A Thesis

entitled

Passionate Cognition: A Perceptual Theory of Emotion and the Role of the Emotions in Cognition

by

Walter Scott Stepanenko

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Master of Arts Degree in

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An Abstract of

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In recent years, a growing number of cognitive scientists have advocated for a more central role of emotion in reasoning and other skills. In this thesis, I investigate how emotion may play such roles and why having emotion in such roles is beneficial to cognition in general. I examine both empirical and philosophical accounts of emotion and suggest that if one wants to provide an account of both how emotion-laden cognition works and why it is successful, one must employ a suitable notion of emotion. I adopt the view that emotions are essentially embodied and I show how understanding a bodily appraisal as the generation of a hypothesis and emotion as the confirmation of that hypothesis can meet many of the charges leveled at perceptual theories of emotion and explain how passionate cognition operates and why passionate cognition is successful.

Specifically, I argue that there are five main advantages to my theory of emotion. First, I argue that my view most accurately meets the developmental constraints of not positing innate emotions. Second, I argue that my view fits the apparent evolutionary continuity of emotion by salvaging the intuition that emotions are not exclusively human. Third, I argue that my view explains the role emotions play in an individual's cognitive

economy, particularly the role in practical decision-making. Fourth, I argue that my view accounts for the duration of emotional episodes whereas more common perceptual views do not. Finally, I argue that my view affords explanations of exceptional psychological cases, such as Capgras Syndrome.

In Chapter One, I present a few exceptional psychological cases so as to elucidate the reason many affective scientists are concluding that emotion plays a larger role in cognition than folk psychological wisdom would have it. In Chapter Two, I construct a preliminary taxonomy of affective phenomena so as to situate emotion amongst other affects, emphasize the dynamics of affective life, and explain why emotions are probably not innate. In Chapter Three, I present a few alternative views of emotion, highlight the ways emotion theorists have come up short, and make the case for thinking that emotion is essentially embodied. In Chapter Four, I reimagine the role of body appraisals in the emotion elicitation process and I demonstrate how such a reimagining meets many of the charges leveled against perceptual views of emotion. In Chapter Five, I conclude with a brief discussion of passionate cognition and I explain why passionate cognition may have contributed to evolutionary fitness.

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Chapter 1

Calmer Heads May Not Prevail

It reads like the back cover of a young adult novel.

"M" senses that something is off with her family. The trouble is that she's the only one. Everyone "M" confides in insists that everything's normal. Despite appearances, "M" knows that isn't true. She knows her family; they're *her* family. These people, they're not her family. These people are...impostors.

But it's no story.

For individuals with Capgras Syndrome, the sense that one's family has been replaced by impostors is unfortunately real. There are various treatment techniques one may choose to explore, but one consistent way for an individual with Capgras Syndrome to undo the delusion is to speak with one's family on the phone. As it turns out, the delusion vanishes during a telephone conversation. This fact is particularly important to neurobiologists who want to understand Capgras Syndrome. For one, it suggests that the syndrome is modality specific. In this case, it suggests that the syndrome is in response to some disturbance in the visual modality, which means that one might expect to find damage to brain regions implicated in visual perception. As it turns out, Capgras patients

often show lesions in the temporal lobe,[1] an area correlated with face-processing, a function many Capgras patients have exhibited impairments in[2] beyond the role it may have in the production of the delusion. Given these results, one might suggest that Capgras Syndrome is simply a face-processing impairment. While that explanation would be consistent with the fact that the delusion vanishes when a patients converses with his or her family on the phone, it doesn't account for the scope of the delusion. If Capgras Syndrome were due to an impairment in face-processing *simpliciter*, one might expect the Capgras patient to construe many individuals with whom he or she is acquainted as impostors, but the patients do not. The Capgras delusion is often restricted to the patient's family. In one case[3], the delusion was reported in regards to the patient's dog. What is it about a patient's family (or dog) that may explain the scope of the delusion? One promising possibility is that a person's family (including one's dog) typically elicits an emotional response from that person.

Humans are social beings capable of having deep affection for one another, but that affection is usually reserved for those to whom we are closest, which often times happens to be our family. Perhaps Capgras Syndrome is due to an inability to link a recognizable face with an emotion typically associated with that face. Such an account would explain why the Capgras delusion is not applicable to a patient's acquaintances, but it raises the issue of what the precise neurobiological impairments underlying the syndrome are. Ramachandran & Hirstein (1997) have attempted to construct an answer to this exact issue. They “propose...that the principal cause of Capgras is a failure of

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1 See Signer (1994).
2 See Young et al. (1993).
3 See Ramachandran (1998).

communication between areas of ventral stream processing in the temporal lobe and the limbic complex, especially the amygdala" (441). On this view, the failure of communication between these structures results in a "deterioration of an ability to generate enduring categories...by extracting and linking a common denominator across successive episodes" (441). In Capgras patients, what may be missing is a link typically supported between an emotion and the face to which the emotion is typically directed. In the absence of such a link, memory management mechanisms may create a new file for the face and in doing so may dissociate the face from the person to whom the face truly belongs. The result of which is the belief that this person appears to be my family member, but is not my family member.

If Ramachandran & Hirstein are right about Capgras Syndrome, emotion is playing a crucial role in the organization of an individual's memory and thus may be described as one of the brain's indispensable resources for testing and constructing an individual's reality. But this might not be all emotion is doing. In addition to the head-turning implications of Capgras Syndrome, there are a set of patients with damage to the ventromedial areas of the frontal lobe who may reveal another surprising function of emotion. Despite all indications of healthy cognition- these patients score in the normal range on a battery of general intelligence and knowledge tests- these patients nonetheless exhibit impairments in practical decision-making. Such patients typically choose risky life partners (often at the behest of their family), get involved in business ventures most of us know to avoid, and spend hours scrutinizing details most of us would find insignificant. Importantly, these patients' deficits do not appear to be due to any

impairment in relevant social knowledge. Rather, the patients with prefrontal ventromedial damage deficits appear to be due to an impairment in emotion. On top of the aforementioned practical reasoning deficits, such patients also report the absence of emotion. It turns out, the co-occurrence of the two may not be a coincidence. Emotions are probably playing a much larger role in practical reasoning and decision-making than common sense may have it.

But that common sense may be mistaken about emotion's place in cognition does not mean the importance of emotion has gone unnoticed altogether. One line of research sensitive to emotion's importance is the vast literature on the impact of prolonged periods of psychosocial deprivation on post-institutionalized adopted children. Such children exhibit a slew of unfortunate deficits. For example, post-institutionalized adopted children have higher rates of social problems than their peers[4], higher rates of attention-deficit/hyperactivity disorder[5], and often have difficulty regulating their behavior.[6] On top of these difficulties, post-institutionalized adopted children also have difficulty identifying emotions.[7] But while there is no available reason to suggest that such children have an inability to experience an emotion (unlike patients with ventromedial damage to the frontal lobe or Capgras Syndrome), one may nonetheless wonder whether or not post-institutionalized childrens' behavioral and social deficits are related to emotion impairments. Perhaps these children fail to learn relevant associations between an emotion and a social situation in the absence of a reliable caregiver and that without the

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4 See Hoksbergen et al. (2004).
5 See Miller et al. (2009).
6 See Jacobs et al. (2010).
7 See Wismer Fries & Pollack (2004).

relevant associations these children are at a loss when the situation calls for a particular response. If so, the explanation one might give for some of post-institutionalized childrens' deficits may not be so different than an explanation one might prefer to give for the impairments in practical reasoning symptomatic of ventromedial damage to the frontal lobe.

This much, however, is certain: we could not be further from that bit of centuries old folk wisdom characterizing the passions as stifling to rationality and objectivity. It may have taken some time to dawn on us, but there is a critical sense in which the expression “calmer heads prevail” is absolutely false. A brain drained of feeling is not something to be desired. As it turns out, cool, passionless thought was not nature's answer to the survival challenges of the time. Instead, nature opted for passionate cognition and the result was the explosion of life around us today. What follows is an effort to explain just how passionate cognition might work and why it may have been successful. Of course, no such explanation can ever be arrived at without traversing the long, hard yards necessary for providing an answer to the question, “Just what is an emotion?” Thus, the bulk of this thesis is devoted to elucidating the nature of emotion. As I will show later, however, once emotion has been suitably understood, the advantage of passionate cognition is more than apparent. But in order to get there, I'm going to need to dig through a mound of feelings.

Chapter 2

Constructing an Empirically Appropriate Affective Taxonomy

It is often thought that emotions belong to a family of related phenomena typically described as affects. Broadly construed, affects are feelings. The view that I am defending corroborates this conviction; the purpose of this chapter is to construct a taxonomy of affective phenomena that may elaborate on and remain faithful to this common conviction. As it concerns the role of emotion in cognition, the purpose of constructing such a taxonomy is to both hone in on the nature of emotion and highlight key relationships between emotion and other affects. Without these insights, emotion's place in cognition simply cannot be grasped. The construction of the taxonomy will come in three parts. The first part will be to characterize those affective phenomena that are not emotions so as to highlight some crucial distinguishing marks of an emotion. The second part will be to examine the nature of mood and its relationship to emotion so as to elucidate the fact that closely related affects exhibit systematic and reliable influences on

cognition. The final part will be to determine which emotions are basic, which I will argue should be construed as the task of determining which emotions are innate so that I may avoid giving a developmentally inappropriate view of emotion.

2.1 Episodes and Dispositions: A Primary Division

The first division we must introduce into our taxonomy demarcates dispositions from episodes. An affective disposition is a non-temporally specified tendency to experience some affect. Affective dispositions may come in various forms. An affective disposition may have a particular object or it may not. There are two types of affective dispositions that take a particular object: attitudinal emotions and sentiments. Attitudinal emotions concern one particular object and one particular emotion. For example, "John is afraid of spiders" is an attitudinal emotion because it concerns one particular object, spiders, and one particular emotion, fear. Unlike an emotions itself, attitudinal emotions have their phenomenal character derivatively; what it's like to have an attitudinal emotion is just what it is like to experience the emotion the attitudinal emotion concerns. Sentiments, on the other hand, concern one particular object, but may evoke more than one emotion. Caring about something is a sentiment because one's care concerns one particular object, but in caring an individual also opens up oneself to emotions concerning that object. For example, Tarzan's love for Jane is a sentiment because it concerns one person, Jane, and opens Tarzan up to a number of emotions: Tarzan may feel happy for Jane's accomplishments or sad for her struggles. Affective dispositions that do not take a particular object are character traits. Character traits are like sentiments in that character traits may concern multiple emotions. For example, grumpiness is a

character trait that concerns multiple emotions. A grumpy person not only displays a tendency toward anger and frustration, but a grumpy person may be less inclined to feel happiness or pity.

On the opposite side of our primary division lie the episodic affects, which include emotions, desires, and moods. I'll begin with desires. In many respects, desires are similar to emotions. For example, like emotion, desires often have an immediate rather than derivative phenomenal quality. What it is like to have a desire to eat the cupcake in the lounge is not dependent on what it is like to have some other experience, as in the case of an attitudinal emotion. In other crucial respects, desires differ greatly from emotions. Unlike emotions, desires must always target some state of affairs that do not currently obtain.[8] For example, I may be happy about the Red Wings' playoff chances while the Red Wings are in the playoffs, but I cannot desire that the Red Wings make the playoffs if they are in fact in the playoffs. One way of construing this difference is in terms of "direction of fit," a term coined by Searle (1983). To say that something has a particular "direction of fit" is to specify which of the two relata implicit in a relation is tailored to the other. According to Searle, emotions and desires have opposite directions of fit. Whereas emotions have a "mind-to-world" direction of fit, desires have a "world-to-mind" direction of fit. For those phenomena that have a "mind-to-world"direction of fit, the nature of the phenomena in question is dependent on how the mind gets tailored to the world. For those phenomena that have a "world-to-mind" direction of fit, the nature of the phenomena in question is dependent on how the world gets tailored to the mind.

[8] More precisely, desires must always target some state of affairs that the subject believes do not currently obtain.

Another way of stating this difference is in terms of function. One may say that those phenomena that have a "mind-to-world" direction of fit have the function of reliably tracking and responding to some event in an environment. Similarly, one may say that those phenomena that have a "world-to-mind" direction of fit have the function of bringing about some event or change in an environment as represented by the phenomena. Because desires are defined by their "world-to-mind" direction of fit, desires must concern some state of affairs that do not currently obtain.

I won't labor on either the nature of affective dispositions or desires. For the most part, the preceding characterizations are generally accepted.[9] The purpose of introducing both is largely due to the need to elucidate the fact that emotions have a particular direction of fit and the fact that emotions are episodic. In truth, there have been some attempts to characterize all emotions as dispositional.[10] I will resist such a characterization, the main reason being that dispositions have only derivative phenomenal qualities whereas emotions appear to have an immediate phenomenal quality. That's not to say that an occurrent emotion does not dispose an individual to act or think some particular train of thoughts, but that qualifying occurrent mental states as dispositional does not reveal any interesting relations between distinct phenomena. All thoughts have a function and in this sense all thoughts dispose an individual to act some particular way or think some particular train of subsequent thoughts. Thus, characterizing occurrent mental states as dispositional does not tell us anything interesting about emotions as separate from other mental states. For this reason, I reserve the term

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[9] For example, Prinz (2004a), and Deonna & Teroni (2012) defend nearly identical taxonomies compared to the one I have just provided.

[10] For example, see Wollheim (1999).

disposition to signify a particular latent property (or set of properties) that reliably produce an occurrent mental state under certain conditions. On my view, dispositions typically connote the fact that an item is stored in long-term memory, but I will return to the role memory plays in emotion in Chapter Four. For now, I transition from a discussion of the preceding affective phenomena to an examination of the nature of mood and the relation between mood and emotion.

2.2 The Nature of Mood and its Relation to Emotion

For some time, moods were thought to differ from emotion in regards to temporal duration, but this line of thinking has come under increased scrutiny.[11] In response to skepticism concerning the distinction between emotion and mood in virtue of temporal duration alone, contemporary debate on the nature of mood has largely centered on whether or not moods count as intentional states. As I see it, two opposing strains of thought have begun to dominate this topic. The first claims that moods are non-intentional, conditions of possibility for the experience of a particular emotion. The second claims that moods are intentional, generalized emotions. In recounting both views, I will highlight the deficiencies I perceive in each and suggest that a proper account of mood must include elements of each. Specifically, I will argue that it is more appropriate to construe mood as an intentional state than a non-intentional state, but that in many crucial respects, mood may be both a condition of possibility for the experience of a particular emotion and a generalized emotion.

One of the more recent advocates for the conception of mood as a non-intentional

[11] For example, Davidson (1994) has argued that moods can be short-lived whereas Lazarus (1994) has argued that emotions can be long lasting.

state has been Matthew Ratcliffe. On Ratcliffe's (2010) view, “a mood is not a kind of intentional state...(a) mood is a background to all specifically directed intentional states” (128). Thus, according to Ratcliffe, one is never free of a mood; moods do change, but they are always replaced by another mood. More importantly, mood structures cognition. That mood structures cognition means that mood determines the kinds of things one can think about, or as it relates to emotion specifically, the kinds of emotions one can experience. As Ratcliffe states, “(t)he range of occurent emotions that can be experienced is determined by the shape of the background mood” (129). Such a view of mood structuring cognition is reminiscent of Davidson's (1994) claim that “moods bias cognition” (54). But whereas Davidson emphasizes the way in which mood biases retrieval of types of information and preattentive mechanisms, Ratcliffe draws on the work of Heidegger and suggests that moods entail care, or self-concern. It is this fact, that moods entail care, that Ratcliffe points to as reason for viewing mood as conditions of possibility for the experience of a particular emotion. As Ratcliffe states, “(a) being without any self-concern, a being that did not *care* for itself in some preconceptual felt way, would not be open to the possibility of emotions such as fear” (129).

From these remarks it is clear that Ratcliffe envisions mood as a background feeling evincing self-concern, but it would be a mistake to construe Ratcliffe's notion of mood as internally directed. According to Ratcliffe, moods involve bodily feelings, but the bodily feelings involved in mood are not strictly internally directed. To show that bodily feelings are not strictly internally directed, Ratcliffe takes aim at a distinction Goldie (2000) has drawn between “bodily feelings” and “feelings towards.” According to

Goldie, a bodily feeling is "the feeling from the inside of the condition of one's body" (236) whereas feelings towards is "unreflective...engagement with the world beyond the body" (214).[12] But on Ratcliffe's (2005) view, "Goldie's distinction is a case of double-counting" (49). As Ratcliffe states, "Feelings of the body and feelings towards are two-sides of the same coin" (51). The body is a medium through which all perception takes place. That the body is a medium through which all perception takes place, Ratcliffe thinks particularly salient in the case of touch. As Ratcliffe (2010) explains,

> in routine activities, where things proceed in accordance with our expectations, what is felt is not the hand but what it touches. The touch is a medium through which something else is perceived. The body continues to feel but is not itself a conspicuous object of feeling. (134)

Now the aforementioned account of touch is not intended to demonstrate that the body cannot be felt as an object. Ratcliffe is clear that the body, or at least a part of it, can be felt as an object: "(w)hen you touch something very hot, the primary object of experience might well be your hand, as you pull back in pain" (134). Rather, the point seems to be that the body, considered as a whole, is the medium through which all perception takes place, but that part of the body can be an object, at least in some cases.

Having established that bodily feelings can be both internally and externally directed, the connection between bodily feelings and mood can be made apparent. According to Ratcliffe (2010) "(c)ertain kinds of bodily disposition are *felt* as how one finds oneself in a world" (138). The implication thus being that moods are world-directed

[12] Goldie's precise definition of "feelings towards" is "unreflective emotional engagement with the world beyond the body." I omit the term "emotional" given that the present discussion is focused on the distinction between mood and emotion generally.

bodily dispositions, which entail both bodily feelings and self-concern. Given the constancy of bodily dispositions and the claim that moods are non-intentional, Ratcliffe's reason for construing mood as a condition of possibility for the experience of a particular emotion is evident. Because thoughts *qua* intentional states are directed and shaped by mood and emotion is a thought of a sort, emotion is possible only in virtue of mood. Thus, on Ratcliffe's view, emotions and mood are co-occurent, but differ insofar as emotion is intentional and mood is itself non-intentional, although it serves as the background for all intentionality.

On Prinz's view (2004b), by contrast, mood is an intentional, generalized emotion. That Prinz views mood as a generalized emotion is indicated by his claim that, "(f)or every mood, there apparently is a closely related emotion. Depression is related to sadness, free-floating anxiety is related to fear, and irritability is related to anger" (183). That Prinz thinks mood is intentional is closely related to his vision of the nature of the intentionality of emotion. On Prinz's view, a mental state is intentional if it involves a representation, but a representation can be a number of many things. More importantly, a mental state can be thought to involve a representation if that mental state "has the function of being reliably caused by something" (184). Because emotions have the function of being reliably caused by things, emotions must involve a representation and therefore emotions are intentional. On Prinz's view emotions represent what he calls "core-relational themes," or organism-environment relations. So, for example, sadness represents the loss of something of value, fear represents something as dangerous, surprise represents something that violates an expectation, etc. Importantly, these

representations do not represents the events or objects to which they are directed. As Prinz (2004b) states, “When I am sad about the death of a child, I have one representation of the child's death and I have sadness attached to that representation. The sadness doesn't represent the death” (62).

This line of thinking applies to mood as well. On Prinz's view, mood can be thought to involve a representation given that mood has the function of being reliably caused by something. As Prinz claims, mood “can be induced by diet, weather, hormones, and other seemingly arbitrary elicitors...they can also be caused by a life event” (184). Given that mood must involve a representation, mood must be intentional, which on his view, means mood must have a function. According to Prinz, moods' “function is to inform us about how we are faring in general”(185). In other words, moods are about how things are going for us. So the crucial distinction between mood and emotion is not whether or not they represent anything at all, but what they represent. To explicate the difference between what moods and emotions represent, Prinz introduces the notion of an “ontic object.” On Prinz's view, an ontic object “refers to the kind of things that exhibit the property comprising the formal object of a term” (185). So, where there is an ontological class of things X to which the term Y applies, the ontic object of term Y is X. Thus, Prinz's claim that “(e)motions and moods have slightly different ontic objects” (185) amounts to the basic implication emotions and moods refer to slightly different classes of things. On his view, emotions refer to specific things whereas moods refers to things generally.[13] As Prinz states, “Emotions are set up to detect localized changes in

[13] Importantly, moods refer to things generally, but not general things. The distinction appears to be between “how one's endeavors are going generally” versus “how one's general endeavors are going.”

organism-environment relations, and moods are set up to detect more global changes" (186). The representations of each reflect their respective object. So, for example, "sadness represents a particular loss, while depression represents a losing battle" (185).

Carrying the distinction further, Prinz suggests that moods and emotions differ in respect to an agent's planning. Prinz claims that emotions respond to immediate challenges while moods respond to more enduring challenges. To clarify the distinction, Prinz posits a hierarchically organized planning system, ranging from what he calls a "temporary work pad for upcoming action" and "major objectives in life" (187). The idea is that emotions influence the "temporary work pad" while moods influence the larger scale projects. As Prinz states, "emotions may cause us to reprioritize immediate goals (while) moods may cause us to reprioritize long-term goals" (187). Thus, on Prinz's view, moods and emotions are closely related phenomena. In fact, the relationship between mood and emotion is so tight that Prinz even goes so far as to suggest that moods are not truly an independent category, but a special case of emotion. As Prinz claims, "There is a sharp distinction between moods and emotions that are not moods but no sharp distinction between moods and emotions" (188).

As I noted earlier, Ratcliffe's suggestion that mood structures cognition and thereby determines the kinds of thoughts and emotions one can experience has precedence in the psychological literature. For example Gray (2001) has shown that negative moods enhance performance on spatial tasks, but impair performance on verbal tasks whereas positive moods enhance performance on verbal tasks, but impair performance on spatial tasks. Gray's results are consistent with Isen's (1987) findings that

positive mood can enhance creativity on verbal association tasks. Similarly, Schwarz (1990) argues that negative mood promotes recall of negative stimuli while positive mood promotes recall of positive stimuli. Bouhuys et al (1995) have shown that individuals primed with positive moods perceive more happiness than sadness in schematical facial expressions and that individuals primed with negative moods perceive more sadness than happiness in schematical facial expressions. Schmid & Mast (2010) have demonstrated that participants primed with sad moods show a negative bias on emotion recognition tasks and participants primed with happy moods show a positive bias on the same task. Storbeck & Clore (2005) have argued that negative mood benefits tasks requiring referential processing whereas positive moods benefits tasks requiring relational processing. Bar-Haim, Lamy & Glickman (2005) indicate that anxious individuals show a processing bias in favor of threat-related stimuli. And finally Matthews (1990) has shown that anxious individuals have a preattentive bias in favor of threatening information and tend to interpret ambiguous events in a threatening way.

While the aforementioned results are by no means conclusive, they are highly suggestive. Each of these studies clearly implicates mood as playing a crucial role in various aspects of cognition. More importantly, these studies suggests that moods role is not limited to long-term planning, as Prinz hypothesizes. Spatial tasks, verbal association tasks, and emotion recognition tasks all appear to have little to do with “major life objectives,” but all appear highly sensitive to an individual's mood. However, this is not to say that these studies substantiate Ratcliffe's claim that moods are conditions of possibility for the experience of a particular emotion. Recall Ratcliffe's claims that “a

being that did not care for itself...would not be open to the possibility of emotions such as fear" and that "(t)he range of occurent emotions that can be experienced is determined by the shape of the background mood" (129). The first claim, that a being without care for itself could not fear, sounds plausible when read as specifying a necessary condition. That is, I agree that it seems impossible to imagine an indifferent creature feeling fear or any other emotion. How seriously thinkers should take the conceivability or inconceivability of such beings is a question for another time. What I will say is that understanding care as some pre-conceptual self-concern need not entail that mood is in any type of "background." I prefer to characterize mood as belonging to what some theorists[14] have described as peripheral, or fringe consciousness. The term "background" suggests a vertical structure to phenomenology I do not find to be particularly salient, but this point might be little more than "nit-picking" and thus I do not want to suggest that it demonstrates Ratcliffe's first claim false. However, it is worth noting that care for one's self alone is probably insufficient for the experiencing of fear of many things. For example, what is needed for a mother fearing that her child may break the "family lamp" is the mother caring about the lamp, not simply about herself. In regards to Ratcliffe's second claim, that the range of emotions is determined by the shape of one's mood, I think such a position requires further defense. While all of the aforementioned studies suggest congruity effects, negative mood promotes the recall of negative stimuli and positive mood promotes the recall of positive stimuli and so on, none of the studies preclude the possibility that an individual in a happy mood can experience a particularly sad emotion. Now, Ratcliffe might respond that an individual's mood may modulate an

[14] For examples, see De Sousa (2002), Kriegel (2004),

occurrent emotion and that an individual in a happy mood may experience a mitigated sad emotion that an individual in a sad mood will not, but, again, this is not obvious and requires further experimental confirmation. One line of experiments, Ratcliffe might appeal to for confirmation of this hypothesis could be found in research regarding fading affect bias (FAB), or the more rapid receding of negative affect compared to the receding of positive affect. For example, Ritchie et al (2009) have found that mood appears to modulate the FAB.

A greater difficulty for Ratcliffe's conception of mood lies in his emphasis on directionality. On Ratcliffe's view, mood is a part of the condition requisite for emotion, but he is silent on the condition requisite for mood. His view does not seem capable of admitting the possibility that an emotion may prolong itself into a mood or that an emotion may instantiate another mood. Several theorists have raised the possibility that an emotion may instantiate a mood. For example, Ekman (1994) has suggested that "moods can be generated by a dense emotional experience" (58) while Davidson (1994) has argued that it "appears to be the case that moods and emotions dynamically interact in important ways...(and that) (e)motions can lead to particular moods" (53). Such considerations cast doubt on the prospect of a one-directional account. Another difficulty for Ratcliffe's view is his claim that moods are non-intentional in virtue of their being bodily dispositions. Here, Ratcliffe seems to suffer from hinging much of his discussion on Godlie's distinction between "feelings towards" and "bodily feelings." Goldie (2002) claims that "(a) bodily feeling...is intentional in the sense that the feeling is directed towards an object, one's body" (236). In denying that bodily feelings are strictly directed

towards the body, Ratcliffe also denies that bodily feelings are intentional, but I do not see why this must be the case. In fact, I think Ratcliffe would be well-advised to consult Prinz's criterion for intentionality. Recall that on Prinz's view, a state can be said to be intentional if it involves a representation and a state can be thought to involve a representation if the state has the function of being reliably caused by something[15]. It seems to me obvious that bodily feelings are reliably caused by things and thus can be thought to involve representations and count as intentional. What Ratcliffe really appears to be getting at in his discussion of Goldie's distinction is the nature of the representations involved in bodily feelings. Given Ratcliffe's characterization of bodily feelings as also involving "feelings towards," Ratcliffe appears to be claiming something about bodily feelings that is very similar to what Prinz says about emotions, they represent relational themes. As I see it, Ratcliffe's mistake lies in thinking that the relational theme represented by the bodily feelings in question is non-intentional when it is merely non-propositional and non-conceptual.

In regards to Prinz's account, I have already argued that it is a mistake to think that moods only, or most of the time, respond to an agents' long term goals. As the evidence suggests, mood has much more to do with our immediate goings-on than Prinz's view can permit. However, I think it may still be possible to conceive mood as generalized emotion. In many of the studies mentioned earlier, mood is often construed as either positive or negative. Importantly, emotions appear to be hedonically valenced, meaning emotions may be either pleasureful or painful. I do not think that the continuity

[15] Note that this is Dretske's (1986) criterion for intentionality. On this view, a state can be said to be representational if it has the function of being reliably caused by something *and* is subject to error. I will have more to say about this in Chapter 3. For now, the shorthand I have provided will suffice.

between the valence of mood and emotion is a coincidence. In Chapter Four, I will develop an account of emotion that will shed some light on just how one may conceive of mood as a generalized emotion while permitting mood to influence short-term cognition. In doing so, I will also show how it makes sense to claim that an occurrent mood determines the range of possible emotions, as Ratcliffe suggests. Both thinkers seem to have important insights on the nature of mood. The view I will defend borrows these insights and synthesizes them, but I will return to this later. For now, I turn my attention to the issue of fundamental, or basic emotions.

2.3 Basic Emotions: Life After APP

For many emotion researchers, basic emotions refer to inherited, hard-wired programs that evolved some time in the evolutionary past as a response to some particular adaptive challenge in the evolutionary environment and which, to this day, continue to poise creatures for action. For the rest of this Chapter, I will refer to this view of basic emotions as the Affect Program Perspective (APP). Over the past few decades, the Affect Program Perspective has found many supporters. For example, Tooby and Cosmides (2000) have claimed that emotions are "adaptations that have arisen in response to the adaptive problem of mechanism orchestration" (92). Izard (2007) has characterized basic emotions as "those emotions that have...evolutionarily old neurobiological substrates, as well as an evolved feeling component and capacity for expressive and other behavioral actions of evolutionary origin" (261). Griffiths (2004) has described basic emotions as "rapid acting, failsafe devices that produce evolved behavioral, physiological, and cognitive responses tailored to certain critical features of the environment" (240). And

Ekman (1999) has described basic emotions as having "evolved for their adaptive value in dealing with fundamental life tasks" and whose "primary function...is to mobilize the the organism to deal quickly with important interpersonal encounters" (46).

But while each of these views has been articulated and defended more recently, the view that emotions are evolved capacities or that they poise creatures for action dates back over hundreds of years. For example, in *The Passions of the Soul*, Descartes famously argued that the agitation of the animal spirits in the nervous system causes the experience of a particular emotion, but that this agitation also primes the body towards motions that may bring about the things the particular emotion motivates an individual towards. As Descartes claims, the passions "dispose our soul to want the things that nature decides are useful to use, and to persist in this volition" (17). Over two centuries later, this characterization of emotion was advanced by Charles Darwin in his book *The Expression of the Emotions in Man and Animals*. There, Darwin argues that "reflex actions...are often brought into play in connection with movements expressive of our emotions" (42) and that the complex of actions represented by the reflex act are serviceable for the state of mind "in order to relieve or gratify certain sensations, (or) desires" (28). That Darwin thought emotions were inherited is evinced by his binding emotion to reflex movements and his argument that heritability of reflex movements is demonstrated in the universality of like movements in species such as dogs, horses, cats, etc. In this light, one might characterize contemporary proponents of the Affect Program Perspective as picking up and advancing a centuries old research program on affective phenomena.

Such a characterization of the contemporary proponents of the Affect Program Perspective is particularly salient in the evidence contemporaries have evoked to demonstrate the nativity of basic emotions. Just as Darwin argued for the inheritance of emotion on the basis of the universality of reflex movements, so too have contemporary advocates of APP turned to highlighting pan-cultural expressions and identification of emotion as a marker for that emotion's nativity. For example, Ekman et. al. (1969) conducted emotion recognition studies in New Guinea, Borneo, Japan, Brazil, and the United States and found that participants in the studies recognize the same emotions in a standard set of facial photographs. As the authors state, "an affect category was never misidentified by the majority of observes in more than one of the preliterate (the Fore group studied in New Guinea) samples" (88). Izard (1969) corroborated these findings in a study of eight literate cultures not included in the Ekman et. al. (1969) study using his own set of facial photographs. In addition to these emotion recognition tasks, proponents of APP also claim to have evidence of pan-cultural expression for particular emotion types. In one study Ekman et. al. (1970) videotaped two groups of college students, one group of Japanese students and one group of American students, as the students sat in a laboratory and viewed both an emotionally neutral film and a stress-inducing film of bodily mutilation. Using a Facial Affect Scoring Technique, the researchers found that these two groups responded isomorphically to the stress-inducing film. As the authors state, "our analysis...shows the same facial expressions to stress by members of these two presumably quite different cultures" (156). These findings have

been corroborated in a study conducted by Eibl-Ebesfeldt (1970) in which film was taken of participants facial movements and similar pan-cultural expression was revealed.

Beyond the realm of facial expressions, contemporary advocates of APP also claim that there is significant evidence in favor of distinct autonomic nervous system (ANS) activity corresponding to specific basic emotions. In a (1983) study, Ekman, Levenson & Friesen correlated distinct activity in heart rate and hand temperature with each of the Big Six (happiness, sadness, anger, fear, frustration, disgust) emotions. These findings were corroborated in a (1990) study by the same authors, again finding "autonomic differences among the six emotional configurations" (369). Schwartz et al (1981) found that affective imagery reliably produced distinct patterns of diastolic and systolic blood pressure and heart rate (cardiovascular activity) corresponding to four emotion types: happiness, sadness, anger, and fear. Roberts & Weerts (1982) corroborated Schwartz et al findings for anger and fear. And Levenson et al (1992) have demonstrated analogous ANS activity in the Minangkabau population in West Sumatra.

Of course, demonstrating the universality of a trait does not prove that the trait is in fact innate. However, it does lend support to the notion, particularly when analogous distinct activity can be found in cultures that differ in their attitude towards the emotion the distinct pattern of activity correlates to. As Ekman (1999) argues, those who prefer a social-constructionist account of emotion "should expect different behavioral patterns to be taught for each emotion, and therefore different patterns of ANS activity should come to be established with each emotion in cultures which are known to differ in their attitudes about emotion" (49). The proponent of APP takes the aforementioned litany of

studies to show that this situation is precisely not the case. If one considers the whole of the emotion recognition, facial expression, nervous and cardiovascular studies similarities can be seen in a vast number of cultures. Thus, on the APP view, it's not that similarities in the environment can't account for similarities in emotional expression, but that the similarities in emotional expression persist in the face of dramatic differences in the environment. The unifying factor behind the differences in the environment just is the genetic blueprint that underpins the human race. Basic emotions must have their design in the genetic material.

The Affect Program Perspective has come under scrutiny from a number of thinkers, many of whom have unique suggestions on how to conceive emotion. Nonetheless, many of the critics of APP have argued directly against the experimental results just canvassed. For example, Barrett (2006) has argued that meta-analyses of recent neuroimaging studies suggest that "unique activation patterns for each category of emotion were difficult to discern, and those that materialized were less consistent than expected" (43). Similarly, Russell (1994) argues that meta-analyses of studies cited by proponents of APP "do not challenge the...conclusion that recognition scores are greater than chance, but they do show that recognition scores are not uniform" and that "(r)ecognition varies in a reliable and systematic fashion" (110). Prinz (2004a) has offered a similar critique, claiming that in Ekman's (1969) study the Fore population in New Guinea was given a forced choice and that "(i)n an open-choice paradigm where...respondents had to simply name a face, the correlations would have dropped considerably" (9-10). Others have criticized the aforementioned line of experiments on

similar ground, but I want to briefly mention a few of my own observations.

First, I believe the results of the Ekman studies just mentioned on distinct patterns of nervous system activity may be overstated. For example, in the (1983) experiment, Ekman et al tested for forearm tension and skin resistance as well as heart rate and hand temperature, but found correlations only with heart rate and hand temperature. Moreover, the correlations established in that study fall more neatly into a positive-negative valence dichotomy rather than into the six discrete emotional configurations. For example, anger, fear, and sadness (all of which may be characterized as negatively valenced affects) each produced a mean increase in average heartbeat of about 8 beats per minute. A similar effect is seen in the (1990) study.[16] In regards to the (1970) study of facial expression in Japanese and American college students there may yet be another explanation: Japanese and American culture may employ similar "self-governing" policies in situational viewing environments or the two cultures may "scaffold" disgust responses to bodily-mutilation isomorphically. For example, the authors note that cultural differences in facial expression were observed later when a fellow countrymen discussed the film with the participants, but they explain the disparity away by claiming that "the situation became a social encounter, display rules were operative, and the facial behavior of the Japenese and Americans was quite different" (156). I see no reason to posit a sharp division between viewing the film and discussing the film. Even if a subject is both left alone and unaware that she is being filmed, this does not mean that the subject behaves in such a way that any "display rule" is not

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However, in the (1990) study skin conductance also approached significance.

operative. I suspect that many individuals bring culturally learned “self-governing” policies with them regardless of whether or not other individuals are present. If this is the case, then, the results of the study do not rule out the influence of culture.

In addition to these criticisms, some researchers have claimed to have observed experimental results disconfirming the APP hypothesis. For example, Camras (2011) has made a similar claim to the one I just advanced regarding Ekman's results, arguing that rater judgments of infant facial expressions and the observation of facial expression in unexpected situations “suggest that...specified expressions for 'pain,' 'anger,' and 'fear' actually represent more generalized states of negative affect in young infants” (139). Bennett, Bendersky & Lewis (2002) have designed an experiment motivated by similar considerations. Given the postulates of APP, the researchers in this experiment reasoned that a specific emotion type should meet two criterion they call “intersituational specificity” and “intrasituational specificity.” Because APP states that emotions are hard-wired programs designed to respond to particular features of a situation or environment, one should expect to observe prototypical expressions in response to a particular elicitor and should not expect to observe a prototypical expression most prevalently in response to a different elicitor. (That one should expect to observe prototypical expressions in response to a particular elicitor represents the criterion of “intrasituational specificity.” That one should not expect to observe the prevalence of a prototypical expression in response to a different elicitor represents the criterion of “intersituational specificity.”) To test these two criterion, the researchers devised the experiment with a number of trials designed to elicit a prototypical response; joy was predicted to be elicited in response to

tickling, surprise was predicted to be elicited in response to a jack-in-the-box, anger was predicted to be elicited in response to arm restraint, etc. After subjecting 150 four-month old infants to the experiment, researchers analyzed videotape of the infants facial expression in the various situations. For the proponent of APP, the results were not favorable. As the authors state, "little support was found for the predicted situational specificity of facial expressions, with only joy expressions demonstrating the predicted intra- and intersituational specificity" (104).

Of course, there may yet be a number of responses available to the proponent of APP. For one, there is no doubt denying that many of the pan cultural similarities found in the facial expression, emotion recognition, and ANS/Cardiovascular studies have results above chance and this is by no means insignificant. That the results of these studies are not uniform may also be accommodated by APP. Many proponents of APP now defend a view of the affective program as an *open* program, meaning, experience may modify or insert new instructions into the program. The idea of an open program might best account for both the above chance results and the apparent lack of uniformity. In many of the cross-cultural studies, participants were adults. These adults most definitely had a great deal of cultural exposure. Perhaps variations in cultural exposure represent a branching out from more native emotions where the latter accounts for the above chance levels and the former the lack of uniformity. Second, this line of thinking might also afford APP proponents a response to Prinz's claim about methodological error in fixed choice paradigms. Open programs may be uniquely modified and individuated so that without some restricted choice space one should not expect to find uniformity in any

task that requires self-generated description for the object of recognition given the expectation that the description the subject chooses will have been informed by unique personal experiences. Without some restricted choice space, even Detroiters may not describe the same face with the same terms. I am inclined to say that this does not mean that Detroiters do not recognize happiness on each others faces. Third, Barrett's objection that meta-analyses of neuroimaging studies hardly yield unique activation patterns for particular emotions is hardly a devastating blow to the proponent of APP. I see no reason why the APP proponent cannot remain substrate neutral (or maybe just neurobiologically neutral) and claim that multiple neural networks may be involved in the instantiation of a particular affect program both at one time and across time.

More difficult for APP, however, are the experiments performed by Camras (2011) and Bennett, Bendersky & Lewis (2002) regarding rater judgments of infant facial expressions and prototypical emotion elicitors, respectively. One strategy may simply be to undercut the results. For example, one problem worth noting in the Bennett, Bendersky & Lewis experiment is the possible absence of a true fear elicitor. In that experiment, the researchers used a masked person to elicit fear. A number of studies[17] have demonstrated that infants have an ability to recognize faces as early as one month, but there is little reason to suggest that babies equate “hidden face” with potential danger. Perhaps, the infants in the study simply do not find the masked person dangerous. If that is the case, then, maybe the results of the Bennett, Bendersky & Lewis experiment are skewed. Proponents of APP might just argue that the researchers made poor decisions in choosing

17 For example, see de Haan et al (2001)

which elicitors would be used in the experiment. Nevertheless, proponents of APP must still explain why six (or more) innate emotions must be posited particularly when many of the results cited for distinct patterns of nervous system and cardiovascular activity may be interpreted into a more economical positive-negative valence dichotomy. Even with their potential limitations, the experiments demonstrating a failure to satisfy the intersituational and intrasituational specificity criterion in children as young as four months cast doubt on the nativity of the canonical "Big Six" emotions. Perhaps the "Big Six" emotions are amongst the first emotions "on the scene" but that they are predated by either more primitive forms of themselves or simple positive-negative valenced feelings that are individuated into lexicalized emotions over time. In what follows, I examine two accounts of emotion that take up this project.

The first view I will take up has been defended by Prinz (2004a) as a hybrid view "that can steer between the extremes of evolutionary psychology and social constructionism" (13). According to Prinz, this hybrid view has two central tenets. The first tenet, borrowed from William James, is that emotions are perceptions of bodily changes; for this reason, Prinz calls his theory an "Embodied Appraisal Theory." The second tenet is, as mentioned earlier, that the content of emotion represents what Prinz calls "core-relational themes." According to Prinz, emotion researchers who maintain that emotions require cognitive components, such as propositional beliefs or judgments, are mistaken.

Recall that on Prinz's (2004b) view, a mental state is intentional if it involves a representation and that a mental state can be thought to involve a representation if that

mental state “has the function of being reliably caused by something” (184). Because emotions have the function of being reliably caused by things, emotions must involve a representation and therefore emotions are intentional. On Prinz's view the intentional content of an emotion is just a “core-relational theme,” or an organism-environment relation. Also recall that these representations do not represent the events or objects to which they are directed. What emotions do represent on Prinz's view is the perception of a patterned change in the body. Thus, on Prinz's view, an emotion represents a “core-relational theme” insofar as that emotion reliably tracks bodily changes associated with some particular feature of the environment. As Prinz (2004b) states, “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.)” (13). The link between the perception of patterned changes in the body and the various dangers that cause these bodily changes is a psychological mechanism called an elicitation file. The job of the elicitation file is to group together a vast number of objects or events associated with a particular change in the body so that they reliably set off the representation of a “core-relational theme.” Thus, whenever one item is activated in the elicitation file, the corresponding emotion results.

According to Prinz, the upshot of the “Embodied Appraisal Theory” is that it can account for a number of ways culture may influence an emotion. One way is that existing appraisals may simply combine to form new emotions. Another way is that culture may train us to modulate our bodily reactions to various situations, which, in turn, modulate

the content of the emotion, given that the emotion is the perception of patterned bodily changes. A third way culture may influence an emotion is through what Prinz calls re-calibration. According to Prinz, an emotion may be re-calibrated when a new item is added to an elicitation file by association thereby freeing closely related items to the newly added item to take on a functional anatomy and trigger an emotion representation without the help of anything in the original elicitation file. As Prinz (2004a) states, "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, *Schadenfreude* is born" (15).

In regards to basic emotions, Prinz argues that the Embodied Appraisal account may reveal more primitive forms of the "Big Six." The "Big Six" emotions may simply be the outgrowth of innate elicitation files culture starts expanding as soon as we are born. Sadness might start out by being elicited by separation distress and only come to encompass more sophisticated forms of loss through learning and enculturation. Similar stories may be had for the other emotions. As Prinz states, "(e)ach 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" (16).

The second view I will take up signifies a more radical shift away from APP. This is the dynamical affective science (DSA) view advocated by Colombetti (2009). Although Colombetti concedes that the DSA approach has not yet yielded quantitative models of specific affective phenomena, she argues that the conceptual tools of the DSA

approach may just be what affective science has been lacking. For one, the DSA approach is tailor made to deal with complex systems whose behavior may be described as the interaction of several component parts. Second, the DSA approach has found success modeling emergent, self-organizing behavior, which may be described as the capacity of a complex system to maintain an internal structure via its component processes. Insofar as human beings seem to exhibit signs of both complexity and self-organizing behavior, the DSA approach potentially presents a unique alternative to understanding affective phenomena.

In dynamical systems theory, a complex system is represented by a number of interdependent variables whose values represent the coordinates of the system at any time in an abstract state space. As the system evolves across time, the system defines a trajectory through the state space. Points in the abstract state space at which the system tends to converge are dubbed *attractors*. In dynamical systems theory, there are three different types of attractors: attractor points, limit cycle attractors, and strange attractors. Attractor points are stable states or endpoints of a system. Limit cycle attractors are points in the system between which a system repeatedly fluctuates and strange attractors are sets of points towards which a system's trajectories converge in neither stable nor periodic ways. In addition to attractors, dynamical systems theory introduces the notion of a control parameter whose value also influences the motion of the system. An example of a control parameter is the influence of a temperature gradient on convection rolls in a heated liquid. By introducing the notion of a control parameter, DST appeals to what may be called reciprocal or circular causality, which refers to the ways in which microscopic

behavior of a system's constituents may manifest as macroscopic changes and the ways macroscopic changes may constrain the microscopic constituents' behavior. Colombetti suggests that we construe this reciprocal causality in terms of order of constraints. She refers to the constraint individual micro-constituents place on one another as first-order constraints; the constraint macroscopic changes of the system place on individual micro-constituents are termed second-order constraints.

With the notion of order of constraints in mind, Colombetti argues that the DSA approach may best account for the variability and context-dependence of an emotional episode while doing justice to the recurrence of the episode. As Colombetti (2009) states,

> "My suggestion..is to conceptualize an emotional episode as the...second-order constraint that emerges from the self-organization of various processes (i.e. neural, autonomic, behavioural, etc.), and that entrains such processes into a meta-stable configuration or pattern" (408).

Thus, on Colombetti's view, interdependent neural, autonomic, and behavioral processes may represent first-order constraints which provide an emotion with its "macroscopic" form whereas events in the environment may represent control parameters that also influence the emotional episode. The consequence of this conceptualization of the episode is that the emotion may vary with the changes in the first-order processes, but the variation is also constrained by the trajectory in the state space of the system as a whole (captured by the attractors that "pull" the system toward them). As Colombetti explains, "(t)he presence of areas of stabilities guarantees relative stability-in-spite-of variations, and the capacity of various processes to influence and constrain one another allows

stability to be achieved in various ways" (409).

As it concerns basic emotions, the DSA approach clearly rejects the APP notion that emotions come with a fixed set of instructions that specify patterns of physiological and behavioral response. In fact, by positing the notion of second-order emergent constraints, the DSA approach rejects the notion of a program altogether. Colombetti even goes so far as to suggest from the DSA perspective no emotional episode is more basic than another. On the DSA view, every emotional episode should be conceived as an emergent pattern of "softly assembled elements" and therefore emotions that occur across cultures are not truly less complex than so-called higher order, personally idiosyncratic emotional episodes. As Colombetti claims,

> "(t)he view is rather that some emotional episodes are phylogenetically old patterns that we share with other primates, whereas idiosyncratic personal emotional episodes are patterns that develop in the course of one's lifetime. In other words, their difference is merely one of history" (423).

The ultimate fate of the basic emotion should be determined empirically. Dynamical systems models have been successful elsewhere, but it remains to be seen whether or not such models can account for an emotional episode. I am optimistic that such models may be constructed so as to represent the various physiological processes that occur in the elicitation, production, and expression of an emotion, but I am wary of equating such processes with the emotion itself. Emotions may distinguishable from an emotional episode. If so, then, an account that obscures the difference will wind up concealing the structure of an emotion itself, which is partly what is in question. Thus, I

take theorists who emphasize a DSA approach to be on the right track so far as one is concerned with how various physiological processes are coordinated so that fluid interaction with a world is possible, but I am not certain that this should be taken to indicate that there are not discrete elements of thought that may be correlated with more or less localized processes. In other words, I accept the premise that emotional episodes may be considered a pattern of "softly assembled elements," but I think that an emotion is itself probably a "tightly assembled element."

Returning to the issue of basic emotions, I think Colombetti is right to want to characterize emotions as emergent. Earlier I showed some responses proponents of APP have available in light of mounting counter-evidence, but I also claimed that APP must provide a reason for sticking with the notion of six innate emotions when the data may be interpreted into a positive-negative valence dichotomy and experimental support for prototypical elicitors of the Big Six is lacking in the critical infant group. Perhaps it is the case that such a reason can be provided, but I think it better to take the foregoing as reason to conclude that the Big Six are not innate. More importantly, I think it consistent with the available evidence to seek an account that posits initially valenced feelings from which developmentally early emotions emerge. Linda Camras (2011) has suggested a dynamical systems model that does just that, but insofar as the above criticism of the DSA approach stands, I suggest scaling back Prinz's Embodied Appraisal theory so as to posit an initial positive-negative valence divide as well. In Chapter Four, I will defend the view that the psychological mechanism underpinning emotion is initially set up to be set off by patterned bodily changes that differ in terms of positive or negative valence and

with experience new patterns are inserted into the elicitation file and grouped such that first more robust emotions (the Big Six) emerge followed by more and more complex iterations. But before I defend show one might give a plausible account of how emotions might emerge from valenced feelings, I want to more extensively articulate the case for preferring the Embodied Appraisal view of emotion.

Chapter 3

Making the Case for an Embodied Appraisal View of Emotion

Giving an account of the role emotion plays in cognition would be impossible were it not for centuries of work on the nature of emotion itself. Today, most thinkers recognize emotions as non-cognitive elements of thought,[18] but such a conception has not always been shared. For many years, thought about the emotions was divided; some thought the emotions were cognitive states of mind, others believed the emotions were non-cognitive. As disagreement persisted, iterations of both views emerged, each building off the success of a predecessor while attempting to address the previous theory's shortcomings. With the advent of neuro-imaging techniques and research methodologies, the dust on this dispute has finally began to settle, though, perhaps more slowly than many would prefer. Consequently, any effort to comment on the future landscape of emotion research must necessarily traverse the history of emotion theory

[18] Of course, many may disagree as to the precise meaning of "non-cognitive." I will refer to a view of emotion as a cognitive view if that view takes a propositional element to be at least partially constitutive of an emotion.

and provide an account of how and why the current landscape got its form. Such an account is the task of this chapter.

3.1 The Cognitive/Non-Cognitive Debate

One of the first cognitive views of emotion was developed by David Hume in the 18th century. According to Hume, the perceptions of the mind fall into two categories: impressions and ideas. The impressions represent an array of phenomena: passions, affections, sensations, pains, etc. The ideas, by contrast, are products of thought, or cognized impressions. The division between impressions and ideas, then, rests no so much on their generic nature, but in their qualitative differences. The impressions are grouped together in virtue of their shared vivacity, a vivacity that is lent towards the ideas, but nonetheless becomes mitigated in the transfer. As Hume states, "(i)mpressions are naturally the most vivid perceptions of the mind; and this quality is in part convey'd by the relation to every connected idea" (112). Between impressions and ideas, Hume argues, are beliefs. Beliefs are little more than particularly vivacious ideas annexed to some present impression. Thus, one may receive an impression of some particular object, cognize the object and thus form an idea of the object. If the impression persists upon forming the idea of the object, then, one may form a belief regarding that object. Therefore, Hume claims "belief is more properly an act of the sensitive, than of the cogitative part of our natures" (100).

Beyond the distinction between impressions, ideas, and beliefs, Hume thinks that the impressions admit of a further division. According to Hume, the impressions can be divided into original and secondary impressions. The original impressions are

“impressions of sensation...without any antecedent perception” (145). Original perceptions, then, arise originally in the soul and require no preceding thought to be experienced. Secondary impressions, on the other hand, “arise either from the original impressions, or from their ideas” (145). Thus, secondary impressions require some preceding thought or impression in order to be experienced. One can divide affects into either original or secondary impressions. Sensation of external objects as well as perceptions of bodily pains and pleasures can be termed original impressions. The passions and the emotions can be termed secondary, or reflexive impressions. Bodily pains and pleasures, therefore, may be the source of passions and emotions, but, the pains and pleasures of the body cannot be equated with passions or emotions. As Hume states, “(a) fit of the gout produces a long train of passions, as grief, hope, fear; but is not deriv'd immediately from any affection or idea” (145).

As regards practical action, Hume's division signifies an attempt to give an account of the harmony amongst passion and reason. On Hume's view, the impressions always actuate the soul, but they never amount to a compulsion of the will. As Hume states, “(d)id the impressions alone influence the will, we should every moment of our lives be subject to the greatest calamities...we should not be provided by nature with any principle action, which might impel us to avoid them” (67). On the same token, the ideas, alone, cannot provide one with an action. Hume claims, “did every idea influence our actions, our condition would not be much mended. (If) the activity of thought...were...mov'd by every idle conception...(we) would never enjoy a moment's peace and tranquility” (67). Thus, Hume thinks that nature must have chosen a medium

from which we are guided in action. Such a medium may be found in Hume's conception of belief. Because belief exists as a sort of in between impressions and ideas, the vivacity of belief more closely resembles that of the passions and as such the “passions are very favourable to belief” (68). The implication, then, is that whereas a belief is an idea derived from and then annexed to an impression, an emotion is an impression derived from a bodily sensations and then annexed to that sensation. Because bodily sensations may be either pleasurable or painful, an emotion necessarily involves a desiderative element; emotions signify a desire to either withdraw from a pain or approach a pleasure. Moreover, because Hume's taxonomy of the mind represents belief as the relation between the element of thought annexed to the impression it is derived from, emotions share the structure of a belief. Thus, on Hume's view, an emotion involves both a desire and a belief, the latter of which qualifies Hume's view as a cognitive view of emotion.

3.1.1 James's View of Emotion

One of the earliest versions of a non-cognitive view of emotion was developed by William James in the century following Hume. A contemporary to Darwin, James' approach to emotion parallels the efforts I mentioned Darwin made in Chapter Two, with an emphasis given to expressive action and reflex movements. More precisely, James saw his task as determining whether or not the emotions should be assigned their own particular brain region. At the time of his writing, James' contemporaries had divided the brain into sensory and motor centers. Thus, for James, the critical question surrounding the emotions was whether or not an account of the emotions could be given such that their inclusion in either sensory or motor centers of the brain could be made intelligible.

James' hypothesis was that such an account of emotion could in fact be provided and that emotion most likely belongs to those brain regions devoted to the processing of sensory information. As James (1884) states, “(t)he purpose of the following pages is to show that...the emotional brain-processes not only resemble the ordinary sensorial brain-processes, but in very truth are nothing but such processes variously combined” (188).

According to James, the fundamental mistake in thought about emotion is the sentiment that it is the perception of some event that triggers an emotion experience, which, in turn, triggers some particular bodily expression. On James' view, this sentiment gets the causal story involved in emotion elicitation backwards; rather James held that it is some particular bodily change directly following the perception of some event that is the emotion. As James states, “we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be” (190). Such a conception of the causal story involved in emotion elicitation is underpinned by James' belief that the nervous system is predisposed to react to certain features of the environment. On his view, every creature is a sort of lock whose keys are destined to be found in the environment; when a creature meets her key, the creature's lock is opened and a certain behavior results. Emotions are just specific locks, whose key is some peculiar environmental event that opens the lock and produces the bodily changes corresponding to the emotion assigned to that lock.

That emotions may be construed as locks of this sort is motivated by what has become one of James' more famous thought experiments. In this thought experiment, James asks us to imagine some particularly strong emotion, abstract all of the

corresponding bodily symptoms from the emotional experience, and report on the remainder of the episode. Such a report, James surmises, will be vacuous. Once we have abstracted away of all of the corresponding bodily symptoms from the emotional experience, there is nothing left to describe. As James states, "we find we have nothing left behind, no 'mind-stuff' out of which the emotion can be constituted, and that a cold and neutral state of intellectual perception is all that remains" (193). Thus, James concludes his initial hypothesis is sound; emotion processes just are the sensorial processes his contemporaries had begun to correlate with particular regions in the brain. More importantly, because these emotion processes are to be identified with sensorial processes, which are often equated with the reflexive and expressive movements of the body identified by Darwin and his colleagues, James also concludes that an emotion need not require some formed antecedent belief or judgment. As James states:

> "(t)he love of man for woman, or of the human mother for her babe, our wrath at snakes and our fear of precipices, may all be described similarly, as instance of the way in which peculiarly conformed pieces of the world's furniture will fatally call forth most particular mental and bodily reactions, in advance of, and often in direct opposition to, the verdict of our deliberate reason concerning them" (191).

We are able to respond to these events or features of the environment with corresponding emotions simply because our nervous system comes predisposed to respond to them. According to James, each emotion, no matter how subtle the difference between it and another emotion of its kin, has some unique bodily change respective to it and none, no matter how complex, require a corresponding belief to be experienced. The latter result

thus qualifying James' view a non-cognitive view of emotion.

Many contemporary views of emotion deviate little from the early views of James and Hume. Of the so-called “cognitive” theories of emotion, perhaps none is more popular than Davidson's (1980) account of the belief-desire complex. Following in the steps of Hume, Davidson argues that an emotional experience can be reduced to a complex of two simple phenomena: belief and desire. The motivation for construing emotion as a belief-desire pair is rather straight-forward. Recall from Chapter Two that emotions can be distinguished from mood in that moods are world-directed whereas emotions have specific content. The notion that emotions have specific content naturally inclines one towards the conclusion that emotions have something to do with beliefs. After all, we'd be hard pressed to conclude Alan is angry at Brad for an offensive comment Brad made if we knew that Alan did not believe Brad made the comment. This fact, that we seem to need to be aware of a certain feature of an event to experience a corresponding emotion, coupled with the claim that emotions must have specific content has resulted in the formulation of what many thinker's refer to as *cognitive pre-requisites* of emotion. Davidson, like Hume, takes these cognitive pre-requisites as a starting place from which to build a theory of emotion.

The difficulty for building a theory of emotion solely off of belief is that, in many cases, belief seems insufficient to elicit an emotion. Imagine a scenario in which two people, Chris and Dave, stand before a dog baring its teeth and preparing to pounce. One might want to conclude that if Chris and Dave both believe that they are standing in front of a dog preparing to pounce, then, they are both likely to feel afraid, but this may only

be true of Dave especially if Chris is a dog trainer. The belief-desire complex theory offers a solution to this difficulty. On the belief-desire complex view, what accounts for the difference between Chris and Dave's reaction to the pouncing dog is a difference in their desires. Because Chris is a dog trainer, he may not have the desire to avoid a pouncing dog whereas Dave, who is not a dog trainer, does. Both believe that they are facing a pouncing dog, but their difference in desire amounts to one feeling fear and the other feeling nothing or something else. In addition to surmounting the difficulty of accounting for emotion elicitation solely off of belief, the belief-desire complex theory also promises an advantage in explaining other emotional actions. Say, for example, that we are back in grade school and you and I just returned to our classroom from recess when you tell me that Billy hit Bradly in the schoolyard this afternoon. When I ask "why?" you may respond, "well, he was angry with him, of course." According to Davidson, to understand Billy's actions one need only analyze the relevant behavior into the two-pronged componential analysis of the complex theory. In short, Billy hit Bradley because Billy desired to avoid a previous offense Billy believed Bradley to have committed.

Here, however, another difficulty presents itself. Though we may be inclined to conclude that Billy's belief that Bradley made an offensive comment and Billy's desire to avoid offense render Billy's anger with Bradley intelligible, we should not be so quick to conclude that these two components are sufficient to render Billy hitting Bradley intelligible. Billy's desire to avoid offense and his belief that Bradley offended him may make Billy's anger intelligible, but they do not seem sufficient to make throwing a punch

intelligible. There are a number of responses one is afforded in anger, what the belief-desire complex theory needs to do is explain how one of these responses, such as throwing a punch, is chosen. Goldie (2000) has offered an account of just this sort. According to him, expressive emotional action may be understood through an appeal to symbolic representation. On this view, emotion reduces to a complex of belief and desire and the expressive action correlates to a belief that the target of the expressive act symbolizes the target of the emotion. So, in the case where Billy hit Bradley, Billy's anger reduces to the desire to avoid offense and the belief that Bradley made an offensive comment while the punch represents the fact that Billy believed punching Bradley to be a sufficient symbol for his anger. Similar stories may be told for other expressive acts. One may clench ones fist in anger because one believes that one's fists represent one's anger, one may jump and down in joy because one believes that one's movements represent one's joy, one may tremble in fear because one believes that one's trembling represents one's fear, etc.

If the foregoing account of expressive action seems implausible, that's because it is. In the case of Billy and Bradley, for example, the appeal to symbolic representation does not appear sufficient to explain the punch. Not only must Billy believe that punching Bradley is a sufficient symbol for his anger, Billy needs to also have the desire to vent his anger. But if emotions simply are a complex of belief and desire and the particular type of emotion experienced is determined by the specific content contained in the belief-desire components, then, the supplemental belief-desire complex needed to explain expressive action should differ from the original complex in both intentionality

and phenomenology. But this does not seem to be the case; expressive acts seem to admit an intentional and phenomenological continuity with the corresponding emotion. Our ordinary way of speaking about such acts attests to this fact; we say we clench our fists *in* anger, we jump up and down *in* joy, we recoil *in* fear, etc. Of course, such a concern is not the only difficulty for the belief-desire complex view. One might also worry that the appeal to symbolic representation is preposterous on the face of it. It does not seem to be the case that one jumps and down in joy because one believes that one's movements represent one's joy or that one clenches one's fist in anger because one believes that one's fists represent one's anger. These expressive acts seem to occur without conscious deliberation at all. As Maiese (2011) notes, "(t)he lack of clear purpose is especially clear...in cases where the agents acts against her better judgment, such as when she flings her phone across the room in a fit of anger and breaks it, thereby acting contrary to her goals" (57). Thus, it seems that not only does the belief-desire view of emotion fail to explain expressive action, but it distorts such action and over-intellectualizes the experience. As Doring (2003) states "(i)n the expressive case, the belief-desire model rationalizes the action by attributing means-end reasoning to the agent where means-end reasoning, and thus rationalization, does not apply" (214-5).

In light of expressive action and the implausibility of attributing occurrent beliefs directed at the act in such instances, one must certainly look elsewhere for a theory of emotion. One such place might be Solomon's account of emotions as evaluative judgments. Unlike the belief-desire complex view, which construes beliefs involved in emotions as essentially neutral perceptions of a state of affairs and explains the relevant

emotion by an appeal to the conjunction of the belief with a desire, the evaluative judgment view of emotion construes the beliefs involved in emotions as essentially evaluative. Once so construed, the belief implicit in emotion becomes a judgment and as such the belief may require no ancillary component to motivate action. The judgment that something is dangerous may serve as the only requisite motivation to flee from it. Likewise, to judge that something is offensive may be to be motivated to lash out at it. If so, then, the evaluative judgment theory may be able to account for the phenomenological and intentional continuity between the emotion and the expressive act from a cognitive perspective on emotion, a task the belief-desire complex view could not accomplish.

Of course, that's not to suggest that the evaluative judgment view does not evoke its own set of difficulties. To elucidate these difficulties, it is necessary to more accurately pinpoint the view itself. According to Solomon (1993), emotions are not simply judgments, but what he refers to as constitutive judgments. This means that emotions are not simply intentional, or about some thing, but that the emotion and the intentional object, what the emotion is about, are the same thing. As Solomon (1993) writes, "(a)n emotion is not distinct or separable from its object; the object as an object of this emotion has no existence apart from the emotion. The emotion is distinguished by its object...(b)ut neither is there any...object...without the emotion" (178). In many instances, such an account seems plausible. Mary may be angry at Sally for a rude comment Sally made and as such the object of Mary's anger is Sally's rude comment, but it seems not to be the case that Mary's anger exists apart from Mary's judging the comment offensive, at least for

Mary.

Nevertheless, there are a few serious objections to the evaluative judgment view. First, it is doubtful that emotions necessarily involve judgments. There seems to be a number of cases in which one may genuinely experience an emotion while making an opposite judgment. For example, I may feel afraid of falling off a precipice even if I judge that I am at a sufficient distance from the ledge, I may feel jealous of my lover's acquaintance even if I judge that she is not romantically interested in the acquaintance, I may be disgusted by centipedes even if I judge that such a response is speciesist, etc. Such cases signify an extent to which emotions are *cognitively impenetrable*, that is, an extent to which emotions appear to be insulated from beliefs and judgments that seem relevant to the emotion's intentional content. However, the problem of necessity is not the only difficulty for the evaluative judgment view. Even more difficult for the evaluative judgment view of emotion is the intuition that a judgment may not be sufficient for the elicitation of an emotion. For example, I might judge that it is dangerous to walk through Detroit at night and yet not feel afraid doing just that.

Circumstances such as these signify the extent to which emotions are essentially feelings. Attempts have been made to amend the evaluative judgment theory so that one is able to specify those evaluative judgments that are emotional and those that are not, but the effort is self-defeating. If emotions have to be added on to an evaluative judgment, then, emotions are not evaluative judgments. But that emotions are not best conceived as cognitive phenomena, be they belief-desire pairs or evaluative judgments, does not mean that the cognitive paradigm has no merit. Rather the very possibility of a cognitive view

of emotion reveals the intentional richness of these experiences. Emotions do not just "color" our thoughts; they inform them. Solomon seems right to suggest that emotions play an important role in determining "the significance of (an) incident" and as such play a crucial role in our cognitive economy by helping shape our interpretation of the world (126). What a proper account of emotion must do, then, is explain how emotion can play such a crucial role in our cognitive economy without binding emotion so tightly to belief or judgments, as both Solomon and Davidson do, and while explaining the relationship to expressive action introduced in the discussion earlier.

3.2 The Promise of Perception and the Route Back to James

One attempt at a non-cognitive view of emotion is found in the family of views known as perceptual theories of emotion. Insofar as James' theory identified emotion with bodily changes in response to some particular feature of an environment, one might also qualify James' view as a perceptual theory of emotion. However, many contemporary advocates of perceptual theories of emotion endorse views that do not put bodily changes at the center of the theory. One standard objection to James' view has been the claim that some emotions, such as regret or hope, appear to have no corresponding bodily change. In Chapter Two I presented empirical evidence which I claimed suggest at least the accompanying of negative or positive bodily changes to emotions, but I will return to neo-Jamesian responses to this objection later and for now simply leave the issue at the claim that the objection is serious enough to warrant consideration of perceptual theories that leave the body out of the center of the story.

Though versions of non-Jamesian perceptual views have been defended as

"feeling theories" or simply "perceptual theories,"[19] the difference between how these types of views construe emotion is inconsequential. On these views, emotions are evaluative perceptions. So, for example, on this view, fear is to perceive danger, anger is to perceive offense, sadness is to perceive loss, etc. One upside to this view is that it accounts for the intentional richness of emotions without binding emotion to judgment or belief: to be afraid is to perceive danger, to be really afraid is to perceive a great degree of danger, but neither perception is a judgment. Just as one may perceive a painting on a wall without forming the corresponding judgment that she is perceiving a painting on a wall so may one perceive danger and feel fear without judging that something is dangerous. Thus, on this view, emotions are essentially intentional feelings that inform us about our situation. In this respect, there is much that the evaluative perception view gets right. Proponents of the evaluative perception view typically maintain that in order for something to qualify as an emotion it must meet a "formal object" criterion. As Doring (2003) states, "each emotion-type has a so-called 'formal object'...which restricts and thereby determines the class of objects the particular type of emotion can be directed at" (221). In other words, in order to be afraid, one needs to perceive danger. If somebody were to claim that he is afraid of a dog, but insist that he does not find the dog dangerous or fearsome, his experience would be unintelligible. Thus, the evaluative perception view does much to reconcile the sense in which emotions are feelings and the sense in which emotions are intentional. The consequence of this reconciliation is the first of the non-cognitive views of emotion capable of giving emotion its apparent place in an individual's

[19] For example, Doring (2003) refers to her view of emotion as a "perceptual theory" whereas Helm (2002) refers to his view of emotion as a "feeling theory."

cognitive economy.

Of course, that's not to suggest that the evaluative perception view is not without its own difficulties. One initial worry is that emotions may be elicited in response to something other than a causal impact upon the senses. So whereas Dustin perceives the Detroit River only if the Detroit River actually causes his visual experience, he may truly feel fear of a trip to the top of some precipice he has only imagined. If such cases exist and emotions are elicited in the absence of any perception of their objects, then, we must certainly worry about the extent to which we can construe emotions as evaluative perceptions. One response open to the proponent of the evaluative perception view may be that imaginings differ only slightly from perceptions; for instance, many researchers[20] now implicate many of the same brain regions involved in visual perception in visual imagery. Perhaps it is the case that the elicitation mechanism involved in emotion is indifferent to whether or not the relevant feature it is evaluating is imagined or perceived. Though I am sympathetic to this line of response, I worry that such a response may undercut one of the more advantageous aspects to the evaluative perception view.

Recall that the evaluative perception view was designed to account for the intentional richness of our emotional experiences and that on this conception the intensity of an emotion co-varies with the degree of the property the emotion responds to so that where danger elicits a fear response a great deal of danger elicits a more intense fear response. Thus, if visual images differ in intensity from visual perceptions (and I think

[20] For example, after a review of available literature, Anderson (2010) concludes that "it seems...visual regions do play a causal role in mental imagery" (104).

we will be hard pressed to find someone who would challenge this intuition), then visual perceptions should reliably produce more intense emotions than visual images. While I presume that such results are true of most cases, I suspect that they are not true of all cases and if these results are not true of all cases, then, we must naturally wonder whether or not the evaluative perception view is concealing crucial features of the elicitation process. Of course, one might imagine the proponent of the evaluative perception view claiming that the degree of danger relevant to the elicitation mechanism need not co-vary with the degree of intensity inherent in the experience, but then worry of the extent to which the mechanism involved in emotion elicitation is tracking perceptual features arises. If emotions are simply evaluative perceptions and the intensity of the experience is irrelevant to the degree of the feature the emotion is evaluating, then, there seems to be little information left in the perception itself so as to inform the elicitation mechanism. The degree of the relevant feature the emotion is evaluating would thus seem to be informed by something other than the perception itself.

Nonetheless, it is clear that the evaluative perception view has made significant strides over the cognitive views of Davidson and Solomon. What should also be clear by now is that the evaluative perception view does little to explain the relationship between emotion and expressive action stressed in the discussion of the belief-desire model. Insofar as the foregoing discussion of the evaluative perception limited itself to those theories that leave the body out of the story, views of the sort just canvassed appear destined to come up short in this respect. Though I temporarily granted the possibility that some emotions may not have a corresponding bodily change, it is nonetheless

obvious that many emotions aggregate around specific bodily expressions. The proponent of the evaluative perception view may make a similar claim to Solomon's and suggest that to perceive something as dangerous just is to be motivated to flee it, but in both cases the claim does little to explain these specific expressions. It may make sense to suggest that to perceive something as dangerous is to be motivated to flee it, but it doesn't even attempt to explain why the motivation to flee something should be accompanied by trembling. Thus, in taking the premise that some emotions may not have a corresponding bodily change seriously, the evaluative perception view seems to over-extend the prospect of a disembodied theory of emotion altogether.

3.2.1 Putting the Body Back in its Place

Though I stressed many of the shortcomings of the view in Chapter Two, the inability of the evaluative perception view to explain expressive action certainly makes the Affective Program Perspective on emotion more attractive. Despite the experimental challenges canvassed earlier, the Affect Program Perspective accomplishes much of what one should demand of a theory of emotion. That is, APP meets both of the major challenges I have thus far argued a theory of emotion should meet; it captures the sense in which emotions are essentially feelings, but intentional and it accounts for an intimate link between emotion and expression. In this sense, APP builds off of the success of the evaluative perception view while addressing one of its major shortcomings. Recall that on the APP view, human beings are born with the capacity to detect a particular feature of the environment and trigger an appropriate response. On this view, the feature detection mechanism might as well be an evaluative perception simply given the additional task of

triggering a bodily response. Additionally, APP retains the intuition that some emotions sidestep the body; on the APP view individuals acquire culturally informed complex emotions that are either a complex of multiple basic emotions or a basic emotion integrated with some cognitive state.

Despite the view's ingenuity, APP runs into the same difficulty I put off earlier in the discussion of the non-Jamesian perceptual accounts: the experimental implication of the body in emotion elicitation.[21] Earlier I mentioned that the advent of neuro-imaging technology had a critical impact on our view of the nature of emotion, but it's time to show just how results produced from these technologies have revived interest in James' theory. To do so, I must start with the chief pioneer of this research, neuroscientist Antonio Damasio. Damasio's research begins with patients suffering from damage to the ventral and medial areas of the prefrontal region in the frontal lobe. For many of these patients, life before brain damage was routine and anything but out of the ordinary. After damage, however, the patients demonstrated peculiar abnormalities in decision-making matters. As Damasio (1996) states, "patients have difficulty planning their work day; difficulty planning their future over immediate, medium and long ranges and difficulty choosing suitable friends, partners and activities" (1413). Despite these marked difficulties, Damasio's patients score in the normal range on a battery of tests. Patients perform well on standard IQ tests, attention and memory tasks, and language and logic evaluations. Though patients demonstrate abnormalities in decision-making matters,

[21] Though I should add that Griffith (2004) has argued his view is compatible with Damasio's results. His strategy is to place bodily changes on the opposite side of the feature detection mechanism than traditional APP advocates, such as Ekman, who views the function of emotion as the quick mobilization of the organism.

particularly those involved in social situations, patients nonetheless demonstrate normal awareness and retention of basic social knowledge. For example, Damasio's patients score in the normal range on the Standard Issue Moral Judgment Interview which ranks subjects in one of five stages of moral reasoning. Thus, not only can Damasio's patients' deficits not be explained in terms of language, memory, attention, or logic, Damasio's patients' deficits cannot be explained in terms of social knowledge deficits either. In fact, these patients appear able to perform tasks one might expect to be relevant to personal decision-making matters. A closer look at the results reveals the extent to which these patients are capable of social decision-making in the abstract; what the patients cannot do is perform these same tasks as it pertains to their own lives, that is, in the concrete. The missing link between these two domains would be inexplicable were it not for one final symptom of these patients' disorders: the inability to experience emotion.

The co-occurrence of defects in social decision-making and emotion elicitation may strike many individuals as strange. “Common sense” or “folk wisdom” tells us that emotions are things that disrupt our ability to interact with one another in a successful manner. Damasio's patients' deficits seem to suggest a counter to these sentiments: the absence of emotion disrupts successful social interaction. To reconcile these two sentiments, we may need to employ a “Goldilocks strategy,” that is, we may need the hypothesis that both emotional overflow and emotional evaporation disrupt successful social decision-making and thus disrupt successful social interaction. But before one is to construct such an account, the link between decision-making and emotion must be elucidated and to elucidate the link, it is necessary to ask whether the co-occurrence of

these deficits show up elsewhere. It turns out that they in fact do in the case of anosognosia for hemiplegia. Anosognosia for hemiplegia is a syndrome characterized by paralysis of the left side of the body and an eerie inability to acknowledge said paralysis. Interestingly, such symptoms are not characteristic of individuals with paralysis of the right side of the body. Those individuals with paralysis of the right side of their body demonstrate no inability to recognize their paralysis- that inability is reserved for those with paralysis on the left. On top of the inability to recognize their paralysis, individuals suffering from anosognosia for hemiplegia also demonstrate an indifference to their health status and an impairment in personal and social decision-making matters (Damasio, 1994, 67). Thus, there is a significant overlap between the symptoms of anosognosia for hemiplegia and the symptoms of Damasio's patients.

Given this overlap, the natural inclination is to inquire into the relevant brain regions implicated in both syndromes. Whereas in Damasio's patients, one finds damage in the ventral and medial areas of the prefrontal region in the frontal lobe, individuals with anosognosia for hemiplegia display damage in a group of right cerebral cortices known as the somatosensory cortex. That the damaged brain regions implicated in these two syndromes do not map onto each other perfectly should be taken as an encouraging rather than discouraging sign. Because Damasio's patients do not share all of the symptoms of an individual with anosognosia for hemiplegia, the discovery of identical damage in identical brain regions would be more alarming than illuminating. Rather the important question to be gleaned from the implicated brain regions in these two syndromes is how these disparate brain areas are involved in both reasoning/decision-

making processes and emotion elicitation processes. The answer to this question, it turns out, amounts to much more of a revitalization of James' theory of emotion than many had anticipated.

Building on the work of a number of previous studies[22], Damasio et al. (2000) constructed a number of functional neuroimaging experiments designed to discover the neural correlates of four emotions: fear, anger, happiness, and sadness. In addition to finding correlates of well-established emotion regions[23], such as the amygdala, Damasio found that each of these four emotions activated a distinct set of neural activity in brain regions long implicated in the representation and/or regulation of bodily states, such as the insular cortex[24], hypothalamus[25], somatosensory cortices[26], and the brain stem. In light of these results, Damasio concluded that "(t)he subjective process of feeling an emotion is thus correlated with activity patterns in brain regions that map the continuously changing internal states of the organism" (1049). In other words, on Damasio's view, to consciously feel an emotion is to experience a suite of corresponding bodily changes. Thus, it is in construing emotion in this manner that Damasio revitalizes James' original intuition.

Of course, that's not to suggest that Damasio endorses James' view wholesale. One crucial point of departure between his and James' view is Damasio's introduction of

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22 For examples, see Davidson & Irwin (1999) and George et al. (1995).

23 For an example of a study implicating the amygdala in emotion, see LeDoux (1992).

24 For an example of a discussion of the role of the insular cortices in the representation of the body , see Critchley (2004).

25 For an example of a discussion regarding the hypothalamus' role in endocrine regulation, see Burdakov, Luckman & Verkhratsky (2005).

26 The implication of the somatosensory cortex in the representation of the body is evidenced by damage to the cortex in the case of anasognosia for hemiplegia, but for a further example of a study implicating this brain region in the representation of the body, see Simaes et al. (2003).

the “as if body loop,” which activates a particular neural configuration typically set off by a bodily change in the absence of said changes. The upshot of this move is that it enables Damasio to reconcile James' view with the intuitions that motivate many of the cognitive views of emotion, namely, that we experience emotions even in the absence of a particular bodily change. Via the “as if body loop” a particular event may trigger an emotion in the absence of the corresponding bodily change, but that does not mean that the emotion is not an experience of that bodily change. Instead, the “as if body loop” activates a representation of the bodily change and thus the individual experiences an emotion (the bodily change) without the change actually occurring. Moreover, the “as if body loop” represents the extent to which Damasio accepts the division of emotions discussed in Chapter Two between those emotions that are basic and those that are more complex. According to Damasio, basic, or what he calls “primary,” emotions are innate dispositions to react to some feature of the environment which manifest in the form of bodily changes and thus trigger an emotion. Complex, or what Damasio calls “secondary,” emotions are acquired dispositions that make use of the “as if body loop.” On this picture, the somatosensory structures implicated in the representation of a body change form association links in the ventromedial cortex with information provided by other cortical regions regarding the classification of a complex situation. Thus, the cognitive evaluation of a particular situation may trigger the reactivation of a given emotion where the present situation has been previously classified. As Damasio (1996) states, “when a situation of a given class recurs, factual knowledge pertaining to the situation...trigger(s) the re-activation of the somato-sensory pattern that describes the

appropriate emotion" (1415).

Bringing the discussion full circle, one can now see a possible route to explaining the analogous symptoms involved in anosognosia for hemiplegia and damage to the ventral and medial areas of the prefrontal region in the frontal lobe characteristic of Damasio's patients. Most evident is that the inability to experience emotion in the case of anosognosia for hemiplegia appears to be due to damage to the somatosensory cortices, which also explains the characteristic paralysis of one side of the body. Perhaps less evident is how this damage results in analogous deficits in reasoning and decision-making also characteristic of Damasio's patients with frontal lobe damage. These results are made explicable by Damasio's hypothesis that the ventromedial cortex forms an association link between information provided by other cortical regions regarding the classification of a complex situation and the emotion typically associated with that situation. According to Damasio, these association links inform the reasoning/decision-making process by activating somatosensory patterns typical of a particular emotion. Once activated, the somatosensory pattern "marks" possible outcomes of the scenario as either "good" or bad" and by so marking the outcomes, options may be quickly rejected or endorsed leaving pertinent options to be processed further.[27] Thus, Damasio claims, "somatic markers...help constrain the decision-making space by making that space manageable for logic-based, cost-benefit analyses" (1415). So, in the case of anosognosia for hemiplegia, damage to the somatosensory cortices prevents the activation of patterns typical of a particular emotion, which in turn, debilitates the "marking" of particular

[27] This rough sketch of how emotion informs the decision-making process captures the essence of what Damasio calls the "somatic marker hypothesis."

outcomes and thus impairs the decision-making space given the failure to make that space more manageable for subsequent analyses. In the case of individuals with prefrontal damage, the story is similar. Prefrontal damage to the ventromedial cortex severs the association link thus debilitating the "marking" of particular outcomes and impairing the decision-making space. In either case, the result is the same. Damage to the somatosensory cortices prevents the "markers" from attaching to the particular outcome and damage to the ventromedial cortex prevents the particular outcome from attaching to the relevant "marker." In the case of Damasio's patients, the failure of the particular outcome to attach to the relevant "somatic marker" explains why these patients demonstrate an ability to reason about social situations in the abstract, but an inability to reason about these same situations in the concrete. Abstract reasoning may not require the "hard-won" associations formed by personal experience stored in the ventromedial cortex that concrete, practical decision-making requires.

In addition to the aforementioned explanations, Damasio's view also entails that damage to the ventromedial cortex prevents the experience of secondary emotions rather than those emotions he calls primary. Given the role of the ventromedial cortex in the "as if body loop," Damasio claims that damage to the area of the ventromedial cortex debilitates only the functioning of emotions reliant on more cognitive evaluations. Because his patients have intact somatosensory cortices, Damasio claims that their ability to experience primary emotions is not at all impaired. As Damasio (1994) states, "prefrontal patients can have primary emotions...they would show fear if someone screamed unexpectedly right behind them, or if their house shook in an earthquake" (138-

9). In fact, Damasio takes these results even further and suggests that emotions and their corresponding feelings can come apart. According to Damasio (2003), emotions precede feelings and those "patients who lost their ability to experience certain feelings still could express the corresponding emotions" (5-6). This claim, that emotions precede feelings, has turned out to be one of Damasio's most controversial suggestions and it has resulted in Damasio's view coming under intense scrutiny from a number of thinkers.[28] I will return to the issue of the separation of emotion and feeling and the possibility of unconscious emotions in Chapter Four, but for now I will focus on the implications of Damasio's work on theories of emotion more generally.

3.3 Emotional Intentionality

By now, it should be evident that Damasio's work has accomplished two major tasks. First, Damasio has presented us with sound empirical evidence suggesting that the body plays a central role in emotion and thus we have good reason to think that those perceptual accounts of emotion that leave the body out of the story are mistaken. Second, Damasio provides an account that retains the Jamesian intuition that emotions without bodily feelings are impossible while addressing the concern that emotions may occur without a corresponding bodily change happening. His view that emotions are representations of these changes and that such representations may be triggered even in the absence of those changes offers a promising solution to the standard objection to James' view regardless of how we feel about the possibility of non-conscious representations. To return to the discussion to the overarching task of this Chapter, it should also be clear that Damasio's view meets the standard I have set regarding the

[28] For example, see Maiese (2011) and Ratcliffe (2010).

relationship between emotion and expressive action earlier. On his view, many of these expressive acts are either part of the elicitation process or are physiological consequences of changes in the elicitation process. What may be less clear is whether or not Damasio's view meets the standard I have set regarding the status of emotions as intentional feelings. Here, it seems Damasio's view is particularly hampered by his insistence on the separation of emotion and feeling. Though I'll continue to withhold judgment on Damasio's view of feelings, I will state that there is reason to be concerned about whether or not Damasio's view meets the intentionality criterion I have thus far stressed. If emotions are representations of bodily changes *simpliciter*, then, it it seems to follow from what we have gleaned about emotions that bodily changes inform our understanding of our current situation. But is it really the case that knowledge of a racing heart, constricted blood vessels, upright hair follicles, etc. suffices to inform us that we are in the presence of something scary? How does the knowledge of a racing heart or of upright hair follicles trigger a flight response? Do such considerations lead us back down the beaten path to those cognitive views we dispatched with earlier? I think not, but to see how one may conceive Damasio's work such that one addresses many of these concerns, I must turn to the work of Damasio's chief flag-bearer, Jesse Prinz.

Having already extensively touched on Prinz's view of emotion in Chapter Two, it is unnecessary to recount the view in full here. However, it will be worthwhile to recall the precise move Prinz makes regarding intentionality. Recall that Prinz appeals to Dretske's (1981 & 1986) notion of intentionality. On this conception, a state can be said to be intentional if it both carries information and can be applied incorrectly. If so, then,

that state represents that which it carries information about. Thus, on this view, a mental state is intentional if it both carries information and can be applied incorrectly. To determine whether or not a state carries information, one must determine if that state reliably co-occurs with that which it is thought to carry information about. In most cases, such co-occurrence is causal. Smoke carries information about fire because it is reliably caused by fire. But that smoke carries information about fire does not mean that smoke is an intentional state—that is, that smoke carries information about fire does not mean that smoke represents fire. Smoke cannot be applied incorrectly.

In order for something to be applied correctly or incorrectly, something must be set up for the purpose of carrying information about that with which it reliably co-occurs. So whereas smoke does not represent fire because it is not set up for the purpose of carrying information about fire (it is just a natural consequence of fire), a smoke alarm does indeed represent smoke because it is set up for the purpose of carrying information about smoke. That is, a smoke alarm represents smoke because it was designed to be sounded upon the detection of smoke and because it may be sounded incorrectly; the smoke alarm may be triggered by tampering with it, for example. What the foregoing is intended to show is that information carriers are said to be representational if they have the function of carrying certain information. So, in the case of mental states, a mental state is said to represent that which it has the function of carrying information about[29]. Thus, in regards to emotion, Prinz thinks they represent that which they have the function of carrying information about.

[29] Of course, it is important to note that a mental state may "have the function of" carrying information in one of two ways: that state may be set up by natural selection or it may be acquired through learning.

At this point, however, Prinz has not made any strides over Damasio. Damasio clearly conceives of emotions as reliably co-occuring with particular bodily changes and as such emotions represent those bodily changes. Rather Prinz's contribution is that emotions need not exclusively represent bodily changes. On Prinz's view, as mentioned in Chapter Two, emotions also represent "core-relational themes." How exactly Prinz arrives at the conclusion that emotions also represent "core-relational themes" will take some brief fleshing out. One route to the conclusion that emotions represent "core-relational themes" is the simple observation that underlying the various events that trigger a particular emotion is a sort of unity. As Prinz (2004b) states, "(a)ll people are frightened by scary things, angered by offensive things, disgusted by disgusting things, and elated by pleasing things" (60). Different people will respond in idiosyncratic ways to particular stimuli, but each person responds to that stimuli relative to how each perceives the stimuli. That each individual responds to a stimuli *relative to* how each perceives the stimuli signifies the extent to which emotions represent organism-environment relations, or "core-relational themes." The foregoing reveals the sense in which neo-Jamesian approaches are perceptual views of a certain sort: just as only a red-seeing being can see red, only a fear-responsive being can be afraid. A simple example will bear this out. Imagine you and a friend come across a lost dog, a puppy, and upon seeing the puppy you approach the puppy, but your friend recoils in fear. You may think your friend's fear response is ridiculous, perhaps even humorous, but there is a sense in which (if you are empathetic enough) you can make sense of your friend's response. You don't find the dog scary (you think it's cute), but you will understand that your friend has perceived the dog

as scary. That is, the dog's being scary is a relational property; the dog is only scary *to* individuals who fear dogs.[30]

Of course, construing emotion elicitation in this precise manner is not likely to carry us very far. For one thing, the point is viciously circular. The claim that fear represents something scary might as well be read as the claim that fear represents what causes fear. Such a conception of fear violates Dretske's intentionality stricture. As Prinz (2004) notes, "If fear represents anything that causes fear, then whenever I am afraid, my fear is accurate or correct..(r)epresentations must be able to misrepresent" (61). To escape this difficulty, Prinz extrapolates the formal object out of the particular objects[31] that elicit our various emotions. While it is circular to say that fear is caused by perceiving something as scary, it is not circular to say that fear is caused by perceiving something as dangerous. Moreover, the claim that fear is caused by perceiving something as dangerous does justice to the notion that emotions represent "core-relational themes." Only a danger-detecting being can be afraid. Other "relational-themes" may be found underpinning the other emotions. What ties the various episodes of sadness together is that they each represent a loss, what ties the various episodes of happiness together is that each represent something pleasing, what ties the various episodes of anger together is that each represent something as offensive, etc. So construed, this picture of emotion can meet Dretske's stricture. For example, I may be afraid of the coil-shaped object in my garden because I perceive it to be dangerous, even though I have only spotted my garden hose,

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[30] In general or in particular. It most certainly can be the case that an individual will only find larger, teeth-baring dogs scary. In either case, the point still holds. Something can only be scary to a creature capable of feeling fear.

[31] Prinz (2004b) describes the difference as follows: a formal object is the property in virtue of which an event elicits an emotion, and a particular object is the event itself (62).

which is not at all dangerous.

Returning to intentionality and bodily changes, it is clear that Prinz's suggestion that emotions do not exhaustively represent bodily changes, but that they also represent "core-relational themes" does much to elevate Damasio's insight such that it may meet the intentionality criterion I have thus far stressed. Whereas Damasio's view of emotions as representations of bodily changes was difficult to reconcile with the role in cognition Damasio's patients seemed to suggest emotion had, Prinz's use of Dretske's view of intentionality gives us an account of emotion that makes the link between bodily changes and information carrying intelligible. Insofar as emotions are set up, either by natural selection or by learning, to be set off by particular bodily changes emotions represent both those changes and the formal object (to be read "core-relational theme") corresponding to those changes. Thus, Prinz has provided a view of emotion that can both count emotions as feelings and indicate how these feelings provide the type of information they appear to. There is no need to postulate cognitive elements, be they judgments or beliefs, as essential to emotion to explain how emotions inform cognition. As Prinz (2004b) states, "(i)f Dretske's story is right, the complexity of that which is represented need not be mirrored by the complexity of the representation" (65). Emotions are representations of "core-relational themes" reliably triggered by corresponding bodily changes that inform us about the significance of an event, outcome, scenario, etc.

As I have already intimated in the preceding, I do not endorse Prinz's view wholesale. I do, however, think that Prinz gets much about emotion right. In what follows, I will outline some of the deficiencies I perceive in Prinz's view in an effort to

set the stage for the view of emotion I will defend in the next chapter. Before I do so, I want to briefly touch on one of the most common objections to Prinz's view. Recall that on Prinz's view, emotions represent "core-relational themes" in virtue of tracking bodily changes that reliably co-occur with a particular event or circumstance in the environment. Because Prinz suggests that emotions represent "core-relational themes" in virtue of tracking bodily changes that reliably co-occur with a particular event or circumstance, Prinz's view of emotion may be construed as an *indirect* perceptual account of value.[32] In making an appeal to indirect perception of values, Prinz opens his view up to the objection that emotions appear to be direct perceptions of values. As Deonna & Teroni (2012) state, "is danger not given to us through fear precisely as danger, in the sense that the phenomenology of fear is what makes this evaluative aspect of the world manifest to us?" (73). I think that we should not be so quick to endorse the aforementioned phemenological conception of fear, or any other emotion, for the matter. One reason is that emotions do not seem to be direct perceptions of anything. If I am angered by a derogatory comment you made to me, neither the comment nor the offense are transparent in my anger. Deonna & Teroni's objection suggests the concession that the former is not transparent in the emotion, but that the latter is. Perhaps the issue amounts to a difference in intuition, but I am inclined to argue that Deonna & Teroni's objection conflates two causally related events. It seems to me phenomenologically evident that we

[32] In Prinz's jargon, this means that emotions represent "real" content in virtue of reliably co-occuring with "nominal' content where the corresponding bodily changes is construed as "nominal" content and the "core-relational theme" is construed as "real" content. Prinz's example of such a representational nexus is the relation between the appearance of a dog and what makes a dog a dog. In this example, a dog's fur, wagging tail, basic skeletal anatomy etc. represent the "nominal" content of a dog where the dog's genome represents the "real" content of the dog.

feel fear and cognize danger in response. For example, I may stand at the ledge of a precipice, feel afraid, and then judge that standing around the ledge is dangerous. Likewise, I may hear your derogatory comment, feel anger, and then judge the comment offensive.

Deonna & Teroni appear cognizant of such a response, but claim that such a characterization of the causal story is not true of all emotion experiences. As the authors state, "(t)he situation is not generally one in which we tell ourselves something along the lines of: 'there is something going on within me I know to be indicative of danger, loss, offense, etc., but where is it exactly located in my surroundings?" (74). I agree that the situation does not generally unfold in the aforementioned manner, but I think there is a way to defend an indirect perceptual account of value that does not fall prey to this objection. However, I will add that insofar as Prinz stresses that emotions represent their corresponding "core-relational theme," but have the structure of only "nominal" contents—in this case, bodily changes—Prinz's account nonetheless remains open to this objection. If emotions have only bodily changes as their "nominal" contents, then, the demand placed on cognitive judgments is great: individuals will need to spend a critical amount of their attention on seeking the feature of the environment that elicits the emotion. Deonna & Teroni's objection that this is not typically the case is well-founded; it does not appear to always be the case that we need to deliberate about the causes of our emotions. Thus, the critical task for an indirect perceptual account of value is to explain how "core-relational themes" are not transparent in the emotion itself while mitigating the need for a great deal of attentive deliberation to link the emotion to its environmental

elicitor.[33] Drawing from an important lesson gleaned from the literature on intuition, I will show how slightly modifying the structure of emotion in Prinz's account can meet this demand in the next chapter.

Another set of deficiencies I perceive in Prinz's view have to do with difficulties in Prinz's account of emotion elicitation and the nuts and bolts of the biological processes there involved. First, there is the worry that bodily changes may persist in the face of a subsiding emotion. For example, my heart may continue to race and the hair on my arms may continue to stand upright even though my fear has subsided. If emotions are triggered by a specific suite of bodily changes, then, it would seem that my racing heart and upright standing body hair should continue to trigger my fear. Second, there is the worry that Prinz's view cannot explain the duration of the emotional episode. In Chapter Two, I showed that most thinkers now agree that emotions and moods need not be divided in terms of their durations, but we should still demand an explanation for why some emotions last longer than others. Third, there is the worry that Prinz's view cannot account for the fine-grained differences between emotional experiences of the same type. Recall that one of the upsides to those evaluative perception views that leave the body out of the center of the story was the ability of the view to account for these fine-grained differences: to be afraid was to perceive danger, but to be really afraid was to perceive a great deal of danger. It is unclear how Prinz's view can accommodate these same results. If fear is triggered by a specific suite of bodily changes in response to danger in the environment, then, we might expect the intensity of fear to reliably co-vary with

[33] A proper account should also explain why this is in fact the case some of the time.

intensities in bodily changes. I know of no available reason to postulate that this is the case. On the face of it, it does not seem to be the case that the more upright body hair stands or the faster one's heart beats the more afraid one feels. Even if this is the case for fear, it is not at all obvious how to construe intensities in bodily changes for the other emotions. Are more intense anger episodes triggered by increases in blood temperature? Again, I know of no reason, empirical or philosophical, to suggest that this is the case. Of course, I do not think anyone should take the foregoing as reason to reject the Embodied Appraisal approach to emotion altogether. Rather the conclusion I think one ought to draw from the foregoing is that Prinz's notion of an elicitation mechanism tracking bodily changes is an over simplification of the elicitation process. Constructing an Embodied Appraisal approach that meets the aforementioned challenges and reconciles the doubt regarding specific physiological changes for each emotion introduced in Chapter Two with the experimental results implicating a crucial role for the body in emotion is the task of the next chapter.

Chapter 4

Modifying Embodied Appraisals: The Appraisal-Hypothesis Confirmation Theory

Before I outline the view of emotion that I will defend here, I want to recount some of the points introduced in the preceding so that the requirements a view of emotion must meet are clear. The overarching task of Chapter Two was to situate emotion in an appropriate taxonomy of affective phenomena. I showed how to distinguish emotion from other affective phenomena such as sentiment, affective disposition, and mood. I argued that mood should not be construed as a non-intentional background to emotion, but that there may be a sense in which mood is both generalized emotion, as Prinz suggested, and a determinant of the range of emotion one can experience, as Ratcliffe suggested. I also presented empirical evidence suggesting that mood and emotion interact in important,

reliable ways. The view of emotion I will advocate here will touch on both the nature of mood and the relation between mood and emotion in such a way that crucial elements of Prinz's and Ratcliffe's views can be reconciled. The second major task of Chapter Two was to examine a commonly accepted division between basic and complex emotions. There I presented evidence suggesting that the so-called "Big Six" emotions are not innate. I expressed my skepticism regarding distinct physiological typologies for each of these "Big Six" emotions and argued that affective scientists should seriously consider the proposal that all emotions are outgrowths of initially valenced feelings. The view of emotion I will present is an attempt to show how initially valenced feelings become robust emotions. The view I will advocate is also an attempt to reconcile the skepticism regarding distinct physiological typologies for each of the "Big Six" emotions with the main lesson learned in Chapter Three: that emotions are non-cognitive elements of thought that necessarily involve the representation of bodily feelings. I also hope to make good on my promise of presenting an Embodied Appraisal view of emotion that diffuses the need for an individual to deliberately link an emotion with its corresponding evaluative judgment.

4.1 Reimagining the Role of Body Appraisals

The first issue I would like to address is the matter of distinct physiological typologies for the "Big Six" emotions. On the face of it, it may seem preposterous to suggest that an Embodied Appraisal view of emotion can be defended while denying that there are distinct physiological typologies for even simple emotions such as the "Big Six." In truth, I am not altogether denying that there are distinct physiological typologies.

In Chapter Two, I claimed that the results in the Ekman et al. (1983) experiment fall neatly into a positive-negative dichotomy and I used the example that anger, fear, and sadness (all negatively valenced emotions) each produce a mean increase in average heartbeat of about 8 beats per minute. Notice, however, that my claim is not inconsistent with the fact that the "Big Six" emotions may be individuated in an expansive matrix of bodily affects including, for example, hand temperature, skin conductance, blood vessel constriction, etc. Rather my point is more precisely the expression of the doubt that the values derived from the matrix of bodily affects should be interpreted individually. The numbers 30, 32, 40, 59, 62, and 65 are no doubt discrete, but they may nonetheless be divided into two groups: one including those numbers under 50 and one including those above 50. The critical question is thus how *should* we group these numbers. If, for example, the preceding six numbers were given to us with the additional information that they represent students' test scores on a pass-fail exam where any score over 50 earns a passing grade and the task of assigning these scores grades, then, if we wish to fulfill the task, we should divide those six numbers into groups of over or under 50. In regards to the Ekman et al.(1983) results, the question is the same: how should we group these results. To answer, we need to clarify both our task and the additional available information. In the last chapter, I showed how Damasio's work implicates many of the same brain regions involved in the representation and/or regulation of bodily states in emotion. I also showed how we may take these considerations (as well as others) to think that emotions are representations of bodily changes. In other words, I showed that we have good reason to prefer an Embodied Appraisal view of emotion. In light of my

comment on Ekman et al.'s results, the present task is thus to determine how the emotion elicitation mechanisms presumably located in the brain regions elucidated by Damasio and others are registering the relevant bodily changes. Are these mechanisms registering fine-grained bodily changes, such as those derived in the bodily affect matrix, or are these mechanisms registering coarse-grained bodily changes, perhaps divided into positive and negative valence? Prinz and Damasio assume the former; I think the case is probably the latter. In the absence of empirical evidence on this precise matter, the issue may not be decisive, but let's see how far the available evidence may take us.

If the emotion elicitation mechanisms are registering fine-grained bodily changes not only must there be individuated values derived from a matrix of bodily affects, but this value must be forwarded to the elicitation mechanism itself. Why must this value be forwarded to the elicitation mechanism itself? Well, consider the fact that skin conductance, heart rate, blood vessel constriction, hormone changes, etc. all occur in a wide number of bodily structures and that in order for a suite of these changes to trigger an emotion, they have to be orchestrated such that the collection of them triggers the corresponding emotion. One way we may want to construe this process is as follows: we may say that each of these bodily changes triggers activation in some brain region implicated in both the representation and/or regulation of bodily states and emotion. Notice, however, that if we construe this process in this manner, the elicitation mechanism must be detecting activation of these particular brain regions. But if the elicitation mechanism is detecting activation of these particular brain regions, then, we have betrayed Prinz's suggestion that emotions have bodily feelings as their nominal

contents. On this view, emotion would represent these bodily changes in much the same manner that they represent "core-relational themes;" they would represent bodily changes in virtue of reliably co-occurring with those changes, but the emotion would not have those changes as a part of their own structure. Thus, if we want to defend the view that the emotion elicitation mechanism are registering fine-grained bodily changes, then, we need to find a place where the suite of bodily changes corresponding to a particular emotion can come together.

Taking a look back at Damasio's (2000) results, we see the implication of a host of brain regions, such as the insular cortex, hypothalamus, amygdala, and brain stem in emotion. Given the unique position of the brain stem, one candidate for a place the suite of bodily changes corresponding to a particular emotion might come together is this very structure[34]; any and all information that comes from the body and goes to the brain must traverse the brain stem. Notice, however, that simply locating a candidate structure does not suffice to solve the problem; the brain stem may be either computing values akin to those derived from a matrix of bodily affects which is in turn forwarded to the relevant elicitation mechanisms or it may simply be passing along more coarse-grained information. Given the fact that any all information from the body must necessarily traverse the brain stem, we have good reason to think that the information requisite for computing values akin to those derived from a matrix of bodily affects is available to this structure, but, again, this availability does not suffice to show that the brain stem is in fact computing such values. At this point, it may seem that we have reached an impasse.

[34] Of course, the brain stem need not be the specific structure involved in this process. One may find other dorsal structures that could serve as candidates.

Insofar as there is no available evidence to elucidate the nature of the computation a candidate structure such as the brain stem may be engaging in, the question of whether or not the emotion elicitation mechanisms are registering fine-grained bodily changes remains open. But this is not to say that we have not gleaned anything at all.

In the closing of the last chapter, I presented a few deficiencies I perceived in Prinz's view and I argued that such deficiencies suggest Prinz's account of emotion elicitation is over-simplified. The present discussion sheds some light on why this is the case. The very need to locate a candidate structure where disparate bodily changes may come together so as to elicit an emotion signifies the extent to which the elicitation mechanism involved in emotion is not simply registering bodily changes. Regardless of whether or not a candidate structure such as the brain stem is computing fine-grained or coarse-grained values, it nonetheless must be the case that some structure is computing such values the elicitation mechanism is registering.[35] That the elicitation mechanism is registering such values is the crux of the view I will defend. I call my view an Appraisal-Hypothesis Confirmation theory, but it is not so much a theory in its own right as it is an elaboration on the neo-Jamesian views of Prinz and Damasio. The main difference between Prinz's view and my view is that I have split the elicitation process in two. On

[35] One might wonder why it must be the case that a candidate structure must be computing such values if the elicitation mechanism involved in emotion is registering positive or negative bodily changes. For example, heart rate consistently varies for positive versus negative emotions. Why not claim the elicitation mechanism just registers heart rate changes? The reason is one physiological change probably occurs in non-emotional matters. To use the heart rate example, heart rate may change during exercise in ways similar to those changes it undergoes in an emotion. Thus, one single physiological change is probably not sufficient for an emotion. That a number of physiological changes is necessary for an emotion, however, need not be taken as reason to think the collection of physiological changes corresponds to lexicalized emotions, such as the "Big Six." My claim is that the collection of physiological changes may just divide into two classes.

my view, the value computed by a candidate structure such as the brain stem is an appraisal of bodily changes, but this value must be forwarded to an elicitation mechanism. As the title of my view suggests, one way to think of this is in terms of generating and confirming a hypothesis; the value computed by a candidate structure such as the brain stem may be thought of as the hypothesis that something relevant to one's concerns is happening while the elicitation mechanism to which this value is forwarded may be thought as the confirmation that something relevant to one's concerns is in fact happening. I will elaborate on the details of this view shortly, but first I want to say a few closing words on fine and coarse-grained value transmission.

In Chapter Two, I made the case for preferring the view that it is positively and negatively valenced feelings that should be considered basic, or innate, rather than the "Big Six." If that line of reasoning is not mistaken, it follows that young infants' and neonates' elicitation mechanisms are initially set up to be set off by such coarse-grained bodily changes. In regards to the "Big Six" and even more complicated emotions, the relevant question is thus how is that the elicitation mechanism goes from triggering valenced feelings to triggering individuated emotions? One possibility is that each of us acquires, or learns, more fine-tuned physiological changes throughout development and that this individuated information is forwarded to the elicitation mechanism. Another possibility is that such fine-tuned physiological changes are never actually acquired and that individuation occurs in the brain. The first possibility posits that the solution is in the body. The second possibility posits that the solution is in the head. The former is the view that Prinz implicitly takes up when he claims that culture may train us to modulate our

bodily reactions thereby changing the content of the emotion.[36] The latter is the view that I wish to defend. The reason that I prefer the view that individuation of emotions from initially valenced feelings occurs in the head is twofold. First, Embodied Appraisal theorists have thus far failed to clarify which physiological changes occur prior to emotion elicitation and those which occur after emotion elicitation. My worry here is that one reason distinct physiological typologies appear to have such a strong correlation with the "Big Six," for example, is that researchers lump the physiological changes that occur before and after an emotion together. Presumably, Embodied Appraisal theorists have taken the "pattern of bodily changes" as the sole *princium individuationis* of emotion and thus thought the issue of determining which changes occur on either side of elicitation a non-problem. The trouble for so conceiving the *princium individuationis* of emotion is that it runs into the difficulty I have just canvassed regarding the status of bodily changes as constitutive of an emotion's nominal content and the over-simplification of the elicitation process. The second reason that I prefer the view that individuation of emotions from initially valenced feelings occur in the head is that it affords the possibility that the triggering of the hypothesis component in the elicitation process is multiply realized. Typically Embodied Appraisal theorists argue that future research will reveal more conclusive results in favor of distinct physiological typologies for some standard set of emotions such as the "Big Six." For example, in response to doubts about distinct physiological typologies, Prinz (2004b) has claimed that had emotion researchers

[36] Of course, given that Prinz posits something like "protosadness," "protohappiness," "protoanger," etc. as basic emotions, he does not ask the question of how the elicitation mechanism goes from triggering valenced feelings to more individuated emotions. The possibility that I am attributing to him is how I think he would answer the question if he had in fact posed it.

"measured other physiological responses (such as changes in digestive organs, blood vessel constriction, respiration, or hormones), further differences might have emerged" (73). I admit that such differences might emerge, but they also might not. The view that I am going to defend does not wed itself to such optimism, but it does support it. The general strategy I am going to employ should be flexible enough to accommodate modifications from those unwilling to give up the view that the hypothesis component of the elicitation process is registering fine-grained values. On that view, the appraisal mechanism would simply generate a detailed value that subsequently informs the elicitation mechanism as to which emotion to trigger. Of course, further features may have to be added to the process, but I'll leave it up to those who wish to defend a view of that sort to extrapolate those features from the account I am going to provide. Future research and thought will be needed to determine whether or not we should ultimately prefer a view that construes the values generated by an appraisal mechanism as fine or coarse-grained, but thinkers will never arrive at such a conclusion if views of both types are not developed such that their implications can be tested. In the hope that it will better serve future inquiry regardless of whether or not it may be the view thinkers ultimately prefer and for the reasons I have just given, I defend the Appraisal-Hypothesis Confirmation view of emotion built on the assumption that the appraisal mechanism generates values individuated in terms of positive and negative valence.

4.2 The Appraisal-Hypothesis Confirmation View

The Appraisal-Hypothesis Confirmation view of emotion is not so complicated, but I need to address a few of the nuts and bolts features of the view so that the process is

made clear. As I have already mentioned, the Appraisal-Hypothesis Confirmation view differs from Prinz's view in that I have split the elicitation process in two. On this view, there are two crucial mechanisms: one which appraises the body and the other which registers the results of this appraisal. That mechanism which appraises the body, I call the Somatic Appraisal Mechanism, or SAM. That mechanism which registers the results of this appraisal, I call the Emotion Confirmation Mechanism, or ECM. I'll begin with ECM. The job of ECM is much the same as the work Prinz posits an "elicitation file" does. Recall from Chapter Two, that on Prinz's view, the elicitation file links the perception of patterned changes in the body with the various items that cause these changes so that various items related to the item the file has linked to the perception of bodily changes may trigger a particular emotion such that an emotion may be triggered by an item that had not been previously linked. Notice, however, that on Prinz's view, the elicitation file's job is not to trigger an emotion. Because Prinz conceives emotion as the perception of patterned changes in the body, the elicitation file's job resembles the work Damasio suggested the ventromedial cortex engages in; that is, the elicitation file aids an individual in connecting discrete emotion representations with the evaluative judgment pertinent to the situation. Also recall that this move was the very one Deonna & Teroni (2012) took exception with: they claimed that the situation was not typically such that an individual acknowledges a "core-relational theme," but seeks the cause of the theme he or she is cognizant of. The Emotion Confirmation Mechanism I am postulating is designed to deal with this and other difficulties.

For the sake of convenience, I'll continue to refer to ECM as an Emotion

Confirmation Mechanism, but in truth, ECM may be a collection of mechanisms. So, for now, I'll refer to the work I'm supposing ECM engages in as ECM's instructions, but keep in mind that each of the instructions I am postulating ECM follows may be followed by individual mechanisms. The first of ECM's instructions is straight-forward; it is simply to trigger an emotion representation upon receiving a value from SAM. The second of ECM's instruction is to determine whether or not to sustain or discontinue the triggered representation set off in instruction one. Taken together, these two instructions solve a few of the deficiencies in Prinz's view I delineated last chapter. Recall that I claimed Prinz's view does not explain the duration of an emotional episode and that it seemed to be the case that Prinz's view could not meet the challenge of accounting for variations in the intensity of an emotional episode. ECM's first and second instructions show how an Embodied Appraisal view of emotion may be defended so that both of these challenges are met. ECM's second instruction clearly accounts for the duration of an emotional episode insofar as the instruction sets ECM up to either continue or discontinue triggering an emotion. If ECM continues to receive the appropriate signal from SAM, ECM continues to trigger the emotion. If SAM stops sending the signal, ECM discontinues the trigger. In this sense, ECM may be thought of as more a gateway than a trigger. That ECM may be thought of as more a gateway than a trigger also may account for the intensity of an emotional episode. The longer the gateway stays open, the more intense the emotional episode may be. The quicker the gateway shuts, the less intense the emotional episode may be. The upshot of this move is that it can account for variations in the intensity of an emotional episode without positing that some emotional

representations are phenomenologically more robust than others. On this picture, all emotions are born equal. Intensity is accounted for quantitatively rather than qualitatively. As I'll explain later, emotions are fed-forward to executive, cognitive programs that underpin an organism's attention. One fleeting, discrete emotion representation fed-forward to these executive, cognitive programs may not cause the sense that the emotion is particularly intense, but a series of persistent discrete emotion representations fed-forward to these same executive programs may cause the sense that the emotion is particularly intense. Of course, just as soon as one set deficiencies has been addressed, another set arises. Though it may be the case that a series of persistent discrete emotion representations can account for the intensity of the episode, positing a series of discrete representations may seem to do injustice to the phenomenological continuity of the episode. For those peculiarly lengthy emotion episodes, an appeal to phenomenological continuity is probably unfounded. The longer the emotion lasts, the more likely it is to morph in more or less subtle ways. Having said that, I nonetheless think that there are probably a large number of episodes that involve a series of discrete emotion representations in which the phenomenological continuity of the experience is evident. ECM's third instruction can explain both of these cases.

ECM's third instruction is to map the values it receives from SAM onto more or less specified content in available perceptual milieu. In the last chapter, I claimed that slightly modifying the structure of emotion Prinz posits can meet the demand raised by Deonna & Teroni (recounted above) that it does not appear to be the case that a great deal

of attentive deliberation is required to link an emotion to its environmental elicitor.[37] ECM's third instruction explains how the structure of emotion is thus modified. To put the point in a metaphor, ECM's third instruction is to ensure that each and every emotion is both signed and notarized. The value that SAM forwards ECM may be thought of as the signature; insofar as ECM's first instruction is to register the value SAM has forwarded, ECM "signs off" on the emotion. The specified perceptual content ECM's third instruction maps onto the value that SAM forwards may be thought of as the notarization. Why suggest that such mapping takes place at all? The main reason is that many of the brain regions implicated in emotion are known to receive perceptual stimuli directly. For example, one account of emotion elicitation commonly evoked in support of the claim that emotions are non-cognitive has been provided by LeDoux (1996). According to LeDoux, fear can be triggered before perceptual stimuli ever reach the neocortex. Skipping a few details, the reason fear can be triggered before perceptual stimuli ever reach the neocortex is that there is a subcortical pathway linking the retina to the amygdala. My claim is the suggestion that the perceptual stimuli may not only be triggering emotions[38], but informing them. Of course, my suggestion does not amount to the claim that emotions have "particular objects" as a part of their structure and thus it does not fall prey to the objection that emotions particular objects are not transparent in an emotion itself. The phenomena of blindsight, and other related disorders, suggest that

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[37] Another way of stating this demand is, as stated in the preceding, that connecting discrete emotion representations with the evaluative judgment pertinent to the situation appears not to require much deliberation.

[38] Of course, there may be cases in which perceptual stimuli delivered to amygdala, or other brain structures implicated in emotion, may not trigger an emotion. Whether or not a perceptual stimuli can trigger an emotion is probably dependent on whether or not the stimuli is closely related to stimuli stored in the elicitation file or has been previously stored. This point should become clearer in the discussion to follow regarding ECM's fourth instruction.

human visual perception is constituted by two distinct perceptual streams, one which evolved farther in the evolutionary past and has pathways in the older, dorsal brain regions and one which evolved more recently and has pathways in the newer, ventral brain regions.[39] My hypothesis is that it is the perceptual stimuli in the evolutionarily older perceptual stream that maps onto the value that SAM forwards the ECM. Given that individuals with blindsight can perceive things such as orientation and color[40], but fail to recognize objects, perceptual stimuli in this stream probably represent coarse perceptual, or low res, features.[41] Insofar as emotions are notarized with a particular coarse perceptual feature,[42] emotions fed-forward to executive, cognitive programs correlated to cortical brain regions may easily link up with the objects to which the coarse perceptual feature belongs. Thus, individuals need not expend much attention, or deliberation, to link an emotion to its environmental elicitor. Emotions exploit the fact that these cortical regions integrate distinct perceptual streams. Once the coarse perceptual feature links to the particular object to which it belongs, the relation between the emotion and the particular object is easily perceived.

As I mentioned in the last chapter, this process resembles explanations cognitive scientists often give for insight. Insight, or if you prefer those "aha" moments we enjoy from time to time, are not magical instances. Instead, insight is a feeling people have when they solve an insight problem. Insight problems are those problems in which people

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[39] For a discussion of blindsight and the neural correlates of visual consciousness, see Lau & Passingham (2006). For a more extensive discussion of disparate visual streams, see Breitmeyer (1984).

[40] For example, see Boyer et al. (2005).

[41] The use of the example of blindsight is not intended to suggest that the perceptual stimuli mapped onto the SAM value is always visual, though it may turn out to be the case that most of the time it is. The suggestion is not dependent on either event.

[42] Or bundle of features. I do not think it matters much for the present task whether or not emotions are notarized with a single feature or a bundle of features.

are not cognizant of the fact that they are nearing an answer. The feeling of insight occurs because the solution is reached in a single, quick step—that is, without accompanying deliberation. Evidence from neuroscience corroborates this story. As Anderson (2010) explains, "(t)he feeling of insight corresponds to the moment when retrieval finally succeeds and activity drops in the retrieval area" (239). My suggestion is that the link between an emotion and its environmental elicitor is established in a similar manner. We can form the relevant evaluative judgment corresponding to a particular emotion in a single step. The process occurs so quickly that we may feel as if the evaluative property implicit in the evaluative judgment is partially constitutive of the emotion itself, which may explain why Deonna & Teroni suggest formal objects are transparent in emotion.

Returning to the issue of phenomenological continuity, the map produced by ECM's third instruction can explain how a series of discrete emotion representations might feel the same and also how an episode may morph in subtle ways. For many emotional episodes, a series of discrete emotion representations may each carry the same notarization, or coarse perceptual feature. Perhaps when ECM first maps on the coarse perceptual feature to the given SAM value, ECM's third instruction retains the coarse perceptual feature and maps the feature onto subsequent SAM values, but if the gateway is open long enough, the coarse perceptual feature fades altogether and is replaced by a new feature or morphs with prolonged retention. If this is right, then, ECM's third instruction may be elaborated on such that it makes sense of both those phenomenologically continuous episodes and those phenomenologically unfolding episodes.

Having demonstrated how ECM's third instruction can meet many of the demands placed on Embodied Appraisal views of emotion, I want to focus on how the conjunction of ECM's third and fourth instructions can make sense of how initially valenced feelings become robust emotions. The fourth of ECM's instructions is to store and organize the maps constructed by the third instruction. On my view, maps get organized by their nominal contents. In this case, maps get organized in virtue of their signatures and notarizations. Given the assumption that SAM appraisals forward values individuated in terms of positive or negative valence, the signatures of these maps will represent one of the two valences. For further differentiation, ECM's fourth instruction turns to the notarization. In an infant's earliest emotional episodes, the notarization added to the SAM value may seem a superfluous addition—that is, ECM's fourth instruction may have no prior emotion stored with a similar signature and notarization. With time and experience, however, patterns in stored maps may begin to emerge and the ECM may begin to store a host of discrete emotion types. Perhaps it is the case that the "Big Six" are the first of these emotion types to emerge. A simple example may explain how.

Imagine that each of the maps stored in the ECM can be represented by a series of digits where the first digit represents the emotion's signature and the next two digits represent the emotion's notarization. Because SAM appraisals are either positive or negative, we can say that each map stored in the ECM begins with either a 0 or a 1. Because the perceptual features mapped onto SAM appraisal values are coarse-grained, we might say that these features represent some form of movement: either withdrawal, approach, or ambiguous where withdrawal is represented by 00, approach is represented

by 11, and ambiguous is represented by any possible combination of 0 and 1. Taken together, maps containing SAM appraisal values and coarse perceptual features of this sort may be divided into six configurations: three positive maps (withdrawal, approach, ambiguous) and three negative maps (withdrawal, approach, ambiguous). Notice that these six configurations may emerge regardless of the order in which they are received so long as ECM's third instruction is designed to first detect and match an emotion's signature and then detect and match the emotion's notarization. If, for example, an individual's first three emotional experiences were all negative, then, the ECM could begin storing and subdividing these negative experiences even without ever having received a positive experience. If an individual's first three emotional experiences were all positive, then, ECM could begin storing and subdividing these positive experiences without having stored a single negative experience and so on.

If the foregoing is not mistaken, then, the instructions I am postulating govern the behavior of the ECM may not only account for how lexicalized emotion types, such as the "Big Six," emerge from initially positive or negative valenced emotions, but it may also account for the learning of "core-relational themes." It might just be the case that in very early childhood development, emotions only represent "good for my concerns" or "bad for my concerns," but over time, as information regarding complex situations becomes available to cognitive, executive programs, we begin to differentiate just what the status of our concerns is. If so, then, the evaluative judgment emotions quickly link up to are ever more crucial. Were it not for the coarse perceptual features contained in the emotion being integrated with the particular object to which they belong, the target of the

emotion would not be so immediately obvious and the relevance the emotion represents could not be so easily learned or quickly grasped.

I'll return to the behavior of the ECM later, but for now I want to discuss the behavior of the mechanism that first makes emotion possible, our reliable friend, SAM. As I mentioned earlier, SAM's job is to appraise bodily changes and forward the result of the appraisal to the ECM. Thus, SAM contains two instructions. The first of SAM's instructions is to identify whether or not bodily changes meet a threshold status. On my view, SAM appraises bodily changes to determine whether or not those changes meet one of two thresholds: a positive threshold and a negative threshold. If the bodily changes SAM appraises meet the positive threshold, SAM forwards the ECM a positive value. If those changes meet the negative threshold, SAM forwards the ECM a negative value.[43] Thus, SAM's second instruction is to pass along the value corresponding to the threshold identified by SAM's first instruction. In regards to emotion elicitation, these two tasks SAM undertakes suffice to make emotion possible. However, I want to suggest that this is not all SAM does.

Insofar as SAM's job is to appraise bodily changes and identify whether or not those changes meet a particular threshold, SAM has a host of bodily information available to it at all times. Most of the time, it may be the case that the information available to SAM does not meet either of the two thresholds.[44] But it's probably also the case that the information available to SAM comes closer to meeting one of these two

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[43] Keeping Dretske's notion of intentionality in mind, the value SAM forwards the ECM need not be itself positive or negative, but represent the meeting of a positive or negative threshold. To use a simplified example, a positive value could be represented by a 0 and a negative value could be represented by a 1.

[44] At least, this is what we should assume given the apparent transience of emotion.

thresholds *all of the time*. My suggestion is that we take the status of the information available to SAM that does not meet either of the two thresholds as indicative of mood. So, for example, if the information available to SAM does not meet either of the two thresholds, but it comes closer to meeting the positive threshold, then, that individual is likely in a positively valenced mood. If, on the other hand, the information available to SAM does not meet either of the two thresholds, but it comes closer to meeting the negative threshold, then that individual is likely in a negatively valenced mood. The implication of the foregoing is that individuals are always in a valenced mood. There is empirical evidence suggesting that this is in fact the case. For example, Watson & Clark ran a number of studies to determine how many minutes in our waking lives are spent experiencing emotions. As the authors (1994) state, "our own extensive analyses...suggest that the bulk of waking life is spent in nonemotional states...(but that) waking consciousness is experienced as a continuous *stream of affect*,[45] such that people are always experiencing some type of mood" (90). Such results are exactly what one would expect, if SAM functions in a similar manner to the one I have just outlined.

Of course, this account of SAM does not alone solve the issue of whether or not moods are intentional states discussed in Chapter Two. In that Chapter, I argued that emotions should not be construed as either a non-intentional background to intentional states nor should mood be construed as generalized emotions responding to long-term goals. In fact, I suggested that we prefer a view of mood that toes the line between these conceptions and construes mood as an intentional background to attentive cognition. The account of SAM I have just provided reveals a path to this conception of mood. Insofar as

[45] Authors' italicizes.

SAM appraises a host of bodily changes, SAM has information regarding most of the body available to it. My hypothesis is that as the information available to SAM is appraised, this information gets stamped with a value which represents the threshold the appraisal comes closer to meeting. This stamped value may be akin to the one forwarded to the ECM or it may be the very value forwarded to the ECM. For example, it may be the case that the stamped value appraised information receives is a 00 where the value 0 is forwarded to the ECM when a negative threshold is met and 00 is stamped when the appraisal falls closer to the negative threshold or it may be the case that SAM stamps the appraised information with a 0 when the appraisal falls closer to the negative threshold, but SAM stops stamping and starts forwarding the value to the ECM when the negative threshold is met. In either event, the result is the same: SAM stamps the available information with a value that represents which threshold the appraisal came closer to meeting. My hypothesis is that this modified information is sent throughout the brain.

One place where this modified information is probably received is in those areas that represent the body. There the modified information might modulate the representation that activation in those areas triggers. If so, then, this process may explain how representations of some part of the body become valenced. Keeping Dretske's stricture in mind, we may also see how the modulation of bodily representations may make the intentionality of mood intelligible: valenced body representations reliably co-occur with a particular SAM appraisal, meaning valenced body representations may have SAM appraisals as their “real” content. In other words, mood represents whether things

are going well or whether things are going poorly.[46] Another place where this modified information is probably received is in those areas that govern movement, such as the motor cortex. There the modified information might modulate motor impulses, the construction of motor commands, motor control, etc. If so, then, this may also explain how mood may manifest in the form of modulated body posture. For example, this may explain why sluggish posture is indicative of a downcast mood, why a lightness in step is indicative of a pleasant mood, why tension is indicative of a frustrated mood, etc. Importantly, most of these changes occur in the absence of our attending to them, which may also explain the tendency to want to construe mood as a background to our conscious dealings.

If the foregoing is correct, then, SAM's stamp function may also provide a way of explaining the influences mood has on cognition suggested by the line of experiments presented in Chapter Two. Perhaps it is the case that mechanisms involved in attention and cognition receive SAM stamped information which reliably influences their behavior. This may explain Schwarz's (1990) findings that negative mood promotes recall of negative stimuli while positive mood promotes recall of positive stimuli. Whereas the coarse perceptual features mapped onto SAM values facilitate the linking of an emotion to its environmental elicitor, SAM stamps may facilitate the retrieval of information stored with similar stamps.[47] So construed, such a process would also explain why moods

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[46] In this sense, Prinz is right about mood. The account I am providing shows how one may defend this conception of mood such that mood need not only respond to long-term goals.

[47] One might take this as a reason to prefer conceiving the stamping process as one in which SAM stops stamping the appraised information and starts forwarding the value to the ECM so that a positive mood may also promote recall of information associated with an emotion.

bias recognition tasks or facial expression interpretations.[48]

Considered as a whole, the evaluative process represented by the collective behavior of SAM and ECM may elucidate a number of important mood-emotion relationships. Recall from Chapter Two that while congruity effects suggest that often times moods promote an emotion of a similar valence, other times particularly intense emotions appear to induce a change in mood's valence. The Appraisal-Hypothesis Confirmation view can explain why. Insofar as SAM appraisals always fall closer to meeting one of the thresholds when they do not meet either, mood is always positively or negatively valenced, which means that the bodily changes mood does represent are either mostly good or mostly bad. The more mostly good things are, the fewer positive changes must occur for the SAM appraisal to meet the positive threshold. Likewise, the more mostly bad things are, the fewer negative changes must occur for the SAM appraisal to meet the negative threshold. Moreover, those physiological changes represented by a mood may have some "spill over" effects. For example, a change in hormone levels may cause a SAM appraisal that fails to meet either threshold, but falls closer to the negative threshold thereby triggering a negative mood. As the hormone level change diffuses through the endocrine system, the change may modulate a number of physiological responses that collectively cause a SAM appraisal that meets the negative threshold. If so, then, the nature of SAM appraisals can explain the preponderance of mood-emotion congruity effects.

In regards to those cases where a particularly intense emotion induces a change in mood's valence, the picture is a bit different. Recall that I have claimed intense emotions

[48] See the Bouhuys et al (1995) and Schmid & Mast (2010) studies introduced in Chapter Two.

are just those persistent, series of discrete emotion representations made possible by the ECM's third instruction. Also recall that I claimed these emotion representations are forwarded to cognitive, executive programs that underpin an individual's attention. To show how an intense emotion induces a change in mood's valence, I must note that cognitive, executive programs are not the only place emotion representations are forwarded to. Many of the brain regions implicated in emotion, such as the amygdala, hypothalamus, somatosensory cortex, etc. are located in the medial and posterior areas of the brain. In order for information to pass from these regions of the brain to cognitive, executive programs reliably correlated with anterior regions of the brain, this information must traverse a number of other brain regions, including the motor cortex. On my view, when emotion representations pass through the primary cortex on their way to cognitive, executive programs, emotion representations modulate motor commands constructed in these regions. (That emotion representations modulate motor commands constructed in these regions explains both the phenomenological continuity between the emotion and the expressive act stressed in Chapter Three and why these acts appear to occur in the absence of means-end reasoning: emotions may modulate these commands before input from brain regions subtending to means-end reasoning arrives). Once these modulated motor commands are executed, these commands trigger a cascade of bodily changes and this cascade of bodily changes in turn effects the outcome of subsequent SAM appraisals. Of course, if an emotion is to induce a change in mood's valence, then, the emotion will have to be triggered by something other than a SAM appraisal that meets the threshold corresponding to the emotion's valence. A trigger of this sort is made possible by ECM's

fourth instruction.

Recall that ECM's fourth instruction is to store and organize the maps produced by ECM's third instruction. Because the maps stored by the ECM contain both an emotion's signature and notarization, emotions may be triggered by perceptions containing a similar notarization or a thought marked by an emotion's signature.[49] In this sense, ECM contains a back door. Whereas many emotions may be triggered by SAM appraisals that meet one of the two thresholds, other emotions may be triggered by information that finds its way through this back door. In those cases in which an emotion induces a change in mood's valence, my hypothesis is that the emotion in question is triggered via this back door. Of course, most emotions triggered via ECM's back door probably do not induce a change in mood's valence. Many of these emotions are probably fleeting. For example, the perception of a spider in a textbook may trigger a fear representation, but this fear representation quickly fades, which is exactly what one would expect if the intensity of an emotion is dependent on ECM's third instruction continuing to receive the relevant value forwarded by SAM. In order for an emotion triggered via ECM's back door to induce a change in a mood's valence, the emotion probably needs to be intense enough to extensively modulate motor commands constructed so that a cascade of bodily changes is induced such that subsequent SAM appraisals are altered. My guess is that this probably occurs in cases in which an individual deliberately attends to some situation or event marked by an emotion's signature for a prolonged period of time. In such situations, ECM's back door may mimic

[49] What I have in mind here is Damasio's "somatic marker hypothesis," or, more specifically, Damasio's account of association links established in the ventromedial frontal lobe discussed last chapter.

the gateway opened or shut by ECM's third instruction. If so, then, prolonged attention to some situation or event marked by an emotion's signature may trigger a series of discrete emotion representations that may extensively modulate motor commands, which in turn trigger a cascade of bodily changes, that subsequently alters the nature of SAM's appraisals.[50]

Back doors like the one found in ECM are probably indicative of many, if not all, neural pathways. As such, neural pathways are probably not best conceived as devices that shuttle information from A to B, but as devices that enable the free exchange of information between A and B. This conception may explain the complex loop that appears to exist between the ECM and the motor cortex. Whereas the trigger of an emotion may often modulate motor commands and trigger an expressive action, many expressive acts appear to trigger a corresponding emotion. For example, Zajonc, Murphy & Inglehart (1989) have provided evidence suggesting that individuals asked to evaluate stories containing vowel sounds whose enunciation produces facial configurations associated with negative emotions rate those stories as less pleasant than stories containing vowel sounds whose enunciation produces facial configurations associated with positive emotions despite no significant difference in the stories content. The Appraisal-Hypothesis Confirmation view can explain how this happens. Given that emotional representations modulate motor commands on their way to cognitive, executive programs, these representations probably forge a path between the ECM and

[50] Note that this account also meets a challenge I raised for evaluative perception views of emotion in the last chapter: to account for how visual imagery may produce more intense emotions than visual perception. Visual images may be "marked" by an emotion and prolonged attention to such images may produce a series of discrete emotion representations.

the motor cortex. Once the path has been forged, subsequent emotion representations probably retrace this path and produce ismorphic motor commands. Likewise, executed motor commands may activate this path and produce corresponding emotion representations. The latter would explain why smiling, grimacing, frowning, etc. produce faint traces of an emotion: the motor command quickly triggers a transient emotion representation. Zajonc, Murphy & Inglehart's results may be due to the fact that the facial configurations trigger a transient emotion representation which procures activation of declarative knowledge marked by the emotion. If we're skeptical that produced facial configurations in the study are triggering full-fledged emotions, we may prefer an explanation in which the motor cortex stores links between commands and an emotion's signature or SAM stamp[51] and that activation of a command so linked procures activation of similarly marked declarative knowledge, thus bypassing the ECM altogether. Whichever explanation we prefer, the Appraisal-Hypothesis Confirmation view can nonetheless make sense of the dynamic relationship between action and emotion.

At this point, one may wonder whether or not I am denying that facial expressions are partially constitutive of an emotion's "nominal" content. On my view, emotion's have as their "nominal" content a number of core physiological changes that represents the emotion's signature and probably includes things such as heart rate, respiration rhythms, and hormone changes.[52] My guess is that coarse-grained information from the face, such

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[51] If we prefer the conception of SAM stamp's in which the stamp is not identical to the emotion's signature.

[52] Keep in mind that I have claimed emotion's signatures account for the valence of an emotion, but that valenced emotions are further differentiated in terms of their notarization. Note that this strategy can account for the phenomenological individuality of each emotion without the need to claim that some emotion represents are more robust than others. On my view, the "what it's like" of an emotion is dependent upon the relationship between an emotion's signature and notarization. In other words, on my

as a change in muscle tension in the face, for example, may also make this list. Rather, it is probably the finer-grained facial movements that are the result of an emotion. That's not to say that finer-grained movements are not represented in the brain; they certainly are and when they are, they may attach to an emotion so that we may be inclined to conclude, as James did, that these finer-grained movements are partially constitutive of the emotion, but I think such a conclusion is probably mistaken. One reason to resist such a conclusion is that emotions and distinct facial expression just seem to come apart. That is, it seems right to say that one can feel happy and not be smiling or that one can feel sad and not be frowning. Of course, that doesn't prove that the feeling of happiness does not involve the feeling of smiling- as we saw last chapter, emotions can involve bodily feelings without bodily changes actually occurring- but, again, the operative assumption in the view that I have been defending conceives bodily appraisals as registering coarse-grained information. Anyone who prefers the view that bodily appraisals register fine-grained information should probably consider the entire facial expression as partially constitutive of the emotion's nominal content.

That I prefer not to construe distinct facial expressions as part of the structure of emotions themselves does not mean that I don't think there is anything important to be learned from the relationship between an emotion and a facial expression. In fact, I think the relationship between an emotion and expressive action, more generally, reveals one of the most important functions of emotion: the modulation of the physiological changes that cause them. In this sense, one might say that one of the reasons emotions exist is to share the love and to share the pain. To see how this is the case, recall the account of

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view, an emotion's phenomenal quality is a relational property.

those cases in which an emotion may induce a change in mood's valence. In that instance, I argued that prolonged attention to an event or item marked by an emotion's signature can trigger the corresponding emotion via a back door in the ECM and that the triggered emotion may subsequently modulate motor commands thereby effecting a cascade of bodily changes. As one might expect, an emotion need not be triggered in this manner to modulate motor commands and thereby effect a cascade of bodily changes. All emotions modulate motor commands and effect such changes. The reason, I want to suggest, is to bring SAM appraisals back below threshold level. In the case of negative emotions, the benefit of such a function is obvious. Prolonged operation at negative threshold levels may mean impending death for an organism.[53] The motor commands and physiological changes caused by a negative emotion may be a way to "take stress off" the relevant structures.[54] In the case of positive emotions, the benefit of such a function is less obvious. After all, why would it benefit a creature to tune down all the fun? Perhaps, the physiological changes a positive emotion effects is not so much about bringing SAM appraisals back below threshold levels as it is about sharing pleasantries, the result of which brings SAM appraisals back below threshold levels. Remember that SAM appraisals represent whether or not physiological changes in the body are good or bad for the organism. Just because a SAM appraisal meets one of the two threshold levels need not necessarily mean that physiological changes events all fall in line with the general trajectory of things. Perhaps the physiological changes a positive emotion causes are for the purpose of maximizing the benefit for the organism; that is, perhaps the expressive

[53] For example, heart rate increase is typical of a negatively valenced emotion. One can imagine why life with a constantly racing heart may be short-lived.

[54] This may explain the function of crying and the cluster of hormones constitutive of tears.

acts associated with positive emotions are to spread the benefit to those physiological structures and/or processes that do not fall in line with the general trajectory of things represented by SAM's appraisal.

Such a conception of the relationship between expressive action and emotion may also explain the modulation of motor commands by an individual's mood. Recall that I suggested the possibility that SAM stamped information is sent throughout the brain and that one place where this information is received is the motor cortex. My suggestion is that we conceive mood's function of reliably modulating motor commands in an analogous manner to the account I have just provided for emotion. In other words, it may be the case that mood modulates motor commands so that mood, like emotion, can spread the love and the pain. Given that mood results from SAM appraisals that do not meet either of the two thresholds, mood cannot have the function of bringing SAM appraisals back below threshold levels, but this does not mean that by reliably modulating motor commands, mood cannot "take stress off" structures or maximize an organism's benefit. Insofar as the valence of a mood represents which threshold SAM appraisals fall closer to, many of an organism's physiological processes will fall in line with the general trajectory of things represented by SAM's appraisal. For those negative moods, the reliable modulation of motor commands may "take stress off" those structures causing SAM appraisals to fall closer to the negative threshold. For those positive moods, the reliable modulation of motor commands may be to spread the benefit to those physiological structures that do not fall in line with the general trajectory of things represented by SAM's appraisal falling closer to the positive threshold. If the foregoing is

correct, then, both mood and emotion have the function of maintaining the healthy functioning of an organism's physiology. In this sense, one might conceive mood as a "family physician" and emotion as a "specialized physician." Whereas most of the time, a trip to the "family physician" is in order, there may be more severe circumstances that call for a trip to a "specialized physician." Likewise, for most of an organism's life, mood probably suffices to maintain healthy functioning, but every once and awhile, mood may not suffice and so emotion steps in.

The preceding analogy brings to mind another possible function of emotion. Though Prinz and Damasio's work highlights how emotions may make the significance of an incident salient and inform practical reasoning, I want to suggest another role for emotion: the providing of an explanation for expressive action. Recall that I claimed emotion representations triggered by the ECM get forwarded to cognitive, executive programs that under pin attention, but that on their way to such structures, emotions must traverse the motor cortex where they modulate motor commands. Implicit in this account is the claim that emotions may modulate motor commands without input from cognitive, executive programs. My hypothesis is that upon modulating such motor commands, emotions are nonetheless fed-forward to cognitive, executive programs so that an organism may be made cognizant of the reason for the expressive action. If the benefit of such a function is not obvious, imagine the confusion one might feel if sadness caused crying and yet was not forwarded to an individual's cognitive, executive programs where it could be attended to.

This function of emotion raises the issue discussed last chapter regarding non-

conscious emotions and the separation of emotion and feeling. Recall that Damasio claimed his patients could not experience secondary emotions, but that they would show primary emotions under the right conditions. As Damasio (2003) states, “patients who lost their ability to experience certain feelings still could express the corresponding emotions” (5-6). While I believe the view I am defending is consistent with this analysis, I am not sure it's the best way to conceive of these patients' circumstances. Insofar as I have argued that emotion representations triggered by the ECM are fed-forward such that they traverse the motor cortex and modulate motor commands, I agree that an emotion may be expressed without the subject attending to the emotion, but I'm not certain that at this point in the process emotions occur non-consciously. I'm inclined to say that at this point, subjects are probably aware of an emotion peripherally. The fact that subjects cannot attend to an emotion need not necessarily imply that subjects feel no emotion whatsoever and thus we need not conclude that emotions and feelings come apart. My hunch is that because of the damage to the ventromedial frontal lobe Damasio's patient's cannot forward the emotion representation to cognitive, executive programs that underpin attention. These patients simply probably experience the emotion peripherally, but given that they cannot attend to the emotion, they can not report the feeling.

If the preceding is not mistaken, the Appraisal-Hypothesis Confirmation view of emotion represents one promising way to defend an Embodied Appraisal theory while addressing many of the main objections raised against neo-Jamesian approaches. To summarize, I have shown how one can develop an Embodied Appraisal account that need not postulate innate emotions nor make claim to distinct physiological typologies for

lexicalized emotions. I have also shown how one can defend an indirect perceptual view of emotion that mitigates the need for conscious deliberation to link an emotion with its target and evaluative judgment. Finally, I have shown how understanding emotion elicitation as one part of an evaluative process can explain the complex relationship between mood and emotion. In the next chapter, I will build on these insights, recount the roles emotion plays in cognition thus far introduced, examine the implications the preceding has on our understanding of the behavior of passionate cognition, and suggest a provisional answer to the question of why passionate cognition is so successful.

Chapter 5

Passionate Cognition

At the outset I promised to shed some light on how passionate cognition might work and why it might have been successful. While I believe the preceding has hinted at answers to both of these questions, I would like to examine each more directly. Before I do so, however, I need to say a word about cognition in general. Cognition is difficult to pin down and the term is not used consistently both across and within a number of disciplines. I prefer to conceive of cognition as a system of sense-taking, sense-making, option-demarcating, and action implementing processes. On this view, there are no thoughts that do not belong to cognition and thus there are no thoughts that do not deserve to be called "cognitive." In Chapter Three, I used the term "cognitive view" of emotion to signify those theories of emotion that take emotions to be at least partially constituted by a propositional element (either a judgment or a belief), but the use of the term was more out of respect for a long-standing debate about the nature of emotion than anything else. To avoid confusion, I will refer to those views of emotion as "propositional" views from here on out.

One upside to the preceding definition of cognition is that it supports multiple characterizations of the affects. For example, Solomon could endorse the notion of

passionate cognition while rejecting my view of emotion. On his view, cognition would be passionate if that system were capable of forming particular evaluative judgments and passionless if that system were not so capable. As I have defined it, this view of cognition could also support the intuition that there may be more or less passionate modes of cognition. For example, one might maintain that a cognition devoid of an ECM would be less passionate than a cognition subsuming both an ECM and a SAM. In supporting both multiple characterizations of the affects and our intuition that there may be more or less passionate modes, cognition thus understood also affords one the opportunity to situate and arrange actual human cognition. One might say, for instance, that Damasio's patients possessed a less passionate cognition after damage to the ventromedial areas of their frontal lobe than before the damage. Similarly, one might generally inquire into the nature and range of healthy human cognition.

I do not want to labor on the virtues of understanding cognition as a system of intricate intelligence capacities. Rather I want to recount many of the roles emotion appeared to be playing in cognition introduced in the previous chapters so as to elucidate just how passionate cognition is realized in healthy human participants and why it has been successful. One role for emotion was made apparent by Damasio's patients. Recall that these patients had difficulty making informed life decisions and experiencing emotions, symptoms which suggest that the ability to simulate an emotion is critical to the process of practical reasoning. Now, notice that this suggestion is an extension of one general role Embodied Appraisal views take emotion to be playing: the representation of the significance of an incident. Whereas in an ordinary episode, an emotion has the role of informing executive programs as to how the situation *does bear* on one's concerns,

typical practical reasoning seems to exploit this same role so that an emotion can inform the program as to how the situation *may bear* on one's concerns. In either case, emotion is playing an indispensable informational role in the various processes we call reasoning.

What I would like to suggest is that emotion's informational role may explain why passionate cognition is successful in general. To see how this might be so, I must note that thinking is a costly activity. Whereas it costs cash to live in today's society, it has always cost calories to live in nature and nothing can drain an organism's bank account like having a brain. Brains can take up as much as 15% of an organism's cardiac output, 20% of an organism's total body oxygen consumption, and 25% total body glucose utilization (Magistretti, Pellerin &Martin, 2000). Given the costs, strategies that mitigate the need for extensive processing and thus extensive calorie consumption are probably the rage in the animal kingdom. The Appraisal-Hypothesis Confirmation view that I outlined in the previous chapter shows how the unique combination of signatures and notarizations constitutive of an emotion may abet these processes. For example, in the case of how an emotion links up to a corresponding evaluative judgment, I argued that the notarization partially constitutive of the emotion enables the association to be established in a single step. In facilitating quick processing, emotions save reasoning time and calories which in turn affords subsequent thought processes a larger reserve to draw from in cases when times get tough. Which, for our thought processes, means those problems whose solution requires the expending of a great deal of conscious attention.

Such an account of the benefit of emotion may also shed some light on the complex relationship that appears to exist between mood and emotion. Beyond its informational role, I have also suggested that emotions play a crucial physiological role;

emotions are for the purpose of maintaining the healthy functioning of an organism. I have, however, also suggested that moods share this purpose. Cost savings strategies explain why mood and emotion can share this function without being redundant. While emotions get forwarded to executive programs that underpin an organism's attention, moods do not. Thus, mood can bring SAM appraisals back below threshold levels without distracting an organism's attention, which, in regards to cost, means that mood can accomplish emotions' physiological role for a fraction of the price.

Recall from the last Chapter that I both described mood as a "family physician" and emotion as a "specialized physician" and that I claimed most of the time one's condition calls for a trip to the former rather than the latter. As it turns out, the common sense cost saving strategies families employ in today's society may have a parallel in biology that dates back further than most of us can even imagine. Health is important to us. As it goes, so, unfortunately, do we.Thus, many of us are willing to spend to stay alive. Of course, that's not to suggest that we are willing to spend anything. Most of us prefer to get what we need at as little cost as possible. So with mood, did nature. Of course, there are those situations where the cheaper option may be less efficacious. In these instances, most of us agree that forking up a few more bucks would be wise. Predating this line of thought, nature chose emotion.

One might carry the metaphor further, but I think the point has been established: emotions facilitate processing and maintain healthy physiological functioning in such a way that the total calorie cost an organism must expend to accomplish these two tasks is significantly lower than if the organism had been emotionless. For my part, I could not have hoped for a more promising solution to the

question “why is passionate cognition so successful?” I do, however, want to say a bit more about the operation of passionate cognition in general. In a straight-forward sense, I have given an account of passionate cognition that stretches Damasio's intuition behind the “somatic marker hypothesis” to

the limit. Though the move is hardly anything to write home about, I am of the opinion that the move nonetheless makes all the difference when it comes to understanding how the passions can play many of the roles they appear to be playing in cognition. Insofar as I have claimed that SAM stamps (or emotion signatures, if we prefer the view that the two are identical) are sent throughout the brain, I take it that associations between items and these stamps are possible across a number of mechanisms playing various functional roles. Given that such associations are possible across a number of mechanisms, I also think it possible that discriminating amongst the two possible stamp values is one of the fundamental principles of organization employed by mechanisms that subtend to long-term memory. The ECM is probably not the only neural mechanism that stores items in this manner.

Such an account of the rules of memory organization would shed some light on Capgras Syndrome. Recall that Ramachandran & Hirstein (1997) hypothesized that the delusion was due to an inability to sustain communication between the amygdala and the temporal lobe and that this failure probably resulted in the failure to connect the face of the individual's family member with the emotion it usually evoked and that the result was the creation of a new file for the face. The view of passionate cognition I have been defending can corroborate this story. In the case of Capgras Syndrome, I suspect that damage to the temporal lobe prevents an elicited emotion from being received at the

temporal lobe site, much the same way that damage to the ventromedial frontal lobe prevents an emotion from being fed forward to mechanisms subtending to practical reasoning. Thus, the intact temporal lobe may more or less construct the appropriate face, but fail to construct the appropriate association, but because the face has been more or less constructed it may procure activation of similar items, in this case, the previously stored face. The consequence of this dual-activation is that the newly constructed face fails to get identified with the older face in virtue of the missing emotion signature. Given the failure, the executive program cannot form the judgment an observer knows should be made: "these two faces are the same." In lieu of the appropriate judgment, the executive program looks for another. Because the program has at its disposal both faces, one with an attached emotion and one without, and an emotion has as its nominal content core bodily feelings, the program can determine that while these two items appear to be the same, there is nonetheless a significant difference and that difference is how one feels about the face. In determining that the difference amounts to how one feels about the face, the program may be made sensitive to declarative knowledge falling under the heading "internal." Couple the sensitivity to the concept "internal" with the determination that these two items appear to be the same, but that there is nonetheless a significant difference between the two and the result is the judgment that while this person appears to be my family member, they are somehow intrinsically different from my family member.

Of course, the preceding is not intended to be taken as the final word on the neural account of Capgras Syndrome. Rather my intention is to support the thesis that emotion discrimination[55] is a fundamental principle of memory organization and consistency

testing. The latter of these two tasks signifies the extent to which more of cognition than just emotion is about hypothesis generation and confirmation. As I claimed last chapter, many[56] neural pathways may be better conceived as two-lane highways than one way streets; information does not just get shuttled from one place to another, but between these two (or more accurately, multiple) locales. Insofar as this shuttling back and forth takes place, the brain (more or less metaphorically) can come to have expectations. When a representation is triggered by a neural mechanism involved in one of these neural loops, the triggering mechanism may anticipate an informational return that fits the type of representation triggered. In those instances in which the informational return fits the type of representation triggered, one might say that the hypothesis, the original representation, is confirmed. In those instances in which the information return does not fit the type of representation triggered, one might say that the hypothesis has been disconfirmed. In cases of confirmation, the brain may go about business as usual, but in those cases of disconfirmation, the results may be alarming, as in the case of Capgras Syndrome or anosognosia for hemiplegia.

If I am not mistaken, the very methodology empiricists employ in the study of natural phenomena may not be so radically different from the methods an individual brain employs in the construction of an individual's reality. Whereas life may be nature's greatest experiment, the brain may be life's greatest methodological achievement with emotion as its indispensable research tool. Such a portrait of the brain signifies the possibility of a deep integration of the brain's various functions.

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[55] By emotion discrimination, I mean either the discrimination made between two emotions or between an item conjoined with an emotion and one not so conjoined.

[56] I suspect that there may be some pathways that are one-directional, but my feeling is that these pathways are probably the minority.

Future research will be needed to determine which functions are integrated and how their integration may enable more complex acts of cognition, but I nonetheless take the preceding as reason to consider the hypothesis generation and confirmation view of cognition as a useful conceptual tool to employ in our understanding of how such integration is both possible and beneficial. The potential limitations of so applying the view should be a topic of further philosophical exploration. I am optimistic about the prospect, but that is a case I cannot make here. Rather I would like to say one final word about passionate cognition.

In giving an account of the virtues of passionate cognition, I by no means want to downplay the importance of emotion regulation. That cool, passionless thought is not something to be desired should not be taken as an excuse not to be brave or not to withhold one's anger. In fact, I think the view I have been defending implies the exact opposite. I will explain. In Chapter Three, I mentioned that the implication of the importance of emotion in cognition is in direct tension with the common sense conviction that emotions can be things that disrupt our ability to interact with one another in a successful manner and that rather than give up on one of these two commitments we should instead prefer a "Goldilocks strategy," which I described as the hypothesis that both emotional overflow and emotional evaporation disrupt successful decision-making. While I will not give an account of how one may employ a "Goldilocks strategy" (that is the job of clinical psychologists), I do want to give an account of why emotional overflow may be detrimental (I take the preceding chapters as a sufficient account of why emotional evaporation would be detrimental).

Recall that I have claimed one of emotion's primary roles is physiological; one

thing emotion accomplishes is the modulation of physiological changes where the cascade of changes emotion enacts have the function of bringing SAM appraisals back below threshold levels. To see how emotional overflow may be detrimental, we need only notice that the physiological changes an emotion induces also introduce changes of their own, which may not in all instances be beneficial. For example, fear triggered by a SAM appraisal meeting a pertinent threshold level may induce some physiological change which ordinarily brings a SAM appraisal back below threshold level, which in this instance would be beneficial, but fear triggered via the ECM's back door, say, in a case in which an individual obsesses over some scary event, will induce the same physiological changes as fear triggered by a SAM appraisal meeting a pertinent threshold level even though the threshold was not actually met. In the latter instance, the cascade of changes induced may not only be superfluous, but damaging. An increase in one particular hormone may be beneficial to offset an increase in another hormone, but an increase in that same hormone may damage other structures if the other hormone displays no change of its own.

There is a body of empirical evidence suggesting that sustained levels of some hormones can have both adverse physiological effects and adverse cognitive effects. One example is the adrenal steroid hormone, glucocorticoid. Glucocorticoids are hormones typically secreted in response to stress that have the function of mobilizing stored energy, increasing cardiovascular tone, and suppressing costly anabolism (Sapolsky, 2003, 1736). However, prolonged exposure to glucocorticoids can have adverse effects. For example, prolonged exposure to glucocorticoids has been linked with immunosuppression, hypertension, and reproductive impairments.[57] Glucocorticoids have also been found to

disrupt both long-term potentiation[58] and primed burst potential[59] in hippocampal cells. On the cognitive side, a number of studies[60] have correlated increased glucocorticoid levels with poor declarative memory performance and glucocorticoids have also been observed to disrupt spatial memory tasks in rats.[61]

Of course, the adverse effects of emotional overflow are not likely limited to consequences mediated by glucocorticoids. There are probably a number of other hormones that behave in a similar manner. Rather the important point to be learned from the effects of prolonged exposure to a hormone like a glucocorticoid is that the very means by which an emotion confers a positive benefit to a creature can also confer a very negative effect. The Appraisal-Hypothesis Confirmation view of emotion can explain how both of these cases occur and thus the view represents one promising route to a "Goldilocks strategy" that seeks to resolve the importance of emotion in cognition with the common sense conviction that emotions can disrupt decision-making and appropriate behavior. In many cases, emotions play crucial informational and physiological roles for an organism, yet an overuse of these tools may bias or impair cognition and wreak havoc on an organism's physiology. Neither emotional overflow nor emotional evaporation are beneficial. Passionate cognition is not about extremes; passionate cognition is about balance. While the struggle for balance is lifelong and inevitable, this much is clear: no matter how much we may wish to tear our hearts out, we couldn't if we tried – not unless, that is, we also wish to rip apart our mind.

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[57] See Sapolsky et al. (2000)
[58] See Shors & Dryver (1994)
[59] See Diamond et al. (1994).
[60] For examples, see Lupien et al. (1998) and Lupien & McEwen (1997).
[61] See Bodnoff et al. (1995).

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