

## Basic Emotions: Can Conflicting Criteria Converge?

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The authors discuss some of the key points raised by Ekman (1992), Izard (1992), and Panksepp (1992) in their critiques of Ortony and Turner's (1990) suggestion that there are and probably can be no objective and generally acceptable criteria for what is to count as a basic emotion. A number of studies are discussed that are relevant to the authors' contention that a more promising approach to understanding the huge diversity among emotions is to think in terms of emotions being assemblages of basic *components* rather than combinations of other basic *emotions*. The authors stress that their position does not deny that emotions are based on "hardwired" biological systems. On the other hand, the existence of such systems does not mean that some emotions (such as those that appear on lists of basic emotions) have a special status. Finally, the authors note that Ekman, Izard, and Panksepp, in adopting different starting points for their research, arrive at rather different conclusions as to what basic emotions are and which emotions are basic. It is concluded that converging resolutions of these questions are improbable.

We start by emphasizing that our article (Ortony & Turner, 1990) had four main goals. First, we wanted to examine the evidence in favor of the claim that there exists a small set of "basic" emotions. Second, we wanted to ask what the criteria for membership in such a privileged set should be. Third, we wanted to question the theoretical utility of the notion of basic emotions. Fourth, we wanted to sketch an alternative way of thinking about emotions in which the basic elements would be not basic emotions, but components of emotions.

Rather than trying to deal one by one with the critiques of Ekman (1992), Izard (1992), and Panksepp (1992), we shall focus on some of the central issues of content that they raise. Thus, we tackle first the notion, suggested by both Ekman and Izard, that the existence of universal and unique facial expressions for some emotions supports the idea that these emotions are biologically basic. We then turn to Ekman's suggestion that the status of some emotions as basic is supported by physiological differentiation among the emotions. Next we discuss Panksepp's position that emotions are mediated by integrative brain systems. Finally, we address an issue raised by Izard, namely that basic emotions have unique and unchanging feeling states associated with them.

### Facial Expressions of Emotions

We do not (and did not) dispute the fact that there are universal facial expressions associated with certain emotions. On this issue, we differ from Ekman and Izard only in terms of how we interpret this evidence and in terms of which aspects of facial displays we consider to be of greatest scientific interest. The

research of Ekman and Izard focuses primarily on prototypical expressions of a small set of allegedly basic emotions (especially in their cross-cultural work that established the universality of certain emotions). For us, the fact that some integrated facial expressions are prototypical does not give them a special status in terms of reflecting mental states, particularly since such expressions nowhere near exhaust the full range of displays that are associated with mental states. In many cases, only a few components (and in some cases only one component) of facial displays are needed either to signal the corresponding feeling to an observer (Ekman, 1992, p. 551) or to evoke the feeling via facial feedback (Strack, Martin, & Stepper, 1988). We therefore think that adopting a componential approach may be a useful research strategy for studying emotions (even for those whose interests lie in the study of facial expressions) because it can provide a rich and subtle description of mental states as well as an interpretative framework for facial expressions that are not prototypical or that are mixes of components found in a number of different facial displays.

Primarily as an example of what an alternative, componential approach might look like, we proposed in our article (Ortony & Turner, 1990) a way in which facial displays of anger might be decomposed into hardwired components, and we cited a few studies that have examined such components (Cacioppo, Petty, & Morris, 1985; Smith, 1989). As the paucity of our references indicate, there is relatively little direct evidence about how such components might be interpreted because research has tended to focus on integrated facial displays. However, there is some indirect evidence. We present the evidence in the form of answers to four questions that relate to central assumptions of the basic emotions view of facial expressions.

First, given that some emotions are associated with prototypical expressions, should research concentrate on the relation between these emotions and such expressions, or is it also worth examining the components of emotions, perhaps especially those that are shared by emotions with different prototypical facial expressions? Consider two possible components of emo-

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tions. One component would be a tendency to approach an object, the other would be the contrasting tendency to avoid an object. It seems plausible to suggest that prototypical cases of fear probably involve an avoidance tendency, whereas those of love or happiness probably involve an approach tendency. Some emotions, such as anger, might have the tendency to approach in some instances (as in an angry attack), and in others, a tendency to avoid (as in angry flight). It has been proposed that patterns of brain activity discriminate between these two tendencies. Thus, Davidson (1984) has suggested that when an emotion involves an approach component, a pattern of relatively greater left anterior activation occurs, whereas if an avoidance component is involved, then right anterior activation is found. How do these components relate to "basic" emotions and to their associated facial expressions? A study by Fox and Davidson (1988) suggests an answer. In this study, infants displayed emotional facial expressions to a number of stimuli, such as being separated from their mothers. The authors classified a number of the expressions as angry or sad according to Izard's Maximally Discriminative Facial Movement Coding System (Izard, 1979). Fox and Davidson found that when these facial expressions occurred, the pattern of regional brain activity depended not on which expression it was (anger or sadness), but on whether the child cried. When the child cried, the pattern typical of avoidance tendencies occurred, and when the child did not cry, the pattern typical of an approach tendency was observed. Interestingly, the same pattern of regional brain activity found in anger and sadness in the absence of crying was also associated with the child's expression of joy at the approach of the mother.

These data suggest to us that there are at least two components of emotions (approach and avoidance tendencies) that are shared by such diverse emotions as anger, sadness, and joy, and that these components are distinct, identifiable, and behaviorally relevant. Most important, the same component can occur in the presence of a variety of facial expressions supposedly associated with very different "basic" emotions. We conclude that by focusing on "basic" emotions and their associated facial expressions, it is quite easy to miss important commonalities in emotions, and that there is much to be gained by moving the level of analysis down from basic emotions to components of emotions.

It might be argued in response to this that the two underlying emotional states that Fox and Davidson (1988) postulated to explain their data are simply parts of the same emotion system, and that the facial expression of sadness, for example, indicates the activation of the *system* rather than of some particular feeling state. This approach appears consonant with Panksepp's (1992) position on emotion systems, although not with that of Izard (1992) who claims that there is a single, invariant feeling associated with each "basic" emotion. However, the fact that the pattern of results found for sadness was also found for anger and joy is not encouraging for this view because, presumably, joy and anger involve the activation of very different systems than sadness. Therefore, the notion of integrated emotion systems cannot explain the data unless one argues that such systems give rise to dissociable components that can occur in a variety of different emotions. This, of course, is essentially the position we proposed in our article.

Second, do some facial displays mix components that can be found in other emotions in ways that are revealing about the mental state of the individual without necessarily implying the co-occurrence of a number of "basic" emotions? We think the answer is yes. An example of apparently mixed emotions occurs when neonates are constrained. They tend to respond with a facial expression that suggests anger and disgust, as well as pain (Stenberg, 1982). An analysis in terms of integrated "basic" emotions would imply that, at the very least, some form of both disgust and anger are being experienced by the neonate. We believe that the data are better understood in terms of a component shared by all three states, namely aversion, and that it is only later in development that this component may be differentiated into aversion resulting from contamination (eliciting disgust) and aversion resulting from blame (eliciting anger). That such differentiation may not be inevitable is suggested by data showing that in anger-type situations, individuals of the preliterate Dani culture express a blend of emotions including disgust (Heider, 1974).

Third, do some emotions have a single, prototypical facial expression or a set of facial expressions that bear a family resemblance to each other? The answer is probably yes for a number of emotions, such as sadness and anger, but the evidence in the case of contempt suggests that there are some emotions for which the answer is no. In fact, the facial expression of contempt suggested by Ekman is only one of several proposed by Izard (Ekman & Friesen, 1986, 1987; Izard & Haynes, 1987), and each has presented evidence in support of the expressions he describes. We see no way in which this kind of disagreement can be resolved empirically, notwithstanding our critics' admonitions for empirical resolutions. However, we do think disagreements about how contempt is expressed facially could be resolved if one considered the possibility that there is no single prototypical facial display or set of prototypical displays for contempt. Then the differences among the facial displays could be readily accounted for in terms of different emotion components, so that aspects of the facial displays, such as a sneer, head tilt, or raised eyebrow could be associated with more discrete affective states such as scorn, disdain, outrage, and so on (see also Fridlund, 1991). Despite Ekman's (1992, p. 551) suggestion, such an analysis does not imply that every single muscle involved in a facial expression must be associated with an internal state. Clearly, some states may be signaled by a combination of different muscle changes, and some single muscle changes may not be associated with any state at all.

Fourth, can analyses at the level of components of facial expression provide useful information about emotional states, or does one require information about integrated facial displays in order to infer an emotional state? An elegant study by Strack et al. (1988) provides a clue to the kind of answer that might emerge. The authors asked subjects to hold a pencil either between their teeth or between their lips while looking at amusing cartoons. The former position activates the zygomatic muscle (thought to be part of happiness expressions), and the latter position activates the orbicularis oris (part of anger expressions). Activation of the zygomatic muscle (by holding the pencil between the teeth) led to greater feelings of amusement than did activation of the orbicularis oris (by holding it between the lips).

We assume that this finding would not trouble either Ekman or Izard. Both have proposed facial coding schemes that are open to the possibility that some components of an integrated facial expression may be better indicators of an underlying emotional state than others, and both appear to accept the idea that activation of one component of a facial expression may be associated with a basic emotion. However, we do not interpret Strack et al.'s (1988) data as showing the existence of basic emotions with integrated facial expressions. We interpret them as showing that even small, discrete components of facial expressions (e.g., of "felt" smiles) can be associated with quite specific feelings, and that an analysis of such components may tell us more about underlying emotional states than an analysis of prototypical facial expressions.

Evidence of the kind we have briefly reviewed above suggests to us that a number of the central assumptions of the basic emotions view of facial expressions warrant critical analysis. Our position is that analyses of facial expression at the level of components of emotions not only can make good sense of the data but also encourages the more fine-grained analyses of mental states that are necessary to account for the complexities of emotional behavior.

### Physiological Responses

Ekman (1992) devotes considerable space to describing peripheral physiological responses that may differentiate among his basic emotions and refers more briefly to work showing differentiation in terms of regional brain activity. We have doubts about the reliability of the peripheral response data because the specific physiological patterns that Ekman discusses were not found reliably in early work on this topic (cf. Levenson, 1988), nor have they been found in more recent work conducted in independent laboratories (e.g., Geen, 1989; Stemmler, 1989). Given this history, we feel that differentiation of emotions by peripheral physiological responses is not yet sufficiently well established.

The unpublished results cited by Ekman (1992) on regional brain activity also fail to persuade us because they stand in contrast to published work from different laboratories showing that regional brain activity, although permitting differentiation between positive and negative emotions (or between approach and avoidance), does not permit differentiation within sets of positive or negative emotions (see Silberman & Weingartner, 1986, for a review).

However, for the sake of argument, let us assume that differential physiological patterning can be shown to occur in "basic" emotions. How would one interpret such data? The answer is not straightforward. Physiological responses can be elicited in conjunction with a wide variety of behaviors and mental states, many of them not emotional. Furthermore, even if one could show that it was an emotional state that correlated with physiological responses, this would still not be conclusive evidence in favor of a basic emotions view because one would need to establish that the physiological responses were due to the emotion itself rather than to dissociable components of it.

In fact, research that Ekman and his colleagues have conducted on differentiation among emotions in terms of regional brain activity (Davidson, Ekman, Saron, Senulis, & Friesen,

1990) not only fails to rule out a componential analysis, but actually supports such an analysis. The data are best understood not in terms of an invariant pattern of brain activity that occurs whenever the same "basic" emotion is experienced, as would be compatible with a basic emotions view, but rather in terms of a variable pattern, the nature of which is determined by the specific components that have been assembled to form the particular emotion. As already mentioned, the patterns of regional brain activity associated with approach and avoidance (Davidson, 1984) are not intrinsically linked to particular emotions, much less to a particular "basic" emotion. Anger sometimes involves an approach component and at other times an avoidance component. Thus, anger should have different patterns of regional brain activity in different contexts (Davidson et al., 1990). Happiness, too, can sometimes exhibit approach tendencies and sometimes not (Fox & Davidson, 1988; Ekman, Davidson, & Friesen, 1990).

Our conclusion is that if the evidence is indeed most readily interpreted as showing that physiological indices are reliably associated with separable components of emotions (such as an approach or avoidance tendency), then searching for invariant patterns of physiological activity that might differentiate among "basic" emotions may not be a very fruitful activity.

Ekman, Izard, and Panksepp would perhaps reply that although there are indeed some dissociable components of emotions, there are others that are a necessary part of certain emotions, and that to the extent that there is differentiation in terms of physiological concomitants of these essential components there is differentiation among emotions. Ekman (1992), for example, argues that the distinctive pattern of autonomic nervous system activity in emotions such as fear and anger is due to the association of these emotions with certain adaptive motor actions, such as flight in the case of fear. We agree that the peripheral physiological patterning found in a specific emotional experience is probably due primarily to associated motor actions or action tendencies. But again, the question we ask is whether these actions are linked to the emotion *per se*, or do they only appear in some instances of the emotion—those in which the motor action is perceived to be appropriate and possible (see Lang, Bradley, & Cuthbert, 1990, for a related point about strategic versus tactical components of emotions). In fact, when the context is experimentally manipulated so that different action tendencies are possible or likely, quite different physiological responses can be observed, even though the emotional state appears to be the same. For example, Iwata and LeDoux (1988) have shown that when the fear network is activated by classical conditioning, presentation of the conditioned stimulus evokes decreases in blood pressure and heart rate in restrained rats, but increases in rats that are free to move. This is presumably related to the fact that the same stimulus elicits freezing in confined environments and flight in open spaces where escape is possible.

The differences between our views and those of Panksepp, Ekman, and Izard have implications for research strategy on the topic of physiological differentiation of emotions. Specifically, we think it is important to distinguish between those physiological responses that are due to nonessential components of the emotion and those that are essential to it. Consider the case of verbal activity as a nonessential component. Left

parietal activation tends to be greater during such activity (e.g., Ehrlichman & Wiener, 1979). Instances of happiness that involve verbal processes would therefore show this pattern of regional brain activity, whereas instances that do not involve such processes would not (Ekman et al., 1990). Because of this, cases of happiness that involve verbal activity can always be differentiated physiologically from cases of other emotions that do not have this component (e.g., instances of disgust). Such evidence does not, of course, conclusively establish that happiness per se can be physiologically differentiated from disgust per se. It might merely indicate the presence of a particular component in a specific instance of an emotion. The published work that Ekman (1992) cites to support differentiation of emotions by physiological responses uses a variety of techniques to induce emotions, including the posing of facial expressions, and so ensures that the specific instances of the emotions are fairly representative ones. However, we still cannot be sure that whatever differentiation is found is not due to nonessential features that happen to occur frequently in the emotions in question. For example, crying is not essential to sadness, although it may well be a frequent component of it, and, as Fox and Davidson (1988) showed in the study discussed above, this nonessential component has important consequences in terms of physiological differentiation of emotions. It is therefore unfortunate that there seems to be no research that explicitly examines necessary versus nonessential components of emotions. We conclude that the question of how to interpret differences among emotions in physiological responses is still an open one.

Finally, even if there were reliable empirical evidence of physiological differentiation among certain emotions per se (and not just among those that happen to share nonessential components), we still think it would be premature to conclude that the emotions are basic. In order to draw this conclusion (that is, to give a special status to these emotions) one would need to show that physiological differentiation does not occur for "nonbasic" emotions, such as relief, disappointment, and nostalgia. This issue has not been addressed in the research cited by Ekman (1992), nor, as far as we know, in any other research. Were it to turn out, as we suspect it would, that nonbasic emotions could with equal ease (or equal difficulty) be physiologically differentiated, then such patterning could not serve to support the notion that certain emotions are basic.

In summary, the current evidence on physiological patterning is inadequate to support a basic emotions view. Such support would occur only if the patterning were independently replicable, if it occurred in a variety of contexts (especially ones that elicit different action tendencies), if it did not occur for nonbasic emotions, and if it could not be accounted for in terms of hardwired components (rather than hardwired emotions).

### Neural Basis of Emotions

In terms of the neural basis of emotions, our primary challenge (Ortony & Turner, 1990) was to the notion that there exists a small set of "basic" emotions in the sense of discrete emotions. We wrote "[existing research results] do not provide encouraging evidence for neural structures corresponding to recognizably different *discrete* [italics added] emotions. The research suggests not so much hardwired neural circuitry for *indi-*

*vidual* [italics added] emotions, but circuitry for emotion, or perhaps better termed response *systems*" (p. 320). Yet Panksepp (1992) views us as denying the existence of biologically basic emotion systems, thereby attributing to us a position that we explicitly rejected. Certainly, we would defer to his expertise and accept the proposition that such systems are not just response systems, but are also integrative systems. But Panksepp appears to go further. In addition to asserting there are a number of innate executive systems that "instigate and orchestrate the various facets of a coherent set of emotive responses" (p. 554), he also suggests that there are basic emotions that these systems mediate. Is Panksepp proposing both *basic emotion systems* and *basic emotions*, with the former underlying the latter? It is not clear how to answer this question because much of the time Panksepp appears to use "emotion systems" and "(basic) emotions" interchangeably. However, the claim that there exists a small privileged set of basic (discrete) emotions does not seem to be the thrust of Panksepp's article. Rather than taking the rhetorical reading of the title of our original article—a reading in which the emphasis is on the second occurrence of the word *basic* in "What's basic about basic emotions?"—Panksepp seems to focus on a somewhat different question—"What's basic about emotions?" He answers this question by appealing to the evidence for a number of biologically based executive systems in the brain. Apart from his occasional identification of these systems with basic emotions, we found Panksepp's responses to the questions we raised in our original article to be both constructive and illuminating. But nothing he says about these systems is incompatible with our proposal that emotions have components (some of which are basic). There must surely be a brain basis for such components.

Panksepp's (1992) discussion of the expectancy system is particularly fascinating. We can of course appreciate that if one views an expectancy system as one which "mediates anticipatory incentive processes" (p. 557), then that system could be regarded as intrinsically embodying positive valence. But that system either does or does not have something to do with the class of mental states that most people call *expectations*. If it does not (as we suspect Panksepp would have to admit), then there is no issue (except perhaps to ask whether, from a biological perspective, there is anything in common between expectations of positive versus negative outcomes). If it does, then the valence must reside in the perception/representation of the object of expectation, not in the expectation itself.

### Defining Features of Emotions

One of the questions we raised about the basic emotions view in our original article (Ortony & Turner, 1990) concerned what we viewed as its inability to provide a coherent account of the formation of new emotions out of "basic" ones (see also, Scherer, 1984, for a critique of what he calls "palette" theories). Few contemporary basic emotions theorists have seriously addressed this issue. We believe this is because there is no good way of getting from "basic" to complex emotions. In this section we briefly discuss Izard's theory as an illustration of another set of problems that the basic emotions view encounters when it attempts to explain the huge variety of emotional states in terms of a limited set of basic emotions.

In a section criticizing the “over-inclusiveness” of our conception of emotion, Izard (1992) complains that we “applied the term *emotion* to concepts ranging from anger and fear, which characterize a wide range of species, to relief, pride, envy, jealousy, and other language-dependent, uniquely human phenomena” (p. 562). All the terms in this list are called *emotions* in common usage, and we therefore see no reason to defend our examples. In contrast, Izard’s implicit definition of *emotion* is very different. He reserves the term for a few states that some others have called “basic” emotions, while labeling all other emotional states *affective-cognitive structures*. Thus, for Izard, relief and disappointment are not emotions because they are not “basic.” Instead, they are affective-cognitive structures.

Izard’s category of affective-cognitive structures is extraordinarily diverse. It appears to include, for example, relief, which refers to a single emotional state, and jealousy, which is ambiguous. Under one reading of *jealousy*, the term refers to a specific, momentary feeling state, whereas under another it refers to a disposition to behave, think, and feel in heterogeneous ways. Thus, under the latter reading, a jealous person might feel at one moment fear, the next sadness, later anger, and so on. In calling jealousy an affective-cognitive structure, Izard is apparently referring to both the state and the dispositional reading of *jealousy*. Izard blurs the important distinction between feeling states and dispositions when he categorizes both as affective-cognitive structures.

We prefer to classify emotion terms rather differently (see Ortony, Clore, & Foss, 1987). We would put in the category of emotions all specific and differentiable emotional states, including “basic” emotions such as happiness and “nonbasic” ones such as relief and (the momentary feeling of) jealousy. In the category of nonemotions would be dispositions, which do not refer to a single emotional state. We prefer this division to Izard’s, even though it produces a longer list of emotions, because the explanatory mechanisms for the two categories are clearly different: Explanations of dispositions must be very different from those of momentary feelings.

By excluding states such as jealousy and relief from the category of emotions, Izard avoids the need to explain how these “nonbasic” emotions might be created out of “basic” emotions such as sadness and happiness. According to Izard, they are not created at all; the feeling of a “basic” emotion such as happiness merely becomes associated with different images, memories, and the like, and so gives rise not to a different emotion but rather to the embedding of the same emotion in a different structure, one which does not change the feeling itself. That is, using Izard’s terminology, the feeling state is “invariant” (p. 564). The problem with this approach in our view is that it seems to define out of existence differences in the feelings associated with emotions such as disappointment and sadness, relief and happiness.

If “basic” emotions do not participate unchanged in new emotional states in the way Izard (1992) suggests they do and if a blending account of the formation of “nonbasic” emotions is not viable (for reasons we outlined in our original article), then we can see no method by which a basic emotions theory can account for the diversity of emotional experiences without postulating the existence of the kinds of dissociable components of emotions that we have suggested.

## Conclusion

Taken together, the three critiques, all by eminent emotion researchers, seem to us to underscore our original observation that there is great diversity across basic emotions theorists with respect to which emotions are claimed to be basic and what basic emotions are claimed to be. It seems that Ekman (1992) is committed to happiness, surprise, fear, sadness, anger, and disgust. Izard (1992) endows a rather different set of states including interest, fear, sadness, anger, guilt, shame, shyness, and disgust with this status, but he fails to commit himself to a full set, saying that his theory “is open to the question of the number of basic emotions and the best labels for them” (p. 562). Panksepp (1992) identifies the rage, fear, expectancy, and panic systems (p. 554), raises the prospect of four more, namely, joy, lust, acceptance, and dominance systems, and sometimes indicates that in addition to these systems there are some unspecified basic emotions that they mediate. Our problem is that we can see no independent, nonarbitrary way of adjudicating among these and similar claims so as to arrive at a defensible set of criteria. Without a stable set of criteria, it is not likely that we will find a stable set of basic emotions. The problem, as we see it, is that each theorist has his own preferred approach to understanding emotions—Ekman’s is the face, Izard’s are biosocial considerations, and Panksepp’s is the brain. Each approach seems to lead to a different set of basic emotions. When one compares the proposals of Ekman, Izard, and Panksepp, the prospect that they might converge either onto an agreed upon set of basic emotions, or onto a set of criteria for identifying such emotions, appears remote indeed. The main agreement between them is on a point that few would deny, namely, that there is a biological and evolutionary basis for emotions.

In conclusion, we acknowledge that a focus on “basic” emotions has been useful, for example, by motivating the development of techniques for the analysis of facial displays as guides to emotional states. Both Ekman and Izard have contributed substantially in this regard. Similarly, Panksepp has contributed substantially to our understanding of the neurobiology of emotions. However, we think that a focus on “basic” emotions helps little in addressing a wide array of important issues in the psychology of emotion. As we have already mentioned, we think that a basic emotions view has difficulty in accounting for the great variety of emotions experienced by people even in our own culture, let alone people in very different cultures. Also, the kind of basic emotions approach exemplified by Ekman and Izard draws our attention away from the many emotions that do not have a unique facial expression, emotions such as pride, admiration, and envy. These emotions are often important in understanding human experience and behavior, especially social behavior, yet it is difficult to talk about them in a detailed manner from within the basic emotions worldview. We believe that reducing emotional experience to the interplay of a small set of “basic” emotions, even if such a set could be identified and agreed upon, leaves us with an impoverished capacity to characterize the rich and diverse experience of emotions and with too few tools to provide an adequate account of the role of emotions in human life. It is also true that the kind of approach that we advocate has yet to be specified in sufficient detail to enable it to be subjected to rigorous empirical tests. However,

we have tried to show that there do exist data that are at least consistent with a componential approach, and this encourages us in our belief that the further development and testing of ideas along these lines is likely to move emotion research forward.

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