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President's Column

The Proper Role of Psychology in Psychopathology Research: Four Noble Truths

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As the premier organization of psychologists who perform psychopathology research, it might be appropriate for us to self-reflect and better understand the proper role of psychology in psychopathology research. We are witnessing major changes in the federal budget and an overall decline in funding available for mental health research, resulting in an even more intense competition for limited resources. This makes the

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need to define our research agenda ever more acute since we are now competing with biological psychiatry, molecular genetics and other neighboring biological disciplines for an increasingly more limited pool of funds. As a recent graduate of one of the NIMH study sections that reviews the more biologically-oriented psychopathology research, the Clinical Neurosciences and Biological Psychopathology (CNBP) study section, and as a participant in a number of other NIMH activities over the past several years, I have made several observations regarding the role of psychology in the enterprise of psychopathology research that I wish to share. I hope that this brief essay will provoke more self-reflective thought about the unique contribution we as psychologists can make in this arena. I also believe that this should be a call to act on behalf of our discipline in the debates that are occurring about the future of biobehavioral research funding. It is not meant to polarize or stereotype the various disciplines that are now involved in mental health research, but rather to draw attention to the unique niche that we occupy.

Psychologists study process: There are numerous basic psychological processes that have been implicated in various forms of psychopathology, such as learning, memory, attention, emotion, language. The study of such processes is part of the historically constituted subject matter of psychology. One of psychology's great strengths is the commitment to understand the role of these processes in behavior and the development of methods for their measurement. There are many examples of research on the role played in various forms of psychopathology by abnormalities in these fundamental processes. For example, a large corpus of research suggests that particular forms of attentional dysfunction may underlie certain symptoms of schizophrenia. A growing literature suggests that other forms of attentional dysfunction occur in phobic disorders, attention deficit hyperactivity disorder and in psychopathy. Patients with a wide spectrum of psychopathol-

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ogy including schizophrenia, affective and anxiety disorders, psychopathy and autism exhibit deficits in different components of emotional processing. The analysis of abnormalities in these fundamental processes and the understanding of how they relate to specific symptoms exhibited in these disorders has played a crucial role in specifying the underlying mechanisms that give rise to the constellation of overt symptomatology that we observe. This level of analysis is also crucial for meaningful dissection of complex behavior into more elementary constituents that can then yield to biological and genetic study.

A corollary of this general claim is that psychologists develop clever ways to measure these constructs. Recognizing that many mental operations proceed in the absence of consciousness, psychologists have led in the development of laboratory paradigms to capture different types of processes such as emotion, attention, and memory that would otherwise elude detection by simple self-report measures. Many of the laboratory tasks that are now being used in psychopathology research are also guided by the recent findings from cognitive and affective neuroscience and are chosen on the basis of their ability to reflect specific brain operations that have been validated in experiments in animals and normal human subjects. Studies that examine relations between performance on such laboratory tasks and specific symptoms of different disorders have helped to delineate the core dysfunctional processes that underlie different forms of psychopathology. Parsing individual differences on the basis of performance on neurally-inspired measures that reflect specific brain operations is likely to be of enormous benefit to studies that focus on relations between molecular genetics and behavior. There have been a recent flurry of reports on relations between scores on self-report measures of personality and symptomatology and the presence of specific alleles that code for neurotransmitter receptors and transporter molecules. Without going into details, some of these findings have already failed to replicate; the status of others is still in question. Psychologists with expertise in the cognitive and affective neuroscience of psychopathology will play a crucial role in helping to define the phenotype with better measures of the underlying psychological processes that have been parsed to reflect specific brain operations. Individual differences reflected in such measures are likely to be more faithfully associated with molecular genetic variation.

Psychologists are grounded in a tradition of research on normal function: Related to the focus on process is the fact that psychology as a discipline is grounded in research on normal psychological processes. Psychologists who do psychopathology research are usually well versed in basic research on normal personality, developmental, social and/or cognitive psychology. There are several consequences of this fact. First, most of the paradigms we use in psychopathology research have first been applied in studies with normals where many of the methodological kinks and conceptual conundrums have been solved or at least addressed. Second, the grounding in research on normal function sometimes affects our understanding of abnormality. The processes we examine are usually measured on continuous scales and abnormalities may be viewed as representing extremes on dimensions that are continuous with normal functioning. On the other hand, psychologists have also pioneered the development of methods to more quantitatively ascertain the extent to which the distribution of scores on a particular set of measures is best understood as taxonic or continuous. The continuing application of these methods will have important bearing on our understanding of relations between normal and abnormal functioning for different psychological processes.

Grounding in the study of normal function also provides psychologists with a special appreciation for the complexities in defining what is abnormal. One issue that has been salient particularly in developmental psychopathology is the role of context in understanding particular symptoms. For example, it is normative for a child confronted by novelty to show some wariness and fear. However, if such behavior were displayed in contexts that are familiar, it would likely be considered abnormal. Psychologists are likely to play a leading role in considering the significance of context in the assessment of particular symptoms.

Psychologists study the environment: Tremendous progress has been achieved in understanding the genetic influences on behavior both

from quantitative genetic approaches as well as from more recent studies investigating molecular genetic influences. This progress and the associated enthusiasm must not obscure the importance of the environment for behavior. As a number of commentators have noted, genetic research provides the best available evidence for the importance of environmental influences. In most cases, genetic factors account for no more than half the variance in behavioral processes or disorders. Psychologists have been champions of the environment at various points in the history of our discipline. Although earlier simple-minded ideas that emerged from the behaviorist era in psychology have appropriately fallen, psychology is the discipline that is committed to understanding environmental influences on behavior. Our neighbor discipline of neuroscience has revealed with unparalleled impact the extraordinary role the environment plays in shaping brain function and brain structure. Gene expression itself is at least in part under environmental control. Psychologists have a unique opportunity to provide sophisticated measures of environmental factors that play an important role in the development and maintenance of psychopathology. Expressed emotion is one example of an environmental influence that seems consequential in the maintenance of many different forms of psychopathology. By joining in hybrid interdisciplinary teams, psychologists can facilitate the understanding of the effects of these identified sources of environmental variance on proximal biological factors that mediate specific patterns of symptomatology. Such environmental influences may be particularly important early in development when the brain is undergoing significant maturational change. A developmental neuroscience of psychopathology has not yet emerged though clearly is poised to make major contributions to our understanding of the complex interaction between environmental and biological influences that surely plays a crucial role in the development of psychopathology.

Psychologists study the brain as the organ underlying mental operations: In the first chapter of his monumental work *The Principles of Psychology*, William James noted that the brain "is the one immediate bodily organ underlying the mental operations." So important was this assertion to James that he argued that the entire remainder of the two volume *Principles* was but a footnote to this claim. Today the neurosciences represent an extraordinarily fertile hybrid discipline that ranges from the molecular to the integrative. Those psychologists who study the brain, particularly those who work at the human level, have tended to heed James' admonition concerning the role of the brain in mental activity and behavior. I believe this perspective is important to the study of brain function in psychopathology since it constrains theories to address how and why specific brain mechanisms and circuits might give rise to the disorder in question. This is a very different approach than that adopted in other quarters where the focus has often been on the identification of "markers." Just why a particular marker might be associated with a specific disorder or pattern of symptoms is not a primary question in such approaches. Relatedly, the causal status of the marker in producing the symptoms or disorder in question is often not considered in such analyses. Psychologists are likely to study the brain at a level that is useful to understanding behavior. Moreover, rooted in the questions that have historically driven the discipline, they are apt to include measures of behavior along with measures of brain function in their studies. Thus, rather than simply identifying a biological correlate of a disorder in question, psychologists have often studied the relation between specific patterns of brain function and severity of particular symptoms, as well as the performance on specific tasks that have been selected to reflect core psychological deficits. It is my belief that the study of brain mechanisms underlying psychopathology will benefit from the level of analysis most commonly adopted by psychologists.

Conclusion: In this brief essay, I have focused on four salient themes that I believe are truths about the unique contributions of psychology to the study of psychopathology. The focus on process, the grounding of psychopathology research in a tradition of research on normal function, the study of the environment and the focus on the brain as the organ underlying mental operations define a unique niche occupied by psychologists doing psychopathology research. Having highlighted these truths, I also hasten to add that we cannot go at it alone and must collaborate with our neighboring disciplines to achieve a full understanding of the etiology, maintenance and treatment of psychopathology. The approaches we

champion are necessary but not sufficient for the complete analysis of the disorders we seek to understand. However, the clear understanding of the special contributions we make should help us in our efforts to secure our fair share of federal funding for our research and also guide us in our training endeavors as we prepare the next generation of scientists who study psychopathology. ■

Forthcoming Publications by Members

Alloy, L.B., Abramson, L.Y., Murray, L.A., Whitehouse, W.G., & Hogan, M.E. (in press). Self-referent information processing in individuals at high and low cognitive risk for depression. *Cognition and Emotion*.

Barch, D.M., Cohen, J.D., Servan-Schreiber, D., Steingard, S., Steinhaver, S.S., & von Kammen, D., C. (in press). Semantic priming in schizophrenia: An examination of spreading octivation using word pronunciation and multiple SOAS. *Journal of Abnormal Psychology*.

Bergman, A., Wolfson, M., & Walker, E. (in press). Neuromotor functioning and behavior problems in children at risk for psychopathology. *Journal of Abnormal Child Psychology*.

Blanchard, J.J., Mueser, K.T., & Bellack, A.S. (in press). Anhedonia, positive and negative affect, and social functioning in schizophrenia. *Schizophrenia Bulletin*.

Bruder, G.E., Stewart, J.W., Mercier, M.A., Agosti, V., Leite, P., Donovan, S., & Quitkin, F.M. (in press). Outcome of cognitive-behavioral therapy for depression: Relation to hemispheric dominance for verbal processing. *Journal of Abnormal Psychology*.

Burack, J.A. (in press). The study of typical and atypical populations in developmental psychopathology: The quest for a common science. In S.S. Luthar, J.A. Burack, D. Cicchetti, & J.R. Weisz (Eds.), *Developmental psychopathology: Perspectives on risk and disorder*. New York: Cambridge University Press.

Burack, J.A., & Enns, J.T. (Eds.), (in press). *Attention, development, and psychopathology*. New York: Guilford Press.

Burack, J.A., Hodapp, R.M., & Sigler, E. (Eds.), (in press). *Handbook of mental retardation and development*. New York: Cambridge University Press.

Clark, L.A., Livesley, W.J., Schroeder, M.L., & Irish, S. (1996). The structure of maladaptive personality traits: Convergent validity between two systems. *Psychological Assessment*.

Cohen, J.D., Braver, T.S., & O'Reilly, R.C. (in press). A computational approach to prefrontal cortex, cognitive control, and schizophrenia. Recent developments and current challenges. *Philosophical Transactions of the Royal Society, Biological Sciences*.

Cohen, J.D., & Schooler, J.W. (Eds.) (1997). *Scientific Approaches to Consciousness: 25th Carnegie Symposium on Cognition*. New Jersey: Lawrence Erlbaum Associates.

Cromwell, R.L., Sewell, K.W., & Langelle, C. The Personal construction of traumatic stress. In B.E. Walker, J. Costigan, L.L. Viney, & W. Warren (Eds.), *Personal construct theory: A psychology for the future*. Melbourne, Australia: APS Imprint Books.

Docherty, N.M. Affective reactivity of symptoms as a process discriminator in schizophrenia. *Journal of Nervous and Mental Disease*.

Dworkin, R.H., Carrington, D., Cunningham, A., Kost, R., Levin, M., McKendrick, M., Oxman, M., Rentier, B., Schmader, K.E., Tappeiner, G. Wassilew, S.W., & Whitley, R.J. (in press). The assessment of pain in herpes zoster: Lessons learned from antiviral trials. *Antiviral Research*.

Faraone, S.V., Seidman, L.J., Kremen, W.S., Toomey, R., Lyons, M.J., Tsuang, M.T. (in press). Neuropsychological functioning among the elderly nonpsychotic relatives of schizophrenia patients. *Schizophrenia Research*.

Garber, J., Robinson, N.S., & Valentiner (in press). The relation between parenting and adolescent depression: self-worth as a mediator. *Journal of Adolescent Research*.

Goldstein, P.C., Rosenbaum, G., & Taylor, M.J. (in press). Assessment of differential attention mechanisms in seizure disorders and schizophrenia. *Neuropsychology*.

Goodman, S.H., Lahey, B.B., Fielding, B., Dulcan,