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To cite this article: Rami Gabriel (2023) The deep history of affect and consciousness, *Philosophical Psychology*, 36:4, 734-744, DOI: [10.1080/09515089.2022.2160310](https://doi.org/10.1080/09515089.2022.2160310)

To link to this article: <https://doi.org/10.1080/09515089.2022.2160310>



Published online: 22 Dec 2022.



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# The deep history of affect and consciousness

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## ABSTRACT

I contrast two notions of cognition offered in Joseph LeDoux's (2019) *The Deep History of Ourselves* toward arguing for the functional role of affect and consciousness in the evolution of matter. I argue that an emphasis on the cultural construction of emotions misrepresents the relationship between culture and biology. A more parsimonious story about the evolution of mind requires leaving behind some aspects of a cognitivist epistemology.

## ARTICLE HISTORY

Received 23 August 2022  
Accepted 15 December 2022

## KEYWORDS

Evolution of mind; affect;  
ecological psychology;  
cognitive science;  
philosophy of affective  
neuroscience

## 1. The deep history

Joseph LeDoux has written an engaging book about the history of life that fits nicely alongside similar efforts by Dennett (1996; 2017), Steven Rose (2006), DeSalle and Tattersall (2014), Antonio Damasio (2018), and Mark Solms (2021). The book can be conceived of as being composed of two halves. In the first part, with candor and ingenuity, numerous insights are provided into how matter coalesced into strategic functional units to metabolize energy for the purpose of sustaining viable and fecund forms of life. In the second part, LeDoux describes a theory of the evolution of mind and brain based on a cognitivist epistemology. While I learned more from the first part of the book, my comments will focus on the philosophy of emotion depicted in the second half.

The interpretation of the evolution of matter and mind reaches a fork in the road when we get to the definition of cognition. LeDoux argues that cognition is the ability to form representations and use them to guide behavior (p. 34). An alternate definition is that cognition is the adaptive regulation of states and interactions by an agent with respect to consequences for the agent's own viability (p. 37). Of course, the use of representations is a kind of adaptive regulation itself, but it is a specific conception of how behavior is guided and how sensation is incorporated into the animal's system. While representations offer a defensible way to explain some higher cognitive skills, including language, there has been

substantial progress in conceiving of mind through perceptual, enactive, affective, and embodied models of mind (Asma & Gabriel, 2019; Hutto & Myin, 2013).

The reason this debate is important is that the nature of affect and consciousness hinges on the role they play in the evolution of matter. The alternate definition of cognition can incorporate nonrepresentational modes of adaptive regulation, including emotions and ecological psychology, while a representational theory of cognition is bound to a particular kind of formal mental vehicle. Since LeDoux commits himself to representations, he is forced to describe consciousness as a passive observer of behavior (p. 43). Furthermore, he must maintain that approach/avoid/survival mechanisms, which seem to many to be the core of feelings, are mediated by different circuits than those that result in emotions (p. 46). Indeed, the second part of the book expertly synthesizes some of the best work of the last fifty years (including his own path-breaking research) to put forward an interpretation of the evolution of matter that eventuates in a higher-order representational theory of mind. In contrast, in this commentary, I trace the implications of adopting the alternate definition of cognition. For reasons adumbrated below, I argue that it is more parsimonious, both metaphysically and as an evolutionary story, to conceive of cognition as an adaptive regulation of states similar to other organismic strategies to maintain viability. Crucially, a more generous conception of the functional role of affect and consciousness allows us to pursue a monist ontology in which matter is mind.

## 2. Anti-anthropomorphism

The study of animal behavior has always been contentious; animal ethologists, psychologists, and animal rights advocates have divergent positions concerning the nature of animal minds and the ethical implications thereof. LeDoux and others maintain that “unless one can rule out alternative nonconscious interpretations in animals, claims of consciousness should be withheld” (p. 200). He finds anthropomorphism about non-human animal emotions to be widespread and blames it on the following mistakes: reification implicit in language use, misguided intuitions about why animals act, emotional and cognitive biases we bring to the problem, and our moral assumptions about the ethical implications of the possession of consciousness (p. 320). For him, this is an empirical question: “behavior is controlled nonconsciously unless proven otherwise” (p. 328).

LeDoux’s enthusiasm to oust the anthropomorphists, who allow for consciousness and emotions in non-human animals, leads him to posit an inaccurate reading of Charles Darwin and Jaak Panksepp (p. 192). He claims Darwin relied too much on intuition in his views on animal emotions, but in

fact Darwin was a thoughtful interpreter of behavior and, being well aware of nonconscious reflexes, he could have described the causes of behavior and emotions in animals as such. The fact that he did not is due to other theoretical, not intuitive, considerations, for example: the distinction between analogical and homological features, the clear existence of cross-species communication, and various philosophically-defensible assumptions (Darwin, 1872). Additionally, Jaak Panksepp (1998) did not rely solely on “purely behavioral” evidence (p. 198); rather, he used a three-pronged research approach that synthesized the study of behavior, neuroscience, and philosophy. Reification and misguided intuitions of biases do not exhaust the behavioral, neural, and philosophical evidence for animal sentience.

First and foremost, Darwin and Panksepp pursued an evolutionary approach that entailed clarifying the form and function of emotions. Emotions for them were a type of behavior which had adaptive purposes for the animal insofar as internal, conscious aspects play a causal role in behavior. Their reasoning followed from basic behavioral phenomena like the Law of Effect and anatomical and philosophical considerations like the existence of homology across clades. In response, LeDoux claims that researchers conflate the question of whether animals have emotions with that of whether innate behaviors indicate emotions in the brain (p. 199).

LeDoux’s sustained attack on the view that animals have emotions springs from his dedication to a multistate hierarchical model of consciousness in which when, and only when, sensory and multimodal sites of the brain are re-represented at higher frontal and temporal locations does consciousness arise. Emotions for LeDoux are thus cognitive evaluations (re: readouts) of situations that affect personal well-being, thus they enlist representations and self-awareness (p. 200). According to this view, basic valenced feelings like pain and pleasure are not emotions, but rather consequences of sensory signals that elicit reflexes, innate reactions, arousal, motivation and reinforcement of instrumental learning. It follows that the effect of reward circuit dopamine is reinforcement but not hedonic state, but this does not align with the standard interpretation of pleasure circuits (Kringelbach & Berridge, 2010). LeDoux’s paradigmatic work portrays the amygdala as responsible for detection and initiation of response but not directly responsible for conscious feeling (p. 198). Accordingly, he claims brain circuits are not the source but rather important contributors to experience. What is striking about this way of conceiving of emotions and consciousness is that it would render them quite rare and hardly functional. While this is an empirical question, LeDoux’s position is neither an eliminativism of the Churchland or Dennett variety, nor a functionalist Darwinian view. I argue it is ultimately a confused position resulting from a misconception of the nature of cognition. Epistemologically, this arises from adoption of a computational theory of mind which, rather than

maintaining its focus on the unity of form and function, the primitive motivation of allostasis, and the clear anatomical and behavioral homologies across clade, models the biological phenomena of mind through the metaphorical frame of information, representation, and algorithm (Gabriel, 2021c).

LeDoux's notion of cognition, appraisal, deliberation, and even instrumental learning hinge on the centrality of internal representations. For instance, he portrays prefrontal cortical working memory as a workbench of task-relevant representational bundles, schema, prototypes, and concepts (p. 232). Top-down predictive forms of pattern-completion are depicted as the building blocks of cognition. This is in accord with the current trend in the cognitive sciences, which crowns the Helmholtzian notion of unconscious inference with Bayesian probabilities and models from machine learning that accommodate for error in negative feedback systems (Clark, 2013). Unfortunately, this emphasis on cortical explanation overlooks the fact that other animals engage in highly intelligent behaviors as well. Indeed, it is possible to conceive of ways in which nonrepresentational, direct perception in conjunction with a functional conception of emotions and consciousness can accomplish many of the same behaviors (Asma & Gabriel, 2019). That is to say, a representational theory of how animals engage in adaptive regulation of behavior is no longer the only game in town (Fodor, 1998).

Furthermore, tertiary-level representational processes may not be sufficient for emotions and are almost certainly not necessary for basic conscious experience. LeDoux's focus on cortical factors underplays the role of the Reticular Activating System (RAS) and specifically of the Periaqueductal Gray (PAG) in arousal and as the endpoint of basic survival circuits in the midbrain (Linnman et al., 2012; Venkatraman et al., 2017). The global nature of affective mechanisms that underlie more sophisticated cognitive emotions share anatomical and neurotransmitter resources in midbrain and hindbrain structures (Panksepp, 1998). The representational theory of mind does not adequately describe volumetric and neuromodulatory transmission in the brain (Brette, 2018; Gabriel, 2012). The PAG plays a role in the indication of salience of sensory percepts (Gabriel, 2021a; Seeley, 2019), it modulates behavioral responses and supplies primal emotional tone to appetitive and aversive responses (Motta et al., 2017). In fact, the "mesodiencephalic selection triangle" is an interface bottleneck between the midbrain and diencephalon that carries the "total extent of information by which the forebrain is ever able to generate, control or influence behavior of any kind" (Merker, 2007). This area was described by Panksepp (1998) as the central clearinghouse of affective systems, the SELF, and by Damasio and Carvalho (2013) as the "proto-self."

To allow for an emphasis upon representations and linguistic concepts, this neuroanatomical and functional data are left out of LeDoux's cortico-centric theory of emotions. A more parsimonious approach to the evolution of consciousness, in line with this literature, would place sentience lower in the brain. We could then characterize human consciousness in relation to cortical functions, culture, and language without having to deny that emotions and consciousness are functional aspects of mind for non-human mammals

### 3. Consciousness and self

The dynamic history of life offered in the first part of *The Deep History of Ourselves* evinces a sense of wonder at the flexibility and ingenuity of matter and compels a sense of continuity across forms of life. It seems then an aberration in the logic of analysis when the human mind is portrayed as *sui generis*. LeDoux's description of the interconnections between prefrontal and medial temporal cortices is thorough, up-to-date, and certainly a clear way to understand how representations are integrated, yet it does not also need to be a theory of consciousness. That is because consciousness may be a simpler aspect of self-organizing systems (see, for example, Solms (2021) and Friston (2009)). To portray cognition as the adaptive regulation of states and interactions by an agent with respect to consequences for the agent's viability would allow for a more parsimonious evolutionary story. In this scheme, affect is in service of the self-organizing system as a qualitative signal that directs the organism to address homeostatic imbalances and external factors worthy of attention. Affect as the evolutionarily basic form of consciousness is then a functional property of the organism that has causal efficacy (Damasio, 2018, 2021). If the function of affect as adaptive cognition is the qualitative consciousness of interoceptive and exteroceptive signals (cf. Baars, 1988), and we adopt a monist metaphysical position, then the mind-body problem ceases to be intractable. In [section III](#), I argue this approach is more parsimonious since it allows for an analysis of the mind that accords with the teleology of matter itself.

LeDoux's adoption of functionalism, a key element of cognitivist epistemology, allows him to sidestep the material basis of consciousness. Likewise, rather than face up to ontological issues, cognitive scientists are intent upon distinguishing nonconscious processes from conscious processes through delineation of neural circuitry and the concept of representation (Fodor, 1998). Perusing LeDoux's complicated schematics of ever higher-orders of re-representation necessary to account for consciousness, one may be led to counter the charge of anthropomorphism with another neologism: infoprocessing-morphist. There is potentially no end to the levels of re-representation, especially since we know there is no Cartesian theater and

that the level of connectivity in the brain is iterative, redundant, and complex enough to sustain a dizzying array of interpretations (Llinas, 2001; Pessoa, 2013). In this regard, the cognitive sciences suffer from their own methodologies, viz., determining whether a creature has internal representations consists of positing an accordance between models of information processing functions and modeling behavior. Any behavior that can be modeled in a representational format is thus assumed to be caused by representational processes, but that may simply be an artifact of the flexibility of computation as a system for formal translation, and not an accurate reflection of the nature of the phenomenon under observation. Misguided functionalist intuitions, reification of computational language concerning how the mind works, and cognitive biases derived from a cognitivist epistemology seem to lurk behind this approach.

On the other hand, a more parsimonious approach would accord with LeDoux's claim that the utility of emotions is the ability to personalize value (p. 369) without requiring the further claim that the creature needs to possess a concept of self. For example, Damasio (2021) argues that all that is necessary to feel and to be conscious in that way is the sense of ownership of the valenced feelings. There are many aspects of representation and episodic and semantic memory involved in the possession of an autobiographical self (Klein, 2012), yet, more basic types of self, like the bodily or "core" self can be sustained simply by a continuous relation between the body and its environment (Damasio, 2010). Damasio (2018) for one emphasizes the importance of placing "feelingness within the perspectival frame of the organism" (p. 160). In fact, as LeDoux deftly illustrates in the first part of the book, the organism is always already attuned to its body in space (also, see Dennett, 1996). A more basic bodily perspective likely supersedes auto-noetic, higher-order cognitive aspects of self. We do not need a self-concept or auto-noetic consciousness to personalize value; value is only a meaningful concept in consequence of its possession by a body. Sussing out the exact nature of the self, or self-awareness in LeDoux's scheme suggests that a higher-order representational model is not necessary to account for basic aspects of sentience if one adopts a more parsimonious model of the relation between consciousness and matter as self-organizing form.

#### 4. Culture and biology

The final issue I consider is how LeDoux's focus on higher-order aspects of human behavior leads to a misappraisal of the relation between culture and biology. The fact that we are adept at mediating our emotions through language does not entail that this is the only level of causal efficacy. Rather, we should reflect upon how human forms of observation and



explanation might not be the only frame by which to determine the limits of mind. To focus on culture and language as unique is a way to define our way out of the problem of other (non-linguistic) minds. Indeed, adopting a continuity between the functional role of affect would allow us to avoid one dead end in the study of the evolution of mind, namely the claim that while survival circuits connect us to the history of life, emotions, as mediated by language and culture, are uniquely human (p. 370). There is no doubt that a mind that has language is of a different order than a mind without language (Dennett, 1996), and that is precisely why we should be suspicious of a research program that uses verbal responses as the only reliable method to indicate consciousness. This applies doubly to a research program that claims emotions are nothing more than cultural constructions (Barrett, 2017). There is no doubt that many human emotions are cultural and historical creations, that is because we are acculturated creatures who live in extended niches that consist of a myriad of historical resonances (Laland et al., 2015). Non-human animals have culture, too, but they don't inhabit it in the same way: culture in animals does not have the capability to maintain the same span of time and intersubjective negotiation. It follows that if non-human animals have emotions, they will not be constructed or expressed in the same way: it does not mean that they do not have emotions.

LeDoux focuses too much on linguistically-mediated emotions, this leads him to claim that some emotions, such as the social emotions of guilt and jealousy, as well as existential emotions, do not require survival circuits (p. 366). Who does not experience survival circuit-mediated arousal or motivation when they feel guilty or jealous? Jealousy is precisely the pairing of the sense that someone has something you want or deserve more, and the desire (however sublimated) to correct the situation. Similarly, is it possible that the dizzying aporia of angst and dread that constitutes the existential contemplation of death does not activate physiological responses? In fact, dread and angst are *only* felt states, their content is abstract and ungraspable. That is one of the reasons these emotions are considered to be existential: they do not refer to discrete content, they are simultaneously about everything and nothing. Are these emotions, as LeDoux would have it, actually "shallow," are they exaptations resulting from the alliance of the possession of language and autozoetic consciousness? The evidence points the other way: social and existential emotions are not simply cognitively arousing, but actually effect the consciousness of the thinker by coloring or crowding the experience with the felt accents of emotional upheaval (Nussbaum, 2012).

The disproportionate power awarded to cultural construction of emotion schemas in this recent wave of research is an over-compensation for a lack of understanding of how deeply conditioned to biology our cultural practices really are. Rather than adopt methods from the human sciences and the historical sciences to appropriately appreciate the nature of sociological,



linguistic, and aesthetic phenomena, many researchers have found it easier to assert that culture is an all-powerful determinant of emotions through top-down cognitivism.

The underlying issue behind this confusion is an insufficient conceptualization of the relation between biology and culture. A cognitivist epistemology is not about culture *per se*, it calls for the study of the mental mechanisms by which cultural practices are instantiated in the information-processing model of the individual mind (Putnam, 1975). This is reflected in the high period of cognitive science in which researchers from Michael Gazzaniga to Leon Festinger, Daniel Kahneman, and Joseph LeDoux himself delineated the role of confabulation and cognitive bias in misleading belief states. These are certainly reliable mechanisms, but the cognitivist agenda, that our thoughts are wholly determined by our information-processors misconstrues the continuity between culture and biology. As any anthropologist, or animal ethologist will tell you, culture is a form of biology and thus biology is continuous with culture (Damasio, 2018; Heyes, 2018). Cultural forms such as habitation, ritual, and kinship structures are determined by the biological factors entailed in ecological conditions (Johnson & Earle, 2000; Laland et al., 2015; Lévi-Strauss, 1955/1969). Culture is thus a reflection of ecological factors upon a given species' biological endowment (De Waal, 2001; Gabriel, 2021b). That is to say, a cultural construction is a biological construction that applies the tools of culture. If language is a cultural tool and cognition is indeed an agent's adaptive regulation with respect to consequences for their own viability, then to say that emotions are a cultural construction is only to say that humans use human tools adaptively. Because *we* use language and history as our cultural tools, it does not follow that emotions do not exist in a non-linguistic and non-constructed manner in other creatures. An adequate appreciation of the role of creative practices in the human condition can help us re-align culture with biology. Equally made up of habits, concepts, and rituals, culture is the way we organize our biological resources.

In light of euphonic references to lyrics and music throughout the book, LeDoux's adoption of the conceptual act theory is disappointing. As he suggests, emotions are incorrigible (p. 357), we can observe this in the emotional and intellectual effects of listening to a song. These effects arise not simply due to emotion schemas (though these conceptual acts do play a part), it is rather the many ethereal affective layers of remembered and unconscious experience and associations that make a song so compelling. While art certainly affects us as linguistic conceptual beings, as a sensory experience mediated through our cultural practices, it also has the potential to move us existentially at our non-linguistic core (Gabriel, 2021b). The sense of meaning engendered through participation in a creative practice reveals the many layers of experience that exist beneath higher orders of

representation. It is one of the most powerful emotional clues we possess about the deep history of ourselves.

## 5. Conclusion

*The Deep History of Ourselves* offers a vivid presentation of both the origins of life on our planet and the state of the art of cognitive neuroscience. The explanation of function and connectivity in frontal and temporal cortices is particularly insightful. Where the book falls short is in offering a parsimonious explanation of the role of emotions and consciousness that fits into the description of the evolution of matter proffered in the first part of the book. Further, the cognitivist epistemology pursued in the second half of the book misconstrues the relation between biology and culture, and thus overlooks the ways in which emotions imbue our creative practices with meaning.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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