardized regression coefficients for affect and cognition change scores predicting attitude change scores as a function of basis of attitude and type of persuasion

	Affective Attitude		Cognitive Attitude	
Predictor	Affective Persuasion	Cognitive Persuasion	Affective Persuasion	Cognitive Persuasion
Affect Change	.46**	.73***	1.14***	.39*
Cognition Change	.64***	.12	.25	.52***
R^2	.66	.62	.68	.62
N	51	51	53	50

* p < .05
** p < .01
*** p < .001

Table 18

Unstandardized regression coefficients for pre-persuasion affect and cognition predicting cognitive responses as a function of basis of attitude

Predictor	Affective Attitude	Cognitive Attitude
Affect Scale	.18	-.36
Cognition Scale	-.17	.12
R^2	.01	.04
N	101	104

* p < .05
** p < .01
*** p < .001

Table 19

Unstandardized regression coefficients for post-persuasion affect and cognition predicting cognitive responses as a function of basis of attitude

Predictor	Affective Attitude	Cognitive Attitude
Affect Scale	-.05	-.02
Cognition Scale	.37*	.28
R^2	.07	.03
N	100	107

* p < .05
** p < .01
*** p < .001

Table 20

Unstandardized regression coefficients for post-persuasion affect and cognition predicting cognitive responses as a function of type of persuasion

Predictor	Affective Persuasion	Cognitive Persuasion
Affect Scale	-.09	.02
Cognition Scale	.32*	.21
R^2	.05	.02
N	103	104

* p < .05
** p < .01
*** p < .001

Table 21

Unstandardized regression coefficients for post-persuasion affect and cognition predicting cognitive responses as a function of basis of attitude and type of persuasion

	Affective Attitude		Cognitive Attitude	
Predictor	Affective Persuasion	Cognitive Persuasion	Affective Persuasion	Cognitive Persuasion
Affect Scale	-.24	.04	.10	-.07
Cognition Scale	.29	.40	.33	.14
R^2	.04	.08	.08	.00
N	49	51	54	53

* p < .05
** p < .01
*** p < .001

Table 22

Correlations between positive affect and negative affect and between positive cognition and negative cognition as a function of time of measurement

Variable Pair	Pre-Persuasion Measures	Post-Persuasion Measures
Positive-Negative Affect	-.07	-.26**
Positive-Negative Cognition	-.36**	-.60**

* $p < .05$
** $p < .01$

Table 23

Unstandardized regression coefficients for pre-persuasion positive affect, negative affect, positive cognition, and negative cognition predicting pre-persuasion attitude as a function of basis of attitude

Predictor	Affective Attitude	Cognitive Attitude
Positive Affect	.42***	-.01
Negative Affect	-.46***	-.21**
Positive Cognition	.10	.52***
Negative Cognition	-.30**	-.14
R^2	.69	.62
N	106	105

* p < .05
** p < .01
*** p < .001

Table 24

Unstandardized regression coefficients for post-persuasion positive affect, negative affect, positive cognition, and negative cognition predicting post-persuasion attitude as a function of basis of attitude

Predictor	Affective Attitude	Cognitive Attitude
Positive Affect	.42***	.56***
Negative Affect	-.35***	-.34***
Positive Cognition	.34**	.04
Negative Cognition	-.26*	-.21*
R^2	.70	.64
N	105	107

* p < .05
** p < .01
*** p < .001

Table 25

Unstandardized regression coefficients for post-persuasion positive affect, negative affect, positive cognition, and negative cognition predicting post-persuasion attitude as a function of type of persuasion

Predictor	Affective Persuasion	Cognitive Persuasion
Positive Affect	.68***	.23**
Negative Affect	-.23**	-.28**
Positive Cognition	.07	.23*
Negative Cognition	-.23*	-.36***
R^2	.68	.60
N	106	106

* p < .05
** p < .01
*** p < .001

Table 26

Unstandardized regression coefficients for post-persuasion positive affect, negative affect, positive cognition, and negative cognition predicting post-persuasion attitude as a function of basis of attitude and type of persuasion

	Affective Attitude		Cognitive Attitude	
Predictor	Affective Persuasion	Cognitive Persuasion	Affective Persuasion	Cognitive Persuasion
Positive Affect	.55**	.25*	.78***	.12
Negative Affect	-.11	-.35*	-.40**	-.12
Positive Cognition	.13	.28	-.05	.31**
Negative Cognition	-.34*	-.37*	-.13	-.37**
R^2	.65	.60	.69	.67
N	53	52	53	54

* $p < .05$
** $p < .01$
*** $p < .001$

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FOOTNOTES

1. The third component of attitudes proposed by Smith (1947) was the policy orientation (i.e., behavioral) component. Smith used this term to refer to how a person wanted to act or behave with respect to Russia. Most early theoretical discussions of attitude structure postulated that attitudes were best described as being composed of three components: affect, cognition, and behavior (Harding, Kutner, Proshansky, & Chein, 1954; Insko & Schopler, 1967; Katz & Stotland, 1959; Kramer, 1949; Krech & Crutchfield, 1948; Rosenberg & Hovland, 1960). This three component view of attitude structure came to be referred to by subsequent researchers as the tripartite model of attitude structure (e.g., Breckler, 1984; Ostrom, 1969; Zanna & Rempel, 1988). Because the behavioral component is not a focus of the present research, the evidence in support of the existence of this component will not be reviewed. However, in the discussion section of the document, the potential role of the behavioral component of attitudes in susceptibility to different types of persuasion will be discussed.

2. These global positive/negative evaluations have typically been conceptualized as bipolar in nature. That is, it has generally been assumed that high levels of positivity should be associated with low levels of negativity and that high levels of negativity should be associated with low levels of positivity. However, recent theoretical discussions have questioned this assumption and proposed that there may be cases where positive and negative evaluations are relatively independent of one another (e.g., Cacioppo & Berntson, 1994).

3. Subjects were excluded from analysis if they indicated in the cognitive response task that they did not believe the cover story concerning market testing of the product. Although it is possible that some subjects doubted the cover story but did not report this in the cognitive response task because that were not explicitly asked to do so, this does not seem particularly likely. In a pre-test of the procedures and materials used in Experiments One and Two, 20 subjects were explicitly asked to write down their beliefs concerning the hypotheses and purpose of the experiment. The subjects were also asked verbally in a post-experiment discussion with the researcher to speculate on the purpose and goals of the experiment. None of the 20 subjects expressed doubt concerning the cover story. Thus, it seems likely that the number of subjects who were skeptical was extremely small.

4. The reason for explicitly mentioning the temperature of the beverage at the attitude formation and persuasion phases of the experiment was to provide a rationale for why the beverage might taste different at these different phases. If subjects had not been provided with a rationale, they would likely have become suspicious as to whether they were drinking the same beverage.

5. The simple bivariate correlations of the affect and cognition scales with the attitude scale within the two attitude formation conditions were also examined. The pattern of these correlations was similar to that of the regression analyses. Within the affect/cognition order, the correlation of the affect scale with the attitude scale ($r=.69$) was slightly larger than the correlation of the cognition scale with the attitude scale ($r=.62$). Similarly, within the cognition/affect order, the correlation of the affect scale with the attitude scale ($r=.74$) was slightly larger than the correlation of the cognition scale with the attitude scale ($r=.64$).

6. Throughout this experiment and subsequent experiments, attitude change results are analyzed using the ANCOVA approach. This is a common analytical procedure in attitude change research. However, there are two other approaches that are also commonly used in attitude research (e.g, Petty & Cacioppo, 1986). One approach is to analyze difference scores between pre-persuasion and post-persuasion attitudes using an ANOVA. The other common approach is to simply analyze post-persuasion attitudes in an ANOVA. Both of these analyses were also conducted for the present data and the results were very similar to those reported in the ANCOVA. In both analyses, the only effect approaching significance was the order of persuasion by order of attitude formation interaction. For the difference score analysis, this effect was not significant, $\underline{F}(1, 105) = 1.64$, $\underline{p} = .20$. For the post-persuasion attitude analysis, it was highly significant, $\underline{F}\ (1, 105) = 8.52$, $\underline{p} < .01$. Additionally, examination of the cell means in both analyses revealed patterns virtually identical to those reported in the ANCOVA analysis.

7. Although the analyses of discrepancy scores provided strong evidence supporting the validity of the formation manipulation, it was possible to conduct an even more sensitive analysis of the discrepancy scores. Prior to conducting Experiment Two, a pre-test of the attitude formation materials and procedures was conducted. This pre-test was based on a sample of 29 subjects and did not include the persuasion phase of the experiment. Thus, these subjects could not be included in the analyses of attitude change results. However, because the formation procedures and materials were identical to those used in Experiment Two, it was possible to include these subjects in analyses assessing the effectiveness of the attitude formation manipulation. These analyses produced an even larger test statistic for the two-way interaction between attitude formation condition and type of discrepancy score, $\underline{F}(1, 86) = 9.80$, $\underline{p} < .01$.

8. As with the discrepancy scores analysis, it was possible to provide an even more sensitive test of the differences among regression coefficients. When the 29 subjects from the pre-testing data were included in the regression analyses, the results became even stronger. Within the affective attitude condition, the affect scale coefficient was highly significant (B=.75, $p < .01$) but the cognitive coefficient was not significant (B=.20, $p = .28$). Within the cognitive attitude condition, the cognition scale coefficient was highly significant (B=.72. $p < .01$) but the affective scale coefficient was not significant (B=.19, $p = .30$). The contrast of effect sizes to test the crossover pattern of the coefficients across conditions was significant, $Z = 2.33$, $p = .02$. Additionally, the cross condition comparison of the affect scale was significant, $Z = 2.26$, $p = .02$, as was the comparison of the cognition scale, $Z = 2.16$, $p = .03$. Thus, with the larger sample size, the regression analyses provided even stronger evidence for the success of the attitude formation manipulation.

9. The simple bivariate correlations of the affect and cognition scales with the attitude scale within the two attitude formation conditions revealed a pattern of results similar to that of the regression analyses. Within the affective attitude condition, the correlation of the affect scale with the attitude scale (r=.72) was slightly larger than the correlation of the cognition scale with the attitude scale (r=.56). However, within the cognitive attitude condition, the correlation of the cognition scale with the attitude scale (r=.69) was slightly larger than the correlation of the affect scale with the attitude scale (r=.52). The differences in the simple bivariate correlations are less pronounced than the differences in the regression coefficients because the bivariate correlations do not control for the correlation between affect and cognition. Thus, the strength of the association between the weaker basis and the attitude is exaggerated

because the portion of its association with the attitude due to its correlation with the stronger basis is not controlled. These results highlight the value of the regression analyses which control for such spurious correlations.

10. Alternative analyses of the difference scores and the post-persuasion attitudes without the covariate produced very similar results. For the difference scores analysis, the main effect of type of persuasion was significant, $\underline{F}(1, 51) = 39.47$, $\underline{p} < .01$, as was the interaction between basis of attitude and type of persuasion, $\underline{F}(1, 51) = 6.15$, $\underline{p} = .02$. The interaction between need for cognition and type of persuasion was not significant, $\underline{F}(1, 51) = 1.76$, $\underline{p} = .19$. For the post-persuasion attitude analysis, the main effect of type of persuasion was also significant, $\underline{F}(1, 51) = 61.03$, $\underline{p} < .01$, as was the interaction between basis of attitude and type of persuasion, $\underline{F}(1, 55) = 7.09$, $\underline{p} = .01$. The interaction between need for cognition and type of persuasion was also significant, $\underline{F}(1, 51) = 7.50$, $\underline{p} = .01$.

11. This pilot study also allowed exploration of the extent to which the appeals were affective or cognitive in nature. Because the sample was so small (N=25), it was not possible to conduct sensitive significance tests of differences among regression coefficients. Nonetheless, a descriptive analysis suggested that the persuasive message manipulation did successfully create affective or cognitive appeals. Within the affective persuasion condition, the affect coefficient was marginally significant (B=.90) whereas the cognition coefficient was not (B=.69). In contrast, within the cognitive persuasion condition, the cognitive coefficient was significant (B=.75) but the affect coefficient was not (B=.41).

12. Simple bivariate correlations of the affect and cognition scales with the attitude scale within the two attitude formation conditions revealed a similar pattern to that of the regression analyses. Within the affective attitude condition, the correlation of the affect scale with the attitude scale (r=.83) was slightly larger than the correlation of the cognition scale with the attitude scale (r=.78). However, within the cognitive attitude condition, the correlation of the cognition scale with the attitude scale (r=.84) was slightly larger than the correlation of the affect scale with the attitude scale (r=.71).

13. As with the previous two experiments, the analyses of attitude difference scores and the post-persuasion attitudes without the covariate produced similar results to the ANCOVA. For the difference score analysis, the critical two-way interaction between basis of attitude and type of persuasion was significant, $\underline{F}(1, 60) = 10.41$, $\underline{p} < .01$. The three-way interaction among basis of attitude, type of persuasion, and dimension of the attitude object was not significant, $\underline{F}(1, 60) = .02$, $\underline{p} = .88$. For the analyses of post-persuasion attitudes without including the covariate, the two-way interaction between basis of attitude and type of persuasion was marginally significant, $\underline{F}(1, 60) = 3.41$, $\underline{p} = .07$. The three-way interaction among basis of attitude, type of persuasion, and dimension of the attitude object was not significant, $\underline{F}(1, 60) = .02$, $\underline{p} = .89$.

14. Simple bivariate correlations of the affect and cognition scales with the attitude scale within the two attitude formation conditions revealed a similar pattern to that of the regression analyses. Within the affective attitude condition, the correlation of the affect scale with the attitude scale (r=.98) was slightly larger than the correlation of the cognition scale with the attitude scale (r=.88). However, within the cognitive attitude condition, the correlation of the cognition scale

with the attitude scale (r=.94) was slightly larger than the correlation of the affect scale with the attitude scale (r=.80).

15. Because pre-persuasion attitudes differed slightly across attitude formation conditions, it was not possible to use pre-persuasion attitudes as a covariate because the ANCOVA requires that the covariate not differ across experimental conditions. Thus, an ANOVA of post-persuasion attitudes was conducted instead of the ANCOVA analysis used in the previous experiments. Importantly, the difference in pre-persuasion attitudes does not threaten the test of the matching and mismatching hypotheses because these hypotheses are assessed by the two-way interaction between bases of attitudes and type of persuasion on post-persuasion attitudes. A significant main effect at the pre-persuasion phase can not account this interaction effect. Additionally, whether the data were analyzed using an ANOVA of attitude change scores or an ANCOVA of post-persuasion attitudes with pre-persuasion attitudes as the covariate, the results were virtually identical. For the ANOVA of attitude change scores, the main effect of type of persuasion was significant, $\underline{F}(1, 64) = 19.86$, $\underline{p} < .01$. The interaction between basis of attitude and type of persuasion was also significant, $\underline{F}(1, 64) = 3.99$, $\underline{p} = .05$. Similarly, the ANCOVA produced a significant main effect of type of persuasion, $\underline{F}(1, 63) = 27.63$, $\underline{p} < .01$. It also produced a significant interaction between basis of attitude and type of persuasion, $\underline{F}(1, 63) = 7.33$, $\underline{p} = .01$. No other effects were significant in either of the analyses.

16. Raters also attempted to code thoughts according to whether they were affective or cognitive in nature. Unfortunately, analyses indicated that very few subjects listed any affective responses and that the inter-rater reliability for the affective/cognitive distinction was quite low. Thus, responses were collapsed across affect and cognition.

These results suggest that in future cognitive response tasks, it might be necessary to more explicitly prompt and encourage reporting of affective reactions.