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Coping with Unfavorable Attribute Values in Choice

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This paper examines how decision makers cope when faced with trade-offs between a higher quality alternative and a lower price alternative in situations where both alternatives involve relatively unfavorable versus relatively favorable values for quality. We hypothesize that choices between alternatives defined by unfavorable quality values will generate negative emotion, resulting in emotion-focused coping behavior. Choosing the higher quality alternative (i.e., maximizing the quality attribute in choice) appears to function as a coping mechanism in these situations. These apparently coping-motivated choice effects are found even after methods are implemented to control for more cognitive factors associated with manipulations of quality-attribute value, such as the possibility that unfavorable attribute values are associated with increased attribute ranges and therefore increased relative importance for quality. © 2000 Academic Press

INTRODUCTION

Imagine that you are taking a job in a new city and, because of the travel requirements of your job, you are constrained to select an apartment located in a particular section of the city. In fact, you must choose between only two apartments. The apartments are very similar, except one apartment is more expensive but offers greater safety to building occupants while the other apartment is cheaper and less safe. How would you make this choice? Would you

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simply focus on one attribute and maximize it (e.g., simply renting the safer apartment)? Or would you make a trade-off between the attributes (e.g., explicitly balancing your utility for lower rent against your utility for increased safety)? Further, would the manner in which you resolve this price–quality trade-off be influenced by the degree to which you perceived the average safety level of the two apartments to be relatively favorable or unfavorable? That is, would your decision differ depending on whether your choice presented a trade-off between a moderately safe versus an extremely safe apartment or between an extremely versus a moderately unsafe one?

The apartment example above captures two central aspects of choice: attribute conflict and attribute valence. First, choices are often characterized by *conflict*; specifically, choices typically confront the decision maker with mutually exclusive courses of action such that each satisfies some goal(s) relatively better than another (or others). The presence of conflict is arguably the most basic aspect of decision making, for an active decision is necessary only when there is some conflict between alternatives. Second, the *valence* of conflicting attributes may be relatively more favorable or unfavorable. For instance, an individual who describes an alternative as the "lesser of two evils" is reflecting a belief that the relevant decision conflicts involve unfavorable attribute values. In this paper, we are concerned with the emotional consequences of unfavorably valenced attribute conflicts and the associated implications for decision behavior.

The general notion of attribute valence is related to the extremely robust finding that decision behavior is typically characterized by loss aversion (e.g., Kahneman & Tversky, 1979). We extend work on loss aversion in two ways. First, we look at valence in the *absence* of specific reference points framing unfavorable versus favorable attribute values as losses or gains. Both real-world and laboratory choice situations are often characterized by absent, ambiguous, or multiple reference points (Kahneman, 1992). In understanding real-world decision behavior, it may often be more difficult to define losses and gains than it is to define more general impressions of favorable versus unfavorable attribute values. Similarly, while most preference-evaluation techniques can avoid presenting decision makers with explicit reference points, these techniques almost always mix decision trials associated with relatively favorable versus unfavorable attribute values. By evaluating attribute valence in the absence of explicit reference points, we seek to illustrate the generality of the relevant choice effects.

Second, following earlier work on decision conflict (e.g., Lewin, 1951; Miller, 1959), we address the *emotional* nature of decision valence, in particular how desires to cope with unfavorable attribute values may alter choice patterns. We develop and test the hypothesis that a decision maker's desire to cope with the emotional threat presented by choice options providing only unfavorable quality-attribute values leads to quality-maximizing decision strategies (i.e., choice of the alternative that is best on the unfavorably valenced quality attribute, with relatively little regard for the overall expected utility of that alternative). We illustrate that such coping effects operate over and above effects driven

by more cognitive or perceptual considerations (e.g., steeper value functions for losses). We do this by utilizing a highly controlled experimental paradigm, manipulating the valence of quality attribute values in the context of choices between a higher quality, higher price alternative and a lower quality, lower price alternative. We utilize price–quality attribute pairs because our prior work indicates that price provides a relatively emotionally neutral background condition against which we can compare reactions to varying (i.e., favorably valenced versus unfavorably valenced) quality-attribute values. In particular, decision makers appear to associate relatively little negative emotion with trading off currency attributes such as price or time (Luce, Payne, & Bettman, 1999). Further, we believe that distinctions between favorable and unfavorable attribute values are more likely for quality than for price. Quality attributes tend to involve scales with definable endpoints and therefore relatively clear midpoints, perceptually separating attribute values into relatively unfavorable and favorable regions. Conversely, prices are more fungible and therefore less likely to be associated with naturally definable upper and lower bounds within a particular decision domain.

CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Attribute Conflict, Value, and Negative Emotion

Conflict can be defined as the competing response tendencies arising when one of a set of multiple alternatives must be chosen (e.g., Berlyne, 1961; Coombs & Avrunin, 1976; Lewin, 1951). The relative value or valence of these alternatives has long been recognized as an important moderator of responses to conflict. For instance, Miller (1959) found that approach–approach conflicts (where choice is between desired but mutually exclusive alternatives) were particularly easy to resolve, in that movement toward one valued alternative caused a weakening of response tendencies toward the other(s). Approach–avoidance conflicts (where each alternative possesses both desired and undesired characteristics) were considered somewhat more difficult, while avoidance–avoidance conflicts (where choice is between undesired alternatives) were considered most difficult to resolve and often resulted in extended vacillation between alternatives. Thus, in general, the introduction of avoidance goals to a choice situation is proposed to make that situation more difficult. Miller's work operationalized this difficulty as the measured physical vacillation demonstrated by rats as they were confronted by choices between simple alternatives (i.e., an avoidance–avoidance dilemma between two electric shocks). However, this theory extends relatively directly to human choice, where vacillation is associated with aversive feelings of "decision conflict" or related negative emotion during choice (see Schneider, 1992).

This core distinction between approach and avoidance is often made in the more basic literature on emotion as well. For instance, Lazarus (1991) proposes that a major determinant of the (positive versus negative) valence of experienced emotion is an individual's cognitive appraisal of the degree to which the

goals that are relevant to a situation are likely to be threatened/blocked versus achieved. Both Miller's conflict theory and Lazarus's emotion theory address the individual's situation at a relatively macro level, making the commonsense prediction that less favorable decision alternatives or situations are associated with more negative affect. In order to make specific predictions regarding attribute valence, we extend this notion to include the valence of particular attributes within an overall decision situation. That is, following Coombs and Avrunin (1977), we extend the notion of valence in conflict to the level of specific attributes. Even within a situation that seems favorable overall (e.g., renting a new apartment), we believe that the introduction of specific attributes defined by unfavorable values can increase negative emotion. Clearly, more favorable attribute values are likely to be associated with increased subjective probabilities that the goals provided by the relevant attribute (e.g., the goal of survival for a safety attribute) will be achieved. This adaptation of Lazarus's (1991) emotion theory to the specific context of a multiattribute decision situation is consistent with previous work in which we have demonstrated that attribute identities and values jointly influence the emotional nature of decision tasks (e.g., Luce, 1998; Luce, Bettman, & Payne, 1997; Luce et al., 1999). Considering in particular price–quality trade-off situations, and focusing on the impact of variation in quality-attribute values, we make the following hypothesis:

EMOTION HYPOTHESIS. Decision makers will associate more negative emotion with price–quality trade-offs defined by unfavorable (versus favorable) quality-attribute values.

Coping with Unfavorable Quality-Attribute Values

Our emotion hypothesis predicts that unfavorable attribute values elicit negative emotion. Our primary question of interest is how do decision makers respond to these proposed emotional threats? Several different theoretical approaches address how cognitive processes are influenced by negative affect, resulting in multiple, opposing possible hypotheses. One important distinction among such approaches is that some involve hypothesized effects of *moods* generated independent of one's current cognitive task(s) while others specifically involve *emotions* generated in reaction to these current tasks (see Yates, 1990, on the task–ambient distinction). Ambient moods versus task-related emotions appear to influence cognitive processing in distinct ways (e.g., Bodenhausen, 1993; Christianson, 1992). As we are interested in how decision behavior is altered when the decision itself is emotion-laden, the emotion literature seems more directly relevant to our theoretical framework. However, we also review the mood literature below, as the influence of mood on *decision tasks* has been studied more extensively than has the influence of task-generated emotion.

Negative affect may function as a signal drawing attention to situations requiring consideration and/or action. This function is one possible explanation for the finding that negative moods elicit more careful, narrow, and analytic decision processing (Isen, 1987; Schwarz, 1990; Schwarz & Bless, 1991). Nega-

tive emotions may also function to draw attention to problematic situations, allowing immediate adjustments to one's action tendencies (e.g., Frijda, 1988; Mandler, 1990; Simon, 1967) and/or more controlled problem-focused coping attempts to solve the underlying problem leading to the negative emotion (e.g., Folkman & Lazarus, 1988; Lazarus & Folkman, 1984). Within a decision domain, careful, analytic processing is typically associated with extensive information search during which decision makers balance conflicting attributes (e.g., Frisch & Clemen, 1994; Payne, Bettman, & Luce, 1996). Further, problem-focused coping motivations will likely result in attempts to increase decision accuracy, that is, to resolve the problematic choice situation in the manner that best represents underlying preferences (Luce et al., 1997). Thus, if affect functions to increase analytic processing or problem-focused coping, we expect decision makers experiencing negative emotion as a function of price–quality trade-offs to balance price versus quality according to the relative importance of each attribute.

Two additional theoretical approaches lead to the opposite prediction regarding negative affect. First, negative affect may decrease attentional capacity, particularly if it is associated with increased arousal (e.g., Eysenck, 1986; Lewinsohn & Mano, 1993), actually degrading cognitive performance. Negative moods are also associated with an increase in the incidence of task-irrelevant thoughts (Siebert & Ellis, 1990). Second, decision makers experiencing negative emotion may be motivated to engage in simplified processing. In fact, even the finding that negative moods encourage more analytical processing may follow from decision makers' seeking to alleviate negative affect by immersing themselves in the relevant decision task (e.g., Isen, 1987). If such distraction is the underlying reason for these mood effects, the relationship between negative affect and analytical processing seems likely to reverse when the task itself is the source of negative affect. Such adaptivity in attempts to alleviate negative affect is consistent with Forgas's (1991) finding that decision makers experiencing negative moods favor personally rewarding over more task-competent partners, but only when they expect to directly interact with the partner and therefore to reap any mood-enhancing benefits of this interaction. Motivations to alleviate negatively emotional states are consistent with the second class of coping behaviors identified by Lazarus and Folkman (1984), namely emotion-focused coping, or coping that directly alters emotional experience (e.g., through avoidance) without addressing the underlying problem leading to the emotion. Thus, due to either degradation of cognitive ability or emotion-focused coping motivations, negative affect may elicit more simplified, avoidant decision processing.

Simplified or avoidant decision processing may take multiple forms. First, decision makers may avoid negatively emotion-laden decisions altogether, for instance by maintaining the status quo or transferring decision responsibility to another party (Janis & Mann, 1977; Luce, 1998). However, this sort of metalevel avoidance strategy may not always be available to the decision maker. Given that a decision is to be made, the decision maker may engage in partial avoidance by using a simplified strategy. One can array specific

decision strategies according to the degree of conflict confrontation (versus conflict avoidance) required by each. Hogarth (1987) notes that more conflict-avoiding decision strategies provide the dual advantage of minimizing both cognitive effort and emotional costs. For instance, a lexicographic decision strategy (choosing the alternative that is best on the most important attribute) avoids consideration of problematic between-attribute trade-offs by focusing the decision maker on one particular attribute in choice.

In summary, various approaches to the influence of affect on decision behavior result in contradictory predictions. We resolve these inconsistencies by arguing that individuals experiencing decision-elicited affect will exploit the nature of their decision task in order to engage in coping. That is, when the source of negative emotion (i.e., unfavorable quality-attribute values) is a salient aspect of the choice task, we hypothesize that coping behavior designed to mitigate the impact of this source will be generated. In price–quality trade-off situations characterized by unfavorable quality-attribute values, we expect decision makers to engage in coping by selecting the option with the best available value on the quality attribute that is the source of emotional threat. In effect, we expect decision makers to simplify their strategies by avoiding giving up quality when negative emotion is generated through concerns over this attribute. This reasoning is similar in spirit to work on mood congruency effects (e.g., Bower, 1981) in that negative affect associated with a particular attribute may fuel increased elaboration on and concern regarding that attribute and specifically regarding the dangers of accepting low values on the attribute. In addition, by maximizing quality, individuals will be able to express to themselves (and to others) that they did all they could in order to minimize the impact of the problematic, unfavorably valued attribute on decision outcomes. In fact, a lexicographic choice strategy maximizing quality may allow for a dominance structure (where the chosen option is cognitively framed as dominating all other options; see Montgomery, 1983) in that disadvantages of the chosen option (here, its higher price) are not explicitly acknowledged by one's decision rule.

CHOICE HYPOTHESIS. Decision makers confronted with unfavorable (versus favorable) quality-attribute values will be motivated to minimize the associated negative emotion by choosing the quality-maximizing alternative.

Our choice hypothesis essentially involves incorporating the additional goal of coping with negative emotion into the theoretical framework arguing that decision makers seek to maximize accuracy and minimize cognitive effort (see Bettman, Luce, & Payne, 1998, for an expanded choice–goals framework). Consistent with Payne, Bettman, and Johnson's (1993) effort–accuracy framework, however, we retain the notion that decision makers will exploit aspects of their decision environments in seeking to attain these metagoals. In the next section, we more explicitly consider predictions regarding attribute value that follow from a focus on factors associated with more perceptual (e.g., loss aversion) and cognitive (e.g., effort–accuracy trade-offs) factors.

Controlling for Cognitive Factors

Decision makers often show asymmetrical responses to losses versus gains of equivalent magnitude (Kahneman & Tversky, 1979; Payne, Laughhunn, & Crum, 1980; Tversky & Kahneman 1991). These asymmetrical responses are typically attributed to the nature of the function scaling attribute values into utilities. Decision makers appear perceptually attuned to changes in attribute values rather than to absolute levels, exhibit diminishing sensitivity to these changes at increasing magnitudes, and tend to be particularly adverse to accepting losses (versus to forgoing gains). For instance, diminishing sensitivity predicts that the difference between a $10 gain and a $20 gain (or loss) will seem subjectively larger than the difference between a $100 gain and a $120 gain (or loss). Loss aversion predicts that a given distance on an attribute scale ($10) will be mapped onto greater utility when it is lost (versus gained). Work on loss aversion therefore clearly establishes that subjective attribute ranges may be a function of the valence of attribute values, if favorable attribute values are perceived as gains and unfavorable attribute values as losses, which seems likely (e.g., if scale midpoints serve as reference points). Subjective ranges, in turn, may sometimes influence attribute importance weights (Fischer, 1995; Goldstein, 1990). Thus, for instance, Tversky and Kahneman (1991) demonstrate that a given difference between attribute values (e.g., the difference between a 10- and a 20-min commute time for an apartment) is likely to have a greater impact on choice outcomes when that difference represents a loss (e.g., one currently has a 5-min commute) than when it represents a gain (e.g., a current 25-min commute).

In decision situations posing a conflict between price and quality, lowering the value of the quality attribute might therefore increase the relative importance attached to quality (over price) through the perceived range of quality-attribute values. Effort–accuracy research has clearly demonstrated that decision makers respond to attribute importance weights, for instance, shifting toward more lexicographic strategies in situations where one attribute is of relatively high importance (e.g., Bettman, Johnson, Luce, & Payne, 1993; Payne, Bettman, & Johnson 1988). In general, focusing on more important attributes in choice will provide favorable effort–accuracy ratios. Thus, an unaugmented effort–accuracy approach suggests that decision makers responding to attribute importance weights may show increased quality-attribute maximization when quality-attribute values are unfavorably valenced.

In summary, there are at least two competing explanations for unfavorable quality-attribute values causing a shift toward quality-maximization in price–quality trade-off situations. First, and consistent with our choice hypothesis, decision makers may be motivated to cope with the emotional threat generated by the presence of unfavorable attribute values by avoiding an explicit trade-off on the problematic attribute. Second, assessments of relative attribute importance may be affected by an increase in subjective attribute ranges for unfavorable attribute values. Because we believe both mechanisms will likely

operate on choice, we seek to demonstrate coping-motivated shifts *after controlling for* these more cognitive factors.

Methodology for Isolating Coping Effects of Attribute Valence

Above, we develop theoretical arguments specifying that unfavorable quality-attribute values may elicit more quality-maximizing choice patterns because of emotion-focused coping considerations (our "value" effect of interest) but also potentially because of cognitive considerations associated with the influence of subjective ranges on attribute importance weights (a "range" effect). At first glance, it seems difficult to demonstrate that one effect is operating on choice, while ruling out the other. Fortunately, it is possible to disentangle these effects by considering differing preference-elicitation tasks. In particular, we are able to disentangle value effects from range effects by using both matching and choice response modes in tandem (see Fig. 1 for example tasks).

Consistent with previous work (Luce, Payne, & Bettman, 1999), we expect emotion-focused coping considerations to have a greater impact on choice patterns than on matching-task responses. Matching tasks require subjects to make an explicit trade-off; the emotional difficulty of doing so may be buffered

Phase 1. **Matching Task** (Rent for higher quality apartment is missing. Assume an example subject enters $1000 rent as his or her matching-task response.)

	Interior condition	Monthly rent
Apartment A	100	**1000**
Apartment B	50	$500

Phase 2. **Choice Tasks** (Subject chooses either Apartment A or Apartment B for each trial, with the price of the high-quality alternative based on the earlier matching-task response. Note that in the actual experiment, choice trials were presented in random order, with the high-quality alternative's position counterbalanced as Apartment A versus Apartment B.)

	Interior condition	Monthly rent	
Apartment A	100	$750	(Price level = 1)
Apartment B	50	$500	

	Interior condition	Monthly rent
Apartment A	100	$875
Apartment B	50	$500

	Interior condition	Monthly rent
Apartment A	100	$1000
Apartment B	50	$500

	Interior condition	Monthly rent
Apartment A	100	$1125
Apartment B	50	$500

	Interior condition	Monthly rent	
Apartment A	100	$1250	(Price level = 5)
Apartment B	50	$500	

FIG. 1. Overview of matching-choice procedure.

by the absence of a commitment to a specific course of action. Choice tasks, on the other hand, are likely to elicit more negative emotional threat (because the decision maker is providing hypothetical commitment to a course of action) but allow for coping through lexicographic choice on a problematic attribute. Thus, we expect choice tasks to be influenced by emotional value effects more than matching tasks are.

Further, previous work indicates that the influence of subjective attribute ranges on attribute importance weights should be greater for matching tasks than for choice tasks. Specifically, Fischer (1995) demonstrates that quantitative tasks requiring explicit attribute trade-offs (including matching) are more sensitive to attribute range effects on importance weights than are more qualitative tasks that can be completed based on attribute importance orderings (such as choice). Based on Fischer (1995), we expect matching tasks to be influenced by subjective attribute ranges more than choice tasks are.

In summary, we expect emotional considerations regarding coping with unfavorable attribute values to have a particularly noticeable effect on choice (versus matching) while we expect considerations regarding subjective attribute ranges to have a particularly noticeable effect on matching (versus choice). Thus in our two experiments, we used a choice-matching paradigm that is adapted in order to separate value from range effects by evaluating inconsistencies between responses to the two types of task.[1]

EXPERIMENT 1

In Experiment 1, we show that decision makers are more likely to maximize quality in choice when quality-attribute values are relatively unfavorable versus relatively favorable. We also implement a bisecting task designed to control for subjective attribute ranges. Thus, Experiment 1 is designed to address attribute value effects while holding constant attribute ranges; Experiment 2 will more directly compare effects of attribute value and range by manipulating both. In both experiments, we also evaluate the degree to which subjects'

[1] The most often studied source of choice-matching preference reversals is the attribute prominence effect, where relatively more important attributes are weighted more heavily in choice than in matching (e.g., Fischer & Hawkins, 1993; Tversky, Sattah, & Slovic, 1988). This prominence hypothesis provides an alternative explanation for our results *only if* there is reason to believe that quality is both more important than price *and* relatively more important in unfavorably valenced (versus favorably valenced) conditions. Thus, as discussed in the context of the experiments, we implemented careful controls to disentangle range-importance effects from value effects. As a further control, we developed our stimuli so that price was often the more important attribute, and we took measures of attribute importance as a check of this. As intended, subjects indicated that price was more important than quality for 59% of trials in Experiment 1 and for 65% of trials in Experiment 2. In these cases, the prominence hypothesis predicts a general preference for the lower quality alternative in choice as compared to matching (opposite to our value prediction). Further, the attribute importance measure did not interact with our value effects and our substantive results remain unchanged if we analyze only the trials for which price is rated more important. See Luce et al. (1999) for a more extensive treatment of these issues.

postchoice assessments of negative emotion are consistent with our reasoning regarding the use of quality-maximization as a coping mechanism.

Methods

Experimental Design

Forty-eight undergraduate students completed this study as part of a course requirement. Subjects were asked to complete matching and choice tasks posing price–quality trade-offs within an apartment rental context. Both the neighborhood's safety and the apartment's interior condition were used as quality attributes. Condition was expressed on a 100-point scale (best value = 100), and Safety was expressed in terms of the probability (from 1 to 25%) of being a victim of crime in 1 year of living in the apartment. Subjects considered both a favorable value and an unfavorable value version of each quality-attribute/rent pairing. Unfavorable value trials involved the worst versus the average value for the quality attribute; favorable value trials involved the average versus the best value. The "average" attribute value was defined individually for each subject/quality-attribute combination, based on the subject's response to a bisecting task designed to hold constant subjective attribute ranges. Two random orders and the reverse of these orders were utilized, but there were no significant order effects. Thus, the effective experimental design involves quality-attribute identity (condition versus safety) and quality-attribute value (favorable versus unfavorable), both manipulated within subjects.

Tasks and Procedure

Instructions, bisecting tasks, matching tasks, and then choice tasks were all presented to subjects using the Mouselab computer program (Payne et al., 1993). Initial task instructions described the safety, condition, and rent attributes in some detail. In particular, subjects read a table containing attribute definitions, plus descriptions of the worst and the best attribute values. This table was in paper form, and subjects were encouraged to use the table for reference throughout the experiment. This detailed range knowledge was particularly necessary for the bisecting task and was thought to be useful for the matching and choice tasks as well. The program presented matching and choice stimuli in the form of a two-alternative, two-attribute matrix of information. Each task is defined below.

Bisecting task. Subjects' first experimental task was bisecting, or specifying a midpoint for each quality attribute based on individual utility for that attribute. Standard task instructions from the decision analysis literature were used (von Winterfeldt & Edwards, 1986), and two practice bisecting tasks were completed initially. The average midpoint assigned to the condition scale was 53 (scale = 1 to 100) and the average midpoint assigned to the safety scale was 11% (scale = 1 to 25%). Thus, subjects' expressed attribute utility functions were both slightly nonlinear, although expressed utility for safety was concave

on average while utility for condition was convex. Recall that the midpoint each subject specified for each attribute was assigned as the average value during construction of unfavorable value (worst-to-average) and favorable value (average-to-best) conditions. Of course, the best and worst attribute values corresponded to the scale endpoints provided to subjects.

Matching-choice methodology. The second task was a matching task essentially asking subjects to specify a willingness to pay for increased quality. In particular, for each of the four quality-attribute by value tasks, subjects were asked to specify a rent for a higher quality alternative that made it equally preferred (for the subject) to a lower quality alternative (see Fig. 1). The lower quality alternative in each pair was always priced at $500 in monthly rent. Prior to the experimental matching trials, subjects were given two practice matching tasks. Following each practice task, a screen identical to the relevant matching-task screen but including the subject's matching response appeared, and subjects were instructed that they should be indifferent between choosing to rent either of the two apartments if they had completed their matching task correctly. Thus, subjects were explicitly instructed as to the (normative) requirement that matching responses should directly correspond to their choice behavior.

The next phase of the experiment involved choice. The quality-attribute values were always identical for the matching and choice tasks, and the lower quality alternative in each choice pair, as in each matching pair, always had a $500 rent. Within this choice context, the rent for the higher quality alternative for each choice was determined individually for each subject, based on his or her earlier matching-task response to the relevant trial (where, for instance, the unfavorable-value, condition-attribute task represented one matching trial). For each matching trial, five choices were constructed by systematically arraying prices for the high-quality alternative around each subject's earlier matching-task response. These prices were constructed (by the computer program) based on the following procedure. First, the difference between the matching-task response (the rent assigned by the subject to the high-quality apartment during matching) and $500 (the rent specified for the low-quality apartment) was calculated. The lowest price level (Level 1) was calculated by subtracting half of this difference from the matching response, and the next price level was calculated by subtracting one quarter of this difference from the matching response. The next price level (Level 3) was the matching response itself, and the following price levels added one quarter (Level 4) and then one half (Level 5) of the difference to the matching task response. Thus, five choices were constructed for each matching trial so that prices of the high-quality alternative were arrayed around the earlier matching-task response in equal increments from one another. If choice- and matching-elicited preferences are equivalent, subjects would be expected to favor the high-quality alternative for Choice Levels 1 and 2, favor the low-quality alternative for Levels 4 and 5, and be indifferent at Price Level 3.

Whether the high-quality alternative was listed first or second in the choice

matrix was counterbalanced across trials. Subjects were not given choices that were explicitly labeled as practice; however, the first two choice trials were fillers, to allow acclimation to the choice task.

Emotion manipulation checks. Our theorizing regarding the effects of attribute values involves the negative emotion generated during decision processing, and we expect that decision makers who are able to successfully cope with this in-process negative emotion by maximizing quality may report relatively low levels of retrospective emotion after a decision. However, we did not want to focus subjects artificially on feelings of negative emotion during their decision processing, so we desired to test our emotion hypothesis using less obtrusive retrospective emotion measures. This is possible because we assume in-process negative emotion generated by low quality-attribute values will be mitigated only *if the decision maker maximizes quality in choice.* However, choice is clearly influenced by a wide variety of factors in addition to coping considerations, so some subjects are expected to forgo quality-maximization in choice even when this strategy provides coping benefits. Thus, we expect to see clear effects of unfavorable (versus favorable) value on retrospective emotion following choices that do not maximize quality (i.e., following choice of the low-price alternative). We expect these value effects to be mitigated or removed following choices that maximize the quality attribute (see Luce, 1998, on retrospective versus in-process negative emotion).

We were further concerned that even retrospective measures of negative emotion would become tedious for subjects if collected after each of 22 choices (20 trials plus 2 fillers). Thus, subjects were asked to answer three emotion questions after a sampling of eight choice trials. All subjects answered emotion questions after each of the 4 choices for which the high-quality alternative was priced at Level 3 (equal to their previous matching-task response). Half of the subjects also answered the emotion questions after each Price Level 1 choice (where the high-quality alternative was at its cheapest value, and below the subject's matching-task response), while the other half answered the emotion questions after each Price Level 5 choice (where the high-quality alternative was at its most expensive level). This design collapses across between- and within-subjects sources of variation; we treated price level as a between-subjects factor in the relevant analysis, for conservative tests.

Dependent Measures

Our primary dependent variable is the proportion of the five choices per task that favor the high-quality alternative. These choice shares control for individualized matching-task responses, in that the price of the high-quality alternative is set according to each subject's relevant matching task response.[2]

[2] Our paradigm of multiple price levels also allows us to determine whether subjects' expressed choices are monotonic over increases in the expense of the high-quality alternative. We create a monotonicity index for each choice task by computing and summing all 10 possible paired comparisons between the five choices associated with each task for each subject. For Experiment 1, 96% of comparisons indicate monotonicity (94% for Experiment 2). In addition, our substantive results

Although our summary choice proportion measure is not strictly continuous, it is analogous to a 6-point (0, .2, .4, .6, .8, 1.0) rating scale assessing relative propensity to choose the high-quality alternative.

Subjects' matching-task responses are not of primary interest in this experiment, as the matching task was used primarily in order to develop choice stimuli controlling for relative attribute ranges and importance weights. However, because our theoretical development involves comparisons of matching versus choice tasks, we will report matching-task responses.

The final dependent measure of interest is the average of three 7-point emotion scales. Scales addressed how good versus bad the subject had felt during the previous decision task (reverse scored), how difficult the previous decision task had been, and how stressful the previous decision task had been. The coefficient alpha for the summary scale measure is 0.79.

Results

If subjects calculate price–quality trade-offs in exactly the same manner across matching and choice tasks, then average choice proportions should be roughly .50 (1.0 for Price Levels 1 and 2, 0 for Levels 4 and 5, and 0.50 reflecting random choice for Level 3). We did not expect this pattern of results, as we argued that motivations to cope with unfavorable attribute values would have a particularly strong effect on choice (versus on matching) tasks, leading subjects to the relatively obvious coping strategy of maximizing quality in choice, even at relatively high price levels.

Choice

As expected, the value manipulation affected choice, with a significantly increased tendency for subjects to choose the high-quality alternative for the unfavorable-value trials ($F(1, 47) = 48.08$, $p < .0001$; $M_{\text{unfavorable}} = 0.82$ versus $M_{\text{favorable}} = 0.55$). The attribute by value interaction is also significant ($F(1, 47) = 6.23$, $p < .02$). However, the value effect is directionally consistent across both the condition attribute ($M_{\text{unfavorable}} = 0.86$ versus $M_{\text{favorable}} = 0.48$) and the safety attribute ($M_{\text{unfavorable}} = 0.78$ versus $M_{\text{favorable}} = 0.62$). The (safety versus condition) attribute replication factor did not have a significant effect ($F(1, 47) = 0.41$, *ns*).

Matching

Subjects gave higher matching-task responses to the unfavorable value trials ($F(1, 47) = 7.24$, $p < .01$; $M_{\text{unfavorable}} = 1439$ versus $M_{\text{favorable}} = 1229$). Subjects also valued the condition attribute more highly in matching, on average

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remain unchanged (and, in fact, become statistically stronger) if we reanalyze our choice data after removing any observations containing one or more violations of monotonicity across the five relevant choices.

($F(1, 47) = 18.25$, $p < .0001$; $M_{\text{condition}} = 1481$ versus $M_{\text{safety}} = 1187$). Attribute and value do not significantly interact ($F(1, 47) = 0.48$, *ns*).

Summary of Matching-Choice Comparisons

As expected, we found a value effect on choice, even though choice stimuli were adjusted for value effects expressed through matching responses. Note, in particular, that subjects' higher relative valuation for unfavorable-value trials in matching was insufficient to account for their even greater relative valuation for quality in the unfavorable-value choice conditions. Conversely, note that while subjects indicated a higher relative valuation for the condition (versus the safety) attribute in matching, there was no attribute-identity effect on choice share. Thus, the higher matching-task responses for the condition attribute appear to have been sufficient to account for greater relative valuation of condition over safety in choice (through the higher average expense associated with the high-quality condition alternatives during choice). This provides indirect evidence that our methodology controls for more cognitive sources of influence on choice.

Emotion Scales

Emotion-scale data were analyzed by value, attribute, and a factor reflecting each subject's choice for the relevant trial. As expected, low versus high-quality choice interacts with the value manipulation ($F(1, 268) = 4.74$, $p < .03$). As the means in Table 1a indicate, emotion ratings are sensitive to the value manipulation following choice of the low-quality alternative, with the effect mitigated following choice of the high-quality alternative.

There is an analogous interaction for value and price level ($F(1, 268) = 4.78$, $p < .01$). The unfavorable-value condition increases negative emotion more for Price Level 5 ($M_{\text{unfavorable}} = 3.48$ versus $M_{\text{favorable}} = 2.85$) than for Price Level 3 ($M_{\text{unfavorable}} = 3.02$ versus $M_{\text{favorable}} = 2.92$) or Price Level 1 ($M_{\text{unfavorable}} = 2.61$ versus $M_{\text{favorable}} = 2.32$). While this second interaction was not explicitly predicted, it seems intuitive that it would be more difficult for subjects to cope with unfavorable quality-attribute value at higher price levels.

Finally, three significant main effects are found. First, subjects rate unfavorable-value choices as more emotion-laden ($F(1, 268) = 10.83$, $p < .001$; $M_{\text{unfavorable}} = 3.03$ versus $M_{\text{favorable}} = 2.75$). Subjects also rate choice tasks as increasingly emotion-laden at higher price levels ($F(1, 47) = 4.63$, $p < .01$; $M_1 = 2.47$ versus

TABLE 1a

Average Emotion Scales (Cell Sizes) by Value and Choice, Experiment 1

	Unfavorable value	Favorable value
Low-quality choice	4.07 ($n = 25$)	3.10 ($n = 86$)
High-quality choice	2.88 ($n = 167$)	2.47 ($n = 106$)

$M_3 = 2.97$ versus $M_5 = 3.16$). Finally, subjects rate choices as more emotion-laden after choosing the low-quality (versus the high-quality) alternative ($F(1, 268) = 17.64$, $p < .01$; $M_{\text{low-Q}} = 3.33$ versus $M_{\text{high-Q}} = 2.72$). The main effect of attribute identity is not significant ($F(1, 268) = 1.01$, *ns*). There are no additional significant interactions. The emotion scale means by value, price, choice, and attribute are reported in Table 1b.

Discussion of Experiment 1

Experiment 1 demonstrates that a manipulation of attribute value influences choice patterns, even when choices are constructed based on subjects' earlier matching-task responses. The value effects within this paradigm suggest that subjects exploit the flexibility of the choice environment (e.g., the ability to make one attribute predominant in their choice rule) to cope with the threat presented by unfavorable quality-attribute values. Note that subjects' choice responses showed very close correspondence to their matching-task responses under favorable value, as choice proportions in that case were close to the 0.50 expected in the absence of matching-choice reversals in preference or strategy selection ($M_{\text{favorable}} = 0.55$). However, under unfavorable value, expressed choices deviated substantially from this 0.50 benchmark ($M_{\text{unfavorable}} = 0.82$). Thus, in general terms, we find substantial choice-matching preference reversals under unfavorable value, but relatively little evidence of choice-matching preference reversals under favorable value. Our emotion data support the conjecture that choice-matching reversals under unfavorable value reflect coping considerations, in that choices were rated as particularly negatively emotion-laden when attribute values were unfavorable but the decision maker had not maximized quality in choice.

Consistent with the development of our value hypothesis based on considerations of emotion-focused coping, we found the above value effects on choice even though we used a bisecting task to control for subjective attribute ranges. Experiment 2 was designed to allow a direct comparison of range versus value effects.

TABLE 1b

Average Emotion Scales (Cell Sizes) for Experiment 1

		Unfavorable value			Favorable value		
		Price Level 1	Price Level 3	Price Level 5	Price Level 1	Price Level 3	Price Level 5
Condition	Low-quality choice	—	3.74 ($n = 3$)	4.55 ($n = 8$)	2.75 ($n = 6$)	3.21 ($n = 27$)	2.67 ($n = 18$)
	High-quality choice	2.42 ($n = 24$)	3.02 ($n = 45$)	3.30 ($n = 16$)	2.32 ($n = 18$)	2.76 ($n = 21$)	3.01 ($n = 6$)
Safety	Low-quality choice	3.86 ($n = 2$)	3.66 ($n = 8$)	4.23 ($n = 4$)	3.88 ($n = 3$)	3.21 ($n = 14$)	3.25 ($n = 18$)
	High-quality choice	2.70 ($n = 22$)	2.84 ($n = 40$)	3.03 ($n = 20$)	1.97 ($n = 21$)	2.66 ($n = 34$)	2.02 ($n = 6$)

EXPERIMENT 2

Experiment 2 differs from Experiment 1 in that *both* value and range are manipulated. Experiment 2 uses the same matching-choice methodology as Experiment 1, with value and range expected to have differential effects across the two tasks. Also, because quality attributes themselves may differ in terms of many important properties associated with negative emotion (e.g., Luce, 1998; Luce et al., 1997), Experiment 2 introduces two new quality attributes to the apartment-rental context from Experiment 1.

Methods

Task and Design

One hundred forty-three undergraduate subjects completed Experiment 2 as part of a class requirement. Seven subjects were eliminated from the analysis for failing to follow task instructions, leaving an effective sample size of 136 subjects. Subjects in Experiment 2 responded to tasks involving an apartment-rental context and presented on computers using the Visual Basic software program. There were three within-subject quality-attribute replications, pairing Interior Space, Landlord Relations, or Safety quality attributes with Rent. The Interior Space attribute involved apartment square footage. The Safety attribute again involved the likelihood of being a crime victim. The Landlord Relations attribute involved the likelihood of having lease negotiation or other difficulties with apartment management. All three attributes were defined on 100-point scales, with 100 defined as the best possible attribute value and 0 described as the worst. This method allows for more direct comparison across attributes than was possible in Experiment 1, where attribute scale varied with attribute identity. Attribute definitions, plus descriptions and examples of the worst and the best attribute values, were provided to subjects on a piece of paper available for reference during the entire experiment.

Experiment 2 manipulated value and range between subjects. Specifically, the unfavorable-value conditions involved quality-attribute values centered on 30 (on our 100-point scales), while the favorable-value conditions involved attribute values centered on 70. The low-range conditions involved a spread of 20 points between the low- and the high-quality alternatives, while the high-range conditions involved a spread of 40 points. The resultant set of four attribute values is presented in Table 2. Thus, the basic design for Experiment 2 contains two between-subjects factors (value and range, each with two levels) and one within-subjects replication factor (attribute identity, with three levels).

Procedure and Dependent Measures

Subjects completed matching and choice tasks consistent with the procedure from Experiment 1. Again, low-quality apartments for each trial were associated with a $500 rent. Several fillers were interspersed with matching and choice trials. In particular, subjects completed matching-task responses pairing

TABLE 2

Experimental Stimuli (Attribute Values), Experiment 2

		Unfavorable value (Midpt. = 30)	Favorable value (Midpt. = 70)
Low range (20 points)	Low-quality alternative	20	60
	High-quality alternative	40	80
High range (40 points)	Low-quality alternative	10	50
	High-quality alternative	50	90

a commute time attribute and a condition attribute with $1000 in rent. Subjects also completed four filler choices for commute time and for condition, each with varying quality-attribute values. Matching and then choice trials were presented in an individually randomized order for each subject, with the exception that two filler tasks (not labeled as such) were completed before each set of randomly ordered trials began.

In order to minimize any potential experimental demand effects from asking subjects about their feelings *during* the collection of choice data, emotion questions were collected after choice measurement was complete. That is, after completing the full set of choices, subjects were informed that they would be asked to make six more choices and that they would be asked a question evaluating each choice. The specific question was an assessment of the negative emotional stress associated with the decision, scored using a scrollbar with endpoints associated with values of 0 and 100. The six emotion trials were exactly identical to the choice trials associated with Price Level 1 (the high-quality alternative's cheapest price level) and Price Level 5 (the most expensive price level) for each of the three quality attributes.[3] Subjects completed one practice question before the six emotion measures were collected. The emotion-question trials were presented in an individually randomized order for each subject.

Results

Choice

As expected, the value manipulation has a significant main effect on choice, with increased choice of the high-quality alternative across the unfavorable-value conditions ($F(1, 132) = 21.67$, $p < .0001$; $M_{\text{unfavorable}} = 0.85$ versus $M_{\text{favorable}} = 0.71$). Conversely, the range effect on choice responses is not significant ($F(1, 132) = 0.09$, *ns*; $M_{\text{low}} = 0.77$ versus $M_{\text{high}} = 0.79$). Value and range do not interact ($F(1, 131) = 0.75$, *ns*). There is a main effect of attribute identity ($F(1, 282) = 9.38$, $p < .0001$; $M_{\text{IneteriorSpace}} = 0.75$ versus $M_{\text{LandlordRelations}} = 0.75$

[3] Thus, emotion measures involved repetitions of (a subset of) the choices from the main experiment. There was a high degree of correspondence between these repeat choices and subjects' earlier choice results, with subjects indicating the same preference in 96% of cases.

versus $M_{\text{Safety}} = 0.84$). There are no significant interactions associated with attribute identity. Table 3 reports average choice by attribute, value, and range.

Matching

Recall that range effects are expected to be particularly strong for trade-off-based tasks such as matching (Fischer, 1995). As expected, subjects reported higher matching-task responses across high-range tasks ($F(1, 132) = 36.42$, $p < .0001$; $M_{\text{low}} = 683$ versus $M_{\text{high}} = 848$). Matching-task responses were not, however, sensitive to the value manipulation ($F(1, 131) = 0.37$, *ns*; $M_{\text{unfavorable}} = 773$ versus $M_{\text{favorable}} = 757$). Thus, the significant value effect on matching responses in Experiment 1 may have been attributable to differences in subjective range across the value conditions (even though the bisecting task was implemented to control for range). Value and range do not interact for matching-task responses ($F(1, 131) = 0.00$, *ns*). There is a main effect of attribute identity on matching responses ($F(1, 282) = 45.24$, $p < .001$; $M_{\text{InteriorSpace}} = 805$ versus $M_{\text{LandlordRelations}} = 675$ versus $M_{\text{Safety}} = 816$). Finally, there is a range by attribute interaction for matching-task responses ($F(1, 282) = 5.97$, $p < .002$). Although in the same direction across all three attributes, the range effect is stronger for the interior space (712 versus 898) and safety (711 versus 920) attributes, as compared to the landlord relations attribute (624 versus 725). There are no other significant effects.

Summary of Matching-Choice Comparisons

We predicted that range would have a relatively stronger effect on matching responses while value would have a relatively stronger effect on choices. Our results clearly supported this prediction. That is, matching responses were significantly influenced by range, but not by attribute value. Conversely, choices were significantly influenced by value, but not by range. More precisely, subjects apparently did not adjust their matching responses to account for the value effects that became relevant in choice, consistent with our conjecture that coping with unfavorable attribute values would have a greater impact for choice. Subjects did appear to appropriately adjust their matching-task responses to account for range effects in choice, in that the range manipulation

TABLE 3

Choice Results, Experiment 2

	Unfavorable value		Favorable value	
	Low range	High range	Low range	High range
Interior space	0.78	0.83	0.74	0.67
Landlord relations	0.82	0.83	0.63	0.69
Safety	0.87	0.94	0.79	0.76

Note. Choice means indicate the proportion of choice trials for which the higher quality alternative in the pair is chosen.

had a nonsignificant effect on choices, once choice stimuli (specifically, the price of the high-quality option) were adjusted based on earlier matching-task responses. Similarly, the significant range by attribute manipulation in matching was not mirrored in the choice data. Finally, note that, unlike Experiment 1, Experiment 2 showed an effect of attribute identity on choice responses, over and above the effect of attribute identity on matching-task responses. Although this issue is not of direct interest here, it appears that the attribute identity effect on choice (involving higher tendencies to maximize the safety attribute) could have followed from divergence in emotional potential across attributes.

Emotion Scales

Recall that emotion scales were collected for the lowest and the highest price level for each attribute. As expected, value interacts with choice ($F(1, 682) = 3.77, p < .05$). As the means in Table 4a indicate, unfavorable value is associated with increased negative emotion after choice of the low-quality alternative, but not after choice of the high-quality alternative. This pattern of results again indicates that choosing the high-quality alternative provides coping benefits, mitigating the negative emotion associated with unfavorable quality-attribute values. Value also interacts with price level ($F(1, 682) = 8.21, p < .004$), a finding that is similar to the emotion findings in Experiment 1. Unfavorable value is associated with more negative emotion when the high-quality alternative is expensive (means within Price Level 5: $M_{\text{unfavorable}} = 36$ versus $M_{\text{favorable}} = 34$), but this effect actually reverses when the high-quality alternative is cheap (Level 1: $M_{\text{unfavorable}} = 16$ versus $M_{\text{favorable}} = 19$).

The only other significant effects are the main effects of attribute ($F(1, 682) = 4.21, p < .02$; $M_{\text{InteriorSpace}} = 26$ versus $M_{\text{LandlordRelations}} = 24$ versus $M_{\text{Safety}} = 28$), price level ($F(1, 682) = 199.60, p < .0001$; $M_1 = 18$ versus $M_5 = 35$), and choice ($F(1, 682) = 12.03, p < .001$; $M_{\text{low-q}} = 39$ versus $M_{\text{high-q}} = 22$). Note that the range manipulation does not enter into any significant effects on emotion. This provides support for our contention that range effects are more cognitive in nature than value effects. The emotion-scale means by value, choice, and price are presented in Table 4b.

Discussion of Experiment 2

In Experiment 2, we extend our demonstration of value effects on choice by crossing manipulations of both value and range. Once again, we find that when

TABLE 4a

Emotion Scales (cell *N*s) by Value and Choice, Experiment 2

	Unfavorable value	Favorable value
Low-quality choice	44.25 ($n = 73$)	36.39 ($n = 126$)
High-quality choice	22.27 ($n = 353$)	22.37 ($n = 300$)

TABLE 4b

Emotion Scales by Value, Choice, and Price Level, Experiment 2

	Unfavorable value		Favorable value	
	Low-quality choice	High-quality choice	Low-quality choice	High-quality choice
Price Level 1	47 (n = 3)	15 (n = 210)	28 (n = 11)	19 (n = 202)
Price Level 5	44 (n = 70)	32 (n = 143)	37 (n = 115)	30 (n = 98)

Note. The emotion question asked subjects to rate the amount of negative emotional stress felt during a decision, on a 100-point scale.

choice stimuli are tailored to individual matching-task responses, matching responses appear to account for some choice considerations (i.e., range effects on relative quality versus price importance) but not for others (i.e., coping considerations involving unfavorable attribute values). Note that, unlike in Experiment 1, choice proportions for the high-quality alternative were substantially above 0.50 across all conditions. Thus, subjects in Experiment 2 seemed to show a general increased preference for maximizing the quality attribute in choice (versus matching). Even given this general preference for choosing high-quality alternatives, the choice data indicate a significant value effect. Choice findings were also again confirmed by emotion scale responses, in that subjects reported more negative emotion for unfavorable-value tasks when they had chosen the low-quality option, but not when they had maximized quality.

Because a relatively strong manipulation of range (e.g., 20% versus 40% of the attribute scale) was insufficient to influence choice over and above matching, we believe that variances in subjective range are an unlikely alternative explanation for the value effects on choice in Experiment 1. Given previous work on attribute range effects (Fischer, 1995), one might actually expect any matching-choice divergence due to range to involve overemphasizing higher attribute ranges in matching responses (as compared to choice), resulting in less quality-attribute maximization in choices as quality-attribute range increases.

GENERAL DISCUSSION AND CONCLUSION

Summary

The two experiments reported in this paper both support the general hypothesis that subjects will adjust their choices to cope with the greater negative emotion associated with unfavorable (versus favorable) quality-attribute values in price–quality trade-off situations. In particular, subjects were more likely to make quality-maximizing choices when the quality attribute was characterized by unfavorable (versus favorable) values. This choice pattern occurred even though stimuli across both unfavorable and favorable value choice tasks were constructed based on subjects' earlier matching values. The assumption that quality-maximization will operate as a coping mechanism in choice is supported by self-reported emotion data. Subjects report experiencing negative

emotion after an unfavorable-value choice situation is resolved in favor of the low-price (and therefore lower quality) alternative, but this negative emotion is mitigated by choice of the high-quality alternative in the pair.

Implications for Understanding Choice

While it has long been clear that decision makers value minimizing losses more highly than they value maximizing gains of equivalent magnitude, we believe we have extended this finding in two meaningful ways. First, we demonstrate attribute value effects in the absence of explicit reference points framing these values as gains or losses. Second, consistent with our earlier investigation of the emotional nature of reference point effects on decision behavior (Luce, Payne, & Bettman, 1999), we demonstrate that it is possible to make unique predictions by considering the emotional nature of value effects.

We believe that value effects of the type we investigate are extremely pervasive in real-world decision situations. In some choice situations, the general quality of all considered alternatives may appear unfavorable to the decision maker. For instance, a car buyer subject to a substantial budget constraint may perceive that all reasonable options have unfavorable values (relative to all available options) in terms of valued quality attributes such as performance or safety. More generally, almost any reasonably complicated real-world decision situation is likely to involve some attributes that are perceived by the decision maker as offering relatively unfavorable values at some phase in the decision process. For instance, even in the absence of real budget constraints, automobiles that offer favorable levels of performance and safety tend to offer relatively unfavorable levels of fuel economy; thus, a decision maker choosing among a subset of high-end automobiles is likely to perceive that the fuel economy attribute has unfavorable values across all considered options. In such situations, decision behavior may in part focus on efforts to cope with the threat generated by these perceptions of unfavorable quality.

Our results also point to the importance of acknowledging minimizing negative emotion as a metagoal driving decision behavior, and of theoretically distinguishing between types of affect and likely coping strategies in understanding the interplay between affect and decision strategy selection. For instance, negative moods are often associated with more careful, analytic processing, and a resultant decrease in cognitive bias (e.g., Isen, 1987; Schwarz, 1990). A straightforward application of this finding would associate our unfavorable-value situation with a lower incidence of choice-matching preference reversals. We believe that the reason for our seemingly contradictory finding of increased inconsistency between choice and matching response modes with unfavorable values is that subjects exploited the content of their decision tasks and in particular the fact that it was possible to use a choice strategy mitigating losses on the problematic attribute. On the other hand, our findings are broadly consistent with previous research demonstrating a shift toward simpler decision strategies under negative moods. However, a straightforward application of that finding would likely lead to the prediction that decision makers in the

unfavorable-valence condition should use a lexicographic strategy maximizing the more important attribute. Again, we are able to increase predictive power by acknowledging that the relevant affect in this case is tied to a specific component of the decision situation, and thus is likely to encourage quality-maximization even across the choices for which price is rated as relatively more important.

Methodological and Measurement Implications

Any empirical evaluation of preference based on choice patterns (e.g., conjoint or similar decision analysis methodologies; see Green, Krieger, Agarwal, & Johnson, 1991; Green & Srinivasan, 1990) is likely to mix decision trials associated with favorable attribute values and trials associated with unfavorable attribute values. Thus, one of subjects' considerations in responding to these tasks is likely to be coping with the negative emotion associated with the unfavorably valued trials. Further, tasks such as matching or rating-based conjoint (e.g., Green & DeSarbo, 1978; Green & Krieger, 1995) may underestimate coping effects on choice such as the value effect we demonstrate. More generally, our experiments indicate an additional possible source of response mode effects in preference-elicitation that may extend to many areas of psychological measurement. For instance, any sort of rating scale provided to subjects is likely to be subject to valence effects such that the difference between ratings at the upper end (e.g., 8 versus 9 on a 9-point scale) may have a different psychological meaning to subjects than the same absolute difference at the lower end (e.g., 1 versus 2).

We believe that the matching-choice methodology reported in this paper is a valuable paradigm for disentangling emotion-focused coping effects in choice from more cognitive considerations. We believe that considerations associated with coping with unfavorable attribute values are likely to have a greater relative impact on choice than on matching tasks, for two reasons. First, matching tasks constrain the subject to indicate a trade-off, effectively eliminating a lexicographic strategy on a problematic attribute as a coping mechanism. Second, matching tasks eliminate direct considerations associated with the commitment to a course of action, and therefore responses to matching tasks seem less likely to be associated with threats to the individual's reputation or self-esteem as a decision maker (the most likely source of threat in a hypothetical decision task; see Janis & Mann, 1977, on types of threat in decision making).[4] Thus, it is possible to gain some estimate of the magnitude of coping effects on choice by comparing across these response modes.

Future Research

Several avenues for future research exist. It would be useful to expand demonstration of value effects in choice beyond the task context used in this

[4] This conjecture is supported by preliminary research in which we found relatively low levels of reported emotion, and no significant differences for a within-subjects value manipulation, within the matching-task environment.

paper. For instance, it would be interesting to evaluate a greater range of value conditions, such as mixed (e.g., one favorable and one unfavorable) value conditions for quality. Similarly, it would be interesting to extend these effects beyond simple price–quality attribute pairings. In particular, it is not clear how decision makers would resolve conflicts between two unfavorably valued quality attributes. Such difficult trade-offs are exceedingly common in some domains, such as the risk–risk trade-offs that are often confronted in the medical domain. For instance, women choosing whether to engage in hormone replacement therapy during menopause essentially must trade off the probability of certain deadly diseases (e.g., cancer) against the probability of others (e.g., heart disease). In these and other medical dilemmas (e. g., deciding whether to take the drug tamoxifen as a preventative measure for women at high risk for breast cancer, or even deciding whether to engage in major but elective surgery), the decision maker is forced to make trade-offs between probabilities of highly dreaded outcomes. In these situations, the qualitative nature of conflicts may influence coping behavior. For instance, decision makers may have different methods for coping with trade-offs between two physical risks than for coping with trade-offs between a physical risk and a psychological cost. In general, richer and more varied decision situations are likely to be associated with more varied and idiosyncratic strategies for engaging in emotion-focused coping during choice.

Finally, perhaps the major opportunity for future research lies in additional research methodologies. Our focus on the emotional nature of decision tasks suggests the utility of more naturalistic research methods where decision behavior could be observed in the context of real outcomes. While ethical considerations would constrain researchers' abilities to implement manipulations of real threats, observation may be useful for determining the generality of our findings.

CONCLUSIONS

We find evidence that coping considerations influence decision strategy selection, in that decision makers appear to cope with relatively unfavorable (versus relatively favorable) quality-attribute values by choosing an alternative that maximizes quality. This finding is part of a growing body of research indicating that emotional considerations influence decision behavior. Specifically, these findings are consistent with recent developments broadening the effort-accuracy framework in order to accommodate additional goals, particularly the goal of minimizing negative emotion (Bettman, et al., 1998; Luce, et al., 1997). More generally, this work is responsive to recent challenges to investigate the impact of decision makers' feelings, as well as the impact of their cognitions, on decision behavior (e.g., Elster 1998; Larrick 1993).

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