Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making

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This article examines how consumer decision making is influenced by automatically evoked task-induced affect and by cognitions that are generated in a more controlled manner on exposure to alternatives in a choice task. Across two experiments respondents chose between two alternatives: one (chocolate cake) associated with more intense positive affect but less favorable cognitions, compared to a second (fruit salad) associated with less favorable affect but more favorable cognitions. Findings from the two experiments suggest that if processing resources are limited, spontaneously evoked affective reactions rather than cognitions tend to have a greater impact on choice. As a result, the consumer is more likely to choose the alternative that is superior on the affective dimension but inferior on the cognitive dimension (e.g., chocolate cake). In contrast, when the availability of processing resources is high, cognitions related to the consequences of choosing the alternatives tend to have a bigger impact on choice compared to when the availability of these resources is low. As a result, the consumer is more likely to choose the alternative that is inferior on the affective dimension but superior on the cognitive dimension (e.g., fruit salad). The moderating roles of the mode of presentation of the alternatives and of a personality variable related to impulsivity are also reported.

> Men, as well as women, are much oftener led by their hearts than by their understandings. (LORD CHESTERFIELD)

> With all its cleverness, however, decision theory is somewhat crippled emotionally, and thus detached from the emotional and visceral richness of life. (GEORGE LOEWENSTEIN 1996, p. 289)

Much of consumer research has been predominantly cognitive in nature, and the role of affect has received inadequate attention. This aspect of consumer research has been widely criticized by eminent researchers such as Bettman (1993), Hoch and Loewenstein (1991), and Holbrook and Hirschman (1982). Researchers recently have shown considerable interest in redressing this imbalance in various domains such as advertising (see, e.g., Batra and Stayman 1990; Edell and Burke 1987; MacKenzie, Lutz, and Belch 1986) and consumer satisfaction (Dubé, Belanger, and Trudeau 1996; Dubé and Morgan 1996; Mano and Oliver 1993; Oliver 1993; Westbrook and Oliver 1991). The consumer choice literature also has not been far behind in redressing this imbalance, with recent work that has provided both theoretical (see, e.g., Hoch and Loewenstein 1991; Loewenstein 1996) and empirical accounts of how affect influences consumer choices (see, e.g., Garbarino and Edell 1997; Luce 1998; Luce, Bettman, and Payne 1997). The broad purpose of this article is to add to this growing body of research in the consumer choice literature.

More specifically, as with the articles in the consumer choice literature cited above, the focus of this work is on choice as influenced by task-induced affect (i.e., affective reactions that arise directly from the decision task itself) rather than ambient affect (i.e., affective states that arise from background conditions such as fatigue and mood), which has been the predominant focus of work on the role of affect in decision making (see, e.g., Gardner [1985] and Isen [1997] for reviews of research on ambient affect; see also Yates [1990] for the distinction between task-induced and ambient affect). Second, in contrast to empirical work that has examined the effects of task-induced affect on

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consumer choice (Garbarino and Edell 1997; Luce 1998; Luce et al. 1997), where the focus has been on negative affect arising from the structure or difficulty of the task, the focus of this article is on the effects of positive affect arising from the stimulus (see Fiske and Taylor [1991] for a discussion of the importance of examining both negative and positive affect due to their differential effects on memory, judgment, persuasion, and decision making; in the rest of this article, we use the term "stimulus-induced affect" rather than "task-induced affect" to distinguish our work from previous work).

Another difference between our work and previous empirical work is based on the distinction made by Berkowitz (1993) between lower-order affective reactions, arising from relatively automatic processes, and higher-order affective reactions, arising from relatively more controlled, higher-order processes involved in thinking, reasoning, and consciousness (see Schneider and Shiffrin [1977] for a distinction between automatic and controlled processes). The focus of our work is on affective reactions that are elicited rather spontaneously by an alternative in the choice task, and, therefore, one could construe our work as being closer to the lower-order end of the continuum. In contrast, (1) Luce (1998) and Luce et al. (1997) focus on affect arising from making trade-offs between attribute values, which implies the use of more controlled processes—assessing the attribute values, comparing values, weighing costs and benefits, and so forth; and (2) Garbarino and Edell (1997) focus on affect arising from high cognitive effort, again implying the use of higher-order controlled processes.

In this article, we develop our conceptualization by integrating recent psychological (Berkowitz 1993; Epstein 1993; Leventhal 1984) and biological (LeDoux 1995, 1996) theories of affect. Our model proposes that, on exposure to alternatives in a choice task, two types of processes may be engendered, one affective in nature and the other cognitive in nature. The former process is likely to occur in a relatively automatic manner (i.e., less likely to be affected by the availability of processing resources), resulting in the affective reactions that could differ on two dimensions, valence (positive or negative) and intensity. The second type of process is likely to occur in a relatively more controlled fashion (i.e., more likely to be affected by the availability of processing resources), resulting in cognitions about the consequences of choosing the alternatives. Further, according to the model, (1) if the availability of processing resources is constrained, the consumer's decision is likely to be based on the first, relatively automatic process and, therefore, to be based on affect rather than on cognitions evoked by the alternatives; and (2) if processing resources are not constrained, the second, relatively controlled process is likely to play a more important role, and, hence, cognitions are likely to have a bigger impact on choice than when these resources are constrained.

We test the above conceptual model using a binary choice task in a context similar to the ones examined by Dhar and Wertenbroch (forthcoming), Hoch and Loewenstein (1991), Rook (1987), and Wertenbroch (1998), a context where the positive affect elicited by one alternative (chocolate cake) in the choice task is more intense than that elicited by another alternative (fruit salad), whereas the cognitions associated with the consequences of choosing the former alternative are predominantly negative. We focus on this specific context for two reasons. First, as indicated by Rook (1987), contexts such as the one examined in this article seem to be widely prevalent among American consumers. Second, by focusing on this specific context, we attempt to build on the seminal work by Berkowitz (1993), Hoch and Loewenstein (1991), and Rook (1987) in several ways. We build on Hoch and Loewenstein (1991) and Loewenstein (1996) by (1) empirically testing some of their key propositions relating to the effects of affect and cognitions on consumer choices and the role of presentation mode in moderating these effects and (2) examining the role of processing resources and of a personality variable related to impulsivity (Logan, Schachar, and Tannock 1997) in moderating the impact of affective and cognitive reactions on consumer choice. In our general discussion section we also attempt to extend our conceptual framework and integrate other elements of Hoch and Loewenstein's (1991) model.

We also contribute to Berkowitz's work by focusing on positive rather than negative affect, which has been the predominant focus of his research. In doing so, our goal is to demonstrate the generalizability of some of the key propositions made by Berkowitz. Finally, we not only provide evidence to further validate the work by Rook but also build on his work by way of operationalizing some of the key constructs and by examining, in a context involving actual rather than imaginary choices, how and under what conditions consumers are likely to give in to the spontaneously evoked affective reactions.

CONCEPTUAL FRAMEWORK

In this section, we first introduce Berkowitz's (1993) theory of how affect and cognition interact to influence behavior. We then discuss how Berkowitz's theory is consistent with other models of affect proposed by experimental psychologists such as Epstein (1993), Hoch and Loewenstein (1991), Leventhal (1984), and Zajonc (1980) and by neuropsychologists such as LeDoux (1987, 1995, 1996). As indicated earlier, our primary focus will be on affective reactions that occur in a relatively automatic manner rather than those that arise from more deliberate processes.

Theories Involving the Interaction between Affect and Cognition

Berkowitz (1993) proposes that three types of processes are likely to occur on exposure to a stimulus event. First, information related to the stimulus is subject to "relatively basic and automatic associative processes" (Berkowitz 1993, p. 10), which occur before the onset of cognitive processes such as "appraisals, interpretations, schemas, attributions, and strategies" (Berkowitz 1993, p. 12). These "crude and primitive" preattentive processes (see, e.g., Ullman [1984] for a discussion of such processes) occur relatively quickly and may give rise to lower-order affective reactions and action tendencies (approach or avoidance) based on a rapid assessment of the affective significance of the stimulus. Second, the information related to the stimulus is subject to more deliberative, higher-order cognitive processing, the outcome of which may serve to strengthen or weaken the action tendencies arising from the lower-order affective reactions. For example, in the case of anger, which has been the predominant focus of Berkowitz's work, higher-order cognitive processes might involve social rules regarding the appropriateness of the action tendencies arising from the lower-order affective reactions, which, in turn, might serve to suppress these action tendencies. Finally, the affective significance of the outcome of the higher-order processing may result in higher-order affective reactions and action tendencies that are engendered relatively slowly compared to lower-order affective reactions since the information is subject to more deliberative processes before these reactions can occur.

The model proposed by Berkowitz is consistent with those proposed by Epstein (1993), Leventhal (1984, 1993), and Zajonc (1980). In line with Berkowitz's theory, Epstein's Cognitive-Experiential Self-Theory (CEST) proposes that two conceptual systems tend to operate in parallel in any given task: an experiential system, which is affective in nature and is associated with crude and rapid processing, and a rational system, which is cognitive in nature and is associated with a more refined and deliberative processing. Leventhal similarly proposes that affective reactions can arise from two routes: an "innate route" accompanied by sensory-motor processes that generate primitive or partially formed affective reactions and a memory route that involves schematic and conceptual processing. Also, the propositions made by Hoch and Loewenstein (1991) and Zajonc (1980) are consistent with Berkowtiz's argument that affective reactions can occur relatively automatically without an active role of higher-order cognitive processes. Zajonc has argued that affect is precognitive in nature, occurring without any extensive perceptual and cognitive processes, and precedes in time these higher-order processes. Hoch and Loewenstein propose that feelings of desire that consumers often experience in shopping situations may "occur with the minimum conscious deliberation characteristic of automatic or mindless behavior" and "with little or no cognition" (Hoch and Loewenstein 1991, p. 498). However, the difference between the propositions made by Zajonc and Hoch and Loewenstein and by Berkowitz is that, rather than stating that affect always precedes cognition, a view taken particularly by Zajonc, Berkowitz proposes that affective reactions can also arise in a relatively controlled, postcognitive manner from deeper higher-order processing of incoming information.

The model proposed by Berkowitz also seems to be consistent with recent work by neuropsychologists (e.g., LeDoux 1987, 1995, 1996; see also Lang 1993). In line with Berkowtiz (1993), LeDoux argues that on exposure to an external stimulus, the following three events may occur: (1) "low-road" processes, centered in the limbic systems of the brain, that occur rapidly and may give rise to low-road affective reactions; (2) "high-road" cognitive processes, involving the cortical systems of the brain, "systems believed to be involved in thinking, reasoning, and consciousness" (LeDoux 1996, p. 161), which strengthen or weaken low-road affective reactions; and (3) "high-road" affective reactions, arising from the outcome of high-road cognitive processes, that occur relatively slowly compared to low-road affective reactions.

Affective-Cognitive Model of Consumer Decision Making

The models described in the previous section suggest that on exposure to an alternative in a choice task, two processes may occur. The first process is likely to occur in a relatively automatic manner and is likely to give rise to affective reactions, which could vary in terms of valence (positive or negative) and intensity. Since the first process occurs relatively automatically, these lower-order affective reactions are likely to be elicited even if processing resources are not allocated to the decision-making task. The second process is likely to be relatively more deliberative and controlled than the first and is likely to engender cognitions about the alternatives. These cognitions could arise from stimulus-based as well as memory-based processes and could be either favorable or unfavorable toward the alternatives in the choice task. Further, since the second process is more controlled in nature, the generation of cognitions is more likely to occur when processing resources are allocated by the consumer to the choice task than when they are not.

Further, in terms of the impact of affect and cognitions on the consumer's final behavior, the models described in the previous section suggest that if the availability of processing resources is constrained, the consumer's behavior is likely to be influenced primarily by the affective reactions elicited by the task: (1) the consumer is likely to choose (reject) an alternative if the affect elicited by it is positive (negative), and (2) the consumer is likely to choose (reject) the alternative that elicits the most intense positive (negative) affect. Conversely, if processing resources are available, the consumer's behavior is likely to be influenced primarily by the cognitions arising from higher-order processes.

The discussion thus far suggests that a critical variable that is likely to affect the relative impact of affective reactions and cognitions on choice is the availability of processing resources, a variable that has been central to various other popular models such as the Elaboration Likelihood Model (Petty and Cacioppo 1986), the Availability-Valence Model (Kisielius and Sternthal 1986), and the Characterization-Correction Model (Gilbert, Pelham, and Krull 1988). Two broad possibilities arise when one examines behaviors across different levels of this key variable: (1) affect and cognitions have the same valence, and (2) affect and cognitions have opposite valences. If affective reactions, which tend to drive action tendencies when processing resources are constrained, and cognitions, which tend to drive action tendencies when processing resources are available, have the same valence, then the direction of their impact on choice is likely to be the same. Consequently, the probability of choosing an alternative that elicits more intense and positive (negative) affect is likely to be the same or higher (lower) when processing resources are available than when they are not. Conversely, if affective and cognitive reactions have opposite valences, then they are likely to act in opposite directions (one prompting choice, the other prompting rejection). As a consequence, the probability of choosing the alternative that elicits more intense positive (negative) affective reactions is likely to be attenuated (enhanced) when processing resources are available compared to when they are not.

Choosing on Impulse—Moderating Role of Presentation Mode and Impulsivity

Rook (1987) characterizes impulse behavior as occurring when a consumer experiences positive affect spontaneously on confrontation with a product, which results in a sudden urge to choose the product eliciting these affective reactions. Also, impulse behavior is often seen as being associated with negative consequences for the decision maker (Hoch and Loewenstein 1991; Rook 1987). Stated differently, in contrast to positively valenced affective reactions, the cognitions associated with impulse behaviors are more likely to possess a negative valence (for an exception, see Rook and Fisher [1995]).

In line with the above characterization of impulse buying, let us consider a binary choice context where one alternative (say, chocolate cake) is superior on the affective dimension (i.e., is associated with more intense positive affect) but is inferior on the cognitive dimension (i.e., is associated with less favorable cognitions) compared to the other alternative (e.g., fruit salad). The affective-cognitive model suggests that when processing resources are constrained, choice is likely to be based primarily on the affective reactions engendered. As a consequence, under these conditions the probability is high that the consumer will end up choosing the alternative that is superior on the affective dimension (i.e., chocolate cake). In contrast, when processing resources are available, choice is likely to be based more on cognitions than on affect. Since the alternative that is superior on the affective dimension is also inferior on the cognitive dimension compared to the other alternative (i.e., fruit salad), the probability that the former will be chosen is likely to be attenuated when the availability of processing resources is high compared to when it is low. However, rather than predicting that processing resources will always affect choice in the manner indicated above, we propose that this effect will be qualified by at least two factors—the mode in which the alternatives are presented (real vs. symbolic) and the consumer's personality (i.e., whether the consumer tends to be impulsive or not).

Based on work by Mischel (Mischel 1974; Mischel and Moore 1973; Mischel, Shoda, and Rodriguez 1992), Loewenstein (1996) proposes that one factor that is likely to moderate the intensity of the affective reactions is the nature of presentation of affect-laden alternatives. The intensity of these reactions is likely to be higher when the presentation mode is real, that is, where real alternatives are presented to the decision maker, rather than when the presentation mode is symbolic, that is, where the consumer is exposed to photographs and/or descriptions of the alternatives. According to Loewenstein (1996), a potential cause for the moderating role of presentation mode is that a real presentation enhances the vividness and, therefore, makes it easier to sense the gratification arising from consuming the alternative compared to a symbolic presentation.

The above discussion suggests that the biggest impact of presentation mode is likely to occur when processing resources are low, which is when affect plays a major role in determining choice. More specifically, when processing resources are constrained, choice of the affect-laden alternative (i.e., chocolate cake) is likely to be higher when the presentation mode is real than when it is symbolic. In contrast, the effects of presentation mode on choice are likely to be diminished when processing resources become available, resulting in a convergence of the preferences for the affect-laden alternative across different presentation modes. Thus,

> **H1:** The effect of restricted processing resources on the choice of an affect-laden alternative will be moderated by the presentation mode, with the effect being greater when the presentation is real than when it is symbolic.

Further, based on Logan et al. (1997), Puri (1996), and Rook and Fisher (1995), we propose that the effects of processing resources on choice are likely to be moderated by a personality variable related to consumer impulsivity. According to Puri (1996), one aspect that differentiates people who are high on consumer impulsivity ("impulsives") and those who are low on this factor ("prudents") is the accessibility of cognitions related to impulse behaviors. Prudents apparently spend more time thinking about the consequences of engaging in such behaviors and, as a result, have more accessible cognitions compared to impulsives. This implies that when processing resources are low, individuals low on consumer impulsivity should be able to overcome their prepotent affective reactions by using highly accessible cognitions and, therefore, be less likely than those high on this factor to choose the option that is superior on the affective dimension (e.g., chocolate cake).

In contrast, when processing resources are available, accessibility should play a diminished role in influencing choice (see, e.g., Chaiken, Liberman, and Eagly [1989] for the effects of accessibility under conditions of low vs. high availability of processing resources). Impulsives should now be able to put in the effort required to retrieve previously stored cognitions from memory and, consequently, also should be able to overcome their prepotent affective reactions. As a result, the choices of individuals high on consumer impulsivity ought to converge with those who are low on this factor. Thus,

H2: The effect of restricted processing resources on the choice of an affect-laden alternative will be moderated by consumer impulsivity, the effect being greater with increased levels of consumer impulsivity.

EXPERIMENT 1

The purpose of experiment 1 was to examine the effects of spontaneously evoked affective reactions on consumers' preferences in a binary choice task when the processing resources available during the decision-making task are high versus low and to test the role of presentation mode in moderating these effects (Hypothesis 1). The specific context examined in this experiment was one where one alternative was superior on the affective dimension but inferior on the cognitive dimension, compared to the other alternative. Experiment 1 used a two-factor (processing resources with two levels [high vs. low] and presentation mode with two levels [real vs. symbolic]) between-subjects design.

Procedure

One hundred and sixty-five undergraduate students were randomly assigned across the four conditions. The experiment was carried out in two different rooms. In the first room, respondents were provided with instructions that stated that the study was about the effects of a change in environment on consumers' memories for information, and that, as part of the study, they would be asked to go to another room. Respondents were also told that they would be asked to memorize a number on exiting the first room and recall it in the second room. Further, respondents were told that they would be provided with a choice of snacks for participating in the study.

After the instructions had been read to the respondents, they were requested to leave the room one person at a time. On exiting the first room, each respondent was provided with a sheet of paper that contained directions to the second room. This sheet of paper was also used to keep track of whether a respondent belonged to the high or the low processing-resources condition. Respondents were then instructed to walk over to a cart that was visible from the first room. Respondents were told that they would find two snacks on display on the cart (which were not mentioned and which became visible only when respondents stood in front of the cart) and that they were to decide which snack they would like to have, choose a ticket for a snack, and then proceed to the second room.

Before respondents proceeded toward the cart and to the second room, the processing-resources manipulation was carried out by adopting a procedure that has been widely used in the literature (see, e.g., Gilbert et al. 1988; Gilbert, Giesler, and Morris 1995; Swann et al. 1990; Trope and Alfieri 1997). One group of respondents (low processing-resources condition) was requested to memorize a seven-digit number; another group (high processing-resources condition) was requested to memorize a two-digit number. The numbers were printed on index cards that were put in envelopes. When a respondent was ready to proceed to the cart and then to the second room, the experimenter opened an envelope, displayed the number briefly, and closed the envelope. Care was taken that respondents left the first room (one at a time) only after the previous respondent had made his/her choice of snack and had moved out of sight on his/her way to the second room. This was to ensure that respondents could not see the number to be memorized before their turn. Further, this procedure ensured that each respondent's decision was not influenced by another respondent's choice.

After respondents had picked up the ticket for their chosen snack, they proceeded to the second room, where they were given a booklet in which they were first asked to recall the number they had been asked to memorize. They then completed other measures described below. After completing the measures, the booklet, the ticket that indicated the respondent's choice of snacks, and the sheet containing directions to the second room (which served to keep track of the processing-resources condition that respondents were in) were collected and stapled together. At the end of each experimental session, the time of day when the session was carried out was noted on all the completed booklets (this variable did not covary significantly with any of the dependent variables and hence will not be discussed further).

Stimuli and the Presentation-Mode Manipulation

Two snacks—a piece of chocolate cake with cherry topping and a serving of fruit salad—were on display in transparent plastic containers that were placed on a cart stationed between the two rooms. To control for the prices and the supplier of these two snacks, a price sticker ($1) obtained from a local grocery store was affixed to each of the containers that were on display. The top of the cart was covered on three sides to ensure that the snacks were not visible until the respondent stood in front of the cart. This was to ensure that all respondents made their decisions only after they had walked up to the cart. The presentation mode was manipulated based on the work by Mischel and Moore (1973) and Loewenstein (1996), who suggest that presenting respondents with photographs of the alternatives, rather than the real alternatives, is likely to reduce the vividness of the options and hence the intensity of positive affect experienced by respondents. Consistent with these findings, the presentation-mode factor was manipulated by presenting the real snacks (chocolate cake and the fruit salad) to one group of respondents and presenting photographs of the snacks to another group. To be certain that the photographs were faithful reproductions of the respective real snacks, a pretest was carried out using respondents from the same population as the main experiment.[1]

[1]Fifty-two respondents were randomly assigned to two experimental conditions. One group of respondents rated two pieces of chocolate cake on one cart and two containers of fruit salad on a second cart (the order was

Further, to assess if, as per our conceptualization, the mode of presentation manipulated the vividness of the options, another pretest was carried out using 38 respondents from the same population as the main experiment. Some respondents rated the real snacks; others rated photographs of the snacks (the stimuli were identical to the ones used in the main experiment). Respondents were asked to rate the vividness of each of the two snacks, with the order being counterbalanced, on the following seven-point items: "not easy to visualize consuming the cake/fruit-salad (1)/easy to visualize myself consuming the cake/fruit-salad (7)," "not easy to imagine myself consuming the cake/fruit-salad (1)/ easy to imagine myself consuming the cake/fruit-salad (7)," and "not easy to picture myself consuming the cake/fruit-salad (1)/easy to picture myself consuming the cake/fruit-salad (7)." These items were adapted from Anand-Keller and Block (1997) and McGill and Anand (1989). Cronbach's alpha for these items measuring the vividness of the snacks was .81 for the cake and .79 for the fruit salad, so the responses were averaged to form one vividness-related variable for the cake and one for the fruit salad. A within-subjects ANOVA, with order of presentation and presentation mode as the between-subject factors and type of snack as the within-subject factor, revealed a significant main effect of presentation mode, and none of the other treatment effects were significant. Consistent with our conceptualization, respondents rated the real snacks as being more vivid (M $= 6.30$) than the photographs of the snacks ($\bar{X} = 5.13$, $F(1, 34) = 16.55$, $p < .0003$).

Measures

Respondents first recalled the number they had been asked to memorize and then responded to the remaining measures. Except for the first (choice), second (thought protocols), and the last (covariates) set of these remaining measures, the scales for all the other measures were adapted from Hoch and Loewenstein (1991), Loewenstein (1996), Puri (1996), and/or Rook and Fisher (1995). First, choice was measured by asking each respondent the following: "Just a moment ago you made a choice from two options, the cake and the fruit-salad. Please indicate below the option you chose." Responses to this question were compared with the tickets for the snacks that respondents had picked from the cart (across all respondents, the responses to the choice-measure matched perfectly with the snacks indicated on the tickets).

Respondents were then asked to describe, as completely as possible, whatever went through their minds while they were deciding between the two snacks. The instructions for reporting thought protocols were similar to those used in the literature (see, e.g., Edell and Keller 1989; Shiv, Edell, and Payne 1997). The protocols were coded by two independent judges for the total number of thoughts. Any statement that represented evaluations or descriptions of the options/attributes, prior experiences, thoughts about the consequences of choosing an option, or thoughts about the task was coded as a thought (all statements in the written protocols fell into one of these categories). Interjudge agreement was 95 percent, and coding discrepancies were resolved through discussion. These thought protocols gave us an opportunity to check if the processing-resources manipulation was successful—a higher number of thoughts was expected to be reported in the high than in the low processing-resources condition.

Each respondent was then asked to indicate the basis of his/her choice on five seven-point items that were presented after the following statement: "My final decision about which snack to choose was driven by." These items were anchored by "my thoughts (1)/my feelings (7)" (adapted from Rook and Fisher [1995]), "my willpower (1)/my desire (7)" (adapted from Hoch and Loewenstein [1991]), "my prudent self (1)/my impulsive self (7)" (adapted from Puri [1996]), "the rational side of me (1)/the emotional side of me (7)," and "my head (1)/my heart (7)." (The appropriateness of these and other items as measures of the underlying constructs of interest was tested through discussions with members drawn from the same population as the main experiment.) The Cronbach alpha for these items measuring the basis for respondents' decisions was 0.91, and, therefore, the responses to the five items were averaged to form a single variable (Decision Basis).

Based on our conceptualization, the presentation-mode factor was expected to influence the intensity of affective reactions elicited by the chocolate cake—the intensity was expected to be greater when the presentation mode was real than when it was symbolic. In order to test if the manipulation of the presentation-mode factor was consistent with our conceptualization, respondents were asked to rate if the following statements were apt descriptions of each of the two snacks: "I could sense a desire to grab it" (adapted from Hoch and Loewenstein [1991]), "I *felt* a strong, irresistible urge to take it," "I *felt* an impulse to take it" (the last two adapted from Rook [1987]), and "The emotional side of me was aroused when I saw it." These items were anchored by "description not apt (1)/description apt (7)." The order in which the respondents rated the two snacks was counterbalanced (in the various relevant analyses, none of the treatment effects involving the order of measurement was significant, and hence this variable will not be discussed further). Cronbach's alpha for these items measuring the

counterbalanced). Another group of respondents rated a piece of chocolate cake and a photograph of this piece of cake placed on the first cart and a container of fruit salad and a photograph of this container on the second cart (the order was counterbalanced). Respondents rated how similar the items displayed on each of two carts were in terms of the ingredients and other features on two items anchored by "very different (1)/very similar (7)," and "don't look alike (1)/look alike (7)." The correlations between these two items were 0.77 for the chocolate cake and 0.76 for the fruit salad, so they were averaged to form one measure for the chocolate cake and one for the fruit salad. A between-subjects ANOVA revealed that the similarity ratings were not different across the real and the photograph conditions. The mean similarity rating for the photograph of the chocolate cake compared to the real one ($\bar{X} = 6.24$) was no different from that for the real cakes ($\bar{X} = 6.36$; $F(1, 50) = .28$; $p > .20$). Further, the mean similarity rating for the photograph of the fruit salad compared to the real one ($\bar{X} = 6.05$) was no different from that for the real fruit salads ($\bar{X} = 6.22$; ($F1$, 50) $= .42$; $p > .20$).

affective nature of the two snacks was 0.97 for the cake and 0.95 for the fruit salad, suggesting that the items could be averaged to form one variable for the cake ($Affect_{cake}$) and one for the fruit salad ($Affect_{fruit}$).

An additional measure, derived from Crites, Fabrigar, and Petty (1994) and representing respondents' cognitions about consuming each snack, was obtained on four seven-point items for each of the two snacks (one at a time, with the order counterbalanced—again, none of the treatment effects involving the order of measurement was significant in the relevant analyses). The scales were anchored by "harmful (1)/beneficial (7)," "not good for health (1)/good for health (7)," "a foolish choice (1)/a wise choice (7)," and "useless (1)/useful (7)." Cronbach's alpha for these items was 0.88 for the cake and 0.84 for the fruit salad, and, therefore, the responses were averaged to form one variable for the cake (Cog_{cake}) and one for the fruit salad (Cog_{fruit}). Further, to ensure that the measures related to Decision Basis, Affect, and Cognitions represent different constructs, we carried out a factor analyses, which revealed that items representing the various constructs loaded uniquely on different factors.

Finally, respondents indicated their gender, whether they were health-conscious individuals, and whether they were cake and fruit-salad fanatics (the last three measures were obtained using seven-point items anchored by "seldom would describe me/usually would describe me"). These measures were collected to serve as covariates in the various analyses. Of these measures only the last three covaried significantly with the dependent measures in this and the next experiment.[2]

Results

Manipulation Checks. To ensure that we successfully manipulated the processing-resources factor, we needed to show that the number of thoughts reported in the protocols was significantly higher in the high processing-resources condition compared to the low processing-resources condition and that none of the other treatment effects were significant. Also, to provide evidence of success in manipulating the presentation-mode factor, we needed to show that $Affect_{cake}$ (i.e., the intensity of affect elicited by the cake) was significantly higher when the presentation mode was real than when it was symbolic. As summarized in Table 1, between-subject ANCOVAs with processing resources and presentation mode as the independent variables revealed that the manipulations were successful.

Further analyses were carried out to ensure that the stimulus material had the desired properties: (1) the cake was more affective in nature compared to the fruit salad when the presentation mode was real and less so when it was symbolic, (2) the presentation-mode manipulation influenced only respondents' ratings of the affective nature of the cake and not their cognitions about consuming the cake,

TABLE 1

INFLUENCE OF PROCESSING RESOURCES AND PRESENTATION MODE ON MANIPULATION-CHECK AND STIMULUS-RELATED MEASURES—EXPERIMENT 1

	Low processing resources		High processing resources	
	Real presentation	Symbolic presentation	Real presentation	Symbolic presentation
Total thoughts	2.30	2.35	3.54	3.28[a]
$Affect_{cake}$	4.28	3.47	4.15	3.36[b,c]
$Affect_{fruit}$	3.32	3.29	3.11	3.12[c]
Cog_{cake}	3.06	3.34	3.24	3.26[d]
Cog_{fruit}	6.12	5.88	5.94	5.91[d]

NOTE.—Results-manipulation check measures: [a] significant main-effect of processing resources ($F(1, 160) = 29.9$, $p < .0001$); other treatment effects NS; [b] Significant main-effect of presentation-mode ($F(1, 160) = 8.9$, $p < .003$); $\overline{X}$ higher when the presentation mode is real than when it is symbolic, both in the low and high processing resources conditions. Results-stimulus properties: [c] significant type of snack by presentation-mode interaction ($F(1, 160) = 4.5$, $p < .04$). Affect is significantly higher for the cake than for the fruit salad when the presentation is real, in the low ($F(1, 160) = 6.71$, $p < .05$) and high processing-resources conditions ($F(1, 160) = 7.35$, $p < .05$); $\overline{X}$ not different otherwise; [d] Significant main effect of type of snack ($F(1, 158) = 325$, $p < .0001$). Cognitions significantly less favorable for the chocolate cake compared to the fruit salad, irrespective of the level of the processing-resources and the presentation-mode factors.

and (3) consistent with our conceptualization, cognitions related to the cake were less favorable than those related to the fruit salad. As indicated in Table 1, within-subject ANCOVAs, with processing resources and presentation mode as the between-subject factors, the type of snack as the within-subjects factor revealed that all three requirements related to the stimuli were satisfied.

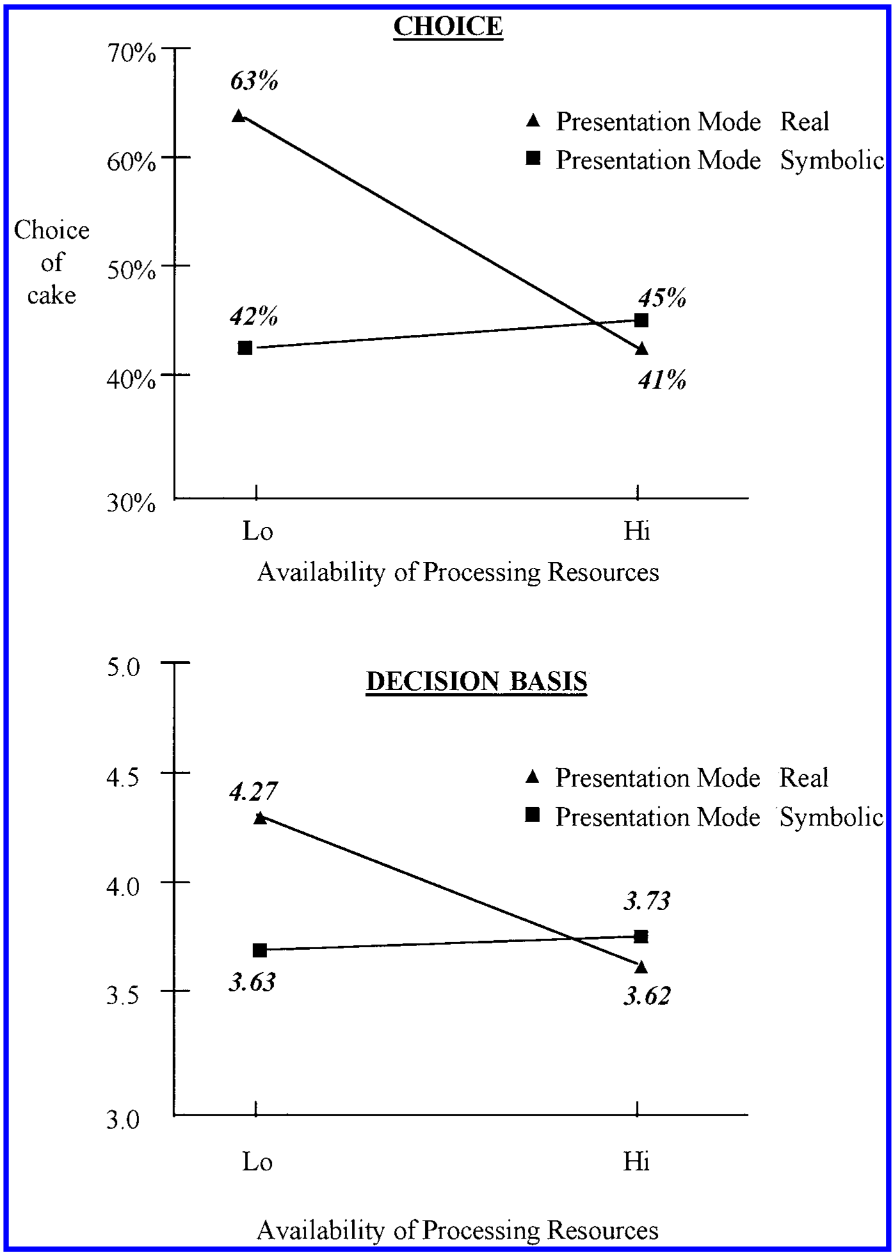
Choice. Consistent with Hypothesis 1, a logistic regression analysis revealed a significant processing-resources by presentation-mode interaction ($\chi^2 = 3.72$, $p = .05$), in addition to a significant main effect of processing resources ($\chi^2 = 5.36$, $p = .02$). As depicted in Figure 1, when processing resources were constrained, changing the presentation mode from real to symbolic by exposing respondents to a photograph of the alternatives rather than the real alternatives resulted in a reduction in the choice of the cake (63 percent when the presentation mode was real compared to 42 percent when it was symbolic; $z = 1.96$, $p < .05$).

Further, when the presentation mode was real, choice of the chocolate cake (superior on the affective dimension but inferior on the cognitive dimension compared to the fruit salad) was higher (63 percent) when the availability of processing resources was low than when it was high (41 percent; $z = 2.0$, $p < .05$). Also, compared to the conditions where the presentation mode was real (the downward-sloping line in Fig. 1), when the presentation mode was symbolic, choice of the cake was not different across the two processing-resources conditions (42 percent and 45 percent in the low and high processing-resources conditions, respectively; $z = .21$, $p > .20$).

[2]Checks were first made to ensure that these covariates did not interact significantly with the independent variables, so that the assumption of homogeneity of regression slopes was met.

FIGURE 1

EXPERIMENT 1—CHOICE AND DECISION BASIS AS FUNCTION OF PROCESSING RESOURCES AND PRESENTATION MODE



NOTE.—Higher numbers in the Decision-Basis graph indicate that the decision was driven more by affect than by cognitions.

Decision Basis. The variable Decision Basis (higher numbers indicate that respondents' choices were based more on affect than on cognitions) served to ascertain whether the decisions across the different conditions were based on respondents' affective reactions or cognitions. As shown in Figure 1, the pattern of results for Decision Basis mirrored that for choice. Consistent with our conceptualization, when the level of processing resources was low, respondents rated their choices as having been driven more by affect in the presentation-mode real condition ($\overline{X}$ = 4.27) than in the presentation-mode symbolic condition ($\overline{X}$ = 3.63; $F(1, 158) = 4.34$, $p < .04$). Further, when the presentation mode was real, respondents rated their choices as having been driven more by affect in the low processing-resources condition ($\overline{X}$ = 4.27) than in the high processing-resources condition ($\overline{X}$ = 3.62; $F(1, 158) = 5.78$, $p < .02$). Also, as with choice, when the presentation mode was symbolic, the means on Decision Basis were not different across the two processing-resources conditions ($\overline{X}$ = 3.63 and 3.73

in the low and high processing-resources conditions, respectively; $F < 1$).

Discussion

The results of experiment 1 indicate that, in a binary choice context, where one alternative (chocolate cake) is superior on the affective dimension but inferior on the cognitive dimension compared to the other alternative (fruit salad), choices are influenced by the level of processing resources allocated to the task and by the mode of presentation of the alternatives. Choice of the chocolate cake was higher when processing resources were constrained (by having respondents memorize a seven-digit number) than when the resources were not constrained (i.e., when respondents memorized a two-digit number). However, these results were obtained only when real alternatives were presented to respondents. Also, in the low processing-resources conditions, changing the presentation mode from real to symbolic by having photographs of the alternatives instead of the real alternatives resulted in a reduction in the choice of the cake.

Support for our conceptualization was also obtained by using a process measure, Decision Basis, which indicated whether respondents' choices were driven by their affective reactions (i.e., their desires and feelings, their impulsive self, their emotional side, and their heart) or by their cognitions (i.e., their willpower and thoughts, their prudent self, their rational side, and their head). Results for this Decision-Basis variable mirrored those for choice. Consistent with our conceptualization, respondents who were presented with the real alternatives indicated that their choices had been influenced more by their affective reactions when processing resources were constrained than when they were not. Further, when the presentation mode was changed from real to symbolic by having photographs of the alternatives rather than the real alternatives, the impact of affect on choice was reduced.

Finally, the results on respondents' affective reactions toward the chocolate cake ($\text{Affect}_{\text{cake}}$) and the fruit salad ($\text{Affect}_{\text{fruit}}$) and on Decision Basis provide an interesting insight into the underlying psychological processes that might have occurred in the presentation-mode real, low versus high processing-resources conditions. When real snacks were presented, respondents in both the low and the high processing-resources conditions expressed similar affective reactions toward the chocolate cake (which were more intense compared to the fruit salad). However, the results on Decision Basis suggest that these affective reactions influenced respondents' choices more when the availability of processing resources was low than when it was high. In other words, the results indicate that respondents who could allocate more processing resources to the task also experienced affective reactions arising from the chocolate cake but were better able to use their cognitions to avoid giving in to these affective reactions compared to respondents who were unable to allocate sufficient processing resources to the task.

EXPERIMENT 2

The purpose of experiment 2 was to test Hypothesis 2 regarding the role of consumer impulsivity in moderating the effects of processing-resources on choice. The procedure, stimuli, and the measures that were used in experiment 2 were similar to those used in the real presentation-mode conditions of experiment 1 (i.e., all respondents in experiment 2 were presented with the real snacks). Sixty-nine respondents from the same population as experiment 1 were randomly assigned to one of two processing-resources conditions.

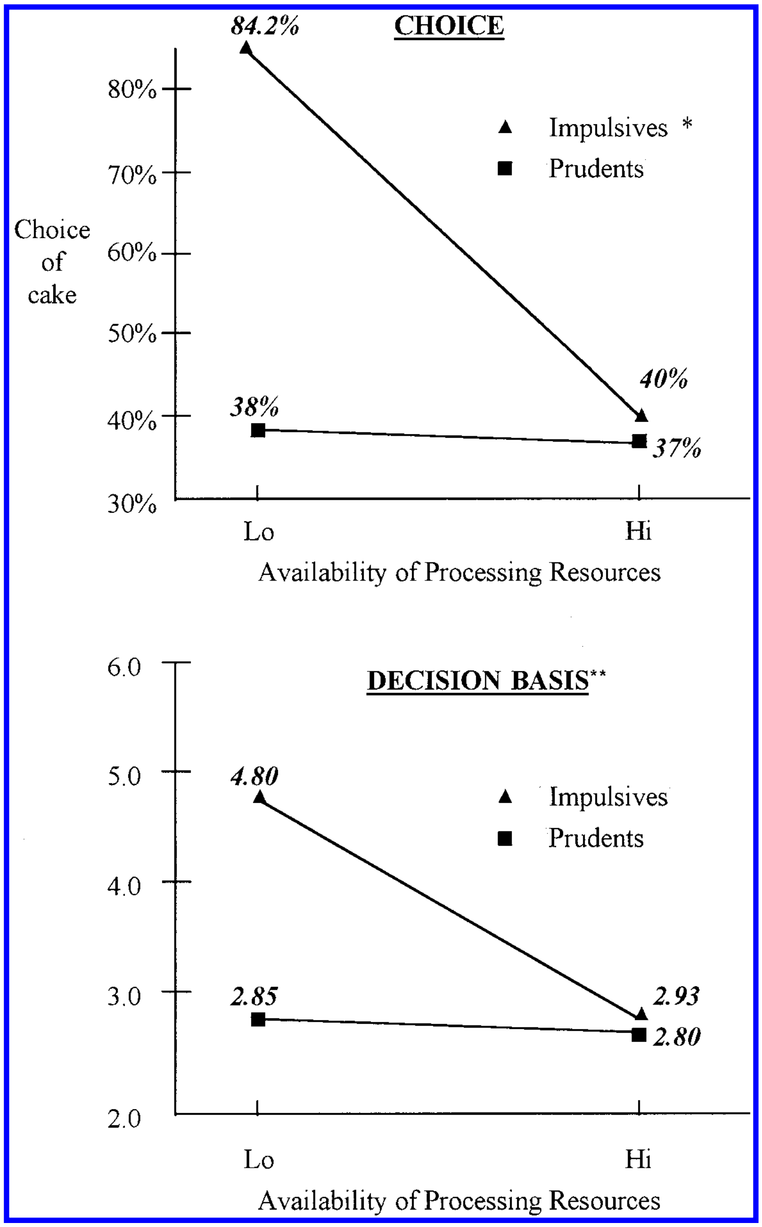
In addition the individual difference measure related to consumer impulsivity was included at the end of the question booklet. The items for this measure were based on Puri's (1996) Consumer Impulsiveness Scale. Respondents were asked to rate how well the following adjectives described them: "impulsive," "careless," and "easily tempted." These items were anchored by "seldom would describe me (1)/usually would describe me (7)." The midpoint was anchored by "sometimes would describe me." The Cronbach alpha for these three items was 0.77, so the responses were averaged to form one variable to represent the respondent's level of impulsivity. To test the reliability of this measure, particularly given that it could have been contaminated since it was presented after choice in the experimental booklet, a test-retest procedure was used (see, e.g., Edwards 1966) with a separate sample of respondents drawn from the same population as experiments 1 and 2. These respondents were presented with measures representing consumer impulsivity twice, with four weeks intervening between the two presentations. During the first phase of the test-retest procedure, respondents were presented with a battery of different measures in which were embedded those representing consumer impulsivity. Four weeks later, these respondents engaged in the same procedure used in experiment 1; that is, respondents were assigned to one of the four between-subject conditions, with the last set of measures representing consumer impulsivity. The correlation between these measures obtained four weeks apart was high (0.79), suggesting that presenting the measure of consumer impulsivity after choice did not adversely affect the conclusions drawn from the results of this experiment.

Results

Manipulation Checks. The thought protocols, which were coded by two independent judges for the total number of thoughts, served to examine if the manipulation of the processing-resources factor was significant (as in experiment 1, any statement that represented evaluations or descriptions of options/attributes, prior experiences, thoughts about the consequences of choosing an option, or thoughts about the task was coded as a thought; all statements in the written protocols fell in one of these categories). Interjudge agreement was 92 percent, and coding discrepancies were resolved through discussion. A between-subjects ANCOVA revealed that significantly more thoughts were reported in the high processing-resources condition ($\bar{X} = 4.19$) com-

FIGURE 2

EXPERIMENT 2—CHOICE AND DECISION BASIS AS FUNCTION OF PROCESSING RESOURCES AND CONSUMER IMPULSIVITY



NOTE.—*Consumer impulsivity has been dichotomized using a median split. **Higher numbers indicate that the decision was driven more by affect than by cognitions.

pared to the low processing-resources condition ($\bar{X} = 2.91$; $F(1, 61) = 16.26$, $p < .0002$), and none of the other treatment effects were significant. These results suggest that the processing-resources manipulation was successful.

Choice. Consistent with Hypothesis 2, a logistic regression analysis with processing resources (categorical) and consumer impulsivity (continuous) as the independent variables revealed a significant processing-resources by consumer-impulsivity interaction ($\chi^2 = 7.20$, $p = .007$), apart from a significant main effect of processing resources ($\chi^2 = 5.36$, $p = .02$). As depicted in Figure 2, when the availability of processing resources was constrained, choice of the chocolate cake was lower for individuals low on consumer impulsivity (38 percent) than for those high on this factor (84.2 percent; $z = 2.82$, $p < .05$; note that consumer impulsivity has been dichotomized in Fig. 2 using a median split for a better exposition of the results). Further, for individuals high on consumer impulsivity, choice of the chocolate cake was higher when the availability of processing resources was low (84.2 percent) than when it was high (40.0 percent; $z = 2.68$, $p < .05$). Choice of the cake was not different across the two processing-resources conditions for individuals low on consumer impulsivity (38 percent and 37 percent in the low and high processing-resources conditions, respectively; $z = .06$, $p > .20$).

Decision Basis. The variable Decision Basis served to ascertain whether the decisions across the different conditions were based on respondents' affective reactions or cognitions. The pattern of results for Decision Basis mirrored that for choice—a between-subjects ANCOVA revealed a significant interaction between processing resources and consumer impulsivity ($F(1, 62) = 11.31$, $p < .001$). As depicted in Figure 2, when the level of processing resources was low, individuals high on consumer impulsivity rated their choices as having been driven more by affect ($\bar{X} = 4.80$) compared to those low on this factor ($\bar{X} = 2.85$; $F(1, 62) = 9.31$, $p < .003$). Further, individuals high on consumer impulsivity rated their choices as having been driven more by affect in the low processing-resources condition ($\bar{X} = 4.80$) than in the high processing-resources condition ($\bar{X} = 2.93$; $F(1, 62) = 7.46$, $p < .008$). Also, as with choice, the means on Decision Basis for those low on consumer impulsivity were not different across the two processing-resources conditions ($\bar{X} = 2.85$ and 2.80 in the low and high processing-resources conditions, respectively; $F < 1$).

Discussion

The results of experiment 2 indicate that, in a binary choice context where one alternative (chocolate cake) is associated with more intense positive affect but with less favorable cognitions compared to the other alternative (fruit salad), choices are not only affected by the level of processing resources allocated to the task but also by a personality variable, consumer impulsivity. For respondents high on this individual-difference factor (i.e., for impulsives), choice of the chocolate cake was higher when processing resources were constrained (by having respondents memorize a seven-digit number) than when the resources were available (i.e., when respondents memorized a two-digit number). Further, when processing resources were constrained, individuals low on consumer impulsivity (i.e., prudents) were less likely to choose the chocolate cake compared to impulsives.

Support for our conceptualization was also obtained by using a process measure that indicated whether respondents' choices were driven by affect or by cognitions. Results for the Decision-Basis variable mirrored those for choice. Consistent with our conceptualization, impulsives indicated that their choices had been influenced more by their affective reactions when processing resources were constrained than when they were not. Further, consistent with our conceptualization, when the processing resources were constrained, the impact of affect on choice was attenuated for prudents compared to impulsives.

GENERAL DISCUSSION

Summary of Findings

The purpose of this article was to examine the influence of spontaneously evoked affect and cognitions arising from more deliberative processing on consumer choice across situations where processing resources are available versus constrained. Based on prior work by Berkowitz (1993), Epstein (1993), and Leventhal (1984), the primary proposition was that under conditions where the consumer does not allocate processing resources to a decision-making task, s/he is more likely to choose based on affect rather than on cognitions. As a consequence, the consumer is more likely to choose the alternative that is superior on the affective dimension but inferior on the cognitive dimension. In contrast, when the consumer does allocate processing resources to the decision-making task, the choice is likely to be based primarily on cognitions, resulting in a reduced likelihood that such an alternative will be chosen. Two additional propositions were made to qualify our primary proposition, one relating to the mode of presentation of the alternatives, and the other relating to a personality variable related to consumer impulsivity. The impact on choice of processing resources and, hence, affect compared to cognitions, was expected to be stronger (1) when the presentation mode was real (i.e., when real alternatives were presented) than when the presentation mode was symbolic (i.e., when photographs of the alternatives were presented), and (2) when the level of consumer impulsivity was high than when it was low.

The above propositions were tested in a binary choice context, where one alternative (chocolate cake) was superior on the affective dimension but inferior on the cognitive dimension compared to the other alternative (fruit salad). Findings from two experiments supported our propositions. Consistent with our conceptualization, choice of the chocolate cake was higher when the availability of processing resources was low than when it was high but only when respondents were presented with real alternatives and when the level of consumer impulsivity was high. In contrast, when the presentation mode was symbolic (i.e., respondents were presented with photographs of the alternatives), or when the level of consumer impulsivity was low, choice of the chocolate cake was the same irrespective of the availability of processing resources for the task.

Theoretical and Managerial Implications

Our work, together with recent empirical research by Garbarino and Edell (1997) and Luce (1998), clearly points to the importance of examining the role of task-induced affect in consumer decision making. Previous empirical work in this area suggests that consumers' decisions can be influenced by affect arising from higher-order processes such as making trade-offs between attribute values (Luce 1998) and from having to expend high cognitive effort. Our work extends previous work by demonstrating that consumers' decisions can also be influenced by affect arising in a relatively spontaneous manner from the stimulus, with little involvement of higher-order cognitive processes.

Our work has implications for the literature on impulse behavior as well. It extends previous work in this area by providing empirical evidence for the role of stimulus-induced affect in such behaviors, the role of processing resources in determining the relative influence of affect and cognitions on choice, and the moderating role of the mode of presentation of alternatives and of an individual difference variable related to impulsivity. In doing so, our work opens pathways to the next phase of research in this topic area, research that is aimed at building the edifice on an already strong foundation laid by Rook (1987) and by Hoch and Loewenstein (1991).

Our findings have tremendous implications for marketers as well. The core finding related to the effects of constrained processing resources on the choice of affect-laden alternatives suggests that any factor that reduces the availability of processing resources in the shopping environment is likely to increase impulse buying by consumers. Marketers of affect-laden products could therefore benefit from actions designed to constrain processing resources such as having distracting music or displays in the shopping environment. Another tactic that derives from anecdotal evidence that we obtained from a local grocery-store manager is to reduce the checkout time so that consumers deliberate less about what is in their shopping carts and end up leaving the store with products they chose on impulse.

The findings related to the mode of presentation of the alternatives also have tremendous implications for marketers. The growing popularity of the Internet and cybershopping suggests that more and more shopping situations are likely to involve presentation modes that are symbolic (i.e., alternatives being presented as digital photographs and/or as descriptions), which in turn is likely to result in choices being based less on affect and more on cognitions. This will particularly affect products that are currently being purchased for their hedonic rather than utilitarian value. Marketers of such products will need to consider ways of obviating this presentation-mode effect. One possibility that arises from the literature on mental imagery is to encourage consumers to vividly imagine themselves using the product so that the sensory processes that result from such imagery are no different than actual product usage.

Limitations and Directions for Future Research

The conclusions in this article are made with the usual caveats of decision-making experiments that are conducted in controlled environments. Even though the experiments used real alternatives rather than scenarios, they were conducted in a binary choice context and in a nonshopping environment with food products that were in plastic containers to control for factors such as aroma and with a student population. In other words, the propositions arising from our affective-cognitive model were tested in a context that was devoid of much of the richness that surrounds real-world brand choices. It is quite possible that as research in this topic area moves closer to reflecting how consumers behave in the real world, further refinement to the theorizing and conclusions presented in this article will be needed. Delineated below are several promising research directions that arise from examining our findings and the traditional view of impulse buying in the context of actual marketplace behaviors.

The traditional view of impulse behavior as being irrational has had a long history, dating back to as early as the turn of the twentieth century, with work in psychoanalysis (Freud [1911] 1959), a view that is still being shared by contemporary researchers (e.g., Rook and Fisher 1995). One question that future research needs to address is, How do consumers view impulse behaviors, and How do their views translate to impulse buying? Preliminary results from our follow-up work suggest that, in contrast to researchers' views of impulse behavior, consumers do not seem to view impulse behavior as normatively inappropriate, at least immediately after the behavior occurs. In an experiment that was similar to the ones reported in this article, respondents who had been subject to cognitive load were asked, immediately after they had indicated their choices, how satisfied they were with their decisions, and whether they would like to change their mind about the snack that they chose. It is interesting that as high as 90 percent of cake pickers stated that they would not change their minds, a percentage that was no different than that related to fruit-salad pickers—all this despite cognitions about consuming the cake being unfavorable, as reported in this article. More research is needed on this topic area, one area of which might be to examine consumers' postdecision processes that would account for discrepancies that we have found between decision satisfaction and cognitions about affect-laden products.

The above discrepancy between researchers' and consumers' views on impulse buying may partly account for a puzzling real-world phenomenon that also behooves us to investigate further: Why do we continue to observe consumers who, for example, know more about the importance of nutrition than ever before and yet struggle with efforts to control their weights and cholesterol levels? An answer to a piece of this puzzle might lie in processes that consumers engage in after impulse behaviors—immediately after purchase consumers may rationalize, resulting in the view that the behavior was appropriate, but after a period of time they may experience pangs of guilt, leading to attempts at self-control.

Another, rather trivial, answer to the above puzzle arising from our affective-cognitive model is that consumers often make decisions mindlessly, without allocating sufficient processing resources to access cognitions related to affect-laden options. A more plausible answer to the puzzle may come from expanding our affective-cognitive model to accommodate higher-order affective reactions as well. To refresh the reader's memory, this article focused on lower-order affective reactions that are elicited in a rather automatic fashion. The work by Berkowitz (1993) and LeDoux (1995, 1996) suggests that impulse behavior, prompted by affective reactions to options, can also arise as a consequence of higher-order processing, that is, when consumers allocate processing resources to the decision task. One possible direction for future research, which will not only provide answers to the above puzzle but also help infuse some of the richness of Hoch and Loewenstein's (1991) framework into our affective-cognitive model, is to examine situations where respondents make delayed choices of alternatives that are presented to them. For example, instead of having respondents make their decisions immediately (as in experiments 1 and 2), they could be asked to wait in the presence of the two options before they make their choices. Here, since processing resources are available, based on the findings of our study, respondents may initially decide against the affect-laden option. But the more respondents deliberate while waiting in the presence of the options, the more they might feel deprived at not being able to consume the affect-laden alternative, resulting in the respondents yielding to their temptations and choosing this option.

More research also is needed to assess the reliability of the variable Decision Basis that we used in our research. Until then, researchers planning to use this variable need to do so with some degree of caution. The basic assumption underlying the use of this variable is that consumers can access their mental processes leading to a decision. However, this assumption has been called to question by several researchers (see, e.g., Nisbett and Wilson 1977). Although it is quite possible that respondents in our experiments did have retrospective access to their mental processes when responding to the Decision-Basis measure, another possibility could also account for the results on this process measure. An alternative account could be that respondents simply inferred the bases of their decisions from their choices—a respondent choosing the cake may have inferred that, since cake is often associated with affective decision making, the choice was based more on affect than on cognitions. As a consequence, in situations where the choice of the chocolate cake was high (low), the results on Decision Basis were also high (low), yielding similar patterns of results on this variable and choice.

Finally, from a theory-building perspective, future research needs to follow up on recent advances in neuropsychology on emotions (e.g., LeDoux 1996). For example, one direction could be to examine neurological and physiological changes that occur when consumers are behaving on impulse and to assess how well the measures of affect that have been used by us and other experimental psychologists, including Luce (1998) and Garbarino and Edell (1997), correlate with neurological and physiological measures. Research in this direction will serve to integrate psychological and biological approaches to understanding affect, a strategy that is being advocated by a number of researchers (see, e.g., Isen 1990; Lang 1993) to increase "our understanding of all these phenomena and the processes that contribute to them" (Isen 1990, p. 89).

CONCLUSION

As indicated by eminent researchers such as Bettman, Hoch, Holbrook, and Loewenstein, the characterization of the consumer in previous decision-making research as a "thinking machine," driven purely by cognitions, is a poor reflection of reality. Moreover, the work by Dickson and Sawyer (1990), examining how consumers actually make decisions in various shopping contexts, suggests that consumers are more often mindless rather than mindful decision makers. This article was an attempt to integrate these two broad themes with the hope that it will infuse more life and realism into an already exciting area of research in consumer decision making.

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REFERENCES

Anand-Keller, Punam and Lauren G. Block (1997), "Vividness Effects: A Resource-Matching Perspective," *Journal of Consumer Research,* 24 (December), 295–304.

Batra, Rajeev and Douglas M. Stayman (1990), "The Role of Mood in Advertising Effectiveness," *Journal of Consumer Research,* 17 (September), 203–214.

Berkowitz, Leonard (1993), "Towards a General Theory of Anger and Emotional Aggression: Implications of the Cognitive-Neoassociationistic Perspective for the Analysis of Anger and Other Emotions," in *Advances in Social Cognition,* Vol. 6, ed. Robert S. Wyer and Thomas K. Srull, Hillsdale, NJ: Erlbaum, 1–46.

Bettman, James R. (1993), "The Decision Maker Who Came in from the Cold," in *Advances in Consumer Research,* Vol. 20, ed. Leigh McAlister and Michael L. Rothschild, Provo, UT: Association for Consumer Research, 7–11.

Chaiken, Shelly, Akiva Liberman, and Alice H. Eagly (1989), "Heuristic and Systematic Information Processing within and beyond the Persuasion Context," in *Unintended Thought,* ed. James S. Uleman and John A. Bargh, New York: Guilford, 212–252.

Crites, Stephen L., Jr., Leandre R. Fabrigar, and Richard E. Petty (1994), "Measuring the Affective and Cognitive Properties of Attitudes: Conceptual and Methodological Issues," *Personality and Social Psychology Bulletin,* 20 (December), 619–634.

Dhar, Ravi and Klaus Wertenbroch (forthcoming), "Consumer Choice between Hedonic and Utilitarian Goods," manuscript under editorial review.

Dickson, Peter R. and Alan G. Sawyer (1990), "The Price Knowledge and Search of Supermarket Shoppers," *Journal of Marketing,* 54 (July), 42–53.

Dubé, Laurette, Marie-Claude Belanger, and Elyse Trudeau (1996), "The Role of Emotions in Health Care Satisfaction," *Journal of Health Care Marketing,* 16 (Summer), 45–51.

——— and Michael S. Morgan (1996), "Trend Effects and Gender Differences in Retrospective Judgments of Consumption Emotions," *Journal of Consumer Research,* 23 (September), 156–162.

Edell, Julie A. and Marian Chapman Burke (1987), "The Power of Feelings in Understanding Advertising Effects," *Journal of Consumer Research,* 14 (December), 421–433.

——— and Kevin Lane Keller (1989), "The Information Processing of Co-ordinated Media Campaigns," *Journal of Marketing Research,* 26 (May), 149–163.

Edwards, Allen L. (1966), *Statistical Methods for the Behavioral Sciences,* New York: Holt, Rinehart & Winston.

Epstein, Seymour (1993), "Emotion and Self-Theory," in *Handbook of Emotions,* ed. Michael Lewis and Jeannette M. Haviland, New York: Guilford, 313–326.

Fiske, Susan T. and Shelley E. Taylor (1991), *Social Cognition,* New York: McGraw-Hill.

Freud, Sigmund ([1911] 1959), "Formulations Regarding the Two Principles of Mental Functioning," in *Collected Papers,* Vol. 4, New York: Basic, 13–21.

Garbarino, Ellen C. and Julie A. Edell (1997), "Cognitive Effort, Affect, and Choice," *Journal of Consumer Research,* 24 (September), 147–158.

Gardner, Meryl P. (1985), "Mood States and Consumer Behavior: A Critical Review," *Journal of Consumer Research,* 12 (December), 281–300.

Gilbert, Daniel T., Brian R. Giesler, and Kathryn A. Morris (1995), "When Comparisons Arise," *Journal of Personality and Social Psychology,* 69 (August), 227–236.

———, Brett W. Pelham, and Douglas S. Krull (1988), "On Cognitive Busyness: When Person Perceivers Meet Persons Perceived," *Journal of Personality and Social Psychology,* 54 (May), 733–740.

Hoch, Stephen J. and George F. Loewenstein (1991), "Time-Inconsistent Preferences and Consumer Self-Control," *Journal of Consumer Research,* 17 (March), 492–507.

Holbrook, Morris B. and Elizabeth C. Hirschman (1982), "The Experiential Aspects of Consumption: Consumer Fantasies, Feelings, and Fun," *Journal of Consumer Research,* 9 (September), 132–140.

Isen, Alice M. (1990), "The Influence of Positive and Negative Affect on Cognitive Organization: Some Implications for Development," in *Psychological and Biological Approaches to Emotion,* ed. Nancy L. Stein, Bennett Leventhal, and Tom Trabasso, Hillsdale, NJ: Erlbaum, 75–94.

——— (1997), "Positive Affect and Decision Making," in *Research on Judgment and Decision Making: Currents, Connections, and Controversies,* ed. William M. Goldstein and Robin M. Hogarth, Cambridge: Cambridge University Press, 509–534.

Kisielius, Jolita and Brian Sternthal (1986), "Examining the Vividness Controversy: An Availability-Valence Interpretation," *Journal of Consumer Research,* 12 (March), 418–431.

Lang, Peter J. (1993), "The Network Model of Emotion: Motivational Connections," in *Advances in Social Cognition,* Vol. 6, ed. Robert S. Wyer and Thomas K. Srull, Hillsdale, NJ: Erlbaum, 109–133.

LeDoux, Joseph E. (1987), "Emotion," in *Handbook of Physiology, Section 1: The Nervous System,* Vol. 5, *Higher Functions of the Brain,* ed. F. Plum, Bethesda, MD: American Physiological Society, 419–460.

——— (1995), "Emotion: Clues from the Brain," *Annual Review of Psychology,* 46, 209–305.

——— (1996), *The Emotional Brain,* New York: Simon & Schuster.

Leventhal, Howard (1984), "A Perceptual-Motor Theory of Emotion," in *Advances in Experimental Social Psychology,* Vol. 17, ed. Leonard Berkowitz, Orlando, FL: Academic Press, 118–182.

——— (1993), "A Componential, Self-Regulative Systems View of Berkowitz's Cognitive-Neoassociationistic Model of Anger," in *Advances in Social Cognition,* Vol. 6, ed. Robert S. Wyer and Thomas K. Srull, Hillsdale, NJ: Erlbaum, 135–146.

Loewenstein, George F. (1996), "Out of Control: Visceral Influences on Behavior," *Organizational Behavior and Human Decision Processes,* 65 (March), 272–292.

Logan, Gordon D., Russell J. Schachar, and Rosemary Tannock (1997), "Impulsivity and Inhibitory Control," *Psychological Science,* 8 (January), 60–64.

Luce, Mary Frances (1998), "Choosing to Avoid: Coping with Negative Emotion-Laden Consumer Decisions," *Journal of Consumer Research,* 24 (March), 409–433.

———, James R. Bettman, and John W. Payne (1997), "Choice Processing in Emotionally Difficult Decisions," *Journal of Experimental Psychology: Learning, Memory and Cognition,* 23 (March), 384–405.

MacKenzie, Scott B., Richard J. Lutz, and George E. Belch (1986), "The Role of Attitude Toward the Ad as a Mediator of Advertising Effectiveness: A Test of Competing Explanations," *Journal of Marketing Research,* 23 (May), 130–143.

Mano, Haim and Richard L. Oliver (1993), "Assessing the Dimensionality and Structure of the Consumption Experience: Evaluation, Feeling, and Satisfaction," *Journal of Consumer Research,* 20 (December), 451–466.

McGill, Ann and Punam Anand (1989), "The Effect of Vivid Attributes on the Evaluation of Alternatives: The Role of Differential Attention and Cognitive Elaboration," *Journal of Consumer Research,* 16 (September), 188–196.

Mischel, Walter (1974), "Process in Delay of Gratification," in *Advances in Experimental Social Psychology,* Vol. 7, ed. Leonard Berkowitz, New York: Academic Press, 249–292.

——— and Bert Moore (1973), "Effects of Attention to Symbolically Presented Rewards on Self-Control," *Journal of Personality and Social Psychology,* 28 (November), 172–179.

———, Yuichi Shoda, and Monica L. Rodriguez (1992), "Delay of Gratification in Children," in *Choice Over Time,* ed. George Loewenstein and Jon Elster, New York: Russell Sage Foundation, 147–164.

Nisbett, Richard E. and Timothy D. Wilson (1977), "Telling More than We Can Know: Verbal Reports on Mental Processes," *Psychological Review,* 84 (March), 231–259.

Oliver, Richard L. (1993), "Cognitive, Affective, and Attribute Bases of the Satisfaction Response," *Journal of Consumer Research,* 20 (December), 418–430.

Petty, Richard E. and John T. Cacioppo (1986), *Communication and Persuasion: Central and Peripheral Routes to Attitude Change,* New York: Springer.

Puri, Radhika, (1996), "Measuring and Modifying Consumer Impulsiveness: A Cost-Benefit Accessibility Framework," *Journal of Consumer Psychology,* 5 (2), 87–114.

Rook, Dennis W. (1987), "The Buying Impulse," *Journal of Consumer Research,* 14 (September), 189–199.

——— and Robert J. Fisher (1995), "Normative Influences in Impusive Buying Behavior," *Journal of Consumer Research,* 22 (December), 305–313.

Schneider, Walter, and Richard M. Shiffrin (1977), "Controlled and Automatic Human Information Processing: Detection, Search, and Attention," *Psychological Review,* 84 (January), 1–66.

Shiv, Baba, Julie A. Edell, and John W. Payne (1997), "Factors Affecting the Impact of Negatively versus Positively Framed Ad Messages," *Journal of Consumer Research,* 24 (December), 285–294.

Swann, William B., Jr., Gregory J. Hixon, Alan Stein-Seroussi, and Daniel T. Gilbert (1990), "The Fleeting Gleam of Praise: Cognitive Processes Underlying Behavioral Reactions to Self-Relevant Feedback," *Journal of Personality and Social Psychology,* 59 (July), 17–26.

Trope, Yaacov and Thomas Alfieri (1997), "Effortfulness and Flexibility of Dispositional Judgment Processes," *Journal of Personality and Social Psychology,* 73 (October), 662–674.

Ullman, S. (1984), "Early Processing of Visual Information," in *Handbook of Cognitive Neuroscience,* ed. M. S. Gazzaniga, New York: Plenum.

Wertenbroch, Klaus (1998), "Consumption Self-Control by Rationing Purchase Quantities of Virtue and Vice," *Marketing Science,* 17 (4), 317–337.

Westbrook, Robert A. and Richard L. Oliver (1991), "The Dimensionality of Consumption Emotion Patterns and Consumer Satisfaction," *Journal of Consumer Research,* 18 (June), 84–91.

Yates, Frank J. (1990), *Judgment and Decision Making,* Englewood Cliffs, NJ: Prentice Hall.

Zajonc, Robert B. (1980), "Feeling and Thinking: Preferences Need No Inferences," *American Psychologist,* 35 (February), 151–175.