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Angry men and disgusted women: An evolutionary approach to the influence of emotions on risk taking☆

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Abstract

Despite considerable research on the influence of emotions on risk taking, investigators have yet to agree on an explanatory framework. Reviewing the literature, we identify problems with popular valence-based approaches. In contrast, Lerner and Keltner's (2000, 2001) appraisal-tendencies theory has been supported, and usefully generates testable predictions regarding the effects of specific emotions. Nevertheless, though premised on the assumption that functional attributes differentiate emotions, this theory overlooks the ultimate goals that emotions serve. Adopting an evolutionary perspective, we predicted that, despite having similar appraisal tendencies, anger and disgust would have opposite effects on risk taking, since anger functions to deter transgression through aggression, while disgust functions to ward off contamination; an evolutionary perspective also led us to predict sex differences in these effects. Employing a gambling task involving substantial real stakes, we demonstrate that anger increases risk taking in men, while disgust decreases risk taking in women.

Keywords: Emotions; Risk taking; Decision making; Anger; Disgust; Evolutionary psychology

Over the last decade, scholars have focused increasing attention on the role of emotions in decision making (Bosman & van Winden, 2001; Charland, 1998; Damasio, 1994; Elster, 1998; Loewenstein & Lerner, 2002; Loewenstein, Weber, Hsee, & Welch, 2001; Pillutla & Murnighan, 1996; Schwarz, 2000). A particularly important issue in this regard is the impact of emotions on decisions involving risk (defined here as the potential for negative outcomes), as this category includes many behaviors that have significant personal and social consequences. To date, investigators have sought to explain the influence of emotions on risk taking largely in terms of the effects of attributes, or combinations of attributes, that differentiate emotions from one another at the proximate or descriptive level. In contrast to such an approach, we adopt an evolutionary view, arguing that the impact of emotions on risk taking is best explored in terms of the ultimate functions that specified emotions evolved to perform. After reviewing the literature, we demonstrate that an evolutionary functionalist approach accurately predicts differing effects on risk taking of two emotions, anger and disgust, differences that are not explicable in terms of the proximate dimensions emphasized by previous researchers. The same focus on ultimate functions also sheds light on sex differences, an issue hitherto largely overlooked in the literature on emotion and risk taking.

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Review of research to date

Emotions impact decision making in at least two ways. First, previously experienced emotions may influence the attractiveness of a variety of potential future courses of action, often via the anticipation of the effects of various outcomes on one's emotional state (Elster, 1998; Loewenstein et al., 2001; Mellers & McGraw, 2001; Mellers, Schwartz, & Ritov, 1999). While not unimportant, this aspect of emotions is of lesser interest to us, as, in these cases, emotions play a passive role in the decision making process, being simply one of many sources of an individual's preferences. In contrast, in a second class of situations, emotions play an active role in the decision making process. Specifically, the ongoing experience of an emotion may differentially highlight various options for responding to the eliciting event. Since many of the most dramatic (and often puzzling) decisions involving risk seem to be influenced by active rather than anticipated emotions, it is with this class of events that we concern ourselves here.

The majority of contemporary theories regarding the relationship between active emotions and risk taking either derive from, or are reactions to, one of two seminal approaches to the problem, namely Isen and colleagues' mood maintenance hypothesis, and Johnson and Tversky's (1983) affective generalization hypothesis.

As initially formulated by Isen and Patrick (1983), the mood maintenance hypothesis held that people in a positive mood avoid taking risks in order to maximize the likelihood that their positive mood will be maintained. This view was subsequently amended to include the proposal that those in a negative mood seek out risks in an attempt to achieve gains that will produce a positive mood (for contributions to the mood maintenance tradition, see Arkes, Herren, & Isen, 1988; Isen & Geva, 1987; Isen, Nygren, & Ashby, 1988; Mano, 1992; Nygren, Isen, Taylor, & Dulin, 1996). Although important findings have been contributed by investigators adopting this perspective, the approach nevertheless suffers from a number of limitations. First, advocates have interpreted mutually contradictory results as lending support to the proposition that people seek to maintain good moods and truncate bad ones (see esp. Arkes et al., 1988; Mano, 1992; Nygren et al., 1996). More broadly, the phenomenology of some negative emotions appears not to be consistent with the hypothesis (Hockey, Maule, Clough, & Bdzola, 2000). For example, angry people may ruminate on the eliciting event (Rusting & Nolen-Hoeksema, 1998) or seek out the antagonist (reviewed in Kring, 2000), behaviors that likely prolong rather than shorten this negative affect. Consistent with this observation, as will be discussed at length, recent investigations indicate that emotions and moods do not have a uniform effect on risk taking as a function of valence.

Whereas the mood maintenance hypothesis seeks to explain the overarching effects of emotions on risk taking, Johnson and Tversky's (1983) affective generalization hypothesis focuses on subjective probabilities, a component of decision making. Johnson and Tversky claim that exposure to information that elicits negative affect increases the perceived frequency of events which, though unrelated, have the same affective valence. Unlike the mood maintenance hypothesis, the affective generalization hypothesis does not view the impact of emotions on decision making as goal-directed, but rather presents the observed effect as an accidental consequence of the operation of the emotion system.

DeSteno, Petty, Wegener, and Rucker (2000) question both Johnson and Tversky's focus on valence and their afunctionalism. The authors argue that emotions inform individuals about the current state of the environment in which they find themselves. Because the occurrence of an event of a given type is crudely predictive of the occurrence of other events of the same type, and because emotions mark such categories, DeSteno et al. predict that, rather than being a function of valence, the impact of emotions on frequency estimation should be emotion-specific. Presenting news accounts that elicited either anger or sadness prior to a frequency-estimation task, the authors demonstrate that, although both primes elicited negative affect, each prime influenced frequency estimates only for events associated with the given emotion. Inducing happiness, sadness, or anger using a relived emotion task, DeSteno et al. then demonstrate that, for participants low in need-for-cognition, even an obviously arbitrarily induced emotional state biases frequency estimates for events associated with the given emotion (see also Wright & Bower, 1992).

Adopting a different tactic in the attack on the primacy of valence in decision making, Lerner and Keltner (2000, 2001) argue that emotions are differentiated from one another not with regard to valence, but on the basis of differences in their impact on various cognitive appraisals—it is the latter, the authors assert, which shape the willingness to take risks. Drawing on Smith and Ellsworth (1985), Lerner and Keltner (2000) argue that anger is associated with high certainty, medium anticipated effort, high control, and high responsibility. In contrast, fear is associated with low certainty, high anticipated effort, low control, and medium responsibility. Broadly, anger thus produces a tendency to perceive negative events as predictable, under human control, and brought about by others, while fear produces a tendency to perceive negative events as unpredictable and under situational control. Using both trait and state measures, the authors assessed fear and anger, then employed Johnson and Tversky's frequency-estimation task. Consistent with the claim that appraisal tendencies determine the impact of emotions, although both anger