

What can animals' survival instincts tell us about understanding human emotion?

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Can animals' survival instincts shed additional light on what we know about human emotion? New York University neuroscientist Joseph LeDoux poses this question in outlining a pioneering theory, drawn from two decades of research, that could lead to a more comprehensive understanding of emotions in both humans and animals.

In his essay, which appears in the journal *Neuron*, LeDoux proposes shifting scientific focus "from questions about whether emotions that humans consciously feel are also present in other [animals](#) and towards questions about the extent to which circuits and corresponding functions that are present in other animals are also present in humans."

The neurological common ground between humans and animals includes brain functions used for survival. It is here, LeDoux contends, that researchers may gain new insights into both humans' and animals' emotions.

"Survival circuit functions are not causally related to [emotional feelings](#), but obviously contribute to these, at least indirectly," he writes. "The survival circuit concept integrates ideas about emotion, motivation, reinforcement, and arousal in the effort to understand how organisms survive and thrive by detecting and responding to challenges and opportunities in daily life. Included are circuits responsible for defense, energy and nutrition management, fluid balance, thermoregulation, and procreation, among others."

LeDoux acknowledges that research on feelings is "complicated because feelings cannot be measured directly. We rely on the outward expression of [emotional responses](#), or on verbal declarations by the person experiencing the feeling, as ways of assessing what that person is feeling. This is true both when scientists do research on emotions and when people judge

emotions in their social interactions with one another."

We are even more limited in interpreting animals' emotions.

"When a deer freezes to the sound of a shotgun we say it is afraid, and when a kitten purrs or a dog wags its tail, we say it is happy," writes LeDoux, who is also director of the Emotional Brain Institute, part of the Nathan S. Kline Institute for Psychiatric Research. "We use words that refer to human subjective feelings to describe our interpretation of what is going on in the animal's mind when it acts in way that has some similarity to the way we act when we have those feelings."

But while he concedes that "we will never know what an animal feels," the basis for our interpretations of their emotions could eventually become more informed.

"If we can find neural correlates of conscious feelings in humans-and distinguish them from correlates of unconscious emotional computations in survival circuits-and show that similar correlates exists in homologous brain regions in animals, then some basis for speculating about animal feelings and their nature would exist," LeDoux posits.

LeDoux, a professor in NYU's Center for Neuroscience and Department of Psychology, has worked on emotion and memory in the brain for more than 20 years. His research, mostly on fear, shows how we can respond to danger before we know what we are responding to. It has also shed light on how emotional memories are formed and stored in the brain. Through this research, LeDoux has mapped the neural circuits underlying fear and fear memory through the brain, and has identified cells, synapses, and molecules that make emotional learning and memory possible.

In addition to numerous publications in scholarly

journals, LeDoux has published books that present his work to a wider audience, including *The Emotional Brain* (Simon and Schuster, 1998), which focuses mainly on emotion, and *Synaptic Self: How Our Brains Become Who We Are* (Viking, 2002), which casts a broader net into the areas of personality and selfhood.

Provided by New York University

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