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## **Portrait of The Angry Decision Maker: How Appraisal Tendencies Shape Anger's Influence on Cognition**

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### **ABSTRACT**

This paper reviews the impact of anger on judgment and decision making. Section I proposes that anger merits special attention in the study of judgment and decision making because the effects of anger often diverge from those of other negative emotions. Section II presents an Appraisal-Tendency Framework for predicting and organizing such effects. Section III reviews empirical evidence for the uniqueness of anger's relations to judgment and decision making. Section IV connects the Appraisal-Tendency Framework to associated mechanisms and theories. Drawing on the evidence, Section V presents the question of whether anger should be considered a positive emotion. It also proposes the hypothesis that anger will be experienced as relatively unpleasant and unrewarding when reflecting back on the source of one's anger but experienced as relatively pleasant and rewarding when looking forward. Section VI synthesizes the evidence into a new portrait of the angry decision maker.

**key words** emotion; anger; decision making; judgment; affect; cognition; choice; risk

### **I. THE IMPORTANCE OF ANGER FOR STUDIES OF JUDGMENT AND DECISION MAKING**

Over two thousand years ago, Aristotle's *Rhetoric* (350 BCE/1991) described a unique set of cognitive causes and consequences associated with anger. Aristotle foretold what experimental studies now imply—that anger merits special attention in judgment and decision making.

Anger merits such attention for several reasons. First, anger is one of the most frequently experienced emotions—at least among individuals in the United States. Averill (1982) concluded in a survey of prior studies that “Depending upon how records are kept, most people report becoming mildly to moderately angry anywhere from several times a day to several times a week” (p. 1146).<sup>1</sup> Similarly, Lerner, Gonzalez, Small, and Fischhoff (2003) found, in a nationally representative sample of US citizens, that out of all the possible emotions experienced by US citizens, anger was the most commonly experienced emotion in response to the September 11th terrorist attacks. Fischhoff, Gonzalez, Lerner, and Small (2005) found that the same pattern held a year later with the same sample. To be sure, the diverse elicitors of anger experiences have been widely studied. Here, by contrast, we study the outcomes of anger—specifically judgment and decision-making outcomes. Admittedly, this is a unique approach. The most frequently studied outcome of anger is aggression (e.g., Berkowitz, 1990, 1993), but here we are concerned with how anger influences perceptions, beliefs, ideas, reasoning, and ultimately choices. Anger has the potential to grip a nation over a sustained period (Fischhoff et al., 2005;

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<sup>1</sup> Regional variations may amplify or attenuate the frequency. Individuals in the southern United States, for example, uphold a “culture of honor” (Cohen, Nisbett, Bowdle, & Schwarz, 1996), which includes lower thresholds for registering “a demeaning offense against me or mine”—a key trigger for anger (Lazarus, 1991a, p. 122).

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Lerner et al., 2003) and thus it is important to understand how it may shape individual choice over time.

A second reason for focusing on anger is that it has an unusually strong ability to capture attention. All emotional stimuli grab attention more so than do neutral stimuli (Derryberry & Tucker, 1994; Pratto & John, 1991). But anger has uniquely captivating properties both for the person experiencing it as well as for the person perceiving it (Solomon, 1990; Tavris, 1989). Hansen and Hansen (1988) have demonstrated what they call “The Anger Superiority Effect” — a tendency for people to pay particular attention to angry faces. Angry faces are spotted quickly and mistakes are rarely made regarding them, as compared with other emotion expressions. And once people perceive angry targets, a cascade of emotion-specific inferences automatically follows. Angry expressers are implicitly perceived as threatening, competent, powerful, and dominant, while sad expressers, by comparison, are perceived as likable, submissive, and in need of help (Clark, Pataki, & Carver, 1996; Knutson, 1996; Tiedens, 2001a). In fact, differentiating the expression of anger from other negative emotions is so basic a skill that even 10-week old infants respond differently to angry faces than to sad faces (Haviland & Lelwica, 1987). Thus, anger is likely to be a frequently used judgment cue, especially at the implicit level.

A third reason to focus on anger is its infusive potential. It commonly carries over from past situations to infuse normatively unrelated judgments and decisions. In Nichomachean Ethics, Aristotle argues that “Anyone can become angry—that is easy. But to be angry with the right person, to the right degree, at the right time, for the right purpose, and in the right way—that is not easy” (350 BCE/2004, p. 150). Many will recognize this experience—punishing the wrong person with one's anger. But anger's infusive influences on judgment go well beyond this. Not only does anger make people indiscriminately punitive (Goldberg, Lerner, & Tetlock, 1999; Lerner, Goldberg, & Tetlock, 1998), it also makes them indiscriminately optimistic about their own chances of success (Fischhoff et al., 2005; Lerner et al., 2003; Lerner & Keltner, 2000, 2001), careless in their thought (Bodenhausen, Sheppard, & Kramer, 1994; Lerner et al., 1998; Small & Lerner, 2005; Tiedens, 2001b; Tiedens & Linton, 2001), and eager to act (Harmon-Jones, Sigelman, Bohlig, & Harmon-Jones, 2003; Mackie, Devos, & Smith, 2000)—all effects reviewed below. Anger does so because it influences the situational construals most basic to judgment and decision making—perceptions of control, responsibility, and certainty—and because it lingers after the triggering events (Lerner & Keltner, 2001; Tiedens & Linton, 2001). Once activated, anger can color people's perceptions, form their decisions, and guide their behavior, regardless of whether the decisions at hand have anything to do with the source of one's anger. For example, in the United States, experimentally priming anger about September 11th influenced not only citizens' risk perceptions about terror-related events (e.g., being attacked) but also their perceptions about routine events (e.g., getting the flu) and their policy preferences where matters of life and death were at stake (Lerner et al., 2003). In sum, anger is a commonly occurring state that affects basic cognitive and social processes which, in turn, shape the decisions people make and the lives they lead.

## II. THE APPRAISAL-TENDENCY FRAMEWORK

Lerner and Keltner (2000, 2001) proposed the Appraisal-Tendency Framework (ATF) as a basis for distinguishing the effects of specific emotions on judgment and decision making. In the

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present paper, we apply and extend this framework, predicting ways that anger exerts unique effects on judgment and decision making.

The ATF assumes that specific emotions give rise to specific cognitive and motivational properties, each expressed at the biological and behavioral level. Here we briefly review evidence consistent with these assumptions, highlighting unique aspects of anger.

### **Cognitive appraisal properties of emotion**

Cognitive-appraisal theories emphasize that a range of cognitive dimensions (including, but not limited to valence/pleasantness) usefully differentiates emotional experience and emotional effects. For example, in an empirical examination of appraisal dimensions of emotions, Smith and Ellsworth (1985) identified six cognitive dimensions that define the patterns of appraisal underlying different emotions: certainty, pleasantness, attentional activity, control, anticipated effort, and responsibility. Each emotion was found to be defined by central dimensions, which characterize its core meaning or theme (Lazarus, 1991b; Smith & Ellsworth, 1985).

The experience of anger, and its related appraisals, has been investigated in a number of studies. Although the terms used to capture these appraisals differ slightly from researcher to researcher, a remarkably consistent picture of anger emerges from this literature (e.g., Lazarus, 1991a; Ortony, Clore, & Collins, 1988; Roseman, 1984, 1991; Scherer, 1999, 2001; Weiner, 1980, 1986). Specifically, anger has been found to be associated with a sense that the self (or someone the self cares about) has been offended or injured (Lazarus, 1991a). Of particular importance for the present paper, feeling angry has been associated with a sense of certainty or confidence about what has happened and about what the cause of the event was. Feeling angry has also been associated with the belief that another person (as opposed to the situation or the self) was responsible for the negative event, and the notion that the self can still influence the situation—or has the power or ability to cope with the situation (e.g., Lazarus, 1991a; Ortony et al., 1988; Roseman, 1984, 1991; Scherer, 1999, 2001; Weiner, 1980, 1986). This kind of response can be compared to a different set of appraisals one might have about a negative event. For example, negative events that are blamed on situational forces foster a sense of sadness rather than anger. Negative events accompanied by the belief that oneself is responsible give way to feelings of guilt and shame rather than anger (Neumann, 2000). And, when people feel uncertain or lack confidence about the cause of negative events, they are likely to feel fear and anxiety rather than anger.

Although such cognitive appraisal patterns were traditionally conceptualized as causes of the experience of anger (cognition-to-emotion), it is important to point out that emotions, including anger, may arise in any number of ways, including relatively non-cognitive routes, such as bodily feedback or unconscious priming (Berkowitz & Harmon-Jones, 2004; Keltner, Ellsworth, & Edwards, 1993; Parkinson, 1996). In these cases, appraisals do not play a causal role in creating the emotion, but nonetheless the corresponding appraisals will ultimately be experienced (Keltner et al., 1993). For example, Keltner et al. (1993) have shown that emotions induced via facial muscle movements give rise to appraisal tendencies that shape subsequent judgments. More generally, emotions and appraisals have a recursive relationship, each making the other more likely. For example, the more anger one feels, the more one perceives others as

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responsible for a negative event; and the more one perceives others as responsible for a negative event, the more anger one feels (Quigley & Tedeschi, 1996).<sup>2</sup>

Appraisal theory is useful for the study of the effects of specific emotions on judgment and choice both because they differentiate emotions in a more fine-grained way than simple valence approaches and because they breakdown emotions into cognitive pieces (or dimensions) that may help to map emotions onto judgment and decision-making processes. Identifying these dimensions is crucial to understanding the nature of the emotional experience, and as we will argue, to understanding the effects of specific emotions on judgment and decision making.

Importantly, a number of these appraisals involve themes that have also been central in research on decision making. For example, classic decision making research has examined people's perceptions of likelihood that various events will occur, the degree to which people feel confident or certain about their surroundings, and how people assign responsibility, blame, and causality. Fundamental to our argument is that the appraisals associated with emotions will influence these very kinds of judgments. Because the experience of anger (but not of some other negative emotions) involves the experience of certainty and the notion that a person was in control of or responsible for a negative event, people's perceptions about these very aspects of subsequent situations are colored by their experience of anger. And importantly, because anger is different from other emotions in its association to certainty, control, and responsibility, its effects on judgments relevant to these dimensions will be distinct from other negative emotions. We elaborate on these ideas below.

### **Motivational properties of emotion**

It has been argued that emotions serve an adaptive coordination role; they trigger a set of responses (physiology, behavior, experience, and communication) that enable the individual to deal quickly with encountered problems or opportunities (Frijda, 1986; Keltner & Gross, 1999; Levenson, 1994; Oatley & JohnsonLaird, 1996; Plutchik, 1979). Even without need for thought, emotions trigger action toward implicit goals—what Frijda (1986) has called “action tendencies.” These tendencies depend not only on an emotion's intensity but also on its qualitative character. For example, in their investigation of action tendencies, Frijda, Kuipers, and ter Schure (1989) found that anger was associated with the desire to change the situation and to “move against” another person or obstacle by fighting, harming, or conquering it. Anger may also be associated with an urge to hurt a target (see for example, Roseman, Wiest, & Swartz, 1994). Regardless of the specific manifestation, this motivational aspect of anger readies the individual to act in order to change the situation, remove the problematic components, and re-establish the situation that existed prior to the offense. As one would expect, the readiness to fight manifests not only experientially but also biologically. For example, anger is associated with relative left frontal hemispheric activation in the brain—a pattern characteristic of approach motivation (Harmon-Jones, 2003; Harmon-Jones & Sigelman, 2001). It is sometimes also

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<sup>2</sup> Because of the recursive relationship of appraisals and emotion, we believe that in most cases, fully experiencing an emotion means also experiencing the cognitive appraisals that comprise that emotional state (Clore, 1994; Frijda, 1994; Lazarus, 1994). It is important to point out, however, that a primary causal role for appraisals in emotion is not a necessary condition for the appraisal tendency framework. It is sufficient to assume that a discrete set of cognitive dimensions differentiates emotional experience and effects (as is widely documented: see review by Ellsworth & Scherer, 2003).

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associated with a range of other changes in peripheral physiology that might prepare one to fight, such as blood flow to the hands (Ekman, Levenson, & Friesen, 1983).

But this is not to say that emotions shut down thought. Rather, of particular importance, emotion-related cognition interrupts ongoing cognitive processes and directs attention, memory, and judgment to address the emotion-eliciting event (Johnson-Laird & Oatley, 1992; Lazarus, 1991b; Schwarz, 1990; Simon, 1967; Tooby & Cosmides, 1990). Interestingly, an emotion's ability to focus cognition may be so strong that the emotion not only directs thoughts relevant to the initial emotion-eliciting event but also to unrelated events—what is often called the carryover of incidental emotion (Bodenhausen, 1993; Loewenstein & Lerner, 2003). For example, incidental anger triggered in one situation automatically elicits a motive to blame in other situations (Quigley & Tedeschi, 1996). Interestingly, the effects of incidental emotion can be so strong that they drive behavior even when the judgment or choice at hand involves real monetary outcomes (Lerner, Small, & Loewenstein, 2004)—i.e., even with incentives to disregard irrelevant influences.

### *Synthesis of appraisal-tendency approach*

In sum, the ATF rests on two broad theoretical assumptions: (a) that a discrete set of cognitive dimensions differentiates emotional experience and effects (Ellsworth & Smith, 1988; Lazarus, 1991a, 1994; Ortony et al., 1988; Roseman, 1984, 1991; Scherer, 1999, 2001; Smith & Ellsworth, 1985; Weiner, 1980, 1986) and (b) that emotions serve a coordination role, automatically triggering a set of concomitant responses (physiology, behavior, experience, and communication) that enable the individual to deal quickly with encountered problems or opportunities (Frijda, 1988; Keltner & Gross, 1999; Levenson, 1994; Oatley & Jenkins, 1992; Plutchik, 1979).<sup>3</sup>

### *Appraisal tendencies*

Drawing these assumptions together, the ATF predicts that each emotion carries with it motivational properties that fuel carryover to subsequent judgments and decisions. The particular form of that carryover takes shape through cognitive appraisals. According to the ATF, emotions not only can arise from but also give rise to an implicit cognitive predisposition to appraise future events in line with the central appraisal dimensions that characterize the emotion—what we call an “appraisal tendency.” Appraisal tendencies are goal-directed processes through which emotions exert effects upon judgment and choice until the emotion-eliciting problem is resolved. Such appraisals, although tailored to help the individual respond to the event that evoked the emotion, persist beyond the eliciting situation—becoming an unconscious perceptual lens for interpreting subsequent judgments and choices.

### *Empirical strategy*

The ATF points to a clear empirical strategy: research should compare emotions that are highly differentiated in their appraisal themes on judgments/choices that relate to that appraisal theme.

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<sup>3</sup> We thank a reviewer for suggesting that the ATF rests squarely within diverse streams of research showing emotion consonance. For example, feeling an emotion can evoke consonant facial and other bodily expressions (“Method Acting”). Behavioral expressions of emotions can evoke the associated feelings and appraisals (Cacioppo, Priester, & Berntson, 1993; Musch & Klauer, 2004). In addition, the sociological literature on emotion management (Hochschild, 1983) reveals the stress associated with attempting to block emotionconsonant behavior.

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For example, because the cognitive appraisal dimension of responsibility shares a conceptual theme with blame judgments, researchers interested in studying emotion effects on blame could contrast emotions on opposite poles of the responsibility dimension, such as sadness (situational responsibility) and anger (individual responsibility) (Ellsworth & Smith, 1988; Smith & Ellsworth, 1985). Consider another example, this time one with neuroaffective systems. Based on an appraisal-tendency approach, one could predict that fear would trigger increasing biological responses to a stressor whereas anger would trigger decreasing biological responses to a stressor (Lerner, Dahl, Hariri, & Taylor, 2006). The rationale is that fear triggers appraisals of low-certainty and low-individual control, relative to anger (Lerner & Keltner, 2001). According to the ATF, what may matter more in determining biological stress responses is whether an emotion is associated with a sense of individual control and predictability rather than whether an emotion is associated with negativity. As a final example, consider the possibility that appraisal tendencies might trigger not only differences in a judgment outcome but also in the process through which the judgment is made. Here one could contrast appraisal dimensions that trigger deep thought—such as those associated with uncertainty—with appraisal dimensions that trigger shallow thought—such as those associated with certainty (Tiedens & Linton, 2001). We expand on these possibilities later in the paper. For now, these examples merely highlight that it is possible to make systematic predications about the precise ways in which anger will differ from other emotions of the same valence.

By illuminating the cognitive and motivational processes associated with different emotions, the ATF can bring specific emotions into the study of judgment and decision making in systematic ways. The appraisal-tendency approach provides a flexible yet specific framework for developing a host of testable hypotheses. Its basis in motivational theories allows it to explain why emotions carryover to judgment and decision making in subsequent situations. Its basis in appraisal theory allows it to predict the specific form such carryover will take. It systematically describes differences among emotions at a much more specific level than mere valence. These attributes make the ATF a particularly powerful way for studying the effects of anger on judgment and decision making. The present paper thus applies the ATF toward hypothesizing about and organizing the effects of anger on judgment and decision making.

### III. EVIDENCE FOR UNIQUE EFFECTS OF ANGER

For over two decades research has supported the intuition that being in a globally negative mood can lead one to form relatively pessimistic expectations, whereas being in a globally positive mood can lead one to form relatively optimistic expectations (for a review, see Forgas, 2003). For example, one influential study found that participants induced to feel negative affect consistently made more pessimistic estimates about frequencies of death than did participants induced to feel positive affect (Johnson & Tversky, 1983). This prototypic valence finding—that the presence of a (negative or positive) mood or disposition increases frequency estimates for similarly valenced events—helped both to launch the field of affect and judgment and to demonstrate the replicability of effects across diverse tasks (see Bower, 1981, 1991; Isen, Shalke, Clark, & Karp, 1978; Kavanagh & Bower, 1985; Mayer, Gaschke, Braverman, & Evans, 1992; Mayer & Hanson, 1995; Schwarz & Clore, 1983; Wright & Bower, 1992). Indeed, in his authoritative chapter for the *Handbook of Affective Sciences*, Forgas concluded that “ ...

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most of the research suggests a fundamental affectcongruent pattern: positive affect improves, and negative affect impairs, the value of self-conceptions” (2003 p. 602).

Although it is tempting to assume that all negative emotions fit the valence-congruent patterns described above, recent studies give compelling reasons to question such an assumption. Specifically, studies examining emotion effects on attribution, evaluation, and judgments involving risk all reveal that anger has distinct effects. In fact, anger can actually enhance self conceptions despite the fact that it is a negative emotion (Lerner & Keltner, 1999)—a phenomenon on which we will elaborate below.

We organize the review of anger effects on judgment and decision making into two overlapping categories. One category emphasizes the outcome of judgments and choices, examining such questions as whether specific negative emotions trigger higher risk estimates than other negative emotions, and if so, why. At the risk of over-generalizing the content in service of simplicity, we call this category “outcome effects.” The other category emphasizes the process through which judgments and choices are made, examining such questions as whether specific negative emotions trigger deeper thought than other negative emotions, and if so, what consequences result. Over-generalizing again, we call this category “process effects.” Evidence concerning each category appears below and (in summary format) within Table 1.

## **Outcome effects**

### *Effects on attribution and evaluation*

In one of the first studies to diverge from the valence-based paradigm described above, Keltner, Ellsworth, and Edwards (1993) asked whether it was possible for negative emotions to elicit effects other than undifferentiated pessimism. In a typical study of this phenomenon, sadness and anger were manipulated in one study, such as in a study presenting emotionally-charged vignettes or a study in which participants' faces were (unbeknownst to participants) shaped into prototypic expressions of the target emotion. In an ostensibly second study given within the same hour, participants were asked to make judgments and/or choices concerning causality. Consistent with the researchers' expectations, sad participants perceived situationally-caused negative events as more likely than did angry participants. In addition, sad participants perceived situational forces as more responsible for ambiguous events than did angry participants. Angry participants tended to attribute blame to another individual. The results are consistent with the idea that the original appraisal patterns associated with each emotion triggered distinct appraisal tendencies in the subsequent judgments. That is, sadness appeared to not only co-occur with appraisals of situational control in the immediate situation, but also to trigger continuing perceptions of situational control even in novel situations. Anger co-occurred with appraisals of individual control and triggered continuing perceptions of such control. In sum, this set of studies demonstrated for the first time that when negative emotions carry over to judgment, they do not necessarily trigger an undifferentiated negative outlook (or mood congruency). Rather, at least in the case of anger and sadness, they have unique—here, opposing—effects.

Other studies have further demonstrated the tendency for incidental anger to trigger attributions of individual blame. For example, relative to participants in a neutral state, participants induced to feel anger made more punitive attributions to a defendant and prescribed more punishment in a series of fictional tort cases even though the original source of the anger had nothing to do with the defendants in the tort cases (Goldberg et al., 1999; Lerner et al., 1998). This blaming tendency can be pernicious. As noted, feelings of anger and thoughts of

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blame escalate each other in a recursive loop (Berkowitz, 1990; Quigley & Tedeschi, 1996). The more anger, the more blame placed on others and vice versa.

These tendencies may have especially deleterious effects in interpersonal and intergroup relations. For example, recent research showed that incidental anger (created through movies, readings, and memories of anger-inducing events) seeped over to employees' judgments of their co-workers and acquaintances such that angry participants felt less trust for these individuals, even though these co-workers and acquaintances had played no role in evoking the employees' anger. These effects were mediated by appraisals of otherperson control (Dunn & Schweitzer, 2005). Additionally, studies have shown that the mere experience of anger can automatically activate precursors to prejudice. DeSteno, Dasgupta, Bartlett, and Cajric (2004) have shown, for example, that people in an angry state are slower to associate positive attributes than negative attributes with members of an out-group (i.e., a group of which they are not a member). Importantly, people in a sad state do not show this same prejudice. Along the same lines, when individuals consider their in-group (i.e., a group of which they are a member) to be strong, the more anger they feel when in the presence of an out-group, and the more they want to take action against that out-group (Mackie et al., 2000). In contrast, even though fear is also experienced in the presence of an out-group, it does not elicit the desire to take action against or the desire to move away from the out-group. In sum, recent research has revealed pervasive carryover effects of anger on attributions of causality, blame, and evaluations. Moreover, these effects are distinct from simple pessimism, often diverging from the effects of other negative emotions (e.g., sadness and fear) on these same outcomes.

#### *Effects on risk perception and risk preference*

Lerner and Keltner (2000, 2001) originally applied the appraisal-tendency framework as a lens for examining emotion-based differences in judgments and choices involving risk. Anger and fear, as outlined earlier, differ markedly in both the appraisal themes of certainty and of control. Certainty and control, in turn, resemble cognitive meta-factors that determine judgments of risk, namely "unknown risk" (defined at the high end by hazards judged to be uncertain), and "dread risk" (defined at the high end by perceived lack of individual control over hazards & catastrophic potential of hazards) (McDaniels, Axelrod, Cavanagh, & Slovic, 1997; Slovic, 1987). Fear and anger, the researchers reasoned, should therefore exert different influences upon risk perception and preference. The results of their initial tests supported the appraisal-tendency hypothesis: fearful people made pessimistic risk assessments, whereas angry people made optimistic risk assessments (Lerner & Keltner, 2000, 2001). Extensions of this work reveal that anger produced in one situation can carry over to a wide range of new situations, increasing both optimistic expectations for one's future and the likelihood of making risk-seeking choices; fear, on the other hand, leads to more pessimistic expectations and more risk-avoidant choices (Lerner & Keltner, 1999; Lerner et al., 2003). Moreover, recent work reveals that these cognitive appraisals influence not only perceptions of future, as-yet unattained outcomes as described above, but also perceptions of one's own lived past and the concrete outcomes it yielded (Fischhoff et al., 2005).

The methods used in risk studies often resemble those used in the attribution literature. A variety of different techniques—e.g., showing movies, asking participants to recall prior events, showing emotionally charged news clips, or measuring self-reports of naturally-occurring emotional experience—are used (Fischhoff et al., 2005; Lerner et al., 2003; Lerner & Keltner,



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2000, 2001). Regardless of the method used, and even though the induced emotions are normatively irrelevant to the judgments or choices at hand, the typical finding is that people induced to feel anger subsequently make more optimistic judgments and choices about themselves than do people induced to feel fear.

Path-analytic models reveal that the proximal mechanisms driving these carryover effects revolve around cognitive appraisals (Smith & Ellsworth, 1985). Specifically, appraisals of control and of certainty mediate the associations (Lerner & Keltner, 2001). In effect, fear and anger create opposing perceptual lenses or “appraisal tendencies,” anger increasing perceived control and certainty, fear decreasing such perceptions (Lerner & Keltner, 2000). Biological correlates of the anger-optimism link are also beginning to be understood. For example, Lerner and colleagues (Lerner et al., 2006) have found that facial expressions of anger in response to a stressful task correlated with decreasing stress-hormone secretion suggesting that the feelings of control associated with anger may be adaptive under certain kinds of stressful circumstances.<sup>4</sup>

The optimism elicited by anger occurs not only in a relative sense (i.e., when compared to such negative emotions as fear and sadness) but also in an absolute sense. Specifically, recent research shows that angry and happy individuals produce similar levels of optimism about the self (Lerner & Keltner, 2001). Moreover, these effects appear not only when participants consider the likelihood of future events but also when they consider negative events that have already occurred. In the latter case, anger elicits a kind of “defensive optimism,” in which angry people systematically de-emphasize the importance and potential impact on the self of the negative events (Hemenover & Zhang, 2004). Finally, these effects appear even when angry subjects rate the likelihood of events for which anger is a predisposing factor. That is, even though chronically angry people are more likely to have cardiovascular problems (Fredrickson et al., 2000; Williams et al., 2000), experience divorce, and have difficulty at work (Caspi, Elder, & Bem, 1987), angry people rate themselves as significantly less likely than the average person to experience these problems (Lerner & Keltner, 2000, 2001).

In sum, recent research has revealed pervasive carryover effects of anger not only on attributions of causality, blame, and evaluations but also on a wide range of judgments and decisions involving risk estimation. Moreover, these effects oppose the prototypical pessimism pattern, diverging from the effects of sadness and fear (respectively) on these same outcomes. In the next section, we examine effects of anger on the process through which judgments and decisions are made.

## Process effects

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<sup>4</sup> On the surface, the results could seem to conflict with research relating dispositional anger to enhanced stress reactivity and to stress-related disorders, such as coronary heart disease (for review, see Siegman & Smith, 1994). Anger, however, is heterogeneous (Harmon-Jones et al., 2003). Whereas behavioral medicine studies have typically found cardiovascular correlates with the intensity of a chronic dispositional tendency to experience explosive and violent anger (for example, see Spielberger, 1996), the Lerner et al. study found cardiovascular and cortisol correlates with the duration of situation-specific facial expressions of anger. It is important to note these differences. It may be that certain kinds of anger are adaptive (and others are not). Specifically, a low intensity, controlled anger expression may be adaptive in stress-challenge task with a pesky experimenter. Feeling a sense of indignation in the face of annoying badgering can be seen as reasonable. It is probably not adaptive, however, to chronically approach the world with a hostile edge. In sum, new results on anger imply the need to expand investigations of anger and biological stress responses by looking at anger not merely as a chronic dispositional quality, but also as a situation-specific behavioral response that may be justified and even adaptive under certain circumstances.

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Research on the effects of emotions in general, and anger specifically, suggests that anger and other emotional states influence not only what people think but also how they think. Anger, in particular, appears to have unique effects on what people pay attention to and how much cognitive effort people expend in processing the stimuli they confront. Two primary kinds of effects of emotional states on processing have been demonstrated: an attention effect and a depth of processing effect.

### *Attention effects*

Attention effects include a cluster of effects in which people selectively attend to and recall stimuli that have content or themes similar to the emotion they were experiencing prior to stimuli exposure. This kind of effect has been demonstrated elegantly for global moods, beginning with the pioneering work of Bower and his colleagues on "mood-congruent processing" (Bower, 1981, 1991; Bower & Forgas, 2000; Bower, Gilligan, & Monteiro, 1981; Forgas & Bower, 1987).

More recently, research has shown that selective attention effects are not limited to valence but also occur even for specific emotions (Niedenthal, Halberstadt, & Setterlund, 1997). For example, Niedenthal et al. (1997) showed that sadness increased processing of sad words, but not of angry words, suggesting that not all negative affect information resides in the same associative network and that, instead, information might be stored and processed in a quite emotion-specific manner.

Differential attention to information based on whether it is congruent or incongruent with one's present emotional state can affect perceptions of the believability of that information and ultimately attitudes and behavior related to that information. For example, DeSteno, Petty, Rucker, Wegner, and Braverman (2004) found evidence of selective processing in persuasion contexts. Participants in their studies were exposed to an appeal for increasing a tax. Participants had either been induced to feel sadness, anger, or neutral feelings, and then were exposed either to arguments for the tax that suggested that sad events would occur if the tax were not supported or that angry events would occur. Whereas sad participants found the sad arguments most compelling, angry participants found the angry arguments most convincing. Consistent with the appraisal tendency approach outline above, DeSteno et al. (2004b) argued that emotions result in people perceiving the world in particular ways (e.g., angry people think that angering things are likely to happen while sad people think sad events are more likely, see DeSteno, Petty, Wegener, & Rucker, 2000) and that these perceptions make the arguments that are consistent with the frame of mind created by the emotion more believable and more persuasive. Thus, again it appears that people are particularly sensitive to emotional stimuli that reflect their own emotional states, and that this sensitivity is reactive to fine distinctions among emotional states. Angry people do not find sad messages convincing; they find angry messages convincing.

The evidence above highlights an important clarification about the relation between anger and optimism. As the DeSteno et al. (2004b) data reveal, angry people do not think that only good things are going to happen; quite the contrary. Angry people do think, however, that they themselves will prevail regardless of what happens. Thus, the angry participants in DeSteno et al.'s study believed that the city of Boston would experience more traffic jams than did sad subjects. Had DeSteno et al. asked the question (they did not), we would wager that the angry subjects would also have said that their ability to outmaneuver such jams exceeded the ability of

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others. Thus, the optimism that anger triggers pertains to the self and not to outcomes for others. It triggers a bias toward seeing the self as powerful and capable.

### *Depth of processing effects*

In addition to selective-attention effects, researchers interested in the process of judgment have questioned the extent to which emotions may trigger deep versus shallow thought and, once again, have found that anger is a special case. Early investigations of this question focused on the effects of positive affect, as compared to neutral states, and found that positive affect increased creativity, breadth of thought, and flexibility in ideas (Isen, 1987; and also more recently, Fredrickson, 2001). Later, researchers included negative affect and considered the effects of affective states in the context of dual-process theories of cognition. Such theories distinguish between a cognitive process that is thorough, detailed, careful, and reliant on analysis versus one that is spontaneous, quick, and reliant on general knowledge structures, or “rules of thumb” (for reviews, see Chaiken & Trope, 1999; Eagly & Chaiken, 1993; Petty & Cacioppo, 1986). The former kind of processing is typically called central or “systematic,” whereas the latter is called “peripheral” or “heuristic.” In this literature, negative affect (typically operationalized as sadness) was associated with careful processing whereas positive affect was associated with heuristic processing (Bless et al., 1996; Forgas, 1998; Forgas & Fiedler, 1996; Schwarz, Bless, & Bohner, 1991). For example, several studies have found that dysphoric mood is associated with vigilant, ruminative thought (Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema & Morrow, 1993) while happiness is associated with relatively heuristic processing (Bodenhausen, Kramer, & Suñer, 1994; Forgas, 1998). Forgas (1998) found, for example, that happy participants were more likely to demonstrate a correspondence bias, overattributing behavior to individual characteristics rather than to situational influences. Similarly, Bodenhausen et al. (1994a) found that happiness increased reliance on use of stereotypes, which indicates categorical (easy) rather than piecemeal (effortful) processing (also see Bless et al., 1996).<sup>5</sup>

Much like in the case of mood-congruency effects, however, recent studies suggest that specific emotions, rather than emotional valence, drive depth-of-processing effects. Specifically, recent findings have shown that participants induced to feel angry do not engage in the same careful and detailed processing as those who have been induced to feel “negative affect” in previous studies. For example, Tiedens (2001b) found that people induced to feel anger made inferences about others' motives based on their chronically accessible scripts whereas people induced to feel sadness seemed to consider more alternatives. Bodenhausen et al. (1994b) found that people induced to feel anger engaged in more stereotyping than people induced to feel sadness, and that in persuasion paradigms they paid little attention to the quality of the arguments made by the speaker and instead became convinced by relatively superficial characteristics of the speaker (also see Tiedens & Linton, 2001). Small and Lerner (2005) found that participants induced to feel anger chose to provide less public assistance to welfare recipients than those induced to feel sad unless the sad participants were under cognitive load—in which case sad participants resembled angry participants. Imposing a cognitive-processing constraint on participants changed the choices of sad participants but not those of angry participants. All of these findings are consistent with the notion that angry people engage in relatively automatic,

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<sup>5</sup> Such heuristic processing is not always harmful, however. For example, Bless et al. (1996) have shown that reliance on general knowledge structures is efficient and allows happy participants to succeed at a secondary task because they have processing resources left over.

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superficial, and heuristic processes. That is, they rely on readily available general knowledge structures. Further, the thought processes associated with anger can be distinguished and differentiated from those associated with sadness. In all the studies described above, people feeling sad did not rely on scripts and other general knowledge structures; they seemed to process stimuli in an effortful and thorough manner. Thus, in the depth-of-processing literature, the effects of anger are quite similar to the effects of happiness (Bodenhausen et al., 1994a; Forgas, 1998), but entirely different from the effects of other negative emotions like sadness.

Consistent with the ATF, Tiedens and Linton (2001) argued that the processing effects of emotional states may be best predicted by understanding the appraisal content of those emotions. Specifically, they suggested that the certainty dimension is more important than the valence dimension in determining whether an emotion results in heuristic or systematic processing. Feeling uncertain has consistently been linked with more systematic processing and feeling certain with more heuristic processing. Therefore, Tiedens and Linton (2001) reasoned that incidental emotions associated with certainty appraisals (such as anger and happiness) could seep over into subsequent situations and influence processing in those situations. Thus, they hypothesized that emotions associated with certainty appraisals would result in people feeling more certain in subsequent situations and that emotions associated with uncertainty appraisals would result in people feeling uncertain in subsequent situations. Further, they hypothesized that these lingering feelings of certainty and uncertainty would influence processing; lingering certainty would result in heuristic processing whereas lingering uncertainty appraisals would lead to more systematic processing. In a series of studies, they provided evidence that emotions like anger, which are associated with a sense of certainty, result in heuristic processing whereas emotions associated with uncertainty result in systematic processing. Further, they found that certainty appraisals mediate these effects and that when certainty appraisals are manipulated independently from emotion, certainty plays a causal role in determining whether people engage in heuristic or systematic processing. In sum, the appraisal-tendency perspective can explain how and why anger elicits relatively heuristic processing.

#### IV. POSSIBLE MECHANISMS UNDERLYING ATF EFFECTS

The studies reviewed in this section have emphasized the effects of specific emotions in general and the effects of appraisal tendencies in particular. Yet, this literature is relatively new and, like any newly documented phenomena, few causal mechanisms have been fully examined. The paucity of explanatory tests for the effects of specific emotions can be contrasted with the literature on the effects of global mood. There have been a number of accounts of how global moods influence the process and outcome of thought, including accounts emphasizing network associations, informational roles of mood, and motivational roles of mood. We believe that these accounts, when combined with the notion of appraisal tendencies, could also be useful in understanding the effects of anger and why they differ from the effects of other negative emotions. Indeed, there is some evidence to support such applications.

##### **Associative network mechanisms**

Research on mood congruency has long suggested that people have affective associative networks; things that create positive affect are stored close to one another as are things that create negative affect (Bower, 1981, 1991; Forgas, 1995). Interestingly, as described earlier,

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some researchers from this tradition have argued that these associated networks are best characterized at the specific-emotion level rather than at the global-affect level (Halberstadt & Niedenthal, 1997; Niedenthal, Halberstadt, & Innes-Ker, 1999). An appraisal-tendency perspective could take this one step further. Nodes in associative networks may be linked by appraisal themes. If so, mood-congruent attention, priming, and retrieval effects should occur not just between an emotional state and stimuli connected to that emotional state, but between an emotional state and stimuli connected to its central appraisals. For example, it may be that in fearful people, a low-control, low-certainty, low-coping potential network is activated and thus low-control, low-certainty, low-coping potential events are salient. Angry people may have a high-control, high-certainty, high-coping potential network activated and thus what is salient to them has a quite different flavor. These salient memories and sensitivities may play an important role in forming risk estimates, determining causality and blame, and optimistic self perceptions.

### **Informational mechanisms**

Another possibility is that people's emotional states directly inform judgment (Schwarz & Clore, 1983; Slovic, Finucane, Peters, & MacGregor, 2002). Prior renditions of informational approaches emphasized how the valence of an emotional state informed the individual about whether a situation was relatively safe and benign or potentially problematic and in need of attention, and argued that people at times overgeneralize this information (Schwarz & Clore, 1983). The appraisal content of specific emotions has the potential to inform people about their situations in a more specific manner and can similarly be over-generalized (Schwarz, 2002). Rather than simply indicating whether their situation is good or bad, emotions indicate to the person experiencing them whether the situation is certain or uncertain, controlled by a person or due to a situation, whether the self or another person is responsible, etc. This specific appraisal information might be conveyed in somatic markers (Bechara, Damasio, Tranel, & Damasio, 1997; Damasio, 1994). After all, there is some evidence that appraisals are associated with specific physiology (Smith, 1989; Tomaka, Blascovich, Kelsey, & Leitten, 1993). Or, the specific appraisal information could be considered "tags" that have been associated with objects based on past experience. Regardless of how one conceptualizes the storage of appraisal information, the idea is that appraisals associated with the emotional state become specific information about the nature of the judgment or decision object. This information then can be overgeneralized to subsequent novel situations and influence the content of future judgments and the process people use to arrive at a judgment.

### **Motivational mechanisms**

Many researchers have speculated that once a mood informs judgment, it can also activate a meta-level motivation that influences both judgment outcomes and processing. Whereas negative moods have been associated with a "mood repair" motive, positive moods have been associated with a "mood maintenance" motive (Isen & Geva, 1987; Isen, Nygren, & Ashby, 1988). Such distinctions carry implications for depth of processing. For example, people experiencing negative affect will not process systematically if they have reason to believe that doing so will only contribute to their negative state (e.g., Wegener & Petty, 1994). Similarly, people experiencing positive affect will process systematically if doing so enhances or maintains positive mood (Wegener & Petty, 1994; Isen, 1987). However, the desire to feel good is not the only human motivation, nor is it the only one with the potential to influence judgment outcomes

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or depth of processing (Raghunathan & Pham, 1999). For example, uncertainty reduction has been a widely recognized human motivation (Eagly & Chaiken, 1993; Festinger, 1957). The fact that uncertainty appraisals are associated with greater processing may be due to the relation between the experience of an uncertainty appraisal and the elicitation of uncertainty reduction motives. An appraisal tendency approach could also be useful in identifying other motivations that may explain the effects of anger on the outcome and process of thinking. For example, anger has been associated with appraisals of injustice (Lazarus, 1991a), particularly the violation of individual rights (Rozin, Lowery, Imada, & Haidt, 1999). Given that perceived injustices often create the motivation to restore justice (Solomon, 1990), angry people's judgments of criminals and unjust behaviors are likely to be particularly harsh (Goldberg et al., 1999; Lerner et al., 1998). And, if they encounter situations in which they believe that greater processing would result in redressing injustice, angry people may actually process more than people who are sad, effectively reversing the tendency for angry people to process more heuristically than sad people.

Although research on the effects of positive and negative mood may have characterized emotion so broadly that it obscures important sources of variation among specific emotions, that literature has been highly successful at identifying the mechanisms through which affect influences judgment and decision making. As researchers increasingly emphasize the effects of specific emotions like anger, they will want to use these previous investigations as a model. As we have argued above, we believe that many of the previously discovered mechanisms can be refined to address the specific effects of anger and other emotions. Once appraisal tendencies are accounted for, these approaches can become more specified and thus provide explanations that are already supported by the literature as well as some that deserve testing. At the same time, it may also be the case that specific emotions generate emotion specific mechanisms, and this possibility deserves research attention as well.

## V. IS ANGER A NEGATIVE OR POSITIVE EMOTION?

Decades of research and theorizing on emotion have classified anger as a negative emotion (for reviews, see Ben-Ze-ev, 2000; Berkowitz & Harmon-Jones, 2004; Lazarus, 1991a; Lerner & Dodge, 2000; Watson, Wiese, Vaidya, & Tellegen, 1999). Given the findings presented above, however, one may question whether anger is in fact a negative emotion. After all, anger does not follow many of the typical patterns associated with negative emotions. Rather than triggering pessimism, it triggers optimism about one's own outcomes (Fischhoff et al., 2005; Hemenover & Zhang, 2004; Lerner et al., 2003; Lerner & Keltner, 2000, 2001). Rather than triggering careful thought, it triggers careless thought (Bodenhausen et al., 1994b; Lerner et al., 1998; Small & Lerner, 2005; Tiedens, 2001b; Tiedens & Linton, 2001). Rather than triggering attention to all negative events, it triggers attention only to angering events (DeSteno et al., 2004a; DeSteno et al., 2000). Anger even resembles happiness in terms of hemispheric laterality (Harmon-Jones, 2003; Harmon-Jones & Sigelman, 2001). The left frontal cortical region of the brain has historically been shown to correspond not only with approach motivation (as noted above) but also with positive affective processes whereas the right frontal cortical region has been shown to correspond with withdrawal motivation as well as negative affective processes (for reviews, see Coan & Allen, 2004; Davidson, 1995; Davidson, Jackson, & Kalin, 2000; Fox, 1991; Silberman & Weingartner, 1986). Importantly, anger deviates from the typical pattern noted above. Both

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state and trait anger are associated with relatively greater left frontal cortical activity than right frontal activity (for a review, see Harmon-Jones, 2003).

Taking all of the reviewed evidence together, one might question if anger is a positive emotion. (“If it looks like a duck ...”) Such a radical proposition would not be inconsistent with some of the earliest scholarly work on anger. Aristotle's *Rhetoric* (350 BCE/1991) addresses this very topic, elucidating several seemingly positive consequences of anger, including a pleasurable belief that you can attain your goals and a pleasurable anticipation of vengeance:

*For since nobody aims at what he thinks he cannot attain, the angry man is aiming at what he can attain, and the belief that you will attain your aim is pleasant. Hence it has been well said about wrath, ‘Sweeter it is by far than the honeycomb dripping with sweetness, And spreads through the hearts of men.’ It is also attended by a certain pleasure because the thoughts dwell upon the act of vengeance, and the images then called up cause pleasure, like the images called up in dreams (p. 146).*

### **Positivity depends on temporal focus**

In order to reconcile these conflicting perspectives, we propose assessing the positivity of anger across a temporal dimension. Specifically, we propose that anger will be experienced as relatively unpleasant and unrewarding when reflecting back on the source of one's anger but may be experienced as relatively pleasant and rewarding when looking forward.

### **Backward reflection**

In the case of anger, an emotion-eliciting event typically involves someone offending you or yours or else someone blocking your goals. In either case, we argue that unpleasantness and lack of reward characterize anger at this stage. In support of this view, studies that ask people to recall emotional events from their lives find that people rate the events that triggered their anger as both negative and unpleasant (Ellsworth & Smith, 1988; Smith & Ellsworth, 1985). Similarly, studies that induce anger in the laboratory find that participants rate their feelings in response to the anger induction as negative and unpleasant (Gross & Levenson, 1995). In contrast, studies find that emotion triggering events for happiness are both experienced and recalled as quite pleasant (Ellsworth & Smith, 1988; Smith & Ellsworth, 1985).<sup>6</sup> In this sense, anger resembles other “negative” emotions, such as fear and sadness and it differs from happiness.

### **Forward reflection**

In forward reflection, one considers not the original emotion-triggering event but instead one's future actions. Here, one implicitly or explicitly formulates a plan. The plan may address the source of the anger or it may address new goals. In either case, we argue that when experiencing anger such forward reflection can be pleasant and rewarding. In support of this view, consider the appraisal and action tendencies associated with anger. Angry people feel as though they can gain control of the situation and change it; further, they expect to conquer their opponents and obstacles (Frijda et al., 1989). In addition, studies find that a central part of being angry is the belief that you will get what you want (Lerner & Keltner, 2001). Anger triggers such beliefs

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<sup>6</sup> There may be exceptions to the overall pattern of negativity in backward reflection. For example, Parrott (1993) has written about the phenomenon of “storming around.” There may be enjoyment in dwelling on how one has been wronged. The general experience, however, is unpleasant.

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across multiple domains, including health, social relations, career, social competence, and political concerns (Lerner et al., 2003; Lerner & Keltner, 2000, 2001).

Interestingly, the forward-reflection stage of anger triggers not only a positive outlook but also a positive subjective sense. In support of this, studies have found that angry people often sense themselves as “more energized” to assault the cause of their anger (Frijda et al., 1989). According to Shaver, Schwartz, Kirson, & O'Connor (1987, p. 1078), “... the angry person reports becoming stronger (higher in potency) and more energized in order to fight or rail against the cause of anger.”

Anger may be especially exhilarating when anticipating revenge (Tripp & Bies, 1997) or when witnessing the misfortune of disliked others (i.e., Schadenfreude) (Leach, Spears, Branscombe, & Doosje, 2003; Smith et al., 1996). Schadenfreude has even been described as “one of the great joys of life” by historian Peter Gay, reflecting on his childhood memory of watching the Germans lose gold medals in the 1936 Olympics (Rothstein, 2000). I

nterestingly, brain imaging studies are beginning to reveal the neural systems that underlie such joyfully wrathful experiences. New evidence reveals that the striatum—a sub-cortical brain structure typically associated with pleasure—is activated when one anticipates punishing a transgressor (de Quervain et al., 2004; Knutson, 2004). Moreover, the striatum remains activated even if administering punishment comes at a personal cost. In the latter case, the medial prefrontal cortex also becomes activated, presumably in the service of balancing costs and benefits (de Quervain et al., 2004; Knutson, 2004). Such imaging studies may be a particularly promising line of future inquiry because they could test the hypothesis that reward centers of the brain will become differentially engaged as a function of forward or backward reflection.

Other neuroscientific lines of inquiry may also prove promising in distinguishing between backward and forward reflection. Notably, Harmon-Jones and colleagues have found that the relationship between anger and left frontal cortical activity appears only in situations where there is an opportunity to approach the source of the anger (Harmon-Jones et al., 2003). It may be that anger does not trigger the same hemispheric pattern as happiness when there is no opportunity to approach because the situation facilitates only backward reflection.

### **Caveats and clarifications regarding positivity**

It is important to keep in mind that we advance a limited argument here about the pleasant and rewarding nature of anger. While describing the anticipatory pleasure of anger, we do not intend to argue that anger is associated with purely positive outcomes. To the contrary, the highly pleasurable exhilaration associated with anger may portend a significant fall. Perhaps like heroin and other addictive substances, anger may be rewarding in the anticipation and experiential stages (see Ainslie, 2003) but harmful in the long run.<sup>7</sup> The “rush” and optimism of anger may lead people to make unwise choices in which they lose sight of their own abilities, their interdependence on others, social norms, and other goals. Thus, the positive aspects of anger could lay the groundwork for some of its very negative consequences such as violence and aggression.

It is also important to keep in mind the role of individual differences. We have sketched hypotheses for two main processes: forward and backward reflection. In both cases, however, we

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<sup>7</sup> We thank an anonymous reviewer for this suggestion.



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would expect individual differences to color the overall pleasantness of anger. In support of this, individuals who are high on trait anger regard the experience of anger more positively than do individuals low on trait anger (Harmon-Jones, 2004). This may be because the experience of chronic anger (without some specific, unpleasant trigger) is actually rewarding in some way. It is not known, however, whether the ratings of high-trait-anger individuals would correspond to positive experience in an absolute sense or merely in a relative sense (i.e., compared to ratings of low-trait-anger individuals). For example, do high-trait anger individuals experience state anger to be as pleasurable as the experience of state happiness?

Finally, it is important to note that mixed emotional states occur (Larsen, McGraw, Mellers, & Cacioppo, 2004; Peters, Burraston, & Mertz, 2004). Anger may be experienced in conjunction with other emotions and this anger would be “fuzzier” and thus depart to some degree from the anger prototype (Russell & Fehr, 1994; Shaver et al., 1987).<sup>8</sup> Regardless of the type of mix, an appraisal-tendency approach still offers clear predictions. Specifically, whatever appraisals co-occur with the emotional state (whether this state is a “pure” emotion or a “mix” of emotions), these appraisals can carry over and influence the judgments, decisions, and processes used in a subsequent situation. Thus, ATF suggests that if an individual is feeling a mix of anger and sadness the effects of this emotional state will be determined by the mix of appraisal experienced with this mixed emotional state. If, for example, this particular instance of sadness and anger is characterized by high certainty and situation control we would expect those appraisals to carry over to new situations. In terms of judgments of causality in future situations, we would expect this individual to respond like a typical sad person whereas in terms of judgments involving certainty we would expect this person to respond more like a typical angry person. As another example, consider contexts in which people feel a mixture of happiness and sad. Some recent data suggest that this state results in increased cognitive processing (Fong, 2004). We suspect that this effect is due to the sense of uncertainty that accompanies this ambivalent state. In other words, it may be that emotional ambivalence, although a mix of two emotions, has an appraisal profile that is distinct from its constituent emotions (Fong & Tiedens, 2005). But, just like any other emotional state, we believe that this emotional profile will affect the judgments and processing of people experiencing it. ATF therefore is well-suited for the study of mixed emotions and clearly this topic merits further examination.

In sum, the idea that anger is a positive emotion merits serious consideration. We here propose that the positivity of anger—when defined as the degree to which something is pleasant and rewarding— will vary across situations. When one reflects backward on the anger-eliciting event, the experience will be primarily negative. When one reflects forward, the experience will be significantly more positive. This contrasts with other negative emotions, such as sadness. With sadness, unpleasant and unrewarding feelings arise not only from reflecting back on the sadness trigger (e.g., the loss of a valued person or possession) but also from reflecting forward on the prospect of living without that valued person or possession.

## VI. CONCLUSION

At least as far back as Aristotle, scholars have remarked on the distinguishing features of anger. In the present paper, we reviewed those features and discussed both their documented and

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<sup>8</sup> We thank an anonymous reviewer and the guest editors for this point.

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potential implications for judgment and decision making. The emerging portrait of the angry decision maker is more complex than one might have expected. For example, angry decision-makers experience negative affect about past events yet they also hold optimistic expectations when it comes to predicting the likelihood that they will succeed in a variety of life domains in the future (Fischhoff et al., 2005; Lerner et al., 2003; Lerner & Keltner, 2000, 2001). This optimism derives primarily from a sense of certainty and predictability as well as from a sense that individuals have control over life outcomes (Lerner & Keltner, 2001) and—importantly— influences reflections about the future. Angry decision makers also typically process information in heuristic ways, not stopping to ponder alternative options before acting (Bodenhausen et al., 1994b; Lerner et al., 1998; Small & Lerner, 2005; Tiedens, 2001b; Tiedens & Linton, 2001). They are eager to make decisions and are unlikely to stop and ponder or carefully analyze. This too derives primarily from the sense of certainty associated with anger, but may also be caused by the optimism they have about the future. Thus, angry decision makers may then, as Aristotle suggested long ago, have a difficult time being angry at the right time, for the right purpose, and in the right way. Their emotional experience and particularly the appraisals they experience, may hinder their abilities to enter a situation with objectivity and rationality. Instead, they approach a situation with the tendency to feel confident, in control, and thinking the worse of others. In some situations, these appraisal tendencies may cascade into undesirable outcomes, such as aggression, unrealistic optimism, and overconfidence. In other situations, these tendencies may cascade into desirable outcomes inasmuch as anger can buffer decision makers from indecision, risk aversion and over analysis. To be sure, the many judgment and decision outcomes associated with anger need to be documented and their normative status in diverse situations evaluated. It is now clear that one cannot reasonably cluster anger in with other negative emotions when making predictions. It is a unique and complex emotion.

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Table 1. Influences of anger on judgment and decision making

Response tendency	Study	Impact of emotion
Attributions of causality and responsibility	Keltner et al. (1993) <sup>b</sup> (Study 1 and 2)	Relative to sad people, angry people regarded dispositional attributions as more likely and dispositional forces more responsible for an ambiguous social event.
	Quigley and Tedeschi (1996) <sup>b</sup>	Feelings of anger and thoughts of blame regarding a situation where someone harmed the participant escalated in a recursive loop where the more anger one experienced, the more blame placed on the perpetrator and vice versa.
	Goldberg et al. (1999) <sup>b</sup>	Relative to neutral emotion, anger activated more punitive attributional heuristics for inferring responsibility of harm but only when the original source of the person's anger went unpunished (i.e., people relied on their own anger from normatively unrelated events when punishing a defendant in fictional tort cases).
Evaluations and attitudes	Mackie et al. (2000) <sup>a</sup> (Study 1 and 2)	Relative to fear, when the ingroup was considered strong, anger towards outgroup members increased as well as the desire to take action toward outgroup members.
	DeSteno et al. (2004) <sup>b</sup>	Relative to sadness and neutral emotion, angry participants were slower to associate positive traits than negative traits with members of an outgroup.
Perceptions of risk	Dunn and Schweitzer (2005) <sup>b</sup>	Relative to sadness, guilt, gratitude, and pride, angry participants were less likely to trust others.
	Lerner and Keltner (2000) <sup>a</sup>	Relative to fear, anger was associated with optimistic perceptions of future risk regarding the number of yearly deaths in the United States across various events (e.g., brain cancer, strokes, floods).
	Lerner and Keltner (2001) <sup>a</sup> (Study 1 and 2)	Relative to fearful people, angry people were more likely to make risk-seeking choices. In contrast to fearful people, happy and angry people held optimistic beliefs about experiencing future life events (e.g., heart attack at 50, developed gum problems, married someone wealthy).
	Lerner and Keltner (2001) <sup>b</sup> (Study 4)	Relative to fear, anger activated optimistic beliefs about experiencing future life events (e.g., heart attack at 50, developed gum problems, married someone wealthy).
	Lerner et al. (2003) <sup>a,b</sup>	Relative to naturally occurring anxiety, naturally occurring anger predicted optimistic perceptions of risks related to terrorism within the year following 9–11. Relative to induced fear, induced anger activated optimistic perceptions of risks related to terrorism within the year following 9–11.
	Hemenover and Zhang (2004) <sup>b</sup>	Relative to neutral emotion, anger activated a defensive optimism where the importance and impact of negative events (i.e., two hypothetical stressors participants were asked to imagine happened to them already) were de-emphasized.

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Table 1. Continued

Response tendency	Study	Impact of emotion
Attention effects	Fischhoff et al. (2005) <sup>b</sup>	Relative to fear and neutral emotion, anger activated optimistic perceptions for memories of terrorism related risk judgments made after 9–11, judgments of what those risks really had been over the year after 9–11, and within the subsequent year (2002).
	DeSteno et al. (2000) <sup>b</sup> (Study 1)	Relative to sadness, anger increased likelihood estimates of angering events (e.g., intentionally being sold a “lemon” by a used car dealer) but not saddening events (e.g., a best friend moving away).
	DeSteno et al. (2004) <sup>b</sup>	Relative to sadness, anger activated perceptions that angry arguments (e.g., increased traffic delays) regarding an appeal to increase the city sales tax were more persuasive than sad arguments (e.g., suffering of special-needs infants).
Depth of processing	Bodenhausen et al. (1994) <sup>b</sup>	Relative to sadness and neutral emotion, anger activated heuristic processing (e.g., more stereotypic judgments, less attention to the quality of the arguments, and more attention to the superficial cues of the message).
	Lerner et al. (1998) <sup>b</sup>	Relative to neutral emotion, anger activated more punitive attributions (e.g., amount of blame, harsher punishment, and heuristic processing (i.e., a reduction in the number of diagnostic cues used) in fictional tort cases.
	Tiedens (2001b) <sup>b</sup>	Relative to sadness, happiness and neutral emotion, anger activated heuristic processing (e.g., use of chronically accessible scripts) and hostile inferences for aggressive (but not nonaggressive) participants.
	Tiedens and Linton (2001) <sup>b</sup> (Study 2)	Relative to worry, anger activated heuristic processing (e.g., greater reliance on the superficial cues of the message and less attention to the argument quality).
	Small and Lerner (2005) <sup>b</sup>	Relative to sadness and neutral emotion, anger activated decisions to provide less public welfare assistance to welfare recipients unless participants were under cognitive load—when no difference between sadness and anger emerged.

*Note:* All studies in this table have either directly measured or manipulated anger.

<sup>a</sup>Indicates emotion was measured.

<sup>b</sup>Indicates emotion was manipulated.

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