Emotion-Cognition Interactions

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Western scholarship has traditionally portrayed human emotions as problematic. Emotions are subjective, this view contends, and therefore inappropriate guides to social behavior, perception, and decision-making, particularly when juxtaposed to seemingly more sophisticated, principled forms of reasoning (Calhoun & Solomon, 1984; Nussbaum, 2001). Moreover, emotions frequently appear irrational, even dangerous, as they arise out of faulty or exaggerated perceptions of reality and can give rise to rash, impassioned behavior. Given that this view of emotions has prevailed in large strands of scholarship, from classical Greek writings onward, many contemporary emotion scholars have claimed that emotions subvert rational judgments concerning morality, blame, causality and the good life, and thus ought to be minimized when perceiving the world or making decisions (Nussbaum, 1996; Oatley, 2004). For example, Immanuel Kant, in writing about judgments related to justice, suggested that emotions like "sympathy" be considered unreliable because such emotions reduce humans to "tender-hearted idlers" (Kant, 1960). The rare exception was the 18th century moral philosopher David Hume, who contended that "Reason is and ought to be the slave of passion."

This dualistic perspective on emotion and reason presupposes that the relationship between emotion and cognition is necessarily one of antagonism. Emotions and rational thought fight one another, it is assumed, for control over behavior, beliefs and interpretations of the social world. Yet twenty-five years of empirical research on the interplay of emotion and cognition, reviewed in this chapter, converges on an alternative point of view (Clore, 1994; Clore & Gasper, 2000; Clore, Gasper, & Garvin, 2001; Clore & Parrott, 1991; Forgas, 1995, 1998, 2000, 2003; Fredrickson, 2001; Isen, 1987; Keltner & Lerner, 2010). This literature can be traced back to Herbert Simon (1967) who pointed out that at any given moment intelligent agents—human beings—are confronted with a plethora of environmental stimuli and possible goals.

Emotions enable agents to prioritize certain goals and actions over others, setting in motion specific cognitive processes to navigate a complex and unpredictable world (see also Oatley & Johnson-Laird, 1987, 1996; Winkielman, Zajonc, & Schwarz, 1997).

In this chapter we survey what has been learned through the scientific study of the interface of emotion and cognition. By "emotion" we mean brief, physiologically-based states that are defined by a valenced phenomenological experience and that orient the individual to respond to specific threats and opportunities in the environment (Keltner & Lerner, 2010). In using the term "cognition," we specifically refer to the more deliberative, controlled mental processes that are rooted in language, conceptual knowledge, and representation. Empirical studies of the emotion-cognition interface can be placed in two broad categories. The first centers upon the study of the cognitive processes that give rise to specific emotions. A second concerns how emotional responses influence various cognitive processes. We review landmark findings and theories within these literatures, and end by delving into areas of recent development.

Cognition Leads to Emotion: The Role of Appraisals in Emotion Elicitation

Emotions occur when events, objects and people are *appraised*—that is, evaluated and interpreted according to certain patterns, and guided by certain goals and concerns of the individual (Lazarus, 1991; Smith & Ellsworth, 1985). Emotion-eliciting appraisals are thus the meaning-making process that gives rise to different emotions (Clore & Ortony, 2008; Roseman, 1984, Roseman, Spindel, & Jose, 1990; Roseman, Wiest, & Swartz, 1994; Scherer, 1997; Scherer, Schorr, & Johnston, 2001; Scherer & Wallbott, 1994; Smith & Ellsworth, 1985). For instance, at the most basic level, appraising a situation as favorable with respect to the advancement of specific goals will give rise to positive emotion whereas appraising a situation as

a hindrance to those goals will give rise to negative emotion. Finally, viewing a situation as neutral or irrelevant to one's goals will not generate emotion (Carver & White, 1994; Davidson, 2004; Higgins, 1997; Russell, 2003). Studies of appraisal tend to be associated with one of two frameworks. One is the *discrete approach*, which emphasizes the unique appraisals underlying each of the different emotions. The second is the *dimensional approach*, which focuses on the way certain appraisals combine in different ways to produce different emotions.

Discrete Approaches to Appraisal

Discrete approaches to appraisal presuppose that there are a finite set of emotions (such as fear, love, disgust and compassion) that arise from distinct sets of appraisals. An influential account of discrete appraisals is that of Richard Lazarus, whose early work on stress inspired ideas about the nature of emotion elicitation (Lazarus, 1991). Stress arises when an individual confronts a problem, threat, or challenge and perceives his abilities and resources to be inadequate to respond successfully. Stress is laced with emotions, often negative. It is pervaded by shifts in cognition—namely, toward a sense of uncertain and imminent danger—and with associated changes in physiology. In the short term, the cognitive and physiological changes associated with stress have adaptive value because they prepare the organism to respond quickly and coherently to threat. Vigilance and attention are heightened and activity of the sympathetic, "fight or flight" branch of the autonomic nervous system sharply increases: Heart rate accelerates, blood pressure spikes, and adrenaline and cortisol levels rise. Thus momentarily, the quick bursts of energy afforded by stress can help provide the resources necessary to approach challenges and defend against perceived threats. But over the long term, recurring work, marital, financial or other tensions can create chronic stress, which has negative effects on mental and physical health (e.g., Epel et al., 2004, McEwen, 1998; Sapolsky, 1996; Segerstrom & Miller,

2004). Chronic stress is linked to life-threatening conditions such as heart disease and cancer and impairs cognitive functions such as memory (Sapolsky, 1994). Most important for the present analysis, experiences of temporary and chronic stress both result from appraising oneself as unprepared to handle significant challenges.

Yet, as Lazarus pointed out, the literature on stress encounters a problem: There are many different kinds of stress. The stress engendered by public speaking, for instance, differs from the stress associated with taking care of a sick family member or even the unexpected stress of apparently positive life events such as marriage, having a child, or embarking on a new career. Observations such as these led Lazarus to propose that different kinds of stress—emotions—are characterized by meaningful appraisal patterns, which he called "core relational themes." Core relational themes are coherent appraisal processes through which events are interpreted. They consistently elicit certain emotions and reliably differentiate emotions from one another (Lazarus, 1991). For example, appraisals that one is personally responsible for a socially valued accomplishment will lead to pride. Regarding negative emotions, anger arises from appraisals that another person has offended oneself or damaged one's property whereas envy results from appraisals that another person is in possession of something one desires.

Lazarus proposed that the core relational themes underlying each emotion are generated by two stages of appraisal (e.g., Folkman & Lazarus, 1989). In the first stage, a person appraises whether an event is congruent or incongruent with his or her goals. These goals can range from basic physical goals to avoid pain and satiate hunger, to more complicated moral goals such as achieving fairness and avoiding harm to others, or goals related to identity, self-esteem, and existential meaning. Positive emotions follow appraisals that current events facilitate goal attainment. Negative emotions follow appraisals that events contradict or interfere with goal

attainment. In the second stage of Lazarus' appraisal model, cognitive processes related to causal attribution and emotion regulation are engaged, and give rise to more specific nuances in emotional experience. People consider the causes of an event, potential responses, and future consequences of different courses of action

In a related approach, Oatley and Johnson-Laird (1987; 1996) also proposed a two-stage appraisal process. They suggested that the primary appraisal is automatic, nonverbal, and unconscious, and involves evaluating the relevance of the situation for one's goals. However, the first appraisal is thought to extend beyond the positive-negative dichotomy to distinguish between several basic emotions such as anger, fear, disgust, happiness, and sadness. Each of these basic emotions has a distinct phenomenology, or subjective tone. Each yields a state of readiness (Frijda, 1986) by influencing brain functioning to prepare the individual to deal effectively with a recurring type of situation. Once the primary appraisal has activated a basic emotion, a secondary appraisal operates above the threshold of awareness. Secondary appraisals involve interpreting the event's causes and possible ways to respond.

Discrete approaches to appraisal have yielded a number of noteworthy insights. For one, approaches such as Lazarus's core relational themes make it has apparent that emotions are inherently social. Emotions and their eliciting appraisals are tied to close relationships, as seen in the way love follows from perceiving the desirability of another individual, or the way compassion follows from appraisals that a suffering other is worthy of help. Emotions are rooted in and engage ideas about moral right and wrong; anger results when goal attainment is blocked in a manner viewed as unfair or demeaning, and guilt is caused by the self's offense against another person or a moral principle. Appraisals involving unfavorable social comparisons are the

root of emotions like envy and jealousy. In fact, Lazarus' work strongly suggests that the social nature of emotion appraisals is the rule with rare exceptions.

Another insight offered by discrete appraisal approaches has to do with the links between emotion, appraisals, and personality. It is increasingly clear that emotions and patterns of emotion-cognition interactions are core elements of childhood temperament and adult personality (e.g., Lyubomirsky, King, & Diener, 2005; Malatesta, 1990; Watson & Clark, 1992). For example, empirical studies find systematic, consequential individual differences in what one could call emotional traits—the frequency and intensity with which people experience specific emotions or clusters of emotions, such disgust, anger, and amusement (e.g., Haidt, McCauley, & Rozin, 1994; Tolin, Lohr, Sawchuk, & Lee, 1997). The discrete approach illuminates potential sources of emotional traits by focusing on individual differences in patterns of cognitive appraisals. A chronically hostile individual appraises ongoing events, such as being shortchanged by a cashier, as evidence of others' blameworthy offenses against the self (Rosenberg, 1998). People afflicted with depression describe the causes of life events in a maximally negative fashion. Failures and unfortunate incidents are consistently interpreted as internal (one's own fault), global (proof that the self as a whole is defective), and permanent (unlikely to change). Successes and positive occurrences, by contrast, are more likely to be appraised as external (due to the situation or other people), local (restricted in scope), and impermanent, or unlikely to happen again (Beck, 1967; Mezulis, Abramson, Hyde, & Hankin, 2004; Rizley, 1978). These illustrations indicate how appraisal patterns are woven into an individual's emotional traits

Finally, the discrete appraisal approach is useful to the study of the spontaneous expression of emotion. Core emotion-eliciting appraisal themes are freely referenced during everyday discourse about emotion, such as when people complain about an injustice or an

unexpected loss. The relevant research suggests that this spontaneous appraisal-making can predict emotion-specific experiences and facial expressions. In one study, researchers gathered narratives from people who had experienced the death of their romantic partner six months prior (Bonanno & Keltner, 2004). The narratives included numerous references to loss, an appraisal theme related to sadness, as well as injustice, an appraisal theme at the heart of anger. Researchers coded the narratives for spontaneous references to appraisal themes of loss and injustice and examined th relation of these to other measures of emotion gathered during the interview. They found that appraisals of loss correlated with facial expressions and self-reports of sadness but not anger, and that appraisals of injustice correlated with facial expressions and self-reports of anger but not sadness. Clearly, studies guided by Lazarus's discrete appraisal approach to emotion could be used to examine how specific appraisals track the occurrence of other elements of emotional response, including autonomic physiology, central nervous system physiology, vocalization, and posture.

As theoretically illuminating as a discrete appraisal approach is, it encounters serious conceptual problems (Ellsworth, 1991). For one, discrete appraisal approaches fail to yield simple explanations about the similarities that exist between emotions (for example, between anger and fear). They also do not easily explain rapid transitions between emotional states, which have been readily documented in studies of the subjective experience of emotion. Finally, discrete approaches do not account for why people report experiencing multiple emotions at a single moment, such as the simultaneous joy and sadness of graduating college, or the bittersweetness of winning a prize coveted by a loved one. A second approach to appraisal, called the dimensional approach, offers theoretical solutions to these conceptual problems.

Dimensional Approaches to Appraisals

Dimensional approaches to appraisal presuppose the existence of basic dimensions of appraisal that, when combined, give rise to specific emotions (e.g., Ellsworth & Smith, 1988; Smith & Ellsworth, 1985). This approach is able to handle the conceptual problems related to similarities and transitions between emotions that we noted above. An appraisal theory, dimensional theorists contend, needs to account for the interesting similarities among emotions, as well as their differences. Anger and fear, for example, are both felt to be unpleasant and high in arousal. The same could be said about gratitude and love, which both feel positive and are both marked by a feeling of appreciation for others. These core similarities between emotions are likely due to overlap in specific dimensions of appraisal, such as pleasantness, interest, arousal, or prosocial intention. Moreover, overlap in these appraisal dimensions may also account for transitions between one emotional experience and another. For example, the appraisal dimension of others' responsibility for one's outcomes may account for rapid transitions between emotions – say anger and gratitude – that share this appraisal.

In light of these and other conceptual interests, Ellsworth and Smith (1985, 1992) developed a theory of appraisal that can account for interesting similarities among the emotions, as well as the many differences in their subjective experiences (for comparable accounts see Frijda, 1986; Ortony, Clore, & Collins, 1988; Roseman, 1984; Scherer, 1984; Weiner, 1985). In an initial review of studies of the semantic content of emotions and appraisal, Smith and Ellsworth derived eight dimensions, reproduced in Table 2, that capture the major appraisal processes that lead to various emotions (see also Scherer, 1997). These appraisal dimensions can be thought of as the basic units of meaning that people ascribe to events, and that underlie the core meaning of an emotion.

Guided by dimensional approaches, studies of emotion-related recall (Ellsworth & Smith, 1988; Smith & Ellsworth, 1985) have shown that each emotion is defined by a fairly distinct pattern of appraisal (for a critique of this methodology, see Parkinson & Manstead, 1992). In one of the most influential studies in this tradition, Smith and Ellsworth instructed participants to visualize themselves experiencing different emotions. Following each of the visualizations, participants rated the original emotional experience for the degree to which it involved eight appraisal dimensions: *attention*, *certainty*, *pleasantness, perceived obstacle, responsibility, anticipated effort control-coping* (level of personal control over the situation), and *legitimacy* (degree to which the event is fair and deserved).

In support of dimensional accounts of appraisal, each emotion was found to be defined by a fairly distinct appraisal profile. For instance, participants' experience of interest was accompanied by appraisals of elevated pleasantness, the desire to attend, the sense that situational factors are producing events, the perceived need to expend effort, moderate certainty about future outcomes, together with little sense of perceived obstacle or illegitimacy of events. Feelings of hope were associated with appraisals of elevated attention and effort and situational agency, moderate pleasantness, and little certainty or sense of perceived obstacle or illegitimacy. As a final example, the appraisals most characteristic of happiness were pleasantness, high certainty and attention, but low effort. In surveying these findings, it is apparent that the appraisal profiles of many emotions can be captured using similar core appraisal dimensions.

Moreover, certain appraisal dimensions are central to differentiation within clusters of emotions (Smith & Ellsworth, 1985). For example, In the face of a negative event, appraisals of agency (which is a combination of control and responsibility), reliably determine which of several different emotions an individual will feel. Blaming others produces anger, believing that

the situation is responsible produces sadness, and self-blame produces guilt (see also Weiner, 1985). Agency is also an important dimension that differentiates select positive emotions. The same positive event attributed to the self is a source of pride, but when attributed to others may be a source of gratitude. Even if there are only a handful of core appraisal dimensions (perhaps eight), the dimensions can be arranged into countless unique combinations and thus produces the diverse emotional palate that characterizes the emotional lives of most humans.

Dimensional perspectives on emotion appraisal have generated several lines of inquiry. They have illuminated specific mechanisms by which emotions such as anger, fear, disgust, compassion, and pride influence cognitive processes, a theme to which we will return (Horberg, Oveis, & Keltner, 2011; Keltner, Horberg, & Oveis, 2006; Lerner & Keltner, 2001; Tiedens & Linton, 2001). As well, dimensional approaches provide a useful conceptual platform for identifying emotional processes associated with different regions of the central nervous system (Davidson, Pizzagalli, Nitschke, & Kalin, 2003; Ochsner, 2008). For example, the experience of anger—which is characterized by high levels of agency—has been associated with activation in the left-frontal regions of the cortex, a region of the brain thought to promote approach-related behavior (Harmon-Jones, Sigelman, Bohlig, & Harmon-Jones, 2003).

Dimensional accounts also shed light on likely areas of cultural variation in emotion-related appraisals. For example, cultures vary in their conceptions of human agency (Morris & Peng, 1994). Consequently, similar events likely trigger different emotions in members of different cultures. This divergence could be traced back to cultural dissimilarities in appraisals of events involving the potential for human agency. Similarly, dimensional approaches are important for understanding individual variation in response to the same emotion-eliciting circumstances. For example, small differences in appraisal can lead to significant changes in the

experience and consequences of difficult tasks such as job interviews, tough exams, or intergroup interactions. An excellent example of this is found in work on the biopsychosocial model of challenge and threat (Blascovich & Mendes, 2000; Mendes, Blascovich, Lickel, & Hunter, 2002; Blascovich & Tomaka, 1996). This model specifically explores how the ratio of perceived ability to perceived demands drives differences in threat- or challenge-related emotional reactions, cognition, physiology, and social behavior. Consider the stressful situation of interviewing for a new job. On the one hand, an interviewee may believe that she lacks the skills and resources necessary to have a succesful interview. She may believe, for example, that she doesn't have sufficient work experience or hasn't done enough research on the company. She would likely enter into a state of *threat*, which is characterized by the desire to withdraw or avoid the situation (e.g., by cancelling the interview), a pessimistic outlook, and negative emotions, perhaps a sense of dread or anxiety. Moreover, her body would respond physically to the threat appraisals. The physiological profile associated with threats involves increased cardiac activity plus elevated blood pressure due to constricted arteries (e.g., Blascovich, Mendes, Hunter, & Salomon, 1999).

Alternatively, the interviewee could appraise her abilities and resources (e.g., past work experience, intelligence) as matching or exceeding the demands of the same difficult job interview. Under these circumstances, she would likely experience the task as a *challenge*—an opportunity to rise to the occasion. She would therefore exhibit a psychophysiological state quite different from that of a state of threat. Behaviorally, states of challenge are characterized by the motivation to approach the situation as well as by positive emotions, such as interest and enthusiasm. Physiologically, challenge is associated with the kind of healthy cardiovascular

performance triggered by aerobic exercise. Cardiac activity increases, just as in a state of threat, but the simultaneous release of adrenaline dilates the vessels, and blood pressure does not rise.

In keeping with dimensional approaches to appraisal, the critical difference between the positive affect associated with challenge and the negative affect associated with threat is not in the event *per se* but in specific interpretations of the event – namely, whether the event is perceived as as manageable or unmanageable. The challenge/threat model has proven useful in elucidating the central role of appraisals in reactions to many different social situations, including downward and upward social comparisons (Mendes, Blascovich, Major, & Seery, 2001), stereotype threat (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010), interactions with outgroup members (Mendes et al., 2002), and athletic performance (Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004).

Having reviewed the two major perspectives on appraisal, we now turn to the critical question of how appraisals appear in consciousness. An assumption of both the discrete and dimensional approaches is that emotion-eliciting appraisals begin with simple evaluations (e.g., good versus bad) and proceed to more complex meaning-making attributions, such as the legitimacy and level of human agency ascribed to the event. Given the simple-to-complex nature of appraisals, an important research question concerns the *automaticity* of appraisals. That is, do some appraisal processes occur beneath conscious awareness, without deliberate intent or effort?

Automaticity of Appraisals

In most models of emotion-related appraisal, it is assumed that the primary appraisals that set emotional responses in motion operate very rapidly and outside of conscious awareness. In the early phases of this thinking, Zajonc offered an important theoretical statement about the nonconscious, automatic processes that give rise to immediate evaluations of objects and events

(Zajonc, 1980; see also Bargh, 1994). He made the case for two independent, but interacting, mental processing systems, one of affect and one of cognition. He further argued that the affect system is primary and often more influential than the cognitive system. In reacting to stimuli, the initial step engages the affect system: We form an automatic, preconscious appraisal of whether the stimulus is positive or negative. This appraisal motivates approach or avoidance tendencies and shapes feelings of positivity or negativity (Barrett, 2006; Russell, 2003). Zajonc and colleagues devised innovative ways to test their ideas: They activated nonconscious primary (positive/negative) appraisals with respect to one stimulus and then ascertained whether the nonconsciously primed appraisals subsequently guided conscious appraisals of an unrelated stimulus. Given Zajonc's claims about an early affect evaluation system, perceivers' evaluations of the conscious object were expected to be affected by the valence of the primary appraisal.

In a now-classic study, these researchers exposed participants to subliminal pictures of smiling or angry emotional expressions in order to nonconscously activate primary appraisals that were either positive (smiling expression) or negative (anger expressions) (Murphy & Zajonc, 1993). The subliminal pictures were masked by unfamiliar Chinese ideographs and participants' task was to rate how much they liked each ideograph. As anticipated, participants liked ideographs better when they had been preceded by a subliminal smiling expression than when preceded by a subliminal anger expression. As further evidence of automaticity, the researchers created a second set of conditions in which the pictures of emotion faces were presented long enough for participants to perceive them consciously and thus recognize the true cause of their present affective state. Under these circumstances, the emotionally expressive faces no longer determined evaluations of the ideographs (see also Clore et al., 2001; Gasper & Clore, 2000).

Zajonc's work stimulated a great deal more research on automatic appraisals and emotion (LeDoux, 1996; Mischel & Shoda, 1995; Russell, 2003; Winkielman et al., 1997). Others have since shown that subliminally presented photos of smiles or anger displays also influence the perceiver's emotional expressions, subjective emotional experience, and physiological reactions (Dimberg & Öhman, 1996; Öhman & Dimberg, 1978). As an example, subliminally primed anger expressions have been shown to trigger negative feelings, elevate physiological arousal, and evoke facial muscle movements related to negative affect. In another study, snake phobics, but not control participants, showed a galvanic skin response when photos of snakes were presented so quickly that the images could not be consciously recognized (Öhman & Soares, 1994).

Nonconscious appraisals of positive and negative stimuli likewise influence the interpretation of ambiguous stimuli (Ferguson, Bargh, & Nayak, 2005). For example, Ferguson and colleagues have documented that participants primed with pleasant stimuli are more likely to provide the positive definition of ambiguous target words (e.g., defining "beat" as "to win" rather than "to hit"). They are also more likely to attribute positive traits to target characters than participants primed with unpleasant stimuli. More recently, Winkielman and colleagues found similar nonconscious carry-over effects with respect to consumer behavior. In one study, researchers had participants report their level of thirst and then subliminally exposed them to either a series of happy, angry or neutral faces during a neutral computer task (Winkielman, Berridge, & Wilbarger, 2005, Study 1). Compared to participants primed with neutral faces, participants primed with happy faces subsequently poured and consumed more of a beverage. By contrast, exposure to angry faces led participants to pour and consume less of the beverage. Similar effects emerged for participants' evaluations of the beverage. Taken together, these and

other studies have painted an increasingly clear picture of the automatic appraisals that give rise to emotions.

Appraisals in the Brain

The automaticity literature has inspired investigators to study primary appraisals at the level of brain activity. LeDoux (1996) has argued that the amygdala, a small, bilateral, almond-shaped structure in the midbrain, is centrally involved in generating the primary appraisals that shape emotion prior to conscious recognition and categorization of a stimulus (for a review, see Phelps, 2006). These claims are grounded in neuroanatomy: The amygdala rapidly receives inputs, relayed by the thalamus, from systems that process sensory information. The amygdala is also connected to the hippocampus and cortex, where semantic classification of the stimuli may originate, but inputs from these systems arrive more slowly. Once activated, the amydgala regulates emotion-related behavior through activation of the autonomic nervous system, a branch of the peripheral nervous system responsible for "fight or flight" responses and other internal functions (Adolphs, Tranel, Damasio, & Damasio, 1994; Aggleton, 2000).

Neuroimaging studies yield further evidence of the amygdala's role in primary evaluative appraisals (Baxter & Murray, 2002). Activity in the amygdala (as well as other brain regions) increases in response to sad film clips (Levesque, Eugene, et al., 2003), erotic film clips (Beauregard, Levesque, & Bourgoin, 2001), disturbing slides (Phan, Wager, Taylor, & Liberzon, 2004), and unpleasant tastes and odors (Zald, 2003). Related imaging work has also examined amygdala activity in response to social stimuli. People show increased amygdala activation to faces of individuals from ethnic groups other than their own (Hart, Whalen, Shin, et al., 2000), and amygdala activation predicts whether people will recall emotionally evocative stimuli (Canli, Zhao, Desmond, & Gabrieli, 1999).

Early work on the amygdala and primary appraisals has portrayed it as the "fear center" of the brain, sensitive to threatening stimuli in ways that warn an individual of potential danger. However, in light of recent findings, some researchers now argue that the amygdala is instead attuned to the salience or importance of an emotional stimulus as opposed to its valence (Phan, Wager, Taylor, & Liberzon, 2002). In one relevant experiment, brain activity was monitored using positron emission tomography (PET) as participants viewed a series of images (Hamann, Ely, Grafton, & Kilts, 1999). Four categories of images were compared: pleasant (e.g., appetizing food), aversive (e.g., mutilated bodies), neutral (e.g., plants) and interesting but unemotional (e.g., a chrome rhinoceros) images. Four weeks later, long-term memory for the pictures was measured with a surprise recognition memory test in which participants were presented with various pictures and asked to identify which had been presented during the PET session. Analyses revealed that bilateral amygdala activity was significantly correlated with enhanced recognition memory for the emotionally pleasant and emotionally aversive pictures. However, activation of the amygdala did not correlate with memory for the neutral or the interesting (but non-emotional) pictures. These comparisons indicate that the amygdala is engaged in memory enhancement for emotional stimuli in particular. More broadly, these data indicate that the amygdala is vigilant to the emotional significance of events, whether positive or negative. In a recent review of the literature, Cunningham and Brosch (2012) similarly argue that the amygdala is involved in processing stimuli for their relevance to a person's goals and motivations, ultimately helping to coordinate a more general psychophysiologial response.

Emotion Knowledge and Representation

Cognitive appraisals initiate an emotion episode and trigger emotion-related responses in the brain, autonomic nervous system, neuroendocrine systems, and communication modalities

such as the face, voice, body, and touch (for a recent review see Keltner & Lerner, 2010). Cognitive processes also have a second general function: They engage in the mental representation of the emotion. Emotions are symbolized in language, concepts, and discourse, forming what can be thought of as *emotion knowledge* (Niedenthal, 2008).

One layer of emotion knowledge is a culture's emotion lexicon. Words employed to describe emotions clarify the perceived cause and content of the affective experience (e.g., Schwarz, 1990). Many expressions used to describe emotions are metaphorical, using allusions to the physical body and physical world. Emotions are popularly represented as natural forces (such as when one claims to have been "swept away" or to be "drowning in sorrow"), fluids ("bubbling over with joy" or "boiling with anger"), and diseases (being "sick with love"). Emotions have also been likened to opponents (one "struggles with depression") and as living organisms ("my love will wither and die") (Lakoff & Johnson, 1983; Kövesces, 2003).

The emotion lexicon can be organized into concepts and categories (Romney, Moore, & Rusch, 1997; Shaver, Schwartz, Kirson, & O'Connor, 1987). At the most general, super-ordinate level, a conceptual distinction is made between good/pleasant and bad/negative. At the second most general level, often considered the basic level, emotion knowledge distinguishes between discrete basic emotions like joy, sadness, and love. Emotion concepts at the basic level readily appear in everyday descriptions of emotion experience, consistent with the cognitive psychology literature on prototypes and language (Rosch, 1973). Finally, at the subordinate level, there are more specific forms within the basic categories of emotion. For instance, a basic emotion concept like "love" contains subtypes like desire, caring, and longing; the concept of joy may embody subtypes like enthusiasm, contentment, and ecstasy.

Emotion experiences are described not just in single-item labels, but also in narratives or scripts of the way emotional events unfold (e.g., Russell, 1991; Johnson-Laird & Oatley, 1989; Shaver et al., 1987). Emotion narratives, at least those assessed through written descriptions, commonly take the form of prototypes. These prototypes contain descriptions of central and peripheral features of the narrative: perceived causes, thoughts, expressions feelings, actions, and consequences. Many researchers have found it useful to gather narrative data in their initial attempts to distinguish among closely related emotions – for example, embarrassment, shame, and guilt (Keltner & Buswell, 1996; Miller, 1992; Parrott & Smith, 1991; Miller & Tangney, 1994; Tangney, Miller, Flicker, & Barlow, 1996) or love, pity, and compassion (Shaver et al., 1987).

Emotion narratives are constructed through mediums other than the spoken or written word. The study of emotion has yielded several recent insights into the question of what happens to emotions when people represent them with words and other representational forms. They provide the foundation of much visual art, music, dance, fiction, and poetry (Hejmadi, Rozin, & Davidson, 2000; Juslin & Laukka, 2003; Oatley, 2003; Oatley, Keltner, & Jenkins, 2006).

Finally, people represent emotion in different forms of communication and social discourse. Gossip, teasing, jokes, and satire all build narratives of emotion in communicating relational information (Abu-Lughod, 1986; Griffin, 1994; Heath, Bell, & Sternberg, 2001; Lutz, 1990). Recently, researchers have made headway in illuminating how emotion is represented in discourses of emotion created by or directed toward children. Emotion narratives can be found in story books (Tsai, 2007; Tsai, Louie, Chen, & Uchida, 2007), children's music (Juslin & Laukka, 2003; Snibbe & Markus, 2005), advertisements (Tsai, 2007), parenting manuals (Shields, 1991), and peer teasing (Keltner, Young, Heerey, Ocmig, & Monarch, 1998). Broadly speaking, people

are reflexively inclined to share their emotions with others through the different representational formats we have discussed (Rimé, Mesquita, Philippot, & Boca, 1991; Rimé, Finkenauer, Luminet, Zech, & Philippot, 1998). In this way, the tendency to disclose emotions renders emotions highly social and confers benefits such as successful relationship building (Clark & Finkel, 2004).

The Influence of Emotion Representation on Emotional Response

Given the rich repertoire of emotion knowledge that humans possess, the next questions we ask concern the role of emotion representation in emotional response. How do concepts, words, narratives, and discourses shape the way people feel? What happens to emotional experience when, for example, appraisal processes give rise to feelings of shame or sadness and the distressed individual then engages language-based processes to label the feeling with words, to invoke a metaphor, or to inspire an artistic creation?

The simplest act of representation is to label emotional experiences with words, which is an important part of parents' socialization of their children. They devote a good deal of time to teaching children words to label their experiences (e.g., Dunn, Bretherton, & Munn, 1987). And studies of adults reveal several effects of labeling experiences with words. How one labels emotion directly affects subjective feelings—the mere act of labeling a state of high arousal as "anxiety" versus "excitement" can change emotional experience and behavior in profound ways. A classic example of labeling effects comes from Schachter and Singer's (1962) two-step theory of emotion (see also Reisenzein, 1983). The theory was based on the assumption that there are two components to emotional experience: (1) undifferentiated physiological arousal, and (2) a construal of the state of undifferentiated arousal, which determines which emotion will be experienced. In other words, the specific emotion the individual experiences—for example,

anger, guilt, or shame—depends largely on the meaning of the situation to which the person attributes the arousal. To illustrate, drinking too much coffee in the morning will lead one to feel tense and jittery at lunch. Those who are aware that the jitteriness is due to ingesting caffeine would not consider themselves to be feeling any particular emotion. However, those who have forgotten that the coffee is the source of tension are likely to experience its effects as emotional, perhaps believing it to be anger toward a co-worker who has called in sick again, anxiety about an upcoming meeting, or even sexual excitement (Dutton & Aron, 1974). In short, the two-factor theory maintains that for an emotion to be experienced, a person must both be in a state of general physiological arousal and attribute that arousal to an emotional stimulus.

In general, this work implies that emotional experience hinges on the labeling and representation of arousal. Many emotion scholars would now argue that rapid, primary appraisals of a stimulus's goodness or badness, harm or benefit, triggers a diffuse core affect that causes an individual to experience a broad, valenced emotional state (Barrett, Mesquita, Ochsner, & Gross, 2007). In this view, more specific emotions (such as sadness, guilt, compassion, or love) arise from situation-specific interpretations and categorizations.

More recently, researchers have proposed that emotions are "conceptual acts." As emotions unfold through appraisal processes, different acts of representation give very specific meaning to the constructed emotional experience (Lindquist & Barrett, 2008; Barrett et al., 2007). People store in memory knowledge and beliefs about emotion categories, for instance, anger or love. Emotions occur when people conceptualize their affective state through the lens of a (mentally represented) emotion category. To illustrate this phenomenon, participants in one study were primed with knowledge about fear, knowledge about anger, or neither (Lindquist & Barrett, 2008). Core unpleasant or neutral affect was subsequently induced through music and

visualization techniques. Finally, participants' aversion to engaging in risky behaviors was assessed as an index of world-focused fear. Consistent with a conceptual account of emotion, participants primed with fear knowledge and manipulated to feel unpleasantly aroused were the most risk-averse, viewing the world as a highly threatening place.

These findings suggest that the subjective experience of distinct emotions is contingent on the activation and application of emotion knowledge. Labeling also has the effect of reducing uncertainty about one's emotional state. Emotional experiences are often associated with anxious questions: What are the real causes of the emotion, how is one to respond to it, what are the broader social implications of the experience, and so on. Putting feelings into words reduces the anxiety and uncertainty associated with an emotion (Wilson & Gilbert, 2008) by specifying its causes and relevance to oneself (Wilson & Brekke, 1994; Wilson, Centerbar, & Brekke, 2002). Labeling emotional experiences with words narrows the intentional object of the emotion, or what it is perceived to be about, and thus reduces the extent to which the feeling colors the interpretation of other stimuli (Keltner, Locke, & Audrain, 1993).

The act of labeling even has the capacity to change basic physiological correlates of emotional states. Representing emotional experiences in words (for example, through reappraisal instructions) reduces the sympathetic autonomic arousal associated with emotional suppression (Gross, 1998) and activates frontal lobe regions of the brain (e.g., the ventromedial prefrontal cortex), which down-regulate limbic-based emotional responses (Ochsner, 2008). Representing negative emotions from an abstract perspective (focusing on why an event occurred rather than how) reduces stress-related cardiovascular response (Ayduk & Kross, 2008). Rumination, by contrast, offers no perspective, no distance, no third-person perspective upon emotional events, and tends to prolong experiences of emotion, both negative and positive

(Lyubomirsky & Nolen-Hoeksema, 1995; Morrow & Nolen-Hoeksema, 1990).

Labeling emotions can also dampen amygdala activity in response to negative emotional stimuli. In one study, activity in several brain regions was monitored while participants viewed images of target facial expressions of anger, fear, happiness, or surprise (Lieberman et al., 2007). Participants who were randomly assigned to the emotion labeling condition were instructed to identify the expressed emotion. A pair of labels (e.g., "scared" and "angry") appeared on the screen below the image and the participant chose the one that best characterized the face in the image. Other participants performed tasks that did not involve labeling emotions, such as indicating the target's gender. Results showed substantially reduced amygdala response among the participants in the emotion labeling condition, relative to the control conditions. Labeling also corresponded to greater activation of the right ventrolateral prefrontal cortex (RVLPFC), a brain region that is typically active during linguistic and symbolic processing of emotional information. It is suggested that the labeling alleviated emotional distress by increasing activity in the RVPFLC (i.e., a linguistic processing center), which is involved in the disruption of amygdala activity (a region linked to negative appraisal processes).

Representation of Emotions Associated with Trauma

The literature we just reviewed speaks to the many benefits of representing emotional experiences in words. Such representations reduce the anxiety associated with emotional experience, they narrow the focus of the emotion, and they even reduce certain stress-related physiological reactions associated with the emotion. One might therefore expect many benefits to arise as the result of representing problematic emotional experiences in more complex narratives. This hypothesis has been borne out in the important research program of Pennebaker

and his colleagues (Pennebaker, 1997; Pennebaker & Seagal, 1999; Pennebaker, Mehl, & Niederhoffer, 2003).

In this research, participants experiencing emotional trauma are given the opportunity to write about their emotions associated with difficult circumstances in an emotion-centered expressive writing process. The scope of traumatic events reported by different participants may be very broad, including bereavement, divorce, the experience of earthquakes, and the attacks of September 11, 2001. Regardless of the source of trauma, people who write about their difficult emotions benefit in myriad ways compared to people who write in a more factual fashion about the same event. Specifically, they are less likely during subsequent months to visit the doctor and are likely to report fewer absentee days at work or school. They experience elevated life satisfaction, and if they are college students, perform better in school (Pennebaker, 1993, 2009).

The reasons for the many documented health benefits of expressive writing are still under investigation. Representing emotions in written narratives seems to enable change at multiple levels: in cognition and appraisal, in subjective feelings, and in shifting physiological processes (Pennebaker, 1997, 2004). First, through writing, cognition and appraisals shift as writers are obliged to organize, structure, and make sense of the emotional disturbance. In doing so, they tend to reflect upon the traumatic event from a more distanced perspective, gaining insight into the causes and implications of their emotions.

Second, subjective moods and feelings are transformed through written self-disclosure. Confronting rather than avoiding a troubling event lessens the event's emotional charge over time, in part through habituation (e.g., Foa & Kozak, 1986). Finally, some work suggests that the beneficial outcomes are mediated by enhanced biological and immune system functioning. Disclosing traumatic events has been linked to improved response to hepatitis B vaccinations

(Petrie, Booth, Pennebaker, Davison, & Thomas, 1995) and lymphocyte proliferation in response to two mitogens, phytohemagglutinin and concanavalin (Pennebaker, Kiecolt-Glaser, & Glaser, 1988). Among HIV patients, writing about difficult emotional experiences (versus a control topic) led to reduced HIV viral load and improved CD4+ lymphocyte count in the six months that followed (Petrie, Fontanilla, Thomas, Booth, & Pennebaker, 2004). Altogether, this research program has marshaled impressive evidence concerning the possibilities of healing through writing.

Reappraisal of Ongoing Emotions

Representing emotional experiences in complex narratives gives people an opportunity to reappraise their emotional circumstances, and to provide new meaning to their experiences. How people reappraise ongoing emotional experiences has been one of the most vibrant topics in the literature on emotion representation and regulation (Gross, 2002, 2008; Gross & John, 2003; John & Gross, 2004; Shiota & Levenson, 2009). In the work of Gross, John, and colleagues, cognitive reappraisal is defined as "changing the way we think about a situation in order to decrease its emotional impact" (Gross, 2002). Reappraisal is an "antecedent-focused" emotion-regulation strategy in the sense that a person attempts to short-circuit the emotion episode prior to the onset of negative feelings and physiological and behavioral reactions. Examples of reappraisal strategies include focusing on the silver lining ("I didn't make the volleyball team but now I have time to be in the marching band"), putting an event in perspective ("In the grand scheme of things, this isn't a big deal"), taking the point of view of a detached observer (e.g., such as a doctor may do when treating a burn victim), or reframing the meaning of an event (e.g., viewing a first date as an opportunity to try a new activity rather than as a test of one's own

attractiveness). Finally, reappraisal may be implemented with the goal of either up-regulating positive emotion, or of decreasing negative emotion (McCrae, Ciesielski, & Gross, 2011).

The experimental and individual-differences data strongly support the effectiveness and long-term benefits of cognitive reappraisal (John & Gross, 2004). Whereas other coping strategies, such as hiding or suppressing feelings, fail to produce positive changes, reappraisal has been found to down-regulate the mental and physiological distress associated with negative emotions such as sadness and disgust. In terms of personality, individuals inclined to regulate emotion via reappraisal tend to have healthier emotional lives than individuals inclined to regulate emotion by trying to suppress their feelings and expressions. For instance, chronic reappraisers on average experience more positive emotions and fewer negative emotions than chronic suppressors. They also function better in relationships and are more likely to be rated by peers as being likable and having close relationships. Suppressors, on the other hand, are more likely to have an avoidant attachment style and have poor social support (Gross & John, 2003).

Recent studies have elucidated biological mechanisms that underlie reappraisal. It activates frontal lobe regions of the brain (e.g., the ventromedial prefrontal cortex), which down-regulate limbic-based emotional responses (Ochsner, 2008) and decreases activity in the amygdala, which is involved in emotion generation and negative appraisals, as we saw earlier (Ochsner, Bunge, Gross, & Gabrieli, 2002). Reappraisal also reduces the sympathetic autonomic arousal associated with emotional suppression. In an illustrative study, participants were videotaped as they watched disgusting film clips of an amputation and the treatment of burn victims (Gross, 1998). Markers of sympathetic autonomic arousal—finger pulse and finger temperature—were concurrently monitored for changes. Before the film began, some participants received instructions to reappraise their ongoing reactions ("…try to adopt a

detached and unemotional attitude as you watch the film. In other words, as you watch the film clip, try to think about what you are seeing objectively, in terms of the technical aspects of the events."). Others were told to suppress their reactions ("as you watch the film clip, please try your best not to let those feelings show. In other words, as you watch the film clip, try to behave in such a way that a person watching you would not know you were feeling anything"). Finally, participants in a control condition were given no instructions and simply viewed the clip. Subsequently, all participants reported how disgusted they felt. Videotapes of the participants were later coded for facial expressions of negative emotion. Participants in the reappraisal condition showed fewer facial expressions than the control condition and reported feeling significantly less disgusted, relative to the control and suppression conditions. By contrast, although participants in the suppression condition inhibited their facial expression, they felt as disgusted as control participants. They also showed higher activation of the sympathetic autonomic nervous system, in the form of larger decreases in finger pulse amplitude and increases in finger temperature. The findings of this systematic experiment strongly suggest that reappraisal is a particularly effective regulation strategy. If performed correctly, reappraisal can improve subjective emotional experience without increasing physiological arousal. Converging findings emerge from studies using a host of different techniques, such as fMRI (Ochsner et al., 2002), EMG (Ray, McCrae, Ochsner, & Gross, 2010), measures of cardiovascular activity (Mauss, Cook, Cheng, & Gross, 2007), facial behavior (Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005), and nonconscious activation of appraisal goals (Williams, Bargh, Nocera, & Gray, 2009).

Levels of Construal in Recalling Emotional Events

A second type of reappraisal involves changes in the level of construal or perspective one takes when recalling an emotional experience. Individuals may construe memories from a first-person vantage point, in which they represent the experience through their own eyes and their own point of view. Alternatively, they may construe memories from a third-person perspective, recalling the experience as if from a distant and more objective bird's eye view (Cohen & Gunz, 2002; Cohen, Hoshino-Brown, & Leung, 2007). Similarly, the recollection of a memory may be very broad and abstract or very specific and concrete (Ayduk & Kross, 2008, 2010).

These possibilities raise important questions about the emotional consequences of representing emotional experiences from different perspectives. Recently, Ayduk, Kross, and their colleagues have explored one such dimension in research on the effects of taking an abstract and distant versus a concrete and proximal point of view in representing a past experience (see also Trope & Liberman, 2003, 2010). In their work, prompting individuals to think about "why" an event happened engages a more distant, abstract perspective on the experience as compared to "how" the event happened, which focuses attention on the concrete specifics of the emotional episode. Aspects of emotional experience are then measured to explore whether these perspectives diverge in their consequences for emotion. Taking an abstract perspective when recalling a negative emotional event (focusing on why an event occurred) reduces stress-related cardiovascular responses, relative to taking a concrete perspective (focusing on how an event occurred) (Ayduk & Kross, 2008).

Moreover, mentally representing a past event from a "self-distanced," third-person perspective enables an abstract focus and allows people to remain relatively detached while reflecting on the negative experience. By contrast, recalling the memory using a "self-immersed," first-person perspective causes individuals to relive the original emotions by

inhibiting reappraisal and keeping attention focused on the concrete, negatively arousing details of the memory. Several studies have compared the effects of using a self-distanced versus self-immersed perspective on emotional reactivity, as they recalled a past unhappy event (e.g., Kross, Ayduk, & Mischel, 2005). In one experiment, participants were instructed to identify an experience in which they had originally felt a great deal of anger. Some participants were then given instructions that led to self-immersed perspective (e.g., "go back to the time and place of the experience and relive the situation as if it were happening to you all over again…"). Others were given instructions that led them to take a self-distancing perspective (e.g., "take a few steps back and move away from your experience…watch the conflict unfold as if it were happening all over again to the distant you…"). Afterward, all participants completed measures of their current feelings of anger. As anticipated, individuals who received the self-distancing instructions felt anger less intensely than those who received self-immersion instructions. Further, it should be noted that these effects were most obvious when participants explained why the event happened (an abstract focus) rather than how the event happened (a concrete focus). Related research shows that the tendency to ruminate offers no perspective, no distance, no third-person perspective upon emotional events, and tends to prolong experiences of emotion, both negative and positive (Lyubomirsky & Nolen-Hoeksema, 1995; Morrow & Nolen-Hoeksema, 1990).

Accuracy in the Representation of Past and Future Emotions

Much of human emotional life involves representations of past emotional episodes or of anticipated emotional experiences (Gard, Gard, Kring, & John, 2006; Levine & Pizzarro, 2004). Given the prevalence of bias in human memory and judgment (e.g., Greenwald, 1980; Nisbett & Ross, 1980), it is necessary to question the accuracy of these emotional representations. The empirical evidence on this topic suggests that representations of past or anticipated emotion often

fail to depict the actual content or duration of the experience. For example, people expect fairly intense emotions when predicting how they will feel about an upcoming event, such as outcomes of an exam, important game, or tenure decision (van Boven & Ashworth, 2007). Moreover, people incorrectly perceive their immediate emotions to be more intense than emotions they experienced in the recent past (van Boven, White, & Huber, 2009).

Following suit, research by Gilbert and others on *affective forecasting* reveals that people routinely mis-predict the impact of emotional events, such as the dissolution of a romantic relationship or the outcome of a tenure review, on their overall well-being (Gilbert, Lieberman, Morewedge, & Wilson, 2004; Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). One common tendency is to over-estimate the happiness one will feel after positive events. This bias is fostered by "focalism," which is a bias to concentrate on the effects of a focal event and fail to recognize that unrelated concurrent events will temper the impact of the focal event (Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000). People may, for instance, fail to account for the impact of health problems or marital tensions when predicting great happiness after receiving tenure. A twin trend is to over-estimate unhappiness after negative events. In addition to the focal bias, overestimations of negativity are fueled by "immune neglect"—the tendency to overlook the human psyche's remarkable capacity to rebound from negative experiences (Gilbert et al., 1998).

Studies reveal similar discrepancies between memories of past emotions and the actual emotion experience. One general trend is for people to under-report or over-report past emotions in ways that fit their current circumstances (Levine & Safer, 2002; Levine & Pizarro, 2004). For example, bereaved individuals' reports of past grief were more highly correlated with their current grief than with actual levels of past grief (Safer, Bonanno, & Field, 2001). This finding

suggests that with ongoing life events, people's current feelings may be more powerful predictors of representations of past experiences than the actual past experience. As another example, romantic partners who had become more attached to their partner over time recalled having more positive initial evaluations of their partner than was actually the case. Those who became less attached to their partner over time recalled initial feelings that were more negative than they actually experienced (McFarland & Ross, 1987).

Interestingly, the tendency to align memories of emotion with current feelings about a person or event also helps perpetuate inaccurate affective forecasting. People assume that their actual feelings about an event (which are less intense than originally predicted) were what they had actually expected to feel—forgetting that those predictions were actually extreme. As a result, people may never learn to adjust their predictions to account for the fact that things are rarely as good or as bad as first anticipated. This problem is nicely illustrated in a study of the 39th Super Bowl in which the Philadelphia Eagles lost to the New England Patriots (Meyvis, Ratner, & Levav, 2010). The researchers recruited a sample of Eagles fans that completed surveys three days before the Super Bowl game and then five days after it. Three days before the game, participants were asked to estimate what their mood would be five days after the Super Bowl if the Eagles lost (i.e., the forecast). Five days after the Eagles lost the game, participants reported their actual mood. They were also asked to recall their forecast from three days before the game. As it turned out, fans had predicted that they would feel worse after the loss than they actually did feel. Critically, when asked to recall their prediction from three days before the game, participants' judgments were biased by their current feelings—namely, they incorrectly assumed that their forecasted mood matched their real mood. By overlooking the inaccuracies of their gut predictions, people neglect to learn how to forecast accurately.

Emotional Discourse Shapes Emotional Profiles

Thus far we have seen that emotion representations involve many elements, from simple words to complex narratives. We have also seen that the ways in which people represent emotions have important effects on their emotional responses. Taken together, these literatures suggest that the particular ways in which an individual comes to represent emotion will profoundly influence his or her emotional life.

One of the important implications of this body of research is that an individual's identity will be shaped by the emotion representations he or she resorts to, as a product of both temperament and socialization. This possibility is anticipated in a rich vein of theory holding that representations of emotion channel individuals into identity-based profiles of emotional response (e.g., Abu-Lughod, 1986; Briggs, 1970). As an example, consider the gendered nature of emotion during emotional socialization and discourse (Citrin, Roberts, & Fredrickson, 2004; Shields, 1991). Mothers talk more about emotions, with the exception of anger, with daughters than with sons (Fivush, 1991). These different emotion discourses are presumed to socialize girls and boys into different patterns of emotional response. Indeed, females do report higher levels of other-oriented positive emotions (e.g., love) than males, who in turn report higher levels of achievement-oriented emotions than women, such as pride, which separate self from other (Shiota, Keltner, & John, 2006). Within emotion-related gender stereotypes, females are assumed to express more submissive emotions, such as embarrassment, whereas males are assumed to express more dominant emotions, such as anger (Plant, Hyde, Devine, & Keltner, 2001). Women systematically show greater sensitivity to social contextual cues when interpreting emotion (Roberts & Pennebaker, 1995) and greater attunement to the emotions of others (Hall, Carter, & Horgan, 2000). Discourses about emotion, this literature suggests,

channel women and men into different emotional styles that place them in different roles within the social and moral order (Citrin et al., 2006; Fischer, 2000; Tiedens, Ellsworth, & Mesquita, 2000). There are numerous cultural representations of emotion similar to those related to gender. Later we take up this theme in a discussion of emotion-cognition interactions as they relate to political and social class identities. As with gender, emotion representations, discourses, and responses can fundamentally shape social identity.

Emotions Shape Cognitive Processes

As we have seen, cognition in its many forms (appraisals, representations, knowledge) figures prominently in human emotion. Just as persuasive is research showing that emotions, in turn, influence cognition. We introduce this idea with the case study of pioneer photographer, Eadweard Muybridge. In 1860, Muybridge sustained severe brain damage when his stagecoach collided with a tree. It is believed that he specifically injured his orbitofrontal cortex, a region of the brain involved in (a) integrating emotion into decision making, (b) the experience of self-conscious emotion, and (c) the regulation of social behavior (e.g., Beer, Heerey, Keltner, Scabini, & Knight, 2003). The accident dramatically altered Muybridge's personality and social behavior. He became extremely temperamental, erratic, and prone to bursts of rage. He neglected personal hygiene. Most tellingly, in 1874 Muybridge became suspicious that his wife had had an affair and had given birth to another man's child. He tracked down the alleged lover and shot him point-blank.

Muybridge's story presages findings from scientific studies of patients with frontal lobe damage. This research has led to claims that such patients lose their capacity to use emotion to guide decision-making—a loss that has profound and often deleterious social consequences (e.g., Beer et al., 2003; Damasio, 1994; Greene, 2007). Although they retain language and abstract

reasoning abilities, frontal lobe patients show a deficit of self-conscious emotions such as embarrassment. Moral functioning becomes severely comprised; patients have trouble empathizing with others, possess highly skewed notions of right and wrong, and are prone to engage in what many would consider inappropriate or unethical conduct. Consequentially, their interpersonal relationships suffer, and even mundane interactions become problematic.

The difficulties encountered by Muybridge and other frontal lobe patients illustrate that emotions are critical guides to judgment, reasoning, and decision-making—contrary to the writings of many Western scholars, as we outlined at the beginning of this chapter. Rather, it was common to assume an antagonistic relationship between emotion and cognition, one in which emotions disrupt and subvert principled cognitive processes. This dualistic perspective on emotion and reason has been countervailed by 25 years of psychological research (Keltner & Lerner, 2010). In the present review, we see that emotions are reasonable in several ways; for example, they may be based on realistic appraisals of events in the world. In the second half of this chapter, we examine how emotions guide cognitive processes in systematic, rational ways.

This literature was largely instigated by the writings of Simon (1967), who argued that emotions help intelligent agents set priorities among the many goals and stimuli that impinge on them at any given moment (see also Oatley & Johnson-Laird, 1987, 1996; Winkielman et al., 1997). Since then, others have noted that humans are continually faced with a multiplicity of goals and concerns (Bargh, 2006; Shah, 2003). There is a need for some sort of interruption and prioritization mechanism, to guide cognitive processes toward events that bear most importantly on current goals and concerns (De Sousa, 1987; Oatley, 1992). Emotions serve this most general function by orienting cognition toward specific events relevant to an individual's goals and concerns. In the most intense moment of fear, for example, cognitive resources are channeled

toward registering and remedying threats. While feeling compassion, cognitive processes become oriented toward harm reduction. In short, emotions are purposeful and, one could say, often quite rational.

Conceptual Distinctions Regarding the Effects of Emotion on Cognition

As the literature on the influences of emotion on cognitive processes has developed, several conceptual distinctions have emerged. A first is between the incidental and integral effects of emotion. *Incidental effects* occur when an emotion triggered by one event influences judgments in an unrelated domain. As shown in the studies that follow, people often fail to understand that incidental emotions are not relevant to a particular judgment. As a result, emotions can influence unrelated judgments in profound ways. *Integral effects* refer to the influences of emotion on judgments of the object that elicited the emotion (Forgas, 1995). Trait approaches to emotion—e.g., the study of the fearful individual—and state approaches to emotion—e.g., the study of momentary bursts of fear—characterize the incidental and integral influences of emotion on cognitive processes (Lerner & Keltner, 2001).

A second distinction pertains to the nature of the influence on judgment. *Processing style accounts* posit that emotions engage qualitatively different kinds of processing that account for the influences of emotions on cognition. As an example, anger triggers more automatic forms of reasoning and sadness more controlled forms of reasoning, accounting for why these two emotions lead to different likelihoods of relying on stereotypes (Bodenhausen, Kramer, & Süsser, 1994). Another example is fear, which triggers a narrowing of attention or vigilance to threat (Mathews & MacLeod, 1994; Mineka & Sutton, 1992).

Informational accounts, in contrast, presuppose that emotions provide specific kinds of information that feed directly into judgments (Forgas, 1995; Lerner & Keltner, 2001; Schwarz &

Clore, 1988). Many real-life judgments are complex: How satisfied am I with my life? Which apartment should I choose? Does this person deserve help? Given this complexity, Schwarz and Clore have argued that we often rely on a simple assessment based on our current feelings, asking ourselves, "How do I feel about it right now?" This is the *feelings-as-information* model of the way emotions infuse cognition (Clore, 1992; Clore & Parrott, 1991; Schwarz, 1990; Schwarz & Clore, 1983). The model's basic assumption is that emotions provide us with rapid, reliable information about events and conditions within our current social environment—gut feelings, so to speak—that shape our most important judgments. Framed by these concerns, the literature on emotion and reason now reveals that almost every cognitive process, including attention, evaluative judgments, probability estimates, perceptions of risk, outgroup biases, and moral judgment, are systematically and profoundly shaped by momentary emotions (Clore & Gasper, 2000; Forgas, 1995, 2000).

Emotion and Selective Attention

One of the most striking qualities of emotions is that they influence our intake of information and thereby shape the world we inhabit. The philosopher Sartre (1957) wrote of the "magical transformation" that emotions bring about in the perceptual world by directing attention to select classes of stimuli. This transformation is reflected in colloquial maxims such as that we see the world through "rose-colored glasses" or "jaundiced eyes." One could say that each emotion is accompanied by its own lens through which we view and construct the world. When angry, afraid, euphoric, or in love, people construe the world in specific ways by paying attention to certain themes or events and ignoring others.

The most fully researched effects of emotions on attention concern fear. Fear and anxiety narrow attention, leading to the selective perception of threats and dangers (Mathews &

MacLeod, 1994; Mineka, Rafaeli, & Yovel, 2003). For example, in the dot probe paradigm participants are presented with words on a computer screen, some threatening (e.g., "disease") and others neutral ("table"). The words are quickly replaced by a dot, and the participant's task is to press a button as soon as the dot appears (Mathews, 1993; Mathews & Klug, 1993). Highly anxious individuals have shorter reaction times to the appearance of the dot immediately following threatening words when compared to non-anxious individuals. However, reaction times to neutral words are no different between anxious and non-anxious individuals. The explanation offered by Mathews and colleagues is that reaction time is shorter when the dot appears in the position of the word to which the participant was actively attending. Anxious participants are much more likely to be looking at the threat word rather than the neutral one. This kind of finding has been replicated with clinically anxious patients and with nonclinical people who score high on personality scales measuring dispositional anxiety (Asmundson & Stein, 1997; Mogg, Bradley, Bono, & Painter, 1997). Other findings are based on the dichotic listening task in which participants attempt to listen to different messages fed into their two ears. When afraid, participants are likely to have their attention drawn away from the message they are supposed to be tracking in one ear if the words presented to the other ear are threatening, such as "death" or "blood" (Mathews & MacLeod, 1994).

Studies using an emotional Stroop task provide further converging evidence. In the emotional Stroop test, some words presented on the computer screen in color are neutral and others have emotional significance. The objective of the test is to see whether people are slower to name the colors in which words with emotional significance are printed. Foa and colleagues (1991) found that rape victims were slower to name the font color of words that were related to rape. People in this study who had coped better with their trauma exhibited less interference

(Foa, Feske, Murdock, Kozak, & McCarthy, 1991). Mathews (1993) summarized the conclusions of the many experiments conducted with this technique: The slowing of color naming is greatest with words that correspond to the subjects' greatest anxiety. Thus people who have a social phobia are slowed by words about confidence; people with eating disorders are slowed by words related to food, and so forth. Mathews and Klug (1993) found that the words did not have to be threatening to produce this effect: the issue was whether they were emotionally significant. If the emotional words included such terms as "confident" or "healthy," then people who were socially anxious or were anxious about disease would be slowed in naming colors of positive words, but only when the positive words were related to their own specific anxiety. A number of explanations have been proposed to account for these effects of anxiety on attention. The most straightforward is that when people are fearful—either because of some immediate threat or because they suffer from chronic anxiety—their nervous system switches to a particular mode of processing. Regions of the brain associated with the fear (e.g., the amygdala, hippocampus, periaqueductal gray, and others) become activated (Mathews, Yiend, & Lawrence, 2004) and in this mode, diverting attention is only partly effective at decreasing this activation. The fearful mode is one in which attention becomes narrowly focused on cues in the environment related to threat and safety. Attention becomes especially attuned to cues related to the objects of a person's anxiety. For instance, people who consider themselves vulnerable to cancer begin to worry whenever they experience physical symptoms. This is true even if the symptoms are unrelated to cancer but nevertheless remind them of their vulnerability (Easterling & Leventhal, 1989). From these studies, we may deduce that cognitive mechanisms related to fear and anxiety arose in response to certain selection pressures in the course of human evolution. However, when these mechanisms are chronically engaged, they sap cognitive

resources, heighten the sense of uncertainty and danger, undermine confidence, and prevent sufferers from concentrating on other things.

Emotion Congruency in Perceptual Biases

Emotions also orient perception toward objects and events that are relevant to any of a person's immediate feelings. Niedenthal and colleagues have found that current emotions, such as fear, anger, happiness, or sadness, lead individuals to quickly categorize other stimuli that are congruent with that emotional state (Niedenthal & Halberstadt, 2000; Niedenthal & Setterland, 1994; Niedenthal, 2008). In one early study in this line of inquiry, researchers induced happy and sad moods by giving their subjects earphones and playing music throughout the experimental session (Niedenthal & Setterlund, 1994). To put people in a happy mood they played upbeat classical pieces such as selections from Mozart's *Eine Kleine Nacht Musik* and Vivaldi's *Concerto for Harpsichord and Strings in C Major*. To induce sadness they played more lugubrious tunes, such as the *Adagio for Strings* by Barber and *Adagietto* by Mahler. Participants then performed a lexical decision task on a computer. Strings of letters were flashed on the screen one at a time: Some of the letter strings were real English words, and others were pronounceable non-words. Participants were instructed to indicate as quickly as possible whether a letter string formed a word or a non-word. Words were from five categories: (1) happy words such as "delight," (2) positive words unrelated to happiness such as "luck," (3) sad words like "weep," (4) negative words unrelated to sadness like "decay," and (5) neutral words like "cluster."

The researchers found that the music selections did indeed put people into happy or sad moods. More importantly, and consistent with the thesis of emotion-congruence, participants in a happy mood were quicker at identifying happy than sad words. When sad, they were quicker at

identifying sad than happy words. But the effects of happy and sad moods did not extend to the positive or negative words that were unrelated to the specific emotions of happiness or sadness, nor to the neutral words.

These effects have been conceptually replicated in closely related studies of perceptions of emotional expression duration. Participants were induced to feel happy, sad, or no emotion through film and music clips (Niedenthal, Halberstadt, Margolin, & Innes-Ker, 2000). Afterward, they watched 100-frame movie clips of faces in which the facial expression gradually morphed from one emotion (either happiness or sadness) to a neutral expression. Participants' task was to identify how long the emotion expression remained on the screen before becoming neutral. As expected, they reliably perceived expressions congruent with their own induced feeling state as lasting longer than other expressions.

The work on emotion-driven attention and perceptual biases makes the impressive point that our current moods and feelings lead us to selectively perceive emotion-congruent objects and events. This point is echoed in research on reappraisal, reviewed earlier, showing that appraisal is an important moment in the emotion sequence to enact regulation strategies. Moreover, it helps explain why emotions and moods can be so persistent: People tend to attune themselves to emotion-congruent objects and events, thus prolonging their experience.***

Positive/Negative Moods Influence Evaluative Judgments

Momentary affective states wield powerful influences on judgments, a robust empirical generalization accounted for by the feelings-as-information perspective discussed above (Clore, 1992; Clore & Gasper, 2000; Clore & Parrott, 1991; Martin & Clore, 2001; Schwarz, 1990; Schwarz & Clore, 1983). This perspective assumes that emotions rapidly signal information about the goings-on of the immediate environment. This information feeds into subsequent

judgments about issues that are too complex to review or when it is impossible to synthesize all of the relevant evidence. In a landmark study of feelings-as-information, Schwarz and Clore (1983) telephoned people in Illinois on either a cloudy or a sunny day and asked, "All things considered, how satisfied or dissatisfied are you with your life as a whole these days?" Half of the participants rated their life satisfaction right away. But the other half responded only after the phone interviewer had drawn their attention to the weather by casually asking, "How's the weather down there?" Participants reported greater life satisfaction on a sunny than on a gloomy day, consistent with a robust literature showing that current feelings—which had been boosted by the beautiful weather on the sunny days—determine levels of subjective well-being (Lucas & Diener, 2008). The joys of the sunny day influenced people's evaluations of life satisfaction, however, only when the weather had not been brought to their attention beforehand. When participants were made aware of the weather, they were able to attribute their current feelings to the weather instead of to their life satisfaction beliefs. Studies motivated by this work have since revealed that current moods and emotions exert powerful influences on evaluative judgments of life satisfaction (Lucas & Diener, 2008), political leaders (Forgas & Moylan, 1987), and consumer choices (Han, Lerner, & Keltner, 2007).

Mood Affects Explanation and Expectation

Explanation and expectation are central activities of the social mind as it seeks to understand the world and prepare for future interactions. These activities judgments also have far-reaching social consequences, given the significance afforded to intention. They figure prominently in whether people forgive others or not. They may influence legal decisions, such as determining a sentence for a convicted criminal. And several studies suggest that causal attributions shift considerably depending on current moods and emotions.

With regard to explanation, there appears to be a general attributional bias produced by negative and positive moods. To demonstrate, Forgas (1994) induced feelings of positive or negative mood in participants by having them read a sad or a humorous literary passage. Participants next recalled one experience with a romantic partner that was pleasant and one that was filled with conflict and difficulty. Forgas coded the different attributions offered for these events. Through these codes, he was able to observe that participants in a negative mood because of the sad literary passage attributed the positive romantic experience to situational factors but blamed themselves for the romantic conflict. Happy people, in contrast, took personal credit for the positive romantic experience and blamed the conflict on circumstantial factors.

Likewise, positive and negative moods differentially influence expectations about the future. Negative moods lead people to view the future pessimistically, whereas positive moods incline people toward optimism. In one of the first studies to document this, Johnson and Tversky (1983) induced negative moods in participants by having them read newspaper accounts of a young man's death. Relative to control participants who did not read a tragic story, people in a negative mood judged negative life events in the future, such as contracting a disease, to be more likely than people in a positive mood. Current moods shape visions of the future.

Beyond Mood: Distinct Emotions Impact Judgments

In other research, more specific emotional states have been found to have fairly distinct influences on social perception, including causal attributions (explanations) and expectations. An *appraisal tendency framework* has been offered to account for the effects of discrete emotions on judgments and decision making (Han et al., 2007; Lerner & Keltner, 2000, 2001; Lerner & Tiedens, 2006; Tiedens & Linton, 2001). This framework assumes, first, that each emotion is triggered and shaped by a core appraisal that persists for the duration of the emotion

episode – a thesis that derives from the dimensional approaches to emotion-related appraisal that we considered earlier. Compassion, for example, involves appraisals of the undeserved suffering whereas pride involves appraisals of one's own strength vis-à-vis that of others. Fear is characterized by appraisals of low certainty and low control whereas anger is characterized by high control and high certainly appraisals. With this in mind, the framework posits that specific emotions influence judgments in a manner consistent with the emotion's underlying appraisal tendency, but only in domains related to the appraisal. For example, fear should influence judgments about risk and certainty—judgment domains most closely related to its underlying appraisal tendency—but not judgments of blame or fairness, which are more closely related to anger.

Distinct Emotions Influence Social Attributions

Several studies guided by the appraisal-tendency perspective have revealed the influences of specific negative emotions like anger and sadness on explanations of events. Anger involves appraisals of agency (certainty and control) and leads people to blame others for various actions, and to be acutely sensitive to unfair actions. Sadness, on the other hand, leads people to attribute events to impersonal, situational causes (Feigenson, Park, & Salovey, 2001; Keltner, Ellsworth, & Edwards, 1993; Lerner, Goldberg, & Tetlock, 1998; Loewenstein & Lerner, 2003; Quigley & Tedeschi, 1996). For instance, one study led participants to feel either angry or sad using visualizations (Keltner et al., 1993). Participants then read a vignette describing an awkward social mishap that could have been due either to human agency (namely, the actions of the protagonist's friends) or to the situation. Sad participants were more likely to explain ambiguous events as due to situational causes whereas participants feeling anger tended to attribute those same events to human agency.

Distinct Emotions Influence Expectations

More recent studies have uncovered more nuanced effects of distinct emotions on expectations, including more specific strains of pessimism or optimism. For example, another study by Keltner et al. (1993) asked whether people feeling angry or sad would judge different events to be more likely in the future. They reasoned that angry people, attuned to the blameworthy actions of others, would judge unfair acts caused by others to be frequent in the future. In contrast, sad people, attuned to situational causes of negative outcomes, should judge negative life events caused by situational factors as more likely. To test this hypothesis, they asked angry or sad participants to estimate the likelihood of different events, some of which were caused by other people (a pilot's error causes a friend to die in a plane crash) and some caused by situational factors (icy roads cause you to experience a car accident). Consistent with expectation, angry people judged the negative life events caused by other people to be more likely than sad people, who judged the events caused by situational factors to be more likely.

In similarly motivated work, DeSteno and colleagues (DeSteno, Petty, Wegener, & Rucker, 2000) asked people feeling anger or sadness to estimate the likelihood of "sad" events (of the 60,000 orphans in Romania, how many will be malnourished?) and "angry" or unfair events (of the 20,000 violent criminals put on trial in the upcoming year, how many will be set free because of legal technicalities?). Angry participants judged the anger-inducing events to be more likely, whereas sad participants judged the sadness-inducing events to be more likely.

Finally research on fear has shown that fear amplifies the expectation of pessimistic life outcomes and risk compared to anger (Lerner & Keltner, 2001; Lerner, Gonzalez, Small, & Fischoff, 2003). Fearful individuals have been shown to have heightened expectations that risky, dangerous events will be part of their future (Lerner & Keltner, 2001). Anxious decision-makers

preferred uncertainty-reducing options, whereas sad decision-makers preferred the reward-seeking option (Raghunathan & Pham, 1999).

In sum, the research on affect and expectation reveals that negative and positive moods make people more pessimistic or optimistic, respectively. Looking more deeply, there also appear to be more subtle kinds of pessimism associated with more specific negative emotions such as anger, sadness, or fear.

Unique Cognitive Outcomes of Positive Emotions

Positive emotions, such as happiness, awe, or compassion, appear to have special influences on cognitive processes. They are believed to trigger more associative, creative, or broadening patterns of thought (Fredrickson, 1998; Isen, 1987). Early in the study of emotion and judgment, Isen argued that happiness prompts people to think in more flexible and creative ways. People induced to feel happiness through events like receiving candy, watching an uplifting film clip, or finding a dime in a public telephone, were more likely to find creative solutions to novel problems, to produce unusual associations to words, and to categorize objects in inclusive or novel ways (Isen, 1987). Other studies by Isen and her colleagues revealed that happiness leads to more flexible cognition, as seen in the more unusual word associations of happy participants (reviewed in Isen, 1987, 1993). When given one word (for example, "carpet") and asked to generate a related word, people feeling happy generated more novel associations (for example, "fresh" or "texture") than people in a neutral state. People feeling happy categorized objects in more inclusive ways, rating fringe members of categories (for example, "cane" or "purse" as an example of clothing) as better members of that category than people in a neutral state, whose categories were more narrowly defined. Happiness has also been found to

prompt people to aim for higher goals (Hom & Arbuckle, 1988), and to persist in what they are doing and to resist shifting to other emotional states.

In an important extension of this work, Fredrickson (1998, 2001) has argued that the overarching function of positive emotions is to *broaden and build* thought-action repertoires. These basic broadening effects of positive emotion enable more creative and flexible thought, which helps an individual form important bonds and explore the environment. Thus, the creativity associated with positive emotion that Isen has consistently documented builds intellectual resources by enhancing perspective taking, novel ideas, and learning. Related research has also shown how positive emotions such as joy, amusement, contentment, and relief facilitate global visual processing relative to local processing, counteract the outgroup homogeneity effect, and prompt self-expansion in relationships (Fredrickson, 2001; Johnson & Fredrickson, 2005; Waugh & Fredrickson, 2006). Further work on the specific effects of distinct positive emotions is needed, but the existing projects reviewed here suggest great promise.

Morality: Emotions Act as Moral Intuitions

Answers to age old questions about human nature involve assumptions about emotions. Are we fundamentally good or evil? Is all human behavior selfish, or are we also capable of genuine altruism? Moral judgments—for example, of whether an action is right or wrong or whether a person is of good character or not—have long been assumed to be founded upon higher-order cognitive processes (Haidt, 2001). According to the once-hegemonic viewpoint, in the act of making a moral judgment, the individual is guided by *a priori* universal principles about concepts such as equality or fairness. Moral judgments hinge on the development of basic cognitive processes, such as the capacity to take another's perspective.

Yet as the empirical science of emotion has matured, longstanding notions that emotions are disruptive, irrational forces that undermine the social and moral order have given way to a much different view. Emotions involve highly sophisticated systems – display, physiology, language, representation, experience – that enable people to adapt to changing social circumstances and form solid relationships. In this way, a different view of emotion-moral judgment interactions has emerged, one that prioritizes emotions as important *intuitions*, or fast, automatic judgments of right and wrong (Damasio, 1994; Greene & Haidt, 2002; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001; Haidt, 2007). This view flows readily from appraisal accounts of emotion, which identify morally significant themes (e.g., harm, fairness) involved in specific emotions, as well as evolutionary proposals that emotions orient cognitive processes to solving problems of social organization. The claim that emotions act as moral intuitions has found expression in the somatic marker hypothesis (Damasio, 1994) and Haidt's two-system view of moral judgment (Haidt, 2001, 2003, 2007).

Moral Emotions and Their Influences on Moral Cognition

Haidt has made a case for four categories of moral emotions, which appear rapidly and effortlessly in consciousness (Greene & Haidt, 2002; Haidt, 2003). *Harm-related* emotions like sympathy and concern motivate pro-social responding to people who suffer or are vulnerable (Batson & Shaw, 1991; Eisenberg et al., 1989). *Self-critical* emotions, such as shame, embarrassment, and guilt, arise when we have violated moral codes or ideas about virtue and character, and they motivate moral behavior (Baumeister, Stillwell, & Heatherton, 1994; Higgins, 1987; Keltner & Anderson, 2000; Keltner & Buswell, 1997; Tangney et al., 1996). *Other-praising* emotions signal our approval of others' moral virtues. Gratitude is a prominent other-praising emotion, as is the state of "elevation," a positive emotion felt by uninvolved

witnesses to another's act of kindness, such as seeing volunteers take part in crisis relief efforts (Haidt, 2003; Keltner & Haidt, 2003; McCullough, Kilpatrick, Emmons, & Larson, 2001). Finally, *other-condemning* emotions, such as anger, disgust, or contempt, underlie disapproval of others' immoral actions (Lerner et al., 1998).

Guided by this work, as well as research on the appraisal-tendency framework discussed earlier, some have argued that different emotions, such as disgust and compassion, shape moral judgments by prioritizing different moral concerns in the perceiver's mind. Moral concerns refer to categories of rules about ethical, prosocial conduct, such as maintaining equality or protecting physical and mental purity (Haidt, 2001, 2007; Rozin, Lowery, Imada, & Haidt, 1999; Shweder, Much, Mahapatra, & Park, 1997; Vasquez, Keltner, Ebenbach, & Banaszynski, 2001). Above, we reviewed research on the appraisal-tendency framework, which states that distinct emotions are triggered by core appraisals that persist throughout the experience of an emotion (e.g., Ellsworth & Scherer, 2003). These emotion-related appraisal tendencies, in turn, define how specific emotions color subsequent social judgments by prioritizing specific concerns semantically related to the emotion's appraisals (Han et al., 2007; Keltner et al., 2006). In applying this appraisal tendency framework to the moral realm, it has recently been suggested that certain emotions arise from appraisals with different moral themes (e.g., injustice) known to underlie moral judgments, for instance, those related to justice, purity, or hierarchy (Haidt & Graham, 2007; Shweder et al., 1997). As a result, appraisal-tendency effects may explain moral judgments made during specific emotional states. That is, different emotions lead to the prioritization and salience of particular moral concerns, which drive moral judgments accordingly (see also Horberg, Oveis, & Keltner, 2011; Keltner et al., 2006; Lerner & Keltner,

2001). Table 1 summarizes several theorized linkages between specific emotions and moral concerns (adapted from Horberg et al., 2011).

TABLE 1 ABOUT HERE

For instance, contempt is an "other-condemning" emotion specifically linked to concerns about respecting duties and roles within social hierarchies. A study of U.S. and Japanese participants showed that members of both cultures reliably selected an image of a contempt facial expression as their response to immoral actions that involved violating one's role (e.g., speaking disrespectfully to a superior) (Rozin et al., 1999). With respect to positive emotions, pride ties to concerns about hierarchy, status, and strength. Pride is evoked by appraisals of the self's accomplishments and rising social status (Tracy & Robins, 2004), and helps resolve morally-relevant decisions, such as how to allocate resources among group members (Shiota et al., 2006). Guided by this framework, in the sections that follow we synthesize research on three of the most widely investigated emotion-morality associations: disgust-purity; anger-justice, and compassion-harm/care.

Disgust and Purity Concerns

Disgust has been tied to moral concerns about protecting bodily and mental purity. One should treat the body and mind as temples by keeping them free of filth and degradation (e.g., Haidt & Graham, 2007). This assertion is informed by the appraisals of disgust, which center on the perception of objects or behaviors as impure. Consistent with its classification as a moral emotion (Haidt, 2003), disgust is known to magnify moral responses to transgressions. In one study (Wheatley & Haidt, 2005), participants were hypnotized to experience a flash of disgust whenever they read a neutral target word (e.g., "often"). Afterward, participants read scenarios describing morally transgressive behaviors (e.g., taking bribes, shoplifting). If the text of the

scenario included the target word (e.g., "Congressman Arnold Paxton…is often bribed by the tobacco lobby…"), participants reported feeling greater disgust and judged the moral transgression in the scenario more harshly.

Although disgust has been found to create harsher attitudes toward immoral behavior in general (e.g., Schnall, Haidt, Clore, & Jordan, 2008; Wheatley & Haidt, 2005), the appraisal-tendency framework holds that disgust chiefly influences moral judgments about actions that violate or uphold purity. Illustrating this conceptual association, a study by Rozin and colleagues (1999) found that people conceive of disgust as the modal response to purity violations but not to violations of two other moral concerns, which they call autonomy (rights, justice, freedom) and community (duties, obligations). Specifically, participants from the U.S. and Japan reported anticipating feelings of disgust in response to purity violations such as eating rotten meat. In contrast, they anticipated anger following autonomy violations like theft and anticipated contempt following community violations, such as being disrespectful to elders.

Rozin's findings bring into focus the conceptual association of disgust and moral purity. Somewhat more direct data come from studies of responses of disgust and moral opposition to purity-relevant behaviors. For instance, opposition to meat consumption and cigarette smoking coincided with greater disgust toward those behaviors and was better predicted by felt disgust than by the perceived health risks of those activities (Rozin & Singh, 1999; see Haidt & Hersch, 2001 and Haidt, Koller, & Dias, 1993, for similar evidence). Moreover, disgust-prone individuals show heightened prejudice against homosexuals, but not against African-Americans (Tapias, Glaser, Keltner, Wickens, & Vasquez, 2007), and are especially likely to hold conservative attitudes about gay marriage and abortion (Inbar, Pizarro, & Bloom, 2008). In addition to trait emotion findings, which are ambiguous with respect to causality, studies find that inducing

disgust leads to increased implicit bias against homosexuals but not against Arabs, whereas the opposite was true of induced anger (Dasgupta, DeSteno, Williams, & Hunsinger, 2009). Finally, studies have shown that individuals high in either trait or experimentally induced disgust tend to be more critical of a variety of impure behaviors, from the consumption of drugs and alcohol to sexual promiscuity (Horberg, Oveis, Keltner, & Cohen, 2009). Moreover, disgusted individuals are more likely to praise practices viewed as purifying, such as meditation and cleanliness. In keeping with domain-specificity predictions, disgust did not relate to judgments about actions perceived to violate or uphold justice or harm/care concerns. It is noteworthy that in the experimental studies described above disgust 'moralized' impurity even when the disgust elicitor did not fit classic definitions of morality, such as viewing images of a filthy toilet. This would suggest that certain emotions, however elicited, prioritize a specific moral framework

Compassion and Harm/Care Concerns

The emotion of compassion is closely related to concerns about caring for and reducing harm to others, particularly those in need. Compassion has historically been hailed as the "foundation of the social instinct" originally evolved from caregiver-child attachments and now extending to non-kin (e.g., Darwin 1871/1952; Goetz, Simon-Thomas, & Keltner, 2010).

Compassion is aroused by perceptions of need, suffering, or weakness, and induces individuals to overcome selfish cost-benefit barriers to helping others (Batson & Shaw, 1991; Eisenberg & Miller, 1987; Eisenberg et al., 1989). This emotion prominently shapes moral judgments of harm and care; for instance, people report greater willingness to help those for whom they feel sympathy (Schmidt & Weiner, 1988).

Critical to the present analysis, studies show that compassion causes people to prioritize harm/care concerns over other moral concerns, such as justice. In one set of studies (Batson,

Klein, Highberger, & Shaw, 1995), participants were asked to allocate tasks of differing appeal to two ostensible workers. One of the workers was portrayed as suffering due to a recent relationship break-up. Half of the participants were made to feel compassion for this worker through perspective-taking instructions while the other half of participants followed instructions to remain emotionally detached. Emotionally detached participants preferred to flip a coin to determine task assignment, which is a more impartial, need-blind approach. However, compassionate participants gave precedence to alleviating suffering, consistently giving the distressed worker the more appealing task. A second study in this series showed that participants feeling compassion for a fictitious young cancer patient were more likely to bump the patient up on a list to receive benefits from a charity (meaning that other children would have to be moved down on the list). Quite clearly in these studies, compassion prioritized others' need over other criteria, such as equality or impartiality, in moral decision-making.

The compassion-harm/care connection becomes apparent in studies of reactions to pleas for aid (Schmidt & Weiner, 1988). Participants were asked to imagine a needy target, such as a student who asks to borrow the participant's class notes. Some were made to feel sympathy for the target, because he or she was portrayed as not responsible for his or her plight. For instance, one target was described as needing to borrow class notes because a recent medical procedure had compromised his vision. These sympathetic participants were quite willing to help in this situation. However, when participants were made to feel angry at a target (who needed help because he or she had behaved irresponsibly), they were significantly less willing to help.

Finally, there is evidence of the compassion-harm/care association in investigating the way positive emotions influence judgments of self-other similarity, which are judgments known to underlie decisions about moral actions like helping (Oveis, Horberg, & Keltner, 2010). This

study focused on a special quality of compassion—that it leads to a heightened sense of similarity between self and others, as a means of enabling altruistic action even when the promise of reciprocity is low and the target of altruism is non-kin. From an appraisal-tendency perspective, compassion shifts perceptions of the social world to align with appraisal themes of suffering, vulnerability, social connection, and common humanity. In three studies, participants were asked to rate how similar they were to a variety of social groups or pictures of unfamiliar individuals. In one study, participants' dispositional levels of compassion were ascertained through self-report. In the other studies, participants were induced through slides to feel either compassion or the comparison emotion of pride. Like compassion, pride is a highly relational emotion and involves a positively valenced phenomenology; however, pride induces self-focus and is thought to increase concerns about status (particularly one's own), hierarchy, and merit rather than concerns about the welfare of others. Whether compassion measured as a trait or induced as a state, the findings supported claims that compassion enhanced ratings of similarity between the self and other groups or other individuals. Secondly, these effects depended on the perceived vulnerability of the target. Compassion enhanced ratings of similarity to relatively weak and powerless targets (e.g., small children, elderly people) more so than relatively strong and powerful targets (e.g., corporate lawyers, professional athletes). These intuitions of self-other similarity, in turn, are likely to support helping, altruism, and cooperation that are vital to group living. Taken together, these studies demonstrate that in contrast to pride, compassion promotes an intuition of self-other similarity. Additionally, compassion especially increases similarity toward weak others, a pattern that is consistent with the harm/care focus that characterizes compassion.

Anger and Justice Concerns

Anger is associated with justice concerns, or the protection of individual rights, fairness, and autonomy. Appraisals of others' unjust actions evoke anger, and studies find that the greater the anger in response to justice violations (such as when one individual monopolizes a shared resource), the greater the condemnation of the violation (Horberg et al., 2009).

An investigation following the 2001 U.S. terrorist attacks provides a compelling demonstration of the anger-justice link association (Lerner et al., 2003). Shortly after the attacks, participants from around the U.S. reported how angry and afraid they felt. Later, they completed manipulations designed to evoke either anger or fear and then rated their level of support for different terrorism-related policies. Some of these policies were more relevant to themes of justice ("Deport foreigners in the U.S. who lack valid visas") whereas others focused on promoting reconciliation ("Strengthen ties with countries in the Moslem world"). It was found that anger, whether naturally occurring or experimentally manipulated, was more likely than fear to predict support for the justice-relevant policy. However, anger was not more likely to predict support for the reconciliation-focused policy.

In line with these findings, DeSteno and his colleagues have found that anger elevates preference for justice-relevant tax policies. In their experiment, participants read news articles designed to elicit feelings of either anger or sadness (DeSteno, Petty, Rucker, Wegener, & Braverman, 2004). After the emotion induction, participants read an appeal to increase a local sales tax. The appeal was framed either in terms of anger and justice (with references to preventing fraud and exploitation in the city's health care system) or in terms of sadness and loss (the tax would help prevent inadequate care of special-needs infants). When framed as relevant to anger and justice, angry participants were most supportive of the proposed tax. When framed as relevant to sadness and loss, sad participants were more likely to support the tax. These

effects, it should be noted, were clearest among participants dispositionally high in the need for cognition (Cacioppo & Petty, 1982), who presumably processed the framing differences more carefully. Nevertheless, the upshot of this work is that anger increased preferences for justice policies, relative to the relatively non-moral negative emotion of sadness.

Related research shows similar effects of anger (versus sympathy) on beliefs about punishment (Rudolph, Roesch, Greitemeyer, Weiner, 2004; Weiner, Graham, & Reyna, 1997). When angry, people view immoral actions as due to stable, controllable, and internal causes (Quigley & Tedeschi, 1996) and are more likely to seek retributive, eye-for-an-eye punishment of the transgression (see also Carlsmith, Darley, & Robinson, 2002; Lerner et al., 1998). In contrast, feeling sympathy for the transgressor leads to seeking utilitarian, rehabilitation-focused punishments (Weiner et al., 1997). For example, a study inspired by the O.J. Simpson trial showed that public reactions to Simpson's arrest ranged from sympathy (among those who believed that he had little control over and responsibility for his actions) to anger (among those who held Simpson personally accountable for his actions). Anger predicted people's preferences for harsher, highly retributive punishment. Sympathy predicted preferences for less harsh punishment that focused on rehabilitation. In more controlled experiments, the researchers provided causal evidence of the effects of anger and sympathy on severity and type of punishment (Graham et al., 1997).

Embodiment in the Emotion-to-Cognition Pathway

As we have seen, there is extensive work on the role of mood and emotion on memory, different forms of judgment, and decision-making. This raises the question: How do emotional experiences come to transform highly conceptual cognitive events? The emergent literature on embodiment attempts to address this question by exploring the intermediary role of the body in

the emotion-to-cognition pathway. Emotions are highly embodied. They engage ancient, mammalian response systems that involve central and peripheral nervous system activity, and muscle movements of the face, torso, and limbs (Keltner & Lerner, 2010). Recently, Niedenthal has argued that not only are our conscious experiences of emotion rooted in the bodily responses of emotion, but so too are the complex ideas, concepts, thoughts, and metaphors that arise during an emotional experience (Niedenthal, 2007, 2008, Niedenthal, Winkielman, Mondillon, & Vermeulen, 2009; Williams, Huang, & Bargh, 2009). Even the higher-order cognitive processes related to an emotion—for example memories of an emotional experience or understanding an emotional scene in a movie—engage the basic bodily responses and sensations of that emotion. Indeed, Niedenthal, Winkielman and their colleagues have generated compelling data on this possibility. Participants in one study were given lists of words related to three different emotions – anger, joy, and disgust – and were asked to determine whether the word related to one of the three emotion categories (Halberstadt, Winkielman, Niedenthal, & Dalle, 2009). For example, a participant could be presented with the word "vomit" or "sun" or "fight" and asked to determine which of the three emotion categories the word belonged to (i.e., anger, joy, or disgust). This simple conceptual judgment caused participant's to move their facial muscles into the corresponding emotional expressions. Categorizing words like "fight" as part of the anger category activated the corrugator muscles that furrow the eyebrows. Categorizing words such as "sun" as relevant to joy activated the zygomaticus major muscle that pulls the lip corners up and the orbicularis oculi muscle surrounding the eyes. Finally, categorizing words like "vomit" as related to disgust led to the activation of the levator muscle that pulls the upper lip upwards. These findings suggest that when we classify stimuli into one emotion category or another, emotion-related bodily responses are engaged.

Moreover, various somatosensory components of emotion causally influence wide-ranging cognitive activities, including attitudes, memory, information-processing and decision-making (Niedenthal, 2007). A basic finding in this literature is that merely contorting facial muscles into an emotional expression can change the way individuals categorize other facial expressions, identify emotion-related concepts, recall emotional memories, and judge social objects (Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005).

Early work on embodiment examined the way the bodily correlates of mood states figure in judgment (e.g., Strack, Martin, & Stepper, 1988; Tom, Pettersen, Lau & Burton, 1991). The goal was to test how engaging embodied elements associated with general positive or negative affective states, like smiling or frowning, would influence social evaluations. One important finding is that cognition shifts to align with the valence of the embodied affect. Several studies have used a clever smile manipulation to demonstrate that smiling alone can improve attitudes toward objects and people. In this manipulation, participants are either unknowingly induced to smile by holding a pen with their teeth, or they are prevented from smiling by holding a pen in their lips. Using this manipulation, it has been shown that smiling causes people to find cartoons more humorous (Strack et al., 1988). In other studies, smiling while viewing photographs of unfamiliar Black individuals subsequently reduced implicit bias against Blacks (Ito, Chiao, Devine, Lorig, & Cacioppo, 2006). Smiling while performing a facial-expression recognition task biased participants to judge mixed or ambiguous facial expressions as happiness (Blaesi & Wilson, 2010).

Similar results have been obtained in research on the "somatic marker hypothesis," which concerns links between value judgments and affect-relevant autonomic reactions (e.g., Bechera, Damasio, Tranel, & Damasio, 1997; Carter & Pasqualini, 2004; Damasio, 1994). One could

think about somatic markers as body-based emotional intuitions that guide behavior and decision-making. According to this work, physiological markers of negative emotional arousal, such as spikes in skin conductance, can intuitively signal the positive or negative value of events. For instance, participants in lab studies are led to play a gambling card game, the Iowa Gambling task. In this game, the participant is presented with four decks of cards. Each card indicates either a reward such as winning $5 or a penalty such as losing $5. The participant's task is to select cards from the decks and try to win as much money as possible. However, the decks have been rigged. The first few cards of all four decks carry a reward, but after that the decks begin to diverge in their outcomes. Some decks carry large rewards but even larger losses. These are "risky decks," and sampling from them is ultimately disadvantageous because it eventually results in a net loss. Other decks carry small rewards but even smaller losses; these decks are less risky and ultimately favorable because continued sampling from these decks eventually leads to a net gain. Participants play while skin conductance (a marker of sympathetic nervous system arousal) is monitored. The results of these studies show that some people start to exhibit higher skin conductance just before sampling from the risky decks after they have initially encountered a few big losses from the risky decks. Without realizing it, these individuals had developed hunches that the decks were disadvantageous, and began to avoid them and gamble successfully. However, people who lack the anticipatory skin conductance responses to risky decks—for example, people with damage to the ventromedial prefrontal cortex—kept sampling the risky decks and incurred losses (Bechara, Damasio, & Damasio, 2000; Bechera et al., 1997; Carter & Pasqualini, 2004).

Embodiment of Distinct Emotions

Beyond diffuse affective states, embodiment effects play a role in the impact of distinct emotions on social cognitive processes. When people are induced to display a bodily component of a distinct emotion, even nonconsciously, they shift toward perceiving the social world as if subjectively experiencing the emotion. For example, Keltner and colleagues wondered whether merely moving facial muscles into the prototypical expression of anger would increase the tendency to attribute life events to human agency rather than situational forces—a causal attribution pattern that emerges when individuals feel angry (Keltner et al., 1993). This is exactly what they found. Relative to individuals led to configure their muscles into the expression of sadness, individuals led to express anger in the face began to view events, such as problems and successes they would encounter in their future careers, as controlled by the actions of humans rather than impersonal factors.

A similarly motivated study tested embodiment effects of the self-conscious emotions of pride and shame on feelings of personal achievement (Stepper & Strack, 1993). First, participants were subtly manipulated to either sit in an upright "proud" or a slumped over posture more indicative of shame. All participants then received positive feedback on a test they had recently taken. As would be anticipated by embodiment theories, participants with a more upright posture felt prouder of their test performance than participants with the slumped posture.

Finally, a series of embodiment studies show that judgments of morality may be influenced by the physical manifestations of emotions. The close link between the body and morality is represented in metaphorical language, such as when people speak of having a "gut feeling" that something is wrong or bad. Schnall and colleagues have greatly advanced this literature in their studies of disgust's impact on condemnation of immoral actions (Schnall, Benton, & Harvey, 2009; Schnall et al., 2008). For instance, participants in their studies who

were induced to feel disgust by watching repulsive film clips or smelling noxious odors went on to more harshly criticize immoral behaviors described in hypothetical stories than non-disgusted participants. However, these effects were most likely to occur among individuals who were highly attuned to the physical sensations in their bodies, suggesting that the bodily sensations of disgust are involved in shifting moral judgments (Schnall et al., 2008). Moreover, related research shows that participants induced to feel disgusted were less likely to become morally critical if they engaged in an embodied action designed to cleanse and eliminate disgust agents—washing one's hands (Schnall et al., 2009; see also Zhong & Liljenquist, 2006).

Altogether, embodiment findings highlight an important theoretical argument. The embodied elements of emotions—facial or skeletal muscle movements, activation in peripheral physiology and the neuroendocrine system—prepare the individual to meet environmental demands by shifting cognition, social perception and judgment.

Identity and the Interface of Cognition and Emotion

In our review thus far we have seen that, far from being antagonistic forces, emotional processes and cognitive processes are deeply intertwined. Specific appraisals give rise to emotional responses, which are shaped in important ways by ensuing cognitive processes such as emotion labeling and narrative representation. And emotions, both at the trait and state level, shape every imaginable cognitive process, from basic perceptual attention to higher-order moral judgments and prejudicial responses to outgroups. The study of the interaction between cognition and emotion is really the study of how an individual systematically makes sense of the social world.

In this closing section, we become more speculative, drawing upon the literatures we have reviewed to consider how cognition-emotion interactions are core processes at the heart of

an individual's identity. Theorizing about childhood temperament and adult personality has long presupposed this (Malatesta, 1990). Arguments about emotion and gender identity likewise have focused on how socialization processes that target emotion – parent communication practices, stereotypes, cultural images, and texts – help to create gender-based profiles in the way children and adults construct, experience, perceive, and represent emotions. Building upon these arguments, we consider in this closing section how cognition-emotion interactions are central to two social identities – political identity and class identity.

Emotion and Political Identity

The notion that self-images are constructed through the interplay of cognition and emotion has implications for the study of identities that stem from political attitudes. Some recent work suggests that conservative political identity is strongly tied to the emotion of fear. In their analysis of research on the motivational underpinnings of political conservatism, Jost and colleagues found that fear and anxiety about death, loss, and threat predicts greater conservatism (Jost, Glaser, Kruglanski, & Sulloway, 2003). One longitudinal study found that nursery school children who were described by their teachers as fearful and uncomfortable with uncertainty were more likely to identify as politically conservative twenty years later as young adults (Block & Block, 2006). Similarly, children's fearfulness (as rated by their mothers) at 4-5 years old predicted more conservative attitudes at eighteen years of age (Fraley, Griffin, Belsky, & Roisman, 2012). In another study, fear-related physiological responses responses to fearful stimuli—for example, increased heart rate or sweaty palms—were shown to covary with the greater endorsement of conservative political attitudes (Oxley, Smith, Alford, Hibbing, & Miller, 2008). Participants who endorsed more conservative beliefs supporting military spending,

warrantless searches, and opposition to immigration showed stronger skin conductance responses when viewing threatening images of spiders or weapons.

Plausibly, political conservatism is operating in part as a fear management mechanism. The stability afforded by more conservative policies—namely, policies that tend to preserve the existing social and economic order and resist change—help to reduce uncertainty and threat.

The data on emotion and political identity to date is quite limited but growing, as these studies suggest. It is likely that the emotional portraits of both liberals and conservatives will prove to be complex and nuanced. They are likely to contain positive as well as negative emotions, and to be embedded in people's identities or images of themselves. Researchers have started to explore links between conservatism, liberalism, and other emotions such as anger, disgust, and sadness (e.g., Inbar et al., 2008; Small & Lerner, 2008), as well as the role that emotions play in shaping political decisions. For instance, some have argued that liberals are more likely than conservatives to be inappropriately swayed by emotional content when making helping decisions (see Tetlock & Mitchell, 1993). Finally, people may maintain emotional ties to their political identities. The large literature on social identity threat suggest that threats to a political identity—perhaps subjecting a self-proclaimed liberal to evidence of his conservative attitudes—would have critical emotional and behavioral consequences (e.g., Ellemers, Spears, & Doosje, 2002). These and related topics deserve more empirical attention.

Emotion and Social Class Identity

The idea that emotions contribute to identity also finds expression in the developing literature on the psychology of social class. Social class, which can viewed as a cultural identity, is defined in part by objective resources (income, level of education, occupational prestige) and

in part by perceptions of class status in relation to others (Kraus, Piff, & Keltner, 2012). Due to lower rank and limited material resources, the lives of lower-class individuals are inherently more stressful, less predictable, and less controllable. Life outcomes tend to be determined by forces outside of one's control. For instance, one's employment is likely to be a subordinate rather than a supervisory position. By contrast, the lives of upper-class individuals allow for increased autonomy and individual control. Members of the middle class, for instance, are more likely to hold supervisory jobs that entail greater power over others, and greater autonomy and complexity (Lachman & Weaver, 1998).

Pervasive social and economic disparities contribute to observable class-based differences in emotional and cognitive processes. As a result of decreased control and predictability, lower-class individuals are highly vigilant to threats (Chen & Matthews, 2001; Gallo & Matthews, 2003), but are also more interdependent and communal than their upper-class counterparts (Piff, Kraus, & Keltner, 2010). They pay greater attention to the social context, become more engaged in social interactions, and show greater concern for the welfare of others (e.g., Kraus & Keltner, 2009; Kraus et al., in press; Lareau, 2003; Snibbe & Markus, 2005). Upper-class individuals, on the other hand, tend to have highly independent self-construals, are less attuned to contextual cues and social interaction partners, and under some circumstances are less inclined to engage in prosocial behavior.

Of interest to the present review, recent studies demonstrate that emotional-cognitive processes vary along class lines, giving shape to social perceptions and flowing into self-image. One area of inquiry pertains to class differences in empathic accuracy, or the ability to infer others' emotions (Ickes, 1993). In general, lower-ranking individuals attend more to social cues and are more reliant on others' emotions (e.g., Guinote & Vescio, 2010). Extending this work,

studies by Kraus and colleagues have shown that individuals from lower-class backgrounds are able to detect and read others' emotions more accurately than their upper-class counterparts, whether the emotion is portrayed in static photos or in spontaneous interactions with a stranger (Kraus, Cote, & Keltner, 2010). Consistent with these results, other studies find that lower-class individuals more readily detect others' hostile emotions (Kraus, Horberg, Goetz, & Keltner, 2011, Study 1). These findings suggest that one important dimension of a social class identity is empathic connection to others.

A second area of inquiry concerns the link between social class and experiencing self-conscious emotions. Self-evaluative emotions like pride and shame function as indicators of status: They signal high or low social worth to the self and others. For instance, participants were more likely to believe that an individual occupied a higher-status position—company boss rather than employee—when the individual was described as reacting to a positive event with pride rather than gratitude (Tiedens et al., 2000). Participants in another study were more likely automatically to pair high-status words with a target male when the target posed pride, relative to other positive and negative emotions (Shariff & Tracy, 2009). As such, one plausible theory is that upper- and lower-class individuals differ in their absolute levels of self-evaluative emotional experiences. More specifically, individuals from higher social classes would be predicted to experience greater pride and less shame overall, relative to individuals from lower social classes. However, a meta-analysis of these studies revealed only a small positive correlation between self-esteem and indicators of socioeconomic status (Twenge & Campbell, 2002), suggesting that the relationship between class and self-conscious emotional experience is more complex. Future researchers would do well to explore the emotional correlates of social class further, and determine how these emotion profiles may figure in other dimensions of the class identity.

Concluding Remarks

For 2500 years, a prevailing view of the human psyche is that emotion and cognition, or passion and reason, are separate and antagonistic forces, vying for control of human action. The new science of cognition-emotion interactions will disabuse a serious reader of this simplistic view of human nature. Cognitive processes systematically give rise to and shape human emotional responses. These emotions in turn shape cognitive processes in a profound, systematic, and generally adaptive fashion. Cognition-emotion interactions are part of how an individual adapts to his or her social environment, and ultimately, builds a rich and meaningful social life.

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Table 1: Linkages Between Emotions and Socio-moral Concerns

Emotion	**Sociomoral Concern**
Disgust	Purity of body and mind
Anger	Justice, rights, autonomy
Contempt	Community role, duty
Compassion	Harm/care, weakness, need
Pride	Hierarchy, status, merit
Guilt	Own transgression
Shame	Own characterological flaw
Gratitude	Reciprocity
Awe, Elevation	Other's virtue