

# **Twelve Crucial Points about Emotions, Evolution and Mental Disorders**

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- 1. Emotions are useful states shaped by natural selection.**
- 2. No one aspect of emotions is primary.**
- 3. Each emotion is distinguished not by its function, but by the adaptive challenges of the situation in which it is useful.**
- 4. The emotions and their subtypes have been partially differentiated from generic precursors into more specific emotions and subtypes to cope with specific kinds of situations.**
- 5. The situations that arise in goal pursuit have shaped specific emotions.**
- 6. The challenges associated with certain recurring social situations have shaped special social emotions.**
- 7. Emotions and affects are valenced for good reason.**
- 8. Negative emotions are just as valuable as positive emotions.**
- 9. Negative emotions seem abnormal because of the “clinician’s illusion.”**
- 10. The “smoke detector principle” explains why we experience so many normal but individually unnecessary instances of negative emotion.**
- 11. There are large individual differences in emotional tendencies.**
- 12. Most mental disorders are emotional disorders.**

Some years ago I realized that if I was going to spend my career treating people with emotional disorders, I should learn something about emotions. After spending a long summer reading the relevant scientific literature, I found myself experiencing several—boredom, frustration, disappointment and hopelessness. Finally, I turned to William James, who, as usual, had been there before.

As far as the scientific psychology of the emotions goes, I may have been surfeited by too much reading of classic works on the subject, but I should as lief read verbal descriptions of the shapes of the rocks on a New Hampshire farm as toil through them again. They give one nowhere a central point of view, or a deduction or general principle. They distinguish and refine and specify *in infinitum*, without ever getting on to another logical level. (James, p. 377)

The study of emotions can still be boring and confusing, but it need not be. What we have now, that James did not, is an understanding of how natural selection shaped the capacities for emotions. This evolutionary perspective brings disparate facts together in a framework that begins to make sense of emotions. While much remains to be done to fill in the details, the main points are simple.

1. **Emotions are useful states shaped by natural selection.** They adjust multiple aspects of the mind/body in ways that increase ability to cope with the adaptive challenges that arise in specific situations that have recurred over the course of evolutionary history. Emotions are the mind's software. In the same way that different software facilitates different computing tasks, such as writing, drawing or calculating, different emotions adjust the body and mind to cope with different situations.
2. **No one aspect of emotions is primary.** Subjective experience, cognition, physiology, vocal changes, facial expressions and action tendencies are all components of integrated systems that adjust the individual to cope effectively with the challenges of different kinds of situations. Natural selection has no plan or direction, it just gradually increases the frequency of genes that make organisms work better. Individuals who respond to situations of life threatening danger with panic have a selective advantage. Individuals who respond to mating opportunities with panic do not; a whole different kind of emotion

is useful in this situation! Emotions are not useful or useless except in relationship to a certain situation.

3. **Each emotion is distinguished not by its function, but by the adaptive challenges of the situation in which it is useful.** Sometimes emotions are explained by saying, “The function of emotion X is Y.” This is generally a mistake. One emotion may have many functions, such as motivation, changes in cognition, arousal, communication, etc. A better way to state the evolutionary explanation for an emotion is, “The situation in which emotion X is useful is Y, and the emotion helps meet adaptive challenges A, B and C that arise in that situation.” For instance, panic does indeed motivate flight, but it also communicates, changes physiology, etc. Many different emotions share the same functions. Emotions are distinguished from each other by the situations in which they are useful.
4. **The emotions and their subtypes have been partially differentiated from generic precursors into more specific emotions and subtypes to cope with specific kinds of situations.** Many studies have found basic emotions, such as happiness, sadness, fear, anger, love disgust and surprise, to be very similar everywhere in the world. Other studies attempt to locate each emotion in a two dimensional space, usually with one axis representing the degree of arousal, and the other representing positive versus negative. Much useful description comes from these approaches, but neither of them reflect the gradual differentiation of emotions over the course of evolutionary time. Emotions are more like branches on a tree. The most basic situations that shaped special states in one-celled animals are opportunities to get food and threats of danger. Organisms got an advantage if they responded to such situations with special states of arousal that get them to rewards and away from danger more quickly. These primal response states have been gradually differentiated into more specific emotions that improve the ability to cope with many different situations. Thus, different emotions are neither all basically the same, nor are they all fundamentally separate from one another. Instead, they are partially differentiated. This is particularly clear in the subtypes of anxiety, each one shaped to cope with a particular kind of dangerous situation.
5. **The situations that arise in goal pursuit have shaped specific emotions.** Goal pursuit in any domain gives rise to certain situations, and each situation has shaped a specific emotion. In anticipation of an opportunity, we experience excitement and desire; in

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anticipation of danger, we experience anxiety. In the pursuit of goals we experience optimism, pessimism, frustration, and eventual satisfaction or disappointment. These emotions fit nicely into a simple table.

**Table 1. Emotions Shaped to Cope with the Situations that Arise in Goal Pursuit**

	<b>Anticipation</b>	<b>Progress</b>	<b>Obstacle</b>	<b>Success</b>	<b>Failure</b>
Physical opportunity	Desire	Anticipation	Frustration	Pleasure	Disappointment
Social opportunity	Excitement	Flow	Frustration	Happiness	Disappointment
Physical threat	Fear	Confidence	Despair	Relief	Pain
Social threat	Anxiety	Confidence	Despair	Relief	Sadness

6. **The challenges associated with certain recurring social situations have shaped special social emotions.** For instance, trading favors with someone over a long time builds friendship and trust. Anticipating that the other person might betray you causes suspicion, and if your fears are fulfilled, you experience anger. When the shoe is on the other foot and you are tempted to defect, you are likely to experience anxiety. If you go ahead and do something that makes the other person angry, you are likely to feel guilty. People who do not experience these feelings, such as some sociopaths, are at a disadvantage.

**Table 2. Emotions shaped to cope with social situations**

	Other cooperates	Other defects
You cooperate	Trust Friendship	Suspicion (before) Anger (after)
You defect	Anxiety (before) Guilt (after)	Disgust Rejection

7. **Emotions and affects are valenced for good reason.** Emotions are positive or negative, because only situations that involve threats, opportunities, losses or gains can shape special states. Happiness, sadness, anger, fear, boredom and other emotions are readily recognized as desirable or undesirable. Each is associated with gain or loss. The exceptions, such as surprise, arise in situations that are nonetheless associated with the possibility of gain or loss.
8. **Negative emotions are just as valuable as positive emotions.** This is hard for many people to understand. It seems so obvious that anxiety and sadness are bad. Studies even show that people who experience a lot of negative affect have worse health and shorter lives. Nonetheless, anxiety and sadness are useful or they would never have evolved. How can this be? The answer comes from recognizing that no emotion or affect state is always useful. Whether an emotion is useful or harmful depends entirely on the situation in which it is expressed. Experiencing calm relaxation is a good thing, unless, that is, a tiger is rapidly approaching. In the natural environment, people who lack a capacity for panic had shorter than average lives. But panic is useful only in certain situations. Experiencing a panic attack in the grocery store is useless. When settling down for an evening with your lover, feeling, dizzy, short of breath and a need to flee is much worse than useless.
9. **Negative emotions seem abnormal because of the “clinician’s illusion.”** Aversive feelings such as pain or anxiety are usually experienced in disadvantageous situations. But the problem is not the bad feeling, the problem is the situation. The subjective experience is aversive because the unpleasantness is useful. It motivates escaping and avoiding such situations. If negative feelings are so useful, then how is it possible to block them so safely? After all, aspirin relieves pain, codeine relieves cough, and benzodiazepines relieve anxiety, all with great safety. Does this prove that these negative experiences are unnecessary? Hardly. There is a good reason why most expressions of such defensive responses are as unnecessary as they are normal.
10. **The “smoke detector principle” explains why we experience so many normal but individually unnecessary instances of negative emotion.** Natural selection shaped systems to regulate the expression of the emotions in ways that maximize the benefits, not our satisfactions. Negative emotions are expressed whenever they are worth it. For instance, the cost of a panic attack is small, a few hundred calories and a few minutes

wasted, while being caught by a tiger, well, that is expensive indeed even if it is not fatal. If the noise you hear behind a tree might be a tiger or might be a mouse, what should you do? It depends on how loud the noise is. What if the noise is loud enough that there is a 10% chance that it was made by a tiger, then what action is optimal? Flight, headlong flight, along with all the aspects of panic that speed it. The flight will be unnecessary in 9 out of 10 instances, but all of them will be normal. This is called the “smoke-detector principle” because we tolerate false alarms in our smoke detectors in order to ensure that the alarm sounds every single time there is a fire.

11. **There are large individual differences in emotional tendencies.** Some people get anxious at any small noise, while others only feel fully alive when climbing up a sheer cliff. Some people get embarrassed whenever anyone looks at them, while others love being the center of attention. These individual differences arise from genetic differences, from differences in experience, and from complex interactions among genes and experiences. For our purposes, the problem is to explain the substantial genetic variation that leaves different individuals with different emotional experiences. Does this mean that natural selection has made a mistake, or that mutations are creeping in? Not at all. Instead it points out that there is no such thing as one normal genome and there is not even such a thing as one normal pattern of emotional tendencies. Environments differ from generation to generation. Even at one point in time, different individuals exist in different social niches. Selection forces vary considerably, thus maintaining much genetic variation. This evolutionary view fosters respect for individuality, and recognition that the genes that are good in one situation may be disadvantageous in another.
12. **Most mental disorders are emotional disorders.** We can't really know what is and what not a disorder until we know the situations that shaped each emotion, and how they are regulated. The dividing line between normal and abnormal emotions does not depend whether they feel good or bad. Even intense negative emotions may be valuable. Every emotion can be abnormal by being excessive or deficient. Disorders of excessive negative emotion are readily recognized and deficits of positive emotion are not being studied. However, disorders of excessive positive emotions and deficits in negative emotions have been sadly neglected. People do not usually complain about problems caused by lack of a capacity for anxiety or negative mood, but lack of anxiety certainly causes risk-taking and increased injuries, and those born with a complete lack of ability to

experience physical pain die in early adulthood. An evolutionary perspective calls attention to these neglected emotional disorders.

This list of a dozen core points about emotions is by no means exhaustive, and it does not being to summarize the vast literature about specific emotions and their characteristics. It does, however, offer a framework for making sense of emotions and their disorders.

#### Further Reading

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