Advances in neuroimaging methods and techniques and interest in understanding the neural bases of psychological phenomena are rapidly changing how the capacity for self-control is being addressed. An approach dubbed Social Cognitive and Affective Neuroscience (SCAN) integrates research across multiple levels of analysis, leading to important findings that link the basic social, cognitive, and affective processes underlying self-control to their neural substrates. This chapter illustrates how a SCAN approach can be useful for addressing questions including the problem of how to enable researchers from different areas with different types of expertise and interests in self-control to communicate with one another and most effectively use each other’s (sometimes highly technical) theories and methods. Towards this end, we begin by describing the basic goals of SCAN and some of the key challenges facing researchers who adopt this approach. We then describe how this approach is currently being used to build an integrative understanding of the processes underlying a particular type of self-control process that involves actively reinterpreting the meaning of an emotionally evocative stimulus to meet and/or modulate ones’ feelings. We conclude by discussing important future research directions in this area.
Biopsychological and Neural Processes of Implicit Motivation
Julie L. Hall, Steven J. Stanton, and Oliver C. Schultheiss

in Implicit Motives
Published in print: 2010 Published Online: May 2010
Item type: chapter

In this chapter we provide an overview of recent research on the biopsychological correlates of implicit motives. We review evidence for a role of gonadal steroids (testosterone and estradiol) as well as stress axis activation in power motivation arousal and satisfaction/frustration, summarize recent research on the role of progesterone and affiliation motivation, and discuss a possible role for arginine-vasopressin in achievement motivation. We also present findings from brain imaging work that indicate that the needs for power, affiliation, and achievement modulate activity in a core motivational circuit consisting of striatum, amygdala, orbitofrontal cortex, and insula when nonverbal social incentives are processed.

LINKING EARLY ADVERSITY, BRAIN, AND DEVELOPMENTAL PSYCHOPATHOLOGY
Vladimir Miskovic and Louis A. Schmidt

in Cognitive Neuroscience, Development, and Psychopathology: Typical and Atypical Developmental Trajectories of Attention
Published in print: 2012 Published Online: September 2012
Item type: chapter

Mounting evidence indicates that early life adversity is associated with increased vulnerability for psychiatric impairment across the lifespan. Until recently, most human studies in this field have been epidemiological in nature and focused on linking early life stress to complex clinical outcomes. This chapter advances a developmental psychophysiological model, where the chapter emphasizes the importance of considering the widespread brain systems that exert a strong influence on emotional reactivity and its regulation. This chapter reviews some of the recent work from our research group that has attempted to trace the effects of prenatal insults (using extremely low birth weight as a proxy marker) and those occurring in the postnatal time period (child maltreatment) on the functional integrity of key components within this affective neurocircuitry. The chapter emphasizes
the value of non-invasive psychophysiological measures in helping to bridge the developmental pathways between early experience and psychological outcomes.

How Primary-Process Emotional Systems Guide Child Development
Jaak Panksepp

in Evolution, Early Experience and Human Development: From Research to Practice and Policy

Published in print: 2012 Published Online: January 2013
Publisher: Oxford University Press
DOI: 10.1093/acprof:oso/9780199755059.003.0004
Item type: chapter

All mammals share homologous primary-process emotional circuits, verified by the capacity of artificial activation of these systems to mediate “rewarding” and “punishing” effects in humans and other animals. These systems (SEEKING, RAGE, FEAR, CARE, PANIC/GRIEF, and PLAY) mediate social functions. These bottom-up primal emotional networks are fundamental for emotional reinforcement processes that regulate secondary-process learning and memory and lead to a diversity of higher cognitive functions, which, primarily via neural plasticity and learning, provide various top-down regulatory factors for emotional homeostasis as well as amplification of psychic disturbances. Many of the interminable controversies in psychological emotions studies may be due to different investigators focusing on different levels of organization within these multitiered levels of circular causality. A better understanding of the emotional primes can help guide the development of coherent new ways to optimize child development.

Understanding the Neurobiology of Core Positive Emotions through Animal Models
Jaak Panksepp

in Positive Emotion: Integrating the Light Sides and Dark Sides

Published in print: 2014 Published Online: April 2014
Publisher: Oxford University Press
DOI: 10.1093/acprof:oso/9780199926725.003.0008
Item type: chapter

This chapter summarizes the primary-process (“core”) positive emotions that are the birthrights of mammals and the foundations of the human mind, and which are next to impossible to understand through human research alone. However, the use of affective neuroscience strategies
in animal emotion research provides novel paths toward a better understanding of primal human emotions and how they can move in and out of balance. The goal of this chapter is to 1) provide historical background into the study of human and animal emotions, 2) summarize cross-species work on positive core-affects through current animal research, 3) describe the subcortical emotion circuits that promote positive affects, and 4) discuss how affective neuroscience strategies can be used to facilitate development of positive affect enhancing psychotherapies. Acceptance of a cross-species strategy to such issues, long resistant to scientific analysis, promotes research efforts that can lead to a deep neuroscientific understanding of positive affects and their beneficial effects on human thriving and resilience.

The Social Neuroscience of Empathy
Jean Decety and William Ickes (eds)

In recent decades, empathy research has blossomed into a vibrant and multidisciplinary field of study. The social neuroscience approach to the subject is premised on the idea that studying empathy at multiple levels (biological, cognitive, and social) will lead to a more comprehensive understanding of how other people’s thoughts and feelings can affect our own thoughts, feelings, and behavior. In the chapters in this book, leading advocates of the multilevel approach view empathy from the perspectives of social, cognitive, developmental and clinical psychology, and cognitive/affective neuroscience. Chapters include a critical examination of the various definitions of the empathy construct; surveys of major research traditions based on these differing views (including empathy as emotional contagion, as the projection of one’s own thoughts and feelings, and as a fundamental aspect of social development); clinical and applied perspectives, including psychotherapy and the study of empathy for other people’s pain; various neuroscience perspectives; and discussions of empathy’s evolutionary and neuroanatomical histories, with a special focus on neuroanatomical continuities and differences across the phylogenetic spectrum. The new discipline of social neuroscience bridges disciplines and levels of analysis.
Ideas for an Affective “Neuro-physio-phenomenology”
Giovanna Colombetti

in The Feeling Body: Affective Science Meets the Enactive Mind
Published in print: 2014 Published Online: May 2014
Publisher: The MIT Press
DOI: 10.7551/mitpress/9780262019958.003.0006
Item type: chapter

This chapter introduces the enactivist research program of “neurophenomenology”, and argues that it should be applied to the scientific study of emotion experience. Affective neuroscience so far has focused primarily on developing third-person methods for the generation of data about brain and bodily activity during emotion, but has paid relatively less attention to the possibility of developing first- and second-person methods for the generation of data about experience. Drawing on neurophenomenology, I argue that affective neuroscientists should also focus on developing first- and second-person methods, and on integrating them with already existing third-person methods. I argue further that such an integrated “affective neuro-physio-phenomenology” could help answer some longstanding questions in affective science. For example, it could help scientists understand whether emotions such as fear, anger, etc. come in different experiential varieties, which would in turn help interpret concomitant brain and bodily activity; and it could help investigate the bodily nature of emotion experience, including how experience relates to actual brain and bodily activity.

Positive Affect and Adolescent Development
Dana L. McMakin and Ronald E. Dahl

in Positive Emotion: Integrating the Light Sides and Dark Sides
Published in print: 2014 Published Online: April 2014
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Item type: chapter

Adolescence is a developmental period characterized by marked changes in emotion, motivation, and many aspects of behavior, which influence—and are influenced by—neural systems of positive affect. In particular, there is growing interest in a set of changes in reward processing during pubertal maturation, as reflected by heightened emotional, cognitive, and physiological reactivity to cues of reward, that contribute to increased appetitive motivation to explore novel, arousing and rewarding situations. On one hand, these changes confer risks. Greater reward-seeking tendencies can contribute to negative spirals of emotion and behavior including substance abuse and addiction,
risky decision-making, and reckless behavior. Alterations in reward processing also may contribute to the increased risk for developing affective disorders in adolescence. On the other hand, these same shifts in reward processing can lead adolescents to healthy versions of exploration and learning, including opportunities for motivational learning that is directed towards increasingly abstract and distal rewards, such as navigating new romantic relationships, or pursuing academic, athletic, or artistic goals. In this chapter, we highlight recent research on changes in positive affect systems in adolescence, and how such changes may relate to these positive and negative growth trajectories of emotional and behavioral health during adolescence. We conclude with a translational discussion of when, how, and for whom might there be clinical opportunities to leverage this affective inflection point to positively shape development. Using targeted intervention strategies to provide the right type of training and experience during key windows of neuromaturational change in positive affect systems could improve adolescent health and development, and reduce morbidity and mortality across the lifespan.

Decision Making, Affect, and Learning
Mauricio R. Delgado, Elizabeth A. Phelps, and Trevor W. Robbins (eds)

Published in print: 2011 Published Online: May 2011
Publisher: Oxford University Press
Item type: book

This latest volume in the Attention and Performance series focuses on two of the fastest moving research areas in cognitive and affective neuroscience — decision making and emotional processing. This book investigates the psychological and neural systems underlying decision making, and the relationship with reward, affect, and learning. In addition, it considers neurodevelopmental and clinical aspects of these issues, for example the role of decision making and reward in drug addiction. It also looks at the applied aspects of this knowledge to other disciplines, including the growing field of Neuroeconomics. After an introductory chapter, the book is arranged according to the following themes: psychological processes underlying decision-making; neural systems of decision-making; neural systems of emotion, reward and learning, and neurodevelopmental and clinical aspects.
Positive Affect Systems in Depression
Greg Siegle, Erika Forbes, and Jennifer Silk

in Positive Emotion: Integrating the Light Sides and Dark Sides
Published in print: 2014 Published Online: April
Publisher: Oxford University Press
DOI: 10.1093/acprof:oso/9780199926725.003.0022

The prevailing psychiatric diagnostic system considers depression a monolithic syndrome that is characterized by either high negative affect or low positive affect, without differentiating between these characteristics. This view has prevailed despite models from clinical psychology and affective neuroscience that posit unique implications of low positive affect, as well as increasing understanding of the functional neuroanatomy of disruptions in positive affect in depression. This chapter takes the stance that there is meaningful dimensional variability in positive as well as negative affect in depression, and that this variability can give rise to multiple syndromes within the disorder. We begin by reviewing the historical context for examining positive affect and its interplay with negative affect in depression. Next, we propose an integrated model of depression, comprised of potential syndromes that reflect different combinations of altered positive and negative affect. We identify three potential syndromes associated with abnormalities of positive affect based on the neural, behavioral, and phenomenological characteristics of those who suffer from depression. These include “high reactors” who react strongly to both positive and negative information, “negative ruminators” who interpret positive information as negative, and “blunted reactors” who have decreased reactions to positive as well as negative information. All three groups differ from healthy individuals who reliably display more positive than negative affect. We describe neural bases for these syndromes, address the developmental context in which they occur, and finally propose future directions for research.

Emotional Foundations of Creativity
Jaak Panksepp

in Secrets of Creativity: What Neuroscience, the Arts, and Our Minds Reveal
Published in print: 2019 Published Online: September 2019
Publisher: Oxford University Press
DOI: 10.1093/oso/9780190462321.003.0011

Emotion in the brain generated by subcortical brain circuits provides the foundation for creativity. Creativity is ultimately a higher brain process that is grounded in a variety of primal affective states of mind, mainly of
the emotional variety. Of these emotional systems, the brain’s SEEKING system, arises from the medial forebrain bundle, which connects many regions of the lower brainstem and midbrain to the many higher regions of the brain, with especially rich innervation of the medial frontal cortex. This system, often known for prompting curiosity and exploration and giving rewards, is probably the most important brain engine for creativity. Animals share this core, primary emotional system with humans, despite the evolution of massive neocortices that are distinct for human creativity. But there are no intrinsic urges for creativity in the cortex itself. From an affective neuroscience perspective, the study of the emotional system in animal models can significantly serve for understanding the motivational sources of creativity in humans.

The Integrative Meaning of Emotion
Daniel J. Siegel

in Evolution, Early Experience and Human Development: From Research to Practice and Policy
Published in print: 2012 Published Online: January 2013
Item type: chapter

Jaak Panksepp's chapter offers a view of the role of subcortical processes in the generation of affective states in humans and how they relate to not only our primate cousins but also, even broader, our mammalian classmates. Our experience of “animalian” emotional life is shaped by our membership in the animal kingdom, a membership that reveals what it means to be an emotional being on this planet. The chapter provides a summary of Panksepp's groundbreaking work on affective neuroscience and the view of how subcortical circuits play a dominant role in affective life.

Integrating Evolutionary Affective Neuroscience and Feminism in Gender Research
Leslie L. Heywood and Justin R. Garcia

in Gender, Sex, and Sexualities: Psychological Perspectives
Published in print: 2018 Published Online: January 2018
Item type: chapter

Tensions between feminist and biological theories applied to human behavior have generated extended debate. The debate has been
multifaceted, with threads focusing on, for instance, particular forms of evolutionary theorizing, the relationship between scholarly and popular discourses, and the relative appropriateness of scientific and humanistic methods of inquiry into human experience. Although many issues remain contentious, in recent years feminist researchers have been making a strong case for the integration of scientific insights into feminist paradigms. Theoretical innovations in evolution, development, and neuroscience point to ways of addressing long-standing tensions between scientific and feminist theory in a manner that honors and requires contributions from both. This chapter focuses on the relevance and complementarity of affective neuroscience to feminist theory.

The Function of Positive Emotions in Exploration

Hans L. Melo and Adam K. Anderson

in Positive Neuroscience

Published in print: 2016 Published Online: June 2016
DOI: 10.1093/acprof:oso/9780199977925.003.0014

In this chapter we examine the relation between positive emotions and cognition, and we argue that exploration is more than just a response to fulfilling life-supporting needs such as food and shelter, but that it also facilitates the development of higher cognitive resources, such as flexibility and creativity, and may further support enhanced levels of well-being. We propose that positivity is associated with frontally mediated exploratory capacities that impact the flexibility and scope of cognition and affect, whereby positive emotions may help individuals become more flexible, discerning, and creative in their approach to present experience, while at the same time building resources for coping with setbacks and obstacles for the future. Finally, we explore how the field of imaging genetics might help elucidate the link between genetics, positive emotions, cognition, and well-being as well as the underlying neural mechanisms by bridging across different levels of inquiry.

Cognitive Biology

Luca Tommasi, Mary A. Peterson, and Lynn Nadel (eds)

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DOI: 10.7551/mitpress/9780262012935.001.0001

In the past few decades, sources of inspiration in the multidisciplinary field of cognitive science have widened. In addition to ongoing vital
work in cognitive and affective neuroscience, important new work is being conducted at the intersection of psychology and the biological sciences in general. This book offers an overview of the cross-disciplinary integration of evolutionary and developmental approaches to cognition in light of these new contributions from the life sciences. This research has explored many cognitive abilities in a wide range of organisms and developmental stages, and results have revealed the nature and origin of many instances of the cognitive life of organisms. Each section of the book deals with a key domain of cognition: spatial cognition; the relationships among attention, perception, and learning; representations of numbers and economic values; and social cognition. Chapters discuss each topic from the perspectives of psychology and neuroscience, brain theory and modeling, evolutionary theory, ecology, genetics, and developmental science.

Linguistics and the Scientific Study of Religion
William Downes

in Religion, Language, and the Human Mind
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Publisher: Oxford University Press
Item type: chapter

Registers of language are cultural templates, normatively constituting the situation types that make up a culture, and yet reciprocally determined by the situation’s linguistic requirements. This chapter proposes that a register such as prayer has typical psychological effects within the mind/brain of its users. These make it also a cognitive register, a linguistically enabled and shaped way of thinking and feeling. This process is analysed using cognitive pragmatics, more specifically relevance theory. Processing petitionary prayer can produce specific psychological effects. It is proposed that the petitions are not directive speech acts, but tools for learning. Petitionary prayer also shapes affectivity and motivation. This is explored using Panksepp’s concept of the SEEKING system. The mind-brain of one who prays is trained into habits of understanding and feeling otherwise unavailable. By bringing together these two approaches, the sociological and the psychological, the essay investigates how a cultural linguistic practice shapes religious cognition.