Chapter 17
Fuel in the Fire: How Anger Impacts Judgment and Decision-Making

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Abstract In keeping with the handbook format, this chapter identifies four types of methods in the behavioral decision-making literature for detecting the influence of anger on judgments and choices. The types of methods include inferring the presence of anger from behavior, measuring naturally occurring anger or individual differences in anger, manipulating anger, and both measuring and manipulating anger. We discuss the strengths and weaknesses of each method and present evidence showing that the effects of anger often differ from those of other negative emotions. The chapter also introduces an overarching appraisal-tendency framework for predicting such effects and connects the framework to broader theories and associated mechanisms. Finally, we examine whether anger should be considered a positive emotion and propose that anger is experienced as pleasant when one is looking forward and unpleasant when one is reflecting back on the anger's source.

In this chapter, we focus on the judgment and decision-making outcomes of anger: how anger influences our perceptions, beliefs, ideas, reasoning, and ultimately our choices. We will review and synthesize an emerging literature that has explored how anger, as distinct from other emotions traditionally viewed as "negative," affects judgment and decision-making. These cognitive effects of anger deserve attention for several reasons. First, anger is a commonly experienced emotion, at least among U.S. residents. In a survey of prior studies on anger, Averill (1982) concluded that "most people report becoming mildly to moderately angry anywhere from several times a day to several times a week" (p. 1146, see Chapter 19).[1] Similarly, in a nationally representative sample, Lerner, Gonzalez, Small, and Fischhoff (2003) identified anger as the most commonly experienced emotion experienced by U.S. citizens in response to the 9/11 terrorist attacks, and Fischhoff, Gonzalez, Lerner, and Small (2005) found that the same pattern held a year later with the same sample.

Second, displays of anger seize our attention (Solomon, 1990; Tavris, 1989). Hansen and Hansen (1988), for example, have demonstrated the "anger superiority effect," or the tendency for people to identify angry faces more quickly and accurately than other emotion expressions. Angry expressers

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[1] Regional variations may amplify or attenuate the frequency. Individuals in the southern United States, for example, tend to 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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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; Tiedens, 2001a). 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.

Third, once activated, anger can color people's perceptions, form their decisions, and guide their behavior while they remain angry, regardless of whether the decisions at hand are related to the source of their anger. In the aftermath of the September 11th attacks, experimentally inducing anger not only influenced U.S. citizens' risk perceptions about terror-related events (e.g., being attacked) but also their perceptions about routine events (such as getting the flu) and their policy preferences concerning matters of life and death (Lerner et al., 2003). Anger makes people indiscriminately punitive (Goldberg, Lerner, & Tetlock, 1999; Lerner, Goldberg, & Tetlock, 1998), 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 take action (Harmon-Jones, Sigelman, Bohlig, & Harmon-Jones, 2003; Mackie, Devos, & Smith, 2000), effects we will review below.

Given that anger has the potential to grip a nation over a sustained period (Fischhoff et al., 2005; Lerner et al., 2003), it is important to understand how it may shape individual choices over time. By shaping basic cognitive and social processes, anger shapes the decisions we make and the lives we lead. In this chapter, we will review the impact of anger on judgment and decision-making. We begin by examining how anger has been studied by judgment and decision-making researchers and present the Appraisal-Tendency Framework as a means of predicting and organizing the effects of anger on cognition. In addition, we will review the evidence concerning the uniqueness of anger's effects on judgment and decision-making and explore possible mechanisms underlying these effects. Finally, citing evidence to the contrary, we conclude by presenting the question of whether anger is truly a negative emotion.

17.1 Anger and the Appraisal-Tendency Framework

More than two decades of research have supported the intuition that being in a globally negative mood can lead a person 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 to launch the field of affect and judgment and to demonstrate the replicability of effects across diverse tasks (Bower, 1991; Isen, Shalker, Clark, & Karp, 1978; Mayer & Hanson, 1995; Schwarz & Clore, 1983; Wright & Bower, 1992). Indeed, the emerging literature led Forgas to conclude in his authoritative chapter for the *Handbook of Affective Science* that "...most of the research suggests a fundamental affect-congruent pattern: positive affect improves, and negative affect impairs, the value of self-conceptions" (2003, p. 602).

Yet recent studies question the assumption that all negative emotions fit such valence-congruent patterns. 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 being widely viewed as a negative emotion (Lerner & Keltner, 2000).

To distinguish the effects of specific emotions on judgment and decision-making Lerner and Keltner (2000, 2001) proposed the appraisal-tendency framework (ATF). The ATF makes two broad theoretical assumptions. First, it assumes that a discrete set of cognitive dimensions differentiates emotional experience and effects (Lazarus, 1994; Ortony, Clore, & Collins, 1988; Roseman, 1984; Scherer, 2001; C. A. Smith & Ellsworth, 1985; Weiner, 1980) 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 that characterize its core meaning or theme, for example, anger being defined by a sense of certainty and individual control along with other-responsibility (Lazarus, 1991b; C. A. Smith & Ellsworth, 1985). For example, one becomes angry when appraising that a person as opposed to natural forces (individual control) clearly (sense of certainty) and with sound mind (other-responsibility) stole a purse. By contrast, one becomes sad if natural forces rained on the purse and ruined it.

Second, the ATF assumes that emotions automatically trigger a set of responses (physiology, behavior, experience, and communication) that enable an individual to deal quickly with problems or opportunities (Frijda, 1988; Keltner & Gross, 1999; Levenson, 1994; Oatley & Jenkins, 1992; Plutchik, 1979).[2] Even without accompanying thought, emotions trigger action toward implicit goals – what Frijda (1986) has been called "action tendencies." These tendencies depend not only on an emotion's intensity but also on its qualitative character.

The ATF predicts that each emotion carries with it motivational properties that fuel carryover to subsequent judgments and decisions. Emotions not only can arise from but also give rise to an implicit cognitive predisposition to appraise future events in line with an "appraisal tendency," or a goal-directed process through which an emotion affects judgment and choice until the emotion-eliciting problem is resolved. Although such appraisals are tailored to help a person respond to the event that evoked the emotion, they persist beyond the eliciting situation, becoming an unconscious perceptual lens for interpreting subsequent judgments and choices.

Rather than shutting down thought, emotions direct attention, memory, and judgment toward the emotion-eliciting event (Johnson-Laird & Oatley, 1992; Lazarus, 1991b; Schwarz, 1990; Simon, 1967; Tooby & Cosmides, 1990) and even 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 can automatically elicit 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 people have a financial incentive to disregard irrelevant influences on their judgment (Lerner, Small, & Loewenstein, 2004).

Because appraisals are a cognitive component of emotion and because most judgments and decisions involve cognitive processes, the ATF is useful for the study of the effects of specific emotions on judgment and choice. Appraisals are especially likely to play a major role in novel, complex situations in which individuals must weigh a number of factors, such as situational constraints. Appraisals differentiate emotions more precisely than valence approaches and also break emotions into cognitive dimensions that may help to map emotions onto judgment and decision-making processes.

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[2]We thank a reviewer from Lerner and Tiedens (2006) 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 emotion-consonant behavior.

Identifying these dimensions is crucial to understanding the nature of emotional experience and to understanding the effects of specific emotions on judgment and decision-making.

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. 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; C. A. Smith & Ellsworth, 1985). Similarly, based on the ATF, one could predict that fear and anger trigger differential cortisol responses to a stressor (Lerner, Dahl, Hariri, & Taylor, 2007) because the two emotions trigger different appraisals of certainty and individual control (Lerner & Keltner, 2001). According to the ATF, biological stress responses may depend more on whether an emotion is associated with a sense of individual control and predictability rather than whether an emotion is associated with negativity. These examples suggest that it is possible to use the ATF to make systematic predictions about the precise ways in which anger will differ from other emotions of the same valence.

Indeed, a remarkably consistent picture of anger has emerged from studies that have investigated the experience of anger and its related appraisals (e.g., Lazarus, 1991a; Ortony et al., 1988; Roseman, 1984, 1991; Scherer, 1999, 2001; Weiner, 1980, 1986). Specifically, anger has been associated with a sense that the self (or someone the self cares about) has been offended or injured (Lazarus, 1991a), with a sense of certainty or confidence about the angering event and what caused it, and with the belief that another person (as opposed to the situation or the self) was responsible for the event and with the notion that one can still influence the situation or cope with it (e.g., Lazarus, 1991a; Ortony et al., 1988; Roseman, 1984, 1991; Scherer, 1999, 2001; Weiner, 1980, 1986). By contrast, people can have completely different sets of appraisals about negative events more generally and thus experience different negative emotions. For example, when someone blames a negative event on situational forces, she is more likely to feel sad than angry. If someone feels responsible for a negative event, he may feel guilt and shame rather than anger (Neumann, 2000). And when someone feels uncertain or lacks confidence about the cause of a negative event, she is likely to experience fear and anxiety rather than anger.

Notably, emotions, including anger, may arise in any number of ways, including relatively noncognitive routes, such as bodily feedback or unconscious priming (Berkowitz & Harmon-Jones, 2004; Keltner, Ellsworth, & Edwards, 1993; Parkinson, 1996). Similarly, in the case of well-practiced anger, as in frequently repeated familial situations, anger might become automatic and require little appraisal. However, even when anger or another emotion is not elicited through an appraisal process it can still activate the appraisal system, resulting in appraisal-consistent judgment. For example, Keltner, Locke, and Audrain (1993) showed that emotions induced via facial muscle movements gave rise to appraisal tendencies that shaped subsequent judgments (cf., Berkowitz, Chapter 16). More generally, emotions and appraisals have a positive feedback relationship, each making the other more likely. The more anger one feels, for example, the more one perceives others to be responsible for a negative event; the more one perceives others as responsible for a negative event, the more anger one feels (Quigley & Tedeschi, 1996).[3]

[3]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 ATF. 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).

Appraisals involve themes that have been central to decision-making research, including our perceptions of the likelihood of various events and how we assign responsibility, blame, and causality. We argue that the appraisals associated with emotions will influence such judgments. Because the experience of anger (but not of some other negative emotions) involves a sense of certainty and control of or responsibility for a negative event, people's perceptions about these aspects of subsequent situations are colored by their experience of anger. And because anger has unique associations with certainty, control, and responsibility, its effects on judgments relevant to these dimensions will be distinct from other negative emotions.

Turning to the motivational properties of anger, in their investigation of action tendencies, Frijda, Kuipers, and ter Schure (1989) found that anger was associated with a desire to change a situation for the better, if sometimes through destructive means such as fighting. The readiness to fight manifests itself biologically as well; some of anger's response tendencies are associated with relative left frontal hemispheric activation in the brain, a pattern characteristic of approach motivation (Harmon-Jones, 2004, 2007; Harmon-Jones & Sigelman, 2001). This approach tendency is sometimes also associated with a range of other changes in peripheral physiology that might prepare one to fight, such as blood flow to the hands[4] (Ekman, Levenson, & Friesen, 1983).

17.2 How Decision Researchers Have Studied Anger

Just as anger has a variety of effects on cognition more broadly, psychologists and behavioral economists have viewed anger in a variety of ways. Decision researchers have used four methodological strategies to study anger, ranging from simply inferring the presence of the emotion to realistically manipulating anger (see Table 17.1 for examples).

Table 17.1 Strategies for determining the locus of anger's effect on judgment and decision-making

Strategy	Study	Effect of anger
Infer anger	Rabin (1993)	The desire "to hurt those who hurt them" drives the rejection of unfair offers in the ultimatum game
Measure anger	Lerner and Keltner (2001) (Study 1 and 2)	Relative to measured dispositional fear, dispositional anger is associated with risky choices and optimistic perceptions of risk
Manipulate anger	Lerner et al. (1998)	Relative to neutral emotion, induced 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
Measure and manipulate anger	Lerner et al. (2003)	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
	Lerner et al. (2007)	Exposing subjects to the Trier Social Stress Test revealed a unique physiological response for angry individuals

[4]The evidence for increased blood flow to the hands is a matter of some debate, however. More research is needed to fully resolve this issue.

17.2.1 Inferring the Presence of Anger

Early judgment and decision-making research looked at anger as a possible mechanism to help explain certain deviations from rational, self-interested behavior. Rather than measuring or manipulating anger, scientists made inferences about anger and used it as a construct in theory building. To take one example, researchers used anger to explain why individuals are willing to forgo economic gain when rejecting unfair offers in the "ultimatum game" (Guth, Schmittberger, & Schwarze, 1982). In this two-player game, player 1 proposes how to divide a sum of money, typically $10, and player 2 decides whether to accept or reject player 1's offer. If player 2 rejects player 1's offer, neither player receives any money. Researchers found that player 2s in this game typically reject unfair offers of $1 or $2 for themselves and $9 or $8 for player 1s, respectively; (for more, see Camerer, 2001). According to rational choice theory, such decisions are irrational, since people should always prefer some amount of money over no money at all. Theorists have pointed to anger, and an attendant desire to harm the proposer, to explain this behavior. As Rabin (1993) puts it, "If somebody is being mean to you, fairness allows – and vindictiveness dictates – that you be mean to him. Clearly, these emotions have economic implications."

17.2.2 Measuring Anger

A second approach to investigating the influence of anger on judgment and decision-making has been to measure some correlate of anger and then correlate that measure with a subsequent behavior. For example, a study explicitly had subjects engage in an open-ended self-report of their reactions and feelings immediately following an unfair offer in the ultimatum game (Pillutla & Murnighan, 1996). Having subjects self-report their emotions prior to the dependent variable of interest (here the choice to accept or reject the offer) is generally not preferable, because labeling a target emotion can reduce its impact on a subsequent judgment (Keltner et al., 1993; Schwarz & Clore, 1983). While the authors use an open-ended response in part to mitigate this effect, it is possible that the self-report did have an impact. Indeed, the rejection rate of unfair offers (between 5 and 10% of the total sum) in the condition that replicates the basic ultimatum game is close to 44%, while in most studies the rejection rate is much closer to 100% (Camerer, 2001). Thus, although measuring the emotion did demonstrate that feeling anger in response to unfair offers is linked to rejecting the offer, the act of measurement still had an effect.

In another study, Lerner and Keltner (2001) presented study participants with Kahneman and Tversky's Asian disease problem (Tversky & Kahneman, 1981), which required them to choose between (1) a "sure thing," or an option in which a certain number of lives would be saved or lost, depending on how the option was framed; and (2) a gamble, or an option in which there was a smaller chance of saving more lives and a larger chance of saving no lives at all. Subjects self-reported their dispositional tendency to become afraid and angry. Lerner and Keltner found that regardless of the framing of the task, dispositionally fearful participants tended to make risk-averse choices, while dispositionally angry participants tended to make risk-seeking choices. Although the researchers could only correlate the emotion with the judgment, they did find that the strength of that relationship could overwhelm the effect of the framing manipulation on judgment. Thus, merely measuring emotion can yield useful insight.

17.2.3 Manipulating Anger

A more powerful strategy for examining anger is to elicit and then directly manipulate the emotion. In many studies, researchers have elicited anger by asking participants to vividly imagine an angering

experience, such as being derogated unfairly by a teaching assistant (Keltner et al., 1993). More recently, researchers have asked participants to write about an anger-eliciting situation (Lerner & Keltner, 2001) or have combined this type of writing task with an accompanying video induction (Gross & Levenson, 1995), such as a clip of someone being abused by a bully. Notably, studies of the effects of anger on judgment do not simultaneously manipulate anger and elicit self-reported anger, as doing so could attenuate the effect of anger on the subsequent judgment (Keltner et al., 1993).

17.2.4 Manipulating and Measuring Anger

To date, the most sophisticated method of examining the effects of anger on judgment and decision-making involves both manipulating and measuring the emotion. In one experiment (Lerner et al., 2007), subjects engaged in a stress task that required them to rapidly count down from a large number by 13. Before and after the task, experimenters collected samples of subjects' cortisol, a physiological marker of stress. The cortisol levels were correlated with the coded facial expressions subjects made during the stress task. As compared to fearful expressions, angry facial expressions were related to a unique physiological stress response. Thus, the experiment demonstrates how anger can be both manipulated (in the stress task) and measured (in facial expressions) to predict a subsequent response (decreasing cortisol as anger expression increased).

Similarly, neuroeconomists who have exposed subjects to unfair offers in the ultimatum game are manipulating anger with the goal of examining the neurological basis of subjects' choices. These studies use functional magnetic resonance imaging to reveal participants' brain activity when they receive unfair offers and decide whether to accept or reject them (Knoch, Pascual-Leone, Meyer, Treyer, & Fehr, 2006; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003). Importantly, these studies do not localize the subjective experience of anger, but rather identify the brain structures and cognitive process that underlie the decision-making that follows from the angering experience. Consequently, the use of these convergent techniques can integrate our understanding of the cognitive and physiological dimensions of anger.

17.3 The Unique Effects of Anger on Judgment and Decision-Making

Anger has two primary types of effects on judgment and decision-making: outcome effects and process effects (see Table 17.2).

Table 17.2 Influences of anger on judgment and decision-making

Response tendency	Study	Impact of emotion
Attributions of causality	Keltner et al. (1993)[b] (Study 1 and 2)	Relative to sad people, angry people regarded dispositional and responsibility attributions as more likely and dispositional forces as more responsible for an ambiguous social event
	Quigley & Tedeschi (1996)[b]	Feelings of anger and thoughts of blame regarding a situation where someone harmed the participant escalated in a recursive loop, such that the more anger one experienced, the more blame one placed on the perpetrator, and vice versa

Table 17.2 (continued)

Response tendency	Study	Impact of emotion
	Goldberg et al. (1999)[b]	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)[a] (Study 1 and 2)	Relative to fear, when the ingroup was considered strong, anger toward out-group members increased, as did the desire to take action toward out-group members
	DeSteno et al. (2004)[b]	Relative to sadness and neutral emotion, angry participants were slower to associate positive traits than negative traits with members of an out-group
	Dunn & Schweitzer (2005)[b]	Relative to sadness, guilt, gratitude, and pride, angry participants were less likely to trust others
Perceptions of risk	Lerner & Keltner (2000)[a]	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 & Keltner (2001)[a] (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, developing gum problems, marrying someone wealthy)
	Lerner & Keltner (2001)[b] (Study 4)	Relative to fear, anger activated optimistic beliefs about experiencing future life events (e.g., heart attack at 50,developing gum problems, marrying someone wealthy)
	Lerner et al. (2003)[a,b]	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 & Zhang (2004)[b]	Relative to neutral emotion, anger activated a defensive optimism that de-emphasized the importance and impact of negative events (i.e., two hypothetical stressors that participants were asked to imagine had happened to them already)
	Fischhoff et al. (2005)[b]	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)
Attention effects	DeSteno et al. (2000)[b] (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)[b]	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)[b]	Relative to sadness and neutral emotion, anger activated heuristic processing (e.g., more stereotypic judgments, less attention paid to the quality of the arguments, and more attention to the superficial cues of the message)

Table 17.2 (continued)

Response tendency	Study	Impact of emotion
	Lerner et al. (1998)[b]	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)[b]	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 & Linton (2001)[b] (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 & Lerner (2005)[b]	Relative to sadness and neutral emotion, anger activated decisions to provide less public welfare assistance to welfare recipients unless participants were under cognitive load, in which case no difference between sadness and anger emerged

Note: All studies in this table have either directly measured or manipulated anger.
[a] Indicates emotion was measured.
[b] Indicates emotion was manipulated.

17.3.1 Outcome Effects of Anger

The first 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.

17.3.1.1 Effects on Attribution and Evaluation

Research has revealed pervasive carryover effects of anger on attributions of causality, blame, and evaluations, effects that often diverge from the effects of other negative emotions (e.g., sadness and fear) on these same outcomes. Diverging from the valence-based paradigm described above, Keltner et al. (1993) asked whether it was possible for negative emotions to elicit effects other than undifferentiated pessimism. The researchers manipulated sadness and anger by presenting emotionally charged vignettes or by shaping participants' faces (unbeknownst to them) into prototypic expressions of the target emotion. Later, when asked to make judgments and/or choices concerning causality, 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, who tended to attribute blame to another individual.

The results were 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. These 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 (and in this case, 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 blame can escalate in a positive feedback loop (Berkowitz, 1990; Quigley & Tedeschi, 1996). The more anger, the more blame placed on others, and vice versa.

These tendencies may be especially deleterious in interpersonal and intergroup relations. Recent research showed that incidental anger (created through movies, readings, and memories of anger-inducing events) seeped over to employees' judgments of their coworkers and acquaintances. Compared to happy and sad participants, angry participants felt less trusting of these coworkers, though they played no role in evoking the employees' anger. Consistent with the Appraisal-Tendency Framework, participants ratings of individuals' control of their own actions mediated the participants' lack of trust (Dunn & Schweitzer, 2005). Additionally, the mere experience of anger can 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 a group to which they do not belong. Importantly, people in a sad state do not show this same out-group prejudice. Along the same lines, when individuals consider their in-group to be strong, they feel greater anger in the presence of an out-group and a greater desire to take action against that out-group (Mackie et al., 2000). By contrast, though fear is also experienced in the presence of an out-group, fear, unlike anger, does not elicit the desire to take action against or move away from the out-group.

Interestingly, while anger can erode personal relationships, as Tiedens (2001a) demonstrated, being perceived as angry can also enhance one's social status, which may in part explain the persistence of anger's expression in organizational settings. Consequently, while anger often leads to biased judgments of others, those judgments also can be reinforced by the situation, leaving open the possibility that biased social judgments may be rational in a broader sense.

17.3.1.2 Effects on Risk Perception and Risk Preference

Lerner and Keltner (2000, 2001) originally used the ATF to examine emotion-based differences in judgments and choices involving risk. Anger and fear, as outlined earlier, differ markedly in their appraisal themes of certainty and control. Certainty and control, in turn, determine judgments of two types of risk: "unknown risk" (defined by hazards judged to be uncertain) and "dread risk" (defined by the perceived lack of individual control over hazards and the 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. Indeed, the results of their initial tests found that fearful people made pessimistic risk assessments, whereas angry people made optimistic risk assessments (Lerner & Keltner, 2000, 2001). This finding has persisted regardless of the methods used in risk studies, such as showing movies, asking participants to recall prior events, or measuring self-reports of naturally occurring emotional experience (Fischhoff et al., 2005; Lerner et al., 2003; Lerner & Keltner, 2000, 2001).

In managerial settings where judgments can either lead to overly risk-averse or overly risk-seeking decisions (Kahneman & Lovallo, 1993), angry decision-making might lead to better or worse outcomes relative to a neutral affective state. Because anger exacerbates risk seeking and causes people to perceive less risk, anger could produce better judgments and choices than neutrality in situations where risk aversion is inappropriate. For example, when playing poker against

a small number of opponents (e.g., two), or when deciding how to succeed at an entrepreneurial venture, excessive risk aversion can often lead to poorer outcomes. This bears out in the lab as well; when individuals in a neutral affective state engage in the Balloon Analogue Risk Task, an externally validated measure of risk taking, they tend to adopt a more risk-averse strategy than the strategy that maximizes expected value (Lejuez et al., 2002). In a pilot study, two of the authors of this chapter (Lerner and Litvak) compared the performance of angry and neutral individuals' performance on the BART. Angry subjects were more risk seeking, and thus closer to the strategy that would maximize value. Thus, it is vital to characterize the specific context of risk-taking decisions facing angry individuals.

Notably, 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; on the other hand, when fear is carried over, it leads to more pessimistic expectations and more risk-avoidant choices (Lerner et al., 2003). Moreover, recent work reveals that these cognitive appraisals also influence perceptions of one's own lived past and the concrete outcomes it yielded (Fischhoff et al., 2005).

Path-analytic models reveal that, in effect, fear and anger create opposing perceptual lenses, or appraisal tendencies; anger increases perceived control and certainty, and fear decreases such perceptions (Lerner & Keltner, 2000). Biological correlates of the anger-optimism link are also beginning to be understood. Lerner and colleagues (Lerner et al., 2007) 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 are adaptive under certain stressful circumstances.[5]

The optimism elicited by anger occurs not only in a relative sense (when compared to other negative emotions) but also in an absolute sense. Recent research shows that angry and happy individuals produce similar levels of optimism about the self (Lerner & Keltner, 2001). Moreover, these effects appear when participants consider both the likelihood of future events and negative events from the past. In the latter case, anger elicits a kind of "defensive optimism," in which angry people systematically de-emphasize the importance and potential impact of the negative events on the self (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 et al., 2003; Lerner & Keltner, 2000, 2001).

[5] 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, while others are not. Specifically, a low-intensity, controlled anger expression may be adaptive in a 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.

17.3.2 Process Effects of Anger

Anger appears to have unique effects on what people pay attention to and how much cognitive effort they expend in processing stimuli.

17.3.2.1 Attention Effects

Researchers have found that people selectively attend to and recall stimuli that have content or themes similar to the emotion they were experiencing prior to stimuli exposure. Such selective attention effects are not limited to valence, but 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 we may store and process information in an emotion-specific manner.

DeSteno, Petty, Rucker, Wegner, and Braverman (2000) found evidence of selective processing in persuasion contexts. Participants in their studies were induced to either feel sadness, anger, or neutral feelings. Next, they were exposed to arguments for a tax increase that suggested either that sad or angering events would occur if the tax were not supported. Whereas sad participants found the sad arguments most compelling, angry participants were most convinced by the angry arguments. Again it appears that people are particularly sensitive to emotional stimuli that reflect their own emotional states. Angry people do not find sad messages convincing; they find angry messages convincing.

Not only can anger cause selective attention to anger-congruent stimuli, but, consistent with the ATF, selective attention to certain features of a situation can themselves cause anger. In one of their studies, Lerner and Keltner (2001) found that manipulated controllability appraisals mediated the relationship between anger and optimistic risk estimates. Another study found that individuals' lacking of perspective-taking related to their propensity to become angry (Mohr, Howells, Gerace, Day, & Wharton, 2007). Specifically, those low in trait perspective-taking experienced an increase in anger following a personal provocation. Consistent with the bidirectional causality predicted by the ATF, a lack of systematic processing can serve as a cause or an effect of anger.

17.3.2.2 Depth-of-Processing Effects

Researchers who have questioned the extent to which emotions may trigger deep versus shallow thought have found anger to be 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 (Fredrickson, 2001; Fredrickson & Branigan, 2005; Isen & Geva, 1987). Later, researchers considered the effects of affective states in the context of cognitive processing. In this literature, negative affect (typically operationalized as sadness) was associated with careful processing, whereas positive affect was associated with faster, more spontaneous processing (Bless et al., 1996; Forgas, 1998; Forgas & Fiedler, 1996; Schwarz, Bless, & Bohner, 1991). Forgas (1998) found that happy participants were more likely than sad participants to demonstrate a correspondence bias, overattributing behavior to individual characteristics rather than to situational influences. Similarly, Bodenhausen and colleagues (1994) found that happiness increased reliance on the use of stereotypes (also see Bless et al., 1996).[6]

[6]Such heuristic processing is not always harmful, however. For example, Bless et al. (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.

Yet recent studies suggest that specific emotions, rather than emotional valence, drive depth-of-processing effects. Specifically, participants induced to feel angry have not engaged in the same careful, detailed processing as those induced to feel "negative affect" in previous studies. Tiedens (2001b) found that people induced to feel anger made inferences about others' motives based on accessible cognitive scripts, whereas people induced to feel sadness seemed to consider more alternatives. Bodenhausen et al. (1994) found that people induced to feel anger engaged in more stereotyping than people induced to feel sadness, and that in persuasion paradigms they could be 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.

In these studies, people who felt sad 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., 1994; Forgas, 1998; Tiedens, 2001b), but entirely different from the effects of other negative emotions, such as 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, just as feeling certain has been linked to more heuristic processing. In a series of studies, Tiedens and Linton (2001) provided evidence that emotions associated with a sense of certainty, such as anger, 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 ATF can explain how and why anger elicits relatively heuristic processing.

Although anger can lead to decreased depth of processing (Tiedens & Linton, 2001), the impact of this effect on judgment varies. Angry individuals will be more biased than neutral individuals in a judgmental context in which additional mental resources will aid decision-making. However, in some contexts, more thinking can produce worse judgments. For example, the introduction of an arbitrary anchor (e.g., "Is the Mississippi river longer or shorter than 5,000 miles?") can influence the judged magnitude of that quantity. In one experiment, researchers (Bodenhausen, Gabriel, & Lineberger, 2000) found that sadness, an emotion associated with increased depth of processing, increased reliance on arbitrary anchors in judgment. The decreased depth of processing associated with anger may be a boon in some situations, as the lack of attention to biasing information could attenuate bias.

Young and Tiedens (2009) suggest that there might be some instances when anger actually results in greater processing. Because anger is associated with the desire to confront, oppose, and argue, it may be that when individuals become angry, they become particularly vigilant about creating oppositional arguments. Beyond providing evidence for this process, Young and Tiedens (2008) showed that it can produce normatively better responses. Specifically, since individuals who were angry were more interested in opposing views, they engaged in better hypothesis testing. Compared to participants who had been induced to feel sadness or neutral feeling, participants induced to feel anger avoided the tendency to only examine hypothesis confiriming evidence and instead sought out information that could invalidate prior hypotheses regardless of whether these hypotheses were self-generated or provided by the experimenter.

17.4 Possible Mechanisms Underlying Anger Effects Predicted by the ATF

The studies we have reviewed identify the effects of specific emotions in general and the effects of appraisal tendencies in particular on judgment and decision-making. Yet, as with any newly documented phenomena, we do not yet understand the causal mechanisms underlying the unique effects of anger. By contrast, a number of accounts have considered how global moods influence the processing and outcomes of thought, including those emphasizing network associations, informational roles of mood, and motivational roles of mood. However, the specific effects of anger contradict the positive–negative dichotomy that these theories assume, complicating their account of the causal mechanisms underlying the effects of emotions. Yet, when combined with the ATF, these accounts could help to explain the unique anger's effects, including heuristic processing and optimistic perceptions of risk.

17.4.1 Associative Network Mechanisms

Research on mood congruency has long suggested that people have "affective associative networks," meaning that thoughts that create positive affect are stored close to one another in memory, as are thoughts that create negative affect (Bower, 1981, 1991; Forgas, 1995). Some researchers in 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). Taking this reasoning a step further, according to the ATF, 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, fearful people facing an uncertain situation may have a low-control, low-certainty, low-coping potential network activated, thus reminding them of past situations where they felt helpless and unsure. Because angry people facing the same uncertain situation may have a high-control, high-certainty, high-coping potential network activated instead, what is salient to them will be quite different. For example, they might focus on what they can do to alter the situation, or who might be responsible for causing their aggravation. These salient memories and sensitivities may play an important role in determining how individuals form risk estimates, assign causality and blame, and form optimistic self-perceptions.

17.4.2 Informational Mechanisms

Another possibility that has been explored is the idea that people's emotional states directly inform their judgment (Schwarz & Clore, 1983; Slovic, Finucane, Peters, & MacGregor, 2002). These informational approaches argue that people sometimes overgeneralize the valence of an emotional state when deciding whether a situation is benign or potentially problematic, like when someone glum about the weather decides that their life is similarly bleak (Schwarz & Clore, 1983). The appraisal content of specific emotions also offers information that people may overgeneralize to subsequent novel situations, thus influencing their future judgments and decisions (Schwarz, 2002). In this framework, the lingering appraisal of uncertainty that accompanies fear would be used as information about the nature of a subsequent risky choice. Appraisals associated with the emotional state, such as whether a situation is certain or uncertain, situational or controlled by oneself or

others, become specific information about the nature of the judgment or decision itself. Thus, unlike the associative network framework where the carryover effect is explained by spreading activation, according to this framework, an informational mechanism explanation posits that in some sense the relevance of an appraisal for a subsequent judgment is inferred.

17.4.3 Motivational Mechanisms

Many researchers have speculated that once a mood affects judgment, it can also activate a motivation that influences both judgment outcomes and processing. For example, an individual might become risk seeking in an attempt to ameliorate her sad mood (Raghunathan & Pham, 1999). Along these lines, negative moods have been associated with a "mood repair" motive, while positive moods have been associated with a "mood maintenance" motive (Isen & Geva, 1987; Isen, Nygren, & Ashby, 1988). It is hard to see how an optimistic bias might be motivated by an attempt to remain angry. While an angry state could be sustained through (optimistic) rumination, it would require that these individuals find the angry state desirable. Thus, although anger may be, in many respects, a positive emotion (see below), mood maintenance theories do not offer compelling predictions for anger.

Aside from the human motivation to "feel good," the ATF could identify other motivations that might explain the effects of anger on the thought processes and outcomes. For example, anger has been associated with appraisals of injustice (Lazarus, 1991a), and particularly with violations of individual rights (Rozin, Lowery, Imada, & Haidt, 1999). Given that perceived injustice often creates 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). In situations in which they believe that greater cognitive processing would redress injustice, angry people may actually process more than sad people, effectively reversing the tendency for angry people to process more heuristically than sad people.

While research on the effects of positive and negative mood may have obscured important sources of variation among specific emotions, this literature has successfully identified mechanisms through which affect influences judgment and decision-making. As researchers begin to focus on the effects of specific emotions such as anger, these previous investigations can serve a model, while also becoming more exact by accounting for appraisal tendencies. Finally, the possibility that specific emotions generate emotion-specific mechanisms deserves research attention as well.

17.5 Is Anger a Negative or a Positive Emotion?

Decades of emotion research and theory have classified anger as a negative emotion (for reviews, see Ben-Ze-ev, 2000; Berkowitz & Harmon-Jones, 2004; Lazarus, 1991a). Yet, as indicated by the findings we have presented, 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). It prompts careless thought, not careful thought (Bodenhausen et al., 1994; Lerner et al., 1998; Small & Lerner, 2005; Tiedens, 2001b; Tiedens & Linton, 2001). Rather than focusing attention on all negative events, it focuses attention only on angering events (DeSteno et al., 2004; DeSteno, Petty, Rucker, Wegener, & Braverman, 2004). Some researchers have argued that anger even resembles happiness in terms of hemispheric laterality (Harmon-Jones & Sigelman, 2001; Harmon-Jones et al.,

2003, Harmon-Jones et al., this book). Historically, the left frontal cortical region of the brain has corresponded not only with approach motivation but also with positive affective processes, whereas the right frontal cortical region has corresponded with withdrawal motivation and negative affective processes (for reviews, see Coan & Allen, 2003; R. J. Davidson, 1995; Richard J. Davidson, Jackson, & Kalin, 2000; Fox, 1991; Silberman & Weingartner, 1986). By contrast, both state and trait anger are associated with relatively greater *left* frontal cortical activity than right frontal activity (for a review, see Harmon-Jones et al., this book).

With this evidence in mind, one might wonder whether anger is actually a positive emotion, a proposition consistent with some of the earliest scholarly work on anger. Aristotle's Rhetoric (350 BCE/1991), for example, elucidates several seemingly positive consequences of anger, including optimism about attaining one's 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).

To reconcile the question of whether anger is a positive or negative emotion, we propose assessing the potential positivity of anger from a temporal perspective. Specifically, we propose that anger will be experienced as relatively unpleasant and unrewarding when one is reflecting back on the source of the anger but may be experienced as relatively pleasant and rewarding when one is looking toward the future.

Consider that an event that elicits anger typically involves someone blocking your goals or offending you or someone close to you. Based on past research, we argue that unpleasantness and lack of reward characterize anger at this stage (see Fig. 17.1). Studies that have asked people to recall emotional events from their lives have found that people rate the events that triggered their anger as both negative and unpleasant (Carlsmith, Wilson, & Gilbert, 2007; Ellsworth & Smith, 1988; C. A. Smith & Ellsworth, 1985). Similarly, studies that induced anger in the laboratory have found that participants rate their feelings in response to the anger induction as negative and unpleasant (Gross & Levenson, 1995). By contrast, studies have found that people experience and recall events that trigger happiness as quite pleasant (Ellsworth & Smith, 1988; C. A. Smith & Ellsworth, 1985).[7] In this sense, anger differs from happiness and resembles other "negative" emotions, such as fear and sadness.

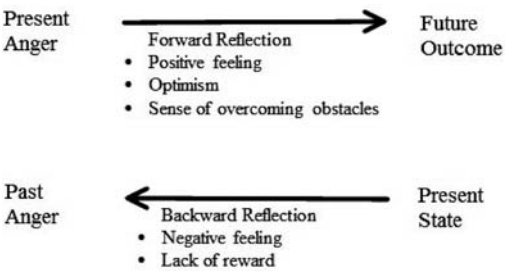

Fig. 17.1 Anger in forward and backward reflection

[7]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 to be gained from dwelling on how one has been wronged, but the experience is generally unpleasant.

Now consider that when engaging in forward reflection, an angry person considers not the original emotion-triggering event, but instead possible future actions. Implicitly or explicitly, the angry person formulates a plan to address the source of the anger or to address new goals. For an angry person, we argue, such forward reflection can be pleasant and rewarding. In support of this view, consider the appraisal and action tendencies associated with anger: a belief that one can control and improve a situation, and an expectation of conquering opponents and obstacles (Frijda et al., 1989). In addition, research has found that angry people tend to believe they will get what they want 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 sense of self. Studies have found that angry people often feel "more energized" to assault the cause of their anger (Frijda et al., 1989). According to Shaver et al. (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 one is anticipating revenge or punishment (Carlsmith et al., 2007; de Quervain et al., 2004; Knutson, 2004; Tripp & Bies, 1997) or witnessing the misfortune of disliked others (Leach, Spears, Branscombe, & Doosje, 2003; R. H. Smith et al., 1996). Moreover, recent research has also showed that individuals can prefer to be in an angry state in order to succeed at a confrontational task where being angry would be useful (Tamir, Mitchell, & Gross, in press). Reflecting on his childhood memory of watching the Germans fail to win gold medals in the 1936 Olympics, for example, historian Peter Gay described Schadenfreude as "one of the great joys of life" (Rothstein, 2000).

Brain-imaging studies are beginning to reveal the neural systems that underlie such joyful wrath. Some neuroeconomists argue that the dorsal striatum – a sub-cortical brain structure activated when one anticipates punishing a transgressor – is associated with reward and thus provides evidence for the pleasurable nature of punishment (de Quervain et al., 2004; Knutson, 2004). Moreover, the striatum remains activated even if administering punishment comes at a personal cost. In this 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 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 help to distinguish between backward and forward reflection. Notably, Harmon-Jones and colleagues (2003) have found that the relationship between anger and left frontal cortical activity appears only in situations where one has an opportunity to approach the source of the anger. Anger may not trigger the same hemispheric pattern as happiness when there is no opportunity to approach because the situation facilitates only backward reflection.

In describing the anticipatory pleasure of anger, we are not arguing that the emotion is associated with purely positive outcomes. On 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. The "rush" and optimism associated with anger may lead people to make unwise choices that overlook 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, individual differences may color the overall pleasantness of anger. For example, individuals who are high on trait anger regard the experience of anger less negatively than do individuals low on trait anger (Harmon-Jones, 2004). This may be because the experience of chronic anger (lacking 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?

Gender may also be an important determinant of how anger is felt. For example, Campbell and Muncer's (1994) finding that men typically see the expression of anger as seizing control of the situation and exerting dominance while women more typically view the expression of anger as a loss of self-control has been replicated cross-nationally (Archer & Haigh, 1999; Ramirez, Andreu, & Fujihara, 2001; Richardson & Huguet, 2001). One current hypothesis is that women are more reluctant to express anger and do so only at higher intensities, which is when they are more likely to feel they have lost control (e.g., Astin, Redston, & Campbell, 2003). Are women thus more likely to experience anger as a negative emotion?

In any event, the 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 appraisals experienced. If an instance of sadness and anger is characterized by high certainty and situational control, we would expect an individual to carry those appraisals over to new situations. When making judgments about control of future situations, we would expect this individual to respond like a typical sad person; when making judgments involving certainty, we would expect this person to respond more like a typical angry person. As another example, consider situations in which people typically feel a mixture of happiness and sadness, as when a parent watches a child go off to college. Some recent data suggest that such a mixed state results in increased cognitive processing (Fong, 2006) perhaps 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, may have an appraisal profile distinct from its constituent emotions. But, just like any other emotional state, we believe that this emotional profile will affect the judgments and processing of those who experience it. The ATF therefore is well-suited for the study of mixed emotions, a topic that merits further examination.

17.6 Conclusion

A unique and complex emotion, anger cannot reasonably be clustered with other negative emotions when making predictions about human judgments and decisions. Angry decision makers feel negatively about past events, yet also make optimistic predictions of their likelihood of success in a variety of life domains (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 of control over outcomes (Lerner & Keltner, 2001). Angry decision makers rely on heuristics when processing information, not stopping to ponder alternative options before acting (Bodenhausen et al., 1994; Lerner et al., 1998; Small & Lerner, 2005; Tiedens, 2001b; Tiedens & Linton, 2001). This tendency also derives primarily from the sense of certainty associated with anger and perhaps from the optimism angry decision makers have about the future.

As Aristotle wrote, angry decision makers may have a difficult time being angry at the right time, for the right purpose, and in the right way. Their emotional experiences and appraisals may hinder their ability to view a situation objectively and rationally. Instead, they approach situations with confidence, a sense of control, and negative thoughts about others. In some situations, these appraisal tendencies may cascade into undesirable outcomes, such as aggression, unrealistic optimism, and overconfidence. Yet these tendencies can also cascade into desirable outcomes, as when anger buffers

decision makers from indecision, risk aversion, and overanalysis. The many judgment and decision outcomes associated with anger must be documented and their normative status in diverse situations evaluated.

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