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## **Enactive appraisal**

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### Abstract

Emotion theorists tend to separate “arousal” and other bodily events such as “actions” from the evaluative component of emotion known as “appraisal.” This separation, I argue, implies phenomenologically implausible accounts of emotion elicitation and personhood. As an alternative, I attempt a reconceptualization of the notion of appraisal within the so-called “enactive approach.” I argue that appraisal is constituted by arousal and action, and I show how this view relates to an embodied and affective notion of personhood.

Key words: emotion, appraisal, embodiment, enaction, personhood.

*the first impression of the world is a physiognomic impression*

Jan Patočka<sup>1</sup>

*In developing a theory of emotion, we should not feel compelled to supplement embodied states with meaningful thoughts: we should instead put meaning into our bodies and let perceptions of the heart reveal our situation in the world*

Jesse Prinz<sup>2</sup>

### 1 Introduction: the need to embody emotion theory

Emotions should be privileged tools in the attempt to reintegrate the mind-body divide. They appear as simultaneously mental and bodily, and their ambiguous nature has raised several hypotheses about how mind and body “make contact.” Nevertheless, emotion theory has hardly been sensitive to the embodied view of the mind articulated by several cognitive scientists (e.g. Varela, Thompson, and Rosch 1991; Thelen and Smith 1994; Kelso 1995; Clark 1997; Thelen et al. 2001; Thompson and Varela 2001; Beer 2003; Noë 2004; Thompson, forthcoming). These authors have characterized processes such as perception, memory, categorization and consciousness as importantly related to the body. Many of them have used the

conceptual and mathematical tools of dynamical systems theory to model the reciprocal influences of the brain, the body and the environment. To be sure, there have been attempts to use the tools of dynamical systems theory to model and understand emotions (Scherer 1984, 2000; Fogel et al. 1994; Lewis and Granic 2000; Freeman 2000). Yet, these attempts have mainly focused on modeling “heady” aspects of emotion, leaving the body aside. On the other hand, most cognitive scientists calling for an embodied view of the mind have remained silent about emotions.

In this paper I attempt to bring emotion theory and the embodied view of the mind closer to each other. I first show in which sense emotion theory is still disembodied; in particular, I point to the separation between “appraisal” on the one hand, and bodily events such as “arousal” and “action” on the other. Despite different characterizations, appraisal is in general assumed to take place in someone’s head; arousal and actions, on the other hand, are characterized as “mere” bodily processes. If one were to draw a caricature of the spirit of several appraisal theories of emotion, one could draw appraisal as a homunculus in the head that evaluates the environment and the state of the body, and that accordingly decides the emotion of the individual in question.<sup>3</sup> This is a caricature because, to be fair, appraisal is not always a homunculus and is not always deliberate; it is often distributed over component systems; it is nonconscious, quick and even influenced by arousal. Nevertheless, appraisal is generally understood as separate from the body, which prevents a thorough embodiment of the mind (what exactly “separate” means depends on individual theories and will become clearer as the arguments proceed).

I argue that this appraisal-body separation has induced accounts of emotion elicitation that are highly implausible when considered through a first-person phenomenological analysis. The main target of my criticisms is what I call *corporeal impersonalism*, namely the tendency to see bodily events as an objective index of emotion, rather than as the processes of a *lived body*. The notion of the “lived body” comes from the phenomenological tradition and refers to the body as *experienced*, versus the body as an object of third-person investigations. Corporeal impersonalism, as I illustrate it, characterizes older and newer theories of emotion, including some recent dynamical models. It influences the way in which all these theories understand appraisal and its relation to the body, and renders them phenomenologically implausible.

I eventually turn to the account of emotion and appraisal recently proposed by Marc Lewis (2005) and I use his arguments as a springboard toward a thoroughly embodied view of appraisal, which I characterize as “enactive.” This view, as we shall see, involves seeing appraisal as *constituted* by bodily events such as arousal and actions. As I discuss toward the end, enacting appraisal has important implications for emotion modeling, for understanding emotional experience and, ultimately, for a phenomenologically plausible notion of personhood.

## 2 The enactive approach

The embodied view of the mind, as mentioned, has several supporters. It has been articulated in different ways, and here I draw on the so-called “enactive approach” (Varela, Thompson, and Rosch 1991; Thompson and Varela 2001; Noë 2004; Thompson, forthcoming), which itself includes several ideas. In this section I briefly mention and illustrate those ideas that relate most closely to my present concerns, namely: (1) the centrality of experience in any investigation of the mind; (2) the deep integration of action and perception (also called the “sensorimotor” integration); (3) the self-regulatory processes of the organism; and (4) the phenomenological distinction between *Leib* and *Körper* – that is, between the subjectively lived body, and the body as the object of third-person observations. I also pay special attention to two ideas that will prove helpful to characterize the notion of enactive appraisal; these are Susan Hurley’s (1997) notion of constitutive interdependence, and Jan Patocka’s (1998) account of dynamic and embodied personhood.

Since its inception, the enactive approach has conceived of the mind as the mind of an experiencing and corporeal subject in relation to the environment. Varela, Thompson, and Rosch (1991) drew connections between cognitive science and the Buddhist mental discipline of “mindful awareness.” More recently, Petitot et al. (1999) and Thompson (forthcoming) have turned to the Western phenomenological tradition; as Thompson discusses in detail, the scientific study of mind and phenomenology should be complementary and mutually informing. This stance is appealing when it comes to emotion, because emotions are, in an important sense, experiences (at least in part), and especially rich ones. In particular, the body (its visceral and somatic changes, and well as action tendencies) has always occupied a central place in the description of emotion and emotion experience (see Colombetti

and Thompson, forthcoming, for an overview and discussion). In modern emotion science, the neuroscientist Antonio Damasio (1999) characterizes consciousness as emotional and bodily, and psychologists such as Frijda (1986) and Lambie and Marcel (2002) describe emotion experience in relation to action tendencies.

The enactive approach also emphasizes the deep integration of perception and action. As first defined by Varela, Thompson, and Rosch, “the enactive approach consists of two points: (1) perception consists in perceptually guided action and (2) cognitive structures emerge from the recurrent sensorimotor patterns that enable action to be perceptually guided” (1991, p. 173). Since then, several theorists have argued that perception is as much a motor process as a sensory one (Churchland, Ramachandran, and Sejnowski 1994; Clark 1997; Hurley 1998; O’Regan and Noë 2001). As Noë (2004) succinctly puts it, perception is enactive in the sense that it is a kind of action. Varela and Thompson (2001) call this “the sensorimotor dimension” of the enactive approach, and Torrance (2005) sees it as a particularly focused set of views that plays a central role in the enactive approach. Enaction thus characterized is a form of embodiment. It states that our capacity to perceive presupposes the ability to orient in the environment – an ability strictly dependent on having a body. Sensorimotor activity is the capacity to master the way in which perception varies as a function of action; it is thus a skill of the whole organism – a disembodied brain would not be able to acquire any such skill. Note also that the idea that perception is a kind of action is explicit and entrenched in western phenomenology (see Thompson and Zahavi, forthcoming, for a clear and succinct overview). Both the enactive approach and phenomenology understand mental activity as deeply linked to the subject’s embodied presence and performances, and both ground cognition in embodied presence and experience.<sup>4</sup>

The terminology that Hurley (1998) employs in her analysis of action-perception relations will be useful in the following sections.<sup>5</sup> First, she distinguishes the *personal* and the *subpersonal* levels of description of a cognitive agent. The personal level is the one at which the cognitive agent is said to be perceiving, believing, desiring, acting for reasons, etc. The subpersonal level is the one of neurophysiological or computational mechanisms on which the personal level depends. Hurley illustrates how perception and action depend on overlapping subpersonal systems and processes. She notices that output from motor systems influences perception even if input to sensory systems remains constant (and vice

versa, see Hurley 1998, pp. 363-364; see O'Regan and Noë 2001 for supporting experimental evidence). In her terminology, this translates into the idea that perception and action are *constitutively interdependent*. The crux of this view is that action and perception are not simply *instrumentally related* – that is, action does not simply serve perception as a means to an end (as in the claim that one needs to move around in order to perceive), and vice versa. Rather, action *constitutes* perception and perception is thus a kind of action. The complex, dynamical relations characterizing the subpersonal processes underlying action and perception yield this special kind of interdependence. These processes interact in a complex and dynamical way, and the mechanisms for action and perception can be thus seen as integrated into one complex system; for this reason, it is not possible to separate and isolate them so that action and perception map onto them in a one-to-one way. In other words, as Hurley puts it, action and perception are not *vertically modular*; they do not correspond to dedicated underlying mechanisms that interact in a linear way (action and perception would otherwise be merely instrumentally related).

The enactive approach has largely focused on embodiment as sensorimotor integration, but Thompson and Varela (2001) also point to organismic processes of self-regulation as essential to being alive and sentient. This dimension of embodiment is evident in conditions such as being awake and asleep, alert or fatigued, hungry or satiated. It is also evident in emotion and feeling, in Damasio's (1999) sense of distinctive patterns of brain-body activity (emotions) and the felt experience of such patterns (feelings). Both the sensorimotor and the self-regulating dimensions are indeed important for the discussion that will follow. Emotion theorists usually distinguish arousal from motor activity (behavior, actions). With the term "arousal" they refer to the activity of the autonomic nervous system, as well as to endocrine and somatic processes. Motor activity refers to changes in the musculoskeletal system, as well as to facial expressions. It could be argued that there is no principled clear-cut distinction between visceral (autonomic and endocrine) and somatic (musculoskeletal) processes; Damasio (1994), for example, calls all of them "somatic," where "somatic" is a synonym of "bodily." Here I shall use either "arousal" or "actions" (or "behavior") when discussing specific emotion theories that make this distinction. I shall otherwise use the term "body" or "bodily events" when I do not think it is important to distinguish arousal from actions.

Finally, the enactive approach has recently turned to the phenomenological distinction between the body as a physical object of third-person observation and scientific investigation (*Körper*), and the body as the so-called *lived body* (*Leib*) (Thompson and Zahavi, forthcoming; Thompson, forthcoming). The lived body is my body as I live and experience it in the background of all my experiences (it is sometimes called “the zero-point” of my experiences). The lived body has been characterized mainly in relation to perceptual experience; when I perceive something, I always perceive it from a certain perspective, and this perspective includes a pre-reflective experience of my body – the lived body. Every perceptual experience is thus in part an experience of my body in relation to the world (even when I perceive – when I look at, for example – my own body as if it were an object).

In this context, the reflections of the Czech philosopher Jan Patočka (1907-1977) on the lived body are, I think, particularly relevant for an embodied-enactive theory of emotion and appraisal. Patočka (1998) traces his philosophy of the body and of the person back to the French thinker Maine de Biran (1766-1824). According to Patočka, neither Descartes nor the British empiricists nor Kant provided an appropriate account of personal experience as corporeal and situated. Descartes’ method of introspection pointed to the active and self-reflective character of subjective experience; however, it lost the body by conceiving it as an accident, as a non-necessary accompaniment of experience.<sup>6</sup> The British empiricists were interested in the body only as an object of scientific investigation. Kant, on his part, understood the I in an abstract way, as a condition of experience; his account made the I a logical necessity rather than an experiencing subject. Maine de Biran, on the contrary, conceived the I as experiencing, active and thoroughly corporeal. Likewise, for Patočka what characterizes the I is “the primordial phenomenon of effort” (1998, p. 25). My awareness of having certain possibilities of movement cannot be reduced – Patočka argues – to sensory impressions; it does not depend on external objects. Rather, it is something that points directly to my experience of being an active I, of being the source of movement. This sense of activity is the one that illustrates the I as necessarily corporeal; there cannot be a sense of effort without a body: “the I is possible *only as corporeal* – the I is a willing, striving I and, *consequently*, a corporeal one” (*ibid.*).

Corporeity and sense of effort are thus central to Patočka’s characterization of the lived body and of personhood. A person is an embodied agent that is aware of its

possibilities of doing something on its own; the I is an “I can.” Moreover – and this is Patocka’s most original contribution – this embodied and practical I is also a feeling, affective I: “[h]ow we are includes an entire scale of feelings and emotions” (Patocka 1998, p. 78). The sensorimotor dimension of embodiment is thus intrinsically also an affective dimension. For example, Patocka discusses “moods” and characterizes them as “a bodily existence in its entire context” (p. 42); moods are part of our corporeal existence, and they manifest themselves in our corporeity: “our attitude betrays our mood” (p. 79).

All these ideas will come together in the embodied and enactive view of appraisal. Before presenting such a view, however, I need to show in which sense emotion theory and different views of appraisal are disembodied, and why I think they are implausible.

### 3 Corporeal impersonalism in emotion theory

Patocka’s conception of corporeal and affective personhood is very different from the one offered by emotion theorists – appraisal theorists in particular. To illustrate this difference I distinguish three different accounts of the appraisal-body relation; I discuss the first two here, and the third one in the next section.

According to the first account, in order to give rise to a specific emotional experience the body needs to be somehow “interpreted”; the body thus participates in emotion *indirectly*. This stance is best represented by Schachter and Singer (1962), who maintain that arousal is “a general pattern of excitation of the sympathetic nervous system” (p. 379). Arousal is undifferentiated and “affectively neutral” – namely, it does not support any specific emotion. In order to acquire affective specificity at the personal level, arousal has to be labeled through a process of interpretation of the environment. Similarly, “attribution theories” (e.g. Ross, Rodin, and Zimbardo 1969; London and Nisbett 1974) claim that arousal has to be attributed to a specific cause in order to acquire affective specificity.

According to a second account of the appraisal-body relation, bodily events are *byproducts* of appraisal – that is, they are effects of appraisal and do not have any causal power on it. This view is illustrated, for example, by Lyons’s (1980) “causal-evaluative theory” of emotion. According to it, a sequence of causally related processes (including appraisal or, in his words, evaluation) leads in various steps to

physiological and behavioral changes. First, the perception of a certain object causes a set of beliefs about a situation. These beliefs “are the basis of an evaluation of the situation in relation to himself or herself. Such evaluation in turn causes the wants or desires which lead to behaviour, while the evaluations and wants together cause abnormal physiological changes and their subjective registering, feelings” (Lyons 1980, p. 57).<sup>7</sup> Figure 1 represents this sequence.

Insert figure 1 about here

Lyons acknowledges that both evaluations and physiological changes are necessary conditions for emotion, and that neither is separately sufficient. In this sense, his theory is a step away from previous philosophical accounts of emotion that denied that bodily states are constitutive of emotional states (Kenny 1963; Solomon 1976). At a closer look, however, the function Lyons assigns to the body is still very limited, because he treats arousal and behavior as effects of previous mental processes (i.e. beliefs and evaluations) that do not play any role in emotion elicitation and in the characterization of emotional experience.

Lazarus’s view is a hybrid between these two accounts. Although it does not have the same linear character as Lyons’s, it still separates appraisal from arousal and behavior, leaving appraisal alone in eliciting and characterizing emotions. According to Lazarus (1966, 1991), appraisal is a cognitive process and it is a necessary and sufficient condition of emotion.<sup>8</sup> Arousal and behavior, in his view, are the effects of appraisal and contribute neither to the elicitation of emotion nor to its experience. In addition, Lazarus believes that emotion depends on an ongoing process of “primary” and “secondary” appraisal. This ongoing process constantly evaluates whether there is anything in the environment that threatens or favors one’s goals, core beliefs and values (primary appraisal), and what can be done about a threatening or challenging situation (secondary appraisal or reappraisal). For Lazarus, what determines an emotion is thus always only a process of appraisal. In a sense, appraisal does everything *alone*: it appraises the situation a person is in, it brings about bodily changes, it reappraises the subsequent person-environment relation, and so on. All explanatory emphasis is on the appraisal process; to put it generously, bodily processes play a role in the unfolding of emotional episodes only indirectly, by being appraised and reappraised.

All these accounts are characterized by what I shall call *corporeal impersonalism* (this expression is directly related to Patocka's notion of personhood). They attribute evaluative functions to an abstract-cognitive appraisal and they identify "personhood" with such a faculty; at the same time, they regard the body as an object (*Körper*) that plays at best an indirect role in the subject's understanding of the environment. This stance can be traced back to the origin of the notion of appraisal. Both Arnold (1960) and Lazarus (1966) developed the notion *in opposition* to previous physiological and behavioral accounts of emotion.<sup>9</sup> Their main criticism was that such accounts had understood emotions as "mere" physiological and/or behavioral states, and/or as feelings thereof; they had not paid sufficient attention to how emotions are elicited and to the fact that emotions also have to do with how individuals interpret the surrounding environment. Both Arnold and Lazarus wanted to emphasize that emotions are *personal* responses to the environment and that as such they must involve a subjective process of interpretation (appraisal). The idea that appraisal characterizes the personal aspect of emotion is still one of the hallmarks of appraisal theory. For example, Lazarus (2001) claims that appraisal has to do with "personal meaning," and he writes that "an *appraisal* connotes evaluation of the personal significance of what is happening in an encounter with the world" (p. 40). Roseman and Smith (2001) state that "[d]ifferences in appraisal can account for individual and temporal differences in emotional response. ... Because appraisal intervenes between situation and emotions, *different individuals who appraise the same situation in significantly different ways will feel different emotions ...*" (p. 6; italics in original). Because of the emphasis these theorists put on the personal character of appraisal, and because of their criticism of physiological and behavioral accounts, one is induced to conclude that behavioral and physiological processes have nothing to do with the personal character of appraisal. This, however, is an instance of corporeal impersonalism and need not follow.

Let us consider the accounts of the appraisal-body relation illustrated above in relation to lived human experience. Consider first the account according to which the body only indirectly determines affective specificity. It seems highly unlikely that affectivity entirely depends on one's capacity to label, or find the cause for, one's arousal. One can be in a state of arousal for which one has no immediate explanation, yet this does not imply that this state is affectively neutral. For example, a few days ago I felt very groggy and without energy, I inclined toward depression and sadness.

Puzzled by my state for a while, I came to think it might depend on having abruptly stopped drinking coffee. Perhaps I was right, but I was not sure; in any case, not knowing the cause of my state did not make my bodily state feel affectively neutral. The same could be said if, eventually, I had come to attribute my state to an “emotional source,” for example to an argument with my friend; before the attribution, I already felt groggy and depressed.<sup>10</sup> Indeed, some studies have shown that arousal experienced as unexplained generates a negatively toned affective state (Marshall and Zimbardo 1979; Maslach 1979). In addition, Damasio (2003, pp. 67-79) has illustrated some interesting cases of emotional states induced in the first place through arousal, with no evident attribution. In one example, a woman started to show facial expressions of sadness, and then to cry and sob, as soon as an electrode stimulated a specific part of her brainstem. She reported feeling worthless, scared and hopeless (and she had not suffered from depression or any other psychiatric condition before). Once the electrode contact was removed, the sobbing stopped together with the feeling of sadness, and the subject reported she did not know why she had felt so awful. In another example, following brain surgery a patient would suddenly burst into crying or laughter without apparent cause (see Parvizi et al. 2001). Sometimes these bursts took place in quick succession, leaving the patient “barely time enough to take a breath and say that he was not in control, that neither laughter nor crying were really meant as such, that no thoughts in his mind justified this strange behavior” (Damasio 2003, p. 78).

Also, one of Schachter and Singer’s (1962) conclusions was that when one knows the cause of one’s state of arousal, no necessity for labeling it ensues; accordingly, in these cases arousal is not accompanied by affective experience. First person phenomenological analysis suggests that this is not always the case. Knowing that my euphoria at the party is caused by alcohol does not reduce it. Frijda (1986) indeed observes that some subjects knowingly receiving adrenaline can still experience emotion (e.g. anxiety), especially if they are predisposed to it. Reisenzein (1983, pp. 249-250) mentions several studies showing that subjects who clearly know the source of their arousal report genuine emotions. Also, attempts to make subjects believe in the wrong cause of their arousal (so called “misattribution manipulation” studies) can fail for subjects particularly prone to certain emotions (see Reisenzein 1983 for further references).

The second account – the one according to which bodily events are a byproduct of appraisal – is also phenomenologically implausible. Consider the examples Lyons (1980) uses to show that love is such in the first place because of what one believes, rather than because of one’s bodily happenings. Bruce – one example goes – sees Moira and blushes; according to Lyons “Bruce will link his own blushing with the emotion love only if he believes that his blushing is a result of his now seeing Moira with whom he believes he is very much in love” (p. 123). Note that this scenario implies that Bruce already loves Moira (he believes so, at least). Yet, according to Lyons’s theory (see figure 1 above), he has to go through non-emotional processes to attribute his bodily arousal to love. First there is a moment in which Bruce “merely blushes” without knowing why; then there is a moment in which Bruce considers that he loves Moira; finally, he relates his love to his blushing. However, if Bruce already “believes he is very much in love with Moira,” it seems more plausible to think that his blushing constitutes and manifests his love, and that he knows this *while blushing*. There does not seem to be any moment in which he has to think about his love for Moira to explain his blushing; rather, he will immediately recognize his blushing as a sign of love.

Lyons’s account also completely overlooks the fact that one can blush, tremble or strive for another person, and attribute these phenomena to love, even when one does not evaluate the person’s characteristics as loveable. Bruce could blush when he sees Moira and attribute his blushing to love even if he did not already believe he loved Moira; he could indeed start believing it because of his blushing.

On its part, Lazarus’s idea of an ongoing monitoring of one’s possibilities of action in the environment is at odds with the claim that appraisal is a necessary and sufficient condition of emotion. Appraising and reappraising alone cannot do anything; there must be a body and a body-environment interaction to provide content to the appraising processes and to bring about changes in emotion. In order to appraise one’s relation to the environment, one must appraise one’s bodily condition and situatedness; in other words, one must be aware of one’s environment *through one’s body*. It is interesting that Lazarus’s (1966) first illustration of appraisal and reappraisal was influenced by accounts of stress and stress-management skills of flight crews during air battles in World War II; it seems that fighting an air battle would require a strong sense of one’s location and possibilities of action in relation to the environment. Once again, phenomenological considerations suggest that the role

of the body in understanding one's environment is not the one of an unspecific state of physiological upset appraised by a non-bodily, abstract evaluation.

#### 4 A componential-dynamic model of appraisal and emotion: still disembodied

According to a third account of the appraisal-body relation, appraisal and body *interact* (appraisal influences bodily processes, and vice versa), but are merely instrumentally related. In other words, appraisal, arousal and behavior are vertically modular (see section 2); although they “interact,” they are subsumed by distinct and separate subpersonal mechanisms.

One example is Scherer's “component process model” (Scherer 1984, 2000). According to it, emotion is a system constituted by five continuously interacting subsystems:

- 1) the “cognitive” subsystem with appraising functions, which continuously monitors the environment and internal feedback signals to determine their significance for the organism. This system is in turn constituted by five stimulus-check components (checking for novelty, pleasantness, goal significance, coping potential, and norm compatibility);
- 2) the “autonomic nervous system” responsible for internally regulating the organism and generating energy resources for action;
- 3) the “motor” subsystem involved in the expression of emotion;
- 4) the “motivation” subsystem governing the preparation and execution of actions;
- 5) the “monitoring” subsystem controlling the states of the other subsystems, and supporting feeling states.

Unlike the accounts illustrated in the previous section, Scherer explicitly acknowledges that arousal can affect evaluations: “feedback of increasing arousal from the physiological system or changes in the motivational system can affect attention deployment or change perception and judgment thresholds” (Scherer 2000, p. 76). Yet, he typically implements the functions of appraisal, arousal and behavior in distinct subsystems. Appraisal, although distributed over different stimulus-check components, and although influenced by the “arousal” and “motor” systems, is still in charge of interpreting, monitoring and controlling the body.

Scherer defines his approach “componential-dynamic” and opposes it to what he calls “structural-modular” ones. According to the latter, cognition, emotion and motivation are separate and independent (as in Zajonc 1980). According to the former, emotion consists of “continuously changing configurations of component states *including* cognitive and motivational processes” (Scherer 2000, p. 71); in particular Scherer suggests that component processes interact through “covariation” and “synchronization.”

This, however, is not enough to make his approach “dynamical” in the way endorsed by several supporters of the dynamical systems approach in cognitive science. An important feature of this approach is to present psychological capacities as *emergent* upon complex interactions of microcomponents that, taken separately, do not have any specific psychological function. Erlhagen and Schöner’s (2002) model of movement and movement preparation, for example, describes behavior as the unfolding of one single dynamic field that evolves according to the position of the organism, the stimulus, and the memory of previous actions. As Thelen et al. (2001) argue, this model can account for the development of cognitive capacities *without positing a separate cognitive faculty inside the organism*. Rather, cognitive capacities “emerge” from the mutual influences of environmental stimuli, memory and intrinsic dynamics of the organism. Similarly, Beer (2003) has shown that it is possible to use dynamical systems theory to describe the development of categorical perception<sup>11</sup> in a simulated embodied agent with no preprogrammed modules coding for stimulus features. He has shown that such an embodied agent comes to discriminate diamond-shaped and circular objects through its continuous interaction with them; its capacity to discriminate shapes thus “emerges” over time from agent-environment interactions and is not preprogrammed into the system.

Scherer’s partition of the emotional agent into five component subsystems is more reminiscent of traditional cognitivist models than of these embodied and emergentist dynamical accounts. In cognitivist models, psychological functions are individuated as components of the system, not as emergent on it. The consequence of the componential aspect of Scherer’s model is that there is no possibility of overlap among functions (including overlap among appraisal, arousal and behavior). Although Scherer opposes his approach to what he calls “modular” ones, his own model is, in a sense, still very much so. He does not claim, like Zajonc, that emotion and cognition are distinct and independent; yet the component systems of his model

are psychological functions identified as such from the beginning. They do not emerge from the complex interactions and temporal unfolding of several microcomponents, but are *engrained* within the system; they are vertical modules. In this framework, the evaluative function belongs uniquely to the cognitive system, and is distinct and entirely separate from the arousal and motor systems. These functions are only instrumentally related (see figure 2).

Insert figure 2 about here

The problem with this componential approach is, once again, phenomenological implausibility and corporeal impersonalism. Unlike other theorists, Scherer allows arousal to be affectively specific and to influence appraisal; nevertheless, appraisal remains an abstract non-bodily faculty whose function is to “register” events in the body and in the environment. Appraisal is disembodied, in the sense that it does not involve bodily events and corporeal experience. It detects bodily events and corporeal experience, and it acts accordingly; yet bodily events and corporeal experience are separate from the subject’s mechanisms responsible for understanding the world. To the extent that emotion theory keeps characterizing appraisal as the faculty that provides “personal meaning” and, at the same time, keeps separating appraisal from bodily processes, the body will have no chance of constituting personal significance.

In the next section I consider an alternative dynamical account of appraisal-body interactions, in which psychological functions posited as components of appraisal and emotion lose their vertical modularity. As we shall see, such an account is an important step toward embodying and enacting appraisal and personhood.

## 5 From emotional interpretation to embodied, enactive appraisal

Marc Lewis’s (2005) account of emotion and appraisal begins in a style similar to Scherer’s, namely as a componential-dynamic model. According to Lewis, for heuristic purposes emotion and appraisal can both be divided into components. Appraisal components are perception, evaluation, memory, attention and planning; emotion components are arousal, feeling, action and attentional orientation. Whereas Scherer sees appraisal as internal to emotion, Lewis sees it as partially overlapping

with emotion. In particular, appraisal and emotion share attentional mechanisms. At the personal level, this means that both orient the organism toward “what is important”; at the subpersonal level, they include the same brain processes such as activation of the anterior cingulate and orbitofrontal cortex, the amygdala and the hippocampus. Despite this overlap, appraisal and emotion are distinct faculties; appraisal is a cognitive interpretation providing the “what” of a situation, and emotion is a response providing the “what to do about it.” Like Scherer’s framework, this characterization still traditionally separates appraisal and body: arousal is seen as a component of emotion, not of appraisal; similarly for action orientation (figure 3).

Insert figure 3 about here

Lewis, however, does not stop at this componential-dynamic analysis. He argues further that, in daily interactions with the world, the mechanisms underpinning appraisal and emotion components can become so deeply integrated that, in fact, it is not possible to precisely map emotion and appraisal onto distinct systems.<sup>12</sup> In Lewis’s terms, appraisal and emotion converge into an *emotional interpretation*, or an “appraisal-emotion amalgam,” where it is not possible to neatly separate individual components anymore – neither anatomically, nor functionally. Emotion and appraisal become functions of the same complex and deeply integrated system. Ultimately, it is unclear whether Lewis thinks that appraisal and emotion (and their components) are *always* entangled together within emotional interpretations, or whether they also function separately (see Colombetti and Thompson, 2005). However, the notion of emotional interpretation is useful as a springboard toward a thorough embodied and enactive view of appraisal. The arguments used by Lewis to claim that emotion and appraisal are deeply integrated at the level of emotional interpretation are, in fact, analogous to those used by Hurley (1998) to show that perception and action are constitutively interdependent. Lewis first contends that emotion and appraisal relations should be appreciated in their bidirectionality (importance of feedback). Then he argues that, at the level of emotional interpretation, the processes traditionally seen as subserving the separate functions of appraisal and emotion are inextricably interconnected. Appraisal and emotion lose vertical modularity; they are rather best seen as emergent onto one complex system and as constitutively interdependent (figure 4).

Insert figure 4 about here

This view has important consequences for the components initially distinguished by Lewis. If emotion and appraisal are constitutively interdependent and lose vertical modularity because they do not map in a one-to-one way onto brain systems, then their alleged “components” must also lose vertical modularity and be constitutively interdependent. This renders it difficult to make sense of the idea that the psychological functions in question “interact.” In the complex brain system described by Lewis, the neural boundaries of the component functions of appraisal and emotion are not clear-cut, and their “interaction” thus amounts to reciprocal influences subsumed by largely overlapping, deeply integrated and dynamically interacting brain mechanisms. The relations among the component functions of emotion and appraisal are thus also best described as constitutively interdependent rather than simply instrumental; perception is not simply a means to an end for action orientation (and vice versa), evaluation is not simply a means to an end for arousal (and vice versa), etc.

What is the relation between this view and the enactive approach introduced in section 2? The integrated view of the brain offered by Lewis implies that perception and what he calls “action orientation” are constitutively interdependent. Action orientation, according to Lewis’ characterization, includes “action plans” that are formed within the brain and that are selected according to the situation and the related emergent emotional interpretation. Lewis’s account, then, does not include *real* actions; his analysis focuses on the brain only and is not enactive in the embodied sense specified by Varela, Thompson, and Rosch (1991) and others. This might well be due to explanatory purposes rather than to Lewis’s conviction that bodily processes are not part of the complex web of subpersonal processes he describes. Indeed, some passages in his paper suggest that this is the case (see below). Yet, it is worth noting that Lewis’s account of action orientation is rather traditional when compared to other dynamical models such as, for example, Thelen et al. (2001) and Beer (2003). These are strictly enactive in the sense that, when they talk of motor activity, they refer not only (or even not at all) to brain mechanisms supposed to subsume action tendencies, but to the actual actions of the body. Lewis’s notion of action plan is reminiscent of more traditional cognitivist models, where reasoning is an intermediate mechanism

between perception and action. Compare his view with Thelen et al. (2001), for example, for whom actions are not guided and/or selected through any plan. As Thelen et al. argue, actions result from brain, body and environment interactions. The organism is led into a certain kind of behavior as a result of the structure of its relation to the environment. The crux of this enactive-embodied dynamical systems approach is that there is no internal plan for behavior; actions do not get selected by an abstract, disembodied and disembedded faculty.<sup>13</sup> Lewis risks missing a crucial aspect of the dynamical approach to cognition if he overlooks the role of real actions in the organism's understanding of the world.

Other parts of Lewis' paper, however, present a more embodied view. For example, when he talks of "arousal," he mentions arousal at the brain level as well as bodily arousal (section 4.3.1). He says that the action of neuropeptides and neuromodulators on limbic and cortical structures is mediated by activity in the bodily endocrine system, as well as vice versa.<sup>14</sup> This embodied perspective is absent in his discussion of action orientation (section 4.3.2), where he only refers to activation in brain structures such as pons, medulla, amygdala, etc. However, if he is willing to admit that arousal is embodied, and that bodily arousal influences brain activity, then he has no reason for excluding bodily actions from influencing brain activity as well. He has already admitted that the subpersonal processes under discussion are neural and chemical, brainy and bodily. The brain and the body, as he acknowledges, are related through a complex web of mutual influences and the entity performing emotional interpretation is thus an embodied organism, not simply the brain. Even if there were structures responsible for producing an action plan, these would constantly need to be updated by the body carrying information about itself and about its relation to the environment (indeed, Lewis talks of "constantly updated plans").

If, on the one hand, Lewis's account is thus "quasi-enactive," on the other hand it makes a crucial contribution to the enactive approach – namely, it provides neurological arguments in support of the idea that sensorimotor processes are emotional and evaluative, or rather emotional-evaluative. In an emotional interpretation, perception and action orientation are in a relation of constitutive interdependence with evaluation, arousal and feelings (among others); in short, sensorimotor activity is "hot." Coupling Lewis's account with a thoroughly embodied-enactive view leaves no theoretical room to non-enacted and disembodied appraisals. Subsuming emotional interpretation by a complex web of subpersonal

relations spanning brain and body processes makes it an enactive appraisal. We have here a neurological counterpart to Patocka's idea that corporeal personhood is sensorimotor and as such also intrinsically affective; and to Thompson and Varela's (2001) idea that embodiment has not only a sensorimotor dimension, but also one of organismic self-regulation involving the activity of the internal milieu.

## 6 Implications: valuing corporeity

The implications of enacting appraisal are of two kinds. One regards the modelling of emotion elicitation; the other regards emotional experience and the sense of "personal significance" related to the notion of appraisal.

As for the former, the suggestion of this paper is that appraisal and bodily events such as arousal and action should not be posited as vertical modules. To some theorists, this suggestion may sound like a category mistake. Appraisal and body, as mentioned earlier, have been divided since the origins of the notion of appraisal; accordingly, the history of emotion theory is often portrayed as a conflict among "physiological," "behavioural" and/or "cognitive" accounts. In this tradition, what happens in the body during an emotion is a very different thing from what goes on in the head when one interprets one's surroundings. Thus although it is a commonplace observation that arousal influences appraisal and that different states of arousal usually make one see the world in different ways, emotion theory has reduced this influence to an abstract process of "monitoring the body." Enacting appraisal implies recognizing that the body has a more important and active role in appraisal, namely a constitutive function. This means that it is misleading to understand the process of emotion elicitation in terms of separate psychological events that are merely instrumentally related and/or that follow one another in a linear causal sequence. The main challenge for emotion theorists is, I think, to find a way to build models of emotion elicitation that do not map psychological functions onto subpersonal mechanisms in a one-to-one way. Dynamical systems theory is a good tool for such an attempt, provided that dynamical models of emotion avoid componential analyses and vertical modularity, and embrace the embodied-enactive view that goes together with several dynamical approaches in cognitive science.

The other implication of enacting appraisal is a phenomenologically more plausible account of emotion experience and its relation to appraisal and "personal

significance.” This takes us back to Patocka’s characterization of the lived body and corporeal personhood, and to the accusation of corporeal impersonalism I raised to traditional theories of appraisal. The present view does not see the appraisal-body relation as a process of labeling, attributing or reappraising arousal. Rather, it claims that the I has a *direct* experience of its corporeity, and this direct experience of one’s corporeity includes an experience of one’s corporeity in relation to one’s environment. In other words, this direct experience is the pre-reflective and constitutive experience of the lived body. The lived body, as explained earlier (section 2), is a pre-reflective experience constituting a point of view and is part of the structure of all perceptual experiences. The arguments in this paper emphasize that the lived body is also part of the structure of every appraising experience. What conventional appraisal theorists see as a process of interpretation of the body and/or the world that causes bodily changes, is here reinterpreted as one’s understanding of the surrounding world through, and as, one’s bodily experience. This is how I interpret Patocka’s opening quote that “the first impression of the world is a physiognomic impression,” as well as Prinz’s idea that meaning should be placed within the body directly, rather than via the intermediary of supplementary meaning-carrying thoughts.

This view does not only invite emotion theorists to rethink the relation between appraisal, body and emotion experience; it also opens up a largely unexplored space for phenomenological analysis. One possibility that I find appealing is to consider appraisal in relation to the perception of one’s possibilities of interaction with the environment (so-called “affordances” in ecological psychology). For example, one’s perception of a bear as either “cute” or “scary” might be constituted by the experience of different action tendencies. Frijda (1986) already suggested that the experience of action tendencies is part of the emotional experience (see also Lambie and Marcel 2002). This analysis would be a helpful illustration of the idea that arousal is neither a byproduct of, nor merely instrumentally related to, appraisal. Quite the opposite, the suggestion would be that different states of arousal render some possibilities of interactions with the environment more “tempting” than others. Different action possibilities would constitute different experiences of appraisal. As it is known, for example, a high amount of testosterone makes people aggressive, namely prone to aggressive actions. Such proneness is likely to trigger emotions of anger, as well as appraisals of aspects of the environment as odious and

obstructive. This account interestingly suggests that arousal specificity is required for the capacity of a rich range of evaluations. The hypothesis here is that an organism whose arousal were a uniform and undifferentiated pattern of heightened visceral activity would not be capable of a variety of actions and action tendencies. Not only then “the first impression of the world is a physiognomic impression,” but perhaps it is also our varied physiognomy that allows us different impressions of the world. This seems consistent, for example, with cases of subjects who have lost the capacity to have feelings and behavior typical of fear and, at the same time, to detect danger in their environment (see Damasio 1999, pp. 62-66).

## 7 Conclusion

Although we ultimately do not know how experience is generated, it seems reasonable – I think – to trust to the quality of our feelings, and thus to avoid drawing a separation that will leave us lost in thought, forever detached from our flesh. By embodying the appraising mind, we can do justice to the apparent (am)bivalent nature of emotion and, at the same time, exploit this (am)bivalence to shed light on the relation of mind and body.<sup>15</sup>

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## FIGURES

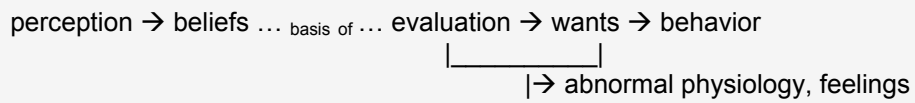


Figure 1: The process of emotion elicitation according to Lyons (1980). Arrows represent causal relations.

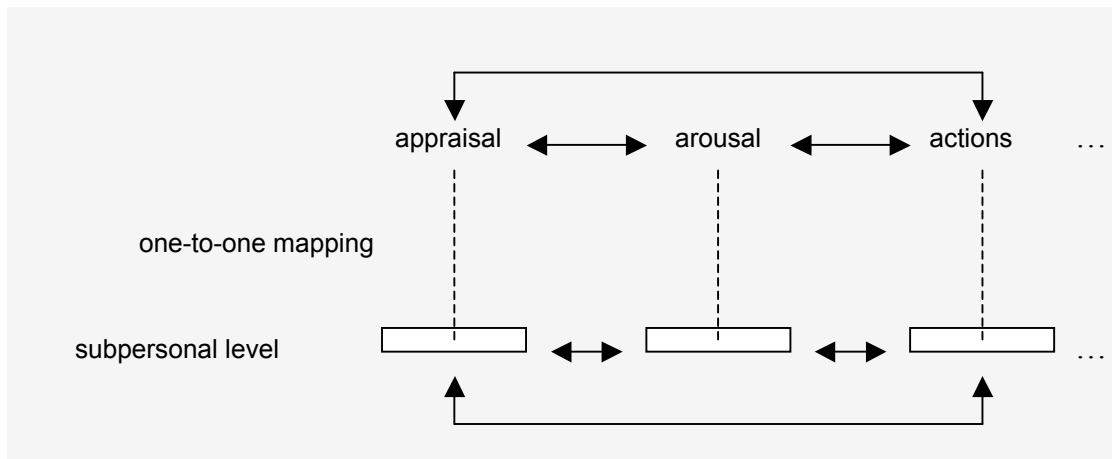


Figure 2: Schema illustrating vertical modularity in Scherer's "component process model."

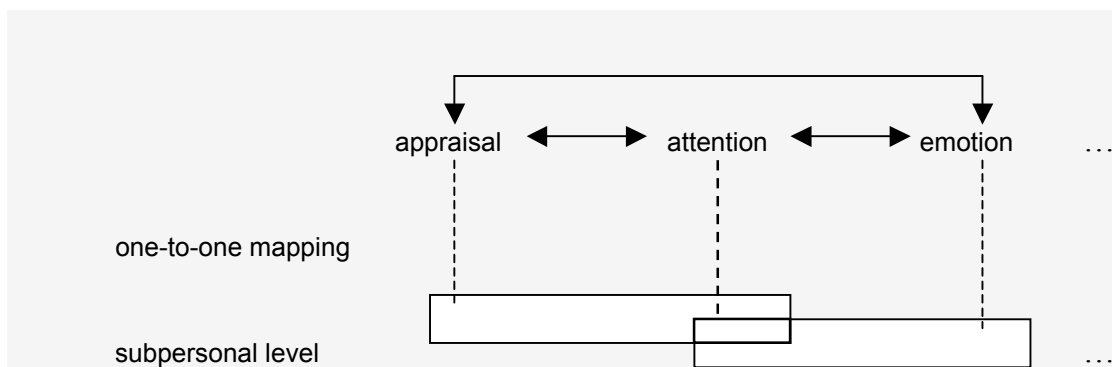


Figure 3: Schema illustrating Lewis's (2005) componential analysis. Despite overlap of subpersonal mechanisms, this analysis keeps vertical modularity: psychological functions are in a relation of one-to-one mapping with subpersonal systems. (Although the figure does not show it, mechanisms subsuming appraisal and emotion are further divided into subsystems subsuming component functions, such as evaluation, perception, arousal, etc. See text).

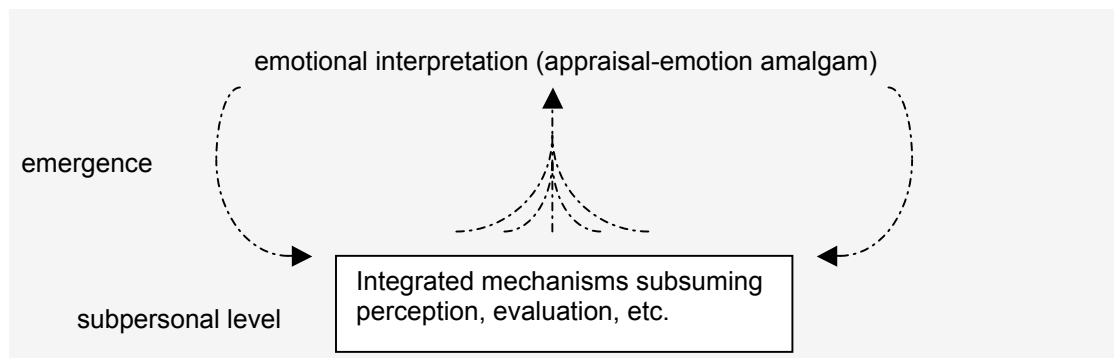


Figure 4: Illustration of Lewis's (in press) notion of "emotional interpretation." In an emotional interpretation, appraisal and emotion are merged together, and they are best seen as emergent on a complex subpersonal system where mechanisms subsuming component functions of appraisal and emotion (perception, evaluation, arousal, etc.) are inextricably integrated. Vertical modularity is lost.

## ENDNOTES

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<sup>1</sup> Patocka (1998, p.134).

<sup>2</sup> Prinz (2004a, p.58).

<sup>3</sup> One exception is Jesse Prinz's recent account, according to which all emotions are embodied appraisals (Prinz 2004a, 2004b). See Colombetti and Thompson (forthcoming), for something more about Prinz's view and the embodied-enactive approach.

<sup>4</sup> For further analogies between the enactive approach and phenomenology, see Thompson (forthcoming).

<sup>5</sup> Note however that Hurley does not characterize herself as an "enactive" theorist.

<sup>6</sup> Patocka refers to the *Meditations*. Note however that Descartes' *Passions of the Soul* is an embodied account of emotions and their phenomenology.

<sup>7</sup> Lyons is aware of the problems of positing a mental state (an evaluation) as the cause of a bodily state. Following Ryle (1949), he thus attempts to account for the process of evaluation in dispositional terms. However, this attempt is problematic in many respects. It is not clear, for example, how the dispositional account fits together with the linear one; whether the dispositional account applies to evaluations or to emotions (or both); and whether or not Lyons believes that evaluation is an identifiable process. In any case, his dispositional account never explicitly acknowledges that the body plays a role in evaluation.

<sup>8</sup> Lazarus has recently turned to the term "appraising," which he understands as "a set of cognitive actions" (e.g. Lazarus 2001, p. 42).

<sup>9</sup> The James-Lange theory had defined emotion as the awareness of the physiological changes induced by the perception of an emotional stimulus. Activation theories had identified emotions with states of increased energy in the body. Behavioural theories had described emotions in terms of possible behaviours.

<sup>10</sup> Someone might observe that in some cases arousal has an affective tone because, *unconsciously*, the subject knows the source of her state. However, this explanation could be made only a posteriori. Also, it would not apply in those cases where an affective state is there, but there is no "emotional cause" (like in the case of mild depression caused by coffee abstinence).

<sup>11</sup> Categorical perception is the capacity to divide the world into objects with distinctive properties (e.g. the stream of words into phonemes, or the spectrum of light into colours).

<sup>12</sup> He distinguishes five mechanisms of integration in the brain: 1) positive and negative feedback among components (horizontal integration); 2) vertical integration across the neuraxis; 3) neuromodulation; 4) action orientation; 5) learning. I discuss action orientation later.

<sup>13</sup> This idea goes back to the ecological approach to action. Turvey (1977) argued that the details of an action cannot be specified at the brain level. One forms an intention to perform a certain action, but the details of the action emerge only while the action is being performed, as a function of body-environment relations.

<sup>14</sup> In his reply to commentators, Lewis writes that emotion is "mediated by neural and endocrine processes within the individual's body" (R2.3.3). During informal conversations, he admitted that the reason for his focus on the brain in the target paper is due only to the space limitations.

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