What Happened to Analysis in Applied Behavior Analysis?

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Abstract

This paper addresses the current help-oriented focus of researchers in applied behavior analysis. Evidence from a recent volume of *JABA* suggests that analytic behavior is at low levels in applied analysis while cure-help behavior is at high strength. This low proportion of scientific behavior is apparently related to cure-help contingencies set by institutions and agencies of help and the editorial policies of *JABA* itself. These contingencies have favored the flight to real people and a concern with client gains, evaluation and outcome strategies rather than the analysis of contingencies of reinforcement controlling human behavior. In this regard, the paper documents the current separation of applied behavior analysis from the experimental analysis of behavior. There is limited use of basic principles in applied analysis today and almost no reference to the current research in the experimental analysis of behavior involving concurrent operants and adjunctive behavior. This divorce of applied behavior research and the experimental analysis of behavior will mitigate against progress toward a powerful technology of behavior. In order to encourage a return to analysis in applied research, there is a need to consider the objectives of applied behavior analysis. The original purpose of behavioral technology is examined and a re-definition of the concept of "social importance" is presented which can direct applied researchers toward an analytic focus. At the same time a change in the publication policies of applied journals such as *JABA* toward analytic research and the design of new educational contingencies for students will insure the survival of analysis in applied behavior analysis.

The current behavior of many applied behavior analysts suggests a lack of concern with the fundamental principles of behavior as put forth in Ferster, Culbertson and Boren (1975). While a recent article by Deitz (1979) has noted this changing emphasis from science to technology, his message was addressed to a general psychological audience and may have missed those most concerned with applied behavioral analysis. The present paper builds on points made by Deitz and extends his discussion to concerns with the reinforcement contingencies controlling

the behavior of applied behavior analysts.

While it is possible to discuss analysis versus implementation along numerous dimensions, this article is limited in scope. The issues of interest involve: a) the distinction between a helping, problem-oriented approach and an analytic approach to applied behavior analysis, b) the failure of many behavior analysts to maintain contact with the basic research principles of the experimental analysis of behavior and, c) the meaning of socially important behavior when viewed from a basic rather than a treatment-oriented viewpoint.

In an attempt to explicate the major points of this article, it is enlightening to point to data taken from Volume 11 of the *Journal of Applied Behavior Analysis (JABA)*. These data represent the current

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behavior of authors in applied behavioral analysis and constitute some objective evidence for the thesis of this article. The data analysis is in no way exhaustive and does not reflect trends in this area over time. Also the classification and measurement system is acknowledged as rather crude and allows for only suggestive evidence regarding the major points of the article.¹ Variables of interest are: a) the number of authors' references to applied and basic journals and books in their reference citation section, b) the number of basic and problem-oriented terms appearing as the author's descriptors of their own article, and c) primary focus of the article in terms of helping others and evaluating effectiveness of procedures, or in terms of drawing out basic principles, contingencies or processes operating in human social environments.

Because of the unreliability of coding references, the journal or book in which the references appeared was used as a measure of referencing behavior of *JABA* authors. The publication sources were independently judged by the authors in terms of applied or basic emphasis. A *basic* (fundamental, analytic) emphasis involved a concern with lawful relationships and relevance to principle (Baer, Wolf and Risley, 1968). On the other hand, an *applied* (treatment-oriented, cure-help or problem-focused) emphasis involved a concern with behavior change or modification due to treatments designed to alleviate problem behavior in problem settings, or a concern with evaluation of the effectiveness of a treatment program in ameliorating clients' behavioral deficits.

In addition, the publication source

was judged as either contingency oriented or noncontingency oriented. A *contingency* orientation showed a concern with contingencies of reinforcement and how these variables control behavior. A *noncontingency* orientation involved a concern with conditions which influence behavior although this view is not formulated as a reinforcement analysis. Often, presumed cognitive factors are postulated as mediators of behavior-environment relations. According to this cross classification, a basic-contingency oriented journal was *Journal of the Experimental Analysis of Behavior* (JEAB), and a basic-noncontingency journal was *Psychological Bulletin* or *Journal of Personality and Social Psychology*. An applied-contingency journal was *Journal of Applied Behavior Analysis*, and an applied-noncontingency journal was *Mental Retardation* or *Child Care Quarterly*. If a journal or book was not judged as classified by these broad categories, it was designated as uncodable. Also, judgments were compared for agreement on coding of publication sources (overall, inter-rater agreement 92.2%) and any disagreements were also treated as uncodable items.

A similar procedure was followed in coding article descriptors (judged as either basic or cure-help). Examples of problem-oriented terms were a) in-service training, b) social skills training, and c) instructional package. Analytic descriptors included, a) response cost, b) generalization, c) successive approximation, and d) observational learning. Any terms which did not fall into these categories were treated as uncodable and any disagreements between judges (inter-rater agreement 79.2%) were also treated as uncodable items.

Finally, articles were judged in terms of their primary focus, with an article like "Measuring client gains from staff-implemented programs," (Green, et al., 1978) being judged as problem-oriented, and an article like "Some thoughts on the

¹Recently the authors have received a manuscript by Hayes, Rincover and Solnick (Note 3) which documents the "technical drift" in *JABA* over the first ten volumes. Our results are remarkably similar for Volume 11, 1978, although our coding is somewhat different and less detailed. This temporal analysis of trends in the field of Applied Behavior Analysis confirms, even more dramatically, the central points of the present discussion.

correspondence between saying and doing," (Israel, 1979) being judged as basic emphasis. Articles that did not have a primary focus or that occasioned disagreement of the judges (inter-rater agreement, 93.7%) were assigned to an uncodable category.

With this data source in hand researchers in applied behavior analysis will see our concern with the field. The next section presents a discussion of the major issues of this paper.

The Cure-Help Approach and Behavioral Analysis

The thesis of the article holds that applied behavior analysis is part of the science of behavior as outlined by Skinner (1953). As part of the science, the technology of behavior is involved in the extension of experimental analysis to the field of human behavior and also to the contingencies governing human affairs. This kind of extension is notable in the early work of Baer and Sherman (1964) who analyzed the social contingencies which control the phenomenon of generalized imitation. However, the current practice of authors of *JABA* does not reflect this commitment to a scientific enterprise, but rather demonstrates greater concern with help, treatment, evaluation and outcome. Even prominent behavior analysts (e.g., Azrin, 1977) have turned to the cure-help approach and have seemingly rejected the analysis of behavior which Skinner envisioned in his work.

It is perhaps useful to clarify the distinction between a scientific enterprise and a cure-help approach to the subject of human behavior. A scientific enterprise is marked by its zealous concern with lawful relations. Skinner (1953) stated:

Science . . . is a search for order, for uniformities, for lawful relations among the events in nature Science sharpens and supplements . . . experience by demonstrating more and more relations among events and by demonstrating them more and more precisely (p. 13).

This dedication to precise specification of relationships is often in opposition

to the cure-help approach. In this latter approach, the immediate concern is "improvement" of behavior(s) or the development and evaluation of intervention strategies. Yet as Deitz (1979) notes, the powerful technology that would change behavior problems rests on a full understanding of the prevailing contingencies, some of which are not even analyzed at this time. Deitz claims it is too soon to give up analysis for technological application (i.e., cure-help) and it is the position of this paper that the technology of behavior must remain a scientific and analytic enterprise. Only behavioral *analysis* will provide the powerful technology which Skinner (1961) described in his design of a culture. However, help-related contingencies of reinforcement seem to mitigate against scientific behavior. This kind of decline in the experimental analysis of behavior was pointed out by Catania (Note 1) when he talked about the survival of behavioral analysis in non-behavioral places. The reinforcement contingencies of non-behavioral and help-oriented places work against applied behavior analysis as an analytic enterprise.

In this regard, Skinner (1972) indicated that social reinforcement contingencies, set by clients or recipients of help, favored the "flight to real people" from analytic research. In addition, Skinner held that the effects of help itself, in terms of benefits to the client, function to establish and maintain cure-oriented behavior. However, Skinner did not analyze the gradual change in the economic contingencies of reinforcement which now support much of the current cure-oriented behavior in behavior analysis. Since the early fifties, there has been a move from the experimental laboratory to natural settings. While social reinforcers from clients may have supported some of this behavior, another powerful contingency was monetary support of research. It was easier to get research money to investigate a practical

"help" problem than to pursue the analysis of behavior. Also, jobs and salaries in the cure-help sector of society became readily available to those in behavioral analysis. Over time more and more behavior analysts were governed by the contingencies of the institutions and agencies which hired them, and analytic behavior declined while behavior relevant to help, cure, evaluation and outcome increased in frequency. Analytic behavior, which is the basis of a science of behavior as applied to human affairs, seemed to weaken as a function of extinction, punishment, the reinforcement of incompatible behavior, or all of these and other contingent processes.

In addition to the contingencies set by institutions and agencies of help, concern with application and technology may have been encouraged by the publication policies of applied journals such as *JABA*. Such policies are responses to contingencies set by readers and competition with other journals of behavior modification. With these market conditions, publication of analytic articles is reduced and this has a direct effect on research behavior. Today, many behavior analysts seem to reflect the effects of cure-help contingencies and publication policies in their research articles.

Finally, as Johnston (Note 4) has pointed out, the behavioral approach to treatment has become more acceptable to professionals outside the core area of behavioral analysis. This has been especially true in education, mental retardation and clinical psychology. Much of the growth of applied behavior analysis has been due to the attention of these professionals to the fringes of behavioral technology. These people bring with them many non-behavioral practices and concepts, and because of their large numbers become influential in redefining the field. And Johnston notes "... it may not so much be that the core behavior analysts are changing their interests, but that those attracted in limited ways to the field, are

Table I

Percentage and number of basic-process and cure-help data-based articles published in *JABA* of 1978 for issues of Volume 11^a

Code	1	2	3	4	Total ^c
Basic-Process	31 ^b (4)	20 (1)	20 (1)	20 (1)	25 (7)
Cure-Help	69 (9)	80 (4)	80 (4)	80 (4)	75 (21)

a) Methodological articles, discussions and research notes are excluded.

b) Percentage with number count in brackets.

c) Uncodable items N=4 include disagreements in judgment of raters and items not classified by coding system.

not dominating it and in some sense diluting it."

Our analysis of the current behavior of researchers in Applied Behavior Analysis takes as an exemplar the 1978 issues of *JABA*. Table 1 presents the results of the categorization of data-based journal articles concerned with basic principles and processes or concerned with cure-help and client outcome. Of the 28 articles coded in these categories, 75% are cure-help oriented and 25% have some concern with principles of behavior. There is a consistent trend over issues of Volume 11 for a cure-help emphasis (approximately 80% of the articles for the last three issues).

Table 2 presents the results of our analysis of reference citations. It is remarkable that only 3.4% of the citations were in basic-contingency journals or books. Even basic-noncontingency journals (7.9%) are cited twice as often as basic-contingency journals or books. As expected, applied contingency journals and books are cited most frequently (50.4%) with applied non-contingency journals in second place (38.0%). These differences generally hold over all issues of Volume 11, 1978. Table 3 presents another analysis of this same data. Here it

Table 2

Percentage and number of journals and books in *JABA* references classified by applied-basic and contingency-noncontingency for each issue of Volume 11, 1978^a

Code	Issue No.				Total ^c
	1	2	3	4	
Basic-Contingency	4.5 ^b (13)	4.5 (6)	4.7 (6)	0.8 (2)	3.4 (27)
Basic-Noncontingency	4.9 (14)	15.7 (21)	5.5 (7)	8.5 (20)	7.9 (62)
Applied-Contingency	50.5 (144)	49.6 (66)	43.6 (55)	54.6 (127)	50.4 (392)
Applied-Noncontingency	40.0 (114)	30.0 (40)	46.0 (58)	36.0 (84)	38.0 (296)

a) Excludes references in methodological articles, discussions, research notes, and reference notes of classified articles.

b) Percentage with number count in brackets.

c) Uncodable publication sources N = 44 include disagreements in judgment of raters and items not classified by coding system.

is clear that the differences are not as much between contingency (53.9%) and noncontingency (46.1%) as between basic (11.4%) and applied (88.5%). Also, note that only 30.3% of the basic citations to journals and books (N = 89) focus on contingency or experimental analysis. These data dramatically illustrate the low proportion of citations related to behavior principles.

As a final measure of the behavior of researchers in applied analysis, data are presented which summarize the number of descriptors that authors in *JABA* assign to their own articles. This measure most directly reflects the current concerns of researchers in applied behavior analysis. Table 4 indicates that of the N = 170 descriptors categorized as cure-help versus basic-process, 76.4% were cure-help while only 24.6% were coded as basic process. This difference is again consistent throughout Volume 11, 1978.

Table 3

Cross classification of percentage and number of journals and books cited in *JABA* references of Volume 11, 1978

	Contingency	Noncontingency	Total
Basic	30.3 ^a (27)	69.6 (62)	11.4 (89)
Applied	56.9 (392)	43.0 (296)	88.5 (688)
%	100	100	100
N	(419)	(358)	(777)

a) Percentage with number count in brackets.

Further, this percentage of analytic descriptors is, if anything, overly generous since descriptors were termed basic even if the author did not imply the basic meaning. For instance, the term generalization, although coded as basic, is employed as a descriptor by several authors when they refer to the generality of treatment effects from one setting to another. There were no instances of generalization used as a reference to a stimulus generalization gradient (Gutt-

Table 4

Percentage and number of cure-help or basic-process terms used as descriptors by authors of *JABA* articles by issue of Volume 11, 1978^a

Code	Issue No.				Total ^c
	1	2	3	4	
Cure-help	81.6 ^b (80)	66.6 (12)	67.6 (23)	75.0 (15)	76.4 (130)
Basic-Process	18.4 (18)	33.4 (6)	32.4 (11)	25.0 (5)	24.6 (40)

a) Methodological articles, discussions and research notes excluded.

b) Percentage with number count in brackets.

c) Uncodable descriptors N = 218 include disagreements in judgment of raters and items not classified by coding system.

man and Kalish, 1956). The term, is therefore, an equivalent of Campbell and Stanley's (1963) external validity and not a reference to relevant principles or behavioral process.

Overall the findings clearly indicate the high proportion of help-oriented behavior in applied research articles. At the same time they highlight the low proportion of analytic behavior focused on fundamental principles. In accord with Catania (Note 1), there is reason for concern with the survival of behavioral analysis as applied to human behavior. Catania suggested that attention be directed to educational contingencies so that analytic behavior of students will be maintained in applied environments. Also, the present analysis suggests that *JABA*, through its publication policy, will have an important effect on research practices. An increase in publication of analytic articles will favor a return to applied analysis as a scientific enterprise. However, unless new contingencies are arranged, scientific behavior will not survive and the goal of a powerful behavioral technology will never be realized.

As an initial step in the return to analysis, there must be more attention given to basic principles as applied to human behavior. In this regard, it is necessary to outline the gap that presently exists between applied behavior analysis and the findings of the experimental analysis of behavior.

Basic Principles and Applied Behavior Analysis

In our review of *JABA*, we were struck by the constant repetition of studies that call on only the most elementary principle of behavior, the law of effect. This principle is demonstrated on numerous and diverse behaviors, in different settings and with different subject populations. These articles, taken together, seem to state "the law of effect works." One can imagine an equivalent development in the science of physics. If

Galileo had started an applied journal there may have been numerous articles that demonstrated the law of gravity held for a) various angles of inclined planes, b) inclined planes composed of different substances, and c) diverse balls varying the size and mass. The journal could have been called the Journal of Applied Gravities as the current *JABA* could be redesignated the Journal of Applied Law of Effects.

The point is of course stretched, but the fact that applied analysts are almost divorced from basic experimental analysis of behavior has serious implications. In terms of extending a science of behavior to human affairs, much of behavior analysis has fallen short of the mark. There is little concern with discrimination contingencies and variables of stimulus control are researched in the discipline of social psychology where there is usually no appreciation of contingencies of reinforcement. In addition, the current emphasis on concurrent operants and the matching law (Herrnstein, 1961; Baum, 1974) within experimental analysis has escaped the attention of researchers in applied behavior analysis. Here is a set of principles describing behavioral choice which are not reducable to statements regarding single operants (Catania, 1966:214). Yet, there has been no systematic extension to human behavior by researchers in applied analysis. What kind of technology will we have if we apply the law of effect in situations where the correlation based law of effect is the operating principle (cf., Baum, 1973)?²

The absence of concurrent operant research and literature is not the only deficit in current applied behavior

²At the present time Pierce and Epling, along with a graduate student S. Greer, are addressing the implications of concurrent operants for the analysis of human communication. We hope that an applied technology for "improved communication" between speaker and audience will follow from this kind of research endeavor. Thus the extension of fundamental principles and their refinement in everyday human behavior seems to have eventual practical relevance.

analysis. There is also an extensive and growing literature concerning adjunctive behavior (Falk, 1971) which has been left unaddressed by these researchers. The possible human implications of adjunctive behavior were discussed in a brief note by Foster (1978). Until we thoroughly analyze the contingencies governing human behavior, we may classify as operant certain behaviors which are adjunctive in nature (Epling and Zelhart, Note 2). These adjuncts may not be as susceptible to contingency control as operants and a technology which fails to distinguish adjunctive from operant behaviors will be relatively ineffective in amelioration of behavior problems.

It is evident that basic experimental analysis of behavior has direct bearing on many of the problems of applied behavior analysis. Much of the analytic aspects of behavior analysis pertain to the extension of basic principles directly to human behavior. Thus, more concern with science and analysis will tie applied analysis into the mainstream of inquiry, involving among other things, concurrent operants and adjunctive behavior. The technology that emerges from this inquiry will be far more powerful than the simple law of effect and its application. In addition, researchers are not only committed to extending basic principles to human behavior but they may also be involved in the discovery of basic principles. For example, the work on generalized imitation (Baer and Sherman, 1964) or maternal-infant attachment (Gerwitz and Boyd, 1977) adds to our understanding of basic processes of human behavior.

If we take seriously that task of focusing on basic principles, then it will be possible to arrange educational contingencies which strengthen and maintain analysis in students. In addition, this goal will exert stimulus control over the editors, authors and readers of applied behavior analysis and publication policies will then increase analytic research.

It is our hope that authors in applied analysis journals re-define applied analysis with an emphasis on fundamental principles. This would reflect a scientific concern with specification of environmental contingencies governing human behavior. Such a concern will be reflected in an increase in *JEAB* citations, a more precise use of terms like stimulus control, schedule of reinforcement, or generalization gradient, and finally an increased effort on the part of authors to make their results clear in terms of the experimental analysis of behavior. Papers devoted to technology and human problems are also important. However, these articles should be reported in journals devoted to behavioral applications. More basic journals of applied research will then become the major outlet for analysis of socially important behaviors.

The scientific endeavor which we have outlined for applied analysis is premised on the assumption that it is that part of the experimental analysis of behavior which deals directly with socially important human behavior. The idea of "socially important" behavior has, we believe, been misunderstood. The final section of this paper attempts to clarify the meaning of this term for applied behavior analysis.

The Meaning of Social Importance

In a recent article by Wolf (1978), the original statement of purpose of *JABA* was examined. In that statement of purpose, Baer et al., (1968) had dedicated applied behavior analysis to the task of applying the analysis of behavior to problems of "social importance." While this task was acceptable to authors, reviewers, editors, and readers of *JABA* there was little critical examination of the concept of social importance. However, the meaning of this term can be inferred from the behavior of authors reporting in *JABA*. It appears that the cure-help contingencies favored a definition of social importance as judged by society and more specifically by relevant institutions, agencies and clients.

These contingencies account for Wolf's (1978) conclusions in his article on the social validation of behavioral applications. It is the "subjective value judgment" of society which validates applied behavior analysis and is the basis of its social importance (p. 11). With the focus on cure-help and behavioral improvement, this kind of definition of social importance seems to make good sense. However, it takes applied behavior analysis outside of the experimental analysis of behavior. Notice the acceptability of subjective report and Wolf's attempt to legitimize subjective measures!

The contingencies of cure-help may shape the behavior analyst toward subjective measurement and cognitive interpretation, while at the same time, emphasizing improvement rather than analytic inquiry. A re-definition of the term social importance is needed which is tied to contingencies of reinforcement favoring scientific behavior on the part of the behavior analyst. In this case, social importance will arise from the concerns of experimental analysis and its attention to the social environment of man (Skinner, 1961). Social importance will then be linked to the study of basic social processes generalized from the everyday interaction of human actors (cf., Burgess and Bushell, 1969).

Thus, an experimental analysis of communication, organization, status and power, interpersonal attitudes and attraction, or other social processes have definite importance. The social importance of such analysis is based on the theoretical understanding of major social behaviors that permeate human interaction. Since, at the conceptual level, applied behavior analysis will specify the critical reinforcement contingencies that control human interaction, a more powerful behavioral technology should follow.

The analysis of generalized imitation meets this criterion of social importance. This is because imitation is viewed as a basic social process involved in individual

socialization. Generalized imitation research provides knowledge and possibilities for control that are of obvious social importance. The importance of such findings is not based on institutional or client gains but rather on the explication of prominent social process from a contingency or reinforcement analysis. Social importance is, therefore, entirely based on the theoretical and scientific concerns of the experimental analysis of behavior.

The present operating contingencies which control the behavior of researchers in applied analysis make it unlikely that scientific behavior or a basic definition of social importance will be favored. Nonetheless, researchers can attempt to change the contingencies which control their behavior. If technological journals are established for the dissemination of applications of behavior principles then more basic journals like *JABA* might pursue the analysis of human behavior. Also, with emphasis on the principles of behavior, it will be possible to design courses, seminars and informal interactions which strengthen and maintain analytic behavior in non-behavioral environments. Research on educational contingencies which favor survival of behavioral analysis will be a necessary step in this process. Given this sort of development, a basic re-definition of social importance will naturally follow. The arrangement of these additional contingencies will function to ameliorate the impact of cure-help contingencies which keep analysis at low levels in applied behavior analysis.

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