In Response

On the Distinction Between Science and Practice: A Reply to Thyer and Adkins

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Applied behavior analysis, unlike most other areas of psychology, is in the difficult position of being regarded by some as a scientific enterprise and by others as a methodology upon which to base applied work. To illustrate, studies published in the *Journal of Applied Behavior Analysis* exemplify the scientific side of applied behavior analysis; great care is taken to objectively define and measure the independent and dependent variables and to demonstrate functional relations between environmental events and behavior change. In contrast, many individuals who also consider themselves to be behavior analysts are engaged in the day-to-day work of attempting to change client behavior but do not necessarily collect substantive data or demonstrate functional control. These differing roles of applied behavior analysts—research and practice—have led to much discussion and debate within the field. The debate was evidenced most recently in an exchange of papers published in *The Behavior Analyst*. First Thyer (1999) informed readers that much of social work was emulating applied behavior analysis. Adkins (1999) replied to Thyer, stating several objections to the suggestion that the work described by Thyer could be subsumed under the label of applied behavior analysis. In this paper we briefly review the positions articulated by Adkins and Thyer, and then attempt

to clarify the distinction between an applied behavior analyst and an individual who serves clients by using a behavior-analytic orientation.

Thyer's Perspective

Although several segments of applied psychology have had fairly close ties to basic behavioral science, social work historically has not. However, Thyer (1999) noted that the clinical branch of social work has increasingly looked to the behavioral sciences for concepts, strategies, and procedures; and it has looked specifically to behavior analysis. Thyer cites evidence that “The conceptual model of behavior analysis is increasingly being represented as among the contending theories for social work practice” (p. 21). He suggests that a person who wishes to become a practitioner, and yet who is committed to behavior analysis, should consider entering social work as a profession, because it is quite possible to become a behavior-analytic clinical social worker.

Thyer (1999) also suggested that one impediment to the spread of a behavior-analytic approach within social work has been behavior analysts’ “strong emphasis on the importance of conducting *experimental* analyses of behavior” (p. 24). The resulting impression is that “if one’s data do not demonstrate a clear and unambiguous functional relation between a behavioral intervention and clinical outcome, then one’s endeavor was in some way incomplete or imperfect” (p. 24). He points out that conducting an experimental demonstration of an interven-

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tion's effects—such as with a no-treatment baseline, an intervention phase, a withdrawal of the intervention, and finally a reinstatement of the intervention—entails a delay of treatment and leads some social workers to question the practicality and appropriateness of behavior analysis to clinical practice. Thyer suggests that the acceptability of a behavior-analytic approach to clinical practice would be increased if standards that have typified applied behavior analysis were relaxed, especially regarding experimentation (demonstrations of functional control) and careful description of the independent variable, the intervention. Specifically, Thyer stated, "Validly documenting positive outcomes alone is sufficient in most practice contexts" and that "There is no need in most clinical situations to prove . . . a functional relation between intervention and improvement" (p. 25).

A Critique of Thyer's Perspective

Although he agreed with some aspects of Thyer's analysis, Adkins (1999) disagreed strongly with the suggestion that experimental rigor be relaxed. Adkins asked, "How is the clinician-analyst able to then know that his or her intervention has been the decisive factor in the outcome?" (p. 159). He objected to the collection of data that merely show client progress and do not demonstrate the influence of the independent variable (the intervention) over the dependent variable (the client's behavior). He asked whether "in doing so, is one doing applied behavior analysis?" (p. 159) and, further, "Can one imagine a call for relaxation of methodological sophistication in training for engineering, medicine, or in any science?" (p. 160).

A Clarification

Adkins' (1999) objections to the reduction of experimental rigor in applied behavior analysis are valid. The emphasis on experimental control and scientific methodology is one of the

most important factors separating applied behavior analysis from other fields of applied psychology. We suggest, however, that the degree of experimental control required in applied behavior analysis often is neither needed nor beneficial for behavior analysts who work as practitioners. A person who works as a practitioner—whether as a physician, clinical social worker, behavior-analytic practitioner, engineer, or other professional—has responsibilities that differ substantially from those of a person who functions as a scientist, even as an applied scientist. This is true even when the same person functions in one role at some times and in the other role at other times, as do many applied behavior analysts who publish in such outlets as the *Journal of Applied Behavior Analysis*, *Journal of Positive Behavioral Interventions*, *Behavior Therapy*, or *Behavior Modification*. A practitioner's primary responsibility usually is to be of optimal help to a client or patient, not to add to our body of knowledge about what interventions influence what outcomes. Not only is it often not feasible to evaluate the effects of the interventions and their component parts experimentally; it is seldom what the practitioner is being paid to do and it can even be counterproductive.

To illustrate, consider the example of a physician who works in a clinical setting. When the physician prescribes a routine of certain exercises and diet for an overweight person, the physician most likely will not collect baseline data by weighing the patient daily or weekly beforehand or continue frequent weighing during intervention. Further, if the patient loses weight, the physician is unlikely to instruct the patient to resume a sedentary routine and poor diet so that an experimental evaluation of the doctor's prescription can be conducted.

The distinction between research and practice has been discussed by other behavior analysts. For example, Johnston (1996) noted that behavior analysts "have excessively intermin-

gled applied research and service delivery interests in our applied literature, to the detriment of each. There are inherent conflicts between the requirements of applied research and the application of research findings for purely practical purposes" (pp. 42–43). Johnston differentiated between applied work and research, pointing out that "the priority of applied practice is to deliver an effective service, not to answer experimental questions" (p. 43). Johnston made clear that applied practice should not involve the rigorous control necessary for prediction and control of behavior, as is needed in the science of behavior. He noted further that, "as in the application of medical technologies, practice is generally not an occasion for discovering, understanding, explaining in a scientific sense" (p. 44). Such rigor generally is not necessary in applied practice because practitioners most often use technology that has been demonstrated to be effective many times. More specifically, behavior-analytic practitioners use principles of behavior and behavior-change strategies that have been demonstrated time and time again to have generality and applicability to a variety of human problems.

Consider an applied example: Suppose a practitioner has a client who complains that her husband, who has refused to see the practitioner, neglects her. She reports that the husband engages in little conversation with her, often leaves her alone in the evening to go out with male friends, seldom accepts her suggestions about activities they could do together, and so on. If the practitioner approached this case as a scientific analysis, target behaviors would include only the behavior of the woman; it would not be possible to reliably measure the husband's behavior, because he will not attend sessions. Suppose then that the practitioner notices that the woman is dressed in drab clothing, and that she speaks in a rather whiny voice. Upon further questioning, the woman admits that many of her female friends have told her that she

complains about her life a great deal, and that they therefore find it unpleasant to be around her. These behaviors (selection of clothing, voice tone, and complaining) are selected as targets for change, although the behavior that the client actually is concerned about is the behavior of her husband. Prior to initiating an intervention, the therapist must first collect baseline data on the occurrence of the client's target behaviors and, to enhance the believability of the intervention, the therapist must enlist the help of another individual to collect reliability data. If data were collected only within sessions, several initial sessions would then be devoted to collection of baseline data. If the client persists in therapy beyond baseline (which most likely spanned several weeks), the practitioner must then identify an experimental design that will allow a demonstration of functional control in an ethically justifiable way. Use of an experimental design would most likely result in either a delay in addressing certain targets (e.g., use of a multiple baseline across behaviors) or an extremely gradual increase in skills (e.g., if a changing criterion design is used). It is unlikely that the practitioner would consider using a reversal design, because intervention likely will involve teaching new skills; even if a reversal design were feasible, most clients are not especially amenable to the removal of an intervention that seems to them to be working.

We hope that our discussion thus far has convinced many readers that behavior analysts who work as practitioners often provide better service if they do not adhere to the rigors of conducting good scientific evaluations. In fact, a practitioner who is determined to conduct an experimental analysis of the interventions used with each client will either provide less than optimal service to many clients or conduct less than optimal experiments, or both. It should also be recognized that a practitioner who attempts to experimentally demonstrate functional relations or conduct experiments with all of his or

her clients or patients often will confront ethical problems. To take an extreme example, suppose a client is lonely, depressed, and threatening suicide. Obviously, a practitioner would not wait to obtain a baseline of, say, frequency of suicidal threats or social activities before intervening. Further, if the intervention seemed to produce favorable results, a reversal (or other demonstration of functional control) would certainly not be attempted. Even less extreme risks raise ethical questions. A practitioner who seeks to improve children's attention to their schoolwork will typically be of greater service if he or she does not attempt to evaluate each intervention with an adequate experimental design, not only because that slows the process and increases the necessity for additional personnel to collect data but also because it is not usually what the practitioner is being paid to do, and it tends to reduce the flexibility with which the practitioner can make promising revisions in the intervention. An additional concern is that the practitioner is often using intervention techniques that differ little from ones that have already been experimentally analyzed, making further experimentation redundant.

A Qualification

We do not mean to suggest that clinical social workers and behavior-analytic practitioners need not collect data frequently, graph those data, and use them for clinical decision making and accountability. As Hawkins and Mathews (1999) and Hawkins, Mathews, and Hamdan (1999) have pointed out, this kind of data collection and usage can substantially improve the effectiveness of one's clinical services, and it constitutes an excellent way to be accountable to the client, to one's superiors within an agency, to one's profession, to the public, and to oneself (see also Hawkins, 1989). These authors do not call such data collection applied behavior analysis, but rather "Level 1 research," which they describe as hav-

ing 10 characteristics (slightly adapted for our purposes here):

1. The goal is behavior change, not explanation of that change. Thus, a baseline is needed only if it is necessary for a functional assessment. Nor is control over (constancy of) extraneous variables or constancy of the intervention across time necessary, again because explanation is not the primary purpose.

2. The intervention involves behavior-change procedures identified throughout an assessment of environment-behavior relations (i.e., a functional assessment), and is not necessarily a specific "package" that has been demonstrated to work with some individuals who have emitted topographically similar behaviors.

3. Data are obtained continuously, usually daily but sometimes less often, depending on such factors as the opportunities for the behavior to occur.

4. The data are direct measures of target behavior or its products.

5. The data are quantitative.

6. The data are graphed daily or, at least, weekly.

7. The graphed data are evaluated regularly for slope (direction and speed of change, if any) and level (problematic or satisfactory).

8. Data are used as a basis for action, for deciding "what to do now." The graph is usually shared with the client.

9. When one measurement outlives its usefulness, it is dropped and another is begun.

10. The intervention is changed whenever the outcomes suggest it needs improvement.

In conducting Level 1 research, the practitioner's primary responsibility is to be optimally helpful to a client or patient and to be accountable, not to add to our body of knowledge about which interventions influence which outcomes.

Thus it seems reasonable to expect behavior-analytic practitioners and clinical social workers to do Level 1 research routinely; to collect and monitor data frequently to evaluate their in-

terventions. It would not be reasonable to expect practitioners to conduct experiments routinely to demonstrate functional relations between their interventions and client behavior change.

We thus disagree with only part of what Adkins (1999) wrote. Consistent with Johnston (1996), we strongly agree that the behavior-analytic practitioners and clinical social workers should base what they do on the scientific knowledge available at the time and, in this sense, behave scientifically, just as good physicians and engineers behave scientifically. Johnston also implies (e.g., p. 45) that the practitioner deserves respect for the expertise involved in practice, and that such respect should not be tied to research and publication. If such respect is accorded the practitioner, the trainee in clinical social work or the practice of applied behavior analysis should feel no pressure to conduct research as part of his or her practice, thus alleviating Thyer's (1999) concern.

We also agree with Adkins (1999) that the behavior-analytic practitioner or clinical social worker who is primarily providing a service—whether conducting Level 1 research or collecting no quantitative data at all—should not call that work applied behavior analysis. Baer, Wolf, and Risley (1968) defined applied behavior analysis in part by stating that

Analytic behavioral application is the process of applying sometimes tentative principles of behavior to the improvement of specific behaviors, and simultaneously evaluating whether or not any changes noted are indeed attributable to the process of application—and if so, to what parts of that process. (p. 91)

Thus, applied behavior analysis is defined as a combination of the experimental part of our science and the practice part. That definition has served behavior analysis well for over three decades, and it seems best to continue to honor it. Level 1 research

would not qualify as applied behavior analysis, even though the work may be behavior analytic in both conception and execution and is carried out by someone who considers him or herself to be a behavior analyst. Instead, it might best be called behavior-analytic practice, and when the behavioral professional is engaged in such practice, he or she might best be called a behavior-analytic practitioner. Using the suggested terms, we can then identify at least four roles that a behavior analyst might fill: conceptual behavior analyst, basic behavior analyst, applied behavior analyst, and behavior-analytic practitioner. Any particular behavior analyst might engage in any one (or more) of those roles at different times, and a few behavior analysts engage in all of them. Perhaps most important, related to Thyer's (1999) concerns, each of these four roles is an extremely valuable part of behavior analysis, and each deserves full and equal respect.

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