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## **Which Emotions Are Basic?**

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There are two major perspectives on the origin of emotions. According to one, emotions are the products of natural selection. They are evolved adaptations, best understood using the explanatory tools of evolutionary psychology. According to the other, emotions are socially constructed, and they vary across cultural boundaries. There is evidence supporting both perspectives. In light of this, some have argued both approaches are right. The standard strategy for compromise is to say that some emotions are evolved and others are constructed. The evolved emotions are sometimes given the label “basic,” and there is considerable agreement about a handful of emotions in this category.

My goal here is to challenge all of these perspectives. I don’t think we should adopt a globally evolutionary approach, nor indulge the radical view that emotions derive entirely from us. I am equally dissatisfied with approaches that attempt to please Darwinians and constructivists by dividing emotions into two separate classes. I will defend another kind of ecumenicalism. Every emotion that we have a name for is the product of both nature and nurture. Emotions are evolved and constructed. The dichotomy between the two approaches cannot be maintained. This thesis will require making some claims that would be regarded as surprising to many emotion researchers. First, while there is a difference between basic emotions and nonbasic emotions, it is not a structural difference. All emotions are fundamentally alike. Second, the standard list of basic emotions, though by many to be universal across cultures, are not basic after all. We don’t have names for the basic emotions. All emotions that we talk about are culturally informed. And finally, this concession to constructivism does not imply that emotions are cognitive in any sense. Emotions are perceptual and embodied. They are gut reactions, and they are not unique to our species. To defend these heresies I will have to present a theory of what the emotions really are.

### **1. Two Perspectives**

#### *1.1 Evolutionary Psychology*

Evolutionary psychologists claim that emotions are adaptations. They are species-typical psychological responses that evolved to serve various challenges faced by our ancestors. Some defenders of this view restrict their claims to a small set of emotions. The most famous of these are the Big Six, used in Paul

Ekman's research on pancultural recognition of emotional expressions (Ekman et al. 1969). The Big Six emotions are happiness, sadness, fear, surprise, anger, and disgust. These have become the mostly widely accepted candidates for basic emotions. They are thought to be basic in two ways: psychological and biological. They do not contain other emotions as parts, and they are innate. More ambitious evolutionary psychologists argue that many more emotions are biologically based. Ekman (1999) has now expanded his basic emotion list to include: amusement, contempt, contentment, embarrassment, excitement, guilt, pride in achievement, relief, satisfaction, sensory pleasure, and shame. I will refer to the theories that restrict evolved emotions to a small set as modest. Immodest theories are ones that try to accommodate many emotions (see, e.g., Ekman, 1999; Frank, 1988; Pinker, 1997). The most immodest theories claim that every emotion is part of our bioprogram. None is in any sense learned.

Defenders of the evolutionary approach have brought various kinds of evidence to bear. One strategy is to establish that certain emotions are universal. While universality does not entail innateness, it can certainly provide some support. The fact that people universally believe that the sun is warm is not evidence for the innateness of that belief. The sun is warm across the globe. General-purpose learning abilities together with this shared feature of the environment are sufficient to explain the universal belief that the sun is warm. Contrast this with the fact that people across different cultures have similar responses to music. Many cultures isolated from each other have musical systems organized around octaves, and, across the globe, tonal music tends to be more prevalent than atonal music. Octaves and tonal preferences can even be observed in macaque monkeys (Wright et al. 2000). No shared feature of the environment that can be used to explain this pattern. Likewise for colors. People who live in deserts, forests, and arctic plains seem to partition colour-space in similar ways, despite the fact that color boundaries find no obvious analogues in the physical world.

It is natural to compare the evidence for emotion universals to the evidence for universals in colour perception and music. Some emotions seem to be found pan-culturally, despite significant environmental variations. Ekman et al. (1969) found that an isolated preliterate tribe in New Guinea, the Fore tended to associate facial expressions of the Big Six emotions with the same kinds of situations with which we associate them in the West. For example, most Fore respondents paired a disgust face with a scenario describing rotten food, they paired the anger face with an insult, and the sadness face with the loss of a child. Ekman et al. conclude that the Big Six emotions are universal and biologically basic.

One can add further support to the evolutionary view by raising questions of learnability. The belief that the sun is warm can be learned given a general

capacity for belief formation. We acquire this belief on the basis of evidence. Contrast this with sneezing. We do not learn to sneeze by weighing evidence or drawing inferences. Sneezing is an involuntary response. We can fake sneezes, but real sneezes are outside of our control. Sneezing isn't the kind of thing that can be learned. Likewise for emotions. Emotions are not like beliefs, so they cannot be acquired by weighing evidence. They are also passive, like sneezes, and outside of voluntary control. They don't seem to be learnable.

Like sneezes, emotions have a lot to do with the body. Emotions are associated with patterns of bodily change, and the brain structures underlying emotion are associated with the perception and production of bodily response (Damasio, 1999). These brain structures are phylogenetically ancient. Reptiles are thought to have homologues of some of the structures that have been implicated in human emotions (Maclean, 1993). The connection between emotions and the body is central to the theory of emotions defended by William James (1884) and Carl Lange (1885). According to them, an emotion is a perception of a patterned change in the body. We sometimes perceive our hearts racing, our lungs inhaling, and our muscles tensing. The perception of these and other changes can be identified with fear. If the James-Lange theory is right, emotions are quite rudimentary from a biological point of view. They involve bodily responses that we share with much simpler animals. The evidence favoring the link between emotions and the body can, therefore, be seen as supporting the evolutionary view.

The bodily response associated with fear is no accident. It prepares an organism for flight. This fact has been used to provide another argument for evolutionary psychology. The evidence adduced so far supports the thesis that emotions are biologically based, but I have said nothing about the thesis that emotions are adaptations. Evolutionary psychologists are committed to this. Fear, they say, is evolved to cope with dangers (Plutchik, 1980). When we are afraid, we flee or fight. Both of these responses allow us to cope with potential threats. Danger poses a major survival challenge, so psychological mechanisms that lead us to cope with danger effectively are the kind of thing that evolution would have selected for. The adaptiveness of fear lends support to the claim that fear is the product of evolution.

Adaptive explanations are a powerful tool in promoting the evolutionary approach to emotions. By demonstrating the survival value of emotions, evolutionary psychologists can establish the thesis that emotions would have been favored by natural selection. This strategy is obviously applicable to the Big Six emotions, such as fear, anger, and disgust, because all of these arise in contexts where life is potentially at stake. But adaptationist explanations can also be offered to explain more advanced emotions that have no counterparts in non-human animals. Why do we feel guilty? The evolutionary psychologist says that,

without guilt, the temptation to cheat others would be much greater. We would take advantage of people whenever we anticipated a personal gain and little risk. Cheating others, however, can be disadvantageous in the long run. If we cheat and get caught, we may reduce prospects for future reciprocal exchanges of resources. If we have the capacity for guilt, others will be more likely to cooperate with us, because they will know that we are unlikely to cheat. If we are caught cheating, and show signs of guilt, others may forgive us and cooperate with us in the future. Guilt, therefore, can be regarded as a mechanism that promotes the kind of behavior that maximizes prospects of reciprocal exchange.

This conception of guilt emerged from the work of Trivers (1971), and was extended by Frank (1988). Frank offers a similar analysis of love. It is advantageous to form long-term bonds with romantic partners. Two people can share in the burden of raising a child better than one. Two people can help each other procure food resources, and they can care for each other when they get old. But people are vulnerable to temptation. Short-term payoffs are easier to conceptualize than long-term payoffs, so we have a tendency to abandon future projects in favor of present rewards. So, once we have invested in a long-term relationship, we run the risk of destroying the pair-bond to find gratification in extra-pair coupling. This risk is exacerbated by the fact that there are many fish in the sea. If a person chooses to commit to someone now, there is always the possibility that a better partner will appear down the line. Short-term temptation problem and the many fish problem are serious impediments to the commitment seekers. If I know that you are likely to be unfaithful to me, and you know that I am unlikely to be faithful to you, then there is no reason for us to make a long-term commitment, even though such a commitment would be very advantageous down the line. If things worked out this way, we would often forgo what's best for us, for fear of infidelity. According to Frank, love solves this commitment problem. If I love you, and you love me, then we will be more likely to commit, at least for a while. Love blinds us to commitment risks ("We are meant for each other"), and it makes us jump into situations that have uncertain long-term prospects ("True love lasts forever"). Couples do not necessarily stay together forever, on Frank's view, but love gives them the reassurance (or foolishness) that they need to get together in the first place. This account explains why love might have evolved.

A related evolutionary story has been developed to explain romantic jealousy—love's unlovely counterpart. Love allows us to make romantic commitments, and jealousy helps prevent our partners from breaking those commitments. Buss et al. (1992) argue that men and women face different challenges when it comes to fidelity. When a woman has a baby, she knows, thereby, that it is hers. Driven by selfish genes, she will invest in her baby's well-being. Men can never be certain about their paternity. When a man's lover gives

birth, the offspring could belong to another father. Selfish genes do not want to waste energy caring for other people's babies. So male genes promote behaviors designed to reduce the prospects of cuckoldry. Male genes make men jealous, often violently so, and men become especially jealous when their female partners are found to be having sex with other men. If a man's female partner has become romantically involved with someone else but remains sexually faithful, that is better, from the gene's point of view, than if she has sex with someone else and remains romantically faithful. In the former scenario, but not the latter, the man runs a risk of investing resources to care for a baby that belongs to another father. Women never have to worry about investing in someone else's baby, but they face another challenge. It is difficult to raise a baby alone, and women take on special burdens of childcare when their babies are young. It is hard for women to forage when they must dedicate constant attention to their young. For women, then, the most important thing they can get from male partners after insemination is support. Women need men to provide for them. If a woman's male partner has sex with other women, but remains romantically faithful, then he will continue to provide for her. If the man has fallen in love with another woman, however, that support may be lost. Buss et al. (1992) reason that, if this evolutionary story is correct, women should be more perturbed to hear that their male partners have fallen in love with someone else than to hear that their male partners are having sex with someone else. Men should be more perturbed by sexual infidelity. This is exactly what they find. The prediction made by the hypothesis that jealousy is an evolved solution to a commitment problem is confirmed.

These last example, guilt, love, and jealousy, illustrate how evolutionary thinking can explain some of our most advanced emotions. Evolutionary psychologists have argued that our innate affective endowment extends beyond the Big Six, and encompasses emotions that may be uniquely human. Frank and Buss defend an immodest view about the evolutionary origins of our emotions, and views of this kind are gaining ground. It has become increasingly popular to suppose that all of our emotions are adaptations.

### *1.2 Social Constructionism*

Not everyone wants to jump on the Darwinian bandwagon. Critics of evolutionary psychology argue that emotions are products of nurture rather than nature. They argue that emotions are socially constructed. This approach has fewer supporters these days than it has had in the past, but it would be a mistake to think constructionism is moribund. Like evolutionary psychology, the constructionist approach is supported by some powerful lines of evidence.

Constructionists often begin their critique of Darwinian approaches by claiming that evolutionary psychologists have an incorrect theory of what the emotions are. I said that evolutionary psychology fits naturally with a James-

Lange theory of the emotions, according to which emotions are fleeting perceptions of involuntary, patterned bodily changes designed to prepare an organism for adaptive behavioral responses. Constructionists typically reject this picture. They argue that emotions are neither fleeting, nor involuntary, nor bodily. This view is nicely represented in the work of Averill (1980). According to Averill, emotions are construed as cognitive appraisals nested in behavioral scripts. An appraisal is a judgment about how one's situation bears on well-being. Appraisals represent situations as matters of concern. Scripts are instructions about what to do when something of concern transpires. Each emotion script dictates a different range of actions, and these actions may be quite complex and protracted. Appraisals and scripts are enculturated. They reflect the values and convictions of a cultural group. When we act out an emotion script, we engage in behavior and decision making that has been prescribed by our culture. In so doing, we are usually exercising our capacity to choose. We could break from the script, and we could form different appraisals. But, according to constructionists, we view these choices as involuntary. Emotions, says Averill (1980), are disclaimed actions: they are voluntary choices that we dupe ourselves into treating as involuntary. Averill also says that emotions need not involve any perturbations of the body. We can have an emotion without a racing heart. The tendency to associate emotions with bodily states is related to the tendency to see emotions as passive. We pretend that they are like animal instincts, rather than cognitive plots.

Social constructionists sometimes defend their position by pointing to examples of emotions that are not highly associated with bodily states. Some examples have already been mentioned. Advanced emotions, such as guilt and love have no obvious bodily correlates. Where fear and anger have identifiable expressions, there is, it seems, no facial visage of love, no grimace of guilt. It seems these emotions can occur without any perturbation of the body. And then can also last a long time. We can be in love or plagued by guilt for years. In addition, these emotions seem to be associated with complex patterns of behavior, indicative of social scripts, rather than immediate gut reactions. When we are guilty, we seek to make amends, by apologizing or improving our behavior. When we are in love, we engage in various forms of courtship. We believe in love at first sight, and we vow to stay with our loved ones forever. These very facts were at the heart of Frank's evolutionary theory, but, on closer examination, they can be interpreted as signs of enculturation. Love and guilt are much more elaborate than, say, the startle response one feels when one trips. Moreover, the kinds of judgments and decisions we are led to when in love or guilty are much more amenable to top-down influence. The complex ways that love and guilt unfold seem much more voluntary than the shock that follows a trip or tumble.

The same can be said of jealousy, with its attendant bouts of paranoid ideation and fantasies of revenge.

The constructionist approach can be extended to subsume emotions that seem biologically grounded. We often presume that anger is an emotion that we share with other creatures: an involuntary disposition to aggress. But this may be a convenient illusion. We sometimes use anger strategically, as when we stage a bout of outrage while returning a defective item at a shop (Greenspan, 2000). It is possible all bouts of anger are strategic choices (Solomon, 1980). Anger, after all, seems to involve a fairly complex conceptualization of the world. Constructionists argue that, to be angry, we need to construe something as an offense, and requires the deployment of subtle, culturally informed moral judgments. Anger is not an animal reflex, but a sophisticated moral attitude.

The primary source of evidence for constructionism is cultural variation. Emotions apparently vary across borders. Anger is, again, a case in point. We regard anger as an irrepressible basic emotion. In Inuit culture, signs of anger are rarely seen (Briggs, 1970). Aggressive responses would be too risky in a small homogeneous culture living in harsh conditions. In Malaysia, there are analogues of anger, but they take on different forms. The Malay language has no exact synonym for “anger.” The closest term is “marah,” which is associated with sullen brooding, rather than aggression (Goddard, 1996). Malay also has the term “amok,” which refers to a violent frenzy. We have imported this term, losing, perhaps, some of its culturally specific meaning.

There are other emotions that have no clear analogue in the West. Consider *amae*, a Japanese term for what has been characterized as an indulgent feeling of dependency, akin to what a child feels towards a mother (Doi, 1973). Westerners may recognize something like *amae* in children but they rarely attribute anything of that kind to adults. Infantile feelings of dependency are disvalued in our autonomous culture. Japanese also has a term *oime* for a feeling of indebtedness and *fureai*, which refers to a feeling of connectedness (Markus and Kitayama, 1991). This rich vocabulary of interdependence is evidence of a collectivist orientation in Japan. Constructionists believe that this orientation leads the Japanese to have emotions that we would find alien. The diversity and cultural specificity of emotion terms certainly gives one pause. In this light, emotions begin to look less like biological universals and more like enculturated scripts.

### *1.3 Hybrid Theories*

There is evidence for evolutionary psychology and for constructionism. Both approaches enjoy support. This presents a puzzle for the emotion researcher. How does one choose between such radically different alternatives? One strategy is to avoid the choice. Perhaps both approaches are right, but they apply to

different emotions. We can divide and conquer emotions by saying that some are evolved and some are constructed.

Such a hybrid has been defended by Griffiths (1997). He argues that emotions are not a natural kind. He defines Ekman's Big Six as affect programs: modular, automatic, response patterns, which have homologues in nonhuman animals. These can be understood in evolutionary terms. Griffiths also thinks we can extend the evolutionary approach to emotions such as guilt and jealousy, but, he argues, these are not modular or phylogenetically ancient. In contrast to evolved emotions, both ancient and modern, Griffiths allows space for emotions that bear the marks of culture. *Amae* and some culture-bound emotional disorders, such as running amok, may fall into this class.

Another hybrid theory is defended by Oatley and Johnson-Laird (1987). They begin with a subset of Ekman's Big Six (dropping off surprise), and argue that these are basic. Each emotion of this list, they say, can be identified with a distinctive mode of informational processing, built into our cognitive architecture. Other emotions are cognitive elaborations. They are basic emotions plus appraisal judgments. Thus, nonbasic emotions and basic emotions have a different structure. Nonbasic emotions comprise basic emotion processing modes, along with cognitive representations. Because of their cognitive component, nonbasic emotions are amendable to cultural influence. Thus, a Darwinian story can be told about the basic emotions, and a (partially) constructionist story can be told about nonbasic emotions.

I will not offer a full assessment of these hybrid theories. I will simply say that a unified theory, that treats all emotions as structurally alike, would be preferable. I offer three reasons for that assessment. First, emotions have a great deal in common. All emotions are typically (if not always) accompanied by expressive behavior and bodily responses, all are motivating, all are eruptive, all are valenced, and all can affect attention and memory. All emotions also seem to involve overlapping brain structures, and all can be affected by the same clinical conditions (e.g., psychopaths have dampened Big Six emotions as well as dampened social emotions). These commonalities are especially problematic for Griffiths' hybrid, because he argues that emotions form disjoint subclasses. Oatley and Johnson-Laird can explain the similarities because they believe that all emotions contain the same basic parts. But their theory is threatened by a second worry. Hybrid theories cannot easily explain the fact that our emotion terms cut across highly cognitive and highly noncognitive episodes. Anger can be stirred-up by a glare or by a chain of high-level moral reasoning. Fear can be triggered by a sudden loss of support, or by reading the latest election returns. Does this mean we should distinguish two forms of fear and two forms of anger? Should we say that "fear" is ambiguous between a basic and a nonbasic emotion? Or, should we instead, resist Oatley and Johnson-Laird's suggestion that emotions can

be classified by their degree of cognitive elaboration. I think the latter option should be the default. Our emotion vocabulary does not draw a neat line between emotions that are primitive and emotions that are cognitively sophisticated. One and the same emotion can be elicited in numerous ways, both simple and complex. Attempts to put different emotions into different categories do violence to folk taxonomy. Revision of folk categories may be inevitable in the end, but that should be avoided if possible. Ordinary emotion talk recognizes something similar across episodes of anger that are caused bottom-up and top-down. It would be nice to have a unified theory of emotions to capture the sense in which these episodes are alike.

The third point against hybrid views is closely related to the second. If some emotions are socially constructed and others are evolved, we need to decide which are which. The difficulty is that evolutionary psychologists and social constructionists often try to explain the exact same emotions. We have seen, for example, that both camps try to explain love and anger. It would be easier to adopt a hybrid strategy if there was a clear indication of which emotions are cultural and which are biologically based. If the boundary is unclear, the major motive for adopting a hybrid view is lost.

I think we should aim for a unified theory of the emotions. But which kind of theory should we adopt? Should we be immodest evolutionary psychologists or immodest cultural constructionists? I will argue that neither approach is satisfying. We must find another route to unity.

## **2. Assessing Evolutionary Psychology and Social Constructionism**

To adjudicate between competing approaches to the emotions, we must weigh the evidence introduced in section 1. Which side of the Darwin-Culture divide has the better arguments?

Let's begin with evolutionary psychology. First, what are we to make of the claim that certain emotions are universal? This conclusion is based on cross-cultural research on facial expressions. That research is quite compelling at first blush, but it begins to unravel under scrutiny (see Russell, 1994, for a trenchant critical review). In the Ekman et al. (1969) study of the Fore, only 44% of respondents correctly identified the facial expression of disgust, and only 50% recognized anger. In some cases, the Fore respondents modal responses did not match up with a Western control sample. 45% of the Fore associated the surprise face with fear, rather than surprise. A startling 56% associated the sadness face with what Westerners call anger. This latter finding may support the constructionist hypothesis that small homogenous groups respond to offense with something akin to sulking. Russell (1994) has argued that the correlation between Fore and Western responses may also be seriously inflated due to problems with Ekman et al.'s methodology. The Fore were given forced choice test, choosing

between sets of three faces, and associating them with scenarios and words that had been picked by the experimenters. In an open-choice paradigm where, say, respondents had to simply name a face, the correlations would have dropped considerably. Thus, the Ekman et al. results really don't demonstrate emotion universals. They show, that a significant number of Fore respondents will associate four of six specially selected emotion expressions with words or scenarios that match the responses of Westerners, when given few response options to choose from. Indeed, even if they associated the faces with scenarios and words in the same way as Westerners, we could not be sure that their emotions are exactly like ours. Fore emotions could be similar to ours expressively, but subtly different conceptually, behaviorally, cognitively, phenomenologically, and so forth. Ekman himself (1999) now talks about universal emotion families, rather than universal emotions, indicating that cultures may customize our innate affective stock in different ways. This is consistent with the constructionist conjecture that there are multiple species of anger.

One can also raise objections to the adaptationist tales told by evolutionary psychologists. To show that an emotion is adaptive does not entail that it is a biological adaptation. Adaptive responses can be discovered by individuals or tailored by cultures. The species of anger illustrate the possibility of cultural adaptations. To show that something is an adaptation, one should show that there is no other explanation for it that does not add needless code to our bioprogram. Consider jealousy. Immodest evolutionary psychologists say that jealousy is innate. Here is another possibility. Imagine that jealousy is a blend of several more basic emotions: sadness, fear, anger, and disgust. When someone is unfaithful to you, it causes sadness; you may lose your partner. It also causes anger, because you have been violated, and fear, because you may have to face life alone or compete with another suitor. Finally, infidelity may cause disgust because we feel that our lover's bodies have been contaminated. So, we have independent reason to think that infidelity will trigger a blend of negative emotions. Jealousy may be a name for this blend. We do not need to postulate a special innate emotion beyond members of the Big Six. Evolutionary psychologists try to establish that jealousy is innate by pointing to gender differences, but these are easy to explain on a cultural model. Women are more concerned about emotional infidelity because, historically, they have depended on men for material resources. Losing a man, meant losing the resources essential to life. Thus, woman's jealousy may reflect a pattern of reasoning that woman can make, or it may reflect a learned pattern inculcated within the culture in which women have been systematically disadvantaged. Men, for their part, may devalue sexual infidelity over romantic infidelity because they have been enculturated to regard women as property. If women are objectified in this way, their preferences and affections are not salient to men. What matters is their

behavior. Men want to control their property; they don't care about the feelings of their property. Other explanations are easy to devise. For example, men may care more about sexual infidelity because they are more preoccupied with sex. We can tell an evolutionary account of male sex drive without supposing that male jealousy is innate. It may be an inevitable byproduct. If gender differences in jealousy were genetically based, we might expect little cultural variation. That is not what we find. In some countries, such as the Netherlands and Germany, male and female responses are more alike, with both preferring sexual infidelity to romantic infidelity (Buunk et al. 1996). This can be explained by appeal to cultural differences in male domination and liberal attitudes towards sex.

Similar points can be made about love. Frank suggests that love is a biological program to ensure pair-bonding for the purposes of raising children. This sounds uncomfortably close to Western ideals. It is hard to reconcile with cultural variation. Some cultures have arranged marriages, and some have avunculate arrangements, where mothers raise offspring with their brothers. In some cultures, and in chimpanzees, offspring are raised with the assistance of larger groups, so the integrity of a pair-bond is not especially important. We can only speculate about how children were raised and how relationships were structured in the Pleistocene. To postulate a genetic explanation for the kinds of relationships that we currently value in the West is a bit like postulating an innate basis for capitalism or health spas. We cannot assume that our institutions and preferences have always been the norm.

Despite these concerns about adaptationist explanations, evolutionary psychology still enjoys considerable support. First, there is overwhelming evidence that emotions are associated with basic bodily responses and ancient brain structures. All emotions are accompanied by changes in our autonomic nervous systems, and these changes are very difficult to control. Emotions have obvious analogues in other creatures, and some appear early in development before there has been much time for cultural learning. Putting the question of how any *specific* emotion is acquired, we can safely assume that having emotions, *in general*, depends on our biology.

Where does this leave social constructionism? First, constructionists may be mistaken to assume that emotions can be disembodied. The claim that some emotions, such as guilt and love, are not associated with bodily perturbations has not been fully investigated. But existing functional imaging studies of these two emotions tell against the constructionist conjecture. Shin et al. (2000) found activation in anterior cingulate cortex and the insula when subjects recalled episodes of guilt. Bartels and Zeki (2000) found similar activations when subjects viewed photographs of their lovers. These structures show up in all imaging studies of the emotions, and they are known to play a role in perception and regulation of the body (Damasio, 1999). Of course, one can be in love or guilty for years

without having a constant state of arousal or indigestion. This only shows that “love” and “guilt” can be used to name dispositional states. A person can be disgusted by peanut butter for a lifetime, without feeling disgust at every moment. But someone who reported being disgusted by peanut butter would be accused of dishonesty if she were not disposed to have a somatic reaction when she came into contact with peanut butter. Likewise, we would distrust the apologies of a defendant who showed no signs of embodied distress when confronted with the victims of her crime. Equally, we would distrust the person who claimed to love someone romantically but never showed the slightest signs of passion.

Constructionists also go too far in emphasizing the role of cognitions in emotion. Emotions can certainly be triggered by complex acts of deliberation, but they can also be set off without any thought at all. Fear can be triggered by seeing a snake, before the image has even reached the neocortex (LeDoux, 1996). Perhaps a man’s jealousy can be set off by smelling foreign cologne on his lover’s blouse. Emotions need not involve any judgments. Nor need they involve protracted patterns of scripted behavior. An emotion can be very short-lived. When more protracted patterns of behavior do arise, they need not bear on the identity of the emotions. Constructionists have an unfortunate habit of inferring cultural variation in the emotions from variation in emotional behaviors. If love leads to marriage in one culture and to a steamy extramarital liaison in another, we need not say there are two forms of love. The same emotion can have different effects. A change in script is not necessarily a change in emotions. If it were, we would expect to see our emotion vocabulary change as new attitudes about how we ought to behave ourselves emerged. It should sound *conceptually* strained to say that love and marriage can come apart,

Despite these complaints against social constructionism, I think the program has much to recommend it. As I said above, evolutionary psychologists have not been able to establish that emotions are exactly the same across cultures. The same situation can be associated with different responses. The variability in facial response, in emotion vocabulary, and in culture-bound emotional disorders provides circumstantial evidence for variation in emotions. Culture can certainly influence when and whether an emotion arises, as well as the valence of our emotional reactions. What one culture finds outrageous, another may find rewarding (consider variable attitudes towards cannibalism). These differences do not entail that cultures have distinct emotions, but they raise that possibility. Constructionists can do an admirable job of relating particular emotional responses to cultural factors. They can explain why *amae* is valued in Japan, and why *amok* is prevalent in Malaysia.

This leaves us in a serious predicament. If what I have been arguing is correct, evolutionary psychologists underestimate the contributions of culture and learning. They offer a flawed theory of how emotions arise. Social constructionists over-emphasize the cognitive and underestimate the centrality of bodily responses. They offer a flawed theory of what emotions, in essence, are. Emotions are neither fixed bioprograms, nor cognitively mediated scripts.

### 3. Escaping the Predicament

#### 3.1 Embodied Appraisal Theory

We need a theory of emotions that can steer between the extremes of evolutionary psychology and social constructionism. In this section, I will outline such a theory. For a full defense, see Prinz (2004).

The theory has two central tenets. The first tenet concerns the *form* of emotions, i.e., their representational format. I said that emotions bear an intimate relation to the body. More concretely, I think James and Lange were right to identify emotions with perceptions of bodily changes. This approach has recently been defended on neurobiological grounds by Antonio Damasio (1994). The brain centers associated with emotion are also associated with perception and regulation of the body. If body perception is impaired, emotions wane. If the body is stimulated through drugs or through feedback from facial expressions, emotions are felt.

The second tenet concerns the *content* of emotions. James and Lange had little to say about what emotions represent. Their bodily theory gives the impression that emotions are primarily in the business of telling us how about our blood pressure, muscle tension, and vasculature. This makes little sense of the role that emotions play in decision making and action. We run when we are afraid. Why? It's certainly not because our hearts are racing. Fear makes us run because fear represents danger. Sadness represents loss, anger represents offenses, and so on.

Many emotion researchers think that such conclusions about what emotions represent can only be maintained if we define emotions as cognitive. To represent danger, fear must contain the judgment that "I am in danger," they suppose. I think this is wrongheaded. According to leading theories of intentionality, mental states represent by functional covariation, not by description (Dretske, 1988). A mental state represents danger if (a) it reliably occurs when danger occurs, and (b) it was acquired for that purpose. Now suppose, with James and Lange, that fear is a perception of a patterned change in the body. If that change reliably arises when we are in danger, and if it was acquired for coping with danger, then the same can be said about our perception of that change. A perception of a patterned bodily response can represent danger in virtue of the fact that it has the function of serving as a danger detector. In other words, emotions are like smoke alarms. A tone in a smoke alarm represents fire because it is set up to be set off by fire. And perceptions of patterned changes in our body represent danger (and loss, and offense, etc.), because they are set up to be set off by danger (and loss, and offense, etc.).

For this to work, there must be a psychological mechanism in place that sustains the link between dangers and perceived bodily responses, just as there is

a mechanism in a smoke alarm that gets the tone to go off when fires draw near. Consider how this works in a typical case. You hear a loud sudden noise. That auditory state sets your body into a patterned response. The response is perceived. The perception of that your response is your fear. Loud noises are not the only fear trigger, however. A sudden loss of support, a snake, or an infelicitous election return can all have the same impact. Our mental representations of all these fear elicitors group together into a mental file. When any item in the elicitation file is activated, fear results. Fear represents danger in virtue of the fact that, collectively, the items in the elicitation file calibrate fear to danger, and they have the function of doing so. Danger is what unites all the disparate contents of the elicitation file. Fear represents danger because it has the function of occurring when danger occurs, and it obtains that function via an elicitation file filled with a wide range of perceptions and judgments.

It might be tempting to identify fear with the representations in the elicitation file, rather than the perception of the bodily response. That would be a mistake. The file contents are too varied, and too variable over time. Moreover, an episode of fear can outlast the duration of an active representation in its elicitation file. A loud noise ends before the fear that it causes even begins.

In sum, I think emotions are perceptions of bodily changes that represent such things as dangers, losses, and offenses, because they are set up to be set off by such things. I call this the embodied appraisal theory (Prinz, 2004). Emotions are embodied because they are perceptions of bodily changes, and they are appraisals because they represent matters of concern.

### *3.2 How Can Culture Influence Emotions?*

If emotions are embodied appraisals, then new emotions can be acquired in various ways. In some cases, new emotions can be acquired by simply combining together existing embodied appraisals to suit situations that have complex emotional significance. Jealousy is an example of that. Cultural factors will determine how intensely this emotion is felt by affecting attitudes towards sexuality and the material consequences of infidelity. In other cases, culture may have even greater impact. Culture can exert an influence on how our bodies react. For example, we can train ourselves to suppress facial expressions or control breathing. Ekman talks about the cultural influence on facial expressions, and he argues that such influences do not affect the emotions themselves. This is untenable if emotions are perceptions of bodily changes. A change in “display rules” alters the bodily basis of the emotion. More dramatically, culture may encourage people to act out molar behaviors that reshape our bodily responses. In Malaysia, the behavioral pattern of running amok establishes a distinctive bodily pattern, which is much more active than ordinary Western anger.

Culture can also affect the content of emotions. Content depends on what the emotion is set up to be set off by. Emotions are set off with the help of elicitation files. Some of these files may be biologically based, but, in the course of life, our mental files can grow, and new files can be established. The establishment of new elicitation files has not been investigated, but the process may be relatively simple. Items are added to an existing file by association, and then clusters of new items that are closely related take on a functional autonomy that allows them to trigger the emotion without aid of anything in the original file. Culture can help to re-calibrate existing emotions to new eliciting conditions in this way. Imagine a sadistic culture that encourages people to take joy in the suffering of others. The file that sustains the relationship between joy and the world will be expanded, under cultural influence, to include representations of people in distress. Thus, *Schadenfruede* is born. *Amae* emerges when cultural factors in Japan lead people to have a warm feeling in the context of dependency relations. Patriotism emerges when joy is recalibrated to national symbols and the accomplishments of fellow citizens. Guilt emerges when sadness gets re-calibrated to personal transgressions.

If these considerations are correct, culture can affect the intensity, incidence, form, and content of our emotions. This is a surprising discovery because it is sometimes assumed that the James-Lange approach to emotions is incompatible with a constructionist approach. I have just shown how emotions can be both embodied and culturally informed. This account presupposes that some emotions are biologically basic, however. Culture reshapes existing bodily responses and re-calibrates existing emotions. What, then, are the emotions that exist prior to cultural influence?

### **3. Which Emotions Are Basic?**

#### *3.1 Rethinking the Big Six*

To find emotions that are biologically basic, we need to look for body patterns that are responsive to concerns in the absence of learning. For example, there is evidence that we are physically perturbed by seeing snakes even if we have never been harmed by a snake. This response may need to be triggered under the right environmental conditions, but it does not require inference, induction, sustained conditioning, or other learning processes. It looks like an innate form of fear. But is it really fear? Should we conclude that fear is an innate emotion?

I am inclined towards a negative answer. First, the negative response to snakes is more specific than fear. It is not a representation of danger-in-general. We may have an innate elicitation file containing other causes of the same bodily response (loss of support, darkness, looming objects, loud noises), but these do not add up to a generalized danger detector. Second, even in adulthood, fear may not correspond to a single pattern of response. Emotion researchers distinguish

two subspecies, which are given the technical terms worry (associated with future dangers) and panic (associated with present dangers). These may be more basic than fear.

A similar fragmentation may occur for other entries on the Big Six list. Each may begin with a set of responses tuned to highly specific elicitors, and some may have several component subspecies. Happiness, for example, may subdivide into sensory pleasures, satisfaction associated with goal attainment, and joy from play. Surprise may subdivide into a positive sense of interest or wonder and a negative state that cannot be fully differentiated from low-intensity panic. Anger may emerge as a blend of something like goal frustration and aggressiveness. Sadness and disgust probably don't divide into subspecies, but they may begin life as much narrower emotions than their adult analogues. Sadness may begin as separation distress and then expand to encompass other forms of loss through learning and enculturation. Disgust may begin as a form of physical revulsion that ultimately gets expanded to subsume moral aberrations.

If these speculations are right, then the Big Six emotions may not be innate. They may be outgrowths and byproducts of more fundamental emotions. This fits with the observation that the Big Six are not exactly the same across cultures. Each culture may adapt the primitive stock of biologically basic emotions in distinctive ways. If so, then the emotions that we have words for may all be culturally informed. If this is true of the Big Six, it is almost certainly true of our more advanced emotions. Ordinary emotion words do not name the highly restricted and narrow emotional responses programmed by our genes, but extensions of these that emerge in a cultural setting.

### 3.2 Conclusions

We are now in a position to take stock and find our way out of the predicament. I said that social constructions are wrong about the nature of emotions, because they emphasize cognitively mediated cultural scripts, rather than bodily responses. Evolutionary psychology is inadequate because it does not do justice to the contributions of learning and culture. The embodied appraisal reconciles these problems. Emotions are simple perceptions of bodily changes, but they carry information by being calibrated to matters of concern. They get calibrated through elicitation files that can be culturally informed, and culture can also alter our patterns of bodily response. Thus, emotions can be both embodied and socially constructed.

On this approach, every emotion that we have a word for bears the mark of both nature and nurture. Each is built up from a biologically basic emotion, but its conditions of elicitation, and hence its content, is influenced by learning. No lexicalized emotion is *biologically* basic. But there is a sense in which all lexicalized emotions are *psychologically* basic. No emotion contains other

emotions as component parts. Each is structurally analogous. Each is simply a perception of a patterned bodily change. Even emotions that we acquire by blending have this simply structure. They are simply perceptions of blended bodily patterns. Some emotions are attained by adding conceptually sophisticated judgments to our elicitation files, but this does not alter their structure. Elicitation files are content-determining causes of our emotions, not constituent parts. And all emotions have elicitation files that can contain judgments, as well as perceptual representations. Thus, hybrid theories are wrong. All named emotions are very much alike. All have the same internal structure, and all bear the marks of both nature and nurture.

In sum, everybody is wrong and every body is right. Contra Evolutionary Psychology, familiar emotions (including the Big Six) show the marks of learning. Contra social constructionism, emotions are embodied states, not cognitive scripts. Contra, hybrid views, all named emotions are very much alike. By the same token, evolutionists are right to think that emotions originate in our genes, constructionists are right to emphasize enculturation, and defenders of hybrid views are right that we can have it both ways.

## References

- Averill, J. R. (1980). A constructivist view of emotion. In R. Plutchik and H. Kellerman (eds.), *Emotion: Theory, research and experience: Vol. I. Theories of emotion* (pp. 305-339). New York, NY: Academic Press.
- Bartels, A. and Zeki, S. (2000). The neural basis of romantic love. *Neuroreport*, 11, 829-834.
- Briggs, J. L. (1970). *Never in anger: Portrait of an Eskimo family*. Cambridge, MA: Harvard University Press.
- Buss, D. M., Larsen, R. J., Westen, D., and Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science*, 3, 251-255.
- Buunk, B., Angleitner, A., Oubaid, V., and Buss, D. (1996). Sex differences in jealousy in evolutionary and cultural perspective: Tests from the Netherlands, Germany, and the United States. *Psychological Science*, 7, 359-363.
- Damasio, A. R. (1994). *Descartes' error: Emotion reason and the human brain*. New York, NY: Gossett/Putnam.
- Damasio, A. R. (1999) *The feeling of what happens: Body and emotion in the making of consciousness*. New York, NY: Harcourt Brace & Company. 1999
- Doi, T. (1973). *The anatomy of dependence*. New York, NY: Kodansha International.
- Dretske, F. (1988). *Explaining behavior*. Cambridge, MA, MIT Press.

- Ekman, P. (1999) Basic emotions. In T. Dalgleish and T. Power (Eds.) *The handbook of cognition and emotion*. Pp. 45-60. New York.: John Wiley & Sons.
- Ekman, P., Sorenson, E. R. and Friesen. W. V. (1969). Pan-cultural elements in facial displays of emotions. *Science*, 164, 86-88.
- Frank, R. (1988). *Passions within reason: The strategic role of the emotions*. New York, NY: Norton.
- Goddard, C. (1996). The “social emotions” of Malay (Bahasa Melayu). *Ethos*, 24, 426-464.
- Greenspan, P. (2000). Emotional strategies and rationality. *Ethics*, 110, 469-87.
- Griffiths, P. (1997). *What emotions really are*. Chicago, IL: University of Chicago Press.
- James, W. (1884). What is an emotion? *Mind*, 9, 188-205.
- Lange, C. G. (1885). *Om sindsbevaegelser: et psyko-fysiologisk studie*. Kjbbenhavn: Jacob Lunds. Reprinted in *The emotions*, C. G. Lange and W. James (eds.), I. A. Haupt (trans.) Baltimore, Williams & Wilkins Company 1922.
- LeDoux J. E. (1996). *The emotional brain*. New York, NY: Simon & Schuster.
- MacLean, P. D. (1993). Cerebral evolution of emotion. In M. Lewis and J. M. Haviland (eds.), *Handbook of emotions* (pp. 67-83). New York, NY: Guilford Press.
- Markus, H. R. and Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Oatley, K. and Johnson-Laird, P. (1987). Towards a cognitive theory of emotions. *Cognition & Emotion*, 1, 29-50.
- Pinker, S. (1997). *How the mind works*. New York, NY: Norton.
- Plutchik, R. (1980). *Emotion: A psychoevolutionary analysis*. New York, NY: Harper & Row.
- Prinz, J. J. (2004). *Gut reactions: A perceptual theory of emotion*. New York, NY: Oxford University Press.
- Russell, J. A. (1994). Is there universal recognition of emotion from facial expression? *Psychological Bulletin*, 95, 102-141
- Shin, L. M., Dougherty, D., Macklin, M. L., Orr, S. P., Pitman, R. K., Rauch, S. L. (2000). Activation of anterior paralimbic structures during guilt-related script-driven imagery. *Biological Psychiatry*, 48, 43-50.
- Solomon, R. (1980). Emotions and choice. In A. Rorty (ed.), *Explaining emotions* (pp. 251–271). Berkeley, CA: University of California Press.
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, 46, 35-57.

Wright, A. A., Rivera, J. J., Hulse, S. H., Shyan, M. and Neiworth, J.J. (2000). Music perception and octave generalization in rhesus monkeys. *Journal Experimental Psychology General*, 129, 291-307.