

Methodological and Biological Background, provides a detailed explanation of methodology, issues involved in researching development in social neuroscience, and a comprehensive summary of the neuroanatomy of the developing social brain. Section III, *Perceiving and Communicating with Others*, includes eight chapters on perception of social information and communication, including face processing, perception of eye gaze, emotion, imitation, adolescent mentalizing, development of communication, and the evolutionary origins of social communication. Section IV, *Relationships*, focuses on relationships and social development including attachment, mothering, and romantic relationships. In Section V, *Regulatory Systems: Motivation and Emotion*, four chapters focus on the development of regulatory systems including temperament, reward systems, neurobiology of attachment, and social decision-making. The final Section VI, *Perspectives on Psychopathology*, includes six chapters on adolescent depression, development and neural bases of psychopathology, autism, genetic syndromes, international adoptions, and early abuse and neglect.

For developmental and pediatric neuropsychologists, the research reviews contained in this book are important to understand and consider in our research or clinical work. Clearly, social perception and functioning develops interactively with and parallel to attention, sensory, motor, visual-spatial, language, and memory systems. As this volume makes clear, neuropsychology often neglects quantitative assessment of emotional and social processing and functioning in assessments. This will likely need to change if the intent is to conduct comprehensive and meaningful research in developmental neuropsychology. Important risk factors for poor social development that should be addressed clinically or considered in research are covered in this volume, and the reader is strongly encouraged to use “hot” executive measures in assessments, including of emotional regulation, affect perception, and theory of mind.

For those who are not familiar with the research field of developmental neuroscience, Drs. DeHaan and Gunnar are thoughtful, well published, and collaborative investigators who present us with a book that has many strengths. The organization of this volume is nearly flawless and the authors assembled include experts in their respective topic areas. As

is often the case with comprehensive, invited volumes, one of the downsides is that some overlap in information is present across the chapters. The upside to this, however, is that each chapter is like a stand-alone literature review paper summarizing the research as well as the authors’ views on what is important to know right now, what are the limitations, and what research is essential to move that area along.

I note a few chapters that should be highlighted as likely of particular interest for pediatric neuropsychologists. Chapter 3, *Neuroanatomy of the Developing Social Brain*, by Payne and Bachevalier provides an easy to read and clear summary of which neural systems are involved in mediating the development of social skills. Chapter 6 by deHaan and Metheson, *The Development and Neural Bases of Processing Emotion*, Chapter 8 by Decety and Meyer, *Imitation as a Stepping Stone to Empathy*, and Chapter 10 by Mills and Conboy, *Early Communicative Development and the Social Brain*, made me think intensely about how to consider these issues in assessing infants and preschoolers. Chapter 9 by Choudhury, Charman, and Blakemore, *Mentalizing and Development during Adolescence*, and Chapter 20 by Pine, *A Social Neuroscience Approach to Adolescent Depression*, emphasized the importance of considering social development and its impact on depression in all adolescent research and assessment. Finally, each of the chapters summarizing the literature on social neuroscience of psychopathology was particularly informative.

Handbook of Developmental Social Neuroscience is highly recommended for use as a comprehensive summary of a new and important field in developmental cognitive neuroscience. This volume will serve as an important reference book for pediatric neuropsychologists doing research or clinical work in early-life developmental areas. This would make an excellent textbook for graduate studies and post-doctoral studies in developmental neuroscience and pediatric neuropsychology. Because of the fast progression of research in these areas, the first edition of this book is likely to become a classic, with further additions hopefully continuing to summarize this important and exciting field. In summary, I would highly recommend this book to any professional involved in research or clinical practice related to early development of neuropsychological functions.

Demystifying Emotion

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Handbook of Emotions, Third Edition. Michael Lewis, Jeannette M. Haviland-Jones and Lisa Feldman Barrett (Eds.). (2008). New York: The Guilford Press, 848 pp., \$95.00 (HB).

Reviewed by KATHLEEN PATTERSON, PH.D., *Zablocki VAMC, Milwaukee, WI; Behavioral Medicine and Neurology, Medical College of Wisconsin, Milwaukee, WI, USA*.

The definition of emotion was once thought to be unfathomable, ethereal, and ineffable and, thus, an inappropriate

topic for scientific study. *Handbook of Emotions, Third Edition* represents a solid compilation of key interdisciplinary research

and theoretical underpinnings related to the multifaceted and multidimensional concept of emotional processing. It integrates emotion as not only part of the whole person but as part of the family and larger society. Given the explosion of research on emotion over the last 2 decades, this book makes a timely and masterful contribution to the understanding of what has been accomplished and to further research. The new chapters on olfaction and neuroimaging are particularly pertinent given novel investigatory tools. Especially inspiring is the focus on positive emotions rather than the historic almost exclusive emphasis on negative emotions. The long-standing question of "What is emotion?" is finally being answered.

Regarding the organization of this book, in Part I, Solomon sets the stage for a psychological odyssey and exploration of the science of emotional experience. Understanding emotion from a philosophical point of view, from the historical to the contemporary, begins with Socrates allocating emotions to the background while emphasizing reason, through to Aristotle, who wedded behavior, cognition, physical arousal, and social context with emotion, the "humours" of the Middle Ages, Descartes' "six 'primitive' passions," Kant, Nietzsche's (somewhat disconcerting for his contemporaries) celebration of passion, to the twentieth century dichotomy in North America and England with emphasis on logic and science and in Europe with an emphasis on conceptualizing the structure of emotion. Solomon highlights the central role of "neurophilosophy" based upon neurophysiologic investigations of emotions. He concludes that experiencing and understanding our emotions "makes life worth living" (p. 14).

Stearns emphasizes the validity of the study of emotions in their own right. Stets and Turner advocate for research in more naturalistic settings in order to be able to assess the dynamic character of the intensity of emotional arousal and encourage researchers to move in the direction of conceptualizing a culture of emotion. Panksepp addresses the pathways from neural activity to affective experience, identifying subcortical networks as integral to the latter. In addition, he underscores the similarities of basic emotional systems in all mammalian brains, promoting animal research as valuable in understanding emotion. Frijda highlights the need to clarify the mechanisms by which the individual appraises stimuli by interdisciplinary communication and sharing of knowledge bases. Greenberg strongly encourages a central role for the analysis and re-education or re-regulation of dysfunctional emotional responses in psychotherapy with the goal of helping to develop more adaptive emotional responses. Johnson-Laird and Oatley explore how a percept of a work of art gives rise to the emotional experience of the same and argue that understanding of the emotional experience can be reached through art as it expresses emotion. Tooby and Cosmides liken the brain to a computer with emotions functioning as intricate information-processing programs. Finally in Part I, Rick and Loewenstein look at how emotions influence monetary behavior from a consequentialist model of decision-making. The unifying theme across all essays is that there is abundant opportunity for more research on emotion by creating an interdisciplinary

"brain bank" and expanding the research arenas to include natural rather than contrived settings.

Overall, Part II is a tantalizing voyage into the brain that can be read and reread without exhausting possibilities for continuing research. Biological and neurophysiologic approaches to understanding emotion are explored. LeDoux and Phelps provide an excellent synopsis of the anatomical organization of fear as the conscious awareness of the activity of the emotional systems, i.e., the interaction of the anterior cingulate, insular cortex, and orbital and prefrontal cortices. Thus, working memory monitors and appreciates the activity of the emotional systems in the brain. In the chapter entitled *The Psychophysiology of Emotion*, the authors outline their goals as combining functional magnetic resonance imaging with more traditional psychophysiological recordings to study autonomic, somatic, and central nervous system systems along with such others as the immune system. They suggest identifying the component processes that result in an emotional experience. Using the study of laughter as a prototype, Bachorowski and Owren propose that the primary function of acoustics is to influence ultimate behavior by influencing the listener's affect. Regarding facial expressions of emotion, the authors of the next entry present an evolutionist approach and have created particularly informative and succinct reference tables. Haviland-Jones and Wilson offer a superior review of the physiology of olfaction and relate "semiochemicals" to human performance, hypothesizing that mood information is conveyed effectively, perhaps without conscious awareness at times, by chemosensory signals.

In the *Neuroimaging of Emotion*, the authors summarize a meta-analytic review of 163 studies with the goal of locating those regions in the brain most consistently activated across a range of emotion-related tasks. The reader should be aware when reading this section that the very informative color plates reflecting regions of activation are located at the end of Part II rather than at the close of the essay. Craig closes this section with a discussion of interoception, beginning with a description of the ascending pathways associated with the sensory representation of the physiological condition of the body. He posits that the fundamental neuroanatomical basis for all human emotion is "the limbic sensory representation of subjective 'feelings' (in the anterior insula) and the limbic motor representation of volitional agency (in the anterior cingulate), together forming the fundamental neuroanatomical basis for all human emotions" (p. 272). Indeed, it is hypothesized that mental health may depend upon the interactions between the left and right insula and cingulate.

Developmental perspectives are summarized in Part III. Cumras and Fantanio offer a dynamic systems perspective. Lewis presents a schema for the development of emotions over the first three years of life. Harris addresses the child's understanding of emotion with a focus on guilt. He encourages the inclusion of children in family discussion of emotion to increase understanding of and insight into emotions. A bioecological framework is presented by Saarni as she views people as dynamic entities, who reciprocally interact with the community. Widen and Russell present a

hierarchical model of emotions. Walker-Andrews discusses the multimodal nature of emotional communications or affect within the family setting, and hypothesizes that even infants can appreciate affective meaning. A most interesting question is posed by Magai in speculating that research on the retardation of the aging process could be applied to human life. If senescence could be delayed, what would be the effect on the emotional development in humans? Her thought is that there would be additional serial relationships and perhaps “blended families” (p. 388). She concludes with, “What’s wrong with that?” (p. 388). Indeed, new vistas open with the possibility of delay of senescence.

Parts IV and V were initially combined in the previous edition of this work. Part IV will gratify the philosophically minded, while Part V could mire one in the semantics of conceptualization if read in one sitting. The main theme of Part IV seems to be that we do not stand alone with our emotions and that cultural efficacy depends upon one’s perception and adaptive use of emotion in a larger context. Brody and Hall view the differential expression of emotions by males and females as being adaptive in the fulfillment of their respective prescribed gender-specific societal roles. In the *Cultural Psychology of the Emotions*, the authors state that different values and belief systems result in societal structure. They reference the eight basic emotions of a Sanskrit text, reminding the reader that mere translations are insufficient to capture the quality of emotional states in a particular culture. Smith and Mackie posit that emotions are not specific to individuals alone, but may characterize a group with which one identifies. They caution that one must be aware of the impact group identification has on emotional processing. Hoffman encourages psychology to recognize the role of affective empathy in research. Fischer and Manstead state that emotions are essential to form and maintain social relationships, and our position relative to others in a society.

Part V reflects the complex interplay between the internal emotional state of the individual or group with which one identifies and the larger society. Lucas and Diener argue that the subjective well-being of the population could be tracked by governments in order to guide future policy decisions. Bates, Goodnight, and Fite hypothesize that temperament may impact adjustment in society, but degree of adjustment depends on the person’s emotional regulation coupled with the impact of environmental factors. Gross presents the theory that one tends to regulate one’s emotions in light of consequences and their relationship to one’s goals. He describes the control of a person over their emotions and emotional impact on the person of the former as an “intricate dance” (p. 509). A literature review of the concept of emotional complexity is offered by Lindquist and Feldman Barrett. They conclude that the greater the flexibility and adaptability of the person, the better one negotiates the emotional world.

Part VI addresses many diverse aspects of cognition and their interface with emotion. In *Emotional Intelligence*, the authors state that individuals differ in skill level related to perceiving, interpreting, regulating, and utilizing emotional information with the goal of achieving emotional well-being

and eventual growth. Isen champions positive affect as the catalyst for encoding and storing positive information and memories, to organize thought, and to increase cognitive flexibility by increasing the ability to cope and decreasing defensiveness. She correlates this state of having a positive affective valence with increased dopamine, and encourages further research in this area. Stein, Hernandez, and Trabasso encourage the analysis in children as well as in adults of the thought processes that precede, accompany, and follow the experience of emotion to elucidate the physiological processes that occur at each stage in real time, as the emotional experience is highly complex and tied to time and goals. Niedenthal posits that emotional constructs are essential for understanding our world, for planning appropriate behaviors, and for creating an adaptive behavioral repertoire. Kensinger and Schachter focus on stimuli, which change a person’s internal state, and how these internal states in turn affect memory. The focus is on the limbic modulation of emotion-laden experiences. According to these authors, future research would do well to focus on selective effects of memory and the neural mechanisms of emotion that underlie them. For those readers who are adherents to theories based upon Minsky’s computational concepts, they will delight in the synopsis of the 2006 Minsky work, “The Emotional Machine.” Clore and Ortony discuss the processes by which cognition shapes affect into emotion by reviewing appraisal theory.

Health and emotions are addressed in Part VII. A fresh perspective is offered by the authors of the first entry in this section related to self-regulation. They discuss the roles that emotions have in their effect on cognitions, which in turn impact health behaviors. Going beyond Hans Selye and the HPA Axis, Kenemy and Shestyuk focus on the specific neuroendocrine and immune system changes that may support adaptive behavioral responses. They recommend the union of affective neuroscience, health psychology, and psychoneuroimmunology in future research efforts. Consigned discusses the highly complex relationships between personal emotions and the environment from a developmental functionalism perspective. Kring identifies emotion-based symptoms and disturbances that are common across several DSM-IV-TR disorders. The summary table is well-organized and highly useful.

Select emotions are addressed in Part VIII. Ohman discusses the relationship between fear and anxiety and suggest that, although both arise in response to a threat, fear is functional when activity can be useful in dealing with the threat and anxiety arises when coping mechanisms are not available or salient. Lerner and Dodge address the socialization of anger both within and outside of the nuclear family. Lewis discusses the need to observe bodily actions more than just facial expressions when studying what he terms the “self-conscious” emotions of embarrassment, pride, shame, and guilt. He states that the ability to consciously evaluate our own emotions is central to our emotional lives and that cognitive processes are the elicitors of such emotions. Rozin, Haidt, and McCauley treat disgust in evolutionary, developmental, and cultural contexts. They view disgust as originally

in evolution a way in which to avoid harm to the body, as in avoiding tainted food, that has developed into a way in which to avoid “harm to the soul” (p. 771). Fredrickson and Cohn use broaden-and-build theory to discuss how vulnerable fleeting emotional states can result in lasting strengths and feelings of well-being. Finally Bonanno, Goorin, and Coifman eloquently discuss how sadness and grief differ.

In conclusion, this thoughtful compilation of literate jewels in the area of emotion research from a multidisciplinary perspective is an indispensable resource and guide for anyone

who is interested in the study of humanity. From the historical investigation of emotion to the intricate neurophysiologic bases of feeling, this handbook will serve as a useful text in any graduate level course related to human development. The ineffable is on the way to being elucidated from many different perspectives that will culminate in a better understanding of man. The fourth edition of this work may include research on the fruit-fly derived postponement of senescence and the quality of the related emotional odyssey into the uncharted waters of healthy very old age.

Recent and Relevant

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The Two Halves of the Brain: Information Processing in the Cerebral Hemispheres, Kenneth Hugdahl & René Westerhausen (Eds.). 2010. Cambridge, MA: The MIT Press, 694 pp., \$75.00 (HB).

Applied Clinical Neuropsychology: An Introduction, by Jan Leslie Holtz. 2011. New York, NY: Springer Publishing, Company, 514 pp., \$95.00 (PB).

Successful Remembering and Successful Forgetting; A Festschrift in Honor of Robert A. Bjork, Aaron S. Benjamin (Ed.). 2011. New York, NY: Psychology Press, 541 pp., \$80.00 (HB).

Recovery from Stuttering, by Peter Howell. 2011. New York, NY: Psychology Press, 390 pp., \$80.00 (HB).

OCD Treatment Through Storytelling: A Strategy for Successful Therapy, by Allen H. Weg. 2011. New York, NY: Oxford University Press, 189 pp., \$32.95 (HB).

Auditory Neuroscience: Making Sense of Sound, by Jan Schnupp, Israel Nelkin, and Andrew King. 2011. Cambridge, MA: The MIT Press, 356 pp., \$40.00 (HB).

Handbook of Pediatric Neuropsychology, Andrew S. Davis (Ed.). 2011. New York, NY: Springer Publishing, Company, 1214 pp., \$195.00 (HB).

Cognitive Science: An Introduction to the Science of the Mind, by José Luis Bermúdez. 2011. New York, NY: Cambridge University Press, 492 pp., \$60.00 (PB).

Forgetting: Current Issues in Memory, Sergio Della Sala (Ed.). 2010. New York, NY: Psychology Press, 338 pp., \$75.00 (HB).

Memory in Mind and Culture, Pascal Boyer and James V. Wertsch (Eds.). 2009. New York, NY: Cambridge University Press, 323 pp., \$105.00 (HB).

Networks of the Brain, by Olaf Sporns. 2011. Cambridge, MA: The MIT Press, 412 pp., \$40.00 (HB).

Rehabilitation of Visual Disorders After Brain Injury, Second Edition, by Josef Zihl. 2011. New York, NY: Psychology Press, 270 pp., \$70.00 (HB).