

EDITORIAL

The interdependence of consciousness and emotion

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For millennia, emotional states have been viewed as avoidable impediments to rational thinking. When conscious of emotions, it was assumed, we should actively suppress them for the sake of objectivity in reasoning. This view entailed that consciousness and cognition could be understood independently of emotion, and it also entailed a normative view of reasoning as excluding emotion.

Recent trends in neuroscience, perceptual psychology, philosophical analysis of the concept of consciousness, and biochemical work on the theory of self-organization increasingly suggest that emotional processes, in a broad sense of that term, play a crucial role in distinguishing between conscious and nonconscious information processing. If we ask ourselves why *this* instance of information processing is conscious, whereas *that* one is not, the answer always involves the fact that this one arises out of an organism's motivating emotional life, whereas that other one does not.

To say this is not to say that all emotional states are conscious; as we shall see, many are not. It is to say, however, that all emotional states have the potential to become conscious, because they involve representations that are in principle available to be used by the organism as conscious imagery. The primary purpose of such imagery is that of motivating, selecting, and guiding goal-directed action. When imagery is activated by emotional valuations, it is activated by efferent and not merely afferent brain processes (Aurell, 1984, 1989; Ellis, 1995, 2000; Luria, 1980; Posner & Rothbart, 1992). The imagery involved in emotional states includes what we think of as ordinary perceptual imagery, as when we become consciously aware of a salient object in our environment, and proprioceptive imagery, as when we imagine kicking a ball or playing the piano (Newton, 1982, 1996). In our view, this imagery involves value-laden

representations of both organismic activities and states of the environment, although the nature and role of representation in self-organizing systems are currently controversial (see Mac Cormack & Stamenov, 1996). What has been neglected, and what this journal aims to supply, is an exploration of the ways in which such conscious imagery, as well as the reasoning and action-planning it supports, depends upon motivating emotional states of the organism.

For example, we know that there can be pretty nearly complete occipital processing of a visual stimulus, even to the level of semantic meaning, with no perceptual consciousness of the object whatever (Aurell, 1984, 1989; Posner & Rothbart, 1992; Mack & Rock, 1998). And we know that the other brain activities that would need to occur in order for the perception to become a conscious one is not caused by the occipital activity (Aurell, 1989; Ellis, 1995; McHugh & Bahill 1985; Srebro, 1985). Instead, it is caused by processes originating in subcortical emotional brain areas (Aurell, 1989; Damasio, 1994, 1999; Faw, 2000; Luria, 1980; Panksepp, 1998; Watt, 1998 & this volume). In short, input does not cause consciousness in an information processing system. Only the system's self-motivated activity can do that.

When we speak of a distinction between "self-motivated activity" and mere "reactivity," we need a theoretical basis for such a distinction. A currently promising strategy is the developing theory of self-organization (Freeman 1987; Hardcastle, 1996; Kauffman, 1993; Mac Cormack & Stamenov, 1996; Monod, 1973; Thelen & Smith, 1994; Varela et al., 1991/1993), which can also be used to support a distinction between living and nonliving beings (even if the distinction turns out to be a gradual rather than sharp one). The editors of this journal believe that viewing emotion and consciousness as integrated and integrating features of self-organizing systems, rather than as independent "modular" processes occurring more or less independently within them, is more compatible with such research and more likely to reveal the nature of and relationship between emotion and consciousness. Thus to understand why one information processing being is conscious and another is not requires understanding it in terms of its biology and the way emotion connects biological purposes to information content. The kinds of "self-organizing" systems relevant here are relatively stable yet "open" in the thermodynamic sense — i.e., they exchange energy and material with their environment while maintaining constant patterns of activity by appropriating and replacing the needed substrata for their definitive patterns of activity (Kauffman, 1993; Monod, 1971). This seems to be the kind of self-organization that is at work in living beings.

Conversely, this line of investigation will lead to new questions about

motivation and emotion themselves. If emotion is attributed only to self-organizing beings, then the aims of the emotions must also be understood in terms of self-organizational dynamics. These aims cannot be understood only in linear terms, as if they were caused by stimuli or by discrete chemical reactions in the nervous system operating in *partes extra partes* fashion; these reactions occur in the context of a larger dynamical system that adjusts and rearranges the parts in terms of the overall purposes of the whole.

Connecting consciousness to emotion, and emotion to self-organization, also leads to important philosophical developments. The problems of mental causation, the knowledge argument, the explanatory gap or “hard problem” of consciousness, the relevance of multiple realizability, the structure of the relation between a process and its substratum, the meaning of the self and agency, the epistemological grounding of logic, the meaning of “reductionism,” the phenomenological meanings of psychological processes, and many other philosophical problems will come out differently depending on the ways self-organizational theory and its relevance to emotion and consciousness are worked out (see Dascal, 1987; Ellis & Newton, 1998; Ellis, 1995, 1998, 1999a,b,c, 2000, forthcoming; Newton, 1989, 1991, 1992, 1993, 1996, 1999).

To take account of the self-organizational biochemical basis of emotions will also require rethinking with regard to the intentional objects and the phenomenology of emotions. A triggering stimulus is not necessarily either the cause or the intentional object of an emotion, and does not necessarily relate to the aims of the emotion (Husserl, 1913; Watt, 1998 and this issue). Emotions, if they are to be understood as the self-motivated activities of dynamical systems, are caused by the total structure of the organism’s self-organizational behavior, which uses objects in the environment as they are found more or less useful for overall purposes in maintaining the organism’s definitive patterns of organization into the future. Trigger stimuli often serve only to call the organism’s attention to the need or desire for a certain kind of *activity* on the organism’s part, which the stimulus signals the organism to pay attention to as going well or not so well; and trigger stimuli may do this for a variety of reasons. They may present examples of types of objects that could be useful; they may temporarily impede the organism’s holistic balance until it finds a way around them; or they may merely *remind* the organism, through a chain of associations, to pay attention to this or that aspect of its need for balance — in which case the trigger stimulus is not the *object* of the emotion and does not figure into its *aims* at all.

For instance, a sexual stimulus may remind us to pay attention to our sexual needs, but may not itself be the most effective available object for

fulfilling those needs — in which case it would be misleading to think that the aim and the object of the emotion pertain specifically to that object, let alone that the object is the *cause* of the sexual desire. Moreover, the sexual desire itself may be only a part of a larger imbalance whose fulfillment cannot be accomplished merely by meeting the sexual need. Recognition of this point can help connect our understanding of the basic workings of emotion to psychotherapeutic concerns.

If the aims of emotions have to do with maintaining or restoring a holistic organizational balance, then the distinction between “primary” (supposedly hardwired) and “secondary” (supposedly “social”) emotions must be thrown into question. Emotions, whether they occur prior to or subsequent to learning and development, do not aim at specific behavioral outcomes in relation to specific objects; the specific object is only a trigger in the above sense, and in some cases represents one among many possible objects for use in attaining the aims of the emotion. Thus new ways of defining such terms as “emotion” and “motivation” will be needed. We can no longer assume that a primary emotion of “anger” is instinctually hardwired to want to “fight” the triggering stimulus, and that a primary emotion of “fear” wants to flee from it, and that “higher” or “social” emotions result from modifications through learning of these “instinctual” reactions to specific types of objects. The situation is a good deal more complicated than that.

Recent affective neuroscience (e.g., Damasio, 1999; Freeman, 1999; Panksepp, 1998; Watt, 1998) points to a self-organizational approach in which the aim of emotions is to maintain a pattern of organismic *activity* that fits certain structural patterns in relation to the environment. The organism desires to act with a certain level of energy or intensity in certain preferred patterns that can be understood in terms of a continuity across time of the organism’s definitive patterns. These structural constraints can be satisfied in a variety of alternative ways under the same environmental circumstances. We therefore cannot nail a specific emotion to a specific environmental constraint. The particular constraint serves only as an example of the type of condition that may be relevant to the organism’s purposes. Some constraints may be particularly salient — e.g., the sudden sight of a large tiger in my path. But even in this simple case, the organism’s aim is not primarily either to fight or to flee from the tiger, but to do *whatever* is necessary to restore its homeostatic balance; the extreme imbalances that suddenly exist in the system prepare the organism for correspondingly all-important action to restore the imbalance, with all other considerations relegated at that moment to a back burner.

The term “consciousness” is used in many senses, each involving its own problems and complexities (Natsoulas, 1978, 1990, 1993). We can distinguish waking from sleeping, dreaming from deep sleep from coma, simple “awareness” from “awareness as,” which presents itself as presenting or being about some object (Natsoulas, 1981; Sellars, 1980), preconscious information processing from conscious processing, Block’s “phenomenal” from “access” consciousness, preconscious from conscious selection for attention (Posner & Rothbart, 1992), etc. What is intended in the title of this paper (and journal) is “phenomenal” consciousness: How is it that there is something that my consciousness “is like” or “feels like” (Nagel, 1974) that cannot completely be gotten at only from the third-person perspective of an empirical scientist studying my brain and behavior? Why does empirical knowledge of everything about these empirical phenomena not reveal what it “is like” to subjectively experience my phenomenal consciousness?

Defining what is meant by “emotion” presents similar difficulties. What we mean in the present context is a state of an organism which has the following characteristics: (a) the state arises from a self-motivating drive to attain a particular holistic equilibrium in the face of real or imagined environmental circumstances; (b) the state includes or is associated with an implicit or explicit representation of the conditions needed for the desired goal, such that the representation can play a role in bringing about the goal (e.g. by serving as an initiator of and guide to action). In specifying that emotions may involve either implicit or explicit representations, we are implying that emotions are at least potentially conscious. Representations become conscious by means of affective sensorimotor and/or proprioceptive imagery, held in working memory during the planning and execution of action.

One reason for including the element of “representation” in the definition of “emotion” is that there are many self-organizing activities that we would not want to include under “emotion” — the regulation of heartbeat, blood pressure, etc., though to be sure these are often interrelated with emotions. The difference between these self-organizational activities and the genuinely “emotional” ones seems to involve the use of representations pertaining to what the emotion is “about” — its intentionality, its objects and aims *vis a vis* the environment.

We do not want to assume *a priori* that all representations need to be explicitly conscious. It can be debated whether nonconscious representational content is even intentional in any meaningful sense (e.g., see Georgalis, 2000). Mere isomorphism between a neural pattern and an object does not constitute intentional representation. A videotape of an event is not a consciousness of the

event, even if the videotape machine is implanted inside one's head and somehow played there. Only when a self-organizing dynamical system is *motivated* to engage in a pattern of activity isomorphic to the pattern of that which is represented can the representation take on a conscious status. To say that "a self-organizational tendency represents the object" is to say that the self-organizing pattern of activity itself, or some aspect of it, intends the object. Thus, when an organism uses a camera to take a snapshot, but does not look at the object or at the picture of the object, the organism has created a "representation" of the object in a certain sense, but its self-organizing tendencies are not themselves *intentionally* representing the object. In principle, this same distinction can be applied to blindsight, implicit perception, and other instances where there is some sensory processing but with no resulting perceptual or imaginative consciousness.

We must be careful to distinguish between the intentional objects of emotions and the intentional objects of perceptions or perceptual images that are concurrent with the emotions. For example, when the sudden sight of a snake elicits fear, the snake is obviously present as a perceptual object, but in addition the fear itself forms proprioceptive imagery of the organism's *escape from* the snake, or the snake's being *gotten away* from the organism. This *removal* of the snake from the organism's vicinity, or *vice versa*, is the intentional object of the emotion; the snake *per se* is the intentional object of the perception that is concurrent *with* the emotion, but strictly speaking is not the object of the emotion. The object of the emotion is imagined independently of the perceptual act that presents the snake *per se*. The difference between concurrent perceptual and emotional objects often can be quite extreme, as when a popular song with no inherent emotional content triggers sentimental feelings about one's home town, loved ones, or even existential life issues such as death or alienation.

We should not assume *a priori* that either emotions or representations are necessarily conscious. Consciousness occurs when the pattern of self-organization *itself* has an intentional relation to relevant environmental conditions, rather than merely existing *alongside* a representation of them.

We should also allow for the possibility that an emotion can be non-conscious even though imagery associated with its self-organizational tendencies *is* activated, if that imagistic activity is precipitated by some *other* emotion, or caused by direct physiological stimulation which then resonates with some other emotion. For example, an alexithymic patient who killed his father agreed that it made sense that he was angry with his father and wanted to kill him, but the patient had experienced neither the anger nor the desire to kill the father

(Sundarajan, 1999). The representation of the father's death was present (i.e., imagery in occipital and parietal cortical areas activated by the anterior cingulate in response to the therapist's reasoning), but that imagery was not present as an attribute of the *same* bodily system whose self-organizational tendency led to the father's death. That is, the thalamus-amygdala activity in interaction with the body's sense of extreme disequilibrium did not *itself* take the father's death as an intentional object, by means of an integrated pattern of activity which *then* would have led to still more vivid imagery by activating the cortical imaging areas. In such cases, we might refer to the unconscious emotion whose imagery is present as "dissociated" from that imagery. In cases where an emotion is "dissociated from its related imagery," there is imagery in consciousness that is at least somewhat isomorphic to environmental conditions needed to achieve self-organizational balance, but that imagery is not being associated in consciousness with the self-organizational tendencies to which it is relevant.

In cases where the imagery associated with the emotion is not activated at all, anywhere in the system, we might refer to a "motivation" as being of a kind that has the potential to become an emotion, if the appropriate imagery *were* activated in the right way; if not, the motivation remains a *mere* motivation, and is not even an unconscious emotion.

Correlatively with the possibility of unconscious emotional phenomena, we should allow for the possibility that the representation of respects in which environmental conditions either resonate or do not resonate with organismic motivational tendencies can be very vague and ill-defined, and then gradually become more clear and distinct as the imagery is refined and brought more and more into resonance with the motivational tendency (Gendlin, 1962/1997, 1992a,b). The more closely the imagery (associated with the missing environmental conditions) resonates with the self-organizing tendency of the system, the more definitely that imagery seems to represent the intentional object of the emotion.

Thus the intentional object of a *perception* may be a different object from the intentional object of the *emotion* that is occurring simultaneously with that perception; the percept may only be a trigger for the emotion, because it resonates only very poorly with the emotion, but just enough to trigger it. For example, a person in need of a rewarding social relationship may have this need triggered by a sexual object, because sexual and social relationships have many structural elements in common with each other, and therefore the one type of imagery may resonate just enough with the other emotion to trigger it, even though it is not the intentional object of it. Then after the person has explored

the percept and the felt sense of the emotion more carefully, she may realize that another set of perceptual imagery resonates much better with the emotion.

The power of imagery to trigger emotions depends not only on the closeness with which it resonates with the emotion, but also on the intensity of associated feelings that the image may also trigger simultaneously. For example, a naked woman who is disliked may more powerfully trigger a man's need for rewarding social contacts than the image of a woman who is better liked, but fully clothed, because the naked woman also triggers the additional emotion of sexual need; it may thus serve as a more powerful evoker of the need for rewarding social contact than the clothed woman. On the other hand, the clothed woman who is socially liked resonates more closely with the need for rewarding social contact than does the naked woman who is disliked, and for this reason her image (even with the clothes on) may serve as a more powerful evoker of the need for rewarding social contact than the image of the naked woman who is disliked. In either case, on exploring the imagery and the corresponding emotion more closely (if he does explore them more closely), the man may realize that the image of the clothed woman who is liked more closely resonates with the emotion in question, and therefore is more correctly characterized as the "intentional object" of it. Thus the ability of a set of imagery to trigger an emotion depends on both the intensity of associated emotions *and* on the closeness with which it resonates with the organismic tendencies at issue in the particular emotion in question.

The editors both have suggested elsewhere that all forms of consciousness, whether perceptual, intellectual, or imagistic, must be motivated by emotional processes, and that the understanding of all these forms of consciousness therefore requires also understanding the way they are motivated — both phenomenologically and physiologically. Not only the conscious status of these states is affected by their essential connections to emotional processes, but also their intentional content and the structure of the ways they process information. The assumption that emotions can not only be conscious themselves, but necessarily underlie all conscious states, is a promising one that meshes well with the self-organizational approach to consciousness and cognition discussed above. Many contributors will support this approach, while others may offer objections or alternatives to it. In all of these cases, the main goal will be realized: to acknowledge and explore the long-neglected relationship between our rational and our emotional natures, and to advance beyond artificial and arbitrary separations among the integrated functions of conscious organisms.

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