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Cognition in Emotion: Always, Sometimes, or Never?

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A not uncommon reaction to claims about the role of cognition in emotions is to agree with the proverbial farmer, who, when asked for directions to the city, replied "You can't get there from here." Certainly, emotions have many characteristics that seem to justify skepticism about any involvement of cognition in them. For example, the fact that we can be surprised by our own emotions suggests that we sometimes have little insight into them, and the fact that emotions occur automatically suggests that we have little control over them. We cannot, for instance, simply decide to feel an emotion the way we can decide to think about one. Furthermore, it is not unusual for people to report emotional reactions that conflict with cognitive ones. For example, in a vivid account of his struggle with anxiety and depression, one author (Solomon, 1998) recalls lying frozen in bed, crying because he was too frightened to take a shower while at the same time knowing full well that showers are not scary. One of our goals in this chapter is to examine the implications of such observations for the idea that emotions always involve cognitive appraisal processes; we argue that a cognitive account of emotion has implications that are both more fundamental and less restrictive than the skeptical view that emotions do not necessarily involve cognition seems to imply.

We take as our starting point the idea that an emotion is one of a large set of differentiated biologically based complex conditions that are about something. Emotions in humans are normally characterized by the presence of four major components: a cognitive component, a motivational–behavioral component, a somatic component, and a subjective–experiential component. The cognitive component is the representation of the emotional meaning or personal significance of some emotionally relevant aspect(s) of the person's perceived world. These representations may be conscious or nonconscious. The motivational-behavioral component is concerned with inclinations to act on the construals of the world that these representations represent, and with their relation to what is actually done. The somatic component involves the activation of the autonomic and central nervous systems with their visceral and musculoskeletal effects. One feature of this component is changes in body-centered feelings (Damasio, 1994), but in addition a whole

range of neurochemical and neuroanatomical processes are needed to make emotions possible. Finally, the subjective–experiential component is the total "subjective feeling" part of an emotion. We assume that this component is particularly elaborate in humans, that it frequently involves efforts to label the emotions, and that it typically involves an awareness of what is often an integrated whole of feelings, beliefs, desires, and bodily sensations. There is much more that we could say about what an emotion is, especially when we consider how these components interact and when we consider questions of the intensity and duration of emotions (e.g., Frijda et al., 1992). But this characterization is sufficient for our purposes here, and we suspect that most emotion theorists would not object too strongly to what we have proposed.

Not surprisingly, cognitive accounts of emotion, while certainly not denying the existence or importance of the other components, focus on the cognitive component—that is, on appraisal and appraisal processes. The central claim of such accounts is simply that emotions depend on the perceived meaning or significance of situations (Mandler, 1984), and indeed, "appraisal" simply refers to the assignment of value or emotional meaning. But, as we shall see, cognitive views need not be limited with respect to exactly how that appraisal is generated, and one of the two main themes of this chapter is that there are two fundamentally different ways in which this can happen.

Unlike sensory experiences, experiences of emotion do not represent physical features of the world, and there are no sensory receptors for emotional value. Hence, emotions require cognitive processes sufficient to generate or retrieve preferences (Zajonc, 1998) or evaluative meaning (Mandler, 1984). But no matter how modest the claim that emotions have cognitive constituents may be, it immediately confronts two problems. One concerns whether cognitive claims are testable—that is, whether they are conceptual (simply definitional) or empirical. The other has to do with how a cognitive view can handle instances in which affective feelings precede appraisals. We consider these preliminary questions before moving to our two main themes: the sources of appraisals and challenges to the cognitive view—challenges such as those posed by episodes or aspects of emotions that are unreasonable, unexpected, unconscious, uncontrollable, or linguistically inexpressible.

Definitional Issues

Some authors (e.g., Parkinson, 1997; Smedslund, 1991) have argued that the kinds of accounts of the cognitive constituents of emotions typically specified in appraisal theories are not testable. For example, in our work (Ortony et al., 1988), we characterized one emotion as "displeasure at the prospect of an undesirable event," arguing that a class of emotions that we call "fear emotions" has this appraisal as a constituent. It is true that our assertion that fear emotions arise by appraising a particular outcome as an undesirable possibility is an assumption as much as a hypothesis; if all the components of fear were present except that appraisal, we would be likely to say that it was not a proper example of fear. Yet, our claims about the eliciting conditions of fear are not vacuous. They relate to the ways we talk about emotions in everyday language, and they conform to people's

experiences of emotions. Moreover, making appraisals conceptually necessary does not make the claim that emotions involve such appraisals any less consequential. Consider in this regard the concept "disease." Particular diseases are defined as conditions in which particular symptoms are caused by particular pathogens. There too, the symptoms without the relevant pathogen simply do not constitute a proper example of the disease. But the conceptual truth is still highly useful, in part because measures to alleviate the disease can target the pathogen that both defines and causes the disease. In a similar manner, measures to alleviate emotional distress can target the particular pattern of appraisal that constitutes that emotion.

We suggest that emotions are both (conceptually) defined by appraisals and (empirically) constituted by them. However, definitions of complex phenomena like emotions and black holes are subject to revision in light of new empirical data. For example, if one argued that blame was part of the definition of anger, but studies found no evidence of blame in what most people called anger, we would be wise to conclude that the definition was inadequate. The problem is that whereas the meanings of words can be specified in definitions, the same cannot be done with phenomena. The "meaning" of a phenomenon is given in theories and explanations, not definitions. If one grants these assertions, then a coherent approach to the tougher question about the meanings of terms that refer to complex phenomena becomes clearer. The meanings of terms that refer to phenomena such as emotions and black holes also cannot be given in definitions, except to say that the terms "emotions" and "black holes" refer to the phenomena encompassed by theories of emotions and black holes. This turns out to be acceptable because over time we engage in scientific negotiation (see, e.g., Boyd, 1993) about the boundaries of such phenomena (and hence the meanings of terms referring to them), and through this process the relative conceptual benefits of alternative accounts become elaborated.

The Emotion–Nonemotion Boundary

Definitional issues of the kind we have just discussed are particularly important if there really are cases of affective states that have no cognitive bases. For example, depression and chronic anxiety can presumably have purely biochemical causes, so that depressed and anxious feelings can occur without any cognitive appraisals. How does a cognitive view explain such instances? Must one assume that chronic anxiety is caused by constant thoughts about threat? Not necessarily; the claim that emotions have crucial cognitive constituents is not a claim about all affective feelings, but only a claim about emotions, and as we have demonstrated elsewhere (Clore et al., 1987; Ortony et al., 1987), not all affective states qualify as emotions.

In our definition of emotions, we noted that emotions are about something. By this we mean that they are affective (i.e., positively or negatively valenced) states that have objects (what philosophers call "intentional" states), which is why not every occurrence of an affective feeling constitutes an emotion. For example, to the extent that "fear" refers to an affective state directed toward a specific object, it qualifies as an emotion, and to the extent that "anxiety" refers to an affective state without an object, it does not qualify as an emotion. Thus, when one is afraid, the fear is crucially about something in particular, but when one feels anxious, the

anxiety is not focally about anything in particular. From a biological perspective it may not matter whether a particular activation of the fear system is an emotion or a mood. But from a psychological perspective the distinction is of central importance because emotions have implications for coping that moods do not. Moods are simply feeling states, which can arise from completely physiological causes. Anxiety may feel like fear, but the information it conveys is not necessarily feedback about the current situation (Clore, 1994a).

It is important to realize, however, that moods and other objectless affective states can readily be transformed into emotions. The conversion of free-floating feelings of anxiety into an object-focused emotion of fear is illustrated by a story about a man whose obsessional concerns appear to have been driven by chronic feelings of anxiety. After the birth of his first child, this man was often concerned about his child's safety. He started worrying that when he got a little older his child might one day climb onto the garage roof, fall off the roof, and injure himself on a stone bench below. The man became so plagued by this threatening thought that he eventually hired workmen to break up the bench with sledge hammers and cart away the rubble.

Presumably, this man's free-floating feelings of anxiety guided him to his threat-filled interpretations of this and other ambiguous situations. But from a cognitive perspective, there is an important difference between the free-floating anxiety and his threat-filled perceptions, because whereas the new feelings generated by these perceptions may have been biologically indistinguishable from the free-floating anxiety that preceded them, the new feelings, having an object, both qualified as and functioned as emotions.

A specific explanation of how such preexisting affective feelings influence appraisal processes in this way is offered by the affect-as-information hypothesis (Clore, 1992; Schwarz & Clore, 1983, 1988, 1996). The hypothesis assumes that people tend to experience their affective feelings as reactions to whatever happens to be in focus at the time. As a result, chronic feelings that are present incidentally during judgment and decision making are likely to be experienced as feedback about the object of judgment or the decision alternative under consideration. This is illustrated in recent research that found that anxious feelings experienced during a risk estimation task increased the perceived likelihood of threatening events (Gasper & Clore, 1998). Hence, anxious persons may become afraid when their anxious feelings are taken as information that a threatening event is imminent.

Before leaving this topic, we note one problematic consequence of the process we have been discussing. Because they have objects, emotions motivate problem-focused coping. In the case of mildly anxious individuals, this may simply result in a tendency to worry and to display a careful personal style. But chronically anxious or depressed persons may vainly try to cope with an inexhaustible supply of plausible threats about which their feelings may seem to provide information. Moreover, failed efforts to exercise control over their affective outcomes may result in learned helplessness, a concept first used to explain the loss of motivation shown by laboratory animals that had learned they had no control over aversive experiences (Seligman & Maier, 1967). This line of research subsequently stimulated a large literature on the role of learned helplessness in causing depression (e.g., Alloy & Abrahamson, 1979). However, in this instance we are suggesting that

depressed feelings may be a cause of learned helplessness and its consequent loss of coping motivation rather than solely a consequence of it.

In summary, we have argued that the definitions of terms referring to complex phenomena such as emotions inevitably implicate theories of the phenomena. Hence, in spite of criticisms to the contrary, the tenets of appraisal theories are empirical as well as definitional. We have also argued that it is not incumbent on cognitive theories of emotions to explain affective states that are not in fact emotions (see also Ortony et al., 1987). In particular, we do not need to worry about cases in which affective feelings precede cognitive appraisals. In agreement with previous treatments of emotion (e.g., Averill, 1980; Frijda, 1986), we take emotions to be affective states with objects. If one distinguishes emotions from other affective states in this way then, according to the affect-as-information hypothesis (Schwarz & Clore, 1983), the affective feelings from noncognitive sources can provide information for appraisal processes which result in genuine emotions.

Overview

The remainder of this chapter deals with how cognitive approaches can respond to challenges such as that emotions can surprise us, that they can conflict with our beliefs, be elicited by stimuli outside of awareness, and be outside of our control. To consider these questions, we shall start by briefly sketching our own account of cognition in emotion. We shall then discuss a class of cases in which emotions are reinstated rather than computed anew and discuss how these two forms of emotion generation relate to two kinds of categorization (prototype and theory based) and two forms of reasoning (associative and rule based). We then go on to show how the two routes to emotional appraisal may serve different behavioral functions (speed and flexibility). In spite of these differences, we shall demonstrate how, in the last analysis, cognition is always involved. This is true in cases of unconscious affect elicitation, which differs from conscious affect elicitation only insofar as the former is deprived of the episodic constraints on emotional meaning. It is also true for automated, conditioned, imitated, and reinstated emotions, all of which are simply manifestations of reinstated appraisals. We then discuss the often nonpropositional relation between appraisals on the one hand and motivation and behavior on the other, a relation which we think is representable linguistically as connotative meaning, before ending by summarizing our main points in 10 proposals about emotion elicitation. By way of preview, the 10 proposals are as follows:

1. Appraisals are constituents of, and therefore also necessary conditions for, emotions.
2. Emotions are affective states with objects.
3. There are two routes to emotional appraisal (reinstatement and computation).
4. These forms of appraisal parallel two kinds of categorization (prototype and theory based).
5. The two routes to emotional appraisal and the two kinds of categorization are governed by two forms of reasoning (associative and rule based).

6. The two routes to emotional appraisal or categorization may serve different behavioral functions (preparedness and flexibility).
7. The fact that some components of an emotion can be triggered before full awareness of its cause does not conflict with a cognitive view.
8. Unconscious and conscious affect elicitation differ only in the episodic constraints on emotional meaning.
9. Automated, conditioned, imitated, and reinstated emotions are all manifestations of reinstated appraisals.
10. The experiential and motivational/behavioral manifestations of appraisals, while difficult to describe in language, can be communicated through connotative meaning.

Two Routes to Appraisal

The Bottom-up Route: Situational Analysis

We start our discussion by describing the basic notion underlying appraisal theories of emotion, using our own account (Ortony et al., 1988) as the primary example. Recognizing that the terms "bottom-up" and "top-down" are relative, we can think of appraisal models as bottom-up models in the sense that the appraisals are built by assembling interpretations of data from the perceived world. According to such theories (e.g., Arnold, 1960; Lazarus, 1966; Mandler, 1984; Ortony et al., 1988; Roseman, 1984; Scherer, 1984; Smith & Ellsworth, 1985), people are continually appraising situations for personal relevance. This process involves an on-line computation of whether situations are or are likely to be good or bad for us, and, if so, in what way. For example, in a diary study of emotion that we conducted with Terence J. Turner several years ago, a young woman reported becoming angry when she learned that a friend of hers had been stealing and reselling books from a bookstore where he worked.

Analyzing that situation in terms of our model, we would say that the young woman experienced feelings of disapproval when she perceived her friend's behavior as violating an important standard. In addition, her description of the event made it clear that she was also displeased at the event because her goal of maintaining the friendship had been threatened. We would expect such perceptions to result in anger because our view is that angerlike emotions are elicited when disapproval of the action of a person (because of violated standards) is combined with being displeased at the outcome of that event (because of thwarted goals).

Our account postulates three kinds of value structures underlying perceptions of goodness and badness: goals, standards, and attitudes. Specifically, we have proposed that the outcomes of events are appraised in terms of their desirability as a function of whether they are seen as promoting or thwarting one's goals and desires. Standards, on the other hand, are relevant to appraisals of actions rather than events. Actions are appraised in terms of their praiseworthiness (or blameworthiness) depending on whether they exceed or fall short of moral, social, or behavioral standards and norms. Finally, attitudes (along with tastes) provide the basis for evaluating objects. Anything, when viewed as an object, may be experienced

as appealing or unappealing, depending on whether its attributes are compatible or incompatible with one's taste and attitudes. The overall structural organization of these three sources of affect, their combinations, and the emotions based on them are illustrated in figure 3.1.

In this account, different sources of value give rise to different kinds of affective reactions. Thus, when goals are the source, one may feel pleased at outcomes that are appraised as desirable and displeased at outcomes that are appraised as undesirable. When standards are the source of value, affective reactions of approval or disapproval arise, depending on whether actions are appraised as praiseworthy or blameworthy. And when attitudes or tastes are the source of value, one likes objects (broadly construed) that are appealing and dislikes objects that are unappealing. Specific emotions are then differentiations of one or more of these three classes of affective reactions. The ways of being pleased or displeased about the outcome of events include emotions that we usually call joy, sadness, hope, fear,

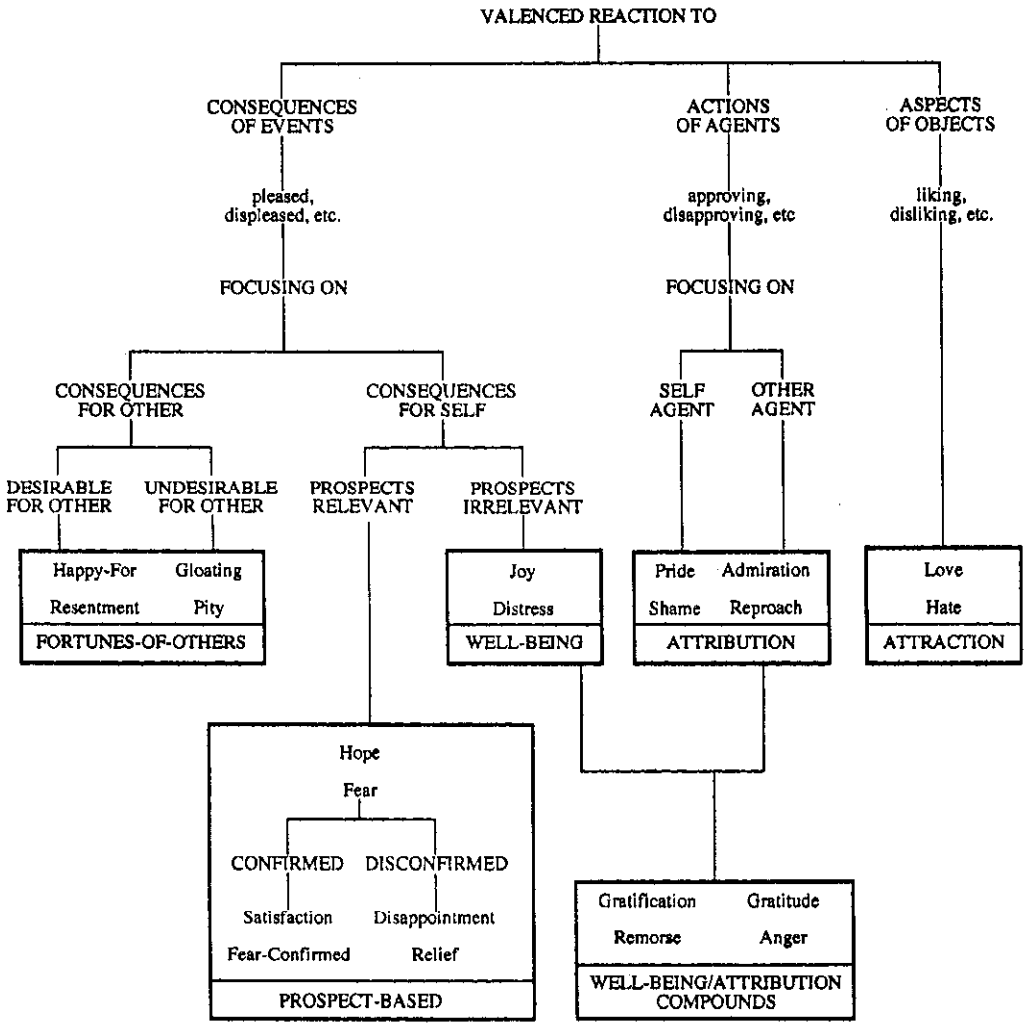

Figure 3.1. Global structure of emotion types.

disappointment, relief, gloating, and pity. Which specific emotion arises depends on whether the outcomes are past (joy, sadness) or prospective (hope, fear), and whether they concern one's own outcomes or those of another (gloating, pity). For example, a participant in one of our studies reported the goal-related emotions of fear and worry when his parents considered divorce. In this analysis, the need for security and the desire for maintaining his family would be treated as goals, threats to which, whether explicitly available to consciousness or not, produced fear.

In contrast, some emotions are based on standards rather than on goals. Pride, shame, admiration, and reproach are forms of affective reactions of approval and disapproval of someone's actions. The specific emotion depends on whether the action is one's own (pride, shame) or someone else's (admiration, reproach). For example, a different participant in our study reported the emotion of shame when he lost bladder control after drinking too much at a party. His shame is seen as a reaction to violating social standards of appropriate behavior in public.

Other emotions are based on attitudes or tastes. Emotions such as momentary (as opposed to dispositional) love, hate, and disgust are forms of the affective reactions of liking and disliking. The question of how tastes and preferences develop is a difficult one, but clearly even in this domain cognition plays a role. People's liking for food, for example, can be significantly affected by their beliefs about what it is they are eating. The sour pickle that might be so appealing with a hot dog can be quite disgusting if its taste appears when one is expecting strawberry ice cream. In other words, even something as rudimentary as whether or not we will react toward something with disgust can depend on our beliefs and expectations—paradigmatic examples of cognitions.[1] Finally, in addition to emotions based on goals, standards, or attitudes alone, some, like anger and gratitude, involve a joint focus on both goals and standards at the same time. For example, one's level of anger depends on how undesirable the outcomes of events are and how blameworthy the related actions are.

In any given situation the emotions experienced should vary as one's focus shifts among the outcomes, actions, and objects involved, so that the same event might make one feel many different emotions in a short space of time. Within this cognitive approach, each emotion type is characterized by a formal emotion specification. For example, emotions of the fear type involve being displeased at the prospect of an undesirable event. Emotions of the shame type involve disapproving of one's own blameworthy action, and emotions such as disgust involve disliking an unappealing object. The account gives such specifications for 22 common emotion types along with proposals for what cognitive variables influence the intensity of each type. For example, the perceived likelihood of an undesirable (or desirable) event is one of several cognitive variables that influences the intensity of fear (or hopefulness), whereas the degree to which one perceives oneself as having fallen short of normal expectations about one's achievements influences the intensity of shame emotions. Thus, for instance, basketball fans reported fear and concern when their team was trailing in the last five minutes of a game, whereas reports of embarrassment were saved for games in which the level of play failed to meet acceptable standards (Ortony, 1990).

It is interesting to note that this same kind of general analysis should hold for emotions in nonhuman species. It may not be unreasonable to apply such reasoning

to the difference between the hang-dog expression of the family dog when he does not get to go in the car and his angry growl when someone reaches for the bone in his mouth. The former reflects a disappointmentlike state fueled by loss of an expected goal, whereas the latter appears to reflect violation of a canine standard of behavior to the effect that food (or anything else) in a dog's mouth is the rightful property of that animal, regardless of his position in the dominance hierarchy (Coren, 1994). However, as one descends the phylogenetic scale, there are limitations on the ability to interpret situations, limitations on the ability to make use of feedback from subjective experience, and limitations on the ability to respond in a flexible manner. At some point the emotion circuits simply activate fixed action patterns, and many of the cognitively mediated processes that make human emotion interesting are no longer present. Thus, although strong biological commonalities may justify the study of certain aspects of emotional processing in any mammal, it is surely not the case that all of the basic questions about emotions can be answered using animal models. For this reason, we think it is important that the scientific study of emotions not be too restricted in scope (as may happen if one investigates only emotion-related behaviors) or too restricted in range (as may happen if one investigates only the emotional reactions of lower animals). A proper account of emotions needs to do justice to the full richness and range of emotions that comprise human emotional life.

Finally, the claim that emotions have cognitive constituents does not mean that emotions are themselves cognitive events. In this regard, Reisenzein (1998) suggests that emotions are meta-cognitive or, as he says, "meta-representational." He proposes that emotion is not a reaction to a cognitive outcome of appraisal processes, but a noncognitive form of the appraisal. Rather than appraisals leading to beliefs about a situation, which then trigger emotions, the appraisals lead directly to both emotions and beliefs as alternative ways of representing the significance of the situation. Thus, emotions have cognitive constituents in the sense that appraisals are transformations of raw sensory input into psychological representations of emotional significance. However, the emotions are multifaceted, involving the simultaneous representation of emotional significance physiologically and experientially, as well as cognitively.

The Top-down Route: Appraisal Reinstatement

Not all situations seem amenable to the kind of bottom-up cognitive analysis we have just presented. Consider the case of a Vietnam veteran who reported being overcome by panic one day while working in a greenhouse. Apparently, the heat, humidity, and tropical foliage in the greenhouse triggered traumatic reactions he had felt during the war (H. Gorini, personal communication, 12 September, 1990). In such reactions, unremarkable fragments of a current experience vividly reactivate earlier experiences together with their emotional significance. The reactions surely feel strange and surprising when they first occur, and might therefore seem to provide a challenge to a cognitive account.

A similar challenge comes from experiments on emotion in which the experimental stimuli are inherently positive or negative for a given species—pictures of smiling or angry faces for human subjects, and rubber snakes for chimpanzees

(Öhman, this volume). How can a cognitive account of emotions of the sort outlined in the last section explain the efficacy of such emotionally preloaded elicitors? Surely, they require little if any cognitive analysis? They seem so different from cases in which an emotional value is computed on-line, cases that yield easily to a cognitive account. And indeed, they are different. In fact, they suggest a second source of emotional value, namely, reinstatements of prior appraisals from earlier situations, rather than the on-line appraisals of new situations in terms of current goals, standards, and attitudes. Both of these sources of emotional value were anticipated in Arnold's (1960) original treatment of appraisal, in which she proposed that new situations are often evaluated in terms of similar past experiences, as in the case of the veteran in the greenhouse.

Our response to such challenges is to show that emotions reflect cognitive appraisals with respect to the goals and concerns of the emoting individual, not only in straightforward examples of appraisal and emotion, but also in examples such as that of the fearful veteran. Fear is a reaction to appraisals of threat, and the fact that the veteran's appraisal of the greenhouse as a threat was unconscious, was pathetically mistaken, and was based on only superficial similarities to a past threat are not inconsistent with that presumption. It is still the case that a particular emotion arose when a situation took on a particular meaning. Whether emotions arise from similarity to a past situation or from a new analysis, our view is that what triggers emotion is activation of a deep structure of situational meaning. It is particular meanings that make situations occasions for anger, fear, shame, or grief. However, such meanings may arise in more than one way, and reinstatement is one of them.

- The Precedent for Reinstatement

Freud is perhaps the best example of a theorist concerned with how emotional meanings in everyday life can be traced to their origins in prior experience. He focused on how one traumatic situation can generate many subsequent instances of emotion through association, including poetic, metaphoric, and symbolic associations that are often apparent only in dreams, poetry, and humor. Though often impressing readers as bizarre, Freud's theory is interesting in the current context because it is the most thorough-going statement of a reinstatement model of emotion elicitation. Freud believed that specific emotions are rooted in pivotal traumatic situations in the experience of the child, including the birth trauma, the Oedipal situation, and so on. For example, while believing (like many after him) that anxiety is a reaction to being overwhelmed by stimuli, Freud felt the need to explain anxiety on the basis of some original experience of being overwhelmed. He concluded that, "The act of birth is the first experience of anxiety, and thus the source and prototype of the affect of anxiety" (Freud, 1900/1953).

Freud assumed that other early emotions also reoccur in analogous situations later in life. Reactions to a powerful father, for example, serve as a prototype for subsequent reactions to other authority figures. And early experiences of ambivalence toward parents and siblings were believed to transfer "to authorities, colleagues, subordinates, loved ones, friends, gods, demons, heroes, and scapegoats" (Smelser, 1998, p. 8). This theme of emotional reinstatement is also found in Freud's conception of moral emotions, with respect to which, he claimed, for ex-

ample, that experiences of shame and modesty in women originate in the shame they experience as little girls when viewing their genitalia and realizing their inadequacy in comparison to the genitalia of their brothers!

Freud was obsessed with the idea that current situations could derive emotional power from symbolic connections with earlier events. For instance, falling in love—the most frequently mentioned emotion in our subjects' accounts—was for Freud a reinstatement of earlier attachments triggered by an unconscious association between the image of the parent and an exciting new person. And the jealousy, hostility, and ambivalence that sometimes emerge in loving relationships he viewed as evidence of poorly resolved conflicts with parents. Psychotherapy was intended to uncover such unconscious relationship conflicts in order to resolve them in a current relationship with a symbolic authority figure in the form of the analyst.

The idea that pivotal emotional reactions early in life form the basis of later emotions, especially in love and attachment, is also central to infant attachment theory (Bowlby, 1969). For example, Morgan and Shaver (in press, p. 1) claim that "it is impossible to understand commitments to romantic relationships unless one considers how the attachment system affects the process of falling in love and choosing a mate." They contrast cost–benefit models of relationships (Rusbult, 1980, 1983) with models based on attachment. Bowlby's theory posits an evolved tendency for infants to develop a strong bond or attachment to their primary caregiver, a bond that may be evident in vigorous emotional protests when children are separated from the caregiver.

Bowlby's ideas were amplified by Ainsworth (e.g., Ainsworth et al., 1978), who identified stable individual differences in patterns of infantile attachment. The three most studied of these are referred to as "secure," "avoidant," and "anxious." What is interesting from the current perspective is the idea that these individual differences in the emotions of attachment remain intact and are therefore ready to be reinstated in adult romantic attachments (for a review, see Shaver & Clark, 1994). The emotions associated with romantic involvement are seen as reinstated emotions occasioned by this reproduction of the original attachment situation.

The central point about the reinstatement view is not the obvious point that people learn from their prior experiences, but the idea that a current situation can bring back whole prior episodes rather than some generalization derived from them or abstract rule implicit in them. The idea is that there is a small number of pivotal, perhaps traumatic, events that serve as the reservoir from which all other affect flows—a view reminiscent of Sullivan's (1953) ideas and of Tomkins's (1979) concept of scripts. Like Freud, these reinstatement theorists anticipated the importance of a case-based approach to cognition, although their claims were less radical than Freud's.

- The Cognitive Nature of Reinstatement

We have proposed that emotions can arise through the reinstatement of prior emotional meaning, as when a current situation reminds one of (i.e., primes) a prior emotional situation, and that under certain circumstances one can be surprised by the emergence of such emotions. We believe, however, that this in no way alters the essentially cognitive nature of the eliciting conditions for the emotions so experienced. Many of the phenomena that might initially appear to challenge a cognitive

account of emotion have no special relation to emotions at all. Rather, they are just general cognitive phenomena quite familiar to cognitive psychologists. In this section, we start by discussing two examples from the recent social cognition literature to substantiate this point. In both cases, innocuous manipulations lead to somewhat surprising outcomes, including in one case otherwise hidden evidence of racial prejudice, and in the other overt but unbidden behavior. These examples are intended to establish an important point—namely, that the fact that certain emotional effects may be surprising and their consequences subtle and complex is not evidence against the involvement of cognition. Such effects can be readily observed in nonemotional domains, where they clearly do have cognitive origins. Activated material, be it emotional or not, can be structurally complex and highly organized, so that accessing any part of a structurally complex representation (or schema) may have extensive implications.

Social psychological work on automaticity illustrates our point about surprisingness. Devine (1989) has shown that mere exposure to attitude objects can automatically elicit stereotypic beliefs, even in otherwise enlightened individuals. Devine reasoned that because individuals high and low in prejudice are equally knowledgeable about relevant cultural stereotypes, this knowledge may be automatically activated in anyone given the presence of a member (or some symbolic equivalent) of the stereotyped group. She proposed that individuals must engage in controlled processing to inhibit the use of the spontaneously activated prejudicial information, and that this is the case even for low-prejudiced individuals for whom the activated prejudicial information represents only part of their cultural knowledge and not their racial beliefs. In her experiments, she showed that when such racial concepts were subliminally activated so that no corrective processes were likely, high- and low-prejudiced individuals were equally likely to show their effects, a finding that would presumably be surprising to the low-prejudiced individuals.

The second point, that the results of automatically activating cognitive material can be complex as well as surprising, is clear from research reported by Bargh (1997). He showed that the subtle activation of complex cognitive structures can automatically elicit not only latent knowledge, but even overt behavior. In one such study, a stereotype of elderly people was activated by incidental exposure to such words as "Miami" and "bingo," and this activation of the old person schema was sufficient to cause subjects leaving the experiment to walk more slowly to the elevator, a finding that was also obtained in replications of the experiment. In a related experiment, subliminal exposure to the faces of individuals stereotyped as aggressive led subjects so exposed (but not others) to voice to the experimenter their complaints about difficulties in the experiment. From this line of research, it is apparent that even when unaware of the process, the material activated in memory by incoming stimuli can be extensive and complex and can produce surprising results, regardless of whether emotion is involved.

As these findings illustrate, the remarkable properties (e.g., apparently spontaneous genesis, surprisingness) that are sometimes attributed to the extracognitive nature of emotion are general characteristics of cognitive processing, albeit characteristics that are also capable of triggering the whole cascade of events that make up emotional states. Our view is that such seemingly insignificant cognitive events

can have dramatic results because the elicitation of emotion is automatic when a particular configuration of activated meaning matches the eliciting conditions for a particular class of emotions (Lazarus, 1994). Because that content need not be in focal awareness, we can be surprised by our own emotions.

The fact that we can be blindsided by our emotions may make emotions seem beyond the reach of cognitive explanations, but the consequences of activating nonemotional material in memory can also be surprising. The surprise may be attributable to the structured nature of material in memory, to the involvement of procedural knowledge that is not represented as declarative knowledge, and to the fact that we may remain unaware of everything but the consequences of these processes. When a perception does have emotional implications, it may also trigger the whole range of processes involved in emotional states because the link between the perceptions that have emotional meaning and the elicitation of emotion is automatic. Although the link between appraisals and emotions may be unique to emotions, the cognitive processes that eventuate in appraisal are not. Furthermore, if cases of reinstated emotions are to be taken as serious evidence of the inadequacy of a cognitive view, it will be necessary to show that the emotional characteristics of the original situation do not have their origins in cognitive appraisals—a requirement that we suspect is, in the general case, impossible to satisfy.

Thus, although we acknowledge that there are two different ways in which emotions arise, we believe that emotions are the same regardless of which of those ways is involved in any particular case. It does not matter whether an individual case of fear or anger arises from on-line computations, from conditioning, from imitation of others, or from species-typical predispositions, fear is always a response to apparent threat and anger a response to apparent infringement. Although the same thoughts, feelings, and physiological activity do not occur in each instance of, for example, anger, our view is that all situations that trigger anger nevertheless involve general perceptions that all angry people share on all occasions of anger. Consistent with what Lazarus (1994) refers to as corelational themes, the constancy that makes a situation one of anger rather than one of fear or joy can be thought of as the deep structure of angry situations (Ketelaar & Clore, 1997). A deep structure can have many possible surface manifestations. What makes a situation one of anger is not the elicitation of angry feelings, thoughts, expressions, words, intonations, or actions, but the deep structure of angry meaning that gives these surface manifestations coherence. Particular emotions involve representations of particular kinds of psychological situations, and one of the central tasks of investigators of emotion is to characterize the structure of those psychological situations. Much progress has been made on this task by theorists including Frijda (1986), Oatley and Johnson-Laird (1987), Ortony et al. (1988), Roseman (1984), Scherer (1984), Smith and Ellsworth (1985), and Weiner (1985) (for a review, see Clore et al., 1994).

In summary, we have proposed that emotions necessarily reflect appraisals of the significance of situations, appraisals that can arise from two different processes, but we have argued that these two different routes to emotion reflect the nature of cognitive processes in general and thus are not unique to emotion. Other cognitive and perceptual processes also involve an interplay of new and old information, of bottom-up and top-down processes. At one end of this continuum are appraisals

TABLE 3.1. Dual Processes in Emotion Appraisal

	Bottom-up processes	Top-down processes
Routes to appraisal	Computed	Reinstated
Kinds of categorization	Theory based	Prototype based
Forms of reasoning	Rule based	Associative
Behavioral function	Flexibility	Preparedness

involving more computation and at the other end appraisals involving more reinstatement of previously learned significance. Table 3.1 summarizes some of the ways we elaborate this distinction in the sections that follow—for example, as kinds of theory-based or kinds of exemplar-based categorizations, which are governed by rule-based or by associative processes, and which may promote behavioral flexibility or behavioral preparedness. As table 3.1 shows, the same duality can be seen in both emotional and nonemotional processes, such as those relating to categorization and to modes of information processing, as well as those relating to adaptive behaviors. All of these dichotomies reflect a speed–accuracy trade-off, with the bottom-up processes generally slower but more accurate and the top-down ones generally faster but more error prone.

Related Dichotomies

Two Modes of Emotional Categorization

If we think of the process of emotion elicitation as involving the categorization of situations as emotionally significant, then the two routes to emotion elicitation we have discussed can be seen as equivalent to the two kinds of categorization prevalent in the cognitive literature: prototype-based (or case-based) categorization and theory-based categorization. Some emotion theorists (e.g., Fehr & Russell, 1984; Russell, 1991; Shaver et al., 1987) have maintained that, along with other concepts, emotions are best characterized as prototypes, rather than as classically defined concepts with necessary and sufficient conditions. In this view, instances are categorized on the basis of their similarity to a prototype or best example of a category (Rosch, 1973). Prototypes are held to consist of a collection of perceptually available features that tend to be found among exemplars of a category without regard to whether they are central or peripheral features. Categorization by prototype involves matching the features of potential exemplars to those of the prototype. For instance, our prototype of a grandmother might include features such as having gray hair, a kindly smile, and baking cookies. Because these are perceptually available features, they tend to be useful in helping us identify grandmothers.

Prototype-based views of categorization are in sharp contrast to theory-based views, which focuses on underlying aspects of the object, rather than on perceptually available features. Thus, in the grandmother example, the issue for theory-based approaches to categorization is not what the person *looks* like, but rather whether she is a mother of a parent, because that defines the category "grand-

mother." One might imagine two people searching for grandmothers, one who looks for a woman with white hair and the other who asks if anyone in the group is a mother of a parent. It is important to note that both people share the same underlying meaning of "grandmother." However, one is looking for someone who seems like a grandmother, that is, who has perceptually available features that are associated with being a grandmother, whereas the other is looking for someone who has the defining features of grandmothers. In general, the former method is faster and easier, but error prone; the latter is slower and harder to assess, but provides greater certainty.

Similarly, in the realm of emotions, people may become, for example, afraid in situations that share perceptually available features with past situations that frightened them. In such instances, they might be told, "You are just being emotional," thereby intimating that they are basing their categorization simply on the fact that a current situation reminds them of a former negative situation—that is, on how it seems, rather than on an objective analysis of the potential for harm.

We have suggested elsewhere (Clore & Ortony, 1991) that it is necessary to view emotion concepts as involving theories as well as prototypes. That is, even in the absence of shared surface features, things can be categorized together when they are believed to share deeper properties (Medin & Ortony, 1989). We proposed combining aspects of prototypes (that category membership can often be determined by similarity to a prototype or typical example) with aspects of a theory-based approach (that members of a category may also share properties that are not perceptually available). Both aspects may be useful because each serves a different information-processing function: identification and classification on the one hand, and reasoning and explanation on the other. Without a theory-based concept, people would never understand why their prototypes had the particular properties they did or how a deviant exemplar could still be in the category. But with only a theory-based concept, one might be good at reasoning but not very fast at recognizing category members because the essential features are not necessarily observable. We expressed this previously (Clore & Ortony, 1991, p. 49) by saying: "Similarity to the prototype provides a good, fast, and efficient heuristic for the identification, classification, and recognition of instances. But we also think that the prototype is of little value for reasoning and explanation. This is best accomplished by the theory-laden component of a concept, which, incidentally, can also be used as a back-up for the similarity-to-the-prototype heuristic in cases where it fails."

Two Kinds of Processing

The two kinds of emotion generation that we have discussed, as well as the two kinds of emotion categorization, are also consistent with a third cognitive processing distinction—namely, that between associative processing and rule-based processing (Sloman, 1996). In associative processing, objects are organized according to subjective similarity and temporal contiguity in experience. In rule-based processing, reasoning operates on symbolic structures. Everyday categorization appears to involve the use of both subjective similarities and rule-based reasoning. So even though young children use similarity as the basis for early categorization, they quickly come to rely on their knowledge about the unseen internal structure

of things as their criteria for categorizing them (Keil, 1989). By the same token, even college students sometimes use superficial similarity as a basis for categorization (e.g., Ross, 1987). Hence, routine cognition seems to involve both associative and rule-based reasoning processes.

We concur with Smith et al. (1996), who propose that these forms of reasoning also underlie the two kinds of emotion elicitation with which this chapter is concerned. Reinstating previous emotional meanings uses similarity as a basis for emotion categorization, whereas computing new emotional values uses reasoning by rule to accomplish theory-based categorization. At this point, however, it is important to emphasize that rule-based reasoning is not necessarily conscious, explicit, or deliberative. Such reasoning can be utterly implicit, as evidenced by the fact that it can be demonstrated even in preverbal infants (e.g., Kotovsky & Baillargeon, 1994; Needham & Baillargeon, 1993).

Associative and rule-based processing can both proceed in parallel and give rise to different, even conflicting, results. We cited one such example at the outset of this chapter—the plight of the anxious and depressed person who was afraid to take a shower (associative), even as he realized that showers are not, in fact, scary (rule-based). We have also produced such a phenomenon in the laboratory. In one experiment (Weber & Clore, 1987), participants were either in an anxiety-induction group or in one of several control groups. On a series of gambles, those who had been made to feel anxious were significantly more likely to choose alternatives promising certainty and to avoid bets involving risk, even though the risky bets had clearly superior expected values. Even when they believed they would win the bets, they remained more risk averse. That is, even when rule-based reasoning suggested taking the bets, the associative reasoning dictated avoidance of risk. Despite the fact that they knew rationally that the bets were advantageous, from an experiential standpoint (because they had undergone an experimental anxiety induction) the bets felt too risky. Thus, they felt uneasy even though they knew there was nothing to fear. This experiment was conducted in the context of the affect-as-information hypothesis (Schwarz & Clore, 1983), and showed that information from feelings may be more compelling than the information from knowing (see also Bechara et al., 1994).

This same kind of conflict can occur without extraneous mood induction. A situation may be categorized as a threat either because it reminds one of a prior situation that was threatening or because a rule-based analysis shows it to involve risk. In the former instance, one need not rationally believe that the event will bring harm. But if one is reminded of a past bad outcome, then a mental representation of that bad outcome comes to mind. Because the triggers for emotions are mental representations of outcomes (rather than actual outcomes), being reminded may be sufficient to elicit an emotion, so that one can feel afraid even when one knows better.

In summary, we have proposed that a situation may elicit emotions either by reinstatement or by being perceived directly as having personal implications. In either case, the situation must be seen as having significance for one's goals, standards, or tastes/attitudes. However, that categorization may be made by case-based reasoning on the basis of similarity to a prior instance or prototype or it may be made by rule-based reasoning. In either case an emotion is automatically triggered

when its eliciting conditions are satisfied. We now consider how these two processes are related to the principal behavioral functions of emotion.

Two Functions of Emotion

Two of the functions commonly attributed to (especially negative) emotions are preparation for rapid action (Toates, 1987) and flexibility of action (Scherer, 1984). But these are strange bed fellows because, while preparation is valuable for acting quickly, flexibility may often require refraining from acting quickly.

Evolutionary psychology suggests that we have innate emotion circuits that reflect the survival situations confronted by early humans during the hunter-gatherer period tens of thousands of years ago. Perhaps fear was elicited by the growls of predatory dogs or the sight of slithering snakes, anger by having someone take one's food or threaten one's kin, loneliness by being separated from one's siblings and family, sadness by losing one's mate, and so on. In this long epoch of human prehistory, individuals who responded to these recurrent situations with particular inclinations and feelings may have survived and passed on those tendencies.

To uncover the automatic and primordial aspects of emotion, many recent studies have presented affective stimuli subliminally because aspects of emotional reactions can sometimes be triggered when the individual is unaware of having seen the eliciting stimulus and before any emotional feelings are experienced (e.g., LeDoux, 1996, this volume; Öhman, this volume). Presumably, these processes prepare the organism for action and are crucial in emergencies. Set patterns of response can be prepared, ready to engage as soon as cortical processes confirm the stimulus identification. In mammals, when sensory patterns match some stored template for a threat stimulus, cardiac activity and some other autonomic nervous system processes may increase. The amount of this change may depend on the threat value of the stimulus and on how suddenly it appears. For example, in rabbits, if the threat is sufficiently strong, blood may flow to the large muscles in preparation for running away. However, although the rabbit is prepared for escape, its behavior also has some flexibility; rabbits sometimes freeze and sometimes run. Which behavior occurs apparently depends on the magnitude of the threat as indexed by the intensity of fear (Panksepp, 1998). Presumably, it makes sense for rabbits to freeze when a predator is at a distance, but as the predator gets closer, freezing becomes less advantageous. Thus, overall, the rabbit benefits from a system that triggers preparedness to run but that does not commit it to running.

On a continuum from rigidity to flexibility of response to their environment, creatures that have emotions are clearly both more complex and capable of greater flexibility. And mental health, too, is characterized by flexibility as opposed to rigidity of response (Leary, 1957). Moths that spend summer evenings banging their heads against light bulbs do not enjoy much flexibility. Higher animals, on the other hand, have emotions instead of tropisms. Humans can have very flexible reactions in emotional situations, sometimes expressing emotions directly, sometimes indirectly, and sometimes not at all.

We are suggesting that some evolutionary advantage may accrue to creatures for which emotion allows flexibility of response, in addition to automatic

preparation for responding. According to Scherer (1984), the great evolutionary advantage of emotion was to allow a stimulus to be registered and reacted to without committing the organism to an overt behavior. Such protocognitive processes allowed behavior to be contingent on a stimulus, but not dictated by it. It is easy to see that it might be adaptive for emotion to facilitate a readiness to respond without committing the organism to actually doing so. Thus, it seems likely that the direct outcomes of emotion are bodily and cognitive manifestations of the significance of a stimulus, rather than behaviors themselves, even though preparation for behavior also has adaptive value. Thus there seem to be two fingers on the emotional trigger: one controlled by early perceptual processes that identify stimuli with emotional value and activate preparation for action, and a second controlled by cognitive processes that verify the stimulus, situate it in its context, and appraise its value.

Presumably, the goal of being prepared benefits from speed of processing, whereas the goal of flexibility benefits from awareness rather than from speed. We think it is no accident that the increased capacity for flexibility appears to parallel an expanded capacity for subjective experience. The subjective experience of emotion registers the urgency of a situation, provides information, and allows processing priorities to be revised. Thus, humans can entertain alternative courses of action and sample how they would feel about different outcomes, but, of course, in order to do this, they must be aware of the stimulus that occasions the processing. Much neuroscientific and cognitive research suggests that the conscious awareness of stimuli changes the process, so considerable attention has been devoted to subliminal presentations and "precognitive" emotion-related processes. The results of this line of research raise the question of whether a cognitive analysis of emotion is applicable to affective stimuli that are "precognitive" or of which we are otherwise unaware.

The Challenge of Unconscious Processes

We have already seen that some of the phenomena to which critics of cognitive accounts appeal have nothing in particular to do with emotions. In this section, we further substantiate this claim by reviewing a range of phenomena, including subliminal priming and supraliminal priming, mood and judgment effects, and the effects of trauma, with respect to their relation to conscious awareness. Our basic claim here is that the possibility of being unaware of the source of one's feelings in no way conflicts with a cognitive view of emotion elicitation. To be sure, reinstated emotions may appear to by-pass cognition, but we propose that it is simply the lack of salience of the source that makes emotions so elicited sometimes appear to be irrational and maladaptive. Likewise, the fact that emotional reactions can occur automatically and that they often seem outside of our control and beyond the reach of intentional reappraisal also seems to challenge a cognitive view of emotion. However, these facts, too, have no bearing on the cognitive view. Regardless of how appraisals are made or of people's insight into or control over the process, an emotion is elicited when one's perception of a situation matches the deep structure

of situational meaning that defines that emotion. This correspondence is not affected or revealed by lack of conscious access to the elements that compose it.

Precognitive Effects

LeDoux's experiments (see LeDoux, 1996) on the role of the amygdala in the acquisition of automatic fear-related and avoidance-related phenomena in rats have become a touchstone for investigators who approach the study of emotions from the perspective of neuroscience. LeDoux's findings, as well as those of Öhman (1986, this volume), suggest not only that one need not be aware of the cause of one's emotions, but that the emotions themselves, including their behavioral consequences, may sometimes be triggered before consciousness comes into play.[2] According to this view, encountering a snake in the woods might activate avoidance behavior before one either feels fear or is even consciously aware of the snake. The explanation is that the sensory thalamus detects something with the form or movement of a snake and that this information reaches the amygdala directly a few milliseconds before it can arrive via the cortex. This direct route allows avoidance behavior to be activated and ready if the tentative identification of the stimulus is confirmed. But does this mean that cognition is not involved? We think not.

First, we would argue that in examining only the earliest part of an emotion sequence, such studies are not in fact dealing with real, full blown emotions at all. If we accept the characterization of emotion as involving cognitive, behavioral, somatic, and experiential constituents, then fascinating and important as these findings are, their incompleteness renders them degenerate instances of emotions, or at the very least, nonrepresentative ones. What these studies do show is that the initiation of avoidance behavior in response to potentially aversive stimuli, behavior that might usually be attributed to the experience of fear, can occur before fear is felt. But at the same time, they remind us that avoidance behavior does not itself constitute fear.

Second, the cognitive claim is that emotions are reactions to (or representations of) the personal meaning and significance of situations, not that emotions originate in the cerebral cortex. When neuroscientists investigate precognitive processes in emotion elicitation, they are studying early processes that occur before the cortex is involved and hence before awareness is possible, but not before meaning or significance is detected. Thus the observation that some processing of emotional meaning can occur before a stimulus is processed in the cortex indicates that cognition can be precortical, but not that emotions occur without cognitive activity. From our perspective, the detection of significance is already a cognitive process; however archetypal the representation of a snake is when it is accessed through the direct, thalamic route, the fact remains that it still is some sort of a representation of a snake,[3] and this is sufficient to qualify the process as a cognitive one. Cognition has to do with the construction, maintenance, manipulation, and use of knowledge representations (Mandler, 1984), not with consciousness. Cognition and consciousness are orthogonal constructs, and as we shall shortly see, emotions can, without contradiction, involve cognition without awareness. What is critical for the cognitive view is simply that the trigger for the cascade of events that is emotion

is a representation of the value and significance of a stimulus, not the stimulus itself. The task for a cognitive theory of emotion is to describe how that value or emotional meaning arises. Thus we conclude that the fact that emotions, or at least fear (Robinson, 1998), can be elicited without awareness does not conflict with a cognitive account of emotion.[4]

More on Priming Effects

In recent years, social psychologists have become captivated by the rediscovery of subliminal exposure effects. It is now apparent that even when stimuli are available for only a few milliseconds, there is often a measurable influence on the interpretation or speed of processing of the stimuli that follow (e.g., Bargh, 1997; Greenwald et al., 1996; Murphy & Zajonc, 1993; Öhman, 1986). In a typical subliminal paradigm (e.g., Bargh, 1997), a mildly positive or negative word is presented as a prime, and then a novel or neutral stimulus (e.g., a Chinese ideograph) appears immediately, blocking awareness of the prime. The result is that the primed evaluation adheres to the subsequent stimulus so that it is then rated more positively or negatively than it would otherwise have been. Even if the task does not concern evaluation (e.g., as in pronouncing words), participants are faster at processing target items when their evaluative meaning is congruent with that of the nonconscious prime.

In contrast to these effects of unconscious primes, several investigators (e.g., Bargh, 1997; Murphy & Zajonc, 1993) have reported that the influences of affective primes disappear when respondents are aware of them. Freud was similarly impressed by such phenomena. He observed that unconscious stimuli with emotional potential could have wide-ranging effects on dreams, symptoms, and behavior that could be neutralized simply by making conscious the unconscious origin of the influence. Indeed, the point of Freud's psychoanalysis was to give patients insight into the origins of their unconscious ideas and hence to take away the power of those ideas to have far-flung effects on other beliefs and emotions.

The comparison between affective primes presented consciously and unconsciously raises questions about how such dramatic differences in effect might be explained. The explanation that we find most appealing is that there is nothing "precognitive" involved in subliminal priming, and that the meanings of masked words are processed in a perfectly ordinary way. The only difference is that the visual mask, which ensures that the image is available for only a few milliseconds, interferes with the episodic knowledge of having seen the stimulus. But it does not interfere with the semantic knowledge of what was seen. As a result, the meaning is activated, but memory for how the meaning came to mind is blocked (see Bornstein, 1992, for a related analysis). Much of the particularity of meaning of any stimulus lies in the context of its appearance. Without context, only the most general aspects of meaning are activated. Indeed, the brevity with which the stimulus is available means that even simple qualifications of meaning, such as those provided by prefixes and suffixes, are lost (Draine, 1997).

We are suggesting that the only important difference between subliminal priming and ordinary processing is that in cases of subliminal priming the presence of the visual mask interferes with episodic processing. Interference in this way ensures

that all of the constraints on the primed meaning usually provided by neighboring words and by the time, place, and context of the experience are missing. Thus, unconscious priming produces semantic activation without any contextual and episodic constraints and markers (Clore & Ketelaar, 1997).

This kind of analysis of the difference between subliminal priming and routine information processing is consistent with certain neuroanatomical considerations. For example, Jacobs and Nadel (1985) distinguish two types of learning systems, each realized within separate neuroanatomical structures. One of these, the locale system, is concerned with the episodic or contextual aspects of stimuli, while the other, the taxon system, is concerned with the meaning of the stimulus free of the constraints of context. According to O'Keefe and Nadel (1978, p. 100): "Concepts and categories, the look, feel, and the sound of things, the goodness and badness of objects: All of these are represented in the taxon systems . . . what is missing is the spatio-temporal context in which this knowledge was acquired . . . this [spatio-temporal context] is provided by the locale system where representations from the taxon systems are located within a structure providing such a context."

Jacobs and Nadel (1985) go on to argue that the hippocampus serves the kinds of functions they specify for the locale system. It serves a cognitive mapping function that allows environments previously experienced to be represented and recognized. They suggest that the phenomenon of infantile amnesia can be explained by the fact that, although a great deal of enduring learning takes place in infancy, there is typically no episodic memory of it because the hippocampus, which is required to situate things in time and space, is not yet developed. In cases of damage to the hippocampus, one gets stereotyped, repetitive, and persistent behavior that is not constrained by an appropriate context in memory (O'Keefe & Nadel, 1978). Jacobs and Nadel propose that under stress, the action of the hippocampus is suppressed, leading to a similar decontextualization of traumatic memories. They report that some phobias reemerge under prolonged stress. The early learning of a fear may then lose its context specificity and become thoroughly general, resulting in a phobic attack triggered by general stress-induced dampening of hippocampal function.

Applying Jacobs and Nadel's concepts to experiments on subliminal exposure, one might think of the backward-masking procedure in experiments involving subliminal exposure also as interfering with registration in the hippocampus of the episode of seeing the priming stimulus. The result would be processing of semantic information in the taxon system, but not of the episodic information in the locale system. In any case, a variety of lines of evidence converge on the conclusion that unconscious ideas are powerful not because of anything specifically to do with affect, but simply and solely because there are no episodic constraints on the subliminally primed semantic meaning. Moreover, as we shall see in a moment, this interpretation unifies a number of phenomena that might otherwise seem unrelated.

An interesting implication of our analysis is that whether a stimulus is presented subliminally or supraliminally is not really the issue. All that is important is whether the individual is able to fully parse the stream of information. And, indeed, similar priming effects are routinely found even when the priming stimuli are clearly available for conscious inspection. For example, Srull and Wyer (1979) developed a priming procedure in which participants form a series of sentences by

circling three of four alternative words for each sentence. Depending on the nature of the alternative words, a general (taxon) level of meaning (e.g., of hostility) can be activated, without focusing the attention of participants on the specific (locale) information about the source of that meaning. Under these conditions, because the number of priming instances and their embeddedness in a meaningful task prevents the priming from standing out as a separate event, the same effects occur as in unconscious priming even though the primes are conscious.

In other studies (e.g., Martin et al., 1990) the source of the primed meaning is often made obvious, but subjects are distracted by a secondary task, so that they do not focus on the priming event. It is generally understood in this literature that priming effects can be found only when participants do not focus on the source (or locale) of the meaning activated in semantic (or taxon) memory. In subliminal exposure research, the backward mask ensures this same pattern by interfering with the registration of the episodic (or locale) information. Our point, then, is that the critical element in so-called unconscious processing is not whether a stimulus is shown rapidly, but simply whether participants can parse the stream of mental events into semantic (taxon) and episodic (locale) information. This a general feature of cognitive life, and therefore not one that is in any way special to emotion.

Finally, given our explanation of "precognitive" affective effects in terms of the cognitive mechanics of backward masking, it may be a mistake for theorists to claim that research on human judgment of the kind popularized by Zajonc and his colleagues and brain-based research of the kind described by LeDoux are mutually supporting. Our caution in this regard is that the human behavioral research conducted by Zajonc always involves backward masking of the priming stimuli and therefore is amenable to an exclusively cognitive interpretation of the kind given above—an interpretation that is in no way dependent on the distinction between the direct and indirect (cortical) route to the amygdala, which is the hallmark of LeDoux's work. From this we conclude that the LeDoux research is essentially irrelevant to Zajonc's findings. By parity of reasoning, the Zajonc results, while compatible with, are not directly relevant to, those of LeDoux. LeDoux neither proposes nor has he any reason to propose that the semantic (taxon) aspects of briefly exposed stimuli get into the brain but that the episodic (locale) aspects do not. But this is precisely what we propose as the explanation of the kind of results that Zajonc presents. Furthermore, the Zajonc studies (and for that matter, the Bargh studies) concern rapid stimulus exposures, whereas the LeDoux studies concern rapid response preparation. This is another reason for suspecting that the same analysis is unlikely to apply.

Misattribution Effects

The same basic phenomenon can be seen in studies of mood and judgment. Judgments of just about anything are more positive in good moods than in bad moods. According to the affect-as-information hypothesis (Schwarz & Clore, 1983), the information on which judgments and decisions are made routinely includes information provided by affective feelings. Bechara et al. (1994) have published dramatic data that suggest that choices (made in a card game) may be mediated by feedback-produced feelings before the formation of relevant beliefs can play a role.

And other results show that feelings from an irrelevant source can influence judgments even when varied independently of beliefs about the object of judgment (Clore et al., 1994). However, this phenomenon is dependent on not experiencing (i.e., not being consciously aware of) the affective feelings as relating to the other (irrelevant) source. When the default linkage or attribution to the target stimulus is eliminated, the effect of mood on judgment also disappears. This kind of pervasive influence of affective feelings on judgment is most easily observed when the source of affect is a mood because a distinguishing feature of moods is that any situational causes are not generally salient. Unlike emotions, which are generally focused on a causal object (as when one is angry *at* someone, or afraid *of* something), moods are relatively undifferentiated feeling states with less salient cognitive content (Clore, 1994b; Ortony & Clore, 1989). As a result, mood-based feelings are easily misattributed to whatever stimulus is being processed at the time. Hence, general moods (and moodlike conditions such as depression) are much more likely than are specific emotions to result in contamination of judgments and decisions. Our explanation for this phenomenon is the same as our explanation for the influence of unconsciously primed affective meaning. The feelings associated with moods can have runaway affective meaning because they are unconstrained by any episodic harness.

The same problem is also apparent in cases of trauma in which a traumatized person ruminates about, but does not communicate about, the traumatic event (Clore, 1994a). Refusing to talk to others about emotional events does not keep one from thinking about them, and refusing to think explicitly about an event does not keep representations of it from being activated in memory and having affective consequences (Wegner, 1994). Indeed, whether one either thinks about a traumatic event constantly or tries to avoid it completely, the accompanying emotional reactions can cease to belong to a specific time, place, and circumstance. When the experience is cognitively unconstrained (i.e., when it is no longer clearly tied to a specific object), it may color the judgment of any situation to which it might appear relevant. Similar processes are seen in avoidance conditioning in rats in which the context of the original conditioned stimulus–unconditioned stimulus (CS–UCS) pairing fades in memory over time. As a result, the animal's fear (which does not fade) becomes more and more general and less and less contained (Hendersen, 1978).

A time-honored solution to this kind of problem in humans is to communicate about one's feelings. Whether expressed to professionals, friends, strangers, or simply to oneself, as in a diary (e.g., Pennebaker, 1991), organizing one's thoughts about trauma for communication appears to situate the suffering person's representations of events. This process reigns-in what can otherwise seem like runaway implications for all aspects of the person's life.

In summary, we have argued in this section that there is substantial and diverse evidence showing that when we are unable to focus on or attend to the source of primed meaning, we tend to apply that meaning indiscriminately. Thus, unconscious exposure to emotional stimuli can have surprising effects because the backward-masking procedure interferes with the episodic constraints on affective meaning that are usually available in ordinary perception or in experiments in which participants are aware of the priming event. Other than this interference with recog-

nition provided by the mask, the processing involved in subliminal exposure does not appear to involve any processes beyond those encountered in everyday instances of perception. Evidence for this assertion includes the fact that the same kind of indiscriminate application of activated concepts can be shown without subliminal exposure, including (1) injury- or stress-induced suppression of hippocampal processes, which code memories with respect to context, as in cases of phobia or post-traumatic stress disorder (Jacobs & Nadel, 1985), (2) backward masking, which has no effect on initial processing but which interferes with the registration of stimuli in memory and hence with their later recognition, (3) ordinary conscious priming situations in which primes appear as incidental information (e.g., Higgins et al., 1977; Srull & Wyer, 1979) or in which distractions interfere with episodic registration of the priming (Martin et al., 1990), (4) mood effects on judgment, in which the nonsalience of their source allows mood-based feelings to be misattributed (Schwarz & Clore, 1983), and (5) situations in which suppression of thoughts about traumatic events interferes with situating the memories in time and place. In addition, (6) comparable phenomena appear in cases of fear conditioning, when the context of the original CS–UCS pairing fades so that fear becomes more and more generally applied (Hendersen, 1978). We suggest that all of these show the action of decontextualized semantic and affective meaning unconstrained by episodic meaning rather than the action of precognitive processing. In other words, these phenomena simply reflect ordinary cognitive processes in which there is interference with the encoding of information about time, place, and context—interference that influences the ability of perceivers to parse their momentary experience. Thus, we propose that reinstated emotions only appear to be devoid of cognition to the extent that the emotional meaning of the original situation is brought to the new situation unconstrained by the distinctive episodic and contextual knowledge that makes one situation different from another.

The Challenge of Automatic and Inaccessible Processes

In a study by Lewicki (1985), some participants had a negative affective experience when they were criticized by a person with curly hair. Much later they had a chance to choose which of two seats to sit in, one opposite a curly-haired person and the other opposite a straight-haired person. Although they were not aware of why they did so, these individuals avoided the curly-haired person. Here we have another example of a phenomenon that might seem to imply that emotion can be elicited without cognitive antecedents—that fear can be elicited by a short-cut without the activation of some threat meaning. But again, we do not think that this is the right explanation. To see why, we begin by considering instances of classical conditioning.

Conditioning and Automaticity

Classical conditioning involves a process whereby the meaning of one stimulus, the conditioned stimulus, is altered so that it comes to stand for the meaning of another, the unconditioned stimulus. After association, the conditioned response may occur automatically when the conditioned stimulus is presented, just as before

conditioning it had occurred automatically when the unconditioned stimulus was presented. In other words, the conditioned stimulus acquires the capacity to elicit a response because it comes to stand for (or acquires the meaning of) the unconditioned stimulus (Hebb, 1949). As such, the response is still triggered by the same meaning, it is just that a new stimulus activates that meaning. This is known as the S-S, as opposed to the S-R, analysis of classical conditioning. The same analysis applies to learning by imitation. For example, Mineka et al. (1984) showed that when avoidance of snakes is induced in rhesus monkeys by observational learning, it is not the behavior that is learned, but the fearful meaning of the stimulus, which is then responded to with defecation, fearful expressions, and other constituents of fear itself.

A similar analysis can be applied to reinstated emotion. When a current situation triggers an emotion previously experienced in a similar situation, we assume that it can do so only if some representation of the original situation is activated. If so, then even reinstated emotions are elicited by the relevant cognitive eliciting conditions. The only change is that mental representations of those eliciting conditions have been activated when a feature of the current situation reminds one of the emotional meaning of the earlier situation. It is not that the emotion has been elicited without the usual eliciting conditions, but simply that some feature of a current situation has activated a representation of a prior situation that had those eliciting conditions. Once the eliciting conditions are in place, the emotion should follow automatically, regardless of whether those conditions are computed anew or are reinstated from a prior situation. Note that the emotion has not become automated because emotions are always automatic (rather than volitional) responses to their cognitive eliciting conditions (Lazarus, 1994). What has become conditioned, or automated, is the emotional meaning of the current situation, not the response. As before, the response follows the meaning. Indeed, this is one of the fundamental points of this chapter—that emotion elicitation is a matter of meaning, not simply of responses, whether physiological or behavioral.

Presumably, individuals can be unaware of the basis of these associations and can therefore occasionally be blindsided by their own emotions. Though fascinating, such possibilities do not contradict this analysis. The fact that emotions can be reinstated, rather than resulting from new appraisals, is important only in that the more removed an emotion is from current cognitive activity, the harder it may be to understand and to regulate.

The advantage of automatic processing is presumably a savings in time and processing resources, so that one can benefit from learning and using saved material. When a process becomes automated, something is short-circuited or a shortcut is established. This is reasonable enough, but some elaboration of what this involves may be instructive with respect to its implications for the relation between appraisals and emotions. For example, when one programs a computer to make a macro, the macro takes the place of the individual key strokes only at the conscious, motor, or user level. Representations of the key strokes are still activated, and the work of each key stroke is still done step by step.

The same is true of such automated action as playing the piano. For a beginner, the playing of every note in a piece must be a conscious and deliberate act, and each symbol on the sheet music must be mentally translated into a note on the

piano and a finger on the hand. But to an experienced pianist who has learned a piece well, little conscious, deliberate self-instruction is required, except perhaps using the music as a reminder of the notes to be played. Being an experienced pianist means that far fewer deliberate or conscious mental instructions are needed to play the piano, but the pianist's fingers must still play each note. Automatization does not mean that one no longer has to play the piano; it only means that one no longer has to think about it consciously and deliberately.

To make a related point about cognitive processes, Anderson (1982, 1987) uses the analogy of interpreted versus compiled computer programs. In knowledge compilation, declarative knowledge is built into domain-specific production rules so that it is no longer necessary to hold declarative knowledge in working memory, and sequences of these productions are collapsed into single productions. Automated processes are like compiled computer programs in the sense that the individual steps that once constituted them are no longer accessible. In the skill domain, once the knowledge is encoded procedurally rather than declaratively, it is no longer in working memory. The computations are still made, but they are automated, so that changes are not as easily made.

Even automated emotional sequences triggered by nonconscious stimuli still require that contact be made with the emotional meaning of the situation. In the case of anger, for example, contact must be made with thwarted goals and violated standards—the deep structure of angry meaning. Someone whose action was angering in the past might later elicit anger quickly and automatically. But this can happen, we suggest, only to the extent that the processing of surface features activates a representation of goal thwarting and standard violations. Like cached images in a computer, frequently accessed meanings that reoccur in intimate relationships may appear quickly because they are precomputed, preloaded, and waiting. However, those meanings must still be accessed for a representation of their emotional meaning in the form of emotional feelings to occur.

So, in the paradigmatic case, a nonconscious connection between a current situation and a past one can trigger an emotional reaction automatically. If it is triggered on the basis of similarity between peripheral (and possibly irrelevant) features of the two situations, it can be hard for the person to explain, and it may be impervious to rule-based reappraisal. To observers for whom the situation does not appear to justify emotion, the reaction may seem irrational. And because the connection between the preloaded features and the reaction may not be conscious, may not be situated in time and place, and may not be open to scrutiny, attempts at rational analysis may not be helpful.

In contrast, reactions elicited by more on-line or bottom-up computation of emotional significance can often be undone by reappraising the situation. For example, if one's feelings were hurt by insulting comments from a colleague, learning that the remarks were actually about someone else would change the interpretation of the situation and eliminate hurt feelings. The emotion would go away as soon as its cognitive basis went away. Indeed, one might laugh with relief. Bandura (1973) has given a persuasive account of anger and aggression that is essentially this view. He argued for a self-arousal view of anger in which the critical variable in maintaining or eliminating anger is whether the individual focuses on the angry meaning of the situation. Similarly, he argued against a catharsis view, suggesting

that whether angry behavior eliminates anger depends not on whether one uses up or drains off a pool of aggressive energy, but on whether it decreases the activation of cognitive material conducive to anger.

But once automated or compiled, meaningful changes in the appraisal of the current situation may be difficult to make. Without affecting the command that triggers the particular chunk of programming, new information may have no impact on the generation of emotional meanings that are automated and appear as wholes. A similar problem arises when a person with a strong preestablished attitude encounters new information. An attitude may be formed by many affective events that are no longer accessible once the attitude is formed because the prior experience has been compiled into one affective reaction. Although new information might end up being stored along with the prior attitude, it may not change the attitude (Wilson & Lindsey, 1998). For this reason, psychotherapy often involves an attempt to uncover the triggering condition of emotions and to relearn or reprogram the cognitive construals that support self-defeating and problematic emotional interpretations. Some therapists argue that this can only be done as the person has new experiences that compete with or replace those that are problematic.

The inference we wish to make from this discussion is that although there may be two routes to emotion elicitation, they are just that—two routes to the same emotional meaning—and it is the activation of this meaning that elicits emotion. In that sense, emotion is always a result of appraisal, even when the appraisals are automated, nonconscious, or even erroneous categorizations. For example, fear arises in response to detected or presumed threats. The fear-inducing stimulus may be linked to threat innately, by early nonverbal experience, or by extended deliberation, but without some threat meaning being activated, there can be no fear, because that is what fear is, an experiential representation of threat.

We now consider one last fact about emotion that challenges a cognitive view, namely, the fact that people are notoriously inept at describing their feelings and at explaining why they feel as they do; people are often wrong about the causes of their feelings (Nisbett & Wilson, 1977). One might assume that if emotions have cognitive origins, people should surely know about their emotions. Does our inarticulateness about our feelings serve as evidence against a cognitive view of emotion?

Linguistic Inexpressibility

One of the perspectives on emotions that we have advanced is that they involve the simultaneous manifestation of appraisals in multiple systems. So, for example, the goodness or badness of something may be manifested experientially as positive and negative feelings, and cognitively as positive or negative beliefs. When one focuses on the noncognitive modes of appraisal manifestation (e.g., affective feelings; behavioral inclinations), it is easy to lose sight of the cognitive nature of the appraisal processes. In this section, we discuss briefly the relation between appraisals and the motivational/behavioral domain.

Many of the behavioral manifestations of appraisals are the learned but often automatic strategies we use for coping with the vicissitudes of daily life. For example, people often clench their fists when receiving an injection, or raise their voices

to discourage dissent. But not all of the connections between appraisals and motivations and behaviors are learned. At a more basic level there is a fundamental innate appraisal–motivation linkage—namely, the one between positive stimuli and approach and between negative stimuli and avoidance. Indeed, Davidson (1992) has argued that positive and negative affect can be reduced to approach and avoidance tendencies. An interesting experiment by Cacioppo et al. (1993) demonstrated the basicness of this connection. These investigators showed that reaction times for engaging in muscular flexion (as in pulling something toward oneself) tend to be faster for positive stimuli. Conversely, reaction times for engaging in muscular extension (as in pushing something away from oneself) are faster for negative stimuli (see also Bargh, 1997; Solarz, 1960). Interestingly, there is evidence that the connection is between appraisal and motivation rather than between appraisal and behavior because variations on this procedure produce the opposite results when arm flexion can be interpreted as withdrawing one's hand from an object (rather than as pulling an object toward oneself), and when arm extension can be interpreted as reaching for the object (rather than as pushing an object away) (M. Brendl, personal communication, 20 October 1997). Hence, it is the situated meaning of flexion and extension that is critical; the affective appraisals are manifested in the motivational realm as the desired end states of approaching or avoiding stimuli, rather than simply as triggers for distance-modulating behaviors (muscular flexion or extension) (Neumann & Strack, 1998).

We have already seen that some of the potential challenges to the cognitive basis of emotions appear to result from the apparent independence of the different constituent facets of emotions, as though the affective right hand does not always know what the cognitive left hand is doing. Indeed, Wilson and Schooler (1991) have shown that attempts to think about our reasons for gut-level decisions sometimes reduce the quality of our final decisions—a state of affairs all too familiar to relative novices (of chess, for example) who often regret second-guessing their first instincts. Many of the examples on which we have focused involve this kind of asynchrony between the experiential and conceptual aspects, which is often why we can be surprised by our feelings.

However, this apparent asynchrony between the various systems does not mean that there is no communication between them. For example, the affect-as-information model (Schwarz & Clore, 1983) is concerned with the impact of feelings in the experiential domain on judgments in the cognitive domain, and as we are about to discuss, there is often communication not just between the experiential and cognitive domains, but also between these and the motivational and behavioral domains. In addition to the idea that affective appraisals may be directly manifested as the motivation to approach or avoid something, it seems highly plausible that good and bad feelings evolved in part as ways of motivating approach or avoidance (Frank, 1988). In a similar manner, research shows that positive and negative feelings can trigger distinctive styles of cognitive processing (for a review, see Clore et al., 1994). Specifically, there is a reliable association between positive moods and inclusive, integrative, category-level processing and between negative moods and piecemeal, analytic, and item-level processing.

Yet there remains one aspect of emotional life that may still seem problematic for a cognitive approach to emotion: the difficulty we often have in being able to

describe our emotional feelings and inclinations in language. However, despite the fact that feelings are often held to be notoriously difficult to describe in words, language does provide a means for achieving the communication of affect through connotative meaning. The denotative meaning of words captures the physical and descriptive attributes of objects, attributes that may assist us in discriminating one object from another. But words (and more generally utterances and texts) also have connotative meaning, meaning which allows us to communicate emotional and other experiential aspects of our perceived worlds. If we consider connotative, and not merely denotative, meaning, we realize that the problem is not that it is difficult to communicate about emotions, but only that it is difficult to describe emotions in language. This difference is especially evident in literature, poetry, drama, and the everyday use of expletives. In all of these, emotional meaning is directly expressed by choosing words with appropriate connotative meanings so that one feels the communication as well as understanding it.

Osgood et al. (1957) took this notion slightly further, making a compelling case that all words in all languages have the same three fundamental dimensions of connotative meaning: evaluation (E), potency (P), and activity (A). Moreover, Osgood (1969) argued that these dimensions evolved into universal dimensions of meaning precisely because the representations of objects that they afforded gave form and direction to behavior. Osgood explained his idea by asking what the proverbial caveman would have needed to know when encountering a completely novel stimulus. He suggested that without necessarily knowing what the novel thing was, it would have been important to know quickly whether it was good or bad, whether it was strong or weak, and whether it was moving quickly or slowly. In this way, one could discriminate saber-toothed tigers from mosquitoes, and one's coping strategy could take form by virtue of being constrained by the connotative meaning of the situation.

We suggest that although the experiential and the motivational/behavioral aspects of emotions cannot easily be conveyed propositionally, they can still be represented linguistically through the connotative meaning of words. And conversely, feeling and acting are themselves ways of realizing aspects of meaning, but the aspects of meaning they can reflect are the connotative, not the denotative aspects. In other words, feelings are one of the ways in which we can represent the affective attributes of the psychological meaning of things; we can feel goodness–badness, strength–weakness, and activity–passivity. We resonate to the emotional and connotative meaning of situations by being moved ourselves. In that sense empathy is a good example of emotional communication. However, the dynamics of connotative meaning can involve more than simply experiencing the same feeling connoted by the words used. For example, something is connotatively bad to the extent that it makes us feel bad, but it may be connotatively strong to the extent that we feel comparatively weak. These connotative dynamics have been brilliantly and formally worked out for subject–verb–object sentences by Gollob (1974). Also, Heise (1979) has taken these formulations and shown (in ingenious mathematical and computer simulations) how the connotative meanings of social roles and social actions can be represented as complementary feelings that motivate the moment-to-moment changes in behavioral interactions between people. In any case, our main point here is that this experiential aspect of meaning, which is represented in

the raw in music and in the prosody of speech, is also representable in language through connotative meaning.

In summary, in this section, we have attempted to show how a cognitive account can explain emotional phenomena despite the fact that they are often surprising, irrational, and uncontrollable, and that our inability to be descriptively articulate about our emotions is to some degree offset by the affective affordances of connotative meaning. We also discussed the virtues of the view first raised by Osgood (1969), and later elaborated by Gollob (1974), Heise (1979), and others (e.g., Foa & Foa, 1974; Leary, 1957; Sullivan, 1953; Wiggins, 1980) that evaluation and the other connotative dimensions of meaning can be made manifest through feelings and action. As such, they are most naturally represented in the knower as feelings rather than as linguistically expressible propositions. Successful communication and comprehension of connotative meaning (including emotional meaning) is marked by the occurrence of complementary feelings in the other, just as successful communication and comprehension of declarative knowledge is marked by the formation in the other of relevant beliefs and propositions.

Conclusion: Ten Proposals about Emotion Elicitation

We have proposed that there are two ways in which situations may be appraised as having emotional significance, and we suggested that these are based on different categorization processes supported by different processing principles that allow emotions to modulate different and sometimes conflicting adaptive goals. However, despite the fact that there are multiple ways for situations to acquire emotional significance, emotions are elicited in only one way as a manifestation of that significance. This aspect of our discussion was summarized in table 3.1, and leads us to the first 6 of 10 proposals about the nature of emotion elicitation.

The second major theme of this chapter has been the analysis of emotional phenomena that initially seem problematic for a cognitive account of emotion. These include the precortical elicitation of emotion components, subliminal affective priming, conditioned and automated emotional responses, and the apparent inexpressibility of emotional feelings. Our general response was to argue that emotions are usefully considered either as manifestations of appraisals of emotional significance or as ways of representing such appraisals. These arguments are summarized in our last four proposals, proposals 7–10.

Taken together, we think that the arguments we have presented provide a compelling answer to the question we set out to address in this chapter: When is cognition implicated in emotion? Always, sometimes, or never? Our answer, of course, is always.

Ten Proposals

1. *Appraisals are constituents of, and therefore also necessary conditions for, emotions.* Definitions of terms referring to complex phenomena such as emotion inevitably implicate theories of the phenomena. Hence, the tenets of appraisal theories are both conceptual and empirical. Just as particular pathogens both define and

cause particular diseases, so appraisals are constituents but also causes of emotions (although not of other affective conditions). This proposal is empirical only to the extent that it offers the kind of conceptual explicitness and clarity that allows empirical progress.

2. *Emotions are affective states with objects.* Emotions are always about something, and this "aboutness" is a useful way to distinguish emotions from other affective states such as moods. Such intentional psychological states are cognitive in that the things they are about are necessarily represented, and representation is the essence of cognition. To deal with instances in which affective feelings precede cognitive appraisals, we characterized moods as feelings states without salient objects and emotions as feelings states with objects. The fact that moods lack salient objects means that moods may be experienced as information about other suitable objects, which can then contribute to appraisals that create genuine emotions.

3. *There are two routes to emotional appraisal* (reinstatement and computation). Importantly, we not only have the on-line computation of a current situation with respect to psychological sources of value, such as goals, standards, and attitudes, we also have the reinstatement of prior emotions when a current situation elicits appraisals (and hence emotions) typical of an earlier situation. The predominantly top-down, reinstatement source (together with its processing correlates) is relatively fast, but error prone. The predominantly bottom-up, "computed" source (and its correlates), tends to be slower but more reliable.

4. *These forms of appraisal parallel two kinds of categorization* (prototype and theory based). A current situation can be categorized as emotionally significant by virtue of its relation to past emotional situations. This prototype-based (case-based, examplar-based) mode of categorization can be contrasted with theory-based categorization in which the features of a current situation are (not necessarily consciously) mapped onto the defining features of particular emotions.

5. *The two routes to emotional appraisal and the two kinds of categorization are governed by two forms of reasoning* (associative and rule-based). Reinstated emotion (and prototype- or case-based emotion categorizations) may be supported by associative reasoning operating on the basis of perceptual similarity. Emotions elicited by on-line computations of appraisals (and theory-based emotion categorizations) may be supported by rule-based reasoning (which need not be conscious, explicit, or easily articulated).

6. *The two routes to emotional appraisal or categorization may serve different behavioral functions* (preparedness and flexibility). Preparedness, and the speed of action it enables, requires speed of processing. Categorization of current situations on the basis of the similarity of surface features to those of prototypic emotional situations can occur even before the identity of the stimulus has been established, its context processed, or appropriate emotional feelings generated (LeDoux, 1996). Flexibility of response is a second advantage conferred by emotion (Scherer, 1984). This is better achieved by rule-based processing. When preparation is accompanied by subjective experiences, emotions provide a mental way station. This way station provides an alternative to direct behavioral expression, allowing relevant environmental and memorial information to be entertained.

7. *The fact that some components of an emotion can be triggered before full awareness of its cause does not conflict with a cognitive view.* Recent experiments

(e.g., LeDoux, 1996) are sometimes interpreted as demonstrating that emotions can be precognitive events because the experiments show that fear-relevant behavioral activation can occur before awareness of the cause and before feelings can be generated. However, the cognitive view maintains only that the trigger for emotional processes lies in the representation of the significance of a stimulus rather than in the stimulus itself. The experiments in question simply suggest that these representations can be widely distributed in the information processing system, so that they may be partially processed in one part of the brain before being fully processed in another (sensory cortex).

8. *Unconscious and conscious affect elicitation differ only in episodic constraints on emotional meaning.* The fact that affective responses can be elicited without awareness of the eliciting stimulus is sometimes interpreted as problematic for a cognitive view of emotion. However, an analysis of the subliminal paradigm suggests that this is not the case and that the power of unconscious stimuli is simply that the visual mask interferes with episodic information about the exposure event. As a result, semantic and affective meaning is broadly activated without the constraints on its applicability usually provided by episodic information about context. Such decontextualization of meaning is also evident in phobias and infantile amnesia when the hippocampus is suppressed or undeveloped (Jacobs & Nadel, 1985), when subjects are distracted during the processing of conscious primes (Martin et al., 1990), in mood and judgment experiments (Schwarz & Clore, 1983), and when the context of avoidance conditioning is forgotten (Hendersen, 1978). Although they may have many problematic effects, none of these phenomena require an extra-cognitive explanation.

9. *Automated, conditioned, imitated, and reinstated emotions are all manifestations of reinstated appraisals.* When some (not necessarily conscious) aspect of a situation reinstates emotions from the past, it is the meaning of the prior situation, not the emotion that is activated in memory. Then, as always, emotions occur automatically when their cognitive eliciting conditions are satisfied. Once "compiled" (Anderson, 1982, 1987), however, the computations of the original appraisal program for that situation may be inaccessible, so that the emotional reaction may be difficult to explain and resistant to change.

10. *The experiential and motivational/behavioral manifestations of appraisals, although difficult to describe in language, can be communicated through connotative meaning.* Connotative meaning has a surprisingly direct relation to action (e.g., Heise, 1979) and is most naturally represented in people as feelings rather than as linguistically expressible propositions. Successful communication and comprehension of connotative meaning (including emotional meaning) is marked by the occurrence of complementary feelings in the other, just as successful communication and comprehension of declarative knowledge is marked by the formation in the other of relevant beliefs and propositions.

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Notes

1. The liking emotions also are subject to metaphorical extension as when, for example, people reported disgust at the idea of sexual relations between brothers and sisters (J. D. Haidt, personal communication, 5 November 1997).

2. This is not to say that emotions themselves can be unconscious. If, as we believe, emotions must have an experiential component, they must be felt, so one cannot be unaware of them (see also Ortony et al., 1988, pp. 176–178).

3. Interestingly, empirical research with humans (e.g., Öhman, this volume) demonstrating the activation of fear-specific physiological responses before any conscious awareness of the fear-related stimulus as yet leaves unanswered a key question: What are the boundary conditions of the aversive stimulus? For example, when in these studies, spider phobics respond with increased skin conductance to subliminally presented slides of a tarantula, we still have no idea under what conditions the effect disappears. We do not know how spiderlike the image must be, and in what respects. Experiments to address this question would provide valuable information about the nature of the unconsciously accessed representation.

4. Apart from the neurological considerations, a proponent of a noncognitive view might argue that if fear of snakes is innate, as implied by its universality among primates, then it would be an example of a noncognitive emotion. But, despite its universality among primates, fear of snakes is apparently not innate. Rather, what is innate is the readiness to learn such a fear (Mineka et al., 1984). Thus, when confronted by a snake, the trigger for fear is not merely the snake, but the threat meaning of snakes learned from others early in life.

References

Ainsworth, M. D. S., Blehar, M. C., Waters, E. & Wall, T. (1978). *Patterns of Attachment.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Alloy, L. B. & Abramson, L. Y. (1979). Judgment of contingency in depressed and nondepressed students: sadder but wiser. *Journal of Experimental Psychology: General, 108*, 441–485.

Anderson, J. R. (1982). Acquisition of cognitive skill. *Psychological Review, 89*, 369–406.

Anderson, J. R. (1987). Skill acquisition: compilation of weak-method problem solutions. *Psychological Review, 94*, 192–210.

Arnold, M. B. (1960). *Emotion and Personality*. New York: Columbia University Press.

Averill, J. R. (1980). A constructivist view of emotions. In R. Plutchik & H. Kellerman (Eds), *Emotions: Theory, Research, and Experience*, vol. 1 (pp. 305–339). New York: Academic Press.

Bandura, A. (1973). *Aggression: A Social Learning Analysis*. Englewood Cliffs, NJ: Prentice-Hall.

Bargh, J. (1997). Automaticity in everyday life. In R. S. Wyer (Ed), *Advances in Social Cognition*, vol. 10 (pp. 1–61). Hillsdale, NJ: Lawrence Erlbaum Associates.

Bechara, A., Damasio, A. R., Damasio, H. & Anderson, S. (1994). Insensitivity to future consequences following damage to human prefrontal cortex. *Cognition, 50*, 7–12.

Bowlby, J. (1969). *Attachment and Loss*, vol. 1. *Attachment*. New York: Basic Books.

Bornstein, R. F. (1992). Inhibitory effects of awareness on affective responding: implications for the affect-cognition relationship. In M. Clark (Ed), *Emotion: Review of Personality and Social Psychology*, vol. 13 (pp. 235–255). Newbury Park, CA: Sage.

Boyd, R. (1993). Metaphor and theory change: what is a "metaphor" a metaphor for. In A. Ortony (Ed), *Metaphor and Thought*, 2nd ed (pp. 481–532). New York: Cambridge University Press.

Caccioppo, J. T., Priestler, J. R. & Berntson, G. G. (1993). Rudimentary determinants of attitudes II: Arm flexion and extension have differential effects on attitudes. *Journal of Personality and Social Psychology, 65*, 5–17.

Clore, G. L. (1992). Cognitive phenomenology: feelings and the construction of judgment. In L. L. Martin & A. Tesser (Eds), *The Construction of Social Judgment* (pp. 133–164). Hillsdale, NJ: Lawrence Erlbaum Associates.

Clore, G. L. (1994a). Why emotions are felt. In P. Ekman & R. J. Davidson (Eds), *The Nature of Emotion: Fundamental Questions* (pp. 103–111). New York: Oxford University Press.

Clore, G. L. (1994b). Why emotions require cognition. In P. Ekman & R. J. Davidson (Eds), *The Nature of Emotion: Fundamental Questions* (pp. 181–191). New York: Oxford University Press.

Clore, G. L. & Ketelaar, T. (1997). Minding our emotions: on the role of automatic, unconscious affect. In R. S. Wyer (Ed), *Advances in Social Cognition*, vol. 10 (pp. 105–120). Hillsdale, NJ: Lawrence Erlbaum Associates.

Clore, G. L. & Ortony, A. (1991). What more is there to emotion concepts than prototypes? *Journal of Personality and Social Psychology, 60*, 48–50.

Clore G. L., Ortony, A. & Foss, M. A. (1987). The psychological foundations of the affective lexicon. *Journal of Personality and Social Psychology, 53*, 751–766.

Clore, G. L., Schwarz, N. & Conway, M. (1994). Affective causes and consequences of social information processing. In R. S. Wyer & T. Srull (Eds), *The Handbook of Social Cognition*, 2nd ed (pp. 323–417). Hillsdale, NJ: Lawrence Erlbaum Associates.

Coren, S. (1994). *The Intelligence of Dogs*. New York: The Free Press.

Damasio, A. R. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Putnam.

Davidson, R. J. (1992). Anterior cerebral asymmetry and the nature of emotion. *Brain and Cognition, 20*, 125–151.

Devine, P. G. (1989). Stereotypes and prejudice: their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5–18.

Draine, S. C. (1997). Analytic limitations of unconscious language processing, (doctoral dissertation). University of Washington, Seattle.

Fehr, B. & Russell, J. A. (1984). Concept of emotion viewed from a prototype perspective. *Journal of Experimental Psychology: General, 113*, 464–486.

Foa, U. G. & Foa, E. B. (1974). *Societal Structures of the Mind*. Springfield, IL: Charles C. Thomas.

Frank, R. H. (1988). *Passions Within Reason: The Strategic Role of the Emotions*. New York: Norton.

Freud, S. (1900[1953]). The interpretation of dreams. In J. Stachey and A. Freud (Eds), *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, vol. 5. London: Hogarth Press.

Frijda, N. H. (1986). *The Emotions*. New York: Cambridge University Press.

Frijda, N. H., Ortony, A., Sonnemans, J. & Clore, G. L. (1992). The complexity of intensity: issues concerning the structure of emotion intensity. In M. Clark (Ed), *Emotion: Review of Personality and Social Psychology*, vol. 13. Newbury Park, CA: Sage.

Gasper, K. & Clore, G. L. (1998). The persistent use of negative affect by anxious individuals to estimate risk. *Journal of Personality and Social Psychology, 74*, 1350–1363.

Gollob, H. F. (1974). The subject-verb-object approach to social cognition. *Psychological Review, 81*, 286–321.

Greenwald, A. G., Draine, S. C. & Abrams, R. L. (1996). Three cognitive markers of unconscious semantic activation. *Science, 273*, 1699–1702.

Hebb, D. O. (1949). *The Organization of Behavior*. New York: Wiley.

Heise, D. R. (1979). *Understanding Events: Affect and the Construction of Social Action*. New York: Cambridge University Press.

Hendersen, R. (1978). Forgetting of conditioned fear inhibition. *Learning and Motivation, 8*, 16–30.

Higgins, E. T., Rholes, W. S. & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology, 13*, 141–154.

Jacobs, W. J. & Nadel, L. (1985). Stress-induced recovery of fears and phobias. *Psychological Review, 92*, 512–531.

Keil, F. C. (1989). *Concepts, Kinds, and Cognitive Development*. Cambridge, MA: MIT Press.

Ketelaar, T. & Clore, G. L. (1997). Emotions and reason: proximate effects and ultimate functions. In G. Matthews (Ed), *Personality, Emotion, and Cognitive Science* (pp. 355–396). Advances in Psychology Series. Amsterdam: Elsevier Science Publishers North-Holland.

Kotovsky, L. & Baillargeon, R. (1994). Calibration-based reasoning about collision events in 11-month-old infants. *Cognition, 51*, 107–129.

Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. New York: McGraw-Hill.

Lazarus, R. S. (1994). Universal antecedents of the emotions. In P. Ekman & R. J. Davidson (Eds), *The Nature of Emotion: Fundamental Questions* (pp. 163–171). New York: Oxford University Press.

Leary, T. (1957). *Interpersonal Diagnosis of Personality*. New York: Ronald Press.

LeDoux, J. E. (1996). *The Emotional Brain*. New York: Simon and Schuster.

Lewicki, P. (1985). Nonconscious biasing effects of single instances of subsequent judgments. *Journal of Personality and Social Psychology, 48*, 563–574.

Mandler, G. (1984). *Mind and Body*. New York: Norton.

Martin, L. L., Seta, J. J. & Crelia, R. A. (1990). Assimilation and contrast as a function of people's willingness and ability to expend effort in forming an impression. *Journal of Personality and Social Psychology, 59*, 27–37.

Medin, D. L. & Ortony, A. (1989). Psychological essentialism. In S. Vosniadou and A. Ortony (Eds), *Similarity and Analogical Reasoning* (pp. 175–194). New York: Cambridge University Press.

Mineka, S., Davidson, M., Cook, M. & Keir, R. (1984). Observational conditioning of snake fear in rhesus monkeys. *Journal of Abnormal Psychology, 93*, 355–372.

Morgan, H. J. & Shaver, P. R. (in press). Attachment processes and commitment to romantic relationships. In W. H. Jones & J. M. Adams (Eds), *Handbook of Interpersonal Commitment and Relationship Stability*. New York: Plenum.

Murphy, S. T. & Zajonc, R. B. (1993). Affect, cognition, and awareness: priming with optimal and suboptimal stimulus exposures. *Journal of Personality and Social Psychology, 64*, 723–739.

Needham, A. & Baillargeon, R. (1993). Intuitions about support in 4.5-month-old infants. *Cognition, 47*, 121–148.

Neumann, R. & Strack, F. (1998). Approach and avoidance: the influence of proprioceptive

and exteroceptive cues on encoding of affective information. Unpublished manuscript, University of Würzburg, Germany.

Nisbett, R. E. & Wilson, T. D. (1977). Telling more than we can know: verbal reports on mental processes. *Psychological Review, 84*, 231–259.

Oatley, K. & Johnson-Laird, P. N. (1987). Towards a cognitive theory of the emotions. *Cognition and Emotion, 1*, 29–50.

Öhman, A. (1986). Face the beast and fear the face: animal and social fears as prototypes for evolutionary analyses of emotion. *Psychophysiology, 23*, 123–145.

O'Keefe, J. & Nadel, L. (1978). *The Hippocampus as a Cognitive Map*. New York: Clarendon Press.

Ortony, A. (1990). *The cognition-emotion connection*. Paper presented at the American Psychological Association, Boston, August 1990.

Ortony, A. & Clore, G. L. (1989). Emotions, moods, and conscious awareness. *Cognition & Emotion, 3*, 125–137.

Ortony, A., Clore, G. L. & Collins A. (1988). *The cognitive structure of emotions*. New York: Cambridge University Press.

Ortony, A., Clore, G. L. & Foss, M. A. (1987). The referential structure of the affective lexicon. *Cognitive Science, 11*, 341–364.

Osgood, C. E. (1969). On the whys and wherefores of E, P, and A. *Journal of Personality and Social Psychology, 12*, 194–199.

Osgood, C. E., Suci, G. J. & Tannenbaum, P. H. (1957). *The Measurement of Meaning*. Urbana, IL: University of Illinois Press.

Panksepp, J. (1998). *Affective Neuroscience: The Foundations of Human and Animal Emotions*. New York: Oxford University Press.

Parkinson, B. (1997). Untangling the appraisal-emotion connection *Personality and Social Psychology Review, 1*, 62–79.

Pennebaker, J. W. (1991). *Opening up: The Healing Power of Confiding in Others*. New York: William Morrow & Co.

Reisenzein, R. (1998). A theory of emotional feelings as meta-representational states of mind. Unpublished manuscript, University of Bielefeld, Germany.

Robinson, M. (1998). Dual processes in the cognitive elicitation of emotion. *Cognition and Emotion, 12*, 667–696.

Rosch, E. (1973). Natural categories. *Cognitive Psychology, 4*, 328–350.

Roseman, I. J. (1984). Cognitive determinants of emotion: a structural theory. In P. Shaver (Ed), *Review of Personality and Social Psychology*, vol. 5. *Emotions, Relationships, and Health* (pp. 11–36). Beverly Hills, CA: Sage.

Ross, B. H. (1987). This is like that: the use of earlier problems and the separation of similarity effects. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 13*, 629–639.

Rusbult, C. E. (1980). Commitment and satisfaction in romantic associations: a test of the investment model. *Journal of Experimental Social Psychology, 16*, 172–186.

Rusbult, C. E. (1983). A longitudinal test of the investment model: the development (and deterioration) of satisfaction and commitment in heterosexual involvements. *Journal of Personality and Social Psychology, 45*, 101–117.

Russell, J. A. (1991). In defense of a prototype approach to emotion concepts. *Journal of Personality and Social Psychology, 60*, 37–47.

Scherer, K. R. (1984). On the nature and function of emotion: a component process approach. In K. R. Scherer & P. Ekman (Eds), *Approaches to Emotion* (pp. 293–317). Hillsdale, NJ: Lawrence Erlbaum Associates.

Schwarz, N. & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being:

Informative and directive functions of affective states. *Journal of Personality and Social Psychology, 45*, 513–523.

Schwarz, N. & Clore, G. L. (1988). How do I feel about it? Informative functions of affective states. In K. Fiedler & J. Forgas (Eds), *Affect, Cognition, and Social Behavior* (pp. 44–62). Toronto: Hogrefe International.

Schwarz, N. & Clore, G. L. (1996). Feelings and phenomenal experiences. In E. T. Higgins & A. Kruglanski (Eds), *Social Psychology: A Handbook of Basic Principles* (pp. 433–465). New York: Guilford Press.

Seligman, M. E. P. & Maier, S. F. (1967). Failure to escape traumatic shock. *Journal of Experimental Psychology, 74*, 1–9.

Shaver, P. R. & Clark, C. L. (1994). The psychodynamics of adult romantic attachment. In J. M. Masling & R. F. Bornstein (Eds), *Empirical Perspectives on Object Relations Theories* (pp. 105–156). Washington, DC: American Psychological Association.

Shaver, P. R., Schwartz, J., Kirson, D. & O'Connor, C. (1987). Emotion knowledge: further exploration of a prototype approach. *Journal of Personality and Social Psychology, 52*, 1–11.

Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin, 119*, 3–22.

Smedslund, J. (1991). The pseudoempirical in psychology and the case for psychologic. *Psychological Inquiry, 2*, 325–338.

Smelser, N. J. (1998). The rational and the ambivalent in the social sciences. *American Sociological Review, 63*, 1–16.

Smith, C. A. & Ellsworth, P. C. (1985). Patterns of cognitive appraisal. *Journal of Personality and Social Psychology, 48*, 813–838.

Smith, C. A., Griner, L. A., Kirby, L. D. & Scott, H. S. (1996). Toward a process model of appraisal in emotion. In N. Frijda (Ed) Proceedings of the Ninth Conference of the International Society for Research on Emotion (pp. 101–105). Toronto: ISRE.

Solomon, A. (1998). Anatomy of melancholy. *The New Yorker, 73*, no. 42 (Jan. 12), pp. 46–61.

Solarz, A. K. (1960). Latency of instrumental responses as a function of compatibility with the meaning of eliciting verbal signs. *Journal of Experimental Psychology, 59*, 239–245.

Srull, T. K. & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: some determinants and implications. *Journal of Personality and Social Psychology, 37*, 1660–1672.

Sullivan, H. S. (1953). *The Interpersonal Theory of Psychiatry*. New York: W. W. Norton.

Toates, F. M. (1987). Motivation and emotion from a biological perspective. In V. Hamilton, G. H. Bower & N. H. Frijda (Eds), *Cognitive Perspectives on Emotion and Motivation* (pp. 3–36). Dordrecht: Kluwer Academic.

Tomkins, S. S. (1979). Script theory: differential magnification of affects. In H. E. Howe, Jr. & R. A. Dienstbier (Eds), *Nebraska Symposium on Motivation*, vol. 26 (pp. 201–236). Lincoln: University of Nebraska Press.

Weber, E. & Clore, G. L. (1987). Anxiety and risk taking. Unpublished manuscript, University of Illinois at Urbana-Champaign.

Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review, 101*, 34–52.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548–573.

Wiggins, J. S. (1980). Circumplex models of interpersonal behavior. In L. Wheeler (Ed), *Review of Personality and Social Psychology*, vol. 1 (pp. 265–293). Beverly Hills, CA: Sage.

Wilson, T. D. & Lindsey, S. (1998). A model of dual attitudes. Unpublished manuscript, University of Virginia, Charlottesville.

Wilson, T. D. & Schooler, J. W. (1991). Thinking too much: introspection can reduce the quality of preferences and decisions. *Journal of Personality and Social Psychology, 60*, 181–192.

Zajonc, R. B. (1998). Emotions. In D. Gilbert, S. T. Fiske & G. Lindzey (Eds), *Handbook of Social Psychology*, 4th ed, vol. 1 (pp. 591–632). New York: McGraw-Hill.