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The Interplay of Affect and Cognition in Attitude Formation and Change

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Two experiments examined the hypothesis that the sequence of affect and cognition in an attitude's formation is an important determinant of its subsequent resistance to affective and cognitive means of persuasion. Affect-based and cognition-based attitudes were induced and subsequently challenged by either affective or cognitive means of persuasion. The procedure used to create the 2 types of attitudes and the means of persuasion involved varying the sequence of affect and cognition while holding the content of communications constant. As predicted, affect-based attitudes exhibited more change under affective means of persuasion than under cognitive means of persuasion. Cognition-based attitudes, on the other hand, exhibited equal change under both forms of persuasion. The interaction between attitude type and means of persuasion emerged both when affect was manipulated subliminally (Experiment 1) and when affect was manipulated supraliminally (Experiment 2). Moreover, in the 2nd experiment, affect-based attitudes were expressed with greater confidence than their cognition-based counterparts. Together, these findings underscore the theoretical as well as practical importance of distinguishing between affect- and cognition-based attitudes and, more generally, the need for influence attempts to make contact with an attitude's origin.

Whether in the form of education or propaganda, whether the desired end is virtuous or evil, persuasion plays a central role in social behavior. Parents and teachers use persuasion to instill appropriate attitudes in young people and to modify attitudes they consider inappropriate. Members of social groups rely on persuasion to gain representation and recognition. Spiritual, intellectual, business, and social leaders assert their strength and maintain a following in large part through persuasive efforts. And participants in a democracy are keenly aware of the important role persuasion and oratory play in the decision making of legislators. Yet two questions remain equivocal: What constitutes the best method of persuasion? And why do some persuasive attempts fail on one occasion and succeed on another?

The Platonic ideal of persuasion emphasizes the exercise of reason and places a premium on skills of oration. This theme underlies a substantial body of empirical work on attitude change, much of which has its origins in the Yale Communication Research Program (Hovland, 1949; Hovland, Janis, & Kelley, 1953). According to this perspective, acceptance of a persuasive message is dependent on the existence of incentives, and a critical incentive "is provided by arguments or reasons which . . . constitute 'rational' or 'logical' support for the conclusions" (Hovland et al., 1953, p. 11). Information-processing models of attitude change, which grew out of this tradition, are based on the premise that effective persuasion is conditional on attention to and comprehension of cogent argumentation (McGuire, 1969). An emphasis on reason and the evaluation of arguments can also be seen in Wyer's (1970, 1974) subjective probability model, according to which persuasion involves assigning subjective probabilities to the premises of arguments and computing their subjective relevance to the conclusion. Cognitive response theorists share this emphasis on cognition but have recast it into a focus on the mediational role played by counterargumentation and by the generation of inferences in anticipation of or in response to a persuasive communication (Brock, 1967; Calder, Insko, & Yandell, 1974; Greenwald, 1968). Research in this tradition has demonstrated that rational communications are more effective for well-educated or analytical people than for less educated or unanalytical people (Cacioppo, Petty, & Morris, 1983; Hovland et al., 1953) and that reasoned arguments are more influential for highly involved audiences than for less involved audiences (Petty & Cacioppo, 1981).

Other theoretical perspectives emphasize the importance of emotional factors in persuasion. There is considerable empirical support for the idea that emotions in the form of fear arousal (Leventhal, 1970; Maddux & Rogers, 1980), empathy (Shelton & Rogers, 1981), or a positive mood (Janis, Kaye, & Kirschner, 1965) can enhance attitude change under certain conditions. According to the elaboration likelihood model (Petty & Cacioppo, 1981), affective cues are particularly potent determinants of attitude change when the ability or motivation to process issue-relevant information is low. Other investigators have found that emotional arguments are more effective when they come from attractive people, a finding that emerges whether attractiveness is operationalized as liking, similarity, or familiarity (Chaiken, 1979; Pallak, Murroni, & Koch, 1983; Snyder & Rothbart, 1971). Findings such as these are in accord

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with common intuitions that communicators—such as parents, charismatic leaders, and peers—who evoke or are associated with good feelings tend to be influential. Advertisers rely to a great extent on promotional appeals in which a product is associated with a favorable image (e.g., wealth, prestige, or beauty) and on communicators who elicit positive emotions from consumers. Similarly, political campaigns increasingly make use of emotion-eliciting appeals, as exemplified by Bush's "hot button issues" in the 1988 presidential contest.

With few exceptions (see, for example, Chaiken, 1983), empirical inquiries into the role of emotion and reason in persuasion have been pursued largely in isolation from one another and without concern for the context in which an attitude was formed. The point of departure for the present research is the hypothesis that the effectiveness of reason and emotion in persuasion depends on the nature of an attitude's origin. Theoretical precedent for the existence of a link between an attitude's origin and its susceptibility to different forms of influence can be found in the functional approach to the study of attitudes (Katz, 1960; Sarnoff & Katz, 1954; Smith, Bruner, & White, 1956). According to this framework, the reasons for forming and modifying attitudes vary according to the psychological functions these attitudes serve for the individual. Thus, whether attitudes are formed in service of ego defensiveness, self-expression, reality testing, or the pursuit of reward and avoidance of punishment will have implications for which influence procedures will be most effective in bringing about attitude change. For ego-defensive attitudes, for example, many common tactics of attitude change (such as the presentation of additional attitude-relevant information or the promise of reward or punishment) are likely to fail, whereas procedures that involve the removal of threat, increased self-insight, or catharsis may be more successful (Katz, 1960). Empirical support for the value of a functional approach to attitude change has been provided by Snyder and DeBono (1985), who have found that high and low self-monitors respond differently to image- and quality-oriented advertisements.

Related to the idea that a particular attitude may arise in response to a variety of motivational pressures is the notion that affect and cognition may be implicated to varying degrees in an attitude's formation. As Zajonc and Markus (1982) state:

> The antecedents of preferences may involve cognitive and affective components in a variety of combinations. In some cases the cognitive component may be dominant, in some the cognitive and affective factors may interact with each other, and in other cases the affective factors may be dominant and primary. (p. 124)

The relative contribution of affect and cognition to an attitude's formation may be associated with particular motivational pressures. For instance, the cognitive component may be dominant for attitudes acquired in service of reality testing or of a need to explain the external world. On the other hand, affective factors may predominate for attitudes arising in response to need gratification or deprivation, threats to the self-image, or unconscious motives.

As a functional analysis makes clear, attitudes are formed not only through reason, but also through needs, wishes, feelings, and other emotional factors. In view of the diversity of attitudes' origins, the range of psychological needs they may fulfill, and the varying composition of affective and cognitive processes that shape the process of attitude acquisition, the process of changing an attitude presents a formidable challenge. A critical assumption of the present research is that the notions of function, origin, and change of attitudes are intertwined: Knowledge about the function an attitude serves for an individual gives some suggestion about its affective or cognitive foundations; this knowledge, in turn, may be instructive about how to develop means to change the attitude. In short, the likely success of reason- versus emotion-based persuasive attempts depends on whether the origin of an attitude is affective or cognitive.

Affect-Based and Cognition-Based Attitudes

The distinction between the affective and cognitive components of attitudes has a long history in theoretical treatments of attitude structure and change (Insko & Schopler, 1967; Krech & Crutchfield, 1948; Rosenberg & Hovland, 1960) and has been empirically validated with a variety of techniques (Breckler & Wiggins, 1989; Kothandapani, 1971; Ostrom, 1969; Woodmansee & Cook, 1967). Traditionally, the affective component of attitudes has included emotions, feelings, or drives associated with an attitude object, whereas the cognitive component has included beliefs, judgments, or thoughts associated with an attitude object (McGuire, 1969).

An implication of many theoretical treatments is that the affective component of attitudes is postcognitive. For example, according to Ajzen and Fishbein's (1975) influential model, affect is derived from attribute beliefs that are evaluated in an expectancy–value manner. However, Zajonc (1980) has made a strong case for the primacy of affect in the formation of certain preferences. What implications does Zajonc's view that affect can precede, and at times function autonomously from, cognition have for some of the classic questions posed in attitude theory? One possibility is that attitudes with affective origins may be relatively impervious to influence attempts that rely on rational argumentation and might be more responsive to persuasive appeals that tap their affective bases (Zajonc, 1980). It is this suggestion, and more generally an interest in the unique case of affect-based attitudes, that prompts the present research.

This research focuses on two broad classes of attitudes—affect-based and cognition-based—that can be distinguished as a function of the primacy or dominance of affect during attitude acquisition.[1] For affect-based attitudes, affective reactions exert

[1] There are a variety of possible typologies for distinguishing among the foundations of attitudes. The degree to which one or another is more useful, it seems, has more to do with the research question than with the validity of the classificatory scheme in some absolute sense. The distinction between affective and cognitive bases of attitudes in this research grew out of an interest in applying Zajonc's (1980) hypotheses about affective primacy to the domain of attitude theory. As such, this classification does not preclude the existence of other bases of attitude formation (e.g., behavior) and should be seen as complementary to other classifications. For instance, the classification of affect-based and cognition-based attitudes is not intended to replace or subsume that of functional theories, which categorize the bases of attitudes into 4–6 groups. Rather, the link between an attitude's affective

a primary and powerful influence on the individual, and the attitude is initially acquired with minimal cognitive appraisal. Relevant information that is acquired subsequent to these affective reactions may serve to confirm or bolster the initial attitude. The cognitive structuring that takes place is likely to be in service of the affect and does not constitute the basis of the attitude (see Wilson, Dunn, Bybee, Hyman, & Rotondo, 1984; Zanna & Rempel, 1988). For cognition-based attitudes, domain-relevant information is acquired first, and affective factors come into play only after, and as a result of, considerable cognitive appraisal. Although affective processes often occur in cognition-based attitudes, their role in shaping attitude development is minimal.

Illustrations of prototypical affect-based and cognition-based attitudes may help clarify the distinction between the two. Phobias provide a good example of affect-based attitudes. These fear reactions may be experienced toward an object that an individual has never encountered. Although phobic individuals are often able to recognize the irrational nature of their fears, their emotional reactions are not amenable to rational control. Neither assurances that the snakes one is likely to encounter are not of the poisonous variety nor the reasoning that one can differentiate between poisonous and nonpoisonous snakes on the basis of their markings is likely to be successful in modifying the attitude of the snake-phobic individual. The failure of informational or reasoned appeals such as these attests to the difficulty of relieving affect-based fears without addressing the underlying basis of the fear.

Contrast the case of phobias with that of a hypothetical individual interested in purchasing a new car. This person may ask friends for advice, read *Motor Trends* and *Consumer Reports*, and test drive several models. When the information obtained from these sources is considered, and pros and cons associated with each are weighted for their importance, the individual may come to hold the attitude that Model X is the best car on the market (e.g., Anderson, 1971). The aggregation of attitude-relevant information and the appraisal of this information unfolds in a relatively impartial manner. The potential buyer experiences positive and negative affect in reaction to each discrete piece of information, for example, "this car has better aerodynamic lines," "that car has the best maintenance record," or "this car has better gas mileage." The affect associated with Model X comes into being only after the appraisal of information, both positive and negative. This class of attitudes bears some structural similarity to what Fiske and Pavelchak (1986) call piecemeal-based affective responses.

An assumption underlying the distinction between affect-based and cognition-based attitudes is that although two people may appear to hold the same attitude, their attitudes may nonetheless exhibit differential susceptibility to persuasion as well as different properties of expression. As illustrated by the case of phobias, attitudes may be expressed with particularly great conviction when they are affect based. This notion is compatible with the view proposed by Zajonc (1980), who argued that a defining feature of affective judgments is that they are often irrevocable. The strength and tenacity of affective reactions are attributable, he claims, to the fact that affect is phenomenologically valid and that we often doubt virtually everything but our own feelings. This analysis raises the question of whether the strength of attitudinal conviction is associated with the primacy or dominance of affect in the ontogeny of an attitude.

The distinction between affect- and cognition-based attitudes is not a dichotomous one. It is unlikely that we ever form pure affect-based or pure cognition-based attitudes. More often than not, affect and cognition jointly determine the course of attitude acquisition, albeit in varying degrees and sequences. In reality, attitudes may be positioned along a continuum according to the primacy and relative contribution of affect and cognition in their development. The critical issue for the experiments reported in this article is the primacy of affect in attitude formation and change.

Two experiments were conducted to address the following questions: First, are affective and cognitive means of persuasion differentially effective as a function of whether affect is primary in an attitude's formation? In particular, it is predicted that affective means of persuasion will be more successful than cognitive means of persuasion in modifying affect-based attitudes. Second, is the primacy of the affect during attitude acquisition predictive of attitudinal conviction? Specifically, it is predicted that affect-based attitudes will be expressed with greater confidence, or conviction, than their cognition-based counterparts. It is against the backdrop of Zajonc's (1980) formulation that stronger predictions are made for affect-based attitudes than for cognition-based attitudes. The first experiment relied on a subliminal priming procedure to engender affect- and cognition-based attitudes and to create affective and cognitive means of persuasion.[2] The second experiment relied on taste and smell to manipulate affective processes during attitude induction and persuasion, respectively.

Experiment 1

It is difficult to identify empirically whether the origins of an existent attitude are affective or cognitive. Thus, the primary experimental task was to create new attitudes with known origins in the lab. Toward this end, a subliminal affective priming procedure was used to vary the sequence of affective and cognitive processes, while holding content of the communications constant across conditions in the induction and persuasion stages. Two considerations prompted the decision to use this procedure: First, varying the sequence rather than the absolute contribution of affect and cognition makes it possible to circumvent the problem of equating the two processes and, more importantly, has greater ecological validity. Second, in view of the centrality of the theoretical distinction between affect and

versus cognitive foundation, on the one hand, and the psychological function it serves the individual, on the other, is simply offered as a theoretical entry to the problem. Although this article suggests that certain functional bases are likely to be primarily affective and others cognitive, this possibility remains in need of empirical validation.

[2] The term *subliminal* is used here without commitment to a particular psychophysical view. Rather, we mean simply those processes of which the subject is not consciously aware. The parameters used in this experiment for the subliminal exposures and for the delay between primes and targets were those used by Murphy and Zajonc (1988).

cognition to this research, it was necessary to use a relatively pure manipulation of affect; that is, one that is free of cognitive mediation. Subliminally triggered affect effectively meets this criterion. A number of investigators have documented that the interpretation of ambiguous stimuli can be affected by subliminally presented stimuli and that affective processes can be elicited outside of conscious awareness and can exert an influence on subsequent evaluations (Corteen & Wood, 1972; Dixon, 1981; Kunst-Wilson & Zajonc, 1980; Niedenthal & Cantor, 1986; Seamon, Brody, & Kauff, 1983; Smith, Spence, & Klein, 1959). Most relevant for the present purposes, Murphy and Zajonc (1988) have established that affective information conveyed by subliminally presented pictures of angry/happy faces produces consistent and reliable effects on subsequent evaluations of supraliminal stimuli. Thus, the subliminal affective priming procedure adopted in this study provides an empirically validated means of manipulating affect independently of cognition and thereby a means of distinguishing between affective and cognitive contributions to attitude formation and change.

Method

Subjects. Sixty-five female undergraduates at the University of Michigan participated in the experiment in return for credit in an introductory psychology course.

Materials. All subjects were exposed to a series of 10 supraliminal and 10 subliminal slides. Ten Chinese ideographs, presented supraliminally, served as attitude objects. They were selected on the basis of their affective neutrality. A set of 10 photographs of female faces, presented subliminally, functioned as affective primes. The targets in the photographs were the same sex and approximately the same age as the subjects in the study. The photographs consisted of five different faces, each of which had been photographed in both a happy and an angry expression. An earlier study (Murphy & Zajonc, 1987) established the distinctiveness of these facial expressions.

Design. A 2 × 2 factorial design was used with two between-subjects manipulations: affect-based versus cognition-based attitude induction and affective versus cognitive means of persuasion. There were two within-subjects variables: favorable versus unfavorable attitude and before versus after persuasion.

Procedure. Groups of 4–6 subjects were seated at individual desks in a semidarkened room. Each subject received an experimental booklet that contained instructions, passages of information about each ideograph, and the dependent measures. Subjects were informed that they would be viewing slides of Chinese ideographs and making several judgments about them. The experimenter told subjects that the purpose of the study was to understand the degree to which people who are unfamiliar with Chinese calligraphy can appreciate the art form.

Subjects in the affect-based attitude induction conditions were exposed to the following sequence of events on each of the trials: A subliminal affective prime (a photograph of a happy or an angry face) was presented for 10 ms and, after an 8-ms delay, was followed by a supraliminal presentation (2 s) of a Chinese ideograph. Thus, the ideograph served both as a pattern mask and target. Subjects were then given 30 s to read a passage of information about the ideograph they had just seen and were given an additional 2 s presentation of the ideograph.

The experimenter exposed the subjects in the cognition-based attitude induction conditions to the same set of 10 ideographs and subliminal primes. For each trial, the content and exposure durations were identical to those used in affect-based attitude conditions. The critical difference, however, was that the sequence of affective and cognitive manipulations was reversed: Subjects viewed and read about the ideograph *before* being exposed to the subliminal presentation of a face conveying positive or negative affect. In these conditions, the supraliminal presentation of the ideograph occurred first and was followed by a passage of information describing the ideograph. Subjects then were presented with the subliminal affective prime, followed by another supraliminal presentation of the ideograph (see Figure 1).

Subjects were told that the source of information about each ideograph was an art historian. Each passage of information contained four sentences, constructed to contain several affectively neutral items of diagnostic information as well as some favorable or unfavorable information that was evaluatively consistent with the subliminal prime on the trial. In the five favorable attitude induction trials, positive affective primes (happy facial expressions) were associated with passages that were favorable toward the ideograph, whereas in the five unfavorable attitude induction trials, negative affective primes (angry facial expressions) were associated with passages of information that were unfavorable toward the ideograph. The following is a sample passage from a favorable attitude induction trial:

> This character was created by the artist, Li Hsiao. He was a writer and scholar in the Hunan province. It was one in an inscription found on a bronze bell belonging to a duke. Each line was created by well-balanced strokes and is properly proportioned.

The following is a passage from an unfavorable attitude induction trial:

> This character is found in a painting entitled, "Journey to Shu." The figure has a bony quality to it; the strokes are thin and brittle. It is not a pleasing pattern either to draw or to behold. The style in which the character is drawn was developed by Zhao Tsai.

After each trial in the induction phase, subjects were asked how much they liked the ideograph and how confident they were of this judgment. Responses were indicated on separate 6-point bipolar scales, with 1 indicating that subjects liked the ideograph very much and 6 indicating that subjects did not like the ideograph at all. On the confidence scale, 1 indicated that subjects were very confident of their judgment, and 6 indicated that subjects were not at all confident of their judgment. Before beginning the experimental trials, all subjects participated in three practice trials to familiarize them with the procedure, the time constraints on each trial, and the rating measures.

Orthogonal to the type of attitude induction, half of the subjects were exposed to an affective persuasion appeal, and the other half were exposed to a cognitive persuasion appeal. Subjects were not told that their attitudes were to be challenged. To minimize suspicion of manipulative intent, only 4 of the 10 ideographs were designated targets of persuasion: 2 that previously had been described in favorable terms and 2 that had been described in unfavorable terms.[3] The objective, therefore, was to influence the former in an unfavorable direction and the latter in a favorable direction. Both affective and cognitive forms of persuasion were implemented using the same procedure as in the induction of affect- and cognition-based attitudes. Persuasion trials involved the presentation of a subliminal affective prime that was opposite in valence to the one used in the induction of the attitude, as well as the presentation of new information about the ideograph in which the opinion of the second source was inconsistent with that expressed by the first source (see Figure 1). On nonpersuasion trials, the affective prime and the information were evaluatively consistent with those associated with the ideograph in the induction phase. Again, faces with

[3] The four ideographs targeted for persuasion were the same for all subjects.

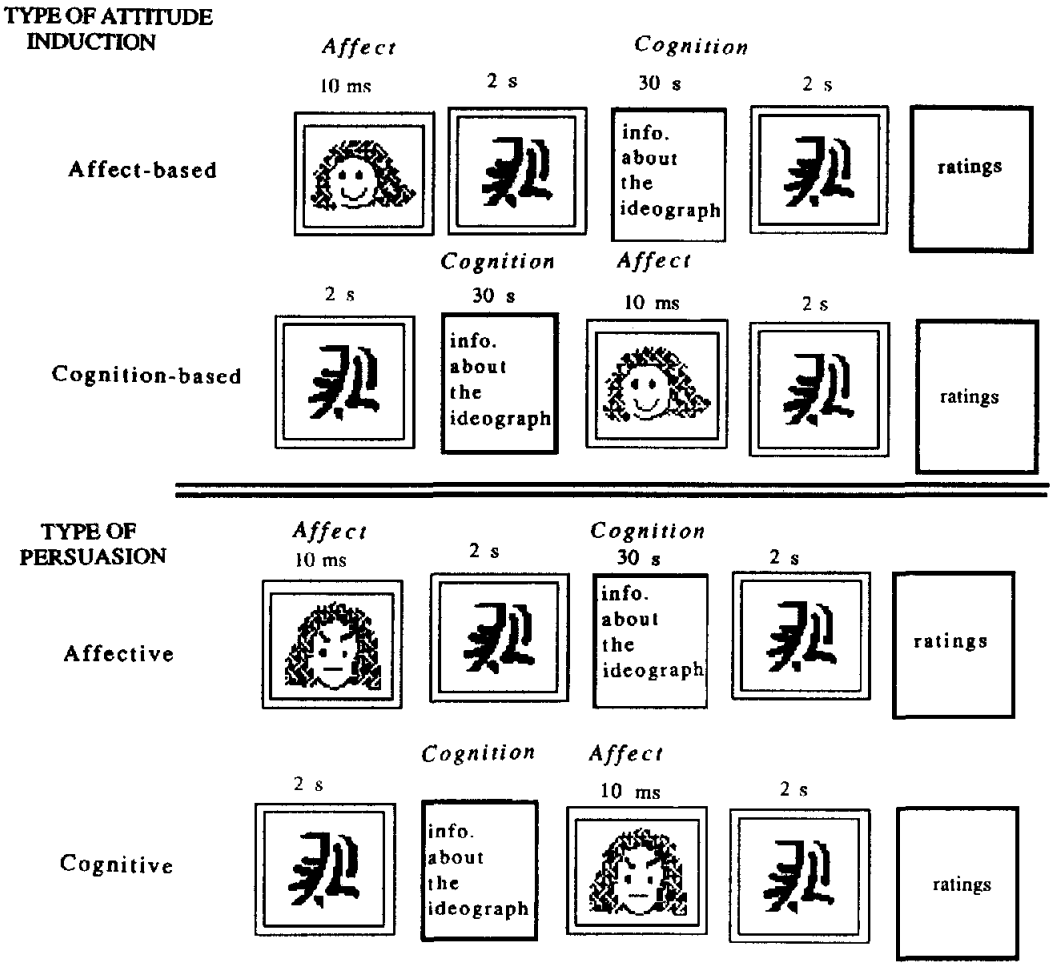

Figure 1. Schematic representation of procedure used to engender affect- and cognition-based attitudes and to create affective and cognitive means of persuasion (Experiment 1). Depicted here is the sequence used to induce and attempt to change favorable attitudes.

happy expressions and angry expressions (positive and negative affect) were used as subliminal primes.

All subjects were told that they would view the same set of ideographs again but that this time, the source of the information would be a different art historian. Subjects in the affective persuasion conditions were presented with a subliminal affective prime prior to the passage about the ideograph, whereas subjects in the cognitive persuasion conditions were presented with the subliminal prime after the passage (see Figure 1). On trials in which the direction of the persuasion attempt was from favorable to unfavorable, a negative affective prime (angry face) was paired with unfavorable information. On trials in which the persuasion attempt was from unfavorable to favorable, a positive affective prime was paired with favorable information.

After each trial, subjects rated how much they liked the ideograph and how confident they were of this judgment. Once subjects had finished their final ratings, they were probed for conscious recognition of the subliminal primes and for suspicion.[4] Subjects were then debriefed, were thanked for their participation, and were dismissed.

Results

Mean scores on the liking measure for the two within-subjects variables and two between-subjects variables appear in Table 1. Before examining the evidence for the predicted effects, a manipulation check for the attitude induction procedure was conducted. The first step in the analysis was to ensure that the affect-based and cognition-based induction procedures did not lead to different initial attitudes (i.e., degree of liking). A mixed-model analysis of variance (ANOVA) was conducted on the four targets of persuasion, with type of induction (affect-based vs. cognition-based) as the between-subjects variable and valence of induction (favorable vs. unfavorable) as the within-subjects variable. No effect for type of induction emerged ($F < 1$), nor did an interaction between type of induction and valence ($F < 1$). The next step in the analysis was to ensure that favorable and unfavorable induction manipulations were successful in producing similarly valenced attitudes. As predicted, a main effect emerged for valence, so that favorable attitude induction trials produced attitudes that were more favorable ($M = 2.6$) than did unfavorable attitude induction trials ($M = 3.2$), $F(1, 61) = 11.9$, $p < .01$.

Recall that the primary hypothesis is that affect-based atti-

[4] One subject reported having seen a face, and was, therefore, excluded from the analyses.

tudes will be more effectively changed by affective means of persuasion than by cognitive means of persuasion. To test this hypothesis, a variable was created to represent the amount of attitude change exhibited between induction and persuasion. Difference scores on the liking measure were computed for the four ideographs that were targets of persuasion. On items for which favorable attitudes had been induced, attitude change was predicted to be in the positive direction. Thus, to yield a positive difference score, induction ratings were subtracted from persuasion ratings. On items for which unfavorable attitudes had been induced, attitude change was predicted to be in the negative direction. Thus, persuasion ratings were subtracted from induction ratings. Summing across these four values, a variable was created to reflect the total amount of attitude change exhibited across the four targets of persuasion.

This variable was then subjected to a 2 × 2 (Type of Attitude Induction × Means of Persuasion) ANOVA, which revealed the predicted interaction, $F(1, 60) = 6.4$, $p < .02$.[5] Simple effects analyses indicated that as predicted, affect-based attitudes exhibited more change when persuasion was affective rather than cognitive, $F(1, 60) = 6.6$, $p < .02$. Cognition-based attitudes, on the other hand, exhibited equal change under both means of persuasion, $F(1, 60) = 1.0$, *ns* (see Figure 2).[6] No main effects emerged from the analysis (induction $F(1, 60) = 1.8$, *ns;* persuasion $F(1, 60) = 1.2$, *ns*).[7]

It was also predicted that affect-based attitudes would be expressed with greater confidence than their cognition-based counterparts. An ANOVA on the means of the confidence ratings obtained at the end of the attitude induction stage, however, failed to yield any support for this hypothesis, $F(1, 62) = 1.6$, *ns,* although 9 of the 10 means were in the predicted direction.

Discussion

Overall, Experiment 1 provides support for the principal hypothesis: Affect-based attitudes are more vulnerable to affective means of persuasion than to cognitive means of persuasion. Because subjects in the two induction conditions did not differ with respect to how much they liked the ideographs prior to the persuasion attempt, differences in initial favorability of affect- and cognition-based attitudes cannot explain the obtained interaction.

Note that the affect-based and cognition-based induction conditions (as well as the two persuasion conditions) are characterized by a different sequence of stimuli. In the affect conditions, the affective manipulation occurs before the first presentation of the target (ideograph), whereas in the cognitive conditions, the cognitive manipulation occurs after the first presentation of the target. Consequently, it could be argued that

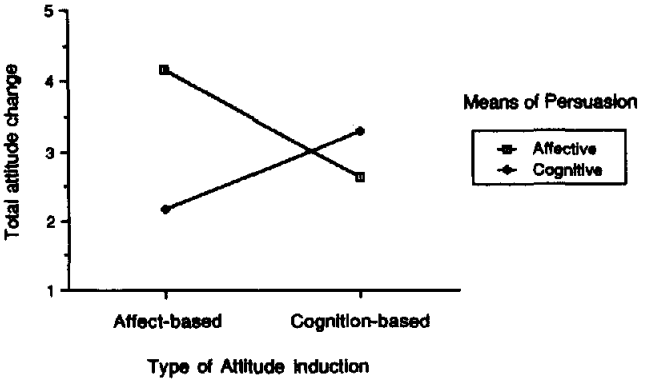

Figure 2. Total attitude change exhibited across four targets of persuasion as a function of type of attitude induction and means of persuasion (Experiment 1).

Table 1
Mean Liking Ratings Measured Before and After Persuasion: Experiment 1

Condition	Time	
	Before	After
Favorable attitude induction		
Affect-based attitude/affective persuasion	2.50	3.44
Affect-based attitude/cognitive persuasion	2.56	2.78
Cognition-based attitude/cognitive persuasion	2.59	3.00
Cognition-based attitude/affective persuasion	3.00	2.91
Unfavorable attitude induction		
Affect-based attitude/affective persuasion	3.47	2.60
Affect-based attitude/cognitive persuasion	3.00	2.75
Cognition-based attitude/cognitive persuasion	2.94	2.44
Cognition-based attitude/affective persuasion	3.16	3.03

Note. For all conditions, $n = 16$. Means are based on 6-point bipolar scales, with lower scores indicating greater liking. For both favorable and unfavorable attitude induction, scores are collapsed across two targets (ideographs) of persuasion.

[5] As a comparison, a similar analysis was performed on the nontargets (i.e., those ideographs that were presented in an evaluatively consistent manner in both induction and persuasion). This analysis revealed no effect for induction, $F(1, 60) < 1$; persuasion, $F(1, 60) = 2.2$, $p > .10$, or their interaction, $F(1, 60) < 1$, *ns.*

[6] One explanation for why cognitive persuasion did not produce differential change is that this form of persuasion was simply ineffective. To rule out this possibility, a *t* test was performed, comparing the change scores in cognitive persuasion conditions against 0. This analysis revealed that the cognitive persuasion produced significant attitude change, $t(30) = 2.53$, $p < .02$.

[7] The original analysis was run as a four-way mixed-model analysis of variance (ANOVA), with type of induction (affect- vs. cognition-based) and means of persuasion (affective vs. cognitive) as between-subjects variables and valence (favorable vs. unfavorable attitudes) and time (before persuasion vs. after persuasion) as within-subjects variables. Consistent with predictions, the four-way interaction was significant, $F(2, 59) = 3.32$, $p < .05$. To determine whether the before persuasion versus after persuasion difference was negative for positively valenced targets and positive for negatively valenced targets, analyses of the simple three-way interaction effect between induction, persuasion, and time were run separately for positively and negatively valenced targets. This analysis revealed the predicted interaction for unfavorable attitudes, $F(2, 57) = 3.00$, $p < .06$. The predicted pattern also emerged for favorable attitudes, although the effect failed to reach conventional levels of significance, $F(2, 57) = 1.51$, *ns.* No other main effects or interactions emerged from the analysis except for the two-way interaction between valence and stage, $F(2, 59) = 11.93$, $p < .001$.

subjects in the cognitive conditions, unlike those in the affective conditions, experienced a direct reaction to the target prior to the cognitive manipulation. It thus appears that the affective versus cognitive manipulations are confounded with the order in which stimuli were presented to the subjects. However, in one important respect this is not the case: Because the (subliminal) affective primes were not visible, subjects' phenomenological experience was identical across experimental conditions. That is, all subjects were consciously aware of first viewing an ideograph, next reading information about it, and then viewing the ideograph a second time. Consider, too, that any other ordering of stimuli would have presented different, and more problematic, confounds. For instance, if the cognitive information had been presented prior to the target (thereby making it possible for it to influence first reactions to the target in the way that affective information does in the affect conditions), subjects in the affective and cognitive conditions would have had very different phenomenological experiences. One group would have experienced target/passage/target (affective conditions), and the other, passage/target/target (cognitive conditions).

Although the primary hypothesis received support, three issues considered in this study require further attention. First, a limitation of the procedure used is that subliminal influence was confounded with affective influence: Subjects were not aware of the affective manipulations (subliminal primes) but were aware of the cognitive manipulations (passages of information). Thus, the obtained effect could be attributable to differences in levels of awareness rather than to the affective/cognitive distinction. Therefore, the primary objective of Experiment 2 was to use a supraliminal manipulation of affect in an effort to rule out this alternative explanation. Second, and relatedly, in view of the importance of nonconscious factors in social information processing (Khilstrom, 1987; Lewicki, 1986; Niedenthal & Cantor, 1986), it is also of interest to determine whether the interaction between type of attitude induction and means of persuasion is limited to circumstances in which affect is experienced subliminally. The second objective of Experiment 2 was to manipulate affect supraliminally (at the level of conscious awareness) and, therefore, to ascertain the generality of the findings obtained in Experiment 1. Third, the prediction that affect-based attitudes would be held with greater conviction than cognition-based attitudes was not confirmed. One explanation lies in the particular manipulation of affect that was used: The subliminal priming manipulation of affect may have been too weak. Thus, the third objective of Experiment 2 was to use a stronger manipulation of affect for testing the hypothesis that affective primacy is associated with greater attitudinal conviction.

Experiment 2

The second experiment was a conceptual replication of the first. As in Experiment 1, affect-based and cognition-based attitudes were experimentally induced and subsequently subjected to either affective or cognitive forms of persuasion. Once again, the induction and persuasion manipulations involved varying the sequence of affective and cognitive processes while holding the content of the communication constant across conditions. In this study, the critical attitude object was a fictitious beverage, which subjects were asked to evaluate. The main procedural modification concerned the manipulation of affect. In this experiment, affect was manipulated supraliminally and was operationally defined as taste in the induction stage and smell in the persuasion stage.

These manipulations were chosen because taste and olfactory processes are inherently affect laden: Indeed, their adaptive significance rests on the information they provide the organism about whether something is pleasant or unpleasant and, accordingly, whether to approach or to avoid. Palatable tastes and pleasant odors are rewarding and are sought after, whereas unpalatable tastes and unpleasant odors are avoided. Taste and smell are also ideal as manipulations of affect because their hedonic value is not dependent on cognitive transformations or representations. The fact that taste is an affective process rather than a cognitive process is readily appreciated from evidence indicating that the ability to experience preferences and aversions for the four basic tastes is present at a very early stage of development. Furthermore, it has been shown that human neonates exhibit specific, well-differentiated behavioral responses to pleasant and unpleasant taste and olfactory stimulation. For example, infants retract the corners of their mouths (in a gesture that resembles a smile), suck, and lick their upper lips when presented with sweet substances and purse their lips, wrinkle their noses, and repeatedly blink their eyes when presented with sour substances. Corresponding patterns of facial reflexes occur in response to odorants. These reflexes appear to be innate and do not seem to be under cortical control, as anencephalic infants without a cortex exhibit the same reflexes as normal infants (Moskowitz, 1978; Steiner, 1974).

Method

Subjects. One hundred twelve female undergraduates at the University of Michigan participated in this experiment in return for credit in an introductory psychology course.

Materials. Attitude objects in this study were three fictitious consumer products purportedly under consideration for public marketing. Two of these products were foils, included to augment the perceived validity of the cover story. One of the foils was a portable copier, from which a sample copy was presented, which was designed to induce a moderately favorable attitude. The other foil was a systemic insecticide, for which there were numerous potential hazards despite the product's advantages, which was intended to elicit a moderately unfavorable attitude. The critical product—the target of persuasion—was a high-energy drink called "Power-Plus." This fictitious product was actually a popular citrus cooler already on the market and was therefore presumed to be relatively pleasant tasting to most people.

Design. Once again, a 2 × 2 factorial design was used with two between-subjects variables, affect-based versus cognition-based attitude induction and affective versus cognitive means of persuasion, and one within-subjects variable, before versus after persuasion. In this experiment, valence of attitude induction was not varied.

Procedure. Subjects were tested in groups of 3 to 4 and were seated at individual desks with partitions on three sides. A cover letter informed them that they would be evaluating three products currently under consideration for public marketing the next year and that the study was being conducted by a team of marketing researchers and psychologists. The experimenter explained that the purpose of the

partitions was to minimize the possibility that subjects would influence each other's opinions and stressed the importance of participants' unique impressions about each product. As in the first experiment, the dependent measures were degree of liking and confidence. Subjects made these ratings after examining each of the three products.

The first product that was evaluated was the "Dup-42" copier. Subjects were given 30 s to read a passage of information about the product and then were asked to compare two photocopy samples: one from a leading brand of full-sized copier, the other presumably produced by the Dup-42 portable copier. Because the induction was aimed at producing a favorable attitude, the passage described several positive features of the product.

The next product that was evaluated was the critical attitude object, Power-Plus. As in the first experiment, affect-based attitudes and cognition-based attitudes were induced by varying the sequence of affective and cognitive processes during attitude acquisition. Subjects in the affect-based attitude conditions first tasted Power-Plus and then read a brief passage of information about the product. Subjects in the cognition-based attitude conditions first read about the drink and then tasted it (see Figure 3). Power-Plus was presented to subjects in a glass bottle covered with a lid. Subjects sampled the product through a straw protruding from a small hole in the lid and were therefore unable to smell the solution as they tasted it. As attitude induction was aimed at engendering a favorable attitude, the passage contained several positive features of the drink:

> Power-Plus is a nutritious drink that quenches thirst and provides the body with essential vitamins that are depleted after strenuous exercise. . . . Power-Plus is also designed to be drunk before engaging in exercise. An enzyme in Power-Plus works to speed up the body's breakdown of fat cells, so that you burn 10% more calories per unit of exercise time than you would without the product.

The last product for consideration was the insecticide, which was intended to yield an unfavorable attitude. Subjects were asked to look at a sample of this product—a sealed container of granules—and then to read the product description. The information about this product stated its effective uses as well as its harmful features.

After each trial in the induction phase, subjects were asked how much they liked the product they had just considered and how confident they were of this judgment. Subjects indicated their responses on separate 14-point bipolar scales, with −7 indicating that subjects did not like the product at all and 7 indicating that subjects liked the product very much. On the confidence scale, −7 indicated that subjects were not at all confident of their judgment and 7 indicated that subjects were very confident of their judgment.

In the persuasion stage of the experiment, subjects were told that they would now learn more about each of the products they had just considered and evaluated. Unlike Experiment 1, in which there were four targets of persuasion, Experiment 2 contained only one target of persuasion: Power-Plus. Orthogonal to the type of attitude induction, half of the subjects were presented with an affective persuasion appeal, and half with a cognitive appeal. Subjects in the affective persuasion conditions first sampled the scent of Power-Plus and then read further information about the product. Subjects in the cognitive persuasion conditions first read the information and then sampled the scent of the product (see Figure 3). The scent of Power-Plus was designed to be mildly aversive; this was accomplished by creating a mixture of 1 ml white vinegar to 2 ml papaya concentrate. The papaya was intended to provide sufficient fruitiness to convince subjects that the scent was that of the solution they had tasted previously. The solution was presented in an opaque plastic bottle. Subjects sampled the scent of the product by squeezing the container firmly, which caused a puff of air to be released.

The new information provided to subjects in this stage included several negative features of the drink:

> Power-Plus should be kept refrigerated, because if it remains at room temperature for too long, a breakdown of its nutritive properties will occur. It is not advisable for pregnant women to drink this product. Power-Plus will be available at all major grocery stores and selected fitness centers.

Subjects subsequently received additional information about the Dup-42 copier and the insecticide. As these products were not designated targets of persuasion, their product descriptions were evaluatively consistent between induction and persuasion stages of the experiment.

On each persuasion trial, after a product had been considered for the second time, subjects completed the second set of dependent measures. Once again, subjects rated how much they liked each product and how confident they were in making this judgment. At the end of

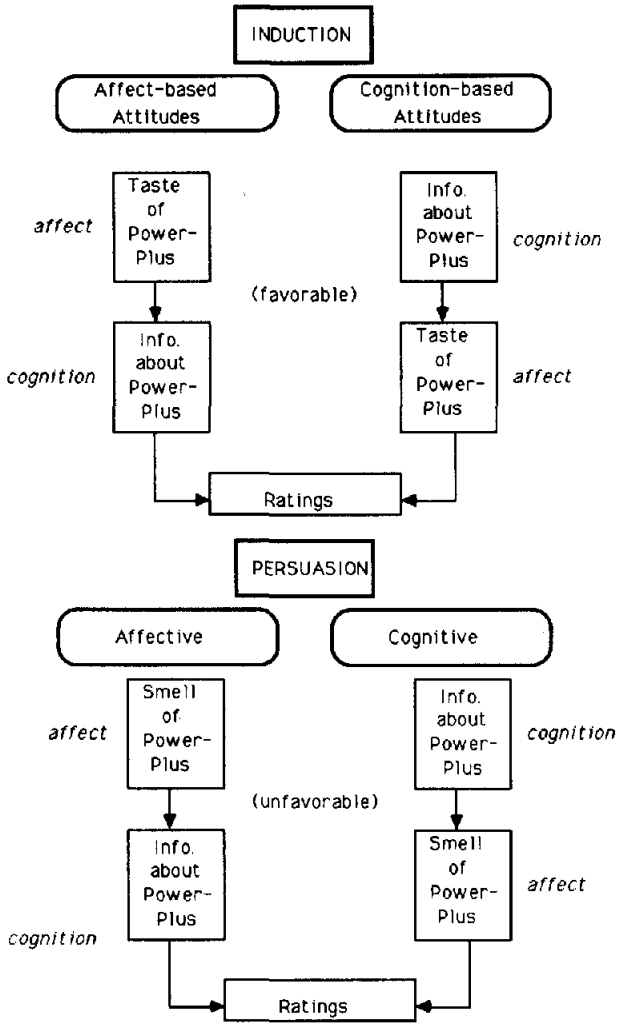

Figure 3. Schematic representation of procedure used to engender affect- and cognition-based attitudes and to create affective and cognitive means of persuasion (Experiment 2).

the experiment, subjects were probed for suspicion and debriefed.[8] They were then thanked for their participation and were dismissed.

Results

Mean scores on the liking measure for the two between-subjects variables appear in Table 2. As in Experiment 1, an ANOVA was conducted to ensure that the affect-based and cognition-based induction procedures did not lead to differential initial attitudes. This analysis revealed no differences on the initial liking measure, $F(1, 105) < 1$.

A variable representing amount of attitude change was calculated by subtracting liking ratings made after the persuasion attempt from liking ratings made after the attitude induction. This variable was then subjected to a 2 × 2 (Type of Attitude Induction × Means of Persuasion) ANOVA, which revealed the predicted interaction, $F(1, 103) = 4.2$, $p < .05$. As in Experiment 1, simple effects analyses indicated that affect-based attitudes were more effectively changed by affective persuasion than by cognitive persuasion, $F(1, 103) = 4.3$, $p < .05$. Cognition-based attitudes, however, exhibited equal change under both means of persuasion, $F(1, 103) < 1$, (see Figure 4).[9] As in Experiment 1, no main effects emerged from the analysis (both Fs < 1).[10]

Finally, an ANOVA on the confidence ratings made after the induction stage revealed a significant main effect for type of induction. As predicted, affect-based attitudes were expressed with greater confidence ($M = 5.4$) than were cognition-based attitudes ($M = 4.6$), $F(1, 103) = 3.8$, $p = .05$.

Discussion

Experiment 2 replicated the interaction between type of attitude induction and means of persuasion obtained in the first experiment. Thus, further support was gained for the notion that affect-based attitudes exhibit greater change when an influence attempt is affective rather than cognitive in nature. As in Experiment 1, cognition-based attitudes exhibited equal change under both means of persuasion. The hypothesis that affect-based attitudes would be held with greater conviction than cognition-based attitudes was supported in Experiment 2, although not in the previous experiment. This difference could be attributable to the stronger manipulation of affect used in Experiment 2. Subjects' heightened confidence in affect-based attitudes may also be conditional on conscious awareness of the affective responses that constitute the basis of an attitude. Whereas subjects in Experiment 1 may not have been aware of the cause of their affective reactions (subliminal faces) or even their reactions themselves, subjects in Experiment 2 presumably were. Alternatively, the confidence effect could be mediated by familiarity with the attitude domain: Whereas Chinese calligraphy is a relatively novel domain of evaluation for most subjects, judgments about consumer products are commonplace.

Note that in both Experiments 1 and 2, all subjects received the same affective and cognitive information about the attitude objects. That is, the procedure used to engender affect-based and cognition-based attitudes and to create affective and cognitive means of persuasion involved varying the sequence—and not the absolute contribution—of affective and cognitive processes. The design, therefore, provides a strong test of the importance of the sequence of affect and cognition in attitude

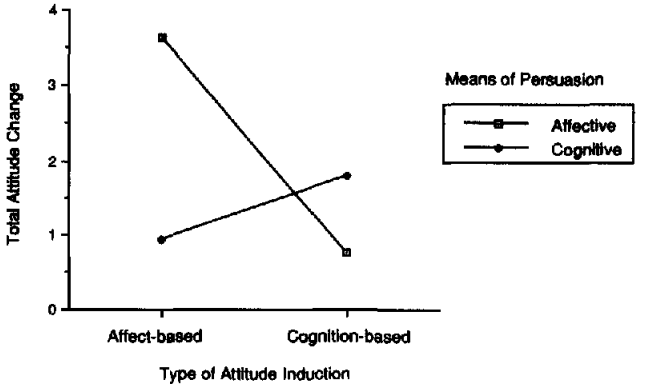

Figure 4. Attitude change exhibited towards the target (Power-Plus) as a function of type of attitude induction and means of persuasion (Experiment 2). The higher the change score, the more unfavorable subjects' attitudes toward the beverage became.

Table 2
Mean Liking Ratings Measured Before and After Persuasion: Experiment 2

Condition	*n*	Time	
		Before	After
Affect-based attitude/affective persuasion	25	4.24	.08
Affect-based attitude/cognitive persuasion	23	3.83	1.66
Cognition-based attitude/cognitive persuasion	30	3.80	.50
Cognition-based attitude/affective persuasion	29	4.66	2.03

Note. Means are based on 14-point bipolar scales, with higher scores indicating greater liking.

[8] Debriefing revealed that 5 subjects were suspicious about the nature of the experiment. Therefore, these subjects were excluded from the analyses.

[9] Once again, to rule out the possibility that cognitive persuasion was ineffective, a t test was performed, comparing the change scores in cognitive persuasion conditions against 0. This analysis revealed that cognitive persuasion produced significant attitude change, $t(51) = 7.97$, $p < .001$.

[10] The identical pattern emerged when the data were analyzed in a three-way analysis of variance (ANOVA) with time (before vs. after persuasion) as the within-subjects variable, $F(1, 103) = 4.2$, $p < .05$. A main effect for time emerged from this analysis, $F(1, 103) = 89.2$, $p < .001$, and there were no other main effects or interactions. Simple effects analyses revealed no effect for induction ($F < 1$) persuasion $F(1, 103) = 1.2$, *ns*, or their interaction ($F < 1$) on the before persuasion measure of liking. On the after persuasion measure of liking, simple effects analyses revealed the predicted interaction between induction and persuasion, $F(1, 103) = 5.1$, $p < .03$, and no main effects for induction or persuasion (both Fs < 1).

formation and change. Note also that the interaction between means of induction and persuasion was obtained using both a subliminal manipulation of affect in Experiment 1 (emotionally charged human faces as affective primes) and a supraliminal manipulation of affect in Experiment 2 (taste and smell).

General Discussion

Taken together, these studies suggest that the conditions under which an attitude is formed cast an influence on its ability to withstand counterattitudinal communications. When affect precedes cognition in attitude formation, an attitude will be more vulnerable to affective means of persuasion than to cognitive means of persuasion. On the other hand, when cognition precedes affect in attitude formation, an attitude may be equally susceptible to affective and cognitive appeals. There is also evidence from Experiment 2 suggesting that an attitude will be expressed with greater confidence or conviction when affect is primary or dominant in its acquisition.

The results suggest that two messages can have different effects as a function of the order in which material is presented. Implicit in the choice of methodology as well as the interpretation of the results is the assumption that the first of the two components in the communications has greater impact. Why, however, should we not assume that the second component has a greater influence? For instance, in an induction sequence in which affect precedes cognition, perhaps the cognitive component is dominant, thereby resulting in a cognition-based attitude rather than an affect-based attitude. Note that adopting this view would oblige us to reach precisely the opposite conclusion about the obtained findings: We would conclude that cognition-based attitudes are more susceptible to cognitive appeals than to affective appeals and that affect-based attitudes are equally susceptible to the two types of influence. Despite the logical plausibility of this scenario, it seems difficult to defend on theoretical or empirical grounds. The greater plausibility of the current formulation receives support from a vast literature on primacy effects, whereby early-presented information has a disproportionate influence on subsequent judgments (Anderson, 1965, 1974; Asch, 1946; Bruner, Shapiro, & Taguiri, 1958; Hamilton & Zanna, 1974; Higgins & Rholes, 1976; Osgood, Suci, & Tannenbaum, 1957; Rokeach & Rothman, 1965; Wyer & Watson, 1969). Some theorists have accounted for primacy effects in information processing in terms of a change of meaning of later-presented material, whereas others explain primacy effects in terms of the differential weighting of early-presented material. Despite their disagreement about the mechanism underlying primacy effects, most theorists agree that the effect emerges because first impressions guide the processing of subsequently encountered material. Of course, in some circumstances, recency effects have been obtained, but their incidence is comparatively low and seems to be conditional on factors not present in these experiments (e.g., a delay between presentations, memory set instructions).

Resistance to Persuasion as a Function of Attitude Type

The two experiments reported here leave open the question of why affect-based attitudes, and not cognition-based attitudes, are differentially susceptible to affective and cognitive appeals. Although it remains for future investigations to reveal the mechanisms underlying this pattern, several speculations can be offered at this time. One approach to understanding the problem rests on the assumption that for affect-based attitudes, an initial affective reaction to a stimulus engenders a hedonic theory or schema that predisposes an individual to process subsequent information in a biased manner. This schema may function to focus attention on certain stimulus features and to generate expectations about incoming information. Such a possibility is compatible with several theoretical formulations (Asch, 1946; Leventhal, 1982; Wilson, Lisle, Kraft, & Wetzel, 1989). A hedonic schema may function to prime the affective dimension of subsequently encountered information and to guide the representation of this information primarily along a favorable–unfavorable dimension. Thus, when an attitude is affect based, it may acquire a rather unidimensional cognitive structure. On the other hand, the primacy of cognition in attitude formation may give rise to a more instance-based cognitive structure. Unlike their affect-based counterparts, cognition-based attitudes in these studies were acquired in a piecemeal fashion (Fiske & Pavelchak, 1986): Attribute by attribute, component features of the stimulus were considered and evaluated; the emergent impression was a composite of these discrete evaluations. Unlike the case of affect-based attitudes, in which affect is a relatively direct and global response to the attitude object, affect is a more indirect process in the formation of cognition-based attitudes and is more specifically related to a particular attribute of the attitude object (e.g., a good taste). Thus, it is likely that cognition-based attitudes were represented along multiple dimensions, including but not restricted to a favorable–unfavorable dimension. The processing differences associated with these two routes to attitude acquisition, and the differences they bring about in an attitude's structure, provide a means of explaining the obtained interaction between induction and persuasion. Affect-based attitudes may be difficult to change by means of influence attempts composed of instances of information that are discrepant from the hedonic schema (cognitive persuasion) because these instances may be assimilated or even discounted. However, if an influence attempt engenders a contradictory hedonic theory or schema (affective persuasion), pressures may arise to accommodate, and attitude change may occur.

For attitudes with cognitive origins, however, affective persuasion attempts are not likely to have this advantage. Persuasive appeals that engender a contradictory hedonic schema (affective persuasion) will be only moderately effective, as they address only one of the several dimensions of the cognitive structure underlying the attitude. Appeals that are composed of specific instances of information about component attributes of the attitude object (cognitive persuasion), on the other hand, will be effective to the degree that they successfully refute or weaken the attitude's supporting cognitions. Note that in the studies reported here, the cognitive persuasion treatment was not a direct antidote to the cognitive induction treatment. That is, the cognitive component of the persuasion attempt contained information that was evaluatively inconsistent with information presented earlier (e.g., "Power-Plus . . . quenches thirst and provides the body with essential vitamins" followed

by "It is not advisable for pregnant women to drink it"). This type of inconsistency is different from that found in the affective persuasion conditions, in which later-presented information more directly contradicted or discredited information presented earlier (e.g., Power-Plus is initially found to taste good and later is found to smell bad). Thus, the answer to why cognition-based attitudes in these studies were not differentially susceptible to cognitive means of persuasion could lie in the nature of the cognitive information. This point suggests that if the cognitive component of a persuasive appeal were more specifically targeted at the explicit beliefs or information on which an attitude is based, a crossover interaction between attitude type and means of persuasion might have emerged. However, this possibility seems unlikely in view of Srull and Wyer's (1989) research on consistency. Srull and Wyer found that perceivers are most influenced by, and devote the most cognitive effort to, evaluative inconsistency and are less attuned to descriptive inconsistency. Thus, it seems that the cognitive persuasion might not be made more effective by adding descriptive inconsistency to the already present evaluative inconsistency. Further research is needed to determine whether a different pattern of results would emerge as a function of variations in the cognitive information.

It goes without saying that these data are open to more than one interpretation. The preceding explanation is based on the importance of the primary conceptual distinction advanced in this article—that between affect and cognition. However, at this stage of the research, it is difficult to rule out alternative explanations that do not rely on this distinction. One might argue, for instance, that it is the primacy of direct experience with an attitude object—and not the primacy of affect—that is the critical factor. Perhaps when an attitude is acquired through direct experience (e.g., first sampling the taste of a beverage), attitude change will be more likely if a persuasion attempt also involves direct experience with the attitude object (e.g., smelling a beverage) rather than indirect experience (e.g., reading information about it). This alternative conceptualization seems particularly reasonable in view of the finding in Experiment 2 that affect-based attitudes are expressed with more confidence than are cognition-based attitudes, a result that is consistent with Fazio and Zanna's (1981) finding that attitudes that are based on direct experience are expressed with greater confidence than those that are based on indirect experience. Nonetheless, the applicability of this interpretation is limited, because in Experiment 1, the attitude induction manipulations did not involve varying the sequence of direct versus indirect experience with the attitude object. Recall that subjects in both affect-based and cognition-based induction conditions viewed an ideograph (direct experience) before reading about it (indirect experience).

Alternatively, a differential opportunity to counterargue the verbal material in the persuasion stage could mediate the relationship between attitude type and means of persuasion: Perhaps an aversive smell is less effective when it follows unfavorable verbal material than when it precedes this material because in the former case, subjects do not have an opportunity to counterargue the verbal material (and thereby strengthen their initial position) before experiencing the aversive smell. This counterargument explanation has the advantage of being able to explain the differential resistance of affect-based attitudes to affective and cognitive persuasion in both experiments. However, its weakness is its inability to account for the absence of a main effect for type of persuasion. According to the counterargument interpretation, cognitive persuasion should have been less effective overall than affective persuasion, but the data do not support this contention.

Greater understanding of the present results will be gained not only through attempts to isolate the mechanism underlying the obtained interaction but also through efforts to delineate the boundary conditions under which the effect emerges. Will affect-based attitudes always be more responsive to affective persuasion techniques? The answer to this question may depend on the degree to which the affective component of an attitude is resistant to change. One way resistance may develop is through experience. Practice in counterarguing or generating cognitive responses can make an attitude less vulnerable to counterattitudinal appeals (McGuire, 1964; Petty & Brock, 1976). Resistance to change may also be more characteristic for certain types of attitudes or attitudes that serve particular psychological functions. For example, if an attitude is ego involving (Sherif & Hovland, 1961), or arises out of deeply rooted psychological pressures or conflicts as is the case with many maladaptive attitudes, it may be especially entrenched and well defended and thereby resistant to change. It seems possible, in this light, that for some instantiations of affect-based attitudes, cognitive persuasion techniques actually may be more effective than affective techniques. This idea is suggested in the work of Milton Erickson, whose approach to therapeutic change emphasizes the necessity of using indirect means of influence to circumvent the patient's resistance (for a review, see Sherman, 1988). An implication of this view is that to the extent that an attitude has been strengthened by means of one component, attitude change efforts may be most effective when they target a different component. Note that this idea seems at odds with the conceptual framework and findings presented here, which suggest that affect-based attitudes are most susceptible to affective persuasion. Nonetheless, note that tactics for countering resistance may be independent of issues arising from a distinction between affect and cognition. That is, an appeal may be convincing by virtue of the fact that it contains (affective or cognitive) information that the individual has not been exposed to or had practice counterarguing. Therefore, the potential superiority of cognitive techniques in modifying certain types of affect-based attitudes may arise because of their novelty to the individual and not as a function of the mismatch between the affectively based attitude and the cognitive appeal.

This explanation may shed some light on the discrepancy between the findings reported here and those of Millar and Millar (1990; see this issue), who found that cognitive appeals are more effective than emotional appeals in changing affective attitudes. Another means of reconciling the discrepancy rests on an important difference between the procedures used in the two lines of research. In two studies conducted by Millar and Millar, subjects were classified as having an affective or cognitive attitude toward a beverage according to whether two of the three statements they selected as most representative of their reactions to the beverage were affective or cognitive. In another experiment, affective and cognitive attitudes were manipulated

by having subjects focus on either their feelings or their thoughts about five analytical problems. It seems likely that these procedures would affect the relative accessibility of affective and cognitive components of an attitude. In contrast, the procedures used in the studies reported here manipulated the primacy of affect versus cognition in the acquisition of an attitude. As discussed later, whether the affective or cognitive component of an attitude becomes dominant often may be independent of which component was most influential when the attitude was initially formed.

Affective Primacy and Attitudinal Conviction

Two tenets of Zajonc's (1980) theoretical formulation suggest an explanation for the finding that affect-based attitudes are expressed with greater conviction. First, Zajonc argued that affective reactions are experienced as valid. Our affective reactions enjoy a privileged status; often, we trust our gut feelings more than objective data. Accordingly, when people who hold an affect-based attitude subsequently encounter information that confirms or validates their initial feelings, they may feel they have known it all along, which could serve to bolster attitudinal conviction. Second, Zajonc claimed that affective reactions implicate the self: Our affective responses not only reveal properties of the stimulus but also inform us of our reactions to the stimulus. Because of the self-referential nature of affect-based attitudes, counterattitudinal information may be experienced as a challenge to the self. We may therefore be motivated to defend affect-based attitudes against the threatening realization that our instincts could be incorrect. Heightened attitudinal conviction may provide a mechanism for deflecting the possibility that one's views could be erroneous and for protecting self-esteem. When attitudes are cognition based and thereby less directly reflective of the self, such motivational pressures may not be as strong, and attitudinal conviction might be tempered by the realization that the information or beliefs on which the attitudes are based could be incorrect.

Usefulness of Distinction Between Affect- and Cognition-Based Attitudes

The degree to which a conceptual distinction between affect-based and cognition-based attitudes will be theoretically useful for investigations of persuasion is, of course, dependent on the validity of this distinction. It is likely that, in many instances of attitude formation, affective processes and cognitive processes operate in parallel and may not be as separable and sequential as this distinction suggests. The actual state of affairs may be that attitudes can be positioned on a hypothetical continuum according to the sequence and relative contribution of affective and cognitive processes in their formation. At one extreme, affective reactions are primary and dominant. This may be the case, for instance, for attitudes with biological origins, such as certain food preferences and aversions; attitudes that serve an ego-defensive function; attitudes toward romantic partners; and attitudes toward political candidates about which a person has little knowledge (for other examples, see Wilson et al., 1984; Zanna & Rempel, 1988). At the other end of the continuum, where cognitive factors predominate, are attitudes that are based primarily on an integration of objective stimulus attributes and factual information. This may be the case for attitudes toward certain consumer products, attitudes toward social policy issues and historical events, and attitudes that serve a knowledge function. Between these extremes on the continuum, where affect is still dominant but the role of cognition in attitude development is more substantial, are attitudes such as first impressions. Virtually by definition, first impressions are characterized by the automaticity and power of affective reactions in the absence of much information; we often know whether we like or dislike someone before knowing the precise reasons for these feelings. Finally, there are attitudes composed of a dominant cognitive structure with affective tags. This pattern may be characteristic of attitude objects about which an individual has considerable knowledge or utilitarian interests (e.g., books, films, political candidates). Such attitudes may also include those with a value expressive function, such as those held toward controversial social issues (e.g., the death penalty, abortion), which often are imbued with symbolic meaning and strong feelings (see Ellsworth & Ross, 1983; Kinder & Sears, 1981).[11]

Despite the heuristic value this typology affords, its boundaries are somewhat fuzzy. Its chief limitation, perhaps, is in its somewhat static conceptualization of the critical determinants of attitude formation. Often, attitude formation is an ongoing, dynamic process between an individual and the environment. In the long run, issues of dominance of affect or cognition may override those of primacy. In some cases, and perhaps more frequently for certain attitude objects, an affect-based attitude may come to acquire an elaborate cognitive structure. This seems particularly likely when an attitude taps central values or has special meaning for a person. Imagine an individual who adopts a pro–animal rights attitude after seeing several gory pictures of tortured animals on a protester's placard (affect-based attitude). This individual may subsequently decide to protest the abuse of animals for research. One could imagine that this person would be vigilant about collecting information for defending his or her attitudinal position as well as for rebutting adversaries. Eventually, the individual's attitude will be supported both by strongly felt emotions and by an arsenal of facts and beliefs about the issue. This example suggests that with the passage of time, the distinction between affect-based attitudes and cognition-based attitudes (defined in terms of primacy) may become blurred. By the same token, it implies that the relative superiority of affective appeals for changing affect-based attitudes may be constrained by time and affected by the complexity of an attitude's cognitive structure.

Applications and Directions for Future Research

The earlier issues have implications for the generality of the present findings, which are based on a procedure in which affect- and cognition-based attitudes are manipulated by varying the sequence of affect and cognition. It must be determined

[11] Of course, these examples are hypothetical; for the middle two categories, in particular, a case could be made for reversing the positions of certain attitudes on the continuum.

whether (or under what conditions) it is the primacy, as opposed to the dominance, of affect versus cognition in attitude formation and change that underlies the effects obtained in these studies. Similarly, it must be ascertained whether experience with an attitude object might mediate the relationship between an attitude's basis and its resistance to persuasion. It is essential, therefore, for future investigations to use different procedures for inducing affect- and cognition-based attitudes and for manipulating affective and cognitive appeals. Likewise, it would be of great interest to know whether the findings are specific to relatively unfamiliar or novel attitude objects (e.g., Chinese calligraphy or an unknown nutritious beverage). In subsequent studies, principles of attitude formation and change gleaned from this research might be explored with relatively familiar or more psychologically meaningful attitude objects.

The interaction obtained in both experiments between attitude type and means of persuasion suggests that for attitudes whose origins are primarily affective, influence attempts that rely on reason, factually supported contentions, or rational argumentation may not be the most effective means of bringing about attitude change. Interpreted in this light, the mixed results reported in the attitude change literature may be explained, at least in part, by the failure of many persuasive communications to make contact with the affective basis of attitudes (see Zajonc, 1980; Zajonc & Markus, 1984). This logic can be extended to the realm of psychotherapy, in which the interplay of affective and cognitive forces is particularly vivid. Approaches to the process of therapeutic change differ with respect to the emphasis placed on cognitive versus emotional factors. The present conceptualization suggests that the extent to which cognitive and emotional procedures will be effective agents of therapeutic change for maladaptive attitudes could depend, in part, on whether the antecedents of a particular attitude are affective or cognitive. The success of therapeutic efforts also may be related to how well an influence procedure addresses the psychological functions an attitude serves for an individual. Evidence for the applied value of these propositions is provided by investigators who have suggested an acquisition-based strategy for adolescent smoking prevention and cessation programs (Chassin, Presson, & Sherman, 1985). On the basis of empirical findings, these investigators suggest that treatment strategies should take into account the basis (affective, cognitive, or behavioral) and function(s) of an individual's beliefs and attitudes about smoking.

The interaction obtained between attitude type and means of persuasion suggests that different forms of influence could be maximally effective depending on an individual's stage of development. Very young children, for example, may have a preponderance of affect-based attitudes, primarily because they lack the cognitive framework to scrutinize information deeply (see Izard, 1984, for a review of the ontogenetic primacy of emotion). They initially respond to stimuli in their environment by touching, tasting, and watching their caretaker's facial expressions and only over time develop the cognitive structures that enable them to make finer distinctions and to conduct more reasoned or rational analyses. As children mature, and pressures arise for them to be able to justify their attitudes, presumably more and more attitudes will take the form of cognition-based attitudes. Results of the present studies suggest that, during the early years, affective appeals would be more likely to produce attitude change than would appeals that are based on reason or argumentation, a conjecture for which there seems to be considerable intuitive support.

The current proliferation of cognitive models of persuasion (Cooper & Croyle, 1984; Eagly & Chaiken, 1984; Wicklund & Frey, 1981) invites the question of how goals, values, desires, and other affective pressures underlying attitude formation are associated with variations in receptiveness to different forms of persuasion. In view of the multiplicity of routes to attitude formation and the differences in the interplay of affect and cognition in this process, it seems that a thorough understanding of attitude change phenomena must include attention to the nature of an attitude's origin.

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