The Promise of Behavioral Medicine: A Review of Pomerleau and Brady's *Behavioral Medicine: Theory and Practice*

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Since the turn of the century major advances have been made in the control of acute, infectious diseases. Death rates for the leading causes of death in 1900 (influenza and pneumonia, tuberculosis and gastroenteritis) are only a fraction of what they once were. This decline in infectious diseases when coupled with the substantial increase in the average life expectancy since 1900 might lead one to conclude that we are much healthier now than at the turn of the century. Unfortunately, strong claims of better health for the adult population are not warranted since much of the gain in life expectancy is attributable to a decline in infant and childhood mortality. In fact, an examination of appropriate tables from the U.S. National Center for Health Statistics reveals that the life expectancy for a 50 year old white male has changed little since 1900. Examination of the leading causes of death for the U.S. in the mid 1970's (cardiovascular disease, cancer, cerebrovascular disease) reveals that infectious diseases have been largely replaced by diseases which have important behavioral factors implicated in their etiology. Thus it seems that a key to the further improvement of health and longevity in the United States, as well as other industrialized countries, lies in the recognition of "diseases of life style" and the development of effective means of controlling important health-related behaviors. Given these setting conditions, the emergence of the field known as "behavioral medicine" seems only reasonable.

While behavioral research and applications to health problems are not recent phenomena, the rate of activity over the last five years has been truly remarkable. We have witnessed the formation of the Society of Behavioral Medicine, the publication of the *Journal of Behavioral Medicine* and the publication of a number of popular books (e.g., Farquhar, 1978; Friedman and Rosenman, 1974; Pritikin and McGrady, 1979) and professional books (e.g., Fordyce, 1976; Glass, 1977; Katz and Zlutnick, 1975; and Williams and Gentry, 1977) on the general topic of health and behavior. Unfortunately, none of these books provides a comprehensive overview and evaluation of behavioral medicine. This gap in the literature has been filled by the recent publication of *Behavioral Medicine: Theory and Practice* by Pomerleau and Brady (1979).

Pomerleau and Brady, both eminent clinicians and researchers in behavioral medicine, have assembled a collection of twelve chapters which covers a variety of basic concepts (such as learning and conditioning, behavioral epidemiology) as well as a sampling of representative clinical applications in behavioral medicine. The clinical applications range from areas where therapist's control of environmental contingencies predominates (behavioral pediatrics and pain management) to areas emphasizing self-management procedures (smoking and weight management). The chapters are written by widely acknowledged experts in their area of coverage and generally consist of a review and discussion of the accumulated behavioral literature in a particular area with varying degrees of critical evaluation of that

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literature. Most of the chapters are written at an advanced introductory level presumably to make the book “. . . one which allows the medical practitioners to grasp the potential benefits of the scientific analysis of behavior and which also allows the behavioral scientist to recognize the medical significance of various health habits” (Pomerleau and Brady, 1979, p. v).¹ Thus some behavioral interventions are described in detail (e.g., pain management programs), and physiological and medical background is presented in some chapters (e.g., hypertension).

Perhaps the first four chapters, which deal with basic concepts, deserve special comment since procedures and concepts discussed in these chapters form the basis of clinical applications reviewed in later chapters.

An introductory chapter by Pomerleau and Brady reviews the historical development of behavioral medicine and offers a definition of behavioral medicine. The definition is laudable in that, unlike prior definitions (Schwartz & Weiss, 1978a, 1978b), the emphasis on techniques derived from the experimental analysis of behavior is clearly acknowledged. While the proposal of definitions seems a common (perhaps even necessary) step in the evolution of a new area of study, the authors clearly recognize the tentative nature of such definitions as reflected in the following statement: “Ultimately a field is defined by what it does; if conditions change, then the definition of behavioral medicine should be modified accordingly.” (p. xii).

The introductory chapter also contains a useful overview of major themes in behavioral medicine. These themes include: 1) management of a behavior which in itself constitutes a problem (e.g., sexual dysfunctions); 2) management of the behavior of a health-care provider (e.g., “malpractice” behaviors); 3)

adherence to treatment regimens (e.g., the ingestion of hypertension medication); and, 4) management of health-related behaviors for the prevention of disease (e.g., smoking). With the exception of the second theme, each of these themes is well represented in subsequent chapters. The lack of coverage of the second theme undoubtedly reflects the relative paucity of literature in this area. While this omission is understandable, it is unfortunate given the potential for behavioral contributions to medical education and staff management with health care providers.

While not traditionally considered a major theme in behavioral medicine, the use of sensitive and objective behavioral measures to assess the effects of chemical interventions should be given priority equal to that of the four previously mentioned themes. An extensive body of basic behavioral literature has been developed under the rubric of “behavioral pharmacology” (Thompson and Schuster, 1968) and “behavioral toxicology” (Weiss and Laties, 1975). A number of recent applied reports using behavioral measures to study the effects of chemical independent variables (e.g., Marholin, Touchette and Stewart, 1979; Rose, 1978; Shafto and Sulzbacher, 1977) suggest the potentially important contributions which might be made by behavioral psychologists in drug evaluation research.

A chapter on behavioral epidemiology by Sexton lists the ten leading causes of death in the United States in 1973 and cites research associating one or more behavioral components with nine of them. This collection of epidemiological research is impressive and lends credence to Sexton's statement “. . . that the prevention and control of the major causes of death in the United States will involve management of the life style or personal behavior of the individual” (pp. 3-4). She also points out the weaknesses of correlation based epidemiological research and briefly discusses the potential contributions that a science of

¹All page references are to Pomerleau and Brady, 1979.

behavior might make to experimental epidemiological research requiring the systematic modification of risk-related behaviors as an independent variable.

The second chapter written by Brady, is entitled "Learning and Conditioning" and provides an introduction to basic principles and concepts of behavioral psychology. Unfortunately, the overview of basic principles is brief and several relatively complex but important topics (e.g., concurrent and compound schedules of reinforcement) are covered without the benefit of health-related examples to clarify the concepts or the implications for behavioral medicine. Those without prior behavioral training may have some difficulty gaining a full understanding and appreciation of behavioral principles, concepts, and research strategies based on this brief introduction. Furthermore, much of the technical terminology introduced in this chapter is not used in subsequent chapters of the book. Rather than simplifying the coverage of basic principles and concepts, the addition of examples relating basic concepts to the analysis of health-related behavior would have helped clarify the concept and its implications for understanding and managing health-related behavior. The continued use of advanced concepts in subsequent chapters would have been most welcome.

The remainder of Brady's chapter is devoted to an excellent review of basic research on the relationship between behavioral variables and physiological responses. The chapter covers classical conditioning of physiological responses, instrumental conditioning (popularly known as biofeedback) and concurrent learning (physiological changes systematically related to ongoing operant behaviors). With the exception of a brief section in Chapter 3 (Biofeedback), this is the only section of the text which reviews a body of relevant literature with non-human organisms as subjects. A discussion of the implications of this research

for clinical applications would have been most beneficial.

The third chapter is an overview of basic concepts and representative applications of biofeedback by Shapiro and Surwit. Despite some overlap with Brady's coverage of instrumental conditioning of physiological responses and subsequent chapters on musculoskeletal and stress-related disorders (Chapter 7) and hypertension (Chapter 9), the chapter makes a number of valuable contributions to the text. First the authors acknowledge the central role of operant conditioning methods in biofeedback, an important clarification for an area in which non-scientific and often mystical explanations abound. Second, their review of selected applications not only points out successful applications of biofeedback but also highlights inconsistent results, methodological problems, the absence of clearly documented superiority of biofeedback over less specific behavioral techniques and the relative paucity of data on generalization and maintenance all of which leaves "the clinical utility of this type of training . . . largely unanswered" (p. 61). This seems an appropriately skeptical evaluation of biofeedback research and a welcome contrast to less conservative claims often made for biofeedback. A number of their suggestions for future research (e.g., the use of portable instruments with permanent product records, training under "stressful" situations) sound promising while other suggestions, especially a call for large scale clinical trials of biofeedback, seem premature.

Chapter 4, on self-management by Mahoney and Arnkoff, begins with an unnecessary and inadequate attempt to summarize the complex conceptual issues of recent debates on self-reinforcement and the nature of determinism (Bandura, 1976; Catania, 1975; Goldiamond, 1976a, 1976b; Mahoney, 1976; Thoreson and Wilbur, 1976). However, the strategy the authors adopt for defining "self-

control”—analysis of the conditions under which the label is applied—seems perfectly reasonable. In the ensuing review of self-control techniques the use of a number of non-operational terms such as the “salience” of behavioral goals (p. 85) and “perception of contingencies” (p. 89) contribute little to a scientific analysis of “self-management.” Similar terms occur in other chapters (e.g., “expectancy” in discussing the behavioral effects of alcohol consumption, p. 256). My objection to such terms is not based on a preconceived notion about the existence of the phenomena to which these terms refer but is based on the role of such terms in the analysis of the controlling variables for behavior. At best, such terms seem to be “pseudo-explanations” which in turn must be explained by reference to historical or current environmental variables (see Skinner, 1977 for a more detailed discussion of this and related issues).

The remaining chapters cover a variety of clinical applications in behavioral medicine. Chapters on Behavioral Pediatrics, Sexual Dysfunction, Hypertension, and Smoking contain especially good methodological critiques of research in their respective areas. The chapters on Sexual Dysfunction and Chronic Pain provide excellent discussions of assessment and measurement problems. Several chapters (e.g., Behavioral Pediatrics) conduct insightful theoretical analyses of problem behaviors which consider multiple and subtle controlling variables. The only obvious inconsistency is between Stoyva's relatively positive evaluation of electromyographic (EMG) feedback (Chapter 7) as contrasted with the more cautious conclusions drawn by Shapiro and Surwit regarding EMG biofeedback (pp. 59-60).

The chapter by Stunkard (Chapter 12, Behavioral medicine and beyond: The example of obesity) is unique in the scope of its suggestion for future directions in behavioral medicine. Stunkard begins

with a review of the behavioral literature on weight control. He points out that behavioral weight management has the longest and most distinguished history of all the clinical applications subsumed under behavioral medicine, and currently enjoys widespread public acceptance. However, in summarizing his evaluation of the behavioral literature on weight management he concludes that “. . . the results are modest, and from the standpoint of clinical utility, disappointing” (p. 287). He continues his evaluation by pointing out that “Clinically significant weight losses achieved by behavioral treatment for obesity are not well maintained” (p. 287) and goes on to suggest “. . . that the limits of effectiveness of current behavioral technologies for the control of obesity may have been reached” (p. 287).

Stunkard then discusses the need for programs to influence the health-related behaviors of large groups (e.g., Farquhar, Maccoby, Wood et al., 1977) and the potential for improving health through the structuring of reinforcement contingencies defined by a number of powerful institutions such as the food and insurance industries, mass communications media and government. Stunkard's suggestions for a public health emphasis in behavioral medicine are both intriguing and exciting. While the magnitude of the tasks proposed is nearly overwhelming, the potential health benefits more than offset the complexity and size of the task and seem to guarantee the behavioral psychologist an important role in health care and health promotion efforts of the future. The potential role of large employers in arranging special contingencies to promote health-related behaviors of their employees should also be given serious consideration.

Behavioral Medicine: Theory and Practice provides an authoritative overview of the emerging field of behavioral medicine. The chapters are well written, appropriately critical and suggestive of

future research and application directions. While I have some minor reservations on the appropriateness of the text without supplementary materials on behavioral research methods and principles for audiences without a behavioral background, the book certainly seems appropriate for advanced undergraduate and graduate psychology courses.

After completing this book, I found myself slightly disappointed, not by the book itself, but by the current status of the field of behavioral medicine. I had hoped, perhaps unrealistically, that we had made more progress during the relatively short time during which behavioral research has been conducted in areas relating to health. However, the collective reviews of research in behavioral medicine reveal only a small number of areas (e.g., enuresis and the treatment of certain sexual dysfunctions) in which effective and replicable behavioral interventions have been convincingly documented. Conclusions regarding the effectiveness and clinical importance of interventions for a large portion of behaviors reviewed must be drawn very cautiously. While encouraging progress has been made in many areas, much of the literature is characterized by one or more of the following problems which compromise our ability to make firm interpretative statements: the reliance on potentially invalid measures of behavior (e.g., self-reports); the lack of adequate experimental designs; the presence of conflicting results without adequate analysis of their source; failure to attempt replications; and, the lack of data on generality and maintenance of behavior change.

Much of the research in behavioral medicine and in the field of applied behavior analysis in general is of a technological nature in that heavy emphasis is placed on *treatment* of behavioral problems by the introduction of procedures (independent variables) whose effects are sufficiently powerful to override the effects of existing variables

which were ostensibly responsible for the development and maintenance of the problem behavior. Such technological research is important but should not be pursued to the exclusion of analytic research in which the emphasis is placed on identification and *understanding* of the factors responsible for the development and maintenance of behavior.

Analytic research might yield multiple benefits, two of which relate to crucial issues in behavioral medicine. First, the identification of environmental variables responsible for the early acquisition of health-enhancing or risk-increasing behaviors would be of particular importance in primary prevention and public health applications. Second, the analysis of controlling variables for behaviors in the "untampered-with" environment will greatly assist the development of behavioral interventions with broad generality. Many applied researchers superimpose a relatively powerful intervention on a set of existing but unanalyzed controlling variables for a given behavior. Major problems occur when we wish the behavior changes produced by our powerful treatment to occur in non-treated settings or we when wish the behavior changes to continue after we have terminated the treatment. Treatment-produced behavior changes will often cease to occur in non-treatment environments unless these behavior changes contact naturally occurring or specially programmed sources of reinforcement. This should not be surprising since the non-treatment environment may still be characterized by unanalyzed contingencies of reinforcement which were crucial to the development and maintenance of the behavior in the first place. The identification and analysis of contingencies of reinforcement in the untampered-with environment seems a crucial step in arranging for behavior changes to occur in non-treatment environments.

Additional analytic research might

focus on the identification of behavioral processes responsible for the effectiveness of replicable behavior change interventions emanating from "non-behavioral" theoretical orientations. After all, if an intervention is effective (changes behavior), its effectiveness depends on the operation of some behavioral process. The careful analysis of any effective intervention might not only result in improvements in the effectiveness or efficiency of that intervention but might also facilitate the study of as yet unanalyzed controlling variables. Careful attention to what non-behavioral researchers *do* as opposed to their interpretations (which may be mentalistic or otherwise misleading) seems a crucial guiding principle for researchers embarking on such an endeavor.

The analysis of factors responsible for between subject variability in response to behavioral interventions is also an important area for further research. It seems that the failure to reproduce a behavioral effect across subjects is taken all too lightly, as if the occurrence of the behavioral effect in a high percentage of the subjects was perfectly adequate to make firm conclusions about an independent variable. It seems a mistake to assume that science operates on a "majority rule" basis. Failures to reproduce a behavioral effect should be taken as an indication of an incomplete understanding of the variables under study, and research should be initiated to track down the causes of the unexplained variability. There are undoubtedly important differences in individual history and behavioral repertoires which interact with interventions to produce between subject variability in treatment effects. The identification of important sources of between subject variability so that maximally effective interventions can be designed for each individual would do much to establish the credibility of behavioral psychologists in the medical community.

Not surprisingly, only a few areas (e.g., hypertension) contain research with

physiological measures whose health consequences are widely recognized. Even fewer studies contain data on health endpoints (e.g., morbidity and mortality rates) associated with behavioral interventions in their area. Only recently have large-scale longitudinal clinical trials (e.g., Multiple Risk Factor Intervention Trial, 1976) relying primarily on behavior changes as independent variables been implemented. The success of such epidemiological research will be closely tied to the ability of researchers to produce and document substantial and durable changes in important health-related behaviors for subjects under study.

In drawing these pessimistic conclusions about behavioral medicine, let me acknowledge that major advances have been made in recent years as evidenced by the publication of *Behavioral Medicine: Theory and Practice* and the body of literature reviewed in this book. However, the contribution of behavioral psychology to the improvement of health remains largely a promise, albeit a bright one whose fulfillment seems closely tied to a number of factors. First, we should be especially careful to train prospective practitioners of behavioral medicine in basic concepts of behavior and the implications of those concepts for the understanding and control of health-related behaviors. Second, we should avoid premature claims of the development of health-promoting behavioral medicine technologies lest our credibility with health care professionals and the general public be seriously and irreparably damaged. Third, we must develop effective public relations efforts with physicians and other health care professionals. The development of an effective technology in behavioral medicine and emphasis on the advantages of a behavioral (natural science) approach to the control of health-related behaviors will do much to promote behavioral medicine. Additionally, emphasis on the

interdisciplinary nature of health care and the role of behavioral medicine as an adjunct to (not as a replacement for) traditional health services seems particularly important to improving public relations with health care professionals. Finally, and most important, we need to renew our emphasis on the research methods and analytic research strategies which have been crucial to the dramatic advances in behavioral psychology over the last forty years.

It seems likely that Pomerleau and Brady share a similar evaluation of the importance of research strategies when they write, "To date, the most important contribution made by behavioral medicine is not its specific recommendations for treatment but its emphasis on the rigor of scientific methodology for dealing with problems in medical care which involve behavior" (p. xxiv). A careful consideration of the nature of the research questions asked (c.f., Platt, 1964) and the manner in which such questions are asked (c.f., Johnston & Pennypacker, 1980) would do much to further the progress of behavioral medicine over the upcoming decade.

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