The role of affect in attitude formation: A Classical Conditioning approach
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RESEARCH NOTE

The Role of Affect in Attitude Formation: A Classical Conditioning Approach

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This study investigates the role of affect in attitude formation. Two experiments, using established conditioning procedures, assessed the impact of affect on attitude formation. The results of Experiment 1 indicate that affect can influence attitudes even in the absence of product beliefs. The results of Experiment 2 suggest that affect plays as important or more important a role than the belief mechanism in attitude formation, depending on the number of repetitions. Implications of the results for understanding the role of affect in advertising are discussed.

A common practice of television advertising is to associate one's brand with appealing visual imagery to shape the consumer's attitude toward their brand. Advertisers have linked adorable animals (e.g., RCA television), panoramic vistas (e.g., Nike, New Balance, American Express, and Chevrolet Cavalier), and beautiful women/men (e.g., Calvin Klein, Bally's Health Club, Sears, and Diet Coke) to their brand in hopes of increasing the target market's attitude toward their brand. The advertisers assume that the affective appeal of the stimulus/source (e.g., celebrity endorsers and physically attractive models) will transfer to their brand and will increase the effectiveness of their advertisement (Brown and Stayman 1992; Walker and Dubilsky 1994). Furthermore, as digital-editing technology becomes more advanced and easier to use, more commercials will rely on the affect-evoking power of the visual stimulus to enhance the attitude toward their brand (Wilke 1993).

Although the use of affective cues to influence attitude formation is widely practiced, the relationship is strongly debated. Fishbein and Middlestadt (1995) argued that attitude formation can only be cognitively based. Consequently, they suggested that other "non-belief-based" determinants of attitudes do not exist. Fishbein and Middlestadt (1995) emphasized this view when they proposed that "findings indicating that variables other than beliefs and their evaluative aspects contribute to attitude formation and change can best be viewed as methodological artifacts resulting from the use of inappropriate predictors and/or criteria" (p. 184).

Most researchers concur that beliefs play an important role in attitude formation. However, they find the belief-based attitude model too restrictive. In addition to beliefs, the researchers advocate that other factors (i.e., affect) will make a significant and unique contribution to attitude formation (Brown and Stayman 1992; Petty, Unnava, and Strathman 1991). To investigate this hypothesis, numerous studies have focused on direct affect transfer by using classical conditioning as the key theoretical explanation (e.g., Allen and Madden 1985; Bierley, McSweeney, and

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Vannieuwkerk 1985; Gorn 1982; Gresham and Shimp 1985; Shimp, Stuart, and Engle 1991; Stuart, Shimp, and Engle 1987). The supposition of direct affect transfer is that an unconditioned stimulus (US) will arouse an affective response. When the US is systematically paired with a conditioned stimulus (CS), the subjects will become aware of the contingency relation, and the generated affect will then transfer from the US to the CS (Allen and Madden 1985; Shimp 1991; Zajonc, Pietromonaco, and Bargh 1982). The results of these research studies indicate that attitudes are not always belief based and that affect transfer can be used in attitude formation. The studies, however, had a major flaw that could potentially dismiss direct affect transfer as the reason for attitude formation. These studies relied on unconditioned stimuli that were able to generate affect. However, the same stimuli had the potential to convey product meaning to the subjects. For example, Shimp et al. (1991) chose attractive water scenes to pair with colas. The attractive water scenes generated affect but may also have communicated an important product attribute (i.e., refreshing) to the subjects. Consequently, the attitude formation may have been due to cognitive factors and affect transfer may have been nothing more than a methodological artifact as suggested by Fishbein and Middlestadt (1995).

Because past studies (e.g., Gorn 1982; Kim, Allen, and Kardes 1996; Shimp et al. 1991; Stuart et al. 1987) have used stimuli that had the potential to dismiss direct affect transfer as an explanation for attitude formation, we cannot unequivocally state that affect plays a role in attitude formation. To make such a statement, a study must be conducted using a stimulus that has the ability to generate affect but no relevant product attribute. The goal of Experiment 1 is to determine if affect influences attitude formation in the absence of product belief.

A second issue that is pertinent to the role of affect in attitude formation is the size of the direct affect transfer mechanism in attitude formation. This issue stems from a recent study by Kim et al. (1996). Their study investigated the mechanisms underlying the effects of classical conditioning on attitude formation. They hypothesized that two diverse mechanisms (i.e., direct affect transfer and beliefs) were the underlying foundations for attitude formation. Their results confirmed that direct transfer and beliefs were the mechanisms for the effects of classical conditioning on attitude formation. Furthermore, their results indicate that both mediational processes can occur concurrently, and that these processes are not rivals but may work together to shape attitudes. Their results are intriguing because cognitive and affective mediations were traditionally viewed as rivals (Eagly and Chaiken 1993; Fishbein and Ajzen 1975; Gorn 1982; Middlestadt 1990). Furthermore, the results also raise an interesting issue. Given that the two mechanisms are operating concurrently to shape attitudes, which mechanism has the greater effect on attitude formation, and under which condition will affect have a stronger influence?

This issue is significant for advertising managers. Kim et al. (1996) stated that

> understanding mediation has important implications for selecting stimuli to be used in advertisements that employ Pavlovian mechanisms. If direct affect transfer alone is facilitated by proper conditioning, then attractive images are crucial to shaping attitudes. However, if inferential belief formation is also operative, then visual imagery connoting product-performance features also should be associated with a brand by following the Pavlovian guidelines. (P. 318)

The statement suggests that the type of mediation will influence the choice of advertising stimuli and provides insights into selecting the stimuli. However, Kim et al. (1996) did not provide a guideline for determining which stimuli characteristics (i.e., affect evoking or product performance) is more important. The ability to evoke positive affect may be more meaningful than product beliefs under certain circumstances, whereas product beliefs may be more pivotal in others. Thus, if we can determine the strength of the mediational processes and under what condition one process will dominate the other, then we can provide a framework for choosing a stimulus that will increase advertising effectiveness.

Thus, this research goes beyond the study by Kim et al. (1996) and investigates two important issues. (1) Does affect play a role in attitude formation in the absence of product belief? (2) If affect plays a role in attitude formation, does it have a greater effect than beliefs on attitude, and if so under what condition will it have a greater effect? We conducted two experiments to address these two issues.

EXPERIMENT 1

Eagly and Chaiken (1993) described the importance of classical conditioning in direct affect transfer when they stated, "Classical conditioning procedures *can* lead people to form attitudes toward objects without any conscious deliberation about those objects' attributes" (p. 403). The important implications of their statement are that classical conditioning can be considered as the theoretical foundation for direct affect transfer, and direct affect transfer may occur without semantic meaning. Thus, attitudes are formed based on affect generated by the UC in the absence of any product attribute.

To investigate the effects of direct affect transfer on attitude formation employing the classical conditioning paradigm, a UC that generates affect but is devoid of product-relevant meaning should be used. The prior studies, due to the stimuli used, do not allow us to conclude that direct affect transfer exists in the absence of product beliefs, and that attitude formation via direct affect transfer is nothing more than a methodological artifact. The goal of Experiment 1 is to investigate the role of direct affect transfer in classical conditioning and provide a strong unambiguous test of direct affect transfer in the absence of product beliefs.

To make a case for direct transfer without product beliefs, extensive pretesting was conducted to make sure

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that the selected US provoked positive affect while communicating no product beliefs. The careful pretesting and subsequent selection of the US allows one to infer that the resultant conditioning effect is due exclusively to direct affect transfer. Thus, the first step in providing evidence for direct affect transfer in the absence of product beliefs is to show a conditioning effect.

H1: Attitude toward the product in the conditioning group will be more positive than in the control group.

Second, the beliefs should not differ between the control and conditioning groups. If the beliefs do not differ, then one can assume that the difference in attitude toward the product between the conditioning and control groups was not due to product beliefs but ascribable to affect.

H2: Beliefs about the product will not differ between the conditioning and control groups.

Method and Procedures

The procedures used in Experiment 1 were fashioned after Kim et al. (1996) and will be described in subsequent sections. The focal CS was Brand L Pizza House. The US was a picture of a kitten, which was chosen after extensive pretesting.

Pretesting for the US. The goal of the pretest was to identify an US that had the ability to provoke positive affect but did not convey any beliefs about L Pizza House. To find such a stimulus, a two-stage pretesting procedure was conducted in a classroom setting using a VCR and television. The first stage of pretesting was designed to assess the level of affect that could be generated by the potential stimuli. Pictures of kittens were used as possible candidates because we thought they had the ability to provoke positive affect and could provide no attribute that was relevant to a pizza house.

Participants were processed in groups of 10 or less, and a total of 31 individuals participated in the first stage of the pretest. The participants were presented with a series of 24 pictures; 8 were pictures of kittens and had been selected as potential US for Experiment 1. (The 24 pictures and the order of the stimuli presentations are presented in Table 1.) Each picture was shown for 7 seconds. The participants then had the opportunity to report their affective reaction to the picture using a 7-point three-item semantic-differential scale used by Stuart et al. (1987). The items included were pleasant/unpleasant, like/dislike, and left me with a good feeling/left me with a bad feeling. Seven of the eight pictures generated positive affect, and because of their ability to generate high level of affect, three pictures were chosen for the second stage of the pretesting. The pictures consisted of a kitten in a field of buttercups (mean of 5.71 on a 7-point scale), two gray kittens (mean of 5.35), and a close-up of a kitten (mean of 5.12).

The second stage of the pretesting was to determine if the three pictures of the kittens provoked any belief that may be applicable to a pizza house. Twenty-seven new participants were exposed to each visual image for 30 seconds via a television monitor. During the 30 seconds, the participants were asked to list their "mental reactions" to the pictures. The visuals of kittens resulted in thoughts that had no relevance to a pizza house. The thought listing included cute, soft, playful, and curious; none of these responses can be construed as being connected to a pizza house. Thus, based on the pretests, a picture that was a close-up of a single kitten was selected as the US. The other two pictures were not used because they may have been problematic when paired with a pizza house. The picture of the two kittens may suggest that the consumer will receive two pizzas for the price of one, and the picture of a kitten in a field of buttercups may suggest that the pizza house is clean/fresh. These inferences were unlikely. However, the problem was avoided by choosing the picture of a close-up of a single kitten.

TABLE 1
Pretest Pictures and the Order of Presentation for Experiment 1

Roll of wire
Race car with spoiler
Three kittens with yarn
Mast and sky
Tubes
Two kittens on chair
Radar dish
Black male runner
Bicycle rider
Two kittens in plant pot
Mountain waterfall
White male runner
Kitten in daisy field
Race car without spoiler
Two white kittens
White female runner
Purple island
Two gray kittens
Second White male runner
Ugly kitten
Third White male runner
Sunset over water
Close-up of kitten
Neon arrows

NOTE: Each picture was shown for 7 seconds.

Participants and procedure. Thirty-six undergraduate students were randomly assigned to one of two conditions (conditioning or control). The subject size consisted of 17 and 19 for the conditioning and control groups, respectively. The experiment was conducted in a classroom setting, and each group viewed the stimuli on a television monitor. Following exposure, participants were asked to complete a questionnaire.

Conditioned stimulus. L Pizza House was employed as the CS. The CS was a picture of a pizza box with L Pizza House printed on it. The fictitious restaurant was ideal because participants did not possess any knowledge or

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FIGURE 1
Partial Example of Presentation Sequence for Experiment 1

A. Experimental Group

S	S1		P	P1		S	S1		L	L4		S	S1		P	P1		C	C1

B. Control Group

P	L		P1	C	C		P	S		L	P1	C1		P	S1		S1	C	L2

P = Pizza House
P1 = Kitten
C = Brand R Cola
C1 = Dirt
L = Brand L Laundry Detergent
L1 = Boards
L2 = Barometer
L3 = License Plate
L4 = Tubers
S = Brand J Soap
S1 = Weeds in a pond

NOTE: Pictures were shown for 5 seconds, and "down time" was 1 second. The blank space represents down time. In the experimental group, participants viewed 80 pictures and 39 down times. In the control group, participants viewed the same 80 pictures and down times. However, they were randomly presented.

prior impression about the restaurant. More important, a pizza restaurant was used by Smith (1991), and she identified salient attributes that were relevant to the product category.

Filler material. To detract participants' attention from the focal CS-US pairing, filler pictures were employed. The use of filler pictures is essential when conducting classical conditioning experiments. An alternative explanation for the results obtained in a classical conditioning study is demand artifact (Kellaris and Cox 1989). Using filler pictures will decrease hypothesis guessing and reduce the possibility of demand artifact interpretation of the results (Kim et al. 1996; Stuart et al. 1987). The filler material used for the study consisted of three fictitious brands (R Cola, J Soap, and M Laundry Detergent) and various US that generated no affect and conveyed no systematic meaning. The filler materials were identical to the ones used in Kim et al. (1996). They were chosen because the target product (i.e., L Pizza House) for this study was the same as their study, and because we are following their procedure, the choice of the same filler material was appropriate.

Presentation of CS and US. The presentation of CS and US was similar to the 10-repetition procedure used in Kim et al. (1996). Ten-repetition was chosen because it was commonly used as the level of exposure to CS-US pairing (e.g., Kim et al. 1996; Stuart et al. 1987). An example of the 10-repetition procedure is presented in Figure 1. In the conditioning group, the participants viewed the CS (L Pizza House) for 5 seconds followed by a 5-second presentation of the US (kitten). After the presentation of the CS-US pairing, 1 second of "down time" occurred. Furthermore, filler CS (i.e., R Cola, J Soap, and M Laundry Detergent) and neutrally affective US (e.g., dirt pile, weeds in a pond, unpainted board, and barometer) used by Stuart et al. (1987) were included to distract participants from identifying the target brand. This reduced the probability of demand artifact interpretation of our results. Another way in which demand artifact was reduced was the variation of the numbers of US for one product (i.e., M Laundry Detergent). For L Pizza House (our target CS), R Cola, and J Soap, only one US was presented. However, M Laundry Detergent was paired with four different US, thereby inducing the participants to think that M Laundry Detergent was the target product.

A control group was included in the study. In the control condition, the participants were exposed to the same stimuli as in the conditioning group. However, the order of stimuli presentation was randomized, and there was no systematic pairing of CS and US. A random group is needed to test for the effects of conditioning (Rescorla 1967). By comparing the different groups, we can infer that the effects were due to conditioning.

Dependent measures. Three categories of dependent measures were used. They will be discussed in the order they were presented to participants. The first set gauged attitude toward three filler brands (i.e., R Cola, M Laundry Detergent, and J Soap), and the target brand (i.e., L Pizza House). Attitude toward L Pizza House was operationalized by using Stuart et al.'s (1987) 7-point, seven-item measure. The items consisted of good/bad, high quality/poor quality, like very much/dislike very much, superior/inferior, attractive/unattractive, pleasant/unpleasant, and interesting/boring. Cronbach's alpha for the scale was .92.

The second set of measures assessed inferential belief formation. The measures were included as a means to investigate whether the participants formed beliefs about the CS (L Pizza House) based on the US (picture of the kitten). If there was no difference in the salient beliefs between the conditioning and control group, we can assume that belief was not a factor in attitude formation. The

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items were composed of five 7-point probability scales in which participants estimated the likelihood that L Pizza House possessed various attributes. The attributes were derived from Smith (1991) and included (1) fast delivery, (2) delivered hot, (3) reliable, (4) provides many different toppings, and (5) tastes good. Furthermore, beliefs about M Laundry Detergent were also included to distract participants' attention from the focal brand and decrease hypothesis guessing.

The next set of measures assessed the participants' affective response to the US. It was a 7-point, three-item scale used extensively in other conditioning studies (e.g., Kim et al. 1996; Stuart et al. 1987). The items were pleasant/unpleasant, like/dislike, and left me with a good feeling/left me with a bad feeling. This set of measures was included as a manipulation check for participants' affective reactions toward the target US (i.e., kitten). Cronbach's alpha for the scale was .95.

Results

Hypothesis 1 suggests that the conditioning procedure will have an effect on attitude toward the product. This is because of the sequencing of the CS and US. Thus, the conditioning procedure should produce more favorable attitudes than the control procedure. The mean scores for the summated, seven-item scale were 23.71 and 18.08 for the conditioning and control groups, respectively. Attitude for the conditioning condition was significantly higher, $F(1, 34) = 5.23, p < .05$, than the control condition. The ω^2 was .133, and the power using $\alpha = .05$ was .61. The results indicate that the conditioning procedure has an effect on attitude toward the product, which supports Hypothesis 1.

Hypothesis 2 posited that product beliefs will not differ between the conditioning and control conditions. Consequently, the conditioning procedures will not have an effect on the generation of product beliefs. The mean salient belief scores for the conditioning and control groups are presented in Table 2. The difference in the mean values between the conditioning and control procedures, for all beliefs, was not significant ($p > .05$). This suggests that the US (i.e., picture of a kitten), did not provoke any beliefs that can be associated with the CS (i.e., L Pizza House). Furthermore, the mean values for affect toward the kitten were 15.30 and 14.21 for the conditioning and control groups, respectively. These mean values were not significantly different, $F(1, 34) = .49, p > .05$, suggesting that participants' positive affect toward the kitten was present in both conditions.

TABLE 2
Mean Scores for Beliefs (Experiment 1)

Group Means	*Fast Delivery*	*Delivered Hot*	*Different Toppings*	*Tastes Good*	*Reliable*
Conditioning group	3.76	3.76	3.29	3.41	3.65
Control group	3.26	3.73	4.21	2.80	3.47
F value	2.09	0.00	3.34	2.14	0.21
df	1, 34	1, 34	1, 34	1, 34	1, 34
p value	.158	.945	.077	.153	.653

NOTE: Higher mean scores represents stronger beliefs about "L Pizza House."

Discussion

The results of Experiment 1 seem to provide evidence for the effects of classical conditioning on attitude formation via direct affect transfer without product beliefs. Attitude in the conditioning group was more positive than the control group, which demonstrates conditioning effects. The US generated positive affect in both groups, and the measured beliefs were not significantly different between the two groups. Thus, we can state that the conditioning procedure allowed the participants in the conditioning condition to associate the product (i.e., L Pizza House) with the US (i.e., kitten) and enabled direct affect transfer to occur even when it seems that no product beliefs were involved. Furthermore, the procedure of using three filler CS and US reduced the possibility of demand artifact interpretation of the results.

As illustrated by the debate between Heath (1990) and Anand and Holbrook (1990), it is difficult to determine absolutely whether attitude formation was due solely to affect. The same is true with Experiment 1. We cannot unequivocally rule out product belief(s) as the underlying mechanism for the effects of conditioning on attitude toward the product because other beliefs that were not measured may have accounted for the conditioning effects. However, this was unlikely due to the extensive pretesting and reliance on past research (Smith 1991), which identified salient attributes that are relevant to the product category.

The results of this experiment demonstrate that the conditioning procedure can be used in conjunction with attractive visual stimuli that are devoid of product attribute(s) to shape a person's attitude toward a brand. However, this approach (i.e., direct affect transfer) may not always produce the greatest effect on attitude formation. Belief(s) may have a greater effect on attitude formation under certain conditions. The goal of Experiment 2 is to further examine the role of affect in classical conditioning and to determine whether repetition of US-CS pairing will moderate the process.

EXPERIMENT 2

Historically, when mediational issues for attitude formation were discussed, cognitive and affective mediations were considered rivals (cf. Eagly and Chaiken 1993; Fishbein and Ajzen 1975; Gorn 1982; Middlestadt 1990). This division was also present in the conditioning stream of research. Conditioning effects were hypothesized to be a function of a cognitive mechanism or an affective mechanism, but not both. However, recent reassessment of the classical conditioning paradigm suggests that the effects can be due to both affective and cognitive mechanisms

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(Kim et al. 1996; Rescorla 1988; Shimp 1991). Considering that both affective and cognitive mechanisms may mediate attitudinal conditioning concurrently, an important issue remains unresolved: Which mechanism has the greater effect on attitude formation, and under what conditions will affect produce the greater effect?

Determining which mechanism yields the greater conditioning effect depends on the characteristics of the chosen US. If the US has the ability to elicit very positive affect and weak product beliefs, then the affective mechanism may dominate attitude formation. However, if both affect and product beliefs are present, the situation in which the US is presented will moderate the relative impact of the affective and cognitive mechanisms. One such situation may be the number of repetitions (conditioning trials).

Number of Repetitions/Conditioning Trials

Prior research suggests that advertising repetition plays an important role in "wearin" (Pechmann and Stewart 1988). Wearin refers to the number of advertising repetition(s) it takes to have a significant positive effect on the consumer. Krugman (1975) suggests that it takes three repetitions of an advertisement to have an impact on the consumer. However, this may not always be the case. A variable that may play an influential role in repetition and attitude formation may be the type of advertising execution used (i.e., informational or transformational). Pechmann and Stewart (1988), by varying the number of advertising repetitions, suggest that affective advertisements require smaller number(s) of repetition than cognitive-based advertisements to produce positive effects. This indicates that different processing mechanisms may have a differential impact on attitude formation depending on the number of repetitions. Similarly, in evaluating attitudinal conditioning, studies have varied the number of conditioning trials from 1 (Stuart et al. 1987) to 28 (Bierley et al. 1985). The results of the studies indicate that conditioning occurred irrespective of the number of conditioning trials. Although effects can be obtained with a single or large numbers of trials, the process underlying the conditioning effects may be different, and to explain the effects of the different processes on attitude formation, the Elaboration Likelihood Model (ELM) is used as the basic framework.

ELM (Cacioppo and Petty 1985) stipulates that attitude formation is based on thoughtful processing of the message (central route), peripheral cues (peripheral route), or both.

Classical conditioning is viewed as a peripheral mechanism for attitude formation (Cacioppo, Marshall-Goodell, Tassinary, and Petty 1992). The premise of this view is that a peripheral cue (US) will spontaneously provoke a positive or negative affective response and when the participants become aware of the contingency between the peripheral cue and the product (CS), the affect will transfer from the US to the CS. This position, that classical conditioning is a peripheral mechanism for attitude formation, is not complete. Kim et al. (1996) indicated that classical conditioning can also be applicable to the central route when the US has the ability to convey meaning that is salient to the CS. Thus, classical conditioning has the ability to influence the peripheral route through affect transfer and the central route through belief formation. If classical conditioning has the ability to influence the peripheral and central routes, which has the greater impact on attitude formation and how does repetition moderate these processes?

Central route processing occurs if the individual is motivated, has the ability, and the opportunity to process the message (Kardes 1994). Otherwise, attitude formation will be dominated by the peripheral route. Numerous variables have been examined to determine what effects they have on motivation, ability, and opportunity. The summary of results suggests that motivation is low when involvement is low (Petty, Cacioppo, and Schumann 1983). Ability is low when the domain-specific knowledge of the subject is low (Alba and Hutchinson 1987). Opportunity is low when the message is time compressed (Moore, Hausknecht, and Thamodaran 1986). These studies seem to indicate that various factors will influence which processing mechanism will dominate attitude formation, and the key elements that will dictate the mechanism are motivation, ability, and opportunity.

Focusing on opportunity, another variable that may have a greater impact than time compression of the message is repetition. Cacioppo and Petty (1985) conducted a study in which they manipulated the number of exposures for an advertisement. The participants viewed the advertisement one, four, or eight times. The results showed that as repetition increased, the amount of product-related thought also increased. The implication of their result is that repeated presentations of an advertisement will provide the audience with a greater opportunity to process the content of the advertisement, and this will lead to a predominantly belief-based attitude formation. In the context of classical conditioning, the number of repetitions can interact with the US to dictate which mediational process will have a greater effect in shaping attitudes. In the case of multiple pairing of CS and US, the participants are afforded the opportunity to process the visual relationship and extract relevant product belief(s). Thus, greater numbers of CS-US exposures will lead to greater elaboration, and formation of attitudes will be dominated by the cognitive mechanism. Alternatively, when participants are exposed to a limited number of CS-US pairings, such as a single trial, they do not have the opportunity to process the visual relationship to a great extent. The participants, under this state, will focus more on the peripheral cues (i.e., attractiveness of the stimulus), and attitude formation will be dominated by the affective mechanism.

H3: Cognitive mediation, compared with affective mediation, will dominate attitudinal conditioning in a multiple-trial condition.

H4: Affective mediation, compared with cognitive mediation, will dominate attitudinal conditioning in a single-trial condition.

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Method and Procedures

Except for a different US, the procedure was identical to Experiment 1. The US employed in this experiment was a race car, and this stimulus was the same one used by Kim et al. (1996) in their Experiment 1. Thus, the race car was paired with the focal CS (L Pizza House).

Conditioned and unconditioned stimuli. To test the effects of affect and belief on brand attitude, a US that has the ability to generate specific belief associated with a particular CS and evoke positive affect is needed. On the basis of Kim et al. (1996), L Pizza House and a race car were identified as this CS and US.[1] The results of their Experiment 1 suggest that the US (i.e., a race car) may have elicited positive affect and certain product belief (i.e., fast delivery) from the participants. Thus, the L Pizza House and the race car were considered to be appropriate CS and US for this study.

Participants and procedure. Eighty-four undergraduate students were randomly assigned to one of four conditions (multitrial conditioning, multitrial control, one-repetition conditioning, and one-repetition control). The subject size consisted of 24, 19, 21, and 20 for the multitrial conditioning, multitrial control, one-repetition conditioning, and one-repetition control groups, respectively. Just as in Experiment 1, the participants viewed the stimuli on a television monitor in a classroom setting. Immediately after viewing the stimuli, participants were asked to complete the questionnaire.

Presentation of CS and US. Multitrial conditioning was operationalized as 10 repetitions. This was in keeping with prior studies where 10-repetition conditioning was commonly used as the level of exposure to CS-US pairing (e.g., Kim et al. 1996; Stuart et al. 1987).

The presentation of the stimuli was consistent with the prior experiment. Except for a different US, the presentations of the 10-trial conditions, conditioning, and control were identical to Experiment 1. For the single-trial conditioning group, each filler brand and the target brand were paired with their corresponding US only once, along with the 1 second down times. The order of the CS-US presentation was randomly chosen. In the 1-trial control condition, the participants viewed the same stimuli. However, the order of the stimuli and down time were completely randomized.

Dependent measures. As in Experiment 1, the participants provided their attitudes toward the filler products and the target product (L Pizza House) on a 7-point, seven-item semantic-differential scale. The seven items were identical to those used in Experiment 1. Cronbach's alpha for the scale that assessed attitude toward L Pizza House was .92.

The second set of measures gauged product beliefs about L Pizza House and M Laundry Detergent. Five beliefs that were relevant to a pizza restaurant (Smith 1991) were assessed by using a 7-point probability scale with end points labeled *highly probable* and *not probable at all.* Although five beliefs were measured, only the focal belief conveyed by the US (i.e., fast delivery) will be used in the analyses (Kim et. al. 1996; Smith 1991).

The final set of measures appraised the participants affective response to the US. The US of interest was a race car, and the items to gauge the subjects' affective reaction to the race car were pleasant/unpleasant, like/dislike, and left me with a good feeling/left me with a bad feeling. Crobach's alpha for the 7-point, three-item scale to measure affect toward the race car was .94.

Results

Hypothesis 3 suggests that greater numbers of CS-US pairing will lead to a higher reliance on cognitive mediation in attitude formation. To test this hypothesis, we must first show the effects of conditioning on attitudes in the 10-trial condition. To show this effect, an ANOVA was conducted. Mean scores on the summated, seven-item attitude scale were 25.00 and 19.11 in the conditioning and control groups, respectively. The higher mean score indicates that attitude was more favorable in the conditioning group than the control group, $F(1, 40) = 4.14$, $p < .05$.

The ANOVA result indicates that conditioning has an effect on attitude formation.

However, ANOVA does not allow us to test which mediational process influenced attitude toward the product and which had a greater impact on that attitude formation. To test this hypothesis, a path analysis using LISREL was conducted. This analysis allows us to directly compare the relative strengths of the two mediational processes (represented as paths in the model). Provided that the path coefficients are significantly different from each other, the higher the path coefficient, the greater the impact on attitude. Furthermore, to test the equality of the path coefficients, a chi-square difference test was performed by comparing the unconstrained model with the constrained model where the two path coefficients are set to be equal. If the chi-square difference is significant, then a difference between the two paths exists.

The results, presented in Figure 2, provide the standardized LISREL path coefficients for the two mediational processes. The standardized LISREL path coefficients were .39 and .50 for affect to attitude and belief to attitude, respectively (both significant at $p < .05$).

The chi-square difference test was conducted to ascertain whether belief had a significantly greater effect than affect on attitude toward the brand. Although the path coefficient was higher for belief versus affect, the difference was not significant (chi-square difference = .86, $df = 1$, $p > .05$). This implies that the affective mechanism and the cognitive mechanism were equally important in the formation of attitudes, and Hypothesis 3 was not supported. The effects of belief and affect on attitude formation were significant, but they did not differ significantly from each other.

Hypothesis 4 suggests that affective mediational process will dominate attitude formation when participants

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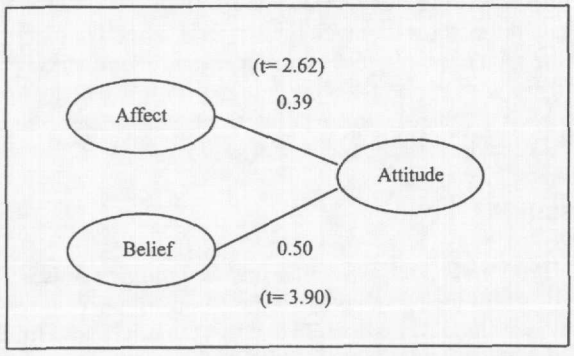
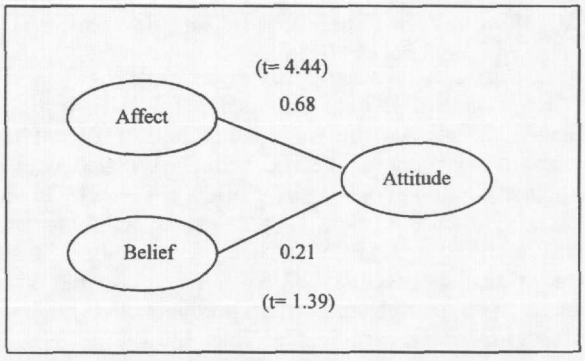
FIGURE 2
Path Analysis of Affect and Belief on Attitude Formation; 10 Repetitions



NOTE: The difference in χ^2 (for this model relative to the one that constrains the path coefficients to be equal) = .86, $df = 1$, $p > .05$.

FIGURE 3
Path Analysis of Affect and Belief on Attitude Formation;1 Repetition



NOTE: The difference in χ^2 (for this model relative to the one that constrains the path coefficients to be equal) = 4.0, $df = 1$, $p < .05$.

are exposed to a limited number of CS-US pairing. The mean scores for attitude were 27.38 and 22.20 for the single-trial conditioning and control conditions, respectively. These means reveal a significant difference in product attitude, $F(1, 40) = 6.21$, $p < .05$, and demonstrate that the conditioning procedure influenced product attitude.

To test which mediational process had a greater effect on attitude, a path analysis using LISREL was again conducted. The results, presented in Figure 3, indicate that the path from affect to attitude was significant ($t = 4.44$, $p < .05$), whereas the path from belief to attitude was not significant ($t = 1.39$, $p > .05$). The standardized LISREL coefficient for the affect-attitude path was much higher (.68) than the belief-attitude path (.21). The difference was significant at the .05 level (chi-square difference = 4.0, $df = 1$, $p < .05$). This implies that the affective mechanism played a major role in attitude formation, whereas the cognitive mechanism was negligible.

Discussion

Historically, affective and belief-based mediations were viewed as rivals. Researchers thought that the presence of one form of mediation precluded the other from playing a role in attitude formation. Only recently has this view been challenged (Kim et al. 1996), and the results of Experiment 2 also reveal that affective and belief-based mediation are not rivals. The presence of one mediational process does not exclude the other in attitude formation. Although multiple mediational processes may occur simultaneously, they have differential effects on the shaping of attitudes, and the effects are moderated by the number of exposures. The results showed that affective mediation dominated in shaping attitudes with one CS-US pairing. However, as the numbers of CS-US pairing increased, belief-based mediation also played a prominent role in attitude formation.

These results are consistent with the ELM model (Petty and Cacioppo 1985). The model postulates that repetition of the persuasive message will influence the process by which people form an attitude. With limited numbers of exposures, as in our one-repetition condition, participants may focus on the attractiveness of the stimulus in forming an attitude toward the object. This occurs because the limited exposures provide scant opportunity for participants to process the information associated with the visual stimuli. Under this condition, the affective mediation will have a significant impact in shaping attitudes. The results of Experiment 2 seem to indicate that this was the case. Furthermore, as the number of exposures increases, as in our 10-repetition condition, the participants have the opportunity to process the visual stimuli and extract product attributes. Thus, attitudes are, under this situation, influenced by the belief mechanism. This mechanism is considered the central route to persuasion, and the results of Experiment 2 also provide evidence for this mechanism. Taken together, the results of Experiment 2 are compatible with the ELM model of attitude formation.

GENERAL DISCUSSION

Advertisers use the powerful effects of pictures to shape brand attitudes. They assume that by associating their brand with attractive stimuli that evoke positive affect, even though the picture does not provide any product information, consumers' attitudes can be shaped. As an example, a recent Pepsi advertisement, which won the *USA Today*'s ad meter during Super Bowl, followed this strategy. (For this contest, 139 adult volunteers rated the commercials they viewed, during the Super Bowl, on the basis of how much they liked or disliked each commercial.) This advertisement featured grizzly bears dancing in a chorus line to the tune of Village People's *YMCA*. People watch-

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ing this ad could not generate any belief(s) about Pepsi. However, the affect generated with the dancing bears spelling out Pepsi may have transferred to Pepsi. The results of Experiment 1 seem to support such an affect-transfer process.

These results have important managerial implications. One goal of advertisers is to garner positive attitudes toward their brand. To accomplish this task, advertisers can rely on classical conditioning principles. Knowledge based on conditioning principles can be beneficial in providing assistance in choosing and arranging visual imagery for television advertisements. By viewing conditioning as a procedure (Janiszewski and Warlop 1993), we can follow the conditioning principles to structure a learning environment that will lead to greater positive brand attitude.

Experiment 1 demonstrates that by carefully structuring the visual elements in accordance to classical conditioning principles, affect can be used to influence attitude formation. However, the results of Experiment 2 suggest that the affective approach may not be the only mechanism that influences attitude formation. A variable that may moderate the relationship is repetition. When participants viewed the CS and US only once, affect was the only factor that influenced brand attitude. However, as the number of CS-US exposures increased, affect and product beliefs had an impact on brand attitude. Thus, as the number of exposures increases, the way in which the visual stimuli are processed also changes; from affective dominated to a dual processing.

The managerial implications of Experiment 2 are intriguing. First, the results indicate that conditioning occurred after one trial. Thus, the implication of the results is that advertising effects, in our case positive brand attitude, can be achieved with only one exposure. This questions mainstream thinking that multiple exposures are required for advertising effectiveness and supports the reemerging and somewhat controversial view that advertising effectiveness can be achieved with just a single exposure (Gibson 1996; Mandese 1995; Surmanek 1995). Using data from real commercials in a real setting for General Mills food products, Gibson (1996) concluded that a single advertising exposure can produce measurable effects. Thus, to build favorable brand attitude, advertising can be an important tool, even if resources limit the advertising campaign to just one exposure.

Second, to produce a maximally favorable brand attitude, advertisers should focus on different properties of the visual stimuli based on the frequency of exposures budgeted. Advertisers who have limited resources and can deliver only few exposures, may maximize their advertising impact by concentrating on visual stimuli that produce the highest level of positive affect. As suggested by the results of Experiment 2, direct affect transfer may dominate attitude formation in this situation, and by choosing a stimulus that provides the highest level of affect, attitude toward the product can be maximized. However, if the advertisers have the resources to repeat their advertisements and provide multiple exposures, they may achieve the greatest effect by selecting visual stimuli that not only create positive affect but also convey product beliefs to the consumers. The repeated exposures may allow the consumers the opportunity to thoughtfully process the cogent advertisement.

The classical conditioning paradigm has a lot to offer to advertisers. Numerous television commercials feature a fundamental structure consisting of multiple presentations of their brand (i.e., CS) interspersed among other visual elements (i.e., US). To structure and choose the visual images, advertisers can follow established classical conditioning principles and laws to achieve the strongest advertising effects. Furthermore, our basic understanding of why conditioning affects attitude formation and what moderates this affect will help expand the conditioning paradigm and provide valuable guidelines in choosing and creatively organizing the stimuli for the advertising practitioners.

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NOTE

1. Kim, Allen, and Kardes's (1996) Experiment 1, using the race car as the unconditioned stimulus (US), found that inferential belief formation was the generative mechanism through which conditioning procedure influenced brand attitude. However, their mediational analysis indicated that it was a partial mediator. Although they did not specifically test the affect mechanism, there was a possibility that the US may also have generated affect that transferred to the brand.

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