

THE NATURE OF EMOTION

Fundamental Questions

Edited by
Paul Ekman
Richard J. Davidson

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Question 5: What Are the Minimal Cognitive Prerequisites for Emotion?

Why Emotions Require Cognition

GERALD L. CLORE

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The phrasing of this question betrays a view in which cognition and emotion are separate and distinct, rather than thoroughly intertwined, and a view in which it would be possible for the role of cognition to be minimal. My own view is that emotions are mental states, so that cognitive involvement is substantial, by definition. Asserting that emotions are mental states in no way implies that emotions are not also bodily states and legacies of our evolutionary past. It does not mean that emotional persons know why they are emotional, or that they cannot be surprised by their emotions. It requires only that emotion be seen as part of a larger information-processing system. A variety of valid answers might be given to this question, but the adequacy of each would seem to depend on certain assumptions. These include assumptions about *the situation* in which the emotion is to occur, the *definition of emotion*, the *implicit model of emotion elicitation*, and the *particular emotion* in question. I will discuss each of these considerations briefly.

The Situation

Processing and Knowledge Prerequisites

A prerequisite for emotion is that a situation be perceived as positive or negative for one's concerns. This is true of all emotions; and if a reaction is not positive or negative, then it cannot be a genuine emotion (Clare & Ortony, 1988; Ortony, Clare, & Collins, 1988). If one accepts a view in which valence is a necessary feature of emotion, then it would follow that the conditions for generating such positive or negative evaluations might also be prerequisites. But the conditions required to arrive at such evaluations turn out to depend on the kind of situation one is confronted with.

In some situations, the minimum processing required to generate an affective reaction may be extensive, conscious, and deliberative. For business executives to determine how they feel about revisions in the tax code surely requires extended

cognitive processing. At the other extreme, however, reacting to a highly charged symbol, like a swastika, would presumably involve much less processing. But even in that situation, one's reaction might be contingent on inferences about who was displaying the swastika and why. Also, one would need to make some mental connection between the symbol and what one knows about the horror that it represents.

In many situations, some of the usual processing steps may be omitted, as when one adopts the evaluations of others or when one retrieves prior evaluations of one's own. But such shortcuts merely allow one to take advantage of the cognitive processing done by others or by oneself at a previous time; they do not alter the assertion that emotions require cognitive appraisals of situations as positive or negative. Similarly, the fact that emotions may occur quickly or that one can be surprised by one's emotional reaction also does not diminish the cognitive contribution, since the requisite computations generally occur outside of awareness.

Less obvious than the processing requirements for emotion are the knowledge requirements. When appraisals are made quickly without much bottom-up processing, they often require correspondingly more top-down processing. In a game of chess, for example, generating an affective reaction to a move by one's opponent requires a lot of knowledge. For that matter, vast stores of knowledge are needed to cope with even the simplest of everyday situations, unless one encounters only one situation over and over again. One of the great contributions of cognitive psychology during the last 25 years has been to discover the importance of stored knowledge in the appropriate execution of even the most mundane behavior. Designers of robotic systems, for example, have succeeded only when their robots are dedicated to repetitive tasks in impoverished environments. One problem is that there is no way to give robots the world knowledge that even small children have at their disposal. This obstacle is crucial, because even if the robots had all the physiological and expressive machinery of the most emotional person, they would remain stonyfaced and impassive to everything that happened to them. This is true because a minimal cognitive prerequisite for emotion is the world knowledge required for things to have meaning. Only then can things take on positive or negative value.

Quasi-Emotions Without Cognitive Mediation

Situations characterized by little or no cognitive processing often include only components of emotion rather than emotions as such. In search of a situation involving emotion but not requiring access to world knowledge, one might consider examples involving sudden fright. Suppose someone were to leap out and say "Boo!" unexpectedly or clap their hands near someone's ear when the person was lost in thought. Would the unsuspecting victim react with fear before accessing any world knowledge? I am inclined to say no. It is true that motorically, physiologically, and in terms of facial expressive behavior the person might look emotional, but such reactions might be better classified as part of a startle reflex than as the emotion of fear. And startle, although it includes some emotion-like reactions, is not generally

seen as an emotion. These reactions might well lower one's threshold for fear, but they would not by themselves constitute fear.

The same problem may arise in cases of stimuli believed to have innate emotional potential. Chickens, for example, are said to have an innate fear of chicken hawks. The sight of the short-necked silhouette of a hawk has been reported to release innate avoidance responses. This kind of example requires, however, that one assume that the avoidance behavior is mediated by an emotional state rather than being a reflex or fixed action pattern (cf., Mandler, 1984). To the extent that the avoidance appears to be a reflex or fixed action pattern, then emotion is not required. Scherer (1984), for example, has an excellent discussion of how the evolutionary emergence of emotion brought with it behavioral flexibility, a great advantage over the limitations of reflexes and fixed action patterns (see also Toates, 1988).

What about stimuli that are innately pleasing, like sweet tastes, or displeasing, like physical pain? Surely, little cognitive processing is required to approach pleasure and avoid pain. True enough, but none of these—pleasure, pain, approach, or avoidance—are emotions. From a cognitive view, the term "emotion" would refer in this instance to the reaction of being *pleased* or *displeased* at the experience of physical pleasure or pain, not to the raw experience of physical pleasure or pain itself.

Other examples of minimal cognitive involvement could include instances in which the weather makes someone depressed. Some of our own research shows that people tend to be less happy on cold and rainy spring days than on warm and sunny ones (Schwarz & Clore, 1983). However, this example also does not establish emotion without cognition. The weather presumably elicits certain physiological reactions that are experienced as sad feelings, but since they have no object, what is elicited by the weather is a mood rather than a specific emotion. There is general consensus that emotions are intentional, which in the philosophical use of the term means that they must be about something (Harré, 1986).

Still other examples of minimal cognitive involvement might include instances in which the characteristic feelings and physiological responses of emotions are triggered simply by making emotional facial expressions (e.g., Strack, Martin, & Stepper, 1988), listening to emotional music (Kenealy, 1988), or watching someone else react emotionally. These are all intriguing phenomena that are potentially informative about the emotional cycle, but they too do not demonstrate emotion without cognitive mediation. Whatever feelings and physiological responses are produced directly by these noncognitive means may be just that—feelings and physiological responses. Even though these are constituents of emotion and may trigger or amplify emotions, they are not emotions by themselves.

Some of the examples mentioned above—being startled, deprived of sunlight, experiencing distinctive facial and physiological feedback—do appear to lower the threshold for the elicitation of emotions. That is, they may activate related mental content or make one vigilant for stimuli that become objects of emotions. But the elicitation of part of an emotion is not itself an emotion, even if it causes an emotion to follow. The fact that emotion-relevant physiology, feeling, or expression can be made to occur by manipulating aspects of the well-integrated emotion system ought not to distract us from the cognitive nature of emotion.

It may seem like semantic gerrymandering to make such fine distinctions about when a reaction does and does not constitute an emotion, but it is not. The task for emotion theory is to arrive at a coherent view of emotion that allows us to use emotion terms in a consistent and meaningful way. The goal is to be able to account for relevant phenomena without changing definitions to accommodate unusual cases. I believe that the current view has the advantage that it is coherent, and that its terms can be used consistently.

Implicit Definitions of Emotion

A question of enduring importance in the study of emotion concerns how to characterize emotion in a way that is both precise and captures what is meant in everyday uses of the term. In an effort to do this, Andrew Ortony and I conducted an analysis of 600 putative emotion terms (Clare & Ortony, 1988). The goal was to arrive at a principled basis on which to determine the words in English that do and do not refer to emotions. The general characterization we arrived at is that emotion terms refer to *internal mental states that are primarily focused on affect* (where "affect" simply refers to the perceived goodness or badness of something). Poor examples of emotion terms generally fail to satisfy one or more of these critical conditions. Some of the rejected terms refer to external conditions (e.g., abandoned) rather than to internal conditions, some refer to bodily states (e.g., tired) rather than to mental states, and some do not refer to states at all (e.g., faithful). Some words did not qualify because the states on which they focused are behavioral states (e.g., cowering) or cognitive states (e.g., confused) rather than affective states (e.g., happy). As a result of this research, a subset of about 200 affective terms was isolated (Clare, Ortony, & Foss, 1987). This study made it clear that good examples of emotion terms do not refer directly to events, bodily reactions, feelings, or behavior, but to mental events with relevance to all these things.

Conceptions of Emotion Based on Physiology and Feelings

Although I argue for the necessity of cognition in emotion, different assumptions can follow from analyses that define emotions on the basis of physiology or distinctive feeling states rather than on the basis of appraisal. Gray (1971), for example, has outlined the kinds of mechanisms in the nervous system that might be responsible for some emotions, including the positive emotions, the active negative emotions, such as anger, and the passive negative emotions, such as fear. If localization of specific emotions could be made, and emotions were to be specified solely at the physiological level, then it would follow that activation of the physiology underlying specific emotions could give rise to emotional feelings and emotional behavior without any cognitive appraisals whatsoever.

The same conclusion might also be reached from a different starting point. Oatley and Johnson-Laird (1987) argue that basic emotions are defined by the occurrence of distinctive feeling states. Theirs is a cognitive account of emotion, but by reducing

basic emotions to particular feeling states, their position would seem to allow emotions to occur whenever these feelings are experienced, regardless of how they are triggered. Like a position based solely on physiological criteria, this position too would include as emotions feelings generated artificially by electrical stimulation, hormone injection, or some other noncognitive means whereby the feelings lack their appropriate signal value.

Conceptions of Emotion Based on Appraisal

From my own perspective, neither physiology nor feeling states provide an optimal starting place for a characterization of emotion. To be an emotion, feelings must signify the results of an appraisal of some kind (Ortony & Clare, 1989). Sadness is not simply a particular kind of feeling, but a particular kind of feeling for a particular kind of reason. Diseases also typically involve particular physical and experiential symptoms, but the concept of disease is appropriate only if those symptoms are assumed to have particular causes. In the case of emotions, the valid use of the concept depends on the feelings having emotional causes. A patient complaining of a tight feeling in the chest, for example, is experiencing a panic reaction only if the feeling is caused by fearful preoccupations, not if it is caused by a heart attack.

An example provided by Ortony and Clare (1989) illustrates this point. Imagine an experiment in which electrical stimulation of some region of the brain gives rise to feelings of anger. A subject in such an experiment might conclude that the reason he was having feelings associated with anger was because of the stimulation from the electrodes. The subject might say, "This is just the *feeling* of anger. I presume I have this feeling because of the electrical stimulation. I'm not really angry."

An experiment could only produce such results, however, for psychological states in which the experience is dissociable from other components, especially the cause. Thus, it could not be done for the feeling of a headache. Someone either does or does not have a headache and no verification is required. One cannot have the feeling of a headache while not really having a headache. Some terms refer simply to feelings, and some refer to feelings as symptoms of psychological states. The existence of these two kinds of feeling terms suggests that a definition of emotion solely in terms of feelings (or any other symptom) is inadequate. Emotion terms appear to refer to something beyond feelings, to psychological states of which feelings are perhaps a necessary but not a sufficient condition.¹

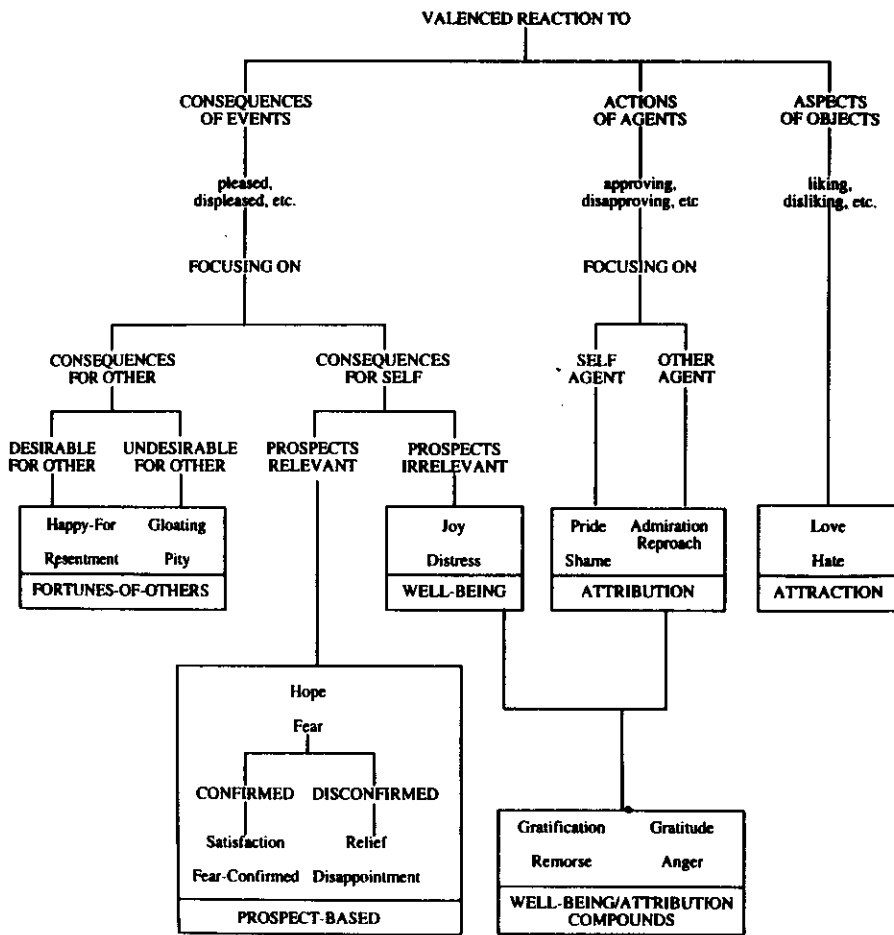
Cognitive Requirements for Appraisals

If the prerequisites for emotion include cognitive processes sufficient to make or retrieve an appraisal of a situation, how exactly are such appraisals made? A preliminary account has been proposed by Ortony, Clare, and Collins (Ortony et al., 1988), which I shall refer to as the OCC account. The OCC account is congenial to, but different from, that of a number of other cognitively oriented emotion theories (e.g., Abelson, 1983; Mandler, 1984; Roseman, 1984; Scherer, 1984; Smith &

Ellsworth, 1985; Weiner, 1985). It specifies the cognitive bases of emotion in general as well as the cognitive requirements for specific emotions.

Cognitive Structure

The theory proposes three broad classes of emotions distinguished in terms of the cognitive focus involved. One can focus on events, actions, or objects. Specifically, one can focus on the outcomes of events, the agency of actions, the attributes of objects, or on combinations. All emotions involve positive or negative (affective) reactions to one of these. If one focuses on events, the basic affective reaction is referred to as being *pleased or displeased about the outcomes of events*. Hope, fear, relief, disappointment, happiness, sadness, and related emotions appear in the left branch of the following figure.



The cognitive eliciting conditions for 22 emotion types according to Ortony, Clore, and Collins (1988).

They are some of the ways of being pleased or displeased at the outcomes or possible outcomes of events. If one focuses not on events but on someone's actions, the relevant affective reaction is referred to as *approving or disapproving of the actions of an agent*. Pride, shame, admiration, and reproach appear in the middle branch of the figure. They are some of the ways of approving or disapproving of the actions of agents. Finally, when focusing on objects, the relevant affective reaction is to *like or dislike the attributes of an object*. Love, hate, and disgust appear in the rightmost branch of the figure. They are forms of liking or disliking the attributes of objects. Thus, according to the OCC account, there are three possible aspects of a situation on which one can focus, and the resulting emotion depends on which of these is taken. In addition, one can also simultaneously focus on two aspects of a situation. For example, gratitude and anger are ways both of being pleased or displeased about the outcome of an event and of approving or disapproving of relevant actions at the same time.

Whether one's affective reactions are positive or negative depends on perceptions of the goodness or badness of what one is focusing on. In the case of events, one has the affective reaction of being pleased only if one sees the outcome of events as *desirable*. In the case of actions, one has the affective reaction of approval only if one sees someone's action as *praiseworthy*. And in the case of objects, one has the affective reaction of liking only if one finds the attributes of an object *appealing*. These perceptions arise from a process of appraising the implications of a situation for one's personal concerns. And the kind of possible concern also varies with the focus. The outcome of events is appraised relative to one's *goals*, the actions of agents relative to one's *standards*, and the attributes of objects relative to one's *attitudes or tastes*.

According to the OCC account, three affective reactions (e.g., *pleased, approving, liking*) are based on three kinds of appraisals (e.g., *desirability, praiseworthiness, and appealingness*) of three kinds of things (*events, actions, objects*). And these three kinds of appraisals are made with respect to three kinds of cognitive structures (*goals, standards, attitudes*). All emotions can be seen as differentiated forms of these three general affective reactions – (1) *being pleased or displeased at the outcome of events that are appraised as desirable or undesirable for one's goals*, (2) *approving or disapproving of the actions of agents appraised as praiseworthy or blameworthy with respect to one's standards*, and (3) *liking or disliking the attributes of objects appraised as appealing or unappealing with respect to one's tastes or attitudes*.

A major aim of the theory is to use a consistent set of terms in a clear and precise way. To do this, some terms such as "pleased/displeased" or "desirable and undesirable event" take on specialized meanings. It should be noted that since emotions are states, the terms "liking" and "disliking" are used in the momentary sense of experiencing a feeling of liking or disliking rather than in the dispositional sense of having an attitude toward something. The emotion of love or hate, therefore, involves loving or hating something in the moment.

Virtual Cognitive Structure

The assumption that appraisals are made with respect to some sort of cognitive structures such as goals is standard for cognitive accounts of emotion. But a close

inspection of that assumption raises some questions. Is it reasonable, for example, to assume that a representation of everything to which a person aspires or in which a person believes is permanently stored, no matter how trivial? It may not be sensible to assume that we maintain in our heads an endless archive of all our possible goals, standards, and concerns. An alternative possibility is that we construct them as we need them. Of such a cognitive structure, the OCC account (Ortony, et al, 1988, p. 35) maintains that

... it seems more sensible to view it as an implicit or "virtual" structure. People behave as if there were such a representation. In fact, we suspect that many of the goals people have are constructed as and when needed, presumably as a result of inferential processes based upon relatively high-level, abstract aspirations, and relatively specific, local considerations.

The idea is that one has a variety of general goals, standards, and attitudes. These are cognitive prerequisites for emotion because without these structures nothing matters to the person. But these prerequisites, although we have referred to them as "cognitive structures," probably do not exist before the appraisal is made.

Presumably most of what we have stored are high-level, relatively nonspecific goals, standards, and attitudes, all of which have powerful generative capabilities. For example, if one has as a standard that people ought not to inflict needless pain, one presumably has implicitly (or sometimes explicitly) a host of instantiations of this standard such as that one ought not to harm animals, and so on (Ortony et al., 1988, p. 47).

People continually propagate inferences about the implications of specific situations in which they find themselves. If these inferences make contact with elements in the appraisal structure, then goals, standards, or attitudes are activated. When this happens, the situation is seen by the person as relevant to his or her concerns and the possibility of emotional reactions arise. If an emotional reaction does occur, then the nature and urgency of the perceived relevance of the situation to one's concerns will be reflected in the experience of the emotion. (This part of the process is discussed further in response to Questions 3 and 12.)

Thus, in the typical situation, the minimal cognitive prerequisites for emotion include a variety of processes, including the retrieval of stored knowledge relevant to interpreting the situation, the propagation of inferences about the implications of the situation, and the appraisal of the relevance of the situation for one's virtual structure of goals, standards, and attitudes.

Cognitive Prerequisites of Specific Emotions

General affective reactions require an appraisal that implicates one's goals, standards, or attitudes. Specific differentiated emotions, such as anger, fear, pity, or shame require that certain other cognitive distinctions also be made. These include such distinctions as whether the implications for one's goals have already been

realized or are only possibilities, whether the person responsible is oneself or another person, and so on. For example, *fear* is a differentiated form of "being displeased." The formal specification of fear in this system is "being displeased at the prospect of an undesirable event." To see what this means in the context of the figure on p. 186, follow the event-based branch. Assume one is focusing on the consequences for self (rather than for another), on the prospect of an event happening (rather than on an event that has definitely occurred), and on possible outcomes that are undesirable (rather than desirable). When these cognitive conditions exist, then the resulting affective reaction, if any, is a kind of fear emotion. In terms of the question posed, these eliciting conditions constitute the minimal cognitive prerequisites for the occurrence of fear. It is important to note that Figure 1 represents a logical and not a temporal structure. One does not first have a reaction of being pleased, for example, and then determine that the outcome about which one is pleased is one's own outcome rather than someone else's. Instead, the cognitive distinctions involved in particular emotions often occur simultaneously as features of a single perception.

The figure on page 186 gives the eliciting conditions for 22 emotion types. The emotions that share common eliciting conditions form groups (Fortunes-of-others emotions, Well-being emotions, Prospect emotions, Attribution emotions, Attraction emotions, Well-being-Attribution Compounds). It is not assumed that there are only 22 emotions. Presumably, the number of emotions that can be distinguished on some basis is large. Indeed, even these 22 emotion types encompass many emotion tokens—terms denoting specific states within the same type. The states denoted by these tokens may differ in several ways from others in the same type, but they all share the same general eliciting conditions.

Consider the Well-being emotions. This is a particularly large category, because it includes all states in which one focuses on events and is pleased or displeased at the desirable or undesirable outcomes for oneself. One might well find meaningful subtypes within this category, but many of them differ from each other mainly in the specific goal that is involved. For example, in the case of being distressed, one can grieve (be distressed at the loss of a loved one), be lonesome (distressed at being alone), be homesick (distressed at not being home), be lovesick (distressed at not being with a lover), and so on. Some well-being emotions may involve irrevocable losses, as in sadness, some may involve the interruption of subgoals on the way toward a larger goal, as in frustration. These various emotions may each have different implications but all share the same kind of eliciting conditions and hence are all considered for the present purposes as examples of the same emotion type, labeled for short "frustration" or "distress." The English terms given here as examples illustrate the kinds of emotions one might feel given a particular cognitive focus. The theory is not designed to sort words, however, but to systematize the emotion states referred to by such words.

The emotions in the figure are cognitively differentiated forms of one or more of the three affective reactions. They achieve their distinctiveness as they are cognitively constrained. The least cognitively differentiated are some of the object-based (Attraction) emotions. Disgust at the prospect of eating a cockroach (Rozin & Fallon, 1987), for example, would seem to require a minimum of cognitive involvement. Reactions of liking and disliking also seem to be experienced often as relatively

undifferentiated reactions. People are frequently at a loss to explain why they like or dislike something, giving as a reason simply that they do like or dislike it. Critics who write about art, literature, film, or restaurants may give lengthy descriptions of what they like or dislike, but their descriptions rarely illuminate aesthetic appreciation as such. Of course, the fact that it is difficult to articulate the cognitive bases of taste does not imply that there are none. Appreciating the harmony and grace of beautiful forms may involve a different set of criteria and a different mode of processing than other emotional reactions without being any less cognitive. There is an extensive literature on the cognitive structure of attitude. However, comparable work on taste is lacking, although complementing the original pioneering work of Berlyne (1971), are more recent cognitive analyses by Mandler (1982) and Ortony (1991).

Summary

Answers to questions about the minimal cognitive prerequisites for emotion depend on various assumptions. These might include assumptions about the situation, about the necessary conditions for emotion, about how emotions are elicited, and about which specific emotion is involved. It was argued that the minimal conditions in some situations might involve extensive cognitive processing and stored knowledge: In some situations the processes involved in making a bottom-up appraisal may be circumvented by retrieving the results of prior processing or learning the results of another's processing. Still other situations may require very little processing, although the resulting physiological, experiential, or behavioral reactions often do not constitute emotions as such.

It was argued that characterizations of emotion solely in terms of physiology or in terms of feeling states are inadequate. Like symptoms indicating a disease, these point to an emotion only when they have an appropriate cause. In the case of emotion, the symptoms need to be caused by a perception of a situation as personally significant in some way. Analyses of the language of emotion suggest that the best examples of emotion terms refer to mental events rather than to feeling and behavior *per se*.

Proposals about the cognitive structure of emotion (Ortony et al., 1988) were reviewed. The account specifies 22 emotion types in terms of their cognitive eliciting conditions. These emotion types are differentiated forms of three basic affective reactions. The nature of the affective reaction (pleased, approving, liking) depends on whether one focuses on events, actions, or objects. Emotions such as hope, fear, happiness, sadness, relief, and disappointment all reflect appraisals of the outcome of events as desirable or undesirable with respect to one's goals. Pride, shame, admiration, and reproach reflect appraisals of the actions of agents as praiseworthy or blameworthy with respect to one's standards. And such emotions as love, hate, and disgust reflect appraisals of the attributes of objects as appealing or unappealing with respect to one's attitudes or tastes. It was argued that the goals, standards, and attitudes on the basis of which appraisals are made are probably best thought of as virtual cognitive structures constructed as needed from quite general aspirations in combination with specific local considerations.

Finally, some of the cognitive distinctions that characterize specific emotions were described. It was suggested that object-focused (Attraction) emotions such as love and disgust appear to be the least elaborated by such cognitive distinctions. Much work remains to be done to illustrate the processes involved in emotions that depend on taste.

Note

1. To the extent that they conflict, the current argument that feeling is not a sufficient condition for emotion should take precedence over an earlier statement that "Feeling is not just a component of emotion, it is the emotion" (Clore & Ortony, 1984).