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Introduction to the Special Issue on Neuropsychological Perspectives on Affective and Anxiety Disorders

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Ironically, in spite of the label "affective disorders", research on affective disorders has little to say about just what is disordered about emotion in these illnesses. One major purpose of this Special Issue is to begin to raise this question as a legitimate domain of enquiry in studies of emotion and psychopathology. Historically, the literature on emotion in normal subjects has proceeded almost entirely independently of studies of emotion-related psychopathology (see Ekman & Davidson, 1994 for a review). And, studies on psychopathology make virtually no reference to basic research on emotion in normals. There are many possible points in the stream of processing emotional information where abnormalities may arise which play some role in affective or anxiety disorders. At the most basic level, we must distinguish between the perception of emotional information and the production of emotional responses. Amazingly, there are still studies that fail to make this very basic distinction (see Davidson, 1993 for a review). Some forms of psychopathology, or particular symptoms, may arise as a consequence of abnormalities in perceiving emotional cues, and other forms or symptoms may result from dysfunctions that are more on the output side. Individual differences in certain parameters of affective reactivity or affective style are likely to play important roles in determining an individual's vulnerability to psychopathology. Modern research has underscored the need to go beyond excessively broad concepts such as "emotionality" to specify with greater precision the specific parameters of affective style in which particular groups might differ (see e.g. Davidson, 1992).

Over the past decade, major advances have occurred in our understanding of the brain mechanisms underlying emotion (see Damasio, 1994 and

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LeDoux, 1996 for two influential recent accounts). Research at both the animal and human levels has advanced to the point of providing important new information about the circuitry that mediates specific forms of emotion (e.g. Davidson & Sutton, 1995). This new information is being applied for the first time to understand the circuitry that may be responsible for affective and anxiety disorders (e.g. Drevets & Raichle, 1995).

This Special Issue assembles exemplars of the best research addressing the neuropsychological substrates of affective and anxiety disorders. It features research at many levels, from animal studies of the detailed circuitry subserving fear and anxiety to human studies of cognitive abnormalities in subjects with affective and anxiety disorders. The first article by Davis and Lee provides important new insights about the neural substrates of fear and anxiety. In particular, it elaborates on the role of the bed nucleus of the stria terminalis in the modulation of context effects which may be particularly pertinent to certain forms of anxiety. The next article by Davidson provides a framework for conceptualising individual differences in different parameters of affective style. Drawing on studies of individual differences in prefrontal activation asymmetry and new work on the role of the amygdala in human negative affect, this article distinguishes the circuitry that may be most important to affective versus anxiety disorders, as well as the neural substrates that may be common to both. Tomarken and Keener provide a complementary perspective on the role of the prefrontal cortex in affect regulation. Drawing on the known cognitive operations instantiated in prefrontal cortex, they illustrate how such conceptions may apply to emotion and explain their role in affective disorders. Heller and Nitschke elaborate on a model that distinguishes between anterior and posterior asymmetric contributions to emotion, with the former influencing the valence of an affective reaction and the latter influencing arousal. They illustrate the application of this model to depression and anxiety and in so doing, clarify some of the existing inconsistencies in the literature. Gotlib, Ranganath, and Rosenfeld describe two studies that examined relations between electrophysiological measures of frontal activation asymmetry and depression that replicate and extend extant findings on this topic. They call attention to a number of important methodological issues in this emerging area. NcNally reviews recent studies of attentional and memory differences in anxious subjects versus controls and discusses the possible neurobiological substrates of these information processing deficits. Abnormalities in certain components of circuitry that integrates affect and cognition are highlighted as candidate neural substrates of anxiety-related information processing deficits. Servan-Schreiber and Perlstein describe a novel paradigm to diagnose individual differences in affective reactivity by administering a pharmacological challenge—procaine—known to activate limbic circuitry. They highlight the variability among individuals in response to procaine and suggest that such individual differences predict other aspects of affective style. In the final article by Drevets and Raichle, they underscore the reciprocal nature of local blood flow changes in regions of the brain implicated in emotional and cognitive functioning in response to emotional and cognitive challenges. They suggest that such reciprocal changes in blood flow may account for the disruptions in cognitive performance during the activation of intense fear or depression.

It is my hope that the research featured in these articles will underscore both the enormous progress that has been made over the past several years in elucidating the underlying neural substrates of affect and disorders of affect, as well the large number of questions that still remain to be tackled. Fortunately, there now exist methods for the analysis of human brain function that permit us to begin to answer questions that have never before been addressed. Affective neuroscience has emerged and is bound to become a major approach in our understanding of the nature of emotion, its disorders, and its relation to cognition.

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REFERENCES

Damasio, A.R. (1994). *Descartes' error*. New York: Grosset/Putnam.

Davidson, R.J. (1992). Emotion and affective style: Hemispheric substrates. *Psychological Science*, *3*, 39–43.

Davidson, R.J. (1993). Cerebral asymmetry and emotion: Conceptual and methodological conundrums. *Cognition and Emotion*, *7*, 115–138.

Davidson, R.J., & Sutton, S.K. (1995). Affective neuroscience: The emergence of a discipline. *Current Opinion in Neurobiology*, *5*, 217–224.

Drevets, W.C., & Raichle, M.E. (1995). Positron emission tomographic imaging studies of human emotional disorders. In M.S. Gazzaniga (Ed.), *The cognitive neurosciences* (pp. 1153–1164). Cambridge, MA: MIT Press.

Ekman, P., & Davidson, R.J. (Eds.), (1994). *The nature of emotion: Fundamental questions*. New York: Oxford University Press.

LeDoux, J. (1996). *The emotional brain*. New York: Simon & Schuster.