

What is Meant by Calling Emotions Basic

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Abstract

Emotions are discrete, automatic responses to universally shared, culture-specific and individual-specific events. The emotion terms, such as anger, fear, etcetera, denote a family of related states sharing at least 12 characteristics, which distinguish one emotion family from another, as well as from other affective states. These affective responses are preprogrammed and involuntary, but are also shaped by life experiences.

Keywords

affect program, autonomic nervous system, basic emotion, universal emotion

Question 1: How does a basic emotion differ from simply a discrete emotion?¹

The adjective “basic,” when used to describe emotions, embodies two main characteristics. One of these is that the emotions are discrete, that they can be distinguished fundamentally from one another. The data for discrete emotions includes facial, vocal, autonomic physiology, and study of the events that precede one or another emotion (Ekman & Davidson, 1994).

A discrete-emotions perspective does not necessarily require an evolutionary explanation of the origins of each emotion. Some discrete-emotions theorists have argued that our emotional repertoire consists of fundamentally different, but socially constructed, ways by which we react to universally shared stimuli (Parkinson, 1996). In this respect it is ontogeny, not phylogeny, which is responsible for any commonalities in each discrete emotion. It is our shared rituals and experiences as human beings, not evolutionary progress, which hone our shared emotional experiences.

The second characteristic embodied in the adjective “basic” is the view that emotions have evolved through adaptation to our surroundings. Though we are a species capable of enormous cognitive load, we are also endowed with biological mechanisms that allow us to react to fundamental life tasks—universal

human predicaments such as losses, frustrations, successes, and joys. Each basic emotion prompts us in a direction that, in the course of our evolution, has done better than other solutions in recurring circumstances that are relevant to our goals.

In addition to this phylogenetic contribution to the nature of each basic emotion, there is also an ontogenetic contribution, the product of social learning, very impactful early in life but with continuing contributions over the life course. The ontogenetic contribution influences attitudes about the experience of each emotion, cognitive representations of emotional experiences, coping responses for dealing with the emotion’s triggers, and triggers that more or less are consistent with the triggers that appraisal mechanisms are sensitive to as a result of our experience in our ancestral environment.

Question 2a: What is your list of basic emotions? Are all emotions basic, or just some? If some, how do you distinguish basic from nonbasic emotions? What is the relation of nonbasic emotions to basic emotions?

Before listing how many emotions there are, it is important to contextualize the basic emotions into families or groups. Each emotion is not a single affective or psychological state but rather a family of related states. The factors that connect each

member of the family are described in the explanation of basic emotion criteria that follows. The criteria that form the basis of an emotion family must, by definition, differ between emotion families—this is what allows us to distinguish one emotion family from another. Additionally, an emotion family is comprised of individual differences, or variations on the emotional *theme*. The theme is comprised of the characteristics unique to that family; the theme is what is influenced phylogenetically. The variations on that theme are the result of social experience. Thus the themes are the product of evolution, while the variations reflect learning.

An emotion is either basic, or it is another affective phenomenon saturated with but different from the emotions, such as a mood, an emotional trait, and emotional disorder, etcetera. Basic emotion theory captures what is unique about emotion, and what emotions have in common that distinguish them from other affective states. The characteristics found in most (nearly all) basic emotions are:

1. Distinctive universal signals.
2. Distinctive physiology.
3. Automatic appraisal.
4. Distinctive universals in antecedent events.
5. Presence in other primates.
6. Capable of quick onset.
7. Can be of brief duration.
8. Unbidden occurrence.
9. Distinctive thoughts, memories, and images.
10. Distinctive subjective experience.
11. Refractory period filters information available to what supports the emotion.
12. Target of emotion unconstrained.
13. The emotion can be enacted in either a constructive or destructive fashion.

In previous writings the first 11 characteristics have been described (Ekman, 2003). It is only recently when considering the possibility that familial compassion might be properly considered an emotion that it became apparent that for all the other emotions the target is not constrained to any specific type of person. By definition, in familial compassion the target is restricted to family members. The last characteristic, the 13th, arose in discussions with the Dalai Lama (Dalai Lama & Ekman, 2008). We rejected the notion that emotions such as anger or disgust were inherently destructive or negative, instead considering that any emotion can be enacted in a constructive or destructive fashion depending upon whether the episode led to further collaboration, and was of benefit in some sense to humanity, or not.

There is evidence for universality in the following seven emotions:

Anger: the response to interference with our pursuit of a goal we care about. Anger can also be triggered by someone attempting to harm us (physically or psychologically) or someone we care about. In addition to removing the obstacle

or stopping the harm, anger often involves the wish to hurt the target.

Fear: the response to the threat of harm, physical or psychological. Fear activates impulses to freeze or flee. Often fear triggers anger.

Surprise: the response to a sudden unexpected event. It is the briefest emotion.

Sadness: the response to the loss of an object or person to which you are very attached. The prototypical experience is the death of a loved child, parent, or spouse. In sadness there is resignation, but it can turn into **anguish** in which there is agitation and protest over the loss and then return to sadness again.

Disgust: repulsion by the sight, smell, or taste of something; disgust may also be provoked by people whose actions are revolting or by ideas that are offensive.

Contempt: feeling morally superior to another person.

Happiness: feelings that are enjoyed, that are sought by the person. There are a number of quite different enjoyable emotions, each triggered by a different event, involving a different signal and likely behavior. The evidence is not as strong for all of these as it is for the emotions listed above.

I expect that evidence will be found for the following ten enjoyable emotions:

Sensory pleasures: visual, auditory, tactile, gustatory, olfactory.

Amusement: the response to something found funny.

Relief: the response when something that was strongly arousing (often fear of harm) subsides.

Excitement: a very high-intensity response to novelty and challenge, often found when there is some risk. This emotion often merges with another emotion.

Wonder: the response to something incomprehensible, incredible but not frightening, a rarely felt emotion. When it combines with fear then the correct term is “awe.”

Ecstasy: or bliss, is a self-transcendent rapture, very intense but different from excitement.

Naches: a Yiddish word for the feeling a parent/caregiver, or teacher, feels when witnessing the achievement of their offspring.

Fiero: an Italian term for the emotion felt when meeting a difficult challenge. It may occur during a competition with others, or when alone, a difficult task is confronted and mastered.

Though they involve distinctly different triggers, some emotion researchers have treated *fiero* and *naches* as a single state of “pride” (Shiota, Campos, & Keltner, 2006; Tracy & Robins, 2004). Further research is required to see if these states affect our physiological and autonomic nervous system in distinctly different ways.

Schadenfreude: the German term for the emotion felt when you learn an enemy has lost or suffered.

Rejoicing: the response to witnessing unexpected acts of human goodness, kindness, and compassion.

Special Cases

Below are listed emotions that include most but not all of the 12 characteristics that distinguish emotions from other mental states. For each of these the missing characteristic is noted. Additional evidence is required via cross-cultural studies in order to call them basic emotions.

Guilt: the response when a person regrets having violated an agreement, principle, or value. It is uncertain whether it has a distinctive signal different from the family of sadness signals.

Shame: the response when a person feels that if their true nature was to be known, others would be repulsed. It is uncertain whether it has a distinctive signal different from the family of sadness signals.

Other emotion researchers have found that guilt and shame have unique expressions (Keltner, 1995); however, the evidence that these are distinctly different from sadness is inconclusive.

Embarrassment: the response when people feel they have broken a social rule, and also when a person has been praised. Although blushing occurs in dark-skinned people, it is not visible, thus depriving this emotion of a universally recognizable signal. There is some evidence that a sequence of actions over time, involving facial expression, gaze, posture, and hand movements can signal this emotion.

Envy: the response to another person's rewards which the envious person wishes to have. The evidence is not clear whether this feeling has many of the 12 characteristics shared by most emotions.

Familial compassion: the strong desire to relieve the suffering of family members. No other emotion is constrained in terms of the target. For example, it is possible to be angry at or afraid of anyone or anything. It is also not certain whether familial compassion has a signal different from members of the sadness family of expressions. Other forms of compassion may exist, but they suffer from another omission—they are not present in all humans. This is unfortunate for our species.

Mental states about which there is argument as to whether they are emotions:

Jealousy: involves three persons, the loved one, the rival, and the person who feels the jealousy. The jealous person may feel many different emotions, for example anger towards the loved one and/or the rival, fear of rejection by the loved one, sadness about the loss of the loved one's commitment, etcetera. I consider jealousy to be an *emotional scene*, with a particular plot and cast of persons. None of the emotions involves a cast of persons, or allows for a number of other emotions to be experienced. Also there is no evidence that jealousy has a unique distinctive universal signal.

Love: is an enduring attachment to a particular person, a child or lover for example. Many different emotions can be felt when one is in love. But the distinguishing characteristic is the commitment or attachment to the other person.

Hate: is an enduring state marked by anger towards a person, but not the acts of that person. Unlike anger, fury, or rage, it does not subside. Rather, hate persists over time and is easily called forth by any stimulus.

Interest: Although considered by some theorists to be an emotion, I consider it to be a cognitive state of focused attention.

Question 2b: What is the relationship between other affective states and basic emotions?

Other affective states do not possess universal, distinctive signals, nor is it certain that they have distinctive antecedent events. For example, a high incidence of anger-related signals within a certain period of time can suggest an irritable mood; a high incidence of joy-related signals over a lifetime can suggest a cheerful emotional trait. But the mood of irritability does not display a unique signal unrelated to the family of anger emotion expressions, nor does cheerfulness have a signal different from those evident in the enjoyable emotions.

There are emotions that do not appear to have a distinctive signal: shame, guilt, embarrassment, familial compassion, and envy. Although the evidence is not complete, we expect they will be found to have the other characteristics present in the other emotions.

Question 3: Does the existence of a basic emotion depend on the existence of a central organizing mechanism (something like an "affect program") or can a basic emotion be simply a patterned response?

When we are in the grip of an emotion, a cascade of changes (without our choice or immediate awareness) occurs in split seconds in: the emotional signals in the face and voice; preset actions; learned actions; the autonomic nervous system activity that regulates our body; the regulatory patterns that continuously modify our behavior; the retrieval of relevant memories and expectations; and how we interpret what is happening within us and in the world.² These changes are involuntary; we don't choose them. Zajonc called them *inescapable* (Zajonc, 1980). Now consider what is running the show, what is generating this cascade of inescapable emotional activity.

To have so many responses—different for each of the emotions and to some extent the same for all human beings—begin so quickly tells us something about the central brain mechanisms that are organizing and directing our emotional responses. The central mechanisms that guide our emotional responses are set into action by automatic appraising mechanisms. Stored in these central mechanisms there must be sets of instructions guiding what we do, instructions that reflect what has been adaptive in our evolutionary past, and our own personal history.

Tomkins proposed the phrase *affect program* to refer to an inherited central mechanism that directs emotional behavior

(Tomkins & McCarter, 1964). The term *program* comes from two sources: *pro*, meaning “before,” and *graphein*, meaning “write,” so program refers to mechanisms that store information written before, or in this case, inherited. There would have to be many programs, different programs for each emotion.

Affect programs are a metaphor. There is not anything like a computer program sitting in the brain, nor is there any implication that only one area of the brain directs emotion. We know already that many areas of the brain are involved in generating emotional behavior, but until we learn more about the brain and emotion, a metaphor can serve us well in understanding our emotions.

The zoologist Ernst Mayr distinguished between open and closed programs (Mayr, 1974). In a closed program nothing can be inserted by experience, while an open genetic program “allows for additional input during the life span of its owner.” Mayr pointed out that in creatures that have a long period of parental care, and therefore a long time for learning, there would be a selective advantage in having an open rather than a closed genetic program. (It is consistent with Mayr’s thinking to suggest that all mammals that manifest emotions will have open affect programs. That is an essential part of the nature of emotion.) Our affect programs are open so that we can learn what will work in the particular environment in which we are living, and store this information in a way that will allow it to guide our behavior automatically.

The evidence on universals in the emotion signals and in some of the changes in the autonomic nervous system activity suggests that although the affect programs are open to new information learned through experience, the programs do not start out as empty shells, devoid of information. Circuits are already there, unfolding over development, influenced but not totally constructed by experience. The specification of what types of new information can enter affect programs and at what point in time the entry may be accessible requires future research.

There must be different circuits for the different responses that characterize each emotion. Evolution preset some of the instructions or circuitry in our open affect programs, generating the emotion signals, the emotion impulses to action, and the initial changes in autonomic nervous system activity, and establishing a refractory period so we interpret the world in a way consistent with the emotion we are feeling.

Further, the evidence on universals in emotion signals and autonomic physiology suggests that typically the instructions for the production of these changes will develop in a similar way for everyone, unless modified by unusual experiences. While there is not much evidence about how such experiences would modify facial expressions, the research on posttraumatic stress disorder (PTSD) suggests that the thresholds for the arousal of autonomic activity can be radically changed (Yehuda, 2001). For example, when asked to speak in front of a group, a task that makes some people ill at ease, women who had suffered abuse early in life were found to produce more stress-related hormones than a comparison group of more fortunate women (Heim et al., 2000).

Affect programs contain more than just what is prewritten by our evolutionary past because it was useful to our ancestors. They

also contain what we found useful in our own lives in dealing with the most important transactions we have with others—the emotional ones. The initial regulatory pattern associated with each of the emotions varies from one individual to another, depending on what they learned early in life. It, too, is entered into the affect programs; once entered it runs automatically, just as if it had been preset by evolution, and is resistant to change. Also entered into the affect programs are the behavioral patterns we learn throughout our lifetime for dealing with different emotion triggers, which may be congruent with or quite different from those that are preset. These, too, operate automatically, once learned.

I do not believe we can rewrite the preset instructions in our affect programs, but that is still to be proven. We can try to interfere with these instructions, but that is an immense struggle precisely because we can’t delete or rewrite them. (An exception is the fact that brain injuries can damage the instructions.) If we could rewrite the instructions, then we would encounter people whose emotions would be totally different from our own—with different signals, different impulses to action, different changes in their heart rate, respiration, etcetera. We would need translators not just for words but also for emotions.

This does not mean that the preset instructions produce identical changes in everyone. The instructions operate on different bodily systems, quite apart from differences between individuals and cultures in what they learn about managing their emotional behavior. Even with the same preset instructions there will be both individual differences and commonalities in emotional experience.

Once set into motion through automatic appraising, the instructions in the affect programs run until they have been executed; that is, they cannot be interrupted. How long the changes resulting from the instructions are noninterruptible varies with the particular emotional response system being considered. For the facial expressions and action impulses, I suspect it is less than a second. I make this suggestion based upon observing how quickly people can wipe an expression off their face, reducing the length of its appearance or masking it with another expression. Listening to what people say when they are trying to conceal their feelings, I have noted that such control over the sound of the voice takes longer, but it is still likely to be only a matter of seconds or at most a few minutes, unless the emotion is very strong, or unless something new happens to reinforce it. The changes in our respiration, perspiration, and cardiac activity also have a longer time line, some stretching out to 10 or 15 seconds. The reader should note that this idea that the instructions can’t be interrupted does not rest on hard scientific evidence. It does, however, fit my observations about how people behave when they are emotional.

To say we can’t interrupt our reactions is not to say we can’t manage them, only that we don’t have the option of choosing instantly to turn them off completely. Even if we reevaluate what is happening, the emotional responses already active may not end instantly. Instead, the new emotional responses may be inserted over or mixed with the emotions already generated. We know from scientific study that two emotions can occur in rapid sequence, again and again. Two emotions also can merge together into a *blend*; but in my research I have seen that happening less often than repeated rapid sequences.

Reevaluations are not the only way in which we may for a time bounce back and forth between different emotional responses. Tomkins pointed out that we often have affect-about-affect, emotional reactions to the emotion we initially feel. We may become angry that we were made afraid, or we may become afraid about having become so angry. We could feel afraid of what we might do because we are feeling so sad. This linking of a second emotion with a first emotion can happen with any pair of emotions. Silvan Tomkins also suggested that one way of understanding the uniqueness of personality was to identify whether a person typically had a particular affect about another affect. He also suggested that sometimes we are not aware of our initial emotional reaction, we are aware only of our secondary emotion about the first emotion. We may not realize that we were afraid at first, and be aware only of the anger that was aroused in response to the fear. Unfortunately, no one has done any research to determine the merit of these very interesting ideas.

Emotions rarely occur singly, or in pure form. What we are reacting to in the environment often changes quickly; what we remember and imagine about the situation may change; our appraising changes; and we may have affect-about-affect. Typically, people experience a stream of emotional responses, not all the same ones. Sometimes each emotion may be separated by a few seconds, so that some of the initial emotional responses come to an end before new ones begin, and sometimes emotions occur in overlapping time, blending.

New emotional behaviors are continuously acquired throughout life, added to the preset emotional behaviors. This feature of our affect programs makes it possible for us to adapt to whatever circumstances within which we live. It is why our emotional responses are linked not just to our evolutionary past, but also to our own personal past and our present. Automobiles were not part of our evolutionary past, but these complex actions that were learned not as children but as young adults were incorporated into the fear response: the learned fear responses—twisting the steering wheel and braking—appear, involuntarily and without thought, when the threat is from another car.

Once learned and entered into the affect programs, these newly acquired emotional responses become involuntary, just as involuntary as the unlearned responses. One of the amazing things about the affect programs is that both learned and innate behaviors can become so tightly joined together and can be brought into action so quickly and involuntarily. However, there is also a downside to having an open emotional response system. These acquired, or added-on, behaviors are hard to inhibit once entered into the affect programs. They happen even when they don't necessarily work, or when we might not want them to occur.

Any responses that involve bodily movement are more easily unlearned than responses that involve the voice and the facial movement. We have great control over the muscles that control our body (the skeletal muscles). Driving teachers learn not to press their foot to the floor when they are sitting in the passenger seat. An involuntary action that had become automatic, part of the instructions added into the

fear affect program, can, over time, be modified with practice and effort. Behavior patterns that were acquired early in life, that were learned during a highly intense and dense emotional episode or series of episodes, will be harder to modify or unlearn. Memories, thoughts, attitudes, and actions that become associated with emotions over the life course may similarly enter into the affect program. Some are learned associations that may enter slower, but still characterize each emotion.

Question 4: In everyday discourse, emotions cause certain behaviors (fear makes us flee, makes our heart race, makes us think irrationally, and so on). In your theory, does a basic emotion have such causal powers? Which powers?

If basic emotions evolved to deal with fundamental life tasks, they should not only provide information through expressions about what is occurring, but there should also be physiological changes preparing the organism to respond differently within different emotional states. There is evidence suggesting that there are specific autonomic nervous system (ANS) responses that correspond to specific basic emotions. It has even been shown that emotion-specific ANS patterning can result from a participant manipulating facial muscles indicative of a particular basic emotion. If no specific pattern of motor activity had survival value for an emotion, then there would be no reason to expect a specific pattern of ANS activity to have been established for the emotion.

A few examples of emotions causing changes in our physiology include:

- In anger, blood flow to the arms and hands increases, which is consistent with the argument that we are prepared phylogenetically to fight when angry (Levenson, Ekman, & Friesen, 1990).
- On the other hand, in fear, blood flow redirects from the hands and arms to the legs and feet, supporting the idea that evolution prepares us to flee (Ekman, 2003).
- In enjoyment or happiness, significant quantities of oxytocin, serotonin, etcetera, are released, increasing available energy and dampening the effects of negative emotions, which would otherwise tax our body's resources (Uvnæs-Moberg, 1998).
- For surprise, the brows are raised and air is quickly inhaled, increasing our ability to react to a sudden and unknown stimulus. Surprise has the quickest onset of any emotion, which allows for other, more appropriate emotions to rush in and initiate a response (Ekman & Friesen, 1975).
- Disgust triggers the gag reflex and restricts airflow to our olfactory receptors. That which has been taken in, comes out (Koerner & Antony, 2010).

Question 5: In what sense are basic emotions basic? Specifically, please touch on the questions about what makes a basic emotion basic: Must the emotion be evolutionarily shaped? Biologically prewired? Psychologically primitive? A building block of other emotions? All of the above?

All of the above. The basic emotions are discrete physiological responses to fundamental life situations that have been useful in our ancestral environment. These responses are universally shared within our species and some are also found in other primates. The basic emotions are not learned from our culture or environment, but rather they are prewired responses to a set of stimuli that have affected our species for tens of thousands of generations.

Question 6: How are basic emotions differentiated from one another?

If all basic emotions follow the criteria described in Question 2: Basic Emotions List, then different basic emotions must embody all of these criteria, but in distinctly different ways. The archetypal expressions for the basic emotions are all universally recognized and, at least visually, are all universally distinguishable. In order for there to be the level of organization obvious and distinctive for each basic emotion, one must postulate a mechanism such as the affect program described in the answer to Question 3: Other Affective States.

The greatest penetration of culture should be found in the way in which we represent each emotion, in the language for emotion, and our attitudes about each emotion. There is evidence that there are large cultural differences in this regard, even to the point that not every culture provides a term for the seven emotions for which the evidence is the strongest (Ekman, 1972).

Question 7: If your list of basic emotions is a set of English terms, how do you respond to the claim that some languages lack equivalent terms for those emotions but include emotion terms that differ in meaning from English terms?

Language and emotion are independent of each other; both can evolve independently without the presence of the other. The Dutch word *uitbuiken* (literally “to stomach out”) means to sit back and enjoy the feeling of a full belly after a meal. Just because it takes 14 English words to get across the concept of *uitbuiken*, does not mean that native Dutch speakers exclusively appreciate a good dinner. Language is socially constructed; basic emotions are not. Individual societies create what is and is not directly expressed with words, and this does not necessarily negate the shared experiences of our basic emotions.

All emotions can be experienced on a continuum of intensity and are subject to individual and situational variation. It is not difficult to imagine that worrying about a test and fleeing from an assailant comprise two very different experiences and are likely accompanied by two very different intensities of fear. Likewise, the sensory pleasure elicited by stepping outside on a sunny day is very different from that elicited by stepping outside for the first time after a decade of incarceration. Just because an event is common and elicits low-intensity emotional states does not mean that a basic emotion is not present. On the contrary, nearly all of our everyday experiences trigger some or all of the basic emotions. That being said, it is an important and delicate job for emotion theorists to construct an accurate

vocabulary of how to describe our feelings and emotional experiences. For example, English speakers sometimes describe a person who is very angry at another individual as being “disgusted” with them. If we agree that the disgust emotion means regarding someone or something as vile, unclean, and/or repulsive, then perhaps we should ask the angry individual if this definition suits their feelings. If not, then it may be that “very angry” or “contemptuous” would be better descriptors of their emotional situation.

Question 8: What are the minimal cognitive prerequisites for the occurrence of a basic emotion?

Since the time interval between the presentation of a stimulus and the onset of a basic emotion can be remarkably short, the cognitive and/or biological appraisal mechanism for the basic emotions must be able to function with incredible speed. It is likely that our appraisal mechanism is (or is very nearly) automatic, having evolved to allow us to respond to fundamental life situations without involving the time-consuming process of conscious reasoning. However, our appraisal mechanism is not exclusively automatic. We can be confronted with events that are sufficiently ambiguous or novel that they are analyzed consciously, until they trigger a specific emotional response.

Automatic appraisal is the evolutionary equivalent of a large and sudden assumption about our environment; whether or not the assumption is true does not matter, as long as we are able to react quickly and efficiently to the stimulus presented. It is likely that the basic emotions are initiated by such primal regions of the brain as the brainstem, the limbic system, the amygdala, etcetera. It is from these areas that the most primal, automatic, and stereotyped responses originate.

Notes

- 1 The answers to these questions were obtained by different means. Daniel Cordaro, a psychology graduate student at UC Berkeley summarized my previous writings, primarily from my chapter on basic emotions in the book *Nature of Emotion* (1994) for the answers to questions 1, 2, 4, 5, 6, 8 and 9. I edited and updated in minor ways those answers. The answer to “Question 3: Other Affective States” about an affect program is drawn from my book *Emotions Revealed* (2003), although I have updated it in a few places. The answer to “Question 7: Differentiation” is primarily drawn from *Emotions Revealed*, although I have made a few major changes.
- 2 There are also neurochemical changes, but I know little about these.

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