

# Emotions Embodied

Jesse Prinz

University of North Carolina at Chapel Hill

[jesse@subcortex.com](mailto:jesse@subcortex.com)

[Penultimate version of chapter in R. Solomon (ed.) *Thinking about Feeling*,  
New York: OUP 2003. Consult published version to quote.]

In one of the most frequently quoted passages in the history of emotion research, William James (1884: 189f) announces that emotions occur when the perception of an exciting fact causes a collection of bodily changes, and “*our feeling of the same changes as they occur IS the emotion.*” The same idea occurred to Carl Lange (1984) around the same time. These authors were not the first to draw a link between the emotions and the body. Indeed, this had been a central theme of Descartes’ exquisite opus, *The Passions of the Soul*. But James and Lange wanted to push things farther than most, suggesting that emotions are exhausted by bodily changes or perceptions thereof. Other kinds of mental episodes might co-occur when we have an emotion state. For James, an emotion follows an exciting perception. But the exciting perception is not a part of the emotion it excited (Ellsworth, 1994, reads James differently, but see Reisenzein et al.’s 1995 convincing response). The majority of contemporary emotion researchers, especially those in philosophy, find this suggestion completely untenable. Surely, emotions involve something more. At their core, emotions are more like judgments or thoughts, than perceptions. They evaluate, assess, or appraise. Emotions are amendable to rational assessment; they report, correctly or incorrectly, on how we are faring in the world. Within this general consensus, there is a further debate about whether the body should figure into a theory of emotions at all. Perhaps James and Lange offer a theory that is not merely incomplete, but entirely off base. Where they view judgments as contingent and non-constitutive concomitants of emotions, it is actually bodily perceptions that deserve this demotion. Perhaps emotions can be, and often are, disembodied in some fundamental sense.

I propose to defend James and Lange, though not completely. They should be criticized for their failure to reckon with what can broadly be regarded as the rationality of emotions. That failure, however, has a remedy that does not depart from the spirit of the James-Lange approach. Emotions are somatic, but they are also fundamentally semantic: meaningful commodities in our mental economies.

I will not be especially concerned with presenting the somatic theory exactly as it appears in James and Lange. I will not assume that emotions are always consciously felt, as James sometimes implies, nor that the relevant bodily changes must have the origins in the vasomotor system, as suggested by Lange. The core idea that I will defend is that emotions are perceptions (conscious or unconscious) of patterned changes in the body (construed inclusively). I begin by briefly presenting some of the positive evidence for this core idea. Then I discuss six stubborn objections. I argue that the objects can be answered without abandoning the core idea but forward by James and Lange, but they do demand an important amendment.

## 2. Arguments Supporting the James-Lange Theory

James and Lange offer several considerations in favor of the hypothesis that emotions are perceptions of bodily changes. Further support comes from more recent work in emotion research. There is no knock down argument for the hypotheses, but the collective force of several considerations adds considerable plausibility.

The first set of considerations that I will consider merely serves to establish a link, or correlation, between emotion and bodily perturbations. The link between emotions and the body is quite obvious. Every culture seems to have bodily expressions for talking about emotional states, from broken hearts in our own culture to bad intestines in Tahiti (see Heelas, 1986). Many of these expressions are obviously metaphorical or byproducts of bad folk theories, but there is also empirical evidence for correlations between emotional states and changes in the body. James (1890, 447f) quotes long passages from authors, such as Darwin, who had carefully observed such correlations. Darwin's list of fear symptoms includes: widely opened eyes and mouth, raised eyebrows, dilated nostrils, stiff posture, motionlessness, a racing heart, increased blood supply to the body, pallor of the skin, cold perspiration, piloerection, shivering and trembling, hurried breathing, dry mouth, faltering voice, that are alternately clenched and opened, and so on. One hundred years later, Levensen, Ekman, and Friesen (1991) systematically studied the autonomic changes associated with Ekman and Friesen's (1971) six basic emotions (anger, disgust, fear, joy, sadness, and surprise), and found that each of these corresponds to a unique bodily pattern. It has also been observed that the principle brain structures underlying our emotional states have all been independently associated with bodily response (Damasio et al. 1999). Some structures, like the amygdala, are involved in orchestrating bodily changes, not in perceiving them. But the amygdala seems to play a role in emotion elicitation, and is not essential for emotions themselves. The structures that seem more essential for emotions themselves, such as insular cortex, second somatosensory cortex, and portions of cingulate cortex, are associated with bodily perception.

In addition to the correlational evidence, there is evidence that bodily changes can induce emotions. This speaks to the sufficiency of those changes. In particular, it suggests that emotions can arise without the mediation of anything like an appraisal judgment. In making this case, Lange was impressed by the fact that affect could be altered by consuming alcohol. More recent authors have emphasized evidence from facial feedback (Zajonc et al., 1989). Mere change in facial musculature seems sufficient for an emotional response, even when we do not realize we are making emotional expressions. There is also anatomical evidence that emotions can be elicited via pathways from early visual structures, such as the pulvinar and superior colliculus, to the amygdala which instructs other structures to perturb the body (Ledoux, 1996; Morris et al. 1999). These pathways trigger an emotional bodily response without the mediation of any kind of judgment. The relevant perceptual centers don't even support categorical object recognition, much less sophisticated appraisal, and the amygdala pairs inputs with somatic responses by association, not by assessment. One could try to argue that the bodily states induced by this pathway would not qualify as emotions unless we supplemented them with appraisal judgments, but this would be gratuitous. The said bodily changes feel like emotions, and they do not require appraisals to occur.

Showing that bodily changes are sufficient, does not establish that the somatic theory is true. For that, one would also need to show that bodily changes are necessary for

emotions. James and Lange defend the necessity claim by appeals to introspective intuition. James asks:

What kind of an emotion of fear would be left, if the feelings neither of quickened heart-beats nor of shallow breathing, neither of trembling lips nor of weakened limbs, neither of goose-flesh nor of visceral stirrings, were present, it is quite impossible to think. (1884, 193f.)

And Lange, without any awareness of James's work, echoes:

If from one terrified the accompanying bodily symptoms are removed, the pulse permitted to beat quietly, the glance to become firm, the color natural, the movements rapid and secure, the speech strong, the thoughts clear, -- what is there left of his terror? (1885, 675)

The authors want us to mentally subtract all the bodily symptoms from an imaged emotional state and see what remains. James says we will discover that "we have nothing left behind, no "mind-stuff" out of which the emotion can be constituted."

James finds further evidence for the necessity of bodily changes in contemporary observations of individuals with no awareness of their bodily states. He considered anecdotal reports from doctors who examine patients with disease induced bodily anesthesia, and even a French study of individuals who had bodily anesthesia induced temporarily through hypnotic suggestion. In these latter cases, and in some of the disease cases, individuals report a profound reduction in emotion. Some other patients were reported to show preservation of emotional behavior, but there was no reported evidence of preserved emotional experience. In a more systematic study, Hohmann (1966) investigated the emotional states in a population of 25 people with spinal cord injuries. He found reductions throughout the group, and those reductions became more acute with injuries higher in the cord. With less bodily feedback, Hohmann, concludes, there is less emotion. He did find that these patients tended to experience an increase in "sentimentality," characterized by crying and feeling choked up. This is unsurprising on the James-Lange view, however, because those bodily states involve changes that are above the injury, and hence perceivable to the patient.

In sum, the hypothesis that emotions are perceptions of bodily changes is consistent with a range of observations. Some of these suggest bodily changes are sufficient for emotions, some suggest that bodily changes are necessary, and some merely establish a correlation. Collectively, these observations tend to favor taking a James-Lange approach, all else being equal. But all else may not be equal. I turn now to six objections that attempt to show that bodily perceptions are either unnecessary or insufficient for emotional response.

### **3. Arguments against the James-Lange Theory**

#### *3.1 Diminished Bodily Perception Does Not Always Diminish Emotions*

As we have seen, some studies of individuals with spinal cord injuries support the James-Lange theory. When Hohmann (1966) asked 25 spinal patients to compare their present emotions to their past emotions, they reported a significant decrease. The decrease was greatest for those whose injuries were highest in the cord. Hohmann does report, however, that some emotions remain. Subjects in his study say that they became more "sentimental"

after their injuries, where being sentimental is characterized in terms of crying a feeling choked-up. Other investigators tried to replicate Hohmann's study more carefully (e.g., by adding control groups), and they found that some spinal patients continue to experience a full range of emotions (Chwalisz et al., 1988). These results seem to contradict the James-Lange theory.

Damasio 1999, pp. 289f) offers a multipronged response to this objection. First, he notes that most spinal cord injuries are incomplete. Second, much information about the body can travel through the blood stream, the vagus nerve, and cranial nerves that remain intact after the spinal cord is sectioned. Third, spinal patients can feel changes above the spinal cord including changes in the throat, face, and central nervous system. Is it any wonder that Hohmann's patients could feel choked-up and cry? Forth, in all studies there is some attenuation of affect, and the attenuation increases with height of the injury.

Damasio also suggests that emotional responses may be able to bypass the body, by means of an "as-if loop". If an emotion is a perception of a bodily change, then the very brain state that underlies that perception must be able to arise in the absence of a bodily change, acting as if the body had changes. James anticipated this suggestion in a footnote about pathological morbid dread. He says that morbid dread can occur without bodily change, but he does not see this as a threat to his theory:

[I]t is of course possible that the cortical centres normally percipient of dread as a complex of cardiac and other organic sensations due to real bodily change, should become *primarily* excited in brain-disease, and give rise to an hallucination of the changes being there,—an hallucination of dread, consequently, coexistent with a comparatively calm pulse, &c. (1885, note 4)

Damasio places much more emphasis on this shortcut than James, and he speculates that emotions may bypass the body even in non-pathological cases.

The as-if loop can also help answer an objection posed by Walter Cannon (1927), in an influential critique of James and Lange. He complained that emotions cannot be perceptions of visceral changes, because the viscera react too slowly. One can respond to Cannon by pointing out that some bodily changes, including those in striate muscles, are quite fast. But this reply concedes that visceral changes are significantly less important for emotional response than James had presumes. The as-if loop helps us avoid this concession. If emotions often work by anticipatory perception—i.e., by simulating a perceived bodily state before that state has occurred, the speed of visceral response would not constrain the speed of emotional response.

Critics may find the whole idea of an as-if loop a bit desperate. Isn't it ad hoc to assume that spinal patients simply hallucinate bodily changes when they are in an emotional state? Doesn't this make the theory impossible to refute? I don't think so. If emotions are evolved from reflexive bodily response, as I suggested above, the brain may have adapted away of anticipating bodily movement before they happened, in order to help us make a faster response. In addition, there is evidence that some neurons involved in body control also serve in body perception. Most notably, mirror neurons (Rizzolatti et al., 1996) in motor cortex respond when we move our hands and when we see hands move. Perhaps some of the cells that underlie perceptions of bodily changes also orchestrate such changes. If so, we would be able to experience changes in our bodies through the very act of instructing our bodies to change. When this occurs, experience of change would occur

prior to, and independent of actually change in the body. The hypothesis could be tested by looking to see when the neurons involved in body change work like mirror-neuron. We could also use neuroimaging to test the more general hypothesis that bodily changes are being hallucinated by spinal cord patients. We need only ask whether the brain centers that are ordinarily involved in body perception are active when they report emotions.

### *3.2 Some Emotions Do Not Involve Bodily Change*

A common criticize of the James-Lange theory is that it doesn't generalize. Critics like to point out that some emotions are not associated with bodily changes at all. Is there a bodily correlate of guilt? What about loneliness? (Harré, 1986). In addition, there are some emotions that have bodily manifestations under certain circumstances and not others. Consider long-standing emotions (Solomon, 1976). One can be in love for a long time, even though one's body isn't in an enduring state of perturbation. The fact that one's body returns to a baseline level of arousal during the hours, days, or even years that one is in love does not entail that one's love periodically wanes during that period. Even James seemed to admit that some emotions fall outside the explanatory purview of his theory. He says,

I should say first of all that the only emotions I propose expressly to consider here are those that have a distinct bodily expression. That there are feelings of pleasure and displeasure, of interest and excitement, bound up with mental operations, but having no obvious bodily expression for their consequence, would, I suppose, be held true by most readers. (1884, 189)

As examples, James cites certain moral, aesthetic, and intellectual feelings. He refers to these as cerebral emotions, and contrasts them with the "standard" or "coarser" (*Principles*) cases, which are always embodied.

In response, one could just say concede emotions form a mongrel category. Some fit the somatic model and others do not. But this concession would leave us with a puzzle. How do we recognize disembodied emotions as belonging to the same category as our most visceral sorrows and fears? Why does a single word, "emotion," lord over such a motley? I suspect there is far greater unity in the emotion category than often appreciated. I think the somatic approach can subsume anything that deserves to be called an emotion.

Consider the alleged counter-examples just adduced. Can we be certain that there is no bodily correlate of guilt? Perhaps it overlaps with the downtrodden bodily state of grief. We talk of guilt pangs and agonies. Perhaps guilt has a face, with downcast eyes and lowered chin. There may even be a blush of guilt, borrowed from the more primitive emotion of embarrassment. Loneliness may not even be an emotion, but, in any case, it is surely embodied. Like grief, again, loneliness seems to be marked by consuming enervation. James's cerebral emotions may also have bodily concomitants. Moral passions are widely believed to prod us into action, and aesthetic response can send tingles down our spines. Intellectual emotions can overlap with surprise or delight and almost certainly have a somatic mark. Consider the self-satisfied grin of a mathematician who has just discovered an elegant proof.

This is not to say that we never ascribe emotions in the absence of bodily perturbations. James mentions the case of art critics, who have mastered the skill of aesthetic judgment so well that they can praise and demolish artworks without visceral

response. Retracting his initial concession, James (1885: 201f) implies that cerebral emotions either have subtle bodily concomitants, or they do not deserve to be called emotions at all. Mocking the well-trained critic, he writes,

A sentimental layman would feel, and ought to feel, horrified, on being admitted into such a critic's mind, to see how cold, how thin, how void of human significance, are the motives for favour or disfavour that there prevail. (1984, 202)

In other words, some alleged cases of disembodied emotions can be dismissed as vague imitations. If a critic claimed to find delight in an artwork, but showed absolutely no sign of somatic response, we might justifiably question her sincerity.

Something similar can be said about long standing emotions. Imagine someone who claimed to be in love but *never* showed signs of somatic response. I think we would regard this person as disingenuous or confused. Long standing emotions deserve to be called emotions only because they *dispose* us to enter into patterned bodily responses. We do not say that these emotions disappear when they are unfelt because the disposition is there all the time. Compare the claim that Sally is sickened by seafood. That does not imply that Sally is in a perpetual state of sickness—only that seafood is disposed to make her sick. The fact that her standing state of being sickened by seafood does not involve a constant perturbation of the body certainly does not imply that being sickened is not a somatic state. Likewise, the quiet phases of our standing passions do not cancel out their carnal nature. I would defy the critic of James and Lange to identify a single emotion that lacks a bodily mark, at least dispositionally.

### *3.3 Bodily Changes Require Interpretation*

Suppose we admit that all emotions are embodied. We can still ask whether perceiving a bodily change is sufficient for being in a particular emotional state. One challenge to the sufficiency claim comes from a famous study by Schachter and Singer (1962). They argue that bodily changes qualify as emotions only when coupled with judgments that attribute those changes to emotionally relevant objects or events. To show this, they injected subjects with adrenalin, which causes autonomic arousal. All subjects were told that they had been given a drug that was designed to improve vision. While waiting for a vision test, some subjects were seated in a room with a stooge who engaged in silly behavior, such as playing with hula hoops and making paper airplanes. Other subjects were given an offensive questionnaire to fill out and seated with a stooge who feigned being irate about the questions contained therein. All subjects were secretly observed during as they interacted with the stooges, and all were given a questionnaire about their physical and psychological states after waiting in the room. Schachter and Singer observed that subjects with the silly stooge behaved as if they were happy, and subjects with the irate stooge behaved as if they were angry. There were also control subjects who had been given a placebo and subjects who were forewarned about the effects of the drug. Both showed less response to the stooges. The experimenters conclude that bodily change is indeed necessary for emotion, but cognitive interpretation is needed to determine what emotion a bodily change amounts to.

These results may look embarrassing for James and Lange, but closer inspection suggests that they are actually harmless. First, strictly speaking James and Lange do not need to insist that every emotion has distinctive physiology. They can say that the identity

of an emotion depends in part on context. In a related context, Gordon (1987) draws the useful analogy between sunburns and windburns; these are physiologically indistinguishable, but they are different ailments, in virtue of having different causes.

Second, the experiment does not actually establish that the subjects in the two conditions have different emotional states. While their behavior is different, subjects in both groups report being relatively happy when they filled out the questionnaire about their current emotional state in the final part of the experiment. Schachter and Singer dismiss this, saying the subjects may have been trying not to offend the experimenters, but the same logic could be used to explain their behavior while interacting with the stooges. Perhaps they were playing along with the stooges just to be sociable. On the face of it, this would not explain why the control subjects were less responsive to the stooges, but there is an explanation for this as well. If the adrenalin made the subjects happy, they may have become more sociable, and thus more likely to mimic the stooge. Subjects without the drug were simply less sociable. Subjects who were informed about the effects of the drug may have recognized that their expected states of arousal felt pretty good. They would have concluded that their happiness was caused by the drug, and knowing that it wasn't caused by being in the presence of another person, they may have been reluctant to act in the sociable way that happiness otherwise promotes.

Third, Schachter and Singer did not actually measure the physiological states of subjects at the end of the experiment. Earlier, I mentioned evidence that some emotions (including anger and happiness) do have distinctive body states, but these overlap. Perhaps the generic state of arousal caused by the drug transformed into emotion specific states over the course of the experiment as a function of context. Subjects without the drug didn't develop strong emotions, because they weren't given a head start. Subjects who were informed about the effects of the drug may or may not have altered emotional state, but either way they would have blamed the drug for a good portion of their feelings and resisted acting out in characteristically emotional ways.

The experimental results are inconclusive. There have been other alleged replications of Schachter and Singer's results along with attempted replications that failed. In a major review, Reisenzein et al. (1983) conclude that Schachter and Singer's conclusions are not supported by the data.

### *3.4 Some Perceived Bodily Changes Are Not Emotions*

A related objection to James and Lange is that some bodily changes are not experienced as emotions at all. The arousal caused by exercise, the shivers caused by cold, and the sluggishness of fatigue all come to mind. Why are these states not regarded as emotions if emotions are just perceptions of the body?

This simple question has a simple answer. James and Lange are not committed to the view that every bodily change corresponds to an emotional state. Only some are. James (1894) says that emotional states tend to involve a number of bodily changes and that these almost always include changes in visceral organs. Shivers caused by the cold are simply too local to qualify as an emotional states.

This reply is okay for shivers, but it is less satisfying for exercise arousal, fatigue, starvation, and other more global bodily states. Mere locality cannot distinguish emotional changes in the body from non-emotional changes. James and Lange could just list all the patterned changes that qualify as emotions as leave it at that, but this would miss the force

of the objection. If the essence of being an emotion is being a perception of a (relatively global) bodily change, then fatigue and starvation should qualify. This suggests that emotions must have some other essence. The James-Lange theory leaves the most fundamental question unanswered: what is it to be an emotion?

A response to this challenge requires the contemporary defended of James and Lange to formulate the account a bit more precisely. We can distinguish two questions. On the one hand we can ask what kind of inner mental states are the vehicles of our emotions. Here, a list a particular body-pattern perceptions may suffice. On the other hand, we can ask what makes those vehicles qualify as emotions at all. Here, it is necessary to say something about functional roles. The bodily states whose perceptions are experienced as emotions characteristically arise under certain kinds of circumstances. They arise when an organism is faces what Lazarus (1991) has called core relational themes: organism/environment relations that bear on well-being. Starvation and fatigue certainly bear on well-being, but they are not relationships between an organism and the environment; they are states of the organism. Core relational themes include dangers, losses, threats, achievements, status demotions, and transgressions. In each case, there is an object, situation, or event that bears some relation to the organism. As a first stab, we can invite James and Lange to say that emotions are perceptions of those bodily states that are characteristically caused when an organism enters a relation that falls under a core relational theme.

### *3.5 There Are Not Enough Bodily Changes to Go Around*

Earlier, I reported that there are emotion-specific bodily states. Levensen, Ekman, and Friesen (1991) identified patterned autonomic changes associated with the six basic emotions investigated by Ekman and Friesen (1971) in their pioneering work on cross-cultural facial expressions (anger, disgust, fear, joy, sadness, and surprise). But what about the many other emotions that we experience? Are there distinctive bodily profiles for guilt, shame, jealousy, love, indignation, amusement, resentment, nostalgia, *Schadenfreude*, and existential dread? Research on this question has been less extensive than one would like, but it is difficult to image positive results in every instance. Will indignation really have a different bodily expression than anger? Will *Schadenfreude* stand out from joy? Will dread have bodily changes not found in fear or grief? If emotions were nothing but perceptions of the body, and there are only a few bodily patterns associated with emotions, then there would be only a few emotions. That is an unfortunate result because there seem to be many emotions. Anger and indignation are assuredly distinct.

The objection has two interconnected replies. First, while anger and indignation are distinct, they are also closely related. So closely, in fact, that it would be appropriate to call the later a species of the former. Indignation is something like anger at an injustice. Similarly, *Schadenfreude* is joy about someone's misery, and jealousy is a combination of anger, sadness, fear, and disgust brought on by a perceived infidelity. If the bodily states of emotions are shared, it is because many emotions belong to common families (cf. Ekman, 1999).

This reply is incomplete. It explains the overlap, but it doesn't explain how we distinguish different members on the same emotion family. That's where the second reply comes in. Emotions can be distinguished by their eliciting conditions. This goes back to



the point made in the previous section. We can think about perceptions of bodily states as the vehicles of emotions, and we can individuate emotions by their vehicles. We can also individuate emotions by their eliciting conditions. Anger and indignation feel alike, from a somatic perspective, but indignation is caused by injustice, and many instances of anger are not. James and Lange are not sufficiently clear on this point, but it is consistent with their theoretical approach.

### *3.6 The James-Lange Theory Cannot Accommodate the Intentionality of Emotions*

Within philosophy, the most persistent objection to the James-Lange theory is that it cannot explain the fact that emotions have intentional content. Indeed, emotions are intentional in two senses. They have formal and particular objects. All fears concern dangers (the formal object), and each particular episode of fear concerns a particular danger, such as an assailant, a great height, a loud noise, a dental visit, an upcoming exam, and so on (particular objects). Intentionality renders emotions amenable to rational assessment. They can be right or wrong, appropriate or inappropriate, warranted or unwarranted or unwarranted, rational or irrational (see, e.g., Pitcher, 1965; Solomon 1976). If emotions were merely perceptions of the body, they would qualify as intentional in only an uninteresting sense; they would represent the body as being in such-and-such a state. This, according to the objection, is not enough.

On a standard cognitive appraisal theory, emotions contain evaluative judgments that explicitly characterize their formal objects. Fear might be the judgment that there is a danger (cf. Lazarus, 1991). These formal objects are what Lazarus calls core relations themes—e.g., dangers for fear, losses for sadness, insults for anger, and so on. Particular objects elicit fear because they can be appraised as exhibiting the core theme expressed in the fear appraisal. A great height is appraised as dangerous. The total mental state, fear of a height, contains a representation of the particular object as well as a representation of the property that makes it fearful. Emotions place representations of particular objects under concepts that represent core themes. Since heights are in fact dangerous, fear is warranted. If fear persists after reliable precautions have been taken, the fear is no longer warranted.

On the face of it, the James-Lange theory is totally incapable of accommodating the intentionality or rationality of emotions. Even Damasio gives in on this point. He says the James-Lange theory places inadequate emphasis on the role that evaluation plays in the induction of emotions (p. 130). To make up for this shortcoming, he recommends that we identify emotions with sensations of bodily changes *coupled with* a mental evaluative process (p. 139). This process can involve innate perceptual triggers in the case of the primitive (or “primary” emotions) exhibited by animals and children, but it will involve more complex cognitive processes mediated by the frontal cortex in the more advanced (or “secondary” emotions) or human adults.

I think Damasio concedes too much. In responding to the last objection, I suggested that James and Lange can make some headway by emphasizing the conditions under which emotions are elicited. Emotions, I said, can be individuated by their reliable elicitors. This suggestion can be taken a step further. According to prevailing theories of mental representation, a mental state gets its intentional content in virtue of being reliably caused (or having the function of being reliably caused) by something (Dretske, 1981; 1988; Fodor, 1990). Let’s assume that a theory of this kind, whatever the details, is correct. There is some causal relation that confers content. If emotions are perceptions of

bodily states, they are caused by changes in the body. But if those changes in the body are reliably caused by the instantiation of core relational themes, then our perceptions of the body may also represent those themes. In other words, leading theories of how mental representations represent *entail* that emotions represent core themes, if they are reliably caused by those themes in the right sort of way.

Consider fear. It seems quite likely that we are wired to undergo a character perceived (or imagined) bodily change under a variety of threatening conditions. A similar bodily pattern is triggered when the auditory system detects a loud sudden noise, or when the visual system detects a looming object, or when we proprioceptively detect a sudden loss of support. The perception of that bodily state represents danger, because it is under the reliable causal control of dangerousness. Danger is the property in virtue of which these highly desperate eliciting conditions have come to perturb our bodies. If loud noises and looming objects were not dangerous, they would not have their characteristic effects. We can think of all of these body-change elicitors as belonging to a mental file—an elicitation file. That file may start out with a handful of triggers and expand over the life span. As we learn of new dangers, we may add new entries to the elicitation file. Elicitation files can even come to include evaluative judgments of the kind emphasized by defenders of appraisal theories. Each addition to an elicitation file will be sufficient for triggering the relevant bodily response, though getting admitted to the elicitation file in the first place will depend on similarity to or association with triggers that have already been attained. Consequently, all the representations that trigger the bodily response will do so in virtue of being recognized as dangerous, either explicitly or implicitly by similarity to previously established elicitors.

This proposal answers one half of the intentionality objection. If bodily perceptions represent core themes by reliable causation (or something along these lines), then they have formal objects. They also have conditions of correctness. If fear happens to be caused by something benign, it would count as inappropriate because fear bears the meaning-conferring causal relation to dangerous things. New emotions can be generated by modifying elicitation files or establishing new elicitation files that are offshoots of those that have already been established. The new files may expand or contract the conditions under which an emotion is elicited. For example, an anger elicitation file can spawn an “indignation” offshoot that contains representations of different kinds of injustice. Culture can exert considerable influence on how elicitation files are modified and created.

This explains how emotions qua bodily perceptions can have formal objects, but what about particular objects? How does a thought about heights latch onto a perception of the body? A full answer to this question would have to include details about how mental states are bound in thought. The idea would be that a representation of heights gets co-activated with a somatic perception and linked to it in such a way that the former causes the latter to occur, and the latter wanes when the former becomes inactive. There is no reason to provide the details here, because any theory of the emotions will have to explain how dependencies arise between representations of particular objects and somatic states. Everyone agrees that bodily response often occur *in virtue of* some particular perception or thought. The defender of the James-Lange theory can say that this dependency, however it gets fleshed out, determines the particular content of an emotional state.

Although only a sketch, I hope this response makes it clear that one could in principle capture the intentionality of emotions without abandoning the idea that emotions

are perceptions of bodily states. Strictly, the intentionality objection does not require one to abandon the core idea behind the somatic theory. This is a very significant finding, because the majority view is that the somatic theory is utterly unworkable. But it would be a hollow victory if there were reasons to favor a theory that identified emotions with compounds of bodily perceptions *and* evaluative states. Are there such reasons?

#### **4. Embodied Appraisals**

I have been suggesting that perceptions of the body could represent core relational themes by being reliably caused by such themes. This proposal offers a way-out for James and Lange, but it faces a pressing objection. Above, I introduced the idea of elicitation files, and I said that these determine what the content-conferring causes of our emotions. I also said that elicitation files may include evaluative judgments. But why not identify the contents of an elicitation file with an emotion? Shouldn't we follow Damasio in saying that emotions are bodily perceptions *plus* evaluations?

I'll mention three considerations that can help us resist this move. First, the fact that elicitation files help establish the intentional content of emotions does not entail that they should be regarded as constituent parts. The nociceptive fibers that link bodily injuries to pains mediate the relation between pains and their contents, but there is little temptation to say that pains are such fibers. Second, the items in an elicitation file do not activate with the right time course to qualify as components of an emotion. An emotion can be triggered by a passing thought or fleeting perception, and then linger. Consider a bout of fear caused when one mistakes a shadow for a bug moving across the floor. Third, the contents of an elicitation file will be very heterogeneous. In contrast to appraisal theories, I submit that there is no privileged representation mediating the link between core relational themes and bodily changes. The items in an elicitation file range from very abstract cognitive appraisals to very concrete perceptual representations of specific objects. If emotions are elicited by different representations on different occasions, there is no reason to think that any one of those representations qualify as constituent parts of the emotion. If elicitation file contents were constituent parts, emotions would change from occasion to occasion. That consequence can be avoided.

These are not knock-down arguments, but they show that we are under no obligation to regard the items in an elicitation file as constituent parts of the emotions they elicit. Far from it. There might be motivation to do so if these items were the only things that could serve as bearers of the right intentional contents. I have been arguing that this is not the case, emotions can represent core relational themes even if they are perceptions of bodily states. In fact, they must represent such themes if leading semantic theories are correct. I call this amendment to the James-Lange theory the "embodied appraisal theory." Emotions are embodied, just as James and Lange proposed. They are perceptions of changes in our somatic condition. But, ironically, they are also appraisals. Let us define an appraisal, not as an evaluative judgment, but as any representation of an organism-environment relation the bears on well-being. Evaluative judgments can serve as appraisals, but they are not alone. If a non-judgmental state represents an organism-environment relation that bears on well-being, it too will count as an appraisal on this definition. My suggestion is that certain bodily perceptions have exactly this property. They represent roughly the same thing that explicit evaluative judgments represent, but they do it by figuring into the right causal relations, not by deploying concepts or providing

descriptions. Our perceptions of the body tell us about our organs and limbs, but they also carry information about how we are faring.

Is this the view that James and Lange had in mind? Probably not. Their contributions predate the relative developments in philosophical thinking about representation. But the embodied appraisal theory preserves their core insight, and endows emotions with semantic properties that can be used to deflect the arrows of dissent. In developing a theory of emotion, we should not feel compelled to supplement embodied states with meaningful thoughts; we should instead put meaning into our bodies, and let perceptions of the heart reveal our situation in the world.

## References

- Cannon, W. B. (1927). The James-Lange theory of emotion: A critical examination and an alternative theory. *American Journal of Psychology*, 39, 106-124.
- Chwalisz, K., Diener, E., & Gallagher, D. (1988). Autonomic arousal feedback and emotional experience: Evidence from the spinal cord injured. *Journal of Personality and Social Psychology*, 54, 820-828.
- Critchley, H. D., Mathias, C. J. & Dolan, R. J. (2001). Neural correlates of first and second-order representation of bodily states. *Nature Neuroscience* 2001; 4: 207-212.
- Damasio, A. R. (1994). *Descartes' Error: Emotion Reason and the Human Brain*. New York, NY: Gossett/Putnam.
- Damasio, A. R., Grabowski, T. J., Bechara, A., Damasio, H., Ponto, L. L. B.; Parvizi, J., & Hichwa, R. D. (2000) Subcortical and Cortical Brain Activity During the Feeling of Self-generated Emotions. *Nature Neuroscience*, 3, 1049-1056.
- Damasio, A. R. (1999) *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. New York, NY: Harcourt Brace & Company. 1999
- Dretske, F. (1981). *Knowledge and the Flow of Information*. Cambridge, MA, MIT Press.
- 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. and Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology*, 17, 124-129.
- Ellsworth, P. C. (1994). William James and Emotion: Is a Century of Fame Worth a Century of Misunderstanding? *Psychological Review*, 101, 222-229.
- Fodor, J. A. (1990). A Theory of Content, I & II. In *A Theory of Content and Other Essays*. Cambridge, MA: MIT Press.
- Gordon, R. M. (1987). *The structure of emotions: Investigations in cognitive philosophy*. Cambridge: Cambridge University Press.
- Harré, R. (1986). The social constructivist viewpoint. In R. Harré (ed.) *The Social Construction of Emotions* (2-14). Oxford: Blackwell.
- Heelas, P. (1986). Emotion talk across cultures. In R. Harré (ed.) *The Social Construction of Emotions* (234-266). Oxford: Blackwell.
- Hohmann, G. W. (1966). Some effects of spinal cord lesions on experienced emotional feelings. *Psychophysiology*, 3, 143-156.
- James, W. (1884). What is an emotion? *Mind*, 9, 188-205.
- James, W. (1894). The physical basis of emotion. *Psychological Review*, 1, 516-529.
- James, W. (1890). *The Principles of Psychology*. New York: Dover.
- 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.

- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- LeDoux J. E. (1996). *The emotional brain*. New York, NY: Simon & Schuster.
- Levenson, R. W., P. Ekman, & Friesen, W. V. (1990). Voluntary Facial Action Generates Emotion-Specific Autonomic Nervous System Activity. *Psychophysiology*, 27, 363-384.
- Lutz, C. (1988). *Unnatural emotions: Everyday sentiments on a Micronesian atoll and their challenge to Western theory*. Chicago: University of Chicago Press.
- Morris, J. A., Öhman, A., & Dolan, R. J. (1999). A subcortical pathway to the right amygdale mediating “unseen” fear. *Proceedings of the National Academy of Science*, 96, 1680-1685.
- Pitcher, G. (1965). Emotion. *Mind*, 74, 324-346.
- Prinz, J. J. (2003). *Emotional perception*. New York: Oxford University Press.
- Reisenzein, R. (1983). The Schachter theory of emotion: Two decades alter. *Psychological Bulletin*, 94, 239-264.
- Reisenzein, R., Meyer, W.-U. & Schützwohl, A. (1995). James and the physical basis of emotion: A comment on Ellsworth. *Philosophical Review*, 4, 757-761.
- Rizzolatti, G., Fadiga, L., Gallese, V., & Fogassi, L. 1996) Premotor cortex and the recognition of motor actions *Cognitive Brain Research*, 3, 131–141.
- Schachter, S and Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, 69, 379-399.
- Solomon, R. (1976) *The passions: Emotions and the meaning of life*, Indianapolis, IN: Hackett Publishing Company.
- Strack, F., Martin, L.L., & Stepper, S. (1988). Inhibiting and facilitating conditions of facial expressions: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology*, 54, 768-777.
- Wierzbicka, A. (1999) *Emotions across languages and cultures: Diversity and universals*. Cambridge: Cambridge University Press.
- Zajonc, R. B. (1984). On the primacy of affect. *American Psychologist*, 39, 117-123.
- Zajonc, R. B., Murphy, S. T., & Inglehart, M. (1989). Feeling and facial efference: Implications of the vascular theory of emotion. *Psychological Review*, 96, 395-416.