ADOPTION OF INNOVATIONS FROM APPLIED BEHAVIORAL RESEARCH: "DOES ANYBODY CARE?"

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Applied behavioral researchers develop useful innovative technologies experimentally, and yet few of these technologies enjoy widespread adoption by our society. This paper analyzes several instances in which government agencies adopted behavioral technology, identifies 10 manipulable variables that could increase the rate of adoption of such technological innovations, and relates them to the field of knowledge diffusion. Unifying theory and experimental analysis are lacking in that field, yet an implicit technology may exist.

DESCRIPTORS: public policy, innovations, diffusion, applied research, technology.

"Is anybody there?

"Does anybody care?

"Does anybody see what I see?"

In the days of the early successes of behavior modification, much alarm was expressed that everyone's behavior would be taken over by all-powerful behavioral techniques (cf. Stolz, 1978); serious writers contended that behavior modification could be used to impose "an orthodoxy of 'appropriate conduct'" on the community (Heldman, 1973). The Congress of the United States investigated behavior modification to see

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if its technology could be used to restrict individuals' rights (U.S. Congress, 1974a, 1974b), and popular works of fiction capitalized on these common fears (e.g., Burgess, 1962).

Applied behavior analysis focuses on the development of technologies for the solution of problems that are important to society, as well as individuals' personal problems (Baer, Wolf, & Risley, 1968). Indeed, one of the defining characteristics of applied research is its focus on socially important problems. Ideally, a new technology, directed at a societal problem, would first be developed and shown to be effective in an applied research setting; the generality of that effective technology would then be demonstrated; finally, the technology would be applied on a large scale, with continued measurement of its generality and effectiveness.

In practice, technologies developed by applied behavior analysts have not been widely adopted by government at any level, and research-based behavior modification has not been used to restrict people's freedoms. Rather, many imaginative technologies have been developed, addressed to an increasing array of pressing social problems; some of these have been shown to be effective, and a few have been demonstrated to be generalizable, often as a result of special programming (Stokes & Baer, 1977). Very few have been given the final test of application on a large

scale. The technologies mostly lie unnoticed in our ever-proliferating professional journals.

Often, only widespread application of a technology can provide the information necessary for an evaluation of its generality and effectiveness. In order for such information to be obtainable on technological innovations, society must commit significant resources to the adoption of the innovation.

What is known and what needs to be known about how to get society to make such a commitment? What is it that behavioral professionals are not doing? Why are so few behavioral technological innovations adopted by government policymakers?

Brooding about these issues one day, I found myself humming a tune, which turned out to be a message from my response repertoire. To understand the tune's relationship to the adoption of technological innovation, consider its context.

Some time ago, a musical was made about the efforts of the Second Continental Congress that resulted in the writing of the Declaration of Independence, a musical called *1776* (Stone, 1964). In it, Congress receives a dispatch from General Washington (which Stone suggests is probably a paraphrase of an actual dispatch). General Washington is complaining that no one has responded to his last 15 dispatches. John Adams reads the dispatch in song, singing, " 'Is anybody there?/Does anybody care?' " and goes on with his own question, "Does anybody see what I see?" (Stone, 1964, p. 127). That is the tune I was humming.

What was the message to me? The dispatch portrays Washington, sending dispatches, asking for money and troops, attempting to design successful military campaigns, yet getting no support from policymakers. The song describes Adams, attempting to persuade the Second Continental Congress to break with England and to design a revolution and a good government, yet getting no response from policymakers. Today, behavior analysts are developing technological innovations directed toward the design of better communities and more humane environments,

yet getting virtually no response from policymakers.

"Does anybody care?" How can we modify the environment to create caring behavior in government policymakers? In other words, how can we get policymakers to notice technological innovations and make use of them? This paper reviews what is known about that issue, and suggests how more and better answers to that question might be obtained. Specifically, the paper considers adoptions by policymakers of technological innovations from applied behavioral research. *Policymakers* refers to individuals in positions of power in local, state, and federal government, rather than individual practitioners; *adoption* refers to announcing that a particular technology is government policy, rather than doing or contracting for evaluation research on the innovation; and *technological innovations* refers to techniques, programs, and packages targeted to a single significant social problem such as unemployment, alcoholism, or delinquency, rather than redesigns of an entire culture (e.g., Skinner, 1971). Thus, the innovations discussed will be feasible, research-based interventions. Finally, most of the examples used will come from the field of applied behavior analysis.

Adoption by Government Policymakers

The importance of having behavioral procedures adopted by policymakers cannot be overstated. Each year, billions of dollars for human services are tied through federal and state regulations to specific models of service delivery (Fishman, Note 1). For example, Medicare funds can be used to pay for only those services that are "reasonable and necessary" (Section 1862, Social Security Act). A Medicare ruling on whether a given service or technology can be covered tends to accelerate adoption of technologies approved for coverage and retard adoption or hasten the abandonment of technologies that are not approved (National Center for Health Care Technology, Note 2).

In over 11 years as an employee of the federal government, my own experience is that govern-

ment policymakers never adopt behavioral and social science technologies as policy solely because of data from carefully designed outcome studies. Indeed, whether having sound data is even necessary will be discussed later in this paper. However, at a minimum, simply having outcome data is not sufficient to ensure adoption by policymakers.

For example, national health insurance has been contemplated for years. Numerous Congressional hearings have been held, and many bills have been proposed. An increasingly large body of data (Jones & Vischi, 1979) suggests that offering mental health services as part of a health care package has quite an impact, reducing the total cost of the package. Although the exact numbers vary from study to study, the typical finding is that adding mental health services decreases the total cost of care for those patients, even including the cost of the mental health services (Jones & Vischi, 1979).

In 13 studies reviewed by Jones and Vischi (1979), the median reduction was 20%; decreases in net costs for patients treated by mental health personnel ranged as high as 67%, compared to those with a diagnosis of mental illness who were treated only by nonpsychiatric medical staff. Yet these data have had no obvious impact on those drawing up the current versions of national health insurance: Mental health services typically are either not included or included in such a limited way as to preclude the impact shown in the research cited.

Paul and Lentz (1977) conducted an elaborate research project comparing three types of environments in a state hospital: a social-learning program, a milieu therapy program, and the standard state hospital treatment. Those familiar with this work agree that the experimental design was exceptionally elegant (Liberman, 1980) and unusually rigorous (Peterson, 1981). The results showed clearly that the social-learning program was superior to the milieu program, and that both were markedly superior to the standard treatment. Yet, as Peterson (1981) despairingly remarks:

Talk about effective services? None better. Talk about evaluating programs? None more convincing. So what happened? Were state hospitals in the State of Illinois immediately transformed to take full advantage of Paul's findings? Not exactly. A change of administration in the governor's office led to a severe budget cut and the programs were discontinued. (p. 310)

The soundness of Paul's design and the clarity of his data were not sufficient to ensure even the continuation of his program, much less convince the state policymakers to disseminate it to other state hospitals.

I know of one country that did act on the basis of research data. In the early 1970's, the British government found its costs increasing astronomically as a result of the high rents, utility costs, and other expenses characteristic of doing business exclusively in London. Decentralization of some government functions seemed a reasonable solution. But first the government hired a researcher to find out which of its staff had to deal in person with which other staff, and which could communicate adequately by telephone or memo. On the basis of the data (Williams, Note 3), the British government then decided whom to decentralize to other parts of the British Isles, and whom to leave in London.

Perhaps ignoring outcome data when decisions are being made will be less of a problem in the United States in coming years. The National Center for Health Care Technology, first funded in 1979, has been charged with developing alternative methods for disseminating knowledge concerning health and health-related activities, and with training people to develop such methods (National Center for Health Care Technology, Note 2).

However, for some time to come, government policymakers are likely to continue to ignore data-based technological innovations when making decisions. What seems to happen most often at present is that a solution to some pressing social problem is adopted, often as part of some general social movement, and, later, research is

done that may (or may not) indicate the value of this solution. Bevan (1976) summed up the situation:

> When the Pentagon develops a new weapons system, the research and development process involves an elaborate sequence of testing and comparing alternative technologies, retaining finally only the one that comes off best in comparative testing. In contrast, when our government confronts a major social problem in the civilian sector, its solution is usually intuitive and immediate and, often to our ultimate sorrow, implemented on a full scale. (p. 490)

Exemplifying just that strategy (if leaping to an unevaluated solution can be called a strategy), the report of the Joint Commission on Mental Illness and Health (1961) on the conditions in state mental hospitals led to the first of a series of laws establishing what has become an extraordinarily expensive system of community mental health care (Bloom, 1975). What had been proved scientifically about the efficacy of community-based versus institutional treatment in 1961, when the report was published, or in 1963, when the first law was passed? Very little. However, the pressure of demands for care outside state institutions led policymakers to set up the community mental health system, even in the absence of any relevant data.

In 1977, the National Institute of Mental Health began a pilot test of a new type of contract given directly to states to assist them in developing community networks to care for the chronically mentally ill (Turner & TenHoor, 1978). The intent was to collect data from a few states, evaluate the mechanism and the procedures developed, and then, if the initial projects were shown to be successful, expand the program by awarding contracts to additional states. However, in 1978, before any meaningful data could be collected from the pilot evaluation, New York State funded a $15.1 million program implementing the untested experimental model in 46 of the 62 counties in the state (Lund, 1980; Lund & Steindorff, in press).

Examples of Dissemination and Adoption

In this section of the article, I will describe four case examples of the dissemination of innovative techniques and their adoption by government agencies. Typically, behavioral research was done to demonstrate the effectiveness of some technology, information about this research was made generally available, and the technology developed in the research became government policy. Except for the initial example, my information on each of these cases comes partially from published literature and partially from interviews with the individuals directly involved in the dissemination of the innovative technology, including both researchers and government adoptors. In some instances, I have omitted identifying information, either at the request of my informants or to emphasize the general nature of the information.

Fairweather Lodge program. Although this program is not usually identified with applied behavior analysis, and although its adoptions were by state hospitals rather than a governing entity, this example is included here even so because it is a classic and because the federal government was centrally involved in its dissemination.

A Lodge (Fairweather, Sanders, Maynard, & Cressler, 1969) is a community home for mental patients who have been trained by what look like reinforcement-based contingencies to run a simple business, e.g., providing janitorial services. Fairweather and his associates do not use the conceptual scheme of behavior analysis or the language of operant conditioning; nevertheless, the Lodge program includes a "step" system with responsibilities, passes, and funds contingent on appropriate patent behavior. The data from the initial development of the Lodge system have been characterized as "most impressive findings" (National Institute of Mental Health, 1971) because of the system's success in helping recovering mental patients become self-sufficient in the community. Although Fairweather wrote several journal articles and a book about the pro-

gram (e.g., Fairweather et al., 1969), institutions for the mentally ill did not adopt it. In particular, attempts were made to interest the Veterans' Administration (VA) in adopting the Lodge system as its own treatment program, but the VA central office was unresponsive, and none of the VA mental hospitals that knew about the Lodge system showed much interest in it (Fairweather, 1980b). A nationwide survey showed that only one state mental hospital had adopted the Lodge procedure, and that one had done so with a National Institute of Mental Health Hospital Improvement Program grant.

Just when Fairweather and his associates were discovering this lack of adoption of their promising technique, administrators at the National Institute of Mental Health were developing an interest in studying the dissemination process experimentally. As a result, a research grant was awarded to Fairweather and his associates to conduct a systematic, experimental, nationwide dissemination study (Fairweather, Sanders, & Tornatzky, 1974), in the course of which 25 hospitals either adopted the Lodge system or said they were on the way to adopting it.

Fairweather et al. (1974) divided the process of implementing the adoption of a new technology into four stages: (a) approaching the target organization, (b) persuading it to adopt the innovation, (c) activating the adoption, and (d) diffusing the innovation to other organizations. The study involved 255 state and VA mental hospitals, virtually the entire population of public inpatient mental institutions in the United States.

This research, investigating these four stages of the process of implementation of a new technology, is a classic in this field and unique in scope. Although on close inspection the research design is disappointing and the implementation of the project was flawed, even so, the project is seminal: It points to what might be possible in this area, given adequate resources.

When the research began, the first two stages of the implementation process—approaching the target organization and persuading it to adopt the innovation—were combined into a single stage. The operationalization of this dimension had three values: (a) a brochure describing the Lodge program, (b) a workshop held at the state hospital, in which the Lodge program was described, and (c) a model program run like the Lodge program, but set up in the hospital, using hospital facilities, staff, and patients. Each of the target hospitals was offered just one of these three options, depending on which experimental condition it was assigned to; the measure of whether any of these approach-and-persuasion techniques worked was the proportion of hospitals offered that option that agreed to accept it.

This plan was implemented for each of the 255 hospitals in this way: One of the three options described in the previous paragraph was offered to a hospital staff member over the telephone; during these calls, the staff members were asked whether they were willing to accept that option. The dependent variable, the measures of the effectiveness of the brochure versus the workshop versus the model program as an approach-and-persuasion technique, was the proportion of those called who agreed to accept what they were offered.

(In actuality, there were not three values of approach-and-persuasion, but rather only one value. Every hospital got the same approach-and-persuasion treatment—a telephone call. What varied was the cost of giving in to the persuasion —supplying a list of professional staff for the researchers' mailing of the brochure, or hosting a one-day workshop, or establishing a demonstration ward program.)

The person from the research team making the telephone calls could not be blind to the experimental procedures, because that person had to be able to say what was going to be offered during each of the telephone calls. Also, the published reports of this work do not mention the use of a standard protocol by the individuals making the calls. Thus, the possibility of experimenter-induced bias exists.

When the adoption results are reported in relation to the approach-and-persuasion variable, Fairweather and his colleagues (Fairweather,

1980a; Fairweather et al., 1974) consistently state that the brochure and workshop interventions yielded "similar results" (Fairweather, 1980a), specifically, only 5% and 15%, respectively, of the 85 hospitals approached in each of these two conditions later adopted the Lodge program. This is always contrasted with the many adoptions in the hospitals that were offered demonstration wards and accepted the offer: 75% or 9 of the 12 hospitals that set up demonstration wards eventually adopted a Lodge program.

However, this contrast disappears on inspection of the data. Of the 85 hospitals in each group, 4 from the brochure group, 10 from the workshop group, and 9 from the demonstration-ward group later adopted the Lodge program. The results of the workshop and demonstration-ward groups are virtually identical, and somewhat (although not very) different from the brochure group. The chief difference is how few hospitals agreed to set up a demonstration ward (12), whereas much larger and quite similar numbers of hospitals submitted a mailing list for brochures to be sent (55 hospitals) and completed workshops (58 hospitals). Thus, in contrast to the Fairweather et al. (1974) conclusions, the workshop seems to be the most cost-effective technique, producing the largest number of adoptions at lowest cost to the adopting hospitals.

The third dimension, activating the adoption, was studied by varying whether a hospital received in-person or written consultation in the development of a Lodge program. Unfortunately, this variable was contaminated in the implementation of the research design, in that the hospitals that were to receive only written consultation were allowed to call the experimenters —collect—for telephone consultation, and, in addition, when they were called by the researchers every 3 mo for data collection, they could get telephone consultation. Even so, the consultant group showed significantly more "movement toward" establishing lodges than did the manual group (Fairweather, 1980a, p. 39).

The fourth dimension, diffusing the innovation to other organizations, was studied simply by a 2-yr follow-up of the entire sample of 255 hospitals; no variables were experimentally manipulated.

To summarize what is noteworthy: (a) the research project could not have been conducted on this grand scale without extensive federal support, and (b) experimental analysis of the process of the adoption of technological innovations is possible, even though (c) this particular project may be disappointing in its implementation.

Trash-packaging program. After researchers (Stokes & Fawcett, 1977) had experimentally demonstrated that a particular enforcement system was effective in getting city residents to package their trash properly, the new technology was adopted by the city commission passing an ordinance implementing the system (Stokes, Note 4).

In this instance, the research project itself was part of a response to a pressing social problem. The sanitation workers' union had been concerned about the safety of its workers and the related issue of how citizens packaged their trash; simultaneously, the city and the union were in conflict. Both sides saw the research as a way to deal with some of their problems. Thus, the union asked that a technology be developed for improving citizens' packaging of their trash; furthermore, the sanitation workers were directly involved in the research project, including the implementation of the experimental enforcement system. Thus, the findings from the research project, later to be passed into law, were developed from a study requested by the union of those individuals who participated the project and who later would implement its adoption.

After the city manager and the union agreed that the research should be done, approval was needed from the city commissioners. The city manager went to the commissioners for this approval—unaccompanied by either the union or the researchers, although the support of the union was made clear (Stokes, Note 4). The

commissioners agreed that the study could be conducted as proposed and that the city would pay most of the project's costs (other than the gasoline costs of the observers who followed the trash-collection trucks).

When the research results showed that the experimental enforcement procedure was successful in improving trash packaging, an implementation plan was developed (Stokes & Fawcett, 1977) jointly by the city management staff and the sanitation workers, who together recommended to the city commission some changes from the procedures used in the research. Prior to adopting the implementation plan, the city commission made some changes of its own. The experimentally developed trash-packaging enforcement plan was eventually passed into law as an ordinance, including enforcement procedures funded by the city (Stokes, Note 4).

Job-finding clubs. Azrin and his associates (Azrin, Flores, & Kaplan, 1975; Jones & Azrin, 1973) developed and analyzed a self-help system for finding jobs, in which a group of unemployed persons work together daily, making calls to seek employment leads. This technique, also called a Job Club or Group Job-Seeking Program, was adopted by the Department of Labor as a standard component of its Work Incentive Program (Hans, Note 5).

Subsequent to the initial publication in professional journals of research on the Job Clubs (Azrin et al., 1975; Jones & Azrin, 1973), the procedure was publicized in the press (Azrin, Note 6); a Congressman inserted a copy of some of this publicity in the *Congressional Record* (Simon, 1975). Department of Labor staff who had seen some of this publicity (Zurer, Note 7) then encouraged Azrin to do a formal evaluation study, using the staff of the agencies that the Work Incentive Program normally dealt with and actual Work Incentive Program clients. This evaluation research, funded by the Department of Labor, showed that Group Job Seeking produced much higher placement rates faster and cheaper than the standard job-counseling procedures then in use (Azrin, Philip, Thienes-

Hontos, & Besalel, 1980; Zurer, Note 7). Azrin's report to the Department of Labor included, at the department's request, a detailed national implementation plan (Azrin, Note 8).

Just at the time that the Azrin et al. (1980) report was received by the Work Incentive Program staff at the Department of Labor, the program was politically unpopular and under pressure to produce impressive results; simultaneously, the administration was deemphasizing the type of public service jobs that had been a frequent source of placements for Work Incentive Program clients. Furthermore, budget limitations meant that the agencies counseling clients had insufficient staff for the standard job-counseling techniques (Zurer, Note 7). In this context, the Job Club program, being a group approach focused primarily on self-help by the clients, enabled job counselors to work with more clients per counselor than the standard procedures, and resulted in more job placements.

An interested Work Incentive Program staff member in Washington obtained from the head of the program the authorization to spend $1.3 million to institute Job Clubs in the Work Incentive Program. Dissemination began with training for the Regional Office Department of Labor staff; these people then gave technical assistance to state staff members; the states then could (and did) apply for funds to run Job Clubs on a pilot basis, to see if they were effective. In the dissemination effort, Job Clubs were presented by the Washington Department of Labor staff to their Regional Offices and later to the states as a successful and easily implemented procedure, which could be an alternative to the standard procedures, i.e., regional office and state staff were not required to adopt the new technology (Hans, Note 9). The Washington Work Incentive Program staff followed up on the initial training with encouraging memos (e.g., Hans, Note 10) and many telephone calls and visits to the regional offices and the states, demonstrating Washington's commitment to the new technology (Zurer, Note 7).

Achievement Place. Achievement Place is a

home-style, community-based treatment facility using behavior analysis techniques such as the token economy (Phillips, 1968). The technology that comprises the Achievement Place program was initially developed through an extensive series of experiments (e.g., Phillips, Phillips, Fixsen, & Wolf, 1971; Phillips, Phillips, Wolf, & Fixsen, 1973). Once the research base was developed, dissemination of its "teaching-family" model was facilitated by grants from the National Institute of Mental Health, which provided partial support for development of a procedural handbook (Phillips, Phillips, Fixsen, & Wolf, 1974), as well as for dissemination conferences and workshops. Many communities and several state governments have adopted this model for the treatment of predelinquent youngsters (e.g., Hamerlynck, 1980).

In one of the adopting states, the teaching-family model was considered for adoption at a time when the state was closing its juvenile correctional facility and trying to strengthen community alternatives. The model was proposed to the state Mental Health Commissioner by a member of his staff who had had experience with the model when studying in the Department of Human Development at the University of Kansas, where the model was developed. Once the Mental Health Commissioner was convinced of the value of the Achievement Place model, he, in turn, persuaded the Commissioner of Social and Rehabilitation Services of its value. As it happens, the deputy of this second Commissioner had also been a student in the Department of Human Development, and was able to support the arguments of the Mental Health Commissioner. A visit was made to a model Achievement Place project at Boys Town in Omaha. Staff in the Department of Social and Rehabilitation Services were also familiar with a successful residential learning center at their state university, which had been set up following a visit from Wolf (McKenzie, Note 11). The two commissioners met with the cabinet secretary above them both, to persuade her to adopt the model formally for the state's treatment of juveniles in

the community. The two commissioners, together with the secretary's deputy, who had been a postdoctoral fellow in the Department of Human Development, were able to convince the secretary, and the Achievement Place model was adopted (McKenzie, Note 11).

Possible Key Variables in Dissemination and Adoption

The preceding section has provided examples of dissemination and adoption of technology developed through applied behavioral research—one example of adoption by mental hospitals, and three examples of adoptions by government policymakers. We can now review these examples to draw out what seem to be the critical variables. To retain the focus of this paper on adoptions by government policymakers, only the latter three examples will be used in what follows. Possible candidates for critical variables include these:

Research data showed that the innovation was effective. In the trash-packaging example, Stokes and Fawcett's (1977) study showed that the enforcement system devised was effective. In the Job Clubs example, Azrin and his associates (Azrin et al., 1975; Jones & Azrin, 1973) had already published several studies demonstrating the effectiveness of the technique before Azrin was contacted by the Department of Labor, and then additional data (Azrin et al., 1980) were collected that were even more relevant to the potential adoptor's interests. Achievement Place technology is based on a large body of research (e.g., Phillips et al., 1971; Phillips et al., 1973), and in the example used above, key state officials were familiar with that research because of their past training at the University of Kansas.

The technology met the continuing mission of the adopting agency. The city commissioners presumably aim to improve the quality of life in their town and to maintain good relations with their employees' unions; the sanitation workers' union wanted improved safety for its members. The Department of Labor's mission included serving more clients with less staff time, because

of budget restrictions; the Job Clubs were able to meet this mission better than standard counseling techniques. The state described in the Achievement Place example was attempting to develop adequate community alternatives to the institutionalization of adjudicated juveniles.

The potential adoptor had a pressing management problem. The sanitation union and the city were at odds in the trash-packaging case. The Department of Labor's program had been threatened with a decreased budget and had also been told to produce more job placements. The state was closing its juvenile correctional facility and needed community placements for the juveniles being deinstitutionalized.

The availability of the dissemination to the potential adoptor was timely. Stokes and Fawcett (1977) proposed the enforcement technology for trash packaging at a time when the union was troubling the city. The Department of Labor was having budgetary and accountability problems when Azrin and associates' data came to their attention. The state in the Achievement Place example was in the process of closing its juvenile correctional facility and state officials were looking for community-based alternatives.

Potential adoptors were able to view ongoing (model) programs. In the trash-packaging case, the sanitation workers could participate in the experimental enforcement program as it was being evaluated prior to adoption. A Department of Labor staff member visited a Job Club, prior to recommending its adoption (Zurer, Note 7). The two state commissioners visited the Boys Town Achievement Place model, and also were familiar with a similar home-based program at their own state university.

The adoption was proposed by policymakers, rather than by the researchers who developed the technology. The city manager in the trash-packaging example was the one who proposed to the city commission that an ordinance be adopted regarding the new enforcement system. It was a Department of Labor staff member who proposed to the head of the Work Incentive Program that funds be set aside for the training nec-

essary to disseminate the Job Club procedure. Although Azrin had proposed a nationwide implementation program, he was so far removed from the adoption process that it was not until some time after the nationwide adoption of the Job Clubs as a standard component of the Work Incentive Program that he heard about it, and then he heard about it only by chance (Azrin, Note 12). The state commissioners proposed that the secretary adopt the Achievement Place model; none of the original researchers was directly involved in that recommendation.

The intervention was tailored to local conditions. Prior to proposing the adoption of the trash-packaging enforcement procedure to the city commission, the city manager and the sanitation workers' union agreed on some changes from the model tested in Stokes and Fawcett's (1977) research; prior to passing the ordinance, the city commission changed the procedure still further. (I have not been able to find out if this variable also applies to the other two examples.)

Those who would have to implement the program were involved in the preliminary research and in asking for the adoption. The sanitation workers' union asked for the development of a technique, participated in the research itself, and requested the adoption of the procedure shown to be effective. The states that adopted the Job Clubs had to apply to the Department of Labor for the funds needed to train their staff and establish the clubs. The commissioners of the state departments that would later implement the Achievement Place model were the ones who asked the secretary to adopt the model for their state.

Funds were available for dissemination. In the case of the trash-packaging program, the city paid the costs of the enforcement program, once the ordinance was passed. The Department of Labor allocated $1.3 million for dissemination costs of the Job Clubs. The Achievement Place dissemination program was supported by a special dissemination grant from the National Institute of Mental Health.

A key person, trained, enthusiastic, and with

significant social skills, persisted through political infighting to protect the program from going under. In the trash-packaging example, the city manager was very receptive to the experimental program from the start, and he and his deputy used their authority to counter attempts by other city personnel to sabotage the program (Stokes, Note 4). At the Department of Labor, two Manpower Development Specialists with the Work Incentive Program supported Group Job-Seeking and worked to ensure its adoption (Zurer, Note 7). The Achievement Place dissemination program nationwide, in addition to the program in the state cited in the example, has relied on many key individuals, often but not always former students at the Department of Human Development, who have shepherded the dissemination process through local political thickets (Hamerlynck, 1980; Wolf, Note 13).

The 10 variables I have drawn from the three examples of government adoption of technological innovations are some of the many key variables described in the published literature on this topic, which is called the diffusion of innovation, or knowledge utilization. This area of research started with research on the diffusion of new farm practices (e.g., Beal, Rogers, & Bohlen, 1957; Ryan & Gross, 1943), and since then has also been concerned with the adoption of new types of medications (e.g., Coleman, Katz, & Menzel, 1966) and new medical procedures (e.g., Coe & Bernhill, 1967), as well as with the adoption of educational innovations by school systems and the spread of acceptance of new retail products (Katz, Levin, & Hamilton, 1963). It is a very large literature (cf. Human Interaction Research Institute, 1976).

Rather than describing individual studies, let me characterize the literature in the area of the diffusion of innovation, or knowledge utilization. Many articles simply speculate on what some effective variables might be, on the basis of the authors' own experiences. Other articles describe how an innovation was adopted, much as I have done in this article, and then speculate post hoc in an attempt to determine what may be the relevant variables, again, as I have done with the three examples of government adoption of behavioral technology. The research of Fairweather et al. (1974), in which variables were manipulated in an attempt to analyze the diffusion and adoption processes, is unusual though not unique.

The preponderance of the literature on the diffusion of innovation is speculation, however, with or without case histories as the basis for that speculation. What this has produced is innumerable lists of possibly effective variables, lists very like the one I produced above. In fact, my list of 10 variables, drawn from the three behavioral case examples involving government adoptions, can easily be translated into any one of the most commonly cited lists.

What strikes me as an applied behavior analyst reading this literature is the absence of a general theory. In applied behavior analysis, proposed research plans and results obtained are related to a coherent theory (reinforcement theory) and to a few powerful variables. In fact, the complaint is often made that there are too few principles and too few variables in applied behavior analysis, and a particularly common and strongly voiced complaint is that there may even be just one key variable in applied behavior analysis.

In the diffusion of innovation, in contrast, there are numerous weak variables and no general theory, so that the result of the few empirical studies is simply to add to the list of variables (or slightly strengthen the evidence for some existing variables). Reading through the literature on the diffusion of innovation, one finds, in fact, lists of the lists (Human Interaction Research Institute, 1976).

In the absence of a general organizing theory, those who develop lists of variables also develop mnemonics for the many variables. A mnemonic is quite different from a general theory: A general theory organizes variables in relation to each other in terms of their known effects; a mnemonic simply organizes them in relation to how they might be recalled most easily, with no logi-

cal, scientific, or theoretical connection between the mnemonic and the variables it helps to recall. (Actually, the presumed positive effect of first-letter mnemonics on recall does not receive strong support in the research literature; rather, first-letter mnemonics, although popular with students, have been shown to interfere with memory more than they aid it, e.g., Carlson, Zimmer, & Glover, 1981.) The most common mnemonic, for example, is Davis' A VICTORY (National Institute of Mental Health, 1971); each letter of his mnemonic is the initial letter of a variable affecting dissemination (*A*bility to carry out the change; *V*alues or self-expectancy; *I*dea or information about the qualities of the innovation; *C*ircumstances that prevail at the time; and so on). Two other commonly cited mnemonics are CORRECT (Glaser, 1973) and HELP-SCORES (Havelock & Lingwood, Note 14.) Again, each letter of the mnemonic is the initial letter of a variable considered to affect dissemination: In the cast of CORRECT, *C*redibility, *O*bservability, *R*elevance, and so on (Glaser, 1973); in the case of HELP-SCORES, *H*omophily, *E*mpathy, *L*inkage, and so on (Havelock & Lingwood, Note 14).

Mnemonics, not being theories or organizing principles except in the most literal structural sense, have no heuristic function. They do not suggest new research, nor is there anything intrinsic to them that would lead a reader to decide that one is preferable to others. The area of knowledge utilization cries out for theory, empirical research, and analysis.

Looking over the variables in the lists and the research in the published literature, the strongest single variable influencing the diffusion of innovation appears to me to be personal interaction, or the influence of the colleagues of the policymaker. The importance of this variable is suggested to me by a study involving interviews with innovators (Roberts & Larsen, Note 15), and supported by the conclusion from an extensive review of the literature by Glaser (1973), one of the leaders in this field. An empirical study of adoptions of new drugs by physicians

(McLaughlin & Penchansky, 1965) also concluded that personal influence was the major factor in adoptions. This variable stands out so much from the others that a National Science Foundation Commission (National Science Foundation, 1969), suggesting how social science research might be used more effectively by federal decision makers, focused on increasing the contacts between social scientists and policymakers (for example, by adding more social scientists to the membership of the President's Science Advisory Committee). The case studies described earlier in this paper also suggested that individual contacts and individual personalities were crucial in determining whether a given behavioral technology would be adopted.

Applied behavior analysts, interested in the solution of the problem of how to disseminate their technological innovations—the difficulty of that dissemination being in itself a significant social problem—will find the presence of a well-trained, personable colleague sympathetic to applied behavior analysis and working near every potential policymaker a difficult environment to engineer. What, then, can the literature on knowledge utilization offer that would be of use to an applied behavior analyst?

Logically, solid data demonstrating the effectiveness of the innovation would seem to be a prerequisite for adoption of the innovation. The literature (Flanagan, 1961) is not consistent on this point, however, and experience suggests that such inconsistency is realistic. Some innovations adopted by policymakers have been shown to be effective prior to adoption; many new technologies are adopted for extraneous reasons, independent of empirical validation or in the absence of such validation (Bevan, 1976; Roberts & Larsen, Note 15). My focus, however, has been on the search for manipulable variables that influence knowledge diffusion. Whether or not data demonstrating effectiveness are available for a given innovation, getting a technology adopted calls for engineering the environment to modify the adopting behavior of the policymaker.

I have noted above that personal influence is

a major variable in determining adoption of innovation. Apart from personal influence, many other variables identified in the literature relate to aspects of program design, and hence are potentially manipulable. To take just a few from the case studies described earlier in this article, potentially manipulable variables include involving those who will be implementing the program in the preliminary research; involving those same individuals in the request for adoption of the innovation; changing the intervention to suit local conditions; and having potential adoptors view ongoing model programs. These variables and others like them could be analyzed experimentally and built into a dissemination package.

A Technology of the Adoption of Innovations

Stokes and Baer (1977) have described a technology of generalization, which they found implicit in the published literature, but which they had to draw out of that literature and then were able to summarize as a list of techniques of varying utility. Is there, then, an implicit technology of the adoption of innovations, of knowledge utilization?

It is often assumed that decision makers will act rationally, if only they have access to the data. For example, Congress, with the passage of the Health Services Research, Health Statistics, and Health Care Technology Act of 1978 (P.L. 95-623), established the National Center on Health Care Technology. Among the charges to the National Center was disseminating to policymakers in those government agencies with responsibilities relating to reimbursement or regulations the results of the best current evaluations of health care and mental health care technology. The National Center's reports were to cover the safety, efficacy, and cost-effectiveness of those technologies, as well as to recommend which of the health and mental health care technologies should be eligible for reimbursement and which subject to standards. The National Center accomplishes this dissemination primarily by making research data and recommendations available through its own publications and through publications in scientific and medical journals (National Center for Health Care Technology, Note 2).

However, many articles complain that the research literature is not read by policymakers (e.g., Halpert, 1966), and that when it is, they do not make use of what they have read (Weiss, 1979; Roberts & Larsen, Note 15; Glaser, Coffey, Marks, & Sarason, Note 16). The National Institute of Mental Health, responding to this complaint, has fostered a special journal, *Innovations,* designed to make it easy for policymakers to read about innovations in human services through simple, attractive graphics, a readable style avoiding jargon, and an emphasis on practical detail (Larsen, Note 17). Analogous to Stokes and Baer's (1977) first "nonmethod" of obtaining generalization, which they called Train and Hope, this technique of diffusion of innovation might well be called Publish and Hope.

Policy innovations spread themselves much less frequently, however, than learned behavior generalizes (Stokes & Baer, 1977; Weiss, 1979; Glaser et al., Note 16). Thus, the problem of getting carefully evaluated innovations adopted does not appear to be solved simply by having information about outcome research on the innovations published in a format designed for easy reading (*Innovations*) or with the special imprimatur of a federal agency like the National Center for Health Care Technology. The problem remains of discovering the techniques that will result in the reading of those publications leading to adoption of the innovations described in them.

Conclusions

When he was a Senator, the late Vice President Humphrey (Humphrey, 1963) spoke on the importance of the United States Government making more direct, action-oriented use of behavioral science research. In his comments on disseminating research results, he said:

We need people to build bridges from research to community programs. The bridges must lead from scientific symposia to the halls of Congress, to Federal office buildings, state legislatures, city halls, school boards, chambers of commerce, trade unions, service clubs, PTAs, churches and temples, neighborhoods, street corners, and every other arena of opinion and action. (p. 291)

This article has given some examples of such bridges, bridges built from research to state hospitals, city commissions, trade unions, federal office buildings, and state officials. Writers in this area often call for "a change in the establishment that will permit" the adoption of new technology (Skinner, 1981, p. 283), or urge researchers to participate in the "political mainstream" (Liberman, 1980) or to control some of the political and social conditions affecting the adoption of behavioral technology (Peterson, 1981), as the solution to how the bridges should be built. What I have attempted in this article is to begin specifying some variables that might enable some such control over the adoption process, or, in other words, to specify some possible building materials for the bridges between research and community programs. I have called for the development of a technology for building such bridges.

With respect to that technology, where are we now? What do we know and what is possible for knowledge utilization? Let me paraphrase some remarks that Mechanic (Note 18), a well-known sociologist, made originally in the context of a talk on community support for the chronically mentally ill, but which apply in many respects to this topic as well: The fact is, Mechanic (Note 18) might have said, that society can realistically provide far better services and educational programs than are typically now being provided. By defining our goals clearly, by developing their implementation carefully, and by ensuring follow-up of our efforts, we can successfully forge more effective and humane social policies. "It is not an easy task nor are there miracles on the horizon. But the opportunity is apparent if we

care enough to take up the challenge" (Mechanic, Note 19, p. 13) of developing the techniques needed to get policymakers to adopt the impressive programs that have already been developed.

I opened this paper by asking, "Is anybody there? Does anybody care?" Let me alter the words of John Adams' song and ask, "Does anybody see what we see?" That is, do policymakers see and care about innovative interventions such as those developed by applied behavior analysts? If we want them to see and to care, to note and to use the techniques, we will have to take up the challenge, as Mechanic (Note 19) says, and develop a behavioral technology of knowledge utilization.

To turn the phrases in one final direction, "Does anybody care?" Do we care enough about the adoption of behavioral innovations to develop the behavioral technology necessary to shape those adoptions?

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