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Behavior Analysis and Real-World Problems

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Behavior Analysis and Real-World Problems

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When applied behavior analysis began as an extension of the experimental analysis of behavior, operant conditioners worked with only those cases that all other mental health professionals had given up on -- the psychotics on so-called "back wards" of state institutions, where few if any professional services were being offered, the most uncontrolled of retarded children, and individuals whose behavior was threatening their health or even their life, so that desperate physicians were willing to try anything, even operant conditioning, in an attempt to save the patient. In these types of cases, generally the environment could be well controlled, and specific behaviors of specific individuals were studied in these controlled environments.

Looking back twenty-five years to the origin of applied behavior analysis, I can remember the social setting in which operant conditioners found themselves. In the academic world of psychology, Skinner and his students were radicals methodologically. They studied the behavior of individual subjects for long periods of time, unlike most psychologists, who studied the average behavior of many subjects who participated in experiments for a short time. It appeared that they rejected what most

psychologists felt was the subject matter of psychology, such as emotions, feelings, and the mind. And, perhaps worst of all, they didn't use statistics. It was the absence of statistics, I have been told, that made their research unpublishable in the standard journals of the day.

At the time, many psychologists felt that psychotic individuals were entirely different from ordinary people. It was thought that their behavior did not follow the usual psychological laws. To convince psychologists of the lawfulness of the behavior of psychotic individuals, Ayllon, Haughton, and Hughes (1965) had to demonstrate that behaviors generally agreed on as psychotic could be shown to be learned. Before that, Lindsley and Skinner (1954) had demonstrated that the behavior of persons classed as psychotic was psychologically lawful, that is, responded to the same contingencies as animals and other humans.

As the field of applied behavior analysis grew and gained a certain amount of respectability, behavior analysts came to be permitted to work with types of subjects other than the initial ones, who had been those on whom society had completely given up. The question that researchers addressed increasingly came to be how generalizable were the procedures and principles of the experimental analysis of behavior.

These two changes can be seen in the shift in the location where applied behavioral research was being done from totally controlled environments and special training rooms, to classrooms for special students, and, later, from special classrooms to

ordinary classrooms. There was also a shift from institutions for retarded persons to schools for retarded persons, to halfway houses for persons with mental retardation. The population studied also expanded from psychotic and retarded people to include relatively normal children, adolescents, and adults with everyday problems of adjustment, job-finding, or marital discord. In other words, as the field grew, applied behavior analysis worked with increasingly normal populations, in increasingly natural social settings, with decreasing amounts of control of those settings.

The Goal of Applied Behavior Analysis

When applied behavior analysis research was first being done, Baer, Wolf, and Risley (1968) defined the essential characteristics of the field in a much-quoted statement. For this paper, two of the characteristics in their statement are the most important. First, they said that applied research should address problems that are of interest to and important to society, rather than to theory, and the results of the study should be a practical improvement in that important problem. The subjects should be those with some problem, rather than merely conveniently available people.

Second, they said that it is important to have the results of applied behavior analysis be generalizable, because of the purpose of applied work. If a practical improvement has been

achieved in an important behavior, in most instances, the more general that improvement, the better. In recent years, the attention of researchers is increasingly focused on the development of methods for enhancing the generalizability of the results of applied behavior analysis (Stokes & Baer, 1977).

Initially, although applied behavior analysts certainly addressed problems that were of interest to and important to society, they tended to be the problems of a relatively small part of society, such as one classroom, one family, or one school. Later, as applied behavior analysis developed, researchers increasingly reached out from institutions, schools, and other relatively closed settings, to open social settings where individuals freely come and go. In such real-world settings, the socially important problems that attract applied behavior analysts may be general social issues, such as health issues, rather than a particular person's problem, such as self-injury, or being late to work. As applied behavior analysts have seen increasing evidence of the power of their procedures, many have turned to such general social problems.

Behavior Analysis and Some Social Problems of Developed Countries

Working on socially important problems in open settings, applied behavior analysts use the same overall methodological style as they use in more restricted settings and with behaviors of significance to only one or a few individuals. That style

includes an emphasis on direct measurement of socially important behavior, introduction of some environmental change in an attempt to make a meaningful alteration in the behavior, evaluation of the function of that change in any observed alteration of the behavior, and, if meaningful improvement is obtained, an attempt to program the environment to expand the generalizability of that improvement.

Let me give a quick overview of the kinds of socially important, real-world behaviors that applied behavior analysts are addressing in the United States. In some instances, these are problems that are also of concern here in Japan; in others, they are problems specific to conditions in the United States. Most impressively, two behavior analytic programs have been implemented on a national scale: Behavior Analysis Follow Through (Bushell, 1978; Stivers & Ramp, 1984), which attempts to improve the school performance of children from disadvantaged backgrounds; and Achievement Place (e.g., Blase, Fixsen, & Phillips, 1984), which attempts to redirect teenagers from delinquent behavior to more socially appropriate behaviors.

Behavior analysts are increasingly working in collaboration with medical personnel, in an attempt to address the behavioral aspects of medically important problems. Physicians in some countries, including the United States, are coming to believe not only that their patients' behavior has much to do with their health status, but also that their behavior can often be redirected into more health-promoting activities if the procedures of

behavior analysis are used. Target topics include adherance to the medical regimen prescribed by the physician, such as special diets or exercise programs (for a program in Finland, see Kolata, 1986), compliance with medication-taking requirements, and many health-promoting behaviors, including, for example, decreasing or stopping smoking, doing regular self-checks for lumps in the breast and other cancer detection procedures, and dental hygiene (Lund & Kegeles, 1982).

Environmental concerns of society are reflected in studies promoting energy conservation in the home (Winett & Geller, 1982), encouraging shifting from the use of private cars to mass transit (Everett, Hayward, & Meyers, 1974), recycling paper and metals, decreasing littering (Geller, 1980), and encouraging the pickup of others' litter (Chapman & Risley, 1974).

Motor Vehicle-Related Behaviors

In the United States, a large country with an excellent system of roads, motor vehicle-related accidents are the leading cause of death for persons between one and 34 years of age. The motor vehicle accident fatality rate in the United States, that is, the number of deaths in car accidents per 1000 population, is the highest in the world, because of the high usage of the road system (R. F. Borkenstein, personal communication, January, 1986). More than 52,000 occupants of motor vehicles die each year in car accidents in the United States.

The behaviors that seem most tied to this high death rate

are speeding, driving while drunk, and not wearing safety belts. Applied behavior analysts have been working on all three of these. For example, in Canada, Van Houten and his colleagues (Van Houten & Nau, 1981, 1983; Van Houten, Nau, & Marini, 1980) have found in carefully controlled research that if roadside signs give drivers feedback on the proportion of drivers who were speeding in that area in some recent time period, such as the previous week, not only does the overall amount of speeding decrease, but the worst offenders seem to show the biggest and longest-lasting effect (Van Houten & Nau, 1983).

With respect to safety-belt use, the baseline rate of safety-belt use in the United States is about 15%; the U.S. Government estimates that the use of safety belts could decrease the number of fatalities by 55%. Currently, more than 17 states and the District of Columbia require motorists to use safety belts. However, the laws alone do not result in safety-belt use. For example, in New York State, the first state to pass such a law, people discovered that if they wore T-shirts with a safety-belt pattern, the police were often fooled and did not stop them for not using the safety belt (Geller & Nimmer, in press).

The U.S. Department of Transportation has been strongly interested in the use of behavior analysis for the three most serious traffic problems, that is, speeding, drunk driving, and the lack of use of safety belts, and with its financial support, much research has been done. In terms of the safety-belt research, honesty requires me to say that, thus far, behaviorists

have not found a practical, effective way to get people in the U.S. to wear their safety belts. This lack of success is itself interesting, in my opinion.

What has been tried? Behavior analysts analyze behavior in terms of its antecedants and consequences. So, behavior analysts have manipulated the antecedants and the consequences of safety-belt wearing behavior, in order to increase people's use of safety belts. In terms of antecedants, for example, the United States government required (for a while) that new cars sold have a loud buzzer that was intended as a discriminative stimulus for fastening the safety belt. The expectation was that the buzzer's sound was aversive, and people would fasten their belts to turn it off. The sound was aversive all right, but what was done to 41% of 800 cars checked in one study (Geller & Nimmer, in press) was to circumvent the buzzer system, so that the buzzer never sounded.

To increase the use of safety belts, various consequences have been given to safety-belt wearing drivers, including cash (Geller & Hahn, in press), tickets to sports events (Geller, in press), and lottery tickets (Elman & Killebrew, 1978). Researchers have even tried having the police stop compliant drivers to give them a prize. This, incidentally, is said to be more irritating than reinforcing to most drivers.

Geller, one of the most active researchers on this topic, attempted intermittent reinforcement for safety-belt use. For example, in one study (Rudd & Geller, 1985) done on his universi-

ty campus, the campus police wrote down the license numbers of the cars in which the drivers were wearing their safety belts. All the license numbers were entered into a lottery, and prizes such as free dinners at restaurants, or movie tickets, were awarded to the owners of cars whose license numbers were randomly drawn. Extending the behavioral design to the policemen as well, the policemen who had written down the winning numbers also received prizes; Geller reports that this may have been one of several factors that helped maintain their cooperation with the study.

With the lottery, safety-belt use did in fact increase on that campus, an increase of approximately 46% from first baseline to last intervention. Geller was even told that at least one person who had fastened his safety belt due to the lottery had his life saved in an accident as a result (Rudd & Geller, 1985). However, analysis of the data showed that faculty and staff members, rather than students, were chiefly responsible for the improvement in belt use. This is definitely a problem, because in the United States, it is in the younger age groups that the risk of accidents and death in motor vehicles are at the highest.

Behavior Analysis and Some Social Problems of Developing Countries

The social problems in the United States that I have been discussing seem, in some sense, minor, when one begins to consi-

der the social problems of the developing countries. Many of the developed countries' social problems have to do with enhancing the quality of people's lives, or improving the environment. I have mentioned, for example, anti-littering programs, recyling, and energy conservation. In the developing countries, in contrast, the urgent social problems deal with life and death issues, for example, child-health related programs, such as immunization, nutrition, and measures to prevent the fatal diseases of childhood.

Recently, some behavior analysts have been involved in designing programs to fight the enemies of child health in developing countries. I see this as the current leading edge of applied behavior analysis, and I would like to spend much of the rest of this paper discussing these programs.

Diarrhea

First, let me set the context by describing the problem. Worldwide, four million children die each year from the consequences of diarrhea. Diarrhea-related deaths account for approximately 30% of all infant deaths in the world (HealthCom, 1985).

What is this potentially fatal disease like for a child in a developing country? As many as eight times a year, the child may have an episode of diarrhea in which the child has bowel movements every 1 1/2 hours on the average and vomits every two hours on the average (Black, 1985). These symptoms result in dehydra-

tion and the loss of body salts, malnutrition, and, for many children, death.

What could be done to prevent this? Large-scale public-health projects might make an impact on world-wide diarrhea. However, doing that would require large-scale construction of clinics, latrines, and water systems in many countries (Smith, Pareja, Booth, & Touchette, 1985). I do not have to give an estimate of the cost of this for it to be immediately obvious that public works projects on that scale are simply impossible.

Similarly, getting people in all these countries to change their health practices in major ways seems also to be virtually impossible, given their circumstances. To give just one example: The diarrhea problem would be lessened if mothers consistently washed their hands before preparing their children's food, but in many places in developing countries, there is no clean water in which to wash. Thus, altering the mothers' habits will not, by itself, make a difference.

What is typically done to treat these sick children? There are no drugs that are effective to combat the bacteria and viruses that cause most diarrhea episodes in children in developing countries (HealthCom, 1985). Once a child is sick, intravenous therapy is used -- for those children who can be brought to a clinic, if there is a clinic, and if their parents can afford it. Such treatment is very expensive, and requires trained medical personnel (see, e.g., Smith, Pareja, Booth, & Rasmuson, 1984).

How bad is the problem? Terribly bad. Beyond one's ability

to grasp, in a way. We live in the healthiest country in the world. Japan has the lowest infant mortality and one of the longest life spans of any country in the world. Here, the infant death rate is 7 in 1,000; that is, out of every 1,000 babies born, seven die.

The Gambia. In The Gambia, accurate statistics are difficult to obtain, it is said, because people are reluctant to report that their babies have died. However, where the statistics are reasonably trustworthy, the Gambian infant mortality rate is estimated to be 153.7 per 1,000 (HealthCom, 1985). In other areas of that country, where statistics are less reliable, the experts estimate that the infant death rate is higher. In other words, in The Gambia, more than 15% of all babies die before they are one year old. I am not ashamed to say that I cried when I first read those statistics.

In The Gambia, at any given time, between 0.8% and 9.0% of babies are reported to have diarrhea. Between 10.4% and 33.7% of babies will be reported to have had diarrhea within two weeks before the survey, depending on the season and other factors (HealthCom, 1985). Where the statistics are reliable in The Gambia, 21% of the deaths of children under five years of age were said to result from diarrhea.

Honduras. In Honduras, at any given time, between 9.9% and 14.3% of children under five will have diarrhea. It is the number one cause of infant mortality, responsible for 24% of infant deaths (Smith et al., 1984).

Other countries. In Swaziland, the infant mortality rate is 133 per 1,000; in Peru, 99 per 1,000. In Equador, the infant mortality rate is 74 per 1,000, and diarrhea-related illnesses cause 21% of infants' deaths (HealthCom, 1985). In Egypt, diarrhea is responsible for 60% of the deaths of infants and children under three years of age (Hirschhorn, 1985).

Oral Rehydration Therapy

What is being done about diarrhea and other causes of children's deaths? Most people are familiar with the World Health Organization (WHO), an international agency that is a major force for better health for all the citizens of the world. On the basis of research and experience, the World Health Organization determined officially in 1975 that if children with diarrhea are treated with so-called oral rehydration therapy, the treatment will counter the effects of diarrhea-caused dehydration, and prevent malnutrition and death in 95% of cases.

Oral rehydration therapy is considered to be the world health community's primary weapon against death due to diarrhea. Oral rehydration therapy is simple to administer, requires no professional help, and is inexpensive. Yet eight years after the World Health Organization's official statement, oral rehydration therapy was used for only approximately 4% of diarrhea episodes in children in developing countries (Black, 1985).

What is the problem? Why are people not using this simple, effective method of keeping their children from dying? And what

would the World Health Organization have to do to get oral rehydration therapy used? That is the question that was asked by the World Health Organization, as well as by UNICEF and the U.S. Agency for International Development (AID).

To answer this question, the Agency for International Development has let contracts to several organizations in the last eight years, asking these organizations to develop effective programs for child survival, focusing especially on oral rehydration therapy for children under five years of age, as they are the ones most at risk. The work groups dealing with this question include experts in anthropology, social marketing, and behavior analysis. The anthropologists contribute their understanding of traditional beliefs and of the cultural context of behavior; the experts in social marketing are skilled in developing mass communication programs focusing on the consumer. And, as you know, the behavior analysts know about assessment methodology, training, and programming.

The goal of the programs that are being developed is to change dramatically what rural people actually do (Smith et al., 1985). The first AID-supported project was conducted in Honduras, starting about seven years ago; the following year, a project was started in The Gambia. More recently, as a result of the success of these first two projects, similar programs have been developed for many other countries, including all those for which I gave mortality statistics earlier.

How Can People Be Persuaded to Use Oral Rehydration Therapy?

Before I discuss the programs that the behavior analysts developed, I would like first to address the general problem: Why don't people do what is good for them (or for their children), and how can we get them to change, so that they do what is good for them and their children (Stolz, 1984a)?

In the field of prevention, the classic theory is called the Health Belief Model (Rosenstock, 1966); according to this model, if people are not engaging in health-promoting behavior, the way to develop the desired behavior is to provide relevant information. The model assumes that this will change their beliefs about health in such a way that they will engage in preventive behavior when it is appropriate to do so.

Although this viewpoint seems like common sense, it has not held up under empirical test, unfortunately (Kegeles & Lund, 1982; Stolz, 1984a; Weisenberg, Kegeles, & Lund, 1980). For example, when women in Bangladesh were taught about oral rehydration therapy, 90% of them correctly learned seven criterion items, but only about 8% of them used oral rehydration therapy when their children had diarrhea (Touchette, 1985). Overall, research has not supported the prediction of this theory, that obtaining information leads to changes in attitudes, which, in turn, leads to changes in behavior (Kegeles & Grady, 1982).

The Contribution of Behavior Analysis

A behavior analysis of preventive behavior suggests a number of reasons why people may not emit more healthful behaviors. For example, the reinforcement for preventive behavior is usually delayed, and preventive behavior may have an indetectable impact on individuals. Furthermore, such behaviors cost time and effort (HealthCom, in press; Stolz, 1984a).

Touchette and other behavior analysts working with the Agency for International Development program have identified some possible causes of people's failure to use oral rehydration therapy. Among antecedant causes, people may be missing necessary skills or knowledge, so that, for example, they do not know how to prepare the salt solution necessary for oral rehydration therapy. The materials, such as the salts, the water, or the correct size of mixing dish, may be missing. The person may not be clear about when to emit the behavior, that is, there may be a problem in stimulus control.

Among causes relating to the consequences of behavior, there may be punishment for engaging in the behavior. In the case of oral rehydration therapy, the child may vomit if given the salt solution, and the mother may thus become concerned that she is making her child more ill. There may also be positive consequences for incompatible behavior: The mother is accustomed to giving a traditional treatment, and the social consensus is that the traditional treatment is best. There may be no positive consequences for the appropriate behavior; a child given oral

rehydration therapy does not improve immediately, for example (HealthCom, 1985).

Using the methodology of applied behavior analysis, the group working with the Agency for International Development used behavioral techniques of measurement to measure directly the mothers' use of oral rehydration therapy. Field workers observed rural mothers' behavior; those observations were used to develop working hypotheses about what was maintaining their present behavior and to suggest behaviors that might be conducive to change (HealthCom, in press). On the basis of known behavioral technology, methods were suggested that might promote change and long-term maintenance of that change. The behavior analysts worked closely with the anthropologists and social marketing experts, so that the final program developed was appropriate for the cultures in each country and made the best possible use of mass communication for dissemination.

Did the contribution of behavior analysis result in a program that was completely new? I was struck by the agency's answer (HealthCom, in press) to this question, and would like to quote it:

> Many of the principles . . . have been part of many excellent programs in the past. The individual principles . . . in themselves are neither novel nor esoteric new insights. Many have emerged as the product of common sense and practical experience. Now, however, we also have a solid theoretical basis for understanding why they work and how to

improve and extend their impact. (p. 52)

It seems to me that this statement is true about many of the programs of applied behavior analysis. They appear to be common sense, nothing new, and people often say that grandmothers all know the principles of applied behavior analysis without studying psychology. Yet the point the agency makes in this statement is the key: With a science of applied behavior analysis, we have a theoretical and methodological basis for evaluating and improving programs, rather than simply a set of folk principles.

A Behavioral Approach to Oral Rehydration Therapy

I will describe the behaviorally developed program for promoting oral rehydration therapy in developing countries, but, like most applied programs, it is not an unusual program, in the sense that no new principles were discovered. Rather, what is innovative and exciting, in my opinion, is the successful application of behavioral expertise to the serious social problem of infant and child mortality in developing countries. In this project, the principles and procedures of applied behavior analysis from developed countries were found to be generalizable to health-promoting behaviors in developing countries.

Let me provide a little more background on oral rehydration therapy for diarrhea. Oral rehydration therapy is a treatment that involves giving the sick child a solution of water and salts, in order to restore the water and salts that are being

lost because of the diarrhea and vomiting. To be effective, the correct amount of solid salts has to be dissolved in the correct amount of water, and administered to the child little by little over a 24-hour period, for every episode of diarrhea. If the dosage is mixed wrong, or if it is administered wrong, it will not help the child, and it can even kill the child (e.g., Smith et al., 1985). The new Agency for International Development-funded program was devised to deal with each of these characteristics of oral rehydration therapy.

I will start with the program in Honduras as an example. To be sure that the solution of water and salts was mixed correctly, several procedures were used. The behavior analysts observed that women in rural villages had access to soft drink bottles and bottle tops. The bottles were used as the standard measuring instrument for the water, and the tops, to measure the salts.

A multi-step training program was designed, in which project staff trained physicians and nurses, who then gave a less technical course to community health workers and midwives. They, in turn, briefly trained local mayors. The result was that a trained person was available everywhere to train the mothers, even in villages with no local health worker.

The content of the training varied, depending on which group was being taught. For example, the physicians and nurses' course included a lecture on the theoretical and research background of oral rehydration therapy, while the rural mothers learned the need for oral rehydration therapy, how to mix the solution, how

to give it to a child, and what other foods a child with diarrhea should be fed (Smith et al., 1984).

Behavioral expertise in training and programming instructional materials was used to design the training programs. In each case, the desired behavior was broken down into a series of specific skills, which were taught using the behavioral procedures of modeling, shaping, and immediate feedback on performance.

Observations in Honduras showed that virtually everyone had access to a working radio. The social marketing experts designed mass communication materials to be broadcast on the Honduras radio stations; the behavioral experts then listened to the radio stations to verify that the programs were being broadcast as agreed on, and discovered that they were not. As a result, prizes were given to radio stations for broadcasting the material, and compliance increased (Smith et al., 1984).

In the health area, mass communication is typically used to criticize people's current behaviors: "Smoking causes cancer; kick the habit", for example. In the oral rehydration project, because of the influence of the behavior analysts, mass communication was used primarily to support appropriate existing behaviors, rather than to punish inappropriate ones. For example, the radio announcements praised women who breastfed their children, rather than telling mothers to stop bottle feeding (HealthCom, 1985).

In The Gambia, there had been a plan to promote the program

with a lottery; the lottery tickets were to have the oral rehydration therapy instructions printed on them. The behavior analysts persuaded the project officers to change that plan, so that it included positive consequences for appropriate behaviors. After the radio programs had given instructions on how to mix the oral rehydration therapy solution, villages held contests. Women who correctly answered questions based on material in the radio programs won a bar of soap (a health-promoting prize); women who mixed the solution correctly got a plastic container, and were eligible for a lottery. The lottery winners were announced on the radio programs that carried the project's announcements (Touchette, 1985). Thus, the revised plan for the lottery provided a number of opportunities for reinforced practice of the appropriate behavior.

Results from These Oral Rehydration Projects

Let me briefly summarize some of the outcome data on the Agency for International Development oral rehydration projects. The two longest running programs, as I indicated earlier, are in Honduras and The Gambia. In Honduras, use of oral rehydration therapy within two weeks prior to being asked went up from 9% four months after the campaign started to 26% after a year (Smith et al., 1984), and to 33% after two years (HealthCom, 1985). Mortality in children from diarrhea-caused deaths dropped concomitantly. Before the program, 40% of children's deaths in Honduras were from diarrhea-caused diseases; after two years,

approximately 25% of deaths were from such diseases.

The Gambia is the country with the incredibly high infant mortality rate, 153.7 per 1,000. Extensive outcome data are not available, but after one year, 50% of reported cases of diarrhea were being treated with oral rehydration therapy, and, after two years, 67% (HealthCom, 1985). In Egypt, the mortality rate of children under two years of age from diarrhea-related causes dropped by 50% when oral rehydration therapy use increased from 1% prior to the program to 70% after (Hirschhorn, 1985).

Another kind of measure of outcome is institutionalization, that is, whether the program becomes independent of the Agency for International Development. In Honduras, after three years of the Agency for International Development program, the Ministry of Health adopted oral rehydration therapy as an agency priority, and expanded the project from a local one to a national one (Smith et al., 1984).

Why Is This Interesting? Why Is It Behavior Analysis?

In this paper, I have given some examples of the activities of people who call themselves "behavior analysts". One of the major origins of the field of applied behavior analysis was the work that Lindsley and Skinner did, when they put psychotics alone in a bare room and reinforced them for standing in one particular location, rather than elsewhere in the room. The experimental room could even have been called "an experimental

chamber", as it would were an infrahuman subject being used.

The work of Geller and his colleagues on safety belts, of Touchette and his associates on oral rehydration therapy, and the other studies I have referred to in this paper are, in many obvious ways, strikingly different from Lindsley and Skinner's early work. On the other hand, the recent work retains completely the essential characteristics of applied behavior analysis that Baer, Wolf, and Risley (1968) initially identified.

Taking the oral rehydration work as an example, it is applied in addressing a behavior of importance to society; it is behavioral in being concerned primarily with what the rural mothers can do; the program components can be completely identified and described; the program, as it was developed, was based on principles of behavior found from the experimental and applied analysis of behavior. It was also analytic, although I am not going to describe in this paper the sorts of analyses that were done. To the extent that outcome data are available, the project seems to be effective, and its generalizability across time has been shown for several years.

Summary and Conclusions

In my opinion, applications of behavior analysis like those I have described in this paper are where the most exciting future lies for applied behavior analysis. When this field was founded, one of its central characteristics was that it should deal with

behaviors that are important to society. Until recently, applied behavior analysts in the United States dealt primarily with behaviors that were important to small segments of society. I believe that applied behavior analysis has now matured to the point where more widespread social problems can become our target.

I have not given examples from Japan in this paper. However, just as most Americans would agree that drunk driving is one of that country's major social problems, it seems to me that most Japanese would agree that bullying (ijime) and, perhaps, young people's suicides are significant social problems here. Working with the educational system, with teachers, parents, and youth, to devise a behavioral approach to these issues is an exciting challenge for Japanese behavior analysts, in my opinion.

The "applied" part of "applied behavior analysis" directs those of us in the field to focus on contributing to the solution of social problems. As I have mentioned this afternoon, as well as in my writings (Stolz, 1981, 1984a, 1984b), society seems generally not interested in using solutions that are offered to it, regardless of the severity of its problems. Thus, a related challenge for applied behavior analysts is to devise ways to persuade society to change itself and use effective solutions.

Some people have been concerned that the use of behavior analysis threatens their personal freedom. But the control of behavior was not invented by Skinner in 1938, nor by the behavior analysts following Skinner. All types of social interactions

involve some form of control of others' behavior (Stolz and Associates, 1978). Bandura (1969) said it eloquently:

> The basic moral question is not whether [people's] behavior will be controlled, but rather by whom, by what means, and for what ends. (p. 85)

Furthermore, behavior analysis can be used to save lives, and to enhance individuals' competence and satisfaction, as indicated in the examples I have given in this paper.

My vision, and, certainly, the vision of many applied behavior analysts, is to see society use behavior analytic methods to deal with its own, currently unsolved problems. I dream of seeing that here, too, in Japan.

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