
The Role of the Affective and Cognitive Bases of Attitudes in Susceptibility to Affectively and Cognitively Based Persuasion

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Two experiments were conducted to examine whether attitudes based on affect or cognition were more susceptible to persuasive appeals that matched versus mismatched the basis of attitudes. Experiment 1 provided evidence for a relative affective/cognitive persuasion matching effect and suggested that this matching effect could not be accounted for by attribute matching rather than affective/cognitive matching. Regardless of whether the persuasive appeal matched or mismatched the attitude on the attribute dimension, an affective/cognitive persuasion matching effect occurred. Experiment 2 examined whether the affective/cognitive matching effect could be accounted for by direct/indirect experience persuasion matching. Holding the direct/indirect experience distinction constant, results again demonstrated a relative affective/cognitive persuasion matching effect. Analyses of both experiments using previously validated measures of affect and cognition confirmed that manipulations of the affective and cognitive bases of attitudes were successful.

Researchers have long speculated that the underlying structure of attitudes can be based on affect and/or cognition (e.g., Cacioppo, Petty, & Geen, 1989; Insko & Schopler, 1967; Katz & Stotland, 1959; Petty & Cacioppo, 1986; Rosenberg & Hovland, 1960; Zajonc & Markus, 1982; Zanna & Rempel, 1988). Affect has typically been used in the contemporary literature to refer to the positive and/or negative feelings and emotions that an individual associates with an attitude object. The term *cognition* has generally been used to describe beliefs about positive and/or negative attributes of an attitude object (e.g., Breckler, 1984; Crites, Fabrigar, & Petty, 1994; Ostrom, 1969). Empirical research has confirmed that people differentiate between attitude-relevant affect and

cognition (e.g., Bagozzi, 1978; Breckler, 1984; Kothandapani, 1971; Ostrom, 1969), and research has also shown that both of these constructs have some independent influence on attitudes (Abelson, Kinder, Peters, & Fiske, 1982; Batra & Ray, 1985, 1986; Breckler & Wiggins, 1989; Crites et al., 1994; Eagly, Mladinic, & Otto, 1994; Granberg & Brown, 1989; Stangor, Sullivan, & Ford, 1991).

Within the attitudes literature, however, the affect/cognition distinction has not been confined to issues of structure. This distinction has also been a popular means of classifying types of persuasive communication. Thus, some research has addressed the extent to which the content of persuasive appeals can be classified as affective or cognitive in nature (Becker, 1963; Knepprath & Cleverger, 1965; Ruechelle, 1958). Other studies have focussed on examining the relative impact of affective versus cognitive persuasive appeals on attitudes, behav-

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iors, and memory (Chen, 1933; Eldersveld, 1956; Hartmann, 1936; Knower, 1935; Matthews, 1947; Menefee & Granneberg; 1940; Weiss, 1960). Finally, some work has investigated the extent to which the two types of persuasive communications change attitudes by different processes (Edell & Burke, 1987; Pallak, Murrone, & Koch, 1983; Roselli, Skelly, & Mackie, 1995).

Bases of Attitudes and Types of Persuasion

Although the affect/cognition investigations of attitude structure and of persuasion developed independently of one another, these two research traditions have converged in recent years. In particular, social psychologists have become interested in whether the affective and cognitive bases of attitudes influence susceptibility to affectively and cognitively based persuasive appeals (Edwards, 1990; Edwards & von Hippel, 1995; Messe, Bodenhausen, & Nelson, 1995; Millar, 1992; Millar & Millar, 1990, 1993). Researchers have addressed whether affectively or cognitively based persuasion is more potent when the nature of the appeal matches or mismatches the basis of the attitude. Unfortunately, as outlined next, this research has produced conflicting results.

Affective/cognitive matching effects. In a series of experiments, Edwards and her colleagues (Edwards, 1990; Edwards & von Hippel, 1995) have attempted to create attitudes toward novel attitude objects that were either affective or cognitive in nature. They then attempted to change these initial attitudes using persuasion that was intended to be either predominantly affective or cognitive in nature. This research has uniformly suggested that persuasive appeals tend to be more effective when the nature of the appeal matches rather than mismatches the basis of the attitude.

It is informative to note that at both the formation and persuasion phases of these experiments, the affective versus cognitive bases of initial attitudes and subsequent persuasive appeals have typically been manipulated by varying the order of affective and cognitive information presented about the attitude object. For example, in one experiment, Edwards (1990) created positive attitudes toward a fictitious beverage by having participants taste a pleasant-tasting beverage (affect) and read positive information about health benefits of the beverage (cognition). Some participants tasted the beverage first and then read the information. Edwards reasoned that these participants should form primarily affective attitudes because affective information was presented first. Others read the information first and then tasted the beverage. She reasoned that these participants should form cognitive attitudes because cognitive information was presented first. Following the

attitude-formation phase, all participants reported their attitudes toward the beverage.

In the persuasion phase, participants were then asked to smell the beverage (affect), which was made to smell bad, and to read more information about health features of the beverage (cognition), which was negative. The order of the smell and informational passage was manipulated to create the affective/cognitive persuasion treatments. As in the formation phase, it was assumed that whatever information (i.e., affective or cognitive) was presented first should constitute the primary basis of the persuasive appeal. Following the persuasive information, all participants once again reported their attitudes toward the beverage.

Analyses of attitude change scores revealed a significant interaction between order at formation and order at persuasion, suggesting support for a relative matching effect.¹ Persuasion based on the affect/cognition order was more effective in changing attitudes based on the affect/cognition order than on the opposite order. In contrast, there was a much weaker tendency for persuasion based on the cognition/affect order to produce more attitude change when attitudes were based on the cognition/affect order than on the affect/cognition order. Similar evidence of a relative matching effect was obtained in two other experiments that used the same general methods (Edwards, 1990, Experiment 1; Edwards & von Hippel, 1995, Experiment 1).

In a final experiment, a relative matching effect was obtained using a slightly different methodology (Edwards & von Hippel, 1995, Experiment 2). In this study, the basis of attitudes was once again manipulated by varying the order in which participants received affective and cognitive information. However, the nature of the persuasive appeal was manipulated by instructing participants to either focus on emotions or objective inferences while reading the persuasive appeal. Results indicated that when attitudes were based on the affect/cognition order, there was a tendency for more attitude change when participants were instructed to focus on emotions compared to when they were instructed to focus on objective inferences. Conversely, when attitudes were based on the cognition/affect order, there was a tendency for more attitude change when participants were instructed to focus on objective inferences rather than emotions.

Edwards reasoned that relative rather than absolute matching effects occur because affective attitudes have a unidimensional evaluative (i.e., positive versus negative feelings) structure, whereas cognitive attitudes have a more multidimensional structure (i.e., a structure that includes evaluation as well as other informational dimensions). Based on this notion, Edwards suggested that one might expect affective attitudes to be relatively

resistant to cognitive persuasion because information about specific attributes can be assimilated into or discounted based on the general evaluative structure. Affective persuasion, on the other hand, is relatively successful because it directly challenges the general evaluative structure. In the case of cognitive attitudes, affective persuasion has only limited effectiveness because it only addresses one relevant dimension of the attitude. Similarly, even cognitive persuasion might only address a subset of the relevant dimensions unless it has an exact one-to-one correspondence to the dimensions of the attitude. Thus, cognitive persuasion might be more effective in changing a cognitive rather than an affective attitude, but it will not necessarily be more effective in changing a cognitive attitude than an affective appeal would be.

Although the data from Edwards's (Edwards, 1990; Edwards & von Hippel, 1995) experiments were interpreted as providing support for a relative affective/cognitive matching effect, there are methodological ambiguities in these experiments that make it difficult to be certain that this interpretation is correct. At the heart of the problem is the use of an order manipulation as a means of manipulating the affective and cognitive bases of attitudes. The affective/cognitive matching interpretation of the order manipulation rests on the assumption that order manipulations produce primacy effects. Although primacy effects have been demonstrated in persuasion contexts, recency effects in persuasion have also been shown to occur (e.g., Cromwell, 1950; Haugtvedt & Wegener, 1994; Hovland & Mandell, 1957; Lana, 1961, 1963). Because manipulation checks on the bases of attitudes created by the order manipulation have not been included in most of the studies, it was not possible to determine if these manipulations produced primacy effects, recency effects, or no impact at all on the affective and cognitive bases of the attitudes formed. In addition, it is not possible to confirm the assumption that primacy (or recency) effects occurred at both the attitude formation and persuasion phases. It is conceivable that recency effects could have occurred at one stage and primacy at another. These various possibilities present problems for empirical evidence advanced as supporting the affective/cognitive persuasion matching effect. Perhaps even more problematic, the few explicit empirical tests of the order manipulation in persuasion experiments that have been conducted have not supported the view that the order manipulation alters the affective/cognitive bases of attitudes (see Edwards & von Hippel, 1995, Experiment 2; Fabrigar, 1995, Experiment 1).

Affective/cognitive mismatching effects. Another reason for caution in accepting the matching conclusion is that studies appearing to support affective/cognitive mismatching effects have been reported (Millar & Millar, 1990). One explanation for mismatching is based on the

notion 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 (Millar & Millar, 1990). This threat can motivate the person to counterargue the message. In contrast, when the persuasive appeal does not directly match the underlying nature of the attitude, the appeal will not directly threaten 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 more attitude change (for another explanation of this effect, see Millar & Tesser, 1992).

Empirical support for mismatching effects comes from three experiments conducted by Millar and Millar (1990). In the first two studies, participants' attitudes toward different beverages were classified as primarily affective or cognitive by having them indicate which 3 of a set of 16 statements of feelings and beliefs about the beverages best reflected their reaction to each target beverage. Participants who endorsed statements of feeling for at least two of their three responses (e.g., "The beverage makes me feel relaxed") were classified as having affective attitudes. Participants who endorsed statements of belief for at least two of their three responses (e.g., "The beverage is expensive") were classified as having cognitive attitudes. In a separate session, participants returned to the laboratory, where they were exposed to counterattitudinal messages for each of the target beverages. Half of the participants received a persuasive message that contained emotional reasons for liking or disliking the beverage (affect), and the other half received a message that consisted of rational reasons for liking or disliking the beverage (cognition). After reading the message, participants reported their attitudes toward each of the beverages. These two experiments provided evidence for an apparent mismatching effect. That is, rational arguments tended to produce greater attitude change when attitudes were classified as based on affect compared to when attitudes were classified as based on cognition. In contrast, emotional arguments tended to result in more attitude change when attitudes were classified as affective in nature compared to when they were classified as cognitive.

In a third experiment (Millar & Millar, 1990), a somewhat different methodology was used. In this study, participants were asked to solve various analytic puzzles. While completing the puzzles, half of the participants were asked to focus on why they felt the way they did about each puzzle. This focus condition was assumed to make the cognitive component of participants' attitudes more salient. The other half of the participants were asked to focus on how they felt while performing each puzzle. This was assumed to increase the salience of the

affective component. Following completion of the puzzles, participants received persuasive messages about the puzzles that contained cognitive arguments or affective arguments. Participants then completed attitude measures for the puzzles. Evidence for a mismatching effect was once again obtained.

Although these experiments provide evidence that is consistent with a mismatching effect, these data are not without their limitations. One limitation is the method of determining if attitudes are affective or cognitive in nature. As just noted, in two experiments, this was done by having participants 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 interrater 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 that 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 (1990) 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 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). Following the focus manipulation, participants who received the cognitive focus are asked to list their reasons for liking or disliking the attitude object, and participants who received 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 is problematic, however, because the wording of the thought-listing measure is confounded with the focus manipulation. That is, in the cognitive focus condition, participants are only explicitly asked to list reasons, whereas in the affective focus condition, participants are only explicitly asked to list feelings. Thus, 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 participants 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 to list one or the other type of response. Consistent with

this explanation, Rosselli et al. (1995) have argued that the wording of thought-listing instructions could bias participants to list primarily cognition or affect even though participants generated both types of responses. In addition, 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 than feelings but weight their feelings more strongly in forming an attitude. In fact, research on cognitive responses in persuasion has demonstrated that people in different conditions can list similar numbers of thoughts, but these thoughts can be differentially predictive of attitudes (e.g., Chaiken, 1980; Petty & Cacioppo, 1979).

Another limitation of the data supporting the mismatching hypothesis is the manner in which the affective or cognitive nature of persuasive messages has been manipulated. In these experiments, messages were constructed by selecting arguments 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 important, based on the descriptions of affective arguments, it is not clear that these arguments can actually be defined as affective 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 him or her to feel a certain way is not necessarily the same as presenting an argument that actually causes the person to experience an affective state related to the attitude object. For example, telling people 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 or having them read a passage that contains emotionally evocative material that induces a state of happiness. 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 rather than another form of cognitive arguments. It is possible that both the affective and cognitive arguments used by Millar and Millar were cognitive in nature and simply tapped different dimensions of cognition related to the object.

Accounting for the discrepant findings. Recently, there have been attempts to resolve the apparent conflict between evidence for the matching effect and evidence for the mismatching effect. Millar (1992) examined whether the amount of direct experience with the attitude object moderated whether matching or mismatching effects would occur. It was postulated that mismatching effects should occur when there was extensive direct

experience with the object because such experience should help a person to effectively generate counterarguments to matching messages. In contrast, if the attitude was based on little direct experience, matching effects were hypothesized to occur. Millar reasoned that this was because it is more difficult to generate counterarguments in defense of an attitude based on little direct experience.

In this study, participants were asked to focus on how they felt while completing a series of puzzles. Thus, all attitudes were assumed to be affective in nature. Some participants only completed one example of each type of puzzle (low direct experience), whereas other participants completed five examples of each type of puzzle (high direct experience). Participants then received messages that provided either informational or emotional reasons for liking the puzzles. The results indicated a mismatching effect under high levels of direct experience (i.e., the cognitive reasons were more effective than the affective reasons) and a nonsignificant matching effect under low levels of direct experience. Although suggestive, this study has limitations similar to past studies of this type. First, no attempt was made to confirm that the affective focus was successful in creating affective attitudes. Similarly, the affective/cognitive nature of the message was manipulated using methods similar to past mismatching studies (i.e., the affective message merely asserted that the object would make someone feel a particular way without necessarily inducing any affect). Finally, there was no cognitive attitude condition, so it is not clear if the same pattern of results would have occurred for cognitive attitudes.

Another possible resolution has been advanced by Messé et al. (1995). These investigators have provided evidence challenging whether past research ostensibly demonstrating affective/cognitive persuasion matching and mismatching effects should be interpreted as due to affect and cognition at all. Messé et al. proposed that this apparent conflict can be resolved by reconceptualizing these experiments in terms of direct and indirect experience. They argued that a number of experiments demonstrating matching effects have used manipulations in which affective information was presented via direct experience (e.g., tasting a beverage) and cognitive information via indirect experience (e.g., reading a passage about a beverage) with the attitude object. Thus, these matching effects could be conceived as direct experience/indirect experience matching effects rather than affect/cognition matching effects. Furthermore, they argued that experiments demonstrating mismatching effects have tended to use attitude objects for which individuals' initial attitudes were likely to have been based on direct experience (i.e., real beverages that participants had probably tasted in the past, puzzles that participants

had attempted to solve), but the persuasive appeals were always written information about the attitude object (i.e., information presented through indirect experience). Thus, the studies favoring mismatching involved attempting to overcome direct experience with indirect experience. Messé et al. reasoned that mismatching persuasive appeals to dimensions of the attitude object should only lead to enhanced persuasion in cases where indirect experience was being used to overcome direct experience.

To support their position, Messé et al. (1995) conducted an experiment in which they crossed affect and cognition with direct and indirect experience in both the attitude formation and persuasion phases of the experiment. Analyses of postpersuasion attitudes produced results consistent with the direct experience hypothesis. In particular, their results suggested that the affect/cognition distinction had no influence at attitude formation or persuasion. Instead, a significant interaction between direct/indirect experience at formation and direct/indirect experience at persuasion was obtained. This interaction indicated that attitudes formed by direct experience were more susceptible to direct experience persuasion than to indirect experience persuasion. Attitudes formed by indirect experience were equally susceptible to direct experience and indirect experience persuasion.

The Messé et al. (1995) data are intriguing in that they raise the possibility that the mechanism underlying at least some prior matching and mismatching effects was due to direct/indirect experience rather than to affect/cognition. Such an explanation would certainly explain why past attempts to validate order manipulations have failed to find evidence of differences in affective/cognitive bases. The direct/indirect experience explanation is also interesting in that it can account for past research demonstrating moderators of matching and mismatching. For example, the finding that the amount of direct experience on which the attitude is based moderates matching and mismatching effects (Millar, 1992) is consistent with a direct/indirect experience perspective (i.e., the more extensive the direct experience on which the attitude is based, the less effective indirect experience persuasion should be relative to direct experience persuasion).

However, despite their intriguing nature, the Messé et al. (1995) arguments do not provide an entirely satisfactory resolution. First, it is not clear that all of the past experiments ostensibly demonstrating affective/cognitive matching effects involved manipulations of indirect/direct experience (e.g., see Edwards & von Hippel, 1995). Second, Messé et al. (1995) failed to articulate a precise psychological mechanism for why direct/indirect experience persuasion matching effects should oc-

cur. One plausible explanation is that written messages might convey information that is represented in propositional form, whereas direct experience and simple perceptual experiences might convey information that is stored in nonpropositional forms. Thus, past affective/cognitive matching effects might involve (mis)matching semantic/episodic representations (Tulving, 1972) or propositional/analog representations (Pavio, 1986) rather than affect/cognition per se. Indeed, Ostrom, Skowronski, and Nowak (1994) have speculated that distinctions such as semantic/episodic and propositional/analog might well have relevance for understanding attitudes and explain some differences attributed to direct versus indirect experience. In any case, these memory representation distinctions might characterize past manipulations of affect/cognition at least as well as the direct/indirect experience distinction does.²

Conclusions and Overview of the Current Research

Interpreting the existing evidence for the role of the affective and cognitive bases of attitudes in susceptibility to affectively and cognitively based persuasion is difficult. Research findings appear to be contradictory with some experiments providing evidence of matching and others of mismatching. However, experiments advanced in support of both of these positions have potential methodological limitations that render interpretation problematic. Experiments demonstrating matching effects have generally not tested if manipulations of the affective and cognitive bases of attitudes were successful. Furthermore, when such tests have been conducted, they have failed to find differences in the bases of attitudes. Likewise, experiments demonstrating mismatching effects have failed to test if the affective and cognitive bases of attitudes were successfully manipulated. Even more problematic, other research has suggested that past matching and mismatching effects might not be due to affect/cognition at all. Thus, the empirical status of affective/cognitive matching and mismatching effects remains in doubt. Given these problems, the most prudent conclusion is that neither affective/cognitive matching nor mismatching effects have been convincingly demonstrated.

EXPERIMENT 1

Experiment 1 was designed to provide a more definitive test of the viability of the affective/cognitive matching and mismatching hypotheses. Because past research supporting each hypothesis is open to question, more definitive tests of these hypotheses are clearly needed. In accomplishing this goal, it was necessary to have an effective methodology for manipulating the bases of attitudes and the nature of persuasion. A second goal of Experiment 1 was to examine the extent to which

precise matching of the persuasive appeal to the basis of the attitude was necessary to obtain affective/cognitive matching effects. Typically, in past studies demonstrating affective/cognitive matching effects, affective and cognitive manipulations of attitudes and persuasion have confounded attribute dimensions of the attitude objects with affect and cognition. For example, in one experiment (Edwards & von Hippel, 1995, Experiment 1), affective manipulations involved presenting visual information about the physical attractiveness of a person, whereas cognitive manipulations involved written information about certain personality attributes of the person. It is possible that the matching effects observed in these studies were not due to matching of affect/cognition per se but instead due to matching attribute dimensions of the attitude object (e.g., physical attractiveness versus personality).

Experiment 1 used a validated method to vary affect versus cognition and unconfounded attribute 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 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 (mis)matching effect by demonstrating that the (mis)matching of affect/cognition is sufficient in its own right to produce persuasion effects.

Second, investigating cases where affect and cognition match but other dimensions mismatch (or the opposite) presents an opportunity for exploring the strength of affective/cognitive matching effects and potential moderators of these 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 effects regardless of whether attribute dimensions of the object match. For instance, a pure affective/cognitive matching effect predicts that if an attitude about a new beverage 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, an attribute dimension matching hypothe-

sis predicts that matching attribute dimensions of the object should enhance persuasion above and beyond any 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 a 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). 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 matched, other attribute dimensions of the object might have been mismatched.

Method

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

The design was a 2 (basis of attitude: affect vs. cognition) \times 2 (type of persuasion: affect vs. cognition) \times 2 (attribute dimension in persuasion treatment: taste vs. smell) factorial. Students participated in groups ranging from 1 to 4. The cover story was similar to that used in Experiment 2 of Edwards (1990). On arriving at the laboratory, all students were informed that they were participating in an experiment being conducted by a team of market researchers and psychologists. They were told that the purpose of the experiment was to find out people's opinions concerning several new products currently being considered for mass marketing. The first product that participants evaluated was a beverage. This product was the target product for the purpose of the experiment and was given the same name used in the original Edwards study, "Power-Plus." Half of the participants were randomly assigned to taste the beverage (affective basis), and half read information about the taste of the beverage (cognitive basis). Thus, the taste dimension of the attitude object 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 manipula-

tions, 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 of the beverage and a persuasive appeal discussing the odor 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).

Basis of attitude manipulation. Before tasting or reading about the taste of the beverage, participants were told that the researchers were first interested in getting a sense of their expectations about Power-Plus. Participants were then asked to answer a set of questions concerning Power-Plus based on their expectations of how they thought they would feel (affect condition) or what they thought they would think (cognitive condition) about the beverage. The set of questions that participants were asked to complete were from the 16-item affect scale or the 14-item cognition scale developed by Crites et al. (1994). The purpose of having participants complete one of these scales prior to tasting or reading about the beverage was to prime the affective or cognitive dimension of attitudes and thus further enhance the likelihood that tasting or reading about the beverage would create an attitude based on affect or cognition.

In the affective basis condition, participants were then asked to cleanse their palettes by sipping 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 try a very cool sample of 50 ml of the pleasant tasting commercially marketed beverage, Hawaiian Punch Blue. Participants were led to believe that they were tasting a sample of Power-Plus cooled to a temperature of 35 degrees Fahrenheit. Participants 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 participants from seeing the beverage.

In the cognitive basis condition, participants read information about the taste of the beverage instead of actu-

ally tasting the beverage. The 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. Although some past researchers might have considered our cognitive-taste manipulation to produce affective attitudes (Millar & Millar, 1990), our conceptualization assumes that simply reading about taste is insufficient to induce attitudes with an affective basis—one must experience affect as well. Nevertheless, this assumption is examined empirically in this study. Both the affective and cognitive treatments were designed to produce favorable initial attitudes toward the beverage.

Type of persuasion manipulation. In the persuasion phase, one fourth of the participants were randomly assigned to (re)taste the beverage (affective-taste persuasion). Participants in this condition rinsed their mouths with water and then tasted a sample of Hawaiian Punch Blue. To make the beverage unpleasant tasting, the 50 ml of the beverage was mixed with 10 ml of vinegar and 1/3 ml of table salt. The beverage was served at a temperature slightly colder than room temperature. Participants 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 has been removed from the refrigerator. 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.

Another fourth of the participants were randomly assigned to smell the beverage (affective-smell persuasion). This was done by providing each participant with a scent container. Each plastic bottle was filled with a liquid containing 15 ml of Hawaiian Punch Blue, 15 ml of vinegar, 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 participants could smell the beverage. The beverage was presented at a temperature slightly colder than room temperature. Participants 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 has been removed from the typical refrigerator.

Another fourth of the participants 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. 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 participants 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. The passage mentioned that the effect of temperature on smell was completely harmless and that it influenced 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.

Measures. Following the basis of attitude manipulation, participants completed measures of affect, cognition, and attitude. Proper assessment of the validity of our affective/cognitive manipulations requires reliable and valid measures of affect and cognition to be used (for critiques of past measurement research, see Crites et al., 1994; Eagly et al., 1994). In the current research, we used the measures validated by Crites et al. (1994). These measures were 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 ensure that at least some subset of items for each scale will be appropriate for most attitude objects. Research by Crites et al. (1994) has indicated that the scales provide comparable reliability of measurement of attitudes, affect, and cognition across a wide range of 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.

In our research, attitude-relevant affect was measured using a 16-item scale that required respondents to indicate the extent to which 16 different emotions described how the attitude object made them feel. Half of the emotions were positive (e.g., *happy, excited*), and the other half were negative (e.g., *tense, angry*). Attitude-relevant cognition was assessed using a 14-item scale that required respondents to indicate the extent to which 14 different traits or characteristics described the attitude object. Half of the traits were positive (e.g., *useful, safe*), and the other half were negative (e.g., *harmful, worthless*). Attitudes were measured using an eight-item scale consisting of different words reflecting general and undifferentiated positive or negative evaluation. Participants 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*). For each affective, cognitive, and attitudinal item, participants recorded their responses on a 1 to 7 scale, with 1 = *not at all* and 7 = *definitely*. Overall scores for the three scales were computed by reverse coding the negative items and then obtaining the average score across all of the scale items. Thus, scores for the three scales ranged from 1 to 7, with higher numbers reflecting greater positivity (of affect, cognition, and attitude). The attitude, affect, and cognition scales were all found to be highly reliable, with Cronbach's alpha coefficients of .94, .86, and .90, respectively.

Although all participants completed the attitude scale first, the order of the affect and cognition scales was counterbalanced. After completing the attitude, affect, and cognition measures, all participants were then asked to answer two questions assessing their perceptions of the beverage's taste and smell. Participants responded to these questions on a 1 to 10 (1 = *very bad tasting/smelling*, 10 = *very good tasting/smelling*). Participants also completed a series of filler questions concerning past consumer behavior related to beverages. These questions were included to increase the realism of the market research cover story.

Following the persuasion phase of the experiment, each participant completed measures of attitude, affect, and cognition in the same order that he or she completed the scales following the attitude formation phase. Participants were then asked to provide cognitive responses and to complete the short form of the Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984).³

Results

Two major sets of hypotheses were tested in Experiment 1. First, it was hypothesized that when participants' initial attitudes toward the beverage were formed by tasting it, the overall evaluation of the beverage should be based predominantly on affect. In contrast, when participants' initial attitudes toward the beverage were formed by reading information about the taste of it, the overall evaluation should be based predominantly on cognition. These hypotheses, of course, were essential to validate in order to examine the second major set of hypotheses—the affective/cognitive (mis)matching persuasion hypotheses and the attribute (mis)matching persuasion hypotheses. Because previous evidence for both affective/cognitive matching and mismatching effects 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. Likewise, there was no strong basis to prefer affective/cognitive

matching hypotheses to attribute matching hypotheses. The affective/cognitive matching hypotheses predict that matching persuasive appeals to attitudes along the affective and cognitive dimensions of attitudes should regulate persuasion regardless of whether attribute dimensions of the attitude object match or mismatch. Thus, these hypotheses predict a significant two-way interaction between basis of attitude (affect vs. cognition) and type of persuasion (affective vs. cognitive). In contrast, attribute matching hypotheses predict that affective/cognitive effects should be weakened or reversed when attribute dimensions of the attitude object (mis)match. These hypotheses predict 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).

Analyses of the affective/cognitive bases of attitudes. An examination of prepersuasion attitudes in the affective attitude condition ($M = 5.27$) and cognitive attitude condition ($M = 5.65$) revealed that the mean attitude following the formation phase of the experiment was statistically equivalent across the two conditions as intended, $t(1, 74) = 1.34, p = .19$. 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. These analyses revealed that the cognitive condition actually produced more positive taste ratings ($M = 7.89$) than did 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.

To assess the extent to which we were successful in altering the basis of the initial attitude, we tested whether affect-attitude consistency and cognition-attitude consistency differed across the affective and cognitive formation conditions. This was done by computing two discrepancy scores. First, the discrepancy between attitude and affect was obtained by computing the absolute value of the difference between each participant's attitude and affect scores. The discrepancy between the attitude score and the cognition score was obtained in an analogous manner. This produced two scores with possible values ranging from 0 to 6. 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 largely on affect, the discrepancy between affect and attitude scores should be relatively small, and if the attitude was based largely on cognition, the discrepancy between attitude and cognition scores should be relatively small. This approach and other forms of discrepancy scores have a well-established

TABLE 1: Experiment 1 Discrepancy Scores by Attitude Formation Condition

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

history as a means of assessing structural consistency among attitudes, affect, and cognition (e.g., Chaiken & Baldwin, 1981; Chaiken, Pomerantz, & Giner-Sorolla, 1995; Crites et al., 1994; Fazio & Zanna, 1978; Norman, 1975; Rosenberg, 1968).

Table 1 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) \times 2 (attitude formation condition: affective vs. cognition) mixed-design ANOVA, the predicted crossover interaction between type of discrepancy scores and attitude formation condition was obtained, $F(1, 74) = 8.18, p = .01$. A contrast between 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, $F(1, 74) = 6.31, p = .02$. A contrast between the means within the cognitive attitude condition indicated a nonsignificant tendency for a smaller cognition-attitude discrepancy score than an affect-attitude discrepancy score, $F(1, 74) = 2.31, p = .20$. 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, $F(1, 74) = 13.51, p < .01$. Thus, taken together, the discrepancy score analyses suggested that the attitude formation manipulation was successful in creating relative differences between the two conditions in the affective and cognitive bases of attitudes.⁴

Attitude change results. To compare the affective/cognitive matching versus attribute dimension matching hypotheses, participants' postpersuasion attitudes were analyzed using a 2 (basis of attitude: affect vs. cognition) \times 2 (type of persuasion: affect vs. cognition) \times 2 (dimension of attitude object: taste vs. smell) ANCOVA, with prepersuasion attitudes serving as the covariate. First, a significant main effect of type of persuasion was obtained, $F(1, 67) = 8.43, p < .01$. 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 ($M = 4.44$) than cognitive persuasion ($M = 3.65$). Second, a significant main effect of attribute dimension

was also found, $F(1, 67) = 5.27, p = .03$, showing that persuasive appeals focussing on taste were more effective ($M = 4.35$) than persuasive appeals focussing on smell ($M = 3.73$).

More important, the critical two-way interaction between basis of attitude and type of persuasion was significant, $F(1, 67) = 5.87, p = .02$. An examination of the means in Panel A of Figure 1 provided evidence of a relative affective/cognitive matching effect. Affective persuasion was better at changing affective ($M = 4.93$) than cognitive attitudes ($M = 3.95$), $F(1, 67) = 6.83, p = .01$. In contrast, cognitive persuasion showed a nonsignificant tendency to be more successful against cognitive ($M = 3.82$) than affective attitudes ($M = 3.48$), $F(1, 67) = .82, p = .37$. Importantly, contrary to what the attribute dimension matching hypotheses would predict, this two-way interaction was not qualified by a three-way interaction including attribute dimension, $F(1, 67) = .73, p = .40$. Thus, these results indicated that the affective/cognitive persuasion matching effect occurred even when attribute dimensions of the attitude object mismatched.

The ANCOVA also revealed a two-way interaction between type of persuasion and attribute dimension of persuasion, $F(1, 67) = 11.20, p < .01$. The means associated with this interaction showed 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 the others. 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. One might expect that if the initial attitude had been based on smell rather than taste, the affective-smell would have had particular impact.⁵

Discussion

One goal of Experiment 1 was to provide a more definitive test of the matching and mismatching hypotheses than was available previously. Discrepancy score analyses suggested that the attitude formation manipulation was to some degree successful in regulating the affective and cognitive bases of attitudes. These results are encouraging in that they support the use 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 often primarily affective in nature, whereas processing of written information about attributes of an object are often primarily cognitive in nature. Another interesting implication of these results was the fact that they suggested that it is possible to create attitudes relevant to the dimension of taste that are affective.

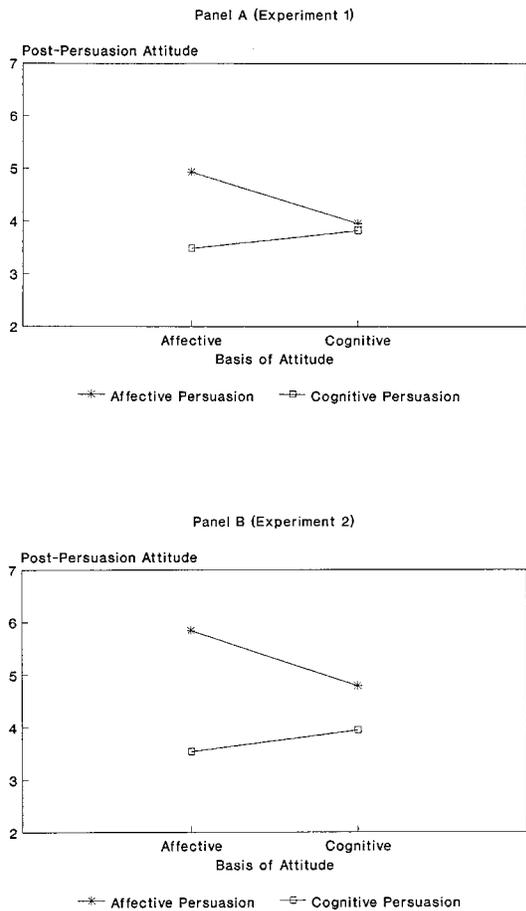


Figure 1 Attitude change as a function of basis of attitude and type of persuasion.

tive or cognitive in nature. The success of the cognitive-taste attitude condition indicates that merely telling participants 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 information was operationalized as information about affective stimuli or reactions rather than as information causing affective reactions. The results of Experiment 1 suggest that the later rather than the former is the more defensible operationalization.

Despite these encouraging results, there are several objections that one might raise concerning our interpretation of the discrepancy score analyses as evidence of the successful manipulation of attitudinal bases. One potential objection might be that the differences observed across conditions were simply due to fluctuations in the reliability of the scales across conditions. However, when

we examined the reliability of the scales across conditions, we found the fluctuations in reliability to be quite small and the pattern of these reliabilities to be unable to account for the differences in the bases of attitudes that we observed (for details, see Fabrigar, 1995). Another potential objection is that differences in bases of attitudes across formation conditions might have been due to differences in the affective and cognitive scales' variances. Once again, an examination of the scales' variances across conditions did not support this objection (see Fabrigar, 1995).

The second important finding in this experiment was that the attitude change 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 successful against affective attitudes than cognitive attitudes. Likewise, there was a nonsignificant tendency for cognitive persuasion to work better when matched against cognitive attitudes compared to when matched against affective 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 is more definitive than that obtained in previous research. This experiment is the first demonstration of affective/cognitive matching in which direct evidence was available to suggest that the affective and cognitive bases of attitudes had been successfully manipulated. Equally important, this experiment demonstrated that even after holding attribute dimensions of the attitude object constant across affect and cognition, the affective/cognitive matching effect occurred. 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 introductory paragraphs of this article, 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 any other dimensions of attitudes.⁶

EXPERIMENT 2

Although Experiment 1 provided more convincing evidence of affective/cognitive matching than was previously available, the manipulations we used confounded the affect/cognition distinction with direct and indirect experience. Specifically, the affect operationalizations 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). As

noted previously, Messé et al. (1995) have argued that this distinction could account for much of the past research exploring the role of the affective and cognitive bases of attitudes in susceptibility to persuasion. Messé et al. might argue that the persuasion matching effect observed in Experiment 1 was not due to affective/cognitive matching but to direct/indirect experience matching.

The purpose of Experiment 2 was to rule out this alternative explanation. The experiment was designed to test the affective/cognitive matching hypothesis in an experimental context in which direct/indirect experience with the attitude object was held constant across manipulations of affective and cognitive attitude bases. A second goal of the experiment was to test the affective/cognitive matching effect using materials substantially different from the previous study and thereby demonstrate the robustness of the affective/cognitive matching effect across different methodologies.

Method

Participants and procedure. Participants were 76 undergraduate students enrolled in an introductory marketing course. The students participated to obtain extra credit in their course. All participants 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 participant was excluded from analysis.

The design was a 2 (basis of attitude: affect vs. cognition) \times 2 (type of persuasion: affect vs. cognition) factorial. Students participated in groups ranging in size from 1 to 10. Participants either read an emotionally evocative passage about an unfamiliar animal or read an informational passage that was designed to produce favorable attitudes toward the animal. They were then exposed to an emotionally evocative passage or an informational passage that was designed to produce an unfavorable attitude. This procedure, adapted from Crites et al. (1994), allowed the affective/cognitive matching hypothesis to be examined with a completely new set of materials that controlled for direct/indirect experience with the attitude object.

Basis of attitude manipulation. In the attitude formation phase, half of the participants were randomly assigned to read a passage designed to evoke positive emotions about a fictitious animal called a *lemphur* (affective attitude). This passage did not merely describe emotions as in some past research but was intended to actually produce emotions in the participants. Before reading the passage, participants were told that they would be reading a selection about a possibly unfamiliar animal and that the researchers were interested in getting a sense of participants' feelings toward the animal. Participants were asked to complete a series of questions about their

feelings toward lemphurs. They were instructed that if they were unfamiliar with the animal, they should answer the questions based on their expectations about lemphurs. Participants then answered the 16-item affect scale used in the previous experiment. As in Experiment 1, the purpose of having participants complete this scale prior to reading the emotional passage was to prime the affective dimension of judgment and thus increase the likelihood that the passage would create an attitude based on affect. On completion of the affect scale, participants 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. 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 was designed to produce positive feelings in the reader that would become associated with the attitude object (see Crites et al., 1994).

The other half of the participants were randomly assigned to read a passage containing positive information about the same fictitious animal (cognitive attitude). Following similar introductory information and instructions as in the affective attitude condition, participants completed the 14-item cognition scale used in Experiment 1. On completion of the cognition scale, participants 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 encyclopaedia of marine life. 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. This passage was a slightly modified version of a selection used by Crites et al. (1994) to create cognitively based attitudes.

Type of persuasion manipulation. In the persuasion phase, half of the participants were randomly assigned to complete a booklet containing a passage designed to elicit negative emotions (affective persuasion). This passage provided relatively little information about the lemphur but did present a graphic description of the lemphur hunting, brutally killing, and then eating a swimmer. The other half of the participants in the persuasion phase were randomly assigned to complete a booklet containing a negative informational passage about lemphurs (cognitive persuasion). This passage was presented as excerpts from an encyclopaedia of marine life. 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. In addition, lemphurs were described as a source of food high in cholesterol. As with the attitude formation materials, both passages were slightly modified versions of passages that Crites et al. (1994) had found to be affective (in the case of the emotionally evocative passage) or cognitive (in the case of the informational passage) in nature.

Measures. Experiment 2 used the same measures and coding procedures as Experiment 1 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. Following the attitude formation phase, all participants completed the attitude scale first. Participants then completed the affect and cognition scales in one of two counterbalanced orders. Cronbach's alpha coefficients for the attitude, affect, and cognition scales were .89, .87, and .83, respectively. Participants 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 participant 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. Participants then completed the same set of filler questions used in the formation phase.

Results

Analyses of affective/cognitive bases of attitudes. An examination of prepersuasion attitudes revealed a tendency for attitudes in the cognitive condition ($M = 6.10$) to be slightly more positive than attitudes in the affective condition ($M = 5.71$), $t(1, 74) = 2.11, p = .04$. As in the previous experiments, the analysis to assess the effectiveness of the attitude formation manipulation was an analysis of discrepancy scores.

The discrepancy scores, presented in Table 2, show that the attitude formation condition was successful in creating affective or cognitive attitudes. When these means were tested in a 2 (type of discrepancy score: affect-attitude vs. cognition-attitude) \times 2 (attitude formation condition: affective vs. cognition) mixed-design ANOVA, the predicted crossover interaction between type of discrepancy scores and attitude formation condition was significant, $F(1, 71) = 50.31, p < .01$. Within the affective attitude condition, the mean affect-attitude discrepancy score was smaller than the cognition-attitude discrepancy score, $F(1, 71) = 41.00, p < .01$. Also, within the cognitive attitude condition, the mean cognition-attitude discrepancy score was smaller than the affect-attitude discrepancy score, $F(1, 71) = 12.75, p < .01$. The mixed-design ANOVA also indicated a significant type of discrepancy score main effect such that

TABLE 2: Experiment 2: Discrepancy Scores by Attitude Formation Condition

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

affect-attitude discrepancy scores were smaller than cognition-attitude discrepancy scores, $F(1, 71) = 3.86, p = .05$. Taken together, these results provided strong evidence that the manipulation was effective in creating affective or cognitive attitudes.⁷

Attitude change results. As in the prior experiment, to test the affective/cognitive matching hypothesis, participants' postpersuasion attitudes were analyzed using a 2 (basis of attitude: affect vs. cognition) \times 2 (type of persuasion: affect vs. cognition) ANCOVA with prepersuasion attitudes as a covariate. First, as was found in Experiments 1, a significant main effect of type of persuasion was obtained, $F(1, 70) = 33.57, p < .01$. 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 potent ($M = 5.32$) than cognitive persuasion ($M = 3.73$).

More important, the critical two-way interaction between basis of attitude and type of persuasion was significant, $F(1, 70) = 7.15, p = .01$. An examination of the means in Panel B of Figure 1 demonstrate that the significant interaction provided evidence for a relative affective/cognitive matching effect. Consistent with a matching effect, a contrast indicated a significant relative increase in effectiveness of affective persuasion when targeted against affective attitudes ($M = 5.84$) compared to when targeted against cognitive attitudes ($M = 4.79$), $F(1, 70) = 7.55, p = .01$. Similarly, cognitive persuasion showed a nonsignificant tendency to have relatively greater impact when targeted against a cognitive attitude ($M = 3.94$) compared to when targeted against an affective attitude ($M = 3.53$), $F(1, 70) = 1.15, p = .29$.⁸

Discussion

Analyses of discrepancy scores provided strong support for the conclusion that the affective/cognitive bases of attitudes can be manipulated even when controlling for direct/indirect experience. Importantly, unlike much of the past research using written materials that were assumed to be affective in nature, the present passages did not simply discuss affective responses but were instead designed to actually elicit such responses. The results of the discrepancy score analyses suggested that the passages were successful in accomplishing this objective. In addition, results from Experiment 2 generally sup-

ported the affective/cognitive matching hypothesis. That is, the affect/cognition distinction produced the persuasion matching effect even when direct/indirect experience was held constant. This finding suggests that the results of Experiment 1 are 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 can be obtained for diverse attitude objects ranging from beverages to unfamiliar animals.

GENERAL DISCUSSION

Summary of Findings

Our two experiments demonstrated several basic findings. In Experiment 1, the affective/cognitive matching and mismatching hypotheses were assessed using a methodology that attempted to overcome some of the potential problems of previous tests. This experiment revealed that the new methodology was successful in influencing the affective and cognitive bases of attitudes. The results of Experiment 1 also provided evidence of a relative affective/cognitive persuasion matching effect. Furthermore, the results indicated that affective/cognitive matching enhanced persuasion regardless of whether the persuasive message matched or mismatched the attribute dimension on which the attitude was based. Thus, Experiment 1 showed that the affective/cognitive matching effect was sufficiently strong to overcome mismatches of attribute dimensions of the attitude object.

Experiment 2 explored whether the persuasion matching effect observed in Experiment 1 could be attributed to a matching of direct/indirect experience with the attitude object rather than affect/cognition. This was done by using manipulations of the affective and cognitive nature of attitudes and persuasion that used only written information that provided attribute information or that evoked emotions. The results of this experiment revealed that the attitude formation manipulation using only written materials was successful in creating affective and cognitive attitudes. Experiment 2 also demonstrated evidence of a relative affective/cognitive persuasion matching effect, thereby demonstrating that such effects occurred even after controlling for the direct/indirect experience distinction.

Taken together, the present experiments provide a relatively consistent pattern of results. Despite the use of different experimental materials and procedures, both experiments showed evidence that the affective and cognitive bases of attitudes were successfully manipulated. Both experiments also showed evidence of a relative matching effect. Each experiment demonstrated a sig-

nificant tendency for affective persuasion to work better against affective attitudes than cognitive attitudes. Not surprisingly, when this effect is examined across experiments, it is clear that it cannot be attributed to chance, $Z = 3.68$, $p < .01$. The tendency for cognitive persuasion to be more successful against cognitive attitudes than affective attitudes was also present in both experiments. However, when this effect is tested across experiments, it does not reach statistical significance, $Z = 1.39$, $p = .16$. Thus, the experiments provided support for relative matching: Affective persuasion was more effective in changing affectively based than cognitively based attitudes, but there was no definitive evidence that cognitive persuasion was more effective in changing cognitively based than affectively based attitudes.⁹

Implications of Findings and Directions for Future Research

Empirical status of affective/cognitive matching. As we noted previously, recent empirical data advanced as evidence of affective/cognitive persuasion matching have methodological features that make clear interpretation of these data difficult (Edwards, 1990; Edwards & von Hippel, 1995). Furthermore, the fact that some studies have been advanced as proof of affective/cognitive mismatching effects (Millar & Millar, 1990) or as evidence that the matching effect is not due to affect/cognition at all (Messé et al., 1995) has also undermined confidence in evidence presumed to demonstrate affective/cognitive matching. Thus, despite its intuitive plausibility, the status of the affective/cognitive persuasion matching effect has remained very much in doubt.

In light of past evidence, the two studies reported here provide the most convincing evidence to date in support of the affective/cognitive persuasion matching hypothesis. These experiments 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. By demonstrating this effect, these experiments provide an illustration of the conceptual use of distinguishing between affective and cognitive bases of attitudes and persuasion.¹⁰

Why affective/cognitive matching works. Although the present studies provide evidence for affective/cognitive matching effects, there are a number of ways to account for why these effects were obtained. As explained previously, Edwards (1990) has speculated that affective attitudes have a unidimensional structure organized along a simple evaluative dimension. In contrast, cognitive attitudes have a more multifaceted structure based on discrete attributes. Edwards suggested that affective attitudes might be relatively impervious to cognitive persuasion because specific attributes can be readily as-

simulated into the existing evaluative structure or entirely discounted. An affective persuasive appeal, however, directly challenges the global evaluation. In contrast, she argued that cognitive attitudes are less susceptible to affective persuasion because such a unidimensional persuasive appeal only targets one of several dimensions on which the attitude is based. Similarly, cognitive persuasive appeals will only be successful to the extent that they directly target the distinct cognitive dimensions on which the attitude is based. One potential implication of this explanation is that direct matching is only necessary for cognition, which by its nature is likely to be multidimensional. It is conceivable that as Edwards (1990) has speculated, affect—although, in principal, multidimensional—might be represented in a more simple unidimensional positive-negative fashion. Thus, any affective persuasion would in theory directly match an affective attitude.

Although this structural explanation is plausible, a potential stumbling block for it is the fact that Experiment 1 did not find clear evidence of attribute matching effects. Based on the structural explanation, one might expect that specific matching of cognitive attributes (e.g., cognition-taste with cognition-taste) would be more effective than mismatching cognitive attributes (e.g., cognition-taste with cognition-smell). However, no evidence of such an advantage was observed. One possible reason for the lack of attribute matching effects might be that attitude bases are typically represented in memory at a more general level than are specific attributes. For example, the affective basis of an attitude might involve the specific emotions associated with the object without reference to the attribute dimensions that initially produced the emotions. Thus, the basis of an affective attitude resulting from smell versus taste would be the same as long as both smell and taste created the same specific emotions (e.g., happiness, disgust). Similarly, the basis of a cognitive attitude would be the same as long as the specific attributes were both relevant to the same general cognitive dimension (e.g., use of the object, value-expressive implications of the object). This explanation suggests that structural matching and consistency among bases occur at a more general level than specific attributes, and thus, one would not necessarily expect specific attribute matching effects.

Moderators of affective/cognitive matching. The structural view of affective/cognitive matching suggests that matching effects should be most likely when it is possible to directly overwhelm the basis of the attitude. If so, success in obtaining a matching effect should be dependent on two things: the strength of the preexisting basis of one's attitude and the strength of the persuasive appeal. When the underlying basis of the attitude is extremely strong (whether affective or cognitive), it is likely to be

difficult to completely overwhelm it with any single 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. In addition, such mismatched persuasion might be hard to counterargue because of its novelty. Consistent with this view, both Edwards (1990) and Millar and Millar (Millar, 1992; Millar & Millar, 1990) have speculated that the strength of the attitude might determine when matching versus mismatching leads to enhanced persuasion.

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 preexisting 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 preexisting basis to serve as a resource and motivation for resisting the message. Petty, Gleicher, and Baker (1991) used just such a rationale when they speculated that argument strength might be a moderator of affective/cognitive matching and mismatching. These proposed moderators of matching and mismatching seem consistent with the data presented here. 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.

Future research exploring the role of these and other moderators of affective/cognitive matching and mismatching 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 these effects.

Second, by examining moderators, the inconsistency in past literature might be resolved—assuming that the results from past literature actually stemmed from affective/cognitive matching or mismatching rather than being spurious. First, it is important to note that given that the current studies provide reasonably compelling evidence that affective/cognitive matching can occur, our data argue against the possibility that mismatching is the only true effect because past studies obtaining matching were spurious. In addition, these experiments rule out

the idea that both hypotheses are wrong and that affective/cognitive matching does not occur but only direct/indirect experience effects can be obtained. A third possibility, however, is that matching effects occur and that mismatching effects have been due to methodological artifact. The methodological ambiguities of past mismatching evidence and the strong evidence for matching effects in the current experiments suggest that this possibility remains viable. In our view, however, the most likely possibility is that both matching and mismatching effects occur, but these effects occur under different conditions. Explorations of moderators would provide the evidence necessary to determine which resolution is correct.

Why are matching effects relative rather than absolute? Another interesting question raised by our data is why the matching effects we observed were relative rather than absolute. Although the bases of attitudes moderated the effectiveness of the two types of persuasion, there was a consistent tendency for affective persuasion to be more powerful overall than cognitive persuasion. One obvious explanation for this finding is that our affective persuasive appeals were simply more extreme or powerful operationalizations than our cognitive persuasive appeals. Thus, the main effect of type of persuasion might not have represented a basic process of any sort but instead was idiosyncratic to our particular operationalizations. If so, one would expect that affective and cognitive persuasive appeals of comparable strength should produce an absolute matching effect (i.e., a crossover interaction). Another possibility is that this main effect was attitude-object specific. That is, it may be that beverages and animals are attitude objects that people more typically evaluate based on affect. If this is true, than using other attitude objects might produce either absolute matching effects or relative matching effects with cognitive persuasion being more powerful.

However, there is reason to doubt both of these explanations. If the main effect was due to the fact that affect is more fundamental for beverages and animals specifically, 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 prepersuasion attitudes were not significantly different from one another for the beverages and were in the opposite direction for the animal. Thus, affect does not appear to be an intrinsically more powerful dimension for modifying attitudes for these two attitude objects. Similarly, the explanation that the two persuasive messages differed in their strength does not withstand empirical scrutiny. In an experiment not reported in this article, we obtained relative matching effect results in which affective persuasion produced more attitude change than cognitive persuasion despite the fact

that pretesting indicated the appeals were of comparable strength (see Experiment 2 of Fabrigar, 1995).

Although the methodological explanations do not seem particularly plausible, there are theoretical reasons for expecting relative rather than absolute matching effects. As discussed earlier, one possible reason for relative effects is that affective attitudes and cognitive attitudes differ in the complexity of their structure (see Edwards, 1990; Edwards & von Hippel, 1995). These differences in complexity lead affective attitudes to be much more susceptible to affective than cognitive persuasion (because affective persuasion directly targets the unidimensional evaluative structure of affective attitudes) but do not necessarily result in cognitive attitudes being more susceptible to cognitive than affective persuasion (because neither type of persuasion will usually target all of the multiple dimensions of cognitive attitudes).

A second possibility might have to do with the nature of evaluative processes. Some theorists have suggested that all evaluative responses are on some level affective (e.g., Katz & Stotland, 1959; Zajonc, 1980; Zajonc & Markus, 1982). When viewed from this perspective, affective attitudes can be conceptualized as affectively laden evaluations that arise in the absence of cognition or with little cognition present. In contrast, cognitive attitudes are affectively laden evaluations that arise from specific cognitions about the attitude object. Thus, because all attitudes are affective on a fundamental level but not necessarily cognitive, one might expect that affective persuasion will tend to be more powerful than cognitive persuasion overall. Consistent with this thinking, some theorists have speculated that affective attitudes should be more vulnerable to affective than cognitive persuasion but that cognitive attitudes will not necessarily be more susceptible to cognitive than affective persuasion (Katz & Stotland, 1959; Zajonc & Markus, 1982). Nevertheless, exploring why relative matching effects occur and if there are conditions under which absolute effects occur would be a useful direction for future research.

NOTES

1. Although both matching and mismatching effects require the existence of an interaction between basis of attitude and type of persuasion, evidence in support of either matching or mismatching effects can take one of two forms: absolute (mis)matching and relative (mis)matching. An absolute matching effect occurs when affective persuasive appeals are more effective than cognitive persuasive appeals in changing affective attitudes, and cognitive persuasive appeals are more effective than affective persuasive appeals in changing cognitive attitudes (i.e., a crossover interaction pattern is obtained). An absolute mismatching effect occurs when exactly the opposite pattern of results is obtained. A relative matching effect refers to one of several situations. In some cases, a relative matching effect might demonstrate that an affective appeal is more potent against affective attitudes than cognitive attitudes, whereas the cognitive persuasive appeal is more effective against cognitive attitudes than affective attitudes. However, in ab-

solute terms, there is no reversal in overall effectiveness of the two types of persuasive appeals across the two types of attitudes. It also possible to obtain a relative matching effect if one of the types of persuasion (e.g., affective) is more potent when targeted against a matched (e.g., affective) attitude compared to a mismatched (e.g., cognitive) attitude, but the other type of persuasion shows no difference in effectiveness across attitudes of different bases. A relative mismatching effect occurs when the opposite of any of these patterns occurs, and there is no reversal in overall effectiveness of the types of persuasion across the two types of attitudes. As reviewed in the text, relative (mis)matching effects are far more common than absolute effects in the affect/cognition persuasion literature. One possible explanation for the frequency of relative rather than absolute effects is that many of these experiments used affective and cognitive persuasive appeals that were not of exactly comparable strength. Also, as explained in the text, there are theoretical reasons for why relative rather than absolute effects might be obtained (e.g., Edwards, 1990, Edwards & von Hippel, 1995).

2. Another attempt to explore potential moderators of affective/cognitive matching and mismatching effects was reported by Millar and Millar (1993). They examined the role of an individual difference variable, repression-sensitization. However, this study does not provide a resolution of past literature because there is no basis to expect that studies finding matching effects and studies finding mismatching effects differed in the extent to which their participants were repressors or sensitizers. Additionally, this study suffers from many of the same methodological limitations as other studies in this area.

3. Because cognitive responses were not a major focus of this research and were included only for exploratory purposes, we do not report analyses of this dependent variable in the two experiments. Likewise, need for cognition was also included for exploratory purposes. Analyses including need for cognition as a third independent variable revealed no consistent effects across the two experiments. More details concerning analyses of cognitive responses and need for cognition can be found in Fabrigar (1995).

4. Several supplementary analyses were conducted to further test the success of the attitude formation manipulation. First, to examine if the order in which the affect and cognition scales were presented influenced the success of the manipulation of attitudinal bases, order of scales was included as third independent variable in a mixed-design ANOVA. This analysis revealed that the critical two-way interaction between type of discrepancy score and attitude formation condition remained significant, $F(1, 72) = 9.02, p < .01$. In addition, this two-way interaction was not qualified by the three-way interaction among the independent variables, $F(1, 72) = 1.79, p = .19$. Second, although discrepancy score procedures have been used in many previous studies exploring the affective and cognitive bases of attitudes, some studies have assessed the impact of attitude bases by using multiple regression analyses. Thus, we conducted separate multiple regression analyses within each of the two attitude formation conditions. In these analyses, scores on the affect and cognition scales were used to predict scores on the attitude scale. These analyses revealed that the unstandardized regression coefficient for the affect scale was a significantly larger in the affective attitude condition ($b = .96, p < .01$) than the cognitive attitude condition ($b = .24, p = .07$), $Z = 2.77, p < .01$. However, the unstandardized regression coefficient for the cognitive scale did not differ between the affective attitude condition ($b = .62, p = .01$) and the cognitive attitude condition ($b = .57, p < .01$), $Z = .19, p = .85$. Thus, as with the discrepancy analyses, the regression analyses revealed that the manipulation produced relative rather than absolute differences in attitude bases.

5. An analysis of attitude change using difference scores between pre- and postpersuasion attitudes revealed a similar pattern of means. The interaction between basis of attitude and basis of persuasion in this analysis was significant, $F(1, 68) = 7.15, p = .01$. An analysis of postpersuasion attitudes without including prepersuasion attitudes as a covariate also produced a similar pattern of means, but the interaction between basis of attitude and basis of persuasion was somewhat weaker, $F(1, 68) = 2.34, p = .13$. In addition, we also conducted these analyses and the ANCOVA analysis including order of scale presentation as an independent variable. These analyses revealed no evidence that scale order influenced the attitude change results.

6. Another objection that might be raised concerning Experiment 1 is that the attribute dimensions used in this experiment (i.e., taste and smell) are closely related and thus might not constitute the strongest test of whether attribute matching moderates affective/cognitive matching effects. Although these attributes are undoubtedly seen as related, they do constitute distinct dimensions. It is possible to generate a number of real-world attitude objects in which perceptions of taste and smell are distinct. For instance, most people would rate many household cleaning products as pleasant smelling but would not expect them to be pleasant tasting. Even in the domain of food and beverages, examples can be found. Some people find the taste of fish to be more pleasant than the smell, and some people perceive the smell of coffee to be more pleasant than its taste. Nonetheless, taste and smell are related dimensions, and future research examining clearly unrelated attribute dimensions would be useful. However, regardless of whether one accepts the distinction between taste and smell, Experiment 2 still constitutes an important advance over previous work in that the taste dimension of the beverage was held constant across the affective and cognitive attitude conditions. This rules out the possibility of attribute matching as an explanation for the observed affective/cognitive matching effect.

7. To examine if the order in which the affect and cognition scales were presented influenced the success of the manipulation of attitudinal bases, order of scales was included as the third independent variable in a mixed-design ANOVA. This analysis revealed that the critical two-way interaction between type of discrepancy score and attitude formation condition remained significant, $F(1, 69) = 48.15, p < .01$. The analysis also revealed that this two-way interaction was not qualified by the three-way interaction among the independent variables, $F(1, 69) = 1.14, p = .29$. We also conducted multiple regression analyses similar to those in Experiment 1. These analyses revealed that the unstandardized regression coefficient for the affect scale was significantly larger in the affective attitude condition ($b = .92, p < .01$) than the cognitive attitude condition ($b = .04, p = .80$), $Z = 4.46, p < .01$. In contrast, the unstandardized regression coefficient for the cognitive scale was significantly larger in the cognitive attitude condition ($b = .76, p < .01$) than the affective attitude condition ($b = .02, p = .89$), $Z = -3.00, p < .01$. Thus, as with the discrepancy analyses, the regression analyses revealed that the manipulation was successful in creating attitudes that were largely affective or cognitive.

8. An alternative analysis of attitude change using difference scores between pre- and postpersuasion of attitudes revealed a similar pattern of means. The interaction between basis of attitude and basis of persuasion in this analysis was marginally significant, $F(1, 71) = 3.53, p = .07$. Similarly, an analysis of postpersuasion attitudes without including prepersuasion attitudes as a covariate produced a significant interaction between basis of attitude and basis of persuasion, $F(1, 71) = 7.65, p = .01$. Finally, when scale order was included as an independent variable in these analyses and the ANCOVA, no evidence was obtained that scale order influenced attitude change.

9. Although the difference in the effectiveness of cognitive persuasion across affective and cognitive attitudes was not significant, we suspect that the tendency observed in these experiments was not due to mere sampling error. In an experiment deleted from the current article during the review process (see Fabrigar, 1995, Experiment 2), we observed the same tendency for affective persuasion to work better when it matched the basis of the attitude and cognitive persuasion to work better when it matched the basis of the attitude. If the results of this experiment are combined with those of the two experiments reported in this article, the effect for affective persuasion remains significant ($Z = 3.88, p < .01$), and the effect for cognitive persuasion becomes significant ($Z = 2.65, p = .01$).

10. In future research, it would be desirable to obtain additional evidence for the matching hypothesis by conducting mediational tests examining the extent to which changes in the underlying affective and cognitive bases of attitudes mediated attitude changes in the various conditions. Unfortunately, these analyses were impractical in the current experiments. One practical problem is that such analyses require path analyses within each experimental condition. This would result in analyses based on very small sample sizes ($N = 15$ to 19). Obtaining significant effects and precise parameter estimates from such small sample sizes is quite difficult. More problematic is the tendency for consis-

tency to develop among affect, cognition, and attitude (e.g., Breckler, 1984; Insko & Schopler, 1967; Kothandapani, 1971; Ostrom, 1969). That is, pressure toward consistency can result in changes in one basis leading to changes in another basis (e.g., Rosenberg, 1960). Such consistency effects could make it difficult to disentangle the role of changes in the bases of attitudes in affective/cognitive matching effects. For example, although cognitive matching might produce changes in attitudes due to changes in cognition initially, inconsistent cognition might produce unpleasant affective reactions due to the discomfort of inconsistency (e.g., Festinger, 1957) or disconfirmed positive expectancies. Thus, it seems likely that even in cases of relatively pure matching, it could be difficult to find distinct mediational patterns across experimental conditions. Consistent with this, when we examined mediational patterns across conditions, we found no clear patterns of effects, although this could be attributed to small sample sizes (for details, see Fabrigar, 1995).

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