

This article was originally published in a journal published by Elsevier, and the attached copy is provided by Elsevier for the author's benefit and for the benefit of the author's institution, for non-commercial research and educational use including without limitation use in instruction at your institution, sending it to specific colleagues that you know, and providing a copy to your institution's administrator.

All other uses, reproduction and distribution, including without limitation commercial reprints, selling or licensing copies or access, or posting on open internet sites, your personal or institution's website or repository, are prohibited. For exceptions, permission may be sought for such use through Elsevier's permissions site at:

<http://www.elsevier.com/locate/permissionusematerial>



Motivationally selective risk judgments: Do fear and curiosity boost the boons or the banes?

Jon K. Maner^{a,*}, Mary A. Gerend^b

^a Department of Psychology, Florida State University, Tallahassee, FL 32306-4301, USA

^b Department of Medical Humanities and Social Sciences, Florida State University, Tallahassee, FL 32306-4300, USA

Received 20 September 2005

Available online 6 October 2006

Abstract

Recent theories of judgment and decision-making have focused increasingly on the role of motivation, affect, and other drive states. The current research examined whether specific motivational orientations associated with approach versus avoidance might be linked selectively to judgments of positive versus negative decision outcomes and future events. Findings from three studies suggest that fear—an emotion intrinsically linked to threat avoidance—was more strongly associated with judgments of negative outcomes than judgments of positive outcomes. In contrast, curiosity—a motivational orientation associated with approaching desired information and experiences—was more strongly associated with judgments of positive outcomes than judgments of negative outcomes. Findings are discussed with respect to functionalist theories of motivation and selective cognition.

© 2006 Elsevier Inc. All rights reserved.

Keywords: Fear; Curiosity; Motivation; Outcome judgment; Risk perception; Likelihood; Utility

Introduction

“Who has not seen a horse, or other animal, alternately approach in curiosity, and flee in fear from, some such object as an old coat on the ground? And who has not experienced a fearful curiosity in penetrating some dark cave or some secret chamber of an ancient castle?” (McDougall, 1923, p. 60).

In recent years, theories of judgment and decision-making have placed increasing emphasis on the role of motivation and affect (Forgas, 1995, 2003; Loewenstein & Lerner, 2003; Loewenstein, Weber, Hsee, & Welch, 2001; Schwarz & Clore, 1996; Zajonc, 1998). Emotions, goals, and other drive states can powerfully influence the manner in which people form judgments, evaluate risks, and make choices under uncertainty (Fessler, Pillsworth,

& Flamson, 2004; Finucane, Peters, & Slovic, 2003; Isen, Nygren, & Ashby, 1988; Ketelaar & Au, 2003; Loewenstein, 1996; Maner et al., in press-c; Mittal & Ross, 1998). However, there still remain many unanswered questions pertaining to the role that motivation and affect play in shaping judgment and choice. Specifying this role is a key step toward better understanding motivational influences on decision-making.

Many choices rely on judgments of both potential benefits and potential costs (e.g., Kahneman & Tversky, 1979; Mellers, 2000). In choosing to start a conversation with a stranger, for example, one might weigh the potential benefit of a new friendship against the potential cost of social rejection. In the current research, we examined the possibility that the links between specific motivational orientations and outcome judgments might be selective—that is, stronger for potential benefits than for potential costs (or vice versa). We focused on the extent to which fear and curiosity—two antagonistic motivational orientations associated with avoidance and

* Corresponding author. Fax: +1 850 644 7739.

E-mail address: maner@psy.fsu.edu (J.K. Maner).

approach, respectively—might be associated selectively with heightened judgments of negative outcomes versus positive outcomes. More specifically, we tested the hypothesis that whereas fear would be more strongly associated with judgments of negative outcomes than positive outcomes, curiosity would be more strongly associated with judgments of positive outcomes than negative outcomes.

Choice under uncertainty: Judging potential benefits and costs

As the quotation (above) from McDougall's classic *Introduction to Social Psychology* implies, people often face choices in which the desire to explore novel opportunities and the desire to avoid harm pull one in opposite directions. Several theories of decision-making (e.g., prospect theory; subjective expected utility theory; decision affect theory) imply that such choices are guided, in part, by judgments of the potential positive and negative consequences (e.g., Hoelzl & Loewenstein, 2005; Kahneman & Tversky, 1979; Loewenstein, Thompson, & Bazerman, 1989; Lopes, 1995; Mellers, Schwartz, Ho, & Ritov, 1997).

Risk judgments involve several components, including perceptions of (1) the utility of positive outcomes (how desirable the benefits are judged to be); (2) the likelihood that positive outcomes will occur; (3) the utility of negative outcomes (how severe the costs are judged to be); (4) the likelihood that negative outcomes will occur. When people judge positive outcomes as strong and likely to occur, they tend to make action-oriented choices; when people judge negative outcomes as strong and likely to occur, they tend to make risk-avoidant choices (e.g., Fishburn, 1988; Mellers & McGraw, 2001).

Motivation, affect, and biases in outcome judgment

As McDougall (1923) implied, outcome judgments can be shaped by fundamental motivations that promote exploration and risk-seeking, on one hand, and self-protection, on the other. Indeed, theories of motivation and cognition suggest that outcome judgments can be shaped by motivational orientations associated with approach or avoidance (e.g., Carver & White, 1994; Higgins, 2000; Watson, Wiese, Vaidya, & Tellegen, 1999). The current investigation is based on the presumption that motives can color the manner in which people judge potential outcomes, because these judgments can facilitate choices promoting avoidance of threat or engagement of opportunity. More specifically, there is reason to think that whereas approach motives are associated with optimistic outcome judgments (thereby facilitating risk-seeking), avoidance motives are associated with pessimistic outcome judgments (thereby facilitating risk-avoidance).

Theories of motivated cognition are consistent with evidence for affective influences on judgment and choice

(e.g., Fessler et al., 2004; Raghunathan & Pham, 1999). Affective states serve as salient forms of information, signaling the presence of threats or opportunities in the environment (Schwarz & Clore, 1983). Emotions, in turn, promote motivational states aimed at the avoidance of threat or engagement of opportunity (Carver & White, 1994; Maner et al., 2005; Watson et al., 1999). The emotion of fear, for example, motivates a desire to protect oneself from harm (see Öhman & Mineka, 2001, for a review). Not surprisingly, evidence also suggests that fear leads to risk-avoidant outcome judgments (e.g., increased judgments of the likelihood of negative outcomes; Lerner & Keltner, 2001). Thus, because affective experiences can activate approach or avoidance motives, those affective experiences can influence in functional ways the manner in which people think about potential risks and opportunities.

The motivationally selective judgment hypothesis

The current investigation was inspired by the following question: are the links between specific motivational orientations and outcome judgments stronger for judgments of benefits versus costs (i.e., observed more strongly for costs than benefits, or vice versa)? A simple consideration of approach or avoidance action tendencies suggests that motivational experiences might elicit a pervasive tendency to judge both positive and negative outcomes in a goal-consistent manner. For example, motives that promote risk-avoidance may be associated with enhanced judgments of negative outcomes *and* reduced perceptions of positive outcomes, because both of these judgments could facilitate risk-avoidance. Consider a student weighing the costs and benefits associated with participating in a potentially dangerous game of rugby. The self-protective motivation, fear, and anticipatory anxiety she feels might lead her to view the potential for harm as especially great, thereby leading her to avoid the game. In addition, the fear might lead her to view the potential benefits—the excitement, fun, and camaraderie—as less appealing than she would otherwise for these judgments, too, could lead her away from joining the game.

There are reasons to suspect, however, that motivationally-tinged judgments may be linked more selectively to positive versus negative outcomes. Indeed, functionalist theories often emphasize that motivated cognition is selective—people preferentially attend to and process stimuli perceived to be highly relevant to the satisfaction of important goals; at the same time, cognitive resources are directed away from less relevant stimuli (Maner et al., 2003; McArthur & Baron, 1983). Similarly, theories of affect as information imply that emotions lead people to become especially attuned to the presence of possible threats or opportunities in the environment (Schwarz & Clore, 1983), which necessarily reduces attention to other, less salient information.

Avoidance-focused motives (and forms of affect such as fear that promote avoidance of threat) are designed primarily to move people away from undesired outcomes. Hence, in the case of avoidance-oriented motivation, people may be especially attuned to undesirable outcomes, thereby enhancing perceptions of those outcomes. At the same time, cognitive resources may be directed away from potential benefits, leaving them relatively unaffected. This would be consistent with evidence that whereas fear heightens perceptions of potential threat, it leaves unaltered perceptions of potential opportunities (Maner et al., 2005). This would also be consistent with evidence that anxiety—a type of affect that promotes self-protective motivation—is associated with heightened perceptions of negative decision outcomes, but not perceptions of positive outcomes (Maner & Schmidt, 2006). Approach-focused motives, in contrast, are designed primarily to move people toward desired opportunities. As a result, one might expect a converse pattern of outcome judgments in which approach-oriented motives are more strongly associated with judgments of positive outcomes than with judgments of negative outcomes.

This reasoning fits with theories of regulatory fit (e.g., Higgins, 2000). These theories imply that it is possible to possess either an approach-oriented motivational stance (promotion-focused), in which individuals are motivated primarily to approach positive outcomes, or an avoidance-oriented motivational stance (prevention-focused), in which individuals are primarily motivated to avoid negative outcomes. Evidence supporting these theories suggests that when making choices, individuals who are approach-focused generally make their decisions based on the nature of potential positive outcomes, whereas avoidance-focused individuals make their decisions based on potential negative outcomes (e.g., Idson, Liberman, & Higgins, 2004).

Thus, this body of theory and evidence suggests a *motivationally selective judgment hypothesis*: An avoidance-focused motivational orientation (and allied affective states, such as fear and anxiety) may be more strongly associated with judgments of negative outcomes than with judgments of positive outcomes; in contrast, an approach-focused motivational orientation may be more strongly associated with judgments of positive outcomes than with judgments of negative outcomes.

Fear and curiosity: Tests of the motivationally selective judgment hypothesis

In the current research, we provide preliminary tests of the motivationally selective judgment hypothesis. These tests required us to examine motivational orientations that are associated with clear avoidance versus approach goals. We chose to examine fear and curiosity because classic theorists regarded them as such opposing

motivational forces (James, 1890/1981; McDougall, 1923). Early in Psychology's history, William James noted that whereas curiosity prompts people to explore their environment, fear leads people to avoid potential dangers associated with that exploration: "curiosity and fear form a couple of antagonistic emotions... and manifestly both useful to their possessor" (James, 1890/1981). Similarly, William McDougall regarded curiosity and fear as two fundamental drives associated with "opposed impulses of approach and retreat..." (McDougall, 1923).

Although current theories of curiosity and fear may be somewhat more sophisticated than James and McDougall originally envisioned them, the core insights of these early theorists remain the same. Curiosity has been conceptualized as signaling the presence of an "information-gap"—that is, a lack of desired knowledge or experience (Loewenstein, 1996; see also Berlyne, 1960; Litman, 2005; Litman & Jimerson, 2004). The experience of curiosity, in turn, reflects an approach-oriented motivational orientation aimed at filling that gap by seeking out relevant information and experience. Fear, in contrast, acts as an antagonist to curiosity. Fear promotes a desire to protect oneself from harm and to withdraw from potential danger (Öhman & Mineka, 2001).

Thus, curiosity and fear reflect basic motivational orientations associated with approach and avoidance. There are reasons, therefore, to expect that fear and curiosity are associated with outcome judgments that could facilitate risk-avoidance and risk-seeking, respectively. Moreover, the motivationally selective judgment hypothesis predicts that whereas curiosity may be linked more strongly to judgments of positive outcomes than judgments of negative outcomes, fear may be linked more strongly to judgments of negative outcomes than judgments of positive outcomes.

The current research

In the current research, we examined relationships among curiosity, fear, and judgments of positive and negative outcomes. In Studies 1 and 2 we examined the extent to which judgments of positive versus negative outcomes are linked to individual differences in dispositional curiosity and fear. In the same way that particular motivational orientations can be experienced acutely, as in when they are temporarily activated by particular aspects of a situation, motivational orientations are also experienced on a more persistent, dispositional basis (e.g., Higgins, 2000; Carver and White; see also Larsen & Ketelaar, 1991; Lazarus, 1994). We use the term dispositional motivation to refer to the tendency to experience particular motives across time and situations. Theory and evidence imply that dispositional motives and acutely activated motives possess similar structural properties and are associated with similar patterns of

cognition (e.g., Carver & White, 1994; Higgins, 2000; Lerner & Keltner, 2001; Maner et al., 2005). In Study 3, we extended this investigation by manipulating the transient experience of fear and examining its causal effects on judgments of positive versus negative events.

In each of these studies, we tested the motivationally selective judgment hypothesis by examining the specificity of the links between curiosity and fear on one hand, and judgments of positive versus negative events and decision outcomes, on the other. We expected that fear would be linked more strongly to judgments of negative outcomes than to judgments of positive outcomes. In contrast, we expected that curiosity would be linked more strongly to judgments of positive outcomes than to judgments of negative outcomes.

Study 1

Study 1 provided an initial test of the motivationally selective judgment hypothesis. Participants judged the utility of positive and negative outcomes that might arise as a result of performing a set of risky behaviors. We then assessed the relationships between these judgments and participants' levels of dispositional fear and curiosity.

Method

Participants

One-hundred eighty-four undergraduates (126 females, 56 males, 2 gender not reported) participated in exchange for partial course credit.

Procedure

The study was introduced as an assessment of personality styles. Participants were given a questionnaire containing all measures for the study.

Measures

The Fear Survey Schedule II (Bernstein & Allen, 1969; Geer, 1965) was used to assess participants' level of dispositional fear. This scale has been used widely in previous studies (e.g., Lerner & Keltner, 2000, 2001; Suls & Wan, 1987). Items assess fear across a number of domains including death, injury, and illness ("Death of a loved one"), social interaction ("Meeting someone for the first time"), social evaluation ("Being criticized"), and live organisms ("Snakes"). Participants responded to each item in terms of how much fear is elicited in them when thinking about the stimulus or event (1 = no fear, 5 = extreme fear) ($\alpha = .73$).

Spielberger et al.'s (1979) ten-item trait curiosity scale assessed participants' level of dispositional curiosity. Previous studies indicate that this scale exhibits adequate reliability, as well as convergent and discriminant

validity (e.g., Litman & Spielberger, 2003; Pritchard & Kay, 1993). Example items include: "I feel like exploring my environment" and "I feel inquisitive" (1 = almost never, 5 = almost always). A composite measure of dispositional curiosity was computed by averaging items on the scale, after reverse scoring appropriate items ($\alpha = .79$).

A 27-item version of the Risk Taking Behaviors Scale (Weber, Blais, & Betz, 2002) was used to assess participants' judgments of positive and negative outcomes. Items reflect potentially risky behaviors in several overlapping domains, including health/safety ("Engaging in unprotected sex"), recreation ("Trying out bungee jumping at least once"), ethics ("Illegally copying a piece of software"), social interaction ("Defending an unpopular issue that you believe in at a social occasion"), and gambling ("Betting a day's income at a high stakes poker game"). This scale was designed so that each item could be viewed in terms of either its potential positive outcomes or its potential negative outcomes. For example, bungee-jumping could result in thrill and exhilaration, but it could also result in injury. By instructing participants to think about both the positive and negative outcomes, we were able to acquire independent judgments of those outcomes.

Participants were instructed first to consider only the positive outcomes and to indicate for each item their judgment of the utility of those positive outcomes ("how desirable the emotional, social, or physical consequences would be"; 1 = not at all desirable; 5 = extremely desirable). Participants then were instructed to consider only the negative outcomes and to indicate for each item their judgment of the utility of those negative outcomes ("how severe or disruptive those emotional, social, or physical consequences would be"; 1 = not at all severe; 5 = extremely severe). Last, participants indicated for each item, the perceived likelihood of positive versus negative outcomes (1 = bad outcomes much more likely, 5 = good outcomes much more likely). Composite measures of positive utility, negative utility, and likelihood were calculated by averaging responses across items (all α 's greater than .80).

Results

Descriptive statistics and zero-order correlations among fear, curiosity and outcome judgments are provided in Table 1. We noted first that, in general, participants judged the utility of negative outcomes to be higher than the utility of positive outcomes, $F(1, 176) = 163.20, p < .001$, suggesting a tendency to view the potential negative outcomes as somewhat more salient than the positive outcomes. However, consistent with the motivationally selective judgment hypothesis, fear was significantly correlated with judgments of the utility of negative outcomes ($r = .22, p < .01$) but not

Table 1

Study 1 descriptive statistics and correlations among fear, curiosity and outcome judgments

	(1)	(2)	(3)	(4)	(5)
1. Dispositional fear	—				
2. Dispositional curiosity	-.22*	—			
3. Perceived utility, positive outcomes	-.12	.21*	—		
4. Perceived utility, negative outcomes	.22*	-.06	-.01	—	
5. Perceived likelihood	-.20*	.21*	.54**	-.41**	—
<i>N</i>	181	180	179	179	177
<i>M</i>	2.67	3.33	2.59	3.39	2.47
<i>SD</i>	0.53	0.53	0.60	0.60	0.38

Note. Perceived likelihood refers to perceptions of the relative likelihood of positive versus negative outcomes.

* $p < .01$.

** $p < .001$.

positive outcomes ($r = -.12$, ns). In contrast, curiosity was significantly correlated with judgments of the utility of positive outcomes ($r = .21$, $p < .01$) but not negative outcomes ($r = -.06$, ns).

These correlations, however, do not account for shared variance between fear and curiosity, which were negatively correlated ($r = -.22$, $p < .01$), as might be expected based on their status as antagonistic motivational orientations. Therefore, we used multiple regression analysis to evaluate the relationships among fear, curiosity, and outcome judgments, while controlling for the overlap between fear and curiosity. Moreover, we controlled for participant sex in these analyses because, consistent with previous research (Byrnes, Miller, & Schaffer, 1999), men's judgments were relatively more optimistic than were women's (higher judged utility of positive outcomes; lower judged utility of negative outcomes; both p 's $< .05$).

Results were consistent with the motivationally selective judgment hypothesis (see Table 2). Whereas fear uniquely predicted judgments of the utility of negative outcomes, curiosity uniquely predicted judgments of the utility of positive outcomes. The difference between the magnitude of fear's link with judgments of negative outcomes and the magnitude of its link with judgments of

positive outcomes only approached significance, $t = 1.53$, $p = .06$ (using a Fisher r -to- z transformation).¹ For curiosity, the difference in magnitude was significant, $t = 1.89$, $p < .05$, such that curiosity was more strongly associated with judgments of positive outcomes than judgments of negative outcomes.

Because participants did not provide separate judgments of the likelihood of positive and negative outcomes, we were not able to conduct a test of the motivationally selective judgment hypothesis for likelihood judgments. Nevertheless, we noted that both fear and curiosity were correlated in the expected direction with perceived likelihood of positive versus negative outcomes. Whereas fear was associated with relatively pessimistic likelihood judgments, curiosity was associated with relatively optimistic likelihood judgments (see Table 1).

Discussion

The results of Study 1 provide preliminary support for the motivationally selective judgment hypothesis. Whereas dispositional fear was linked with relatively pessimistic utility judgments, dispositional curiosity was linked with relatively optimistic utility judgments. More important, we observed some evidence that these links were selective. Curiosity was more strongly associated with judgments of the utility of positive outcomes than the utility of negative outcomes. An opposite pattern was observed for fear, such that fear seemed somewhat more strongly associated with judgments of the utility of negative outcomes than positive outcomes, although this difference was not statistically significant. The overall pattern of results seems to provide at least preliminary support for the motivationally selective judgment hypothesis. It is also worth noting that dispositional curiosity and fear were negatively correlated, consistent

Table 2

Study 1 Regression analyses predicting judgments of the utility of positive and negative outcomes from dispositional fear, curiosity, and participant sex

	<i>B</i>	Partial <i>r</i>	Significance
DV = subjective utility of positive outcomes			
$R^2 = .08$, $F(3) = 4.90$, $p < .01$			
Fear	-.02	-.02	.76
Curiosity	.18	.18	.02
Participant sex	.20	.19	.01
DV = subjective utility of negative outcomes			
$R^2 = .07$, $F(3) = 4.50$, $p < .01$			
Fear	.18	.17	.02
Curiosity	.01	.01	.93
Participant sex	.16	.16	.04

Note. Participant sex was coded as female = 0, male = 1.

¹ Given the presence of strong directional predictions, 1-tailed probability values are reported for all tests of differences between correlations.

with the notion that they reflect antagonistic motivational orientations.

Two important limitations to the methodology used in Study 1 should be noted. First, participants in this study *imagined* the potential positive and negative outcomes associated with a set of behaviors—behaviors for which the outcomes are fairly uncertain. Although this resembles the circumstances under which people often make real world decisions, it somewhat obscures the nature of the links between fear, curiosity, and outcome judgments. For example, although these findings might indicate that fearful individuals judged negative outcomes in a relatively pessimistic manner, it is possible that fearful individuals instead may have imagined different outcomes altogether. Perhaps fearful individuals simply conjured images of different and more severe outcomes, rather than judging the same outcomes as more severe.

A second limitation involves the way in which judgments of outcome likelihood were assessed. The primary hypothesis of this investigation pertains to the presence of differential judgments of positive versus negative outcomes. The method we used, however—having people judge on a single scale, the *relative* likelihood of positive versus negative events—precluded a test of this hypothesis. Thus, we conducted a second study aimed at redressing these limitations.

Study 2

Study 2 again tested the motivationally selective judgment hypothesis by evaluating links between dispositional fear and curiosity and judgments of positive and negative outcomes. In contrast to the method of Study 1, which relied on imagined outcomes, participants in Study 2 judged a set of known positive and negative events, in terms of their utility and likelihood.

Method

Participants

Sixty-nine undergraduate students (53 females, 16 males) participated in exchange for course credit.

Procedure

Participants were given a questionnaire containing all measures for the study. The study was introduced as an assessment of personality styles.

Measures

Spielberger et al.'s (1979) trait curiosity scale was used again to assess dispositional curiosity ($\alpha = .79$). The Fear Survey Schedule II was again used to assess dispositional levels of fear. See Study 1 for descriptions of these scales.

We used Weinstein's (1980) Optimism Scale to evaluate four distinct outcome judgments: (1) perceived likelihood of positive outcomes; (2) perceived likelihood of negative outcomes; (3) perceived utility of positive outcomes; (4) perceived utility of negative outcomes. As in previous research (e.g., Lerner & Keltner, 2001; Weinstein, 1980), participants responded to a set of positive events (e.g., "My achievements were written up in the newspaper," "I won some money while gambling") and negative events (e.g., "I tripped and broke a bone," "I was sued by someone") by indicating how likely they thought it was that the outcome might happen to them in the future, relative to other same sex students at their university (1 = much less likely, 5 = much more likely). Separate indices of perceived likelihood of positive and negative outcomes were calculated (positive, $\alpha = .75$; negative, $\alpha = .75$). We also assessed judgments of utility. For each of the positive events, participants indicated how "desirable the emotional, social, or physical consequences" were perceived to be (1 = not at all desirable, 5 = extremely desirable) ($\alpha = .87$). For each of the negative events, participants indicated how "severe or disruptive the emotional, social, or physical consequences" were perceived to be (1 = not at all severe, 5 = extremely severe) ($\alpha = .84$).

Results

As in Study 1, we observed a significant negative correlation between dispositional fear and curiosity, $r(69) = -.32$, $p < .01$. We therefore conducted multiple regression analyses to examine the unique relationships among dispositional fear, curiosity, and event judgments. Separate analyses were conducted for each of the four judgments. As in Study 1, participant sex was included as a covariate in each analysis. Results are summarized in Table 3.

Results were consistent with the motivationally selective judgment hypothesis. With respect to judgments of utility, curiosity was associated with judgments of the utility of positive events, but not negative events. The difference between the magnitude of these two relationships was significant $t = 1.91$, $p < .05$ (based on the partial correlations). In contrast, fear was associated with judgments of the utility of negative events, but not positive events. Again, the difference between the magnitude of these two relationships was significant, $t = 2.18$, $p < .05$.

With respect to judgments of likelihood, we observed a similar pattern. Curiosity was associated with judgments of positive event likelihood, but not negative event likelihood. The difference between the magnitude of these two correlations was significant, $t = 1.68$, $p < .05$. In contrast, fear was associated with judgments of negative event likelihood, but not positive event likelihood. However, the difference between the magnitude of these two correlations was not significant, $t = 1.02$, *ns*.

Table 3

Study 2 Regression analyses predicting perceived utility and likelihood of positive and negative outcomes from dispositional fear, curiosity, and participant sex

	<i>B</i>	Partial <i>r</i>	Significance
DV = perceived utility of positive outcomes $R^2 = .16$, $F(3) = 4.17$, $p < .01$			
Fear	.20	.20	.11
Curiosity	.40	.37	.002
Participant sex	.07	.06	.61
DV = perceived utility of negative outcomes $R^2 = .30$, $F(3) = 9.09$, $p < .001$			
Fear	.54	.50	.001
Curiosity	-.08	-.09	.47
Participant sex	.08	.09	.49
DV = perceived likelihood of positive outcomes $R^2 = .22$, $F(3) = 6.16$, $p < .001$			
Fear	-.04	-.04	.75
Curiosity	.36	.35	.004
Participant sex	.18	.17	.16
DV = perceived likelihood of negative outcomes $R^2 = .10$, $F(3) = 2.42$, $p = .07$			
Fear	.26	.24	.05
Curiosity	.03	.03	.81
Participant sex	-.13	-.12	.32

Note. Participant sex was coded as female = 0, male = 1.

Discussion

The results of Study 2 provide additional support for the motivationally selective judgment hypothesis. Dispositional curiosity was associated more strongly with utility judgments for positive events than negative events. In contrast, dispositional fear was more strongly associated with utility judgments of negative events than positive events. These data therefore suggest a conceptually-grounded symmetry between the approach and avoidance orientations reflected in curiosity and fear on one hand, and judgments of the utility of positive versus negative events on the other.

Results pertaining to judgments of outcome likelihood were similar to those for utility, although somewhat weaker in the case of fear. Consistent with the motivationally selective judgment hypothesis, dispositional curiosity was more strongly associated with likelihood judgments for positive events than for negative events. Although the opposite pattern was observed for fear, in that fear was significantly associated with likelihood judgments for negative events but not positive events, the difference between these two relationships was not significant and therefore this result should not be over-interpreted.

Building on the results of Study 1, results of this study confirm that dispositional curiosity and fear are associated with the manner in which people judge future outcomes, as all participants judged an identical set of positive and negative events. This seems to rule out the alternative possibility left over from Study 1—that relatively fearful and curious participants simply imagined different types of outcomes, rather than judging them in different ways. Instead, it appears that relatively fearful and curious participants indeed were inclined to judge the same outcomes in different—and predictable—ways.

Study 3

Results of the first two studies suggest that chronic motivational orientations associated with approach and avoidance may be differentially associated with judgments of positive versus negative outcomes and future events. Because those studies focused on dispositional orientations, we were not able to infer any causal connections between those orientations and patterns of outcome judgment. Therefore, we conducted a third study aimed at providing a preliminary test of the causal effects on outcome judgment.

This study manipulated the transient experience of fear and examined effects on judgments of positive versus negative events. We did not attempt to manipulate curiosity in this study because whereas manipulations of fear can be found readily in the empirical literature, well-validated manipulations of curiosity are less available.² Therefore, attempting to validate a new manipulation of curiosity, in addition to evaluating its effects on outcome judgment, seemed beyond the scope of the current investigation.

Participants were randomly assigned to undergo a manipulation designed to induce the experience of either fear or a control state. Effects of this manipulation on judgments of utility and likelihood were assessed. Based on the motivationally selective judgment hypothesis, and the results of the first two studies, we expected the manipulation to influence judgments of negative events more strongly than judgments of positive events.

² However, see Loewenstein (1994) for preliminary description of a potential curiosity manipulation.

Method

Participants

One hundred twelve undergraduate students (70 women, 40 men, 2 failed to indicate their sex) participated in return for partial course credit.

Design and procedure

Study 3 included a manipulation used in previous research to elicit a fearful, self-protective state (see Maner et al., 2005). Participants were randomly assigned to view one of two film clips designed to elicit either fear/self-protective motivation or a neutral control state. The fear clip included scenes from *Silence of the Lambs*, in which a serial killer stalks an FBI agent officer through a dark basement. This clip has been previously demonstrated to elicit high levels of fear (e.g., Gross & Levenson, 1995). The control clip, taken from the film *Koyaanisqatsi*, included time-lapse videography of urban living (e.g., people going up and down on an escalator, people working on an assembly line), accompanied by rapidly-paced orchestral music. We did not ask participants to report on their state after watching the film because previous research suggests that labeling one's state can reduce its impact on subsequent judgment processes (Keltner, Locke, & Audrain, 1993). However, data reported by Maner et al., 2005, which used the same film clips, demonstrated that participants viewing the self-protection clip, compared to those watching the control clip, experienced appreciable higher levels of fear and exhibited greater cognitive biases consistent with a self-protective motivational state. Both film clips were between seven and seven-and-a-half minutes in length.

The overall design of this study was a 2 (film clip: fear versus control) \times 2 (judgment: positive versus negative events) mixed design.

Measures

As in Study 1, Weinstein's (1980) Optimism scale was used to assess (1) perceived likelihood of positive outcomes; (2) perceived likelihood of negative outcomes; (3) perceived utility of positive outcomes; (4) perceived utility of negative outcomes (all α 's $> .75$). Participants completed these measures immediately after viewing their assigned film clip.

Results

Two mixed design Analyses of Covariance (ANCOVAs) assessed effects of the experimental manipulation on judgments of positive versus negative events, which were included as repeated measures. The first analysis was conducted on judgments of likelihood; the second was conducted on judgments of utility. For these analyses, perceived likelihood and utility of positive outcomes were reversed scored to reflect the direction that would be consistent with fear-induced biases (i.e., lower perceived likelihood and utility of positive outcomes). As in the previous studies, participant sex was included as a covariate.

For judgments of likelihood, results indicated a significant main effect of the fear manipulation, $F(1,106) = 5.43$, $p = .02$, a main effect of outcome valence, $F(1,106) = 35.37$, $p < .001$, and a significant two-way interaction between the fear manipulation and outcome valence, $F(1,106) = 4.05$, $p < .05$ (see Fig. 1).

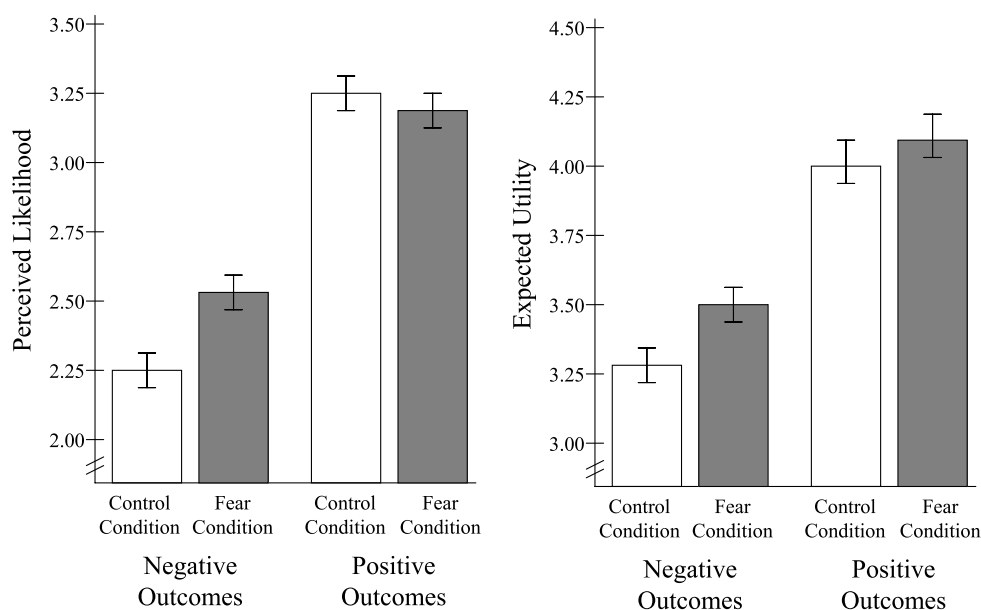


Fig. 1. An experimental fear induction procedure enhanced judgments of the likelihood and utility of potential negative outcomes, but did not significantly influence evaluations of potential positive outcomes.

Planned contrasts indicated that the fear manipulation appreciably increased the perceived likelihood of negative outcomes, $F(1,106)=9.82$, $p=.002$, $d=.60$, but did not affect the perceived likelihood of positive outcomes, $F<1$.

A similar analysis was conducted to assess effects on utility judgments. Results indicated only a significant main effect of outcome valence, $F(1,107)=210.07$, $p<.001$. Although the predicted two-way interaction between fear and outcome valence only approached significance, $F(1,107)=3.03$, $p<.10$, planned contrasts were conducted to test the predicted pattern of outcome judgments. These tests indicated that, consistent with the motivationally selective judgment hypothesis, the fear manipulation appreciably increased judgments of the utility of negative outcomes, $F(1,107)=4.11$, $p<.05$, $d=.40$, but did not affect judgments of the utility of positive outcomes, $F<1$ (see Fig. 1).

Discussion

The results of Study 3 provide evidence that a self-protective orientation, induced through the transient experience of fear, shaped the manner in which people judged potential outcomes. These results also provide evidence supporting the motivationally selective judgment hypothesis. In particular, the fear manipulation increased negative likelihood judgments, whereas positive likelihood judgments were unaffected. Although the results were relatively weaker for judgments of utility (in that the predicted interaction only approached significance), the overall pattern was similar: whereas the fear manipulation increased judgments of the utility of negative events, no such effect was observed for positive events. The overall pattern of findings, therefore, provides moderate support for the prediction that self-protective motivation (and its allied affective state of fear) exhibits selective effects on event judgments, such that effects are observed primarily for judgments of negative events, rather than positive events.

General discussion

The current research adds to a growing literature suggesting that top-down psychological factors such as goals, emotions, and other drive states can profoundly influence judgment and decision-making. Findings from these studies suggest that fear and curiosity—fundamental motivational orientations associated with avoidance and approach—are linked to the manner in which people judge decision outcomes and future events. Curiosity has been conceptualized as a motivational orientation reflecting a pronounced desire to approach opportunities for attaining desired information and experiences (Loewenstein, 1994). Consistent with this view, curiosity

was associated with judgments that could promote exploration and risk-seeking. Fear, in contrast, signals the presence of danger and leads people to process information so as to facilitate avoidance of risk and protection from harm (Öhman & Mineka, 2001). Consistent with this avoidance orientation, fear was linked to judgments that could promote risk-avoidance. These judgments, therefore, fit with a functionalist perspective and are consistent with the basic approach versus avoidance orientations associated with curiosity and fear.

Moreover, the current research also provides novel evidence suggesting that the links between particular motivational orientations and outcome judgments may be selective; i.e., they differentiate between positive outcomes and negative outcomes. Across these studies, curiosity was associated primarily with heightened perceptions of positive outcomes, whereas fear was associated primarily with heightened perceptions of negative outcomes. In contrast, relatively weaker links were observed between curiosity and negative outcomes and between fear and positive outcomes. The specificity of these links was observed for both perceptions of utility and likelihood, consistent with evidence that perceptions of likelihood and utility are often linked (Keren & Teigen, 2001). Thus, findings from these studies converge on a pattern suggesting that the links between particular motivational orientations and positive and negative outcome judgments are selective, such that these links exhibit relative differences in magnitude. (We would not, however, go so far as to conclude that there are *no* links between approach-focused motives and judgments of negative outcomes, or between avoidance-focused motives and judgments of positive outcomes. Such null findings carry intrinsic interpretational difficulties.)

The current research fits with a number of other conceptual frameworks that have been used to explain judgment and decision-making processes. The current evidence for motivational specificity, for example, is consistent with theories of motivation and selective cognition (e.g., Maner et al., 2003, 2005). Such theories suggest that specific motives lead goal-relevant aspects of the environment to receive preferential processing, while other aspects of the environment are processed less intently. The current findings are also consistent with theories of “regulatory fit.” These theories imply that when making decisions, individuals with a self-regulatory stance aimed at avoiding costs make decisions based primarily on negative outcomes, whereas individuals who regulate their behavior in terms of approaching desired opportunities consequently make decisions primarily on the basis of positive outcomes (e.g., Higgins, 2000; Idson et al., 2004).

The current research may also fit within a priming framework. Particular motivational orientations may be associated with increased psychological accessibility of goal-consistent concepts and beliefs. For example, fear

may be linked to heightened accessibility of potential threat (Barlow, 2002), thereby facilitating pessimistic outcome judgments. The optimistic and pessimistic judgment tendencies observed in the current studies may partially reflect the increased accessibility of particular beliefs associated with the presence of threat or opportunity in the environment (see Lerner & Gonzalez, 2005; Schwarz & Clore, 1983).

The current studies also may be consistent with appraisal theories (Lazarus, 1991; Lerner & Keltner, 2001; Smith & Ellsworth, 1985), which imply that particular judgment tendencies are linked to appraisal dimensions such as certainty and control. For example, fear is associated with appraisals of uncertainty and lack of control, which tend to promote judgments aimed at reducing risk and uncertainty. Results of the current investigation seem consistent with this appraisal formulation. It is not as clear that curiosity fits as easily within an appraisal framework, however, because curiosity has been conceptualized as arising from a state of uncertainty (e.g., a lack of knowledge) and therefore curiosity might be expected to promote pessimistic judgments aimed at facilitating risk-avoidance. Instead, curiosity appeared to be linked with more optimistic judgments, consistent with its status as an approach-focused motivational orientation.

How might one reconcile the current findings with previous studies that seem to imply that particular states can influence both positive and negative outcomes (e.g., Lerner & Keltner, 2001; see also DeSteno, Petty, Rucker, Wegener, & Braverman, 2004)? The difference between the current studies and such previous findings may rest on whether one compares two antagonistic states (e.g., comparing curiosity-induced judgments to those induced by fear) versus examining judgments associated with a single state. For example, if fear were to increase judgments of negative outcomes, whereas curiosity were to increase judgments of positive outcomes, then a comparison of fear versus curiosity would reveal differences in both positive and negative outcomes, possibly making it seem as though both fear and curiosity had influenced judgments of both positive and negative outcomes. In contrast, evidence for selectivity may be observed most clearly when a particular state is compared to a neutral state, for example, as fear was in the current research (see Study 3).³ Future research might explore further the potential differences produced by these two empirical approaches.

Limitations, implications, and future directions

There are several limitations to the current studies that provide useful opportunities for future research.

One limitation pertains to the primary empirical focus on motivational orientations that were chronic or dispositional, as opposed to transient. Many theories of motivation imply that dispositional motives and transient motives possess similar structural properties and are associated with similar cognitive and behavioral consequences (e.g., Carver & White, 1994; Higgins, 2000; Maner et al., 2005) and some previous studies of judgment and decision-making have examined dispositional and transient motivational factors with equivalent results (e.g., Lerner & Keltner, 2000, 2001). Nevertheless, a focus on dispositional motivation precludes strong tests of causality. In this respect, the current results involving fear were relatively stronger than those pertaining to curiosity. The current studies showed that both dispositional fear and experimentally induced fear exhibited similar associations with negative outcome judgments. However, because we did not manipulate the transient experience of curiosity, we were unable to provide evidence of curiosity's causal effects. This empirical step remains for future research.

Another limitation involves the fact that the current studies required participants to judge *both* positive and negative outcomes, so that these judgments could be directly compared. This is not to say, however, that when making decisions individuals naturally focus their attention to an equivalent degree on positive versus negative outcomes. For example, given a risky choice, some individuals may attend to potential gains while ignoring potential costs. The current methods cannot directly address the degree to which individuals differentially attend to positive versus negative outcomes. This difference in attentional focus, therefore, leaves some interesting and as of yet unexplored questions for further research.

A third limitation involves the specific motivational orientations under investigation in the current studies. We focused on fear and curiosity because they are associated with clear approach and avoidance goals, and therefore were good candidates for examining approach- and avoidance-oriented judgment tendencies. These motivational orientations, however, are but two of the many motivational factors that may guide judgment processes. While the judgment tendencies observed in the current research could generalize to other motivational systems, further research is clearly needed to specify the extent to which other motivations may functionally and selectively guide judgment and decision-making processes.

Despite these limitations, the current research has potentially important implications for understanding motivational and affective processes associated with judgment and decision-making. The present studies supplement a growing body of research aimed at understanding the underlying processes through which motivation and emotion guide judgment and choice. The current research

³ We are grateful to an anonymous reviewer for suggesting this possibility.

provides evidence that particular motivational orientations are linked—functionally and selectively—to the manner in which people judge decision outcomes and future events. The current research suggests the utility of considering independently, the effects of top-down factors on subjective judgments of desirable versus undesirable outcomes.

The current research also has broader implications for the integration of functionalist theories of motivation and cognition with theories of judgment and decision-making. These findings suggest the utility of a motivational approach to decision-making and are consistent with other theories positing adaptive motivational influences on judgment and choice (e.g., Fessler et al., 2004; Ketelaar & Au, 2003; Maner, DeWall, Baumeister, & Schaller, in press-b; Maner, Gailliot, & DeWall, in press-a). The current studies go beyond evidence simply for adaptive relationships among motivation, affect, and judgment; these studies suggest that such relationships can be highly selective, as well. Hence, these findings supplement current lines of research seeking to integrate theories of motivation and selective cognition with research on judgment and choice.

Conclusion

Although behavioral scientists have long been interested in the experience of specific types of motivation and affect, only recently have researchers begun to emphasize the importance of these factors in judgment and decision-making. The present studies add to this body of research by clarifying the manner in which specific motivational orientations might guide judgment processes. At a broader theoretical level, the current research adds to a growing literature suggesting that selective patterns of higher-order cognition are shaped by fundamental motives designed to help people navigate the opportunities, challenges, and choices present in everyday life.

References

- Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (Second ed.). New York, NY: Guilford Press.
- Bernstein, D., & Allen, G. (1969). Fear survey schedule (II): normative data and factor analysis based upon a large college sample. *Behavior Research and Therapy*, 7, 403–408.
- Berlyne, D. (1960). *Conflict, arousal, and curiosity*. New York: McGraw-Hill.
- Byrnes, J., Miller, D., & Schaffer, W. (1999). Gender differences in risk-taking: a meta-analysis. *Psychological Bulletin*, 125, 367–383.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, 67, 319–333.
- DeSteno, D., Petty, R. E., Rucker, D. D., Wegener, D. T., & Braverman, J. (2004). Discrete emotions and persuasion: The role of emotion-induced expectancies. *Journal of Personality and Social Psychology*, 86, 43–56.
- Fessler, D. M., Pillsworth, E. J., & Flanson, T. J. (2004). Angry men and disgusted women: an evolutionary approach to the influence of emotion on risk-taking. *Organizational Behavior and Human Decision Processes*, 95, 107–123.
- Finucane, M. L., Peters, E., & Slovic, P. (2003). Judgment and decision-making: the dance of affect and reason. In S. L. Schneider & J. Shanteau (Eds.), *Emerging perspectives on judgment and decision research. Cambridge series on judgement and decision-making* (pp. 327–364). New York: Cambridge University Press.
- Fishburn, P. C. (1988). *Nonlinear preference and utility theory*. Baltimore: Johns Hopkins University Press.
- Forgas, J. P. (1995). Mood and judgment: the affect infusion model (AIM). *Psychological Bulletin*, 117, 39–66.
- Forgas, J. (2003). Affective influences on attitudes and judgments. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of Affective Sciences* (pp. 596–618). New York: Oxford University Press.
- Geer, J. J. (1965). The development of a scale to measure fear. *Behavior Research and Therapy*, 3, 45–53.
- Gross, J. J., & Levenson, R. W. (1995). Emotion elicitation using films. *Cognition and Emotion*, 9, 87–108.
- Higgins, E. T. (2000). Making a good decision: value from fit. *American Psychologist*, 55, 1217–1230.
- Hoelzl, E., & Loewenstein, G. (2005). Wearing out your shoes to prevent someone else from stepping into them: anticipated regret and social takeover in sequential decisions. *Organizational Behavior and Human Decision Processes*, 98, 15–27.
- Idson, L. C., Liberman, N., & Higgins, E. T. (2004). Imagining how you'd feel: the role of motivational experiences from regulatory fit. *Personality and Social Psychology Bulletin*, 30, 926–937.
- Isen, A. M., Nygren, T. E., & Ashby, F. G. (1988). Influence of positive affect on the subjective utility of gains and losses: it's just not worth the risk. *Journal of Personality and Social Psychology*, 55, 710–717.
- James, W. (1890/1981). *The principles of psychology*. Cambridge: Harvard University Press.
- Kahneman, D., & Tversky, A. (1979). Prospect theory. *Econometrica*, 47, 263–292.
- Keltner, D., Locke, K. D., & Audrain, P. C. (1993). The influence of attributions on the relevance of negative feelings to personal satisfaction. *Personality and Social Psychology Bulletin*, 19, 21–29.
- Keren, G., & Teigen, K. H. (2001). The probability-outcome correspondence principle: a dispositional view of the interpretation of probability statements. *Memory and Cognition*, 29, 1010–1021.
- Ketelaar, T., & Au, W. (2003). The effects of feelings of guilt on the behaviour of uncooperative individuals in repeated social bargaining games: an affect-as-information interpretation of the role of emotion in social interaction. *Cognition and Emotion*, 17, 429–453.
- Larsen, R. J., & Ketelaar, T. (1991). Personality and susceptibility to positive and negative emotional states. *Journal of Personality and Social Psychology*, 61, 132–140.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lazarus, R. S. (1994). The stable and the unstable in emotion. In P. Ekman & R. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 79–85). New York: Oxford University Press.
- Lerner, J., & Gonzalez, R. M. (2005). Forecasting one's future based on fleeting subjective experiences. *Personality and Social Psychology Bulletin*, 31, 454–466.
- Lerner, J., & Keltner, D. (2000). Beyond valence: toward a model of emotion-specific influences on judgments and choice. *Cognition and Emotion*, 14, 473–493.
- Lerner, J., & Keltner, D. (2001). Fear, anger, risk. *Journal of Personality and Social Psychology*, 81, 146–159.
- Litman, J. (2005). Curiosity and the pleasures of learning: wanting and liking new information. *Cognition and Emotion*, 19, 793–814.
- Litman, J. A., & Jimerson, T. L. (2004). The measurement of curiosity as a feeling-of-deprivation. *Journal of Personality Assessment*, 82, 147–157.

- Litman, J., & Spielberger, C. (2003). Measuring epistemic curiosity and its diverse and specific components. *Journal of Personality Assessment*, 80, 75–86.
- Loewenstein, G. (1994). The psychology of curiosity: a review and reinterpretation. *Psychological Bulletin*, 116, 75–98.
- Loewenstein, G. (1996). Out of control: visceral influences on behavior. *Organizational Behavior and Human Decision Processes*, 65, 272–292.
- Loewenstein, G., & Lerner, J. (2003). In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 619–642). New York: Oxford University Press.
- Loewenstein, G., Thompson, L., & Bazerman, M. (1989). Social utility and decision-making in interpersonal contexts. *Journal of Personality and Social Psychology*, 57, 426–441.
- Loewenstein, G., Weber, E., Hsee, C., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127, 267–286.
- Lopes, L. (1995). On modeling risky choice: why reasons matter. In J. Caverni & M. Bar-Hillel (Eds.), *Contributions to decision-making—I* (pp. 29–50). Amsterdam: North Holland/Elsevier Science Publishers.
- Maner, J. K., Gailliot, M. T., & DeWall, C. N. (in press-a). Adaptive attentional attenuation: evidence for mating-related perceptual bias. *Evolution and Human Behavior*.
- Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (in press-b). Does social exclusion motivate interpersonal reconnection? Resolving the “porcupine problem.” *Journal of Personality and Social Psychology*.
- Maner, J. K., Kenrick, D. T., Becker, D. V., Robertson, T., Hofer, B., Neuberg, S. L., et al. (2005). Functional projection: how fundamental social motives can bias interpersonal perception. *Journal of Personality and Social Psychology*, 88, 63–78.
- Maner, J. K., Kenrick, D. T., Becker, D. V., Delton, A. W., Hofer, B., Wilbur, C., et al. (2003). Sexually selective cognition: beauty captures the mind of the beholder. *Journal of Personality and Social Psychology*, 85, 1107–1120.
- Maner, J. K., Richey, J. A., Cromer, K., Mallott, M., Lejuez, C., Joiner, T. E., & Schmidt, N. B. (in press-c). Dispositional anxiety and risk-avoidant decision making. *Personality and Individual Differences*.
- Maner, J. K., & Schmidt, N. B. (2006). The role of risk-avoidance in anxiety. *Behavior Therapy*, 37, 181–189.
- McArthur, L. Z., & Baron, R. M. (1983). Toward an ecological theory of social perception. *Psychological Review*, 90, 215–238.
- McDougall, W. (1923). *An introduction to social psychology*. Boston: John Luce & Co.
- Mellers, B. A. (2000). Choice and the relative pleasure of consequences. *Psychological Bulletin*, 126, 910–924.
- Mellers, B. A., & McGraw, A. P. (2001). Anticipated emotions as guides to choice. *Current Directions in Psychological Science*, 10, 210–214.
- Mellers, B. A., Schwartz, A., Ho, K., & Ritov, I. (1997). Decision affect theory: emotional reactions to the outcomes of risky options. *Psychological Science*, 8, 423–429.
- Mittal, V., & Ross, W. T. (1998). The impact of positive and negative affect and issue framing on issue interpretation and risk taking. *Organizational Behavior and Human Decision Processes*, 76, 298–324.
- Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: toward an evolved module of fear and fear learning. *Psychological Review*, 108, 483–522.
- Pritchard, W., & Kay, D. (1993). Personality and smoking motivation of US smokers as measured by the State-Trait Personality Inventory, the Eysenck Personality Questionnaire, and Spielberger's Smoking Motivation Questionnaire. *Personality and Individual Differences*, 14, 629–637.
- Raghunathan, R., & Pham, M. (1999). All negative moods are not equal: motivational influences of anxiety and sadness on decision-making. *Organizational Behavior and Human Decision Processes*, 79, 56–77.
- Schwarz, N., & Clore, G. (1983). Mood, misattribution, and judgments of well-being: informative and directive functions of affective states. *Journal of Personality and Social Psychology*, 45, 513–523.
- Schwarz, N., & Clore, G. (1996). Feelings and phenomenal experiences. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 433–465). New York: Guilford Press.
- Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology*, 48, 813–838.
- Spielberger, C. D., Jacobs, G., Crane, R., Russel, S., Westberry, L., Barker, E., et al. (1979). Preliminary manual for the State-Trait Personality Inventory. Unpublished manual, University of South Florida, Tampa.
- Suls, J., & Wan, C. K. (1987). In search of the false-uniqueness phenomenon: fear estimates of social consensus. *Journal of Personality and Social Psychology*, 52, 211–217.
- Watson, D., Wiese, D., Vaidya, J., & Tellegen, A. (1999). The two general activation systems of affect: structural findings, evolutionary considerations, and psychobiological evidence. *Journal of Personality and Social Psychology*, 76, 820–838.
- Weber, E., Blais, A., & Betz, N. (2002). A domain-specific risk-attitude scale: measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision-making*, 15, 263–290.
- Weinstein, N. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39, 806–820.
- Zajonc, R. (1998). Emotions. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 1, pp. 591–632). New York: Oxford University Press.