The Acquisition and Maintenance of Behavioral Skills: A Response to Michael

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A response to Michael's (1980) presidential address to the Association for Behavior Analysis is presented. The position is taken that in many instances we have failed to adopt a behavioral approach to dealing with problems within our field concomitant with the shift from an emphasis on behaviorism and a science of behavior to technology. It is argued that we need to be sensitive to the data and consider the contingencies that are operating within the culture. A general strategy and some tactics are presented to acquire and maintain behavioral skills.

At the 1980 annual meeting of the Association for Behavior Analysis, Michael (1980) characterized his presidential address as a "state of the union" message consisting of "telling the good news, and who should receive credit for it; the bad news, and who is to blame . . . and what we can do about it" (p. 1). It is an important paper since it focuses on the development and current status of our field and raises serious questions about the prospects for behavior analysis to grow as a science of human behavior, and to contribute to our society and humankind in general. His address to the Association has since been published in the Fall, 1980 issue of *The Behavior Analyst*.

As such, it seems important to examine Michael's comments and respond particularly to those issues which seem most controversial. This paper, then, is a "commentary" in which I (a) briefly review what Michael said, (b) offer a slightly different analysis of the current

problems within our graduate training programs and our field in general, and (c) offer some additional and perhaps alternative "solutions" to those which he proposed.

A REVIEW OF MICHAEL'S POSITION

The Good News

Basically, the good news identified by Michael is that in the last 40 years, the field of behavior analysis has shown substantial growth. He emphasized the development of principles of behavior, increasing resource materials, and the extension of behavior analysis to diverse aspects of human activity. The strength of behavior analysis was characterized by noting that "the ease with which relevant knowledge can be transmitted . . . is closely linked to the availability of written material that can serve instructional purposes" (p. 1).

As signs of growth, Michael also cited an increase in personnel, the development of behavioral undergraduate and graduate psychology programs, and a large number of conferences on various aspects of behavior analysis. In summary, Michael noted that from the standpoint of the teacher more instructional materials are available to teach a larger number of students involved in learning.

In fact, I am in substantial agreement with Michael's views concerning the development and current problems within the field of behavior analysis. It is certainly not necessary to look very far to docu-

Preparation of this paper was in part supported by Calhoun County Community Mental Health. Appreciation is expressed to George Boswell, Executive Director, and to Luann Proteau, Sharri Upton, Tina Knapp, and Donna Swift who typed various drafts of the manuscript. Appreciation is expressed to Carl Johnson for taking the time to listen and especially to Wayne Fuqua who provided the contingencies. I also appreciate the many helpful comments by Chuck Lowe, Paul Mountjoy, Dale Brethower, Janel Harris, Paul Yoder, and Gerry Gaydos. I accept full responsibility, however, for interpretations expressed and any inaccuracies in the paper. Requests for reprints should be sent to the author at 87 Lathrop Avenue, Battle Creek, Michigan 49017.

ment the growth of the field in terms of personnel, aspects of human activity to which behavior analysis has been expanded, or the number of instructional materials available for transmitting knowledge to new generations of behaviorists. A cursory look at any number of behavioral journals or attendance at the annual meetings of the Association for Behavior Analysis will substantiate that fact.

The Bad News

The bad news, according to Michael, is that "these highly desirable materials seem to be influencing a smaller and smaller proportion of the increasingly large number of people working in the field" (p. 5). He traced his own attempts to contribute to the science of behavior and "behavioralize the culture" (p. 6) and suggested that others who entered the field prior to 1970 could be characterized by a similar commitment to finding out as much about behavior as possible, a considerable familiarity with the behavioral body of knowledge, and a view of behaviorism as more important for the survival of the species than just as a particular psychological approach.

A shift in emphasis. However, according to Michael, a shift occurred during the early 70's away from viewing behaviorism as a basis for understanding the human condition and behavior analysis as a basic science toward viewing behavior analysis as a profession, with the result that behavioral psychology has emerged as the basis for a relatively specific technology. He attributes the shift to four changes. First, there has been an infusion into the field of people who view behavioral technology as a means to help *individuals* rather than as a means to produce *broad cultural change*.

Second, an outcome-cure research orientation has developed which is characterized by an emphasis on the independent variable, packaged independent variables which are not analyzed according to basic behavioral components, and decreased continuity among specific research attempts and the general behavioral field.

Third, demands of the applied market

place have resulted in a de-emphasis on behavioral courses in our graduate curricula as other topics have been added.

Finally, efforts to disseminate our subject have resulted in a reduction in the extensiveness and complexity of "instructional packages" which are used for workshops and college instruction. Michael suggests that while none of the above four developments are in themselves undesirable, they have in combination had a definite detrimental effect on the analytic and philosophical aspects of behavior analysis.

Harmful effects of the shift. Michael noted that as a result of the shift in emphasis, some members of the field have recently suggested that it is no longer necessary for people in applied settings to learn anything about basic research methods and results (Note 1), although he clearly disagrees with that view and identified a number of detrimental outcomes which could accrue as a result of such a divorce (1980, pp. 11-16). He acknowledged Branch and Malagodi's (1980) concern that the commitment to behaviorism has been dampened by mentalistic psychologists and that reinforcement and punishment contingencies at work in non-behavioral settings all too often result in a change in the verbal behavior of the fledgling behaviorist to a non-behaviorist view in which mentalistic concepts assume a central role in the determination of behavior.

In summary, the bad news consisted of less generalizable independent variables in applied settings, decreased critique and direction from the applied field to basic researchers, decreased sensitivity to useful basic findings by applied workers, increased superficiality (especially with respect to remote contingencies and verbal behavior) and increased dilution of the behavioral approach with mentalistic common sense terms.

There is considerable substantiation for Michael's contentions that (a) the availability of such instructional materials does not ensure that people working in the field will be influenced by them and that (b) within the last ten years a shift has occurred away from behaviorism and basic

science toward behavior analysis as a profession and as a basis for a technology of helping people. Recent articles by Ferster (1978), Deitz (1978), Hayes (1978), Birnbrauer (1979), Pierce and Epling (1980), Branch and Malagodi (1980), and Hayes, Rincover, and Solnick (1980) have all expressed concern about various aspects of this "drift." Others (e.g. Azrin, 1977) have suggested that focusing on outcome in the applied setting is appropriate and that the applied behaviorist should be both scientist and practitioner. However, if we are concerned about the future of behavior analysis as a science and the future of our culture, it seems clear that a shift in emphasis within the field which results in superficial analysis, loss of generality, and inability on the part of many behavior analysts to extrapolate basic findings to applied settings is detrimental.

The Solution

However, I find it necessary to take issue with some of Michael's views concerning factors responsible for the problems in the field and, in particular, the solutions he proposed.

Michael suggested that in order to generate the repertoires needed in the field of behavior analysis and increase the probability that behavior analysts will remain capable and committed to the philosophy of behaviorism and the science of human behavior, we need to improve our graduate training programs by "increasing the depth of training in several essential areas" (p. 17). In order to accomplish this task, he made the following recommendations.

Package the digressions. Michael suggested that we should "package the digressions" (e.g., mental health law, systems analysis, evaluation research) that are "crowding behavior analysis out of our programs" (p. 17) since the behavioral psychologist only needs to know "enough to stay out of trouble and talk to the experts in the field" (p. 17). He suggested that all of this material could be abbreviated into self-instructional units and taught within one semester, leaving more time to learn behavior analysis.

In addition, Michael suggested that

students who are primarily interested in such topics should be "encouraged" to leave the field of behavior analysis in order to pursue their chosen field of interest.

A program in behavior analysis. Michael conceded that at the present time, he was unable to describe the necessary repertoire for behavior analysts in terms of competencies; rather he identified three main areas in terms of relevant teaching materials: basic science, applied science, and behaviorism (p. 18), and displayed these areas in terms of a sample of text materials which could be used to teach them, emphasizing that the extensiveness of the list was intended only to illustrate the range of topics which should be included in the curriculum. Additional topics which he identified as part of the curriculum were history of the field and practice at behavioral interpretations of alternative points of view. He argued that to develop a repertoire at a doctoral level of expertise in behavior analysis would require at least four years of intensive graduate training—comparable to a doctorate in Chemistry.

Teach it better. Michael's final suggestion was that it will require teachers who are "at least more knowledgeable in all aspects of the various areas than the students they are instructing" (p. 18). He argued that preparing for class and interacting with students regarding the subject matter are not things that can be easily delegated to a teaching assistant and suggested that verbal aspects of the student's repertoire might best be taught through apprenticeship since students need to behave verbally and have their verbal behavior reacted to by someone who thoroughly understands the issues.

He warned that his recommendations involved more time and effort as well as disregarding the preferences of many students, colleagues, and the marketplace. However, he pointed out that the field of behavior analysis started under conditions when all of these things were ignored because the potential gain was worth the effort and social aver-siveness. He concluded that it still is (p. 20).

AN ALTERNATE ANALYSIS

The Ultimate Irony: A Strategic Error

However, while I agree that we need highly trained, committed professionals, I am not sure that ignoring the demands of the marketplace is a good idea. I also think that it is possible to expand on Michael's notion of how to train our professionals in order to produce the behavior change experts who are ostensibly needed to enhance the probability that our species will survive.

Analyzing the entire system. In essence, I think that our biggest problem may be that we have sometimes failed to utilize a behavioral approach in our attempts to behavioralize the culture. Skinner (1972c) has noted that "changing a culture is itself a cultural practice, and we must know as much as possible about it if we are to question it intelligently" (p. 40). One graphic method of displaying the relationship between behavior analysts and the rest of the culture is in terms of a Total Performance System (Brethower, 1972), as in Figure 1. The attempt at this point, of course, is not to present an *exhaustive* functional analysis of the variables which control the behavior of behavior analysts within the university or in research or clinical settings. Figure 1 simply highlights the fact that individual behavior as well as the direction of the field as a whole will not be solely influenced by ourselves and the resources which we control. Others within the culture who constitute members of the "receiving system" for the products of our efforts (such as graduates of our training programs, our instructional resources, our technology, and our recommendations for improving the culture) will not respond to our efforts unless doing so is reinforced; perhaps by increased success or effectiveness at analyzing problems and generating solutions within the confines of their own "processing systems." In many of these settings, there are apt to be strong contingencies for utilizing more traditional, "non-behavioral" technology, resources, and personnel, etc. . . . If we are to impact on the behavior of others in more traditional settings, we must determine what is currently reinforcing for *them* and ar-

range the contingencies appropriately. In the process, we may also need to condition new reinforcers that are more in line with the ultimate survival of the culture. This will not be accomplished by insensitivity to "feedback" from the receiving system.

In addition, we need to recognize that these same individuals selectively reinforce and punish our behavior and control the resources which serve as "inputs" into our "processing systems" (universities, research and applied settings).¹ The "data" that Michael presented concerning the shift within the field suggest that we have not adequately designed our programs and arranged the contingencies to develop and maintain behavioral skills, and that many who are in the field have simply not come into contact with contingencies that have been arranged. As such, we need to respond to, not ignore, information provided by various components of the system when we develop our goals and objectives. Of course, remaining in contact with and being able to respond to others who can exercise control over our behavior does *not* necessitate capitulation or adopting their views as our own. Catania (1979) has forcefully argued that membership in the American Psychological Association for behaviorists remains important "not so much for any benefits that occur to us as individuals, but rather because the Association is in a position to influence the growth and training of future generations of behavior analysts" (p. 2).

Isolating the problems and defining our goals. In order to assess the value of Michael's analysis of the factors responsible for the drift within the past ten years and his proposed solutions, it is necessary to ask what the goals are for behaviorism and a science of behavior. Skinner (1953) suggested that we should apply the techniques of science to human affairs so that we might achieve order and prevent famine and pestilence. Michael (1980)

¹ Of course, this paper is an effort to further the analysis of the controlling variables for the behavior of behaviorists. Pursuit of this aim could serve as a dissertation project for someone if the contingencies were right.

Figure 1. An overview of the relationship between behavior analysts and the rest of the culture as a total performance system. (Adapted from Brethower, 1972.)

suggested that his goal all along has been to

contribute to the science of behavior and to "behavioralize" the culture. Work in behavior modification was of value in its own right but . . . it was mainly a way to show people how valuable it was to know about behavior analysis and behaviorism and thus move the behavioral revolution a little further along. (p. 61).

If our attempts to improve the human condition are to be evaluated as effective or ineffective, several questions need to be asked. What does it mean to behavioralize the culture? How can we best achieve positive change in the culture? Skinner (1953) argued that it is more effective to change a culture than an individual because any effect upon the individual as such will be lost at his or her death. Since cultures typically survive for much longer periods, effects upon them are more reinforcing in the sense that they have more impact on the survival of the species. However, Skinner also recognized that cultures change and perish and that they are "created by individual action and survive only through the behavior of individuals" (p. 448).

Thus it may be that if survival of the species is our ultimate goal, and the "behavioralization" of the culture is viewed as a means to achieve that end, impacting on those who help establish cultural policies that will survive the demise of the individual is critical. Discussing education, Skinner (1968) certainly recognized the necessity of performing an experimental analysis of the receiving system. He noted that we need a better understanding not only of students, but also teachers, educational researchers and developers, administrators, policy makers, and supporters of education. All of these people are subject to contingencies of reinforcement which may need to be changed.

Of course, Michael is also aware of the need to consider such individuals. Discussing radical behaviorism as a way of life (1977) he noted that:

Training in psychology, and even a close familiarity with Skinner's work and a thorough understanding of the literature and practice of applied behavior analysis, does not really equip behaviorists very well to assess the effectiveness of cultural practices. The

empirical information relevant to any particular problem is more likely to be found in one of the political sciences, or economics; or it may be a part of such areas as business administration, law and jurisprudence, of history (especially the history of technology and of social practices as opposed to an emphasis on personal and political entities). It may be available simply as an example of investigative journalism, without the prestige of any substantive discipline . . . This does not mean that one must become an expert in any or all of these areas to work effectively for the survival of the culture but only that in dealing with any special issue, one must not assume that if the relevant information is not in Skinner's works or in the *Journal of Applied Behavioral Analysis*, that it is unavailable and one can safely proceed on one's own. Because laymen and experts in other areas have such defective verbal repertoires regarding the causes of human behavior, behaviorists have an undesirable tendency to discount all aspects of those repertoires. It may well be that administrators, lawyers, journalists, businessmen, and even politicians know more about long-range cultural effectiveness than many behavior modifiers, particularly those whose education is limited to the natural sciences and psychology (p. 301).

While it may not be necessary or desirable to produce graduates who are "expert" in each of these areas, it may be important for individual behavior analysis students to acquire relatively more training in some of these areas than others, depending on the area in which they expect to contribute to the culture.

Analysis of the Changes Within the Field

New Personnel. I agree with Michael that new professionals in our field who do not have a commitment to behaviorism or a science of behavior may in part be responsible for a shift within the field. In order to attempt to reverse this trend, we probably need to restructure our graduate training programs to some extent. As noted by Michael, however, much of the growth within the field is accounted for by those who were not trained specifically in behavior analysis but who have different perspectives and have "added behavior analysis" to their collection of techniques, without acquiring the science or the philosophy of that science.

Merely restructuring our behavior analysis training programs will not modify the behavior of these individuals. As such, we should not be surprised to find that the development of new texts and journals has not influenced many

professionals in the field. Without contingencies in the field to require that skills be kept intact and that individuals engaging in specific practices be qualified to do so, it is unlikely that the availability of instructional materials per se will have much impact on the behavior of those working outside of the university environment.

Research Methodology. Undoubtedly, the development of a research methodology which could be utilized by practitioners and researchers in the field without necessarily adhering to a radical behaviorist view has resulted in some undesirable trends including a shift toward independent variables, decreased continuity between specific research studies and the main stream of the larger body of applied research, description of procedures in common sense or "omnibus" terms, and an inability on the part of many people in the field to relate manipulations to concepts of the science of behavior. Obviously, training new students alone will not solve this problem either, nor will ignoring, dismissing, or simply punishing the efforts of researchers who behave in such a manner. Michael alluded to one answer when he noted that journal editors accept "this style of applied science" (p. 9).

Some measure of ongoing quality control (not just one-shot licensure) governing the behavior of researchers and other applied professionals might help ensure a higher quality of research, particularly if editors would set standards and provide more discriminative information to authors submitting papers for publication. When preparing papers, authors need to know that publication will require explaining their procedures in descriptive terms (rather than in quasi-technical ones), component analyses whenever possible, and relating their findings to existing knowledge in the field (which will include extending what is known). It would also be appropriate for tenure committees and editors to encourage thematic research.² We may be selectively strengthening the wrong behavior by

making reinforcers contingent on quantity of research rather than quality. One further point needs to be made concerning "in response" or "reaction" type papers. It is not unusual to read a series of papers on some topic by different authors in which primary emphasis seems to be placed on seeing who can most severely castigate the other, much in the style of a presidential debate. Our field would be much better served by learning a lesson from Ben Franklin (Mountjoy & Sundberg, 1981) and eliminating such polemics in favor of responding to the issues in positive, constructive terms. In this way, researchers might be selectively reinforced for their accurate analyses and receive guidance and direction to further their skills. As a result, we might make friends instead of enemies (Carnegie, 1936), inspire joint research instead of rivalry, and set a model for others whose help we need to further the cause of survival.

Demands of the marketplace. It is a given that the marketplace will put demands on the behavior of those who work in the field. Michael stated that the primary difficulty with such demands is (a) outcome is more important than furthering the cause of behaviorism, and that (b) professionals typically are required to perform functions unrelated to their graduate degree and that consequently the contingencies in the environment result in the individual ceasing to function as a behaviorist (1980, p. 10). Marketplace demands do in some instances mitigate against displaying scientific behavior. I am not sure that it is necessarily antithetical to the cause of behaviorism to focus on outcome or that functioning in an "administrative" role is unrelated to the graduate degree. It may be that the cause of behaviorism will be best served by demonstrating the effectiveness of the science and by behaviorists gaining positions of power within the organization in which they are employed. Similarly, it may not be necessary, as Michael implies (1980, p. 11) for behaviorists to *either* remain committed to behaviorism and talk in technical terms *or* lose their commitment and develop good public relations.

²See Johnston and Pennypacker (1980).

As Michael (1977) has suggested, others possess information which may be needed in our efforts to shape the culture. We will probably not reduce the mentalistic verbal behavior of others or convince them to aid in a common cause by talking in terms that they don't understand. Some of our goals should be to develop good relations, acquire a position of influence, and make substantial changes within and through organizations that will benefit the culture *without losing* a commitment to behaviorism or to the science of behavior. This is probably a long term process which entails outlasting others in the organization, gradually shaping the verbal and non-verbal behavior of others over whom one has a measure of control, and remaining affiliated with a support group that will selectively reinforce and guide one's own behavior to resist the counter-control of others.³ We need to analyze advancement requirements for positions of influence outside of the university and incorporate such information into our training programs.

Mass dissemination. I am in accord with Michael's notion (p. 18) that it is important to provide our students with the opportunity to analyze non-behavioral approaches. However, accurate analysis of non-behavioral approaches may require relatively extensive knowledge of such approaches which might not be possible if such "digressions" were packaged to the extent Michael seems to be advocating (p. 17). Other, non-psychological areas of study, of course, might be condensed to a greater degree than is currently the case in some programs.

Finally, I agree with Michael that the packaging of behavior analysis is no solution either and that more in-depth undergraduate and graduate training programs need to be "taught better" by those who serve as a model for students entering the field as professionals. Some additional suggestions for improving our graduate programs will be offered below.

A terminal repertoire. Although

restructuring our graduate training programs will not solve *all* of our problems, it will certainly solve some of them. As such, it is important to examine what skills should be in the terminal repertoire of a doctoral student as s/he prepares to enter the field, and Michael has indicated the magnitude of the task.

In a sense, it may be easier to describe what type of student we would prefer *not* graduate with a degree in behavior analysis. First, we do not want students to graduate with insufficient skills to perform accurate behavioral analyses of the world around them. If behaviorists are to contribute to the betterment and survival of the species, we must produce professionals committed to that end and capable of contributing to and utilizing a science of behavior. Second, it is important that students not only *develop* skills but that those skills be maintained once they leave the university environment. This, of course, is what Michael is arguing for and what Branch and Malagodi (1980) advocated when they warned that,

We must provide them (our students) with a history that will render them immune to the seductive security of mentalism, so that when exposed to their mentalistic colleagues, they can persevere in their attempts to isolate and control the manipulable variables of which behavior is a function. (p. 37)

Naturally, no one is "immune" to the contingencies in the immediate environment. A person's (inter)behavioral history interacts with variables in the current situation such that antecedent and consequent stimuli have various functions (Kantor, 1926). The nature of that interaction is still only poorly understood and warrants further empirical study. Whether or not students "persevere" as behaviorists or are "seduced" by mentalists will be at least in part depend on the extent to which students develop a history of analyzing the methods and results of non-behavioral interventions, responding to criticisms, and producing alternative, more effective "solutions" in the "real world." As such, we should not produce students who have well-developed behavioral skills but who are parochial in their views. They must be able to communicate knowledgeably with professionals who

³ See Skinner (1972c) for elaboration of the notion of reciprocal control.

hold other views and address the problems and questions raised by such professionals in a constructive manner (Michael, 1977; Catania, 1979). What type of student then *should* we try to produce? Michael (1980, p. 18) suggested that it is very difficult to describe the desired repertoire in terms of competencies, but that training would be in three main areas: basic science, applied science, and behaviorism. Indeed, I suspect that *there is no single repertoire* that can be described in terms of competencies or even content areas that will be sufficient to serve as a criterion for all of our students. Each student's repertoire will need to be developed based on the best projections possible about the type of stimulus conditions in which s/he will work after graduation and the type of behavior that will be reinforced in that type of setting.

Nevertheless, Michael has provided us with some important clues about the type of skills which a proficient behavior analyst should have. These include (a) a background in behavior analysis consisting of knowing as much about behavior as one can find out from studying the texts and articles available at the time, (b) a thorough familiarity with that body of knowledge, and (c) a view of behaviorism as more important for the human species than just as a particular approach within psychology. As noted previously, the most salient features of this behavioral orientation are (a) heavy emphasis on the environment; (b) interpretive skill at using principles and facts of behavior to interpret everyday events, non-behavioral approaches, ethical and moral issues, and scientific methodology; and (c) some understanding of the complex role of private stimuli and responses in behavior analysis.

Beyond these analytic skills, I would suggest that the behavior analyst needs to have (a) a set of marketable skills and credentials, so that s/he can obtain and survive in a position where the contingencies are such that individuals who possess those skills are selected from among those who do not, and (b) an ability to utilize the skills that are in their repertoire in the natural environment without alienating

those who disperse the reinforcers outside of the university.

The Culture as a Receiving System

I have not made the above recommendations lightly nor have I intended for them to sound facetious. Catania (1979) has argued that we need to train students for academic careers; that we must continue to be represented significantly in both graduate and undergraduate curricula. Whether or not behavior analysis survives and continues to grow will depend on whether or how well we train future generations of students to pass on the best of this subject matter and to create new subject matter.

However, Keller (1978) has pointed out that others are not listening. In education, our leaders are still concerned with matters other than a technology of teaching; the voice of the technologist of teaching is rarely heard throughout the upper echelons of higher learning. He concludes that it is the teachers and students who comprise a sympathetic group and who may get the essence of the message. In the long run, he suggested, *they* may be the ones to bring about the kind of educational change that we desire.

One solution is to teach behavior analysis in our elementary and secondary schools, since students sometimes grow up to the teachers, and teachers sometimes go on to become principals and policy makers. Skinner (1972a) noted that prevailing practices are derived from scientific "philosophies of education" and from the personal experiences of administrators and teachers, and the results are particularly disturbing to those who know what might be done instead. The first behavior which needs to be modified is obviously that of the teacher, administrator, or philosopher of education. (p. 282)

Ethics and Objective Assessment

In areas other than in education, efforts are necessary to increase communication with members of the receiving system. Efforts to obtain social validity (Wolf, 1978) for our techniques should not be viewed as inappropriate unless they lead us to compromise our ethics. If the culture is to be our "client," then the culture has a legitimate right to be an active partner in negotiating the contract for services, and

we have an ethical responsibility to ensure that this right is upheld. Evaluation of progress (for both individual clients and comprehensive social programs) legitimately involves ongoing assessment of the appropriateness of established goals as well as the extent to which the program has been carried out as designed, and this process usually involves some "team" comprised of experts from various disciplines. Our program for the culture should be subjected to no less rigor. Goldiamond (1974, 1977) has discussed this matter in detail. As noted above, contracting does not mean abandoning our goals or sacrificing our methods. We must also educate members of the receiving system to value the services we provide.

What we need to do is continue to pursue our goals and at the same time, continue to demonstrate the proficiency of behaviorists at dealing with problems in all sectors of our society. We need to be sensitive to inputs and information from the receiving system (the culture) and show responsiveness to the data. We need to "catch the attention" of those in positions of power and look for opportunities to relate progress on the part of behaviorists and non-behaviorists alike to the principles of behavior analysis. Furthermore, we have to take data on the activities of others and "catch them being good;" we have to differentially reinforce their appropriate behavior. To do so will require not only knowledge of principles of behavior analysis but some knowledge of the subjects which are the purview of those whom we seek to influence, as well as some knowledge of the principles of human relations.

SOME ALTERNATIVE SOLUTIONS: STRATEGIES AND TACTICS

A Guiding Strategy

To design a comprehensive program to meet the challenges identified above and elsewhere will require concerted, unified, and directed effort on the part of many who *already* are committed to a "behavioral revolution" as well as those who will work in the field of behavior analysis in the years to come. Perhaps no other activity within the field at the present time is as important as designing a

program to secure the future of our science as a source of knowledge through which to ensure the survival of our species and perhaps that of life on our planet.

However, the data are not all in. We have not systematically assessed the nature or extent of the problems within our culture or involved in the acquisition and maintenance of behavioral skills. As such, specification of particular *techniques* is premature.⁴ The strategy behind our efforts to ensure the continuation of a science of behavior, however, should be to adopt a behavioral approach to the development of such a program. That is, our guiding principle should be responsiveness to the data, not simply our "preferences" or "wisdom" acquired through contact with particular techniques. The recommendations below constitute a set of tactics for the acquisition and maintenance of behavioral skills. Many of the components are already in place, functional, and contributing to the quality of students and professionals currently within our universities and in the field.

Assessment of the Problem

Probably a first step in the process is for some organization, perhaps the Association for Behavior Analysis, to assign a task force to conduct an empirical analysis of the role and effectiveness of the behavior analyst in addressing the problems of our culture. A number of questions should be operationalized and addressed by this group including, "what are the problems within the culture that are most important to address?" "What types of results have we obtained?" "What are the long term, intermediate, and short term goals for our profession?" "What variables account

⁴ Johnston and Pennypacker (1980) have distinguished between strategies, tactics, and techniques. *Strategies* refer to the overall plans, principles or goals of scientific investigation, while *tactics* refer to general methods and procedures necessary to implement guiding strategies. *Techniques* are detailed procedures necessary to implement tactics in specific experimental situations (pp. VII-VIII). In this case, a technique might be to identify the actual terminal repertoire for a graduate entering a particular type of setting and then identify, sequence, and design specific courses to develop such a repertoire.

for the successes and failures that we have encountered in meeting those goals?" "What are the repertoires that would be required for behavior analysts to work effectively within various settings without losing a commitment to behaviorism or a science of behavior?" "How can we best generate such repertoires?" Undoubtedly, numerous other questions need to be asked, and the answers to these questions, derived from data obtained both within and outside our "processing system," should be used to generate additional tactics and techniques to achieve the specified goals. While "setting up a committee" often creates more problems than it solves, it would appear in this case to be an appropriate first step down a very long and difficult road. Of course, within the Association itself, there may be problems or inadequate resources which would preclude effective action. This needs to be assessed as well.

Shaping Behavior Within the University Which Will Be Maintained in the Natural Environment

As noted, restructuring the training programs within our universities will not solve *all* of our problems. It will solve many of them; however, improving the training of students will involve more than just changing the curricula.

Determine prerequisite skills. Michael (1967) recognized that it is inefficient to spend large amounts of time teaching students materials if their repertoires with respect to prerequisites for that material are defective. Probably more emphasis needs to be placed on assessing the entering skills of students with respect to the terminal repertoire required for working in a particular type of setting. Reliance on standard "aptitude" tests is not apt to prove particularly useful. Entrance criteria should be stated in terms of measurable, objective competencies. An entrance examination (currently used in some departments) might meet part of this need. Other means of assessment (examination of permanent products, observation, letter-of-recommendation forms which request information about performance in specific areas) could also be devised. It would be important that

students who do not meet entrance criteria not be summarily rejected. "Finalists" not granted admission should be advised of remedial activities which would eliminate deficiencies, and all rejected applicants should be advised of the opportunity to have their skills reviewed with respect to entrance criteria in a positive, constructive manner. Applicants who took advantage of the opportunity to have their deficiencies and strengths reviewed and who engaged in activities to overcome such deficiencies might very well be those whom we would identify as displaying the type of behavior called "commitment." More time and effort on the part of screening committees would probably be required to accomplish this type of assessment; however, it might reduce the frequency of students entering a university simply because they live in the vicinity (Michael, 1980) as well as the probability of students graduating with incomplete repertoires or dropping out without graduating.

Ensure that resources are available. Within the department (as well as the university as a whole) it is important that adequate resources be available for students and faculty. Money, faculty time, study and lounge areas that are available evenings and weekends, equipment, and other resources are as important as any other component to ensure a positive learning experience. Most departments probably are sensitive to such needs. However, brief consideration in this context seems warranted since availability of resources is usually dependent on members of the receiving system.

Define long-term goals. Goldiamond (1974) and Holland (1976), among others, have noted the importance of identifying target or outcome objectives as well as entry behaviors, beginning strengths of the individual, behavior change steps, and maintenance consequences, when attempts are made to build on the existing repertoire of an individual. In line with the recommendations above concerning entering skills of students, it would seem important for members of the department and the entering student to attempt to define long-term and short-term goals at

the onset of the student's graduate or undergraduate education. The goals and philosophy of the department should be explained in detail (perhaps during a mandatory "orientation" to the department), along with an overview of how departmental and individual faculty activities are related to departmental goals. Expectations and challenges should be laid out in a positive, constructive manner. Departments should begin to build a commitment to a science of behavior at the onset and specify how meeting short-term goals will culminate in attaining long-term reinforcers.

Obviously, it may be difficult to predict the settings in which graduates will function (or the individual contributions that students will make to the field) at the onset of their education, and it would be inappropriate for individual student goals to be defined in a "coercive" manner. Too narrow an education may result in an inability on the part of the student to secure an appropriate position while a program which is too broad may result in a defective behavioral repertoire. However, much graduate student education is acquired through "assistant," "apprentice," or "journeyman" relationships with faculty. By making the purpose of some of these activities more explicit at the onset and by identifying alternative behaviors which will be reinforced, the student will, in a sense, be in more of a "free choice" position (Catania & Sagvolden, 1980).

Develop quality training programs. There is, of course, a whole body of literature devoted to improving the quality of our educational programs (cf. Cole, 1975; Fraley & Vargas, 1976; Johnson & Ruskin, 1977; Johnston & Pennypacker, 1971; Keller, 1977; Michael, 1967; Skinner, 1954, 1968; Vargas, 1978). Mastery of the philosophy and science of human behavior will serve as the foundation for the student's professional behavior. As such, the need to develop a model for an intensive training program, such as that proposed by Michael (1980), cannot be overemphasized. Hayes (1978), Birnbrauer (1979), and Branch and Malagodi (1980) are among those who recognize the

need to provide more training in basic research since, as Skinner (1972a) notes, "most improvements in technology now come from what is essentially basic research. . . . Laboratory research tells us what to look for and equally important, what to ignore, and in doing so, it leads to the improvement of practical contingencies" (pp. 276, 278). In-depth training in basic science, as recommended by Michael (1980, p. 18) must constitute the bulk of our graduate programs. This material must be taught *first*. "Specialist" courses in computers, grant-writing, ethics, law, systems analysis, teaching and interpersonal relations should not be deleted from our graduate curricula; however, mastery of the above three behavioral areas, which would serve as prerequisites for analysis of problems in the real world, should be demonstrated *prior* to entering the specialist courses. Michael (1980) noted that the undergraduate psychology curriculum at Western Michigan University around 1970 was sequenced in such a manner. A course in "Systems and Theories" using a text by Marx and Hillix (1963) was offered after a comprehensive sequence of courses in behavior analysis had been completed.

Once mastery of behavioral courses has been demonstrated, "specialist" courses, some of which were noted above, should be *required, depending on the type of setting in which the student expects to work*. As with behavior analysis skills, many skills will apply across settings, but some may be more relevant than others in particular environments. Inclusion of such courses does not have to "dilute" the graduate program for behavior analysts. Some of these courses can be offered as higher level required courses while others can continue to serve as "cognates," "research tools," and "practica." Even if the inclusion of these courses does result in a slightly longer curriculum, it is probably reasonable to expect, as noted by Michael (1980, p. 18), that to develop a level of expertise in behavior analysis will require an intense undergraduate major plus at least four years of doctoral training. It is notable that at least several

clinical psychology programs approved by the American Psychological Association require *five* years of graduate training.

Another concern should be to provide internships for *each* student in both "behavioral" and "non-behavioral" settings . . . in that order, where students can come into contact with contingencies in such environments. Holland (1976) has noted that successful fading seems to be dependent on arranging conditions that ensure a response contingent relationship with new stimuli similar to that found during response shaping. Particularly in light of competing contingencies in non-behavioral environments, it is important that the behavior of "performing behavioral analysis" be reinforced by the successful application of techniques derived from such analyses to the problems at hand. For such internships to be maximally beneficial, it will be necessary to ensure that the student is part of a "behavioral support group" during the experience that focuses, among other things, on how to function and survive in such environments without prostituting one's behavioral views. Such training, following an intensive academic program such as that described above, will be most likely to allay Branch and Malagodi's fears that "the training of behaviorists has come to emphasize rules and rule-governed behavior to too great an extent, rendering such behavior easily changeable" (1980, p. 37). Inclusion of specialist courses and internships in non-behavioral environments will better prepare the student for employment and reduce the need for on-the-job training which is often provided by non-behaviorists and which may undermine adherence to the behavioral orientation developed during prior training.

Teach it better. Obviously, improved graduate curricula are not enough (Keller, 1968, 1974, 1978; Michael, 1980; Skinner, 1968). Michael (p. 18) pointed out that the generation of expert repertoires on the part of students would require teachers who are more knowledgeable than the students they instruct. He suggested that preparing for class, making up exams, grading, and interacting with students are

not easily delegated to teaching assistants and that graduate education should not become synonymous with mass education. This would not eliminate the role of teaching assistance; it would, however, require that teachers teach and that teaching assistants assist, rather than vice versa. The exception would be in courses specifically designed to teach "college teaching" skills.

Take frequent data. The need to be sensitive to data generated by the receiving system has been noted above. We need to pay attention to what others have to say about the extent to which our behavior is reinforcing to members of the receiving system, and the extent to which we are contributing to the culture. Members of the university administration and other departments within the university, employees, parents, other community members, and students themselves are all sources of valuable data which need to be tapped in order to assure that the efforts within behavioral departments are producing desired objectives. Whether we like it or not, just as the university negotiates a contract for services with the student, so too the culture negotiates an implicit contract with the university. Data from the community cannot and should not be ignored. One of the more pressing "demands of the marketplace" is for professionals who are *licensed*. The best training in the world will not be sufficient if graduates are not hired because they lack a necessary piece of paper which would enable an employer to receive third-party reimbursements for the services performed by the employee. A "follow-up" system for students and employers is a minimal requirement for identifying such data from the receiving system.

The fact that data are gathered from the community does not mean that we should always adjust activities within the departments in order to meet the expectations of the marketplace. When expectations are at variance with ethical or legal standards or when following a "behavioral prescription" would benefit the community, we have a responsibility to uphold our standards and advise the

community of alternatives. We can "shape" to some degree what employers find valuable through education, federal, state and local mandates, and by demonstrating the utility of our approach.

Finally, helping the student with job placement will be useful. Taking frequent "processing system" data on activities within the various departments as they relate to "outputs" (number of students placed, types of degrees obtained, adherence to "behavioral commitment," contributions to the field, and other measures of productivity) is important. We should examine the extent to which our teaching tactics and techniques result in objectives set by the department and adjust accordingly.

In summary, if entering skills are assessed, goals and objectives are specified, resources are made available, mastery of behavioral, "specialty" and interpersonal skills is demonstrated, practice in the real world is supervised, an appropriate technology of teaching is employed, activities within the graduate program are adjusted based on community and professional standards and progress measures, and the student is assisted in finding a job which is consistent with his or her training and experience, it is reasonable to predict at the present time that the student will acquire a set of behavioral skills which are more apt to be supported in the "natural environment" after graduation.

Maintaining Behavior Outside of the University

Modifying educational contingencies within the university alone; however, will not solve all our problems. Despite our efforts, unless contingencies are arranged in the environment which maintain behavioral rigor, "fledging behaviorists"—or even renowned researchers—may "succumb to the reinforcement and punishment practices of the immediate verbal community" (Branch & Malagodi, 1980). Providing contingencies within behavioral training programs will also not affect those whose formal training or experience was obtained in traditional departments or outside of the university setting. Un-

fortunately, I am not currently prepared to offer two sets of recommendations to impact separately on behaviorally trained professionals and non-behaviorally trained individuals with some expertise or interest in behavior analysis. What I can do is suggest several tactics which may impact on both groups to varying degrees.

Provide incentives. One suggestion is to provide incentives (perhaps through ABA) for members of the scientific community to learn and adhere to behavioral principles. I do not have a well developed notion of how to do so at the present time, but several ideas seem possible. Thomas (1979) has reported on the certification of behavior analysts in Minnesota. The first part of a certification examination was recently held at the 1980 meeting of the Association of Behavior Analysis. Certification should probably not be a "one shot" process. Rather, periodic documentation of continuing education (and perhaps applied work) should be required for continued certification. A second possibility would be to present a variety of "service awards" to individuals for contributions in different service areas and/or geographical locations. Third, we need to educate consumers. Birnbrauer (1979) has pointed out some limitations of expecting consumers to utilize "packages" without having acquired a conceptual system or scientific training. However, educating consumers may make them more receptive to behavior analysts who do have such skills, and wary of behavioral and other psychologists who lack such skills. In addition, we should not ignore the possibility that non-behaviorists may develop effective techniques (regardless of their orientation). We need to selectively reinforce the accomplishments of others, while analyzing their accomplishments within the framework of a scientific research methodology.

Develop more support groups. We need to offer more "clinics" or "behavioral encounters" and a special interest group at ABA for clinicians, academicians, and others who work in non-behavioral places to discuss problems in dealing with pressure from non-behavioral sources.

Behavioral departments within local colleges and universities could offer ongoing "extension" support groups either at the university or on-site to focus on the analysis of everyday work or community related problems from a behavioral perspective, and techniques to behavioralize or build local support structures. These groups should be low-cost or free, and oriented to practitioner and consumer. If developed as a course, the "syllabus" should be developed by the participants. Students from behavioral departments should be encouraged to form such support groups within their organizations when they enter the field. Local groups may be the most productive.

In line with the notion of sponsoring behavioral events, behavioral departments might sponsor "homecoming reunions" which would provide graduates and current students with an opportunity to "show and tell" examples of their applications of specific courses or contributions to the field of behavior analysis or the culture at large. The department of psychology at Western Michigan University sponsors a poster session of recent work by faculty and students as its contribution to the annual homecoming activities. This could serve as a model for other such events.

Increase quality control efforts. Pierce and Epling (1980) have suggested that papers devoted to technology and human problems be reported in journals devoted to behavioral applications and that more basic journals of applied research become the major outlet for the analysis of socially important behaviors. This may be a worthwhile recommendation if, as the author suggests, it would result in more precise use of terms and an increased effort on the part of authors to make their results clear in terms of an experimental analysis of behavior. The efforts of new researchers need to be supported and we should not further polarize professionals in the field of behavior analysis, but we should uphold publication standards and provide authors and other members of the scientific community with differential reinforcement for their efforts in order to guide their performance. Similarly, poster

sessions at scientific conventions also serve as an outlet for much scientific effort. Authors who expend considerable energy in the design and execution of an experiment and preparation of a manuscript for public display deserve to have their submissions scrutinized and returned with constructive comments. Automatic acceptance, like unexplained rejection, does not help guide performance in subsequent endeavors.

Expand control of resources. We need to expand our locus of control in traditional organizations by channeling students and resources into appropriate settings. Branch and Malagodi (1980) stressed the need to get some control over resources such as federal grants which among other things, impact on training of professionals. We need to find ways *within the system* to influence those who make decisions affecting public policy and the distribution of resources. As noted above, Catania (1980) has argued that it is necessary to strengthen behavior analysis both within academic institutions and within the American psychological Association since our roots are in psychology and the APA is still psychology's national voice.

Considerable effort needs to be expended in order to design maintenance programs that will result in long term, high rate behavior on the part of behavior analysts in the field. At the present time, it seems reasonable to suggest that such behavior might be better controlled by (a) providing professionals with more opportunities to engage in the desired behaviors through special interest, extension and local support groups, as well as by gaining expanded resources and control in traditional organizations; (b) presenting professionals with certification and publication standards which will increase the likelihood that particular behaviors are reinforced and punished; and (c) contingently administering reinforcers for commitment to behaviorism and contributions to the culture.

Conclusion

Hayes (1978) has argued that (M)ABA may help to unify the field of behavior analysis since it encompasses all levels of

analysis in the behavior analytic paradigm and since it is dedicated to a particular scientific paradigm. He suggests that advances in the field are made by persons or groups developing a unified point of view (p. 32). What is needed in our field is to ensure that the behaviorist's scientific and clinical behavior is under the antecedent control of the subject matter and the data, and the consequent control of further data. Dogmatism will stifle the development of the field; responsiveness to the data will keep the spark of commitment lit and the science of behavior vital. Keller (1978) has lamented that, "... never before, in the history of mankind, have we known so much about the learning process or the conditions under which an individual human being can be effectively and happily prepared for any occupation or a profession; and never, perhaps, have we had so little power to put our knowledge into practice (p. 53)."

However, the power rests in the contingencies, and the contingencies *can* be arranged. The reinforcements responsible for activity on other levers can be made contingent upon the response in which we are primarily interested (Skinner, 1972b). When that happens, the behavior will occur.

REFERENCE NOTE

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