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A program to train and maintain geographically dispersed service providers' teaching.

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A PROGRAM TO TRAIN AND MAINTAIN
GEOGRAPHICALLY DISPERSED SERVICE PROVIDERS' TEACHING

A Thesis Presented
by
CHRISTOPHER J. FOX

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

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A Program to Train and Maintain
Geographically Dispersed Service Providers' Teaching

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by
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I would like to express my gratitude to all those who had a direct role in this thesis. I was fortunate to have Beth Sulzer-Azaroff as my committee chairperson. Her kind words and thoughtful advice helped enormously. My committee members Thomas Zane and Roger Frant receive special thanks for their patience, insight, and understanding. The subjects of this study, Jan Mangano, Karleen Balmer, and Mary Allard, and their "clients" became more than just subjects, they are now my friends. The Specialized Home Care staff, especially Gretta Buckley and Karen Stevens were extremely helpful. My research assistants Kathy Mottarella, Joe Ringland, and Dale Gardner-Fox helped by performing their jobs to the utmost of their abilities.

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The deinstitutionalization movement has challenged adminis-
trators and professionals to develop new methods of providing services
to handicapped clients who reside in geographically dispersed areas.
Geographic dispersion limits the frequency of direct contact with clients and increases dependency on parents or paraprofessionals for program implementation and data collection. A difficulty is that these direct service providers' program implementation or data collection efforts may be reinforced infrequently. This problem may be especially acute when the service recipients are severely or profoundly handicapped. Such individuals have slow rates of learning thus making it difficult for the service providers to discern progress.

This study was designed to assess a program for geographically dispersed service providers who had moderately to profoundly retarded children living with them and to teach them to work effectively and persistently with their charges and continue to collect data.

Three service providers were recruited as subjects and asked to select two skills to teach their charges. Then a program was implemented which included training in relevant teaching concepts, hands-on training in teaching and data collection, feedback, and in-home observation. The effects of the program were assessed by measuring six dependent variables: (a) The clients' progress as rated by trained observers, and (b) as reported by the subjects' service providers, (c) The rates of program implementation and data collection, (d)
Accuracy of program implementation, (e) Performances on quizzes designed to test service providers' initial and long term mastery of the teaching concepts, and (f) The costs of implementing various aspects of the program.

Inter-observer-agreement measures taken on four of the dependent variables averaged 87% or more. Although agreement indices were not assessed for the data on client progress submitted by the service providers, the reliability and validity of these data can be roughly estimated by comparing it to the observers' data. The results showed that: (a) The subjects were taught to teach their charges effectively, (b) Teaching and data collection maintained, and (c) When feedback switched from in-person to over-the-phone, a less costly procedure, there was no discernable deterioration in performance.

The results imply that these programmatic and administrative challenges of serving the handicapped in the community can be met in an accountable and cost-effective manner. Subsequent research might investigate the timing and nature of maintenance procedures, the amount and nature of training needed, the collateral effects of this type of program, and the effects of direct observation.
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CHAPTER I
INTRODUCTION

From the eighteen-hundreds until recent times it had been common practice to segregate retarded individuals in large institutions away from the majority of the non-retarded (Wolfensberger, 1975). There can be little doubt that the living conditions of many of the institutionalized retarded have left much to be desired as depicted by Blatt and Kaplan (1966) in a scathing pictorial report on the depravities of institutional life. Wolfensberger (1975) traces the development of our current institutional policies back in time, and shows how the focus changed from education to neglect. The current trend towards deinstitutionalization, that is providing the retarded with residential services in the community (Butterfield, 1976) or at least in small rather than large institutions (Conroy, 1977) holds promise for improving the quality of life for the retarded. However changing the size and physical quality of the residences of retarded individuals has not been shown, in and of itself, to change their behavior, increase parental or community involvement, or necessarily insure better care (Balla, 1976). Even recent attempts to insure quality placements for retarded individuals by liscensing residences has not as yet been shown to make a difference in the quantity or quality of services received (Repp & Barton, 1980).

Besides poor living conditions, comprehensive educational programs were seldom available to institutionalized retarded children.
Due to inadequate funding, lack of success of past educational efforts, public attitude, and other reasons the emphasis in these institutions had come to be primarily that of custodial care (Baroff, 1974). Recent legal developments, most notably Public Law 94-142, have dramatically increased the educational opportunities available to retarded children. These events are juxtaposed with a burgeoning literature documenting advances made in behavioral technology. These advances have helped make possible achievements by even those severely and profoundly retarded individuals who were previously considered unteachable. Retarded people, however, still learn slowly, and newly acquired behaviors may fail to generalize to non-training conditions; across time, settings, or responses. Yet progress is being made in remedying these difficulties.

Retarded Persons' Acquisition of Behavior. Acquisition of new behaviors has been the explicit or implicit general problem addressed in many experimental reports involving the retarded. An early report of the use of a behavioral technique with a retarded individual was based on a study by Fuller (1949). The subject was an (apparently) profoundly retarded adult, who according to the author, seemed to have learned little or nothing in 18 years of institutional life. In just three-20 minute trials, the man was taught to raise his right arm in order to receive a sugar and milk solution. The response was then extinguished and re-learned over seven more trials.
More recently Azrin, Sneed, and Foxx (1973) taught a group of 12 profoundly retarded men to refrain from nighttime bedwetting. Auditory prompts, extra fluids (which increased subjects opportunity to respond), food reinforcers for correct toileting, and a mild punishment procedure were used. Results showed an average decrease of over 90% in the number of resident beds discovered wet in the morning. This program included a provision for retraining if the resident's rate of bedwetting exceeded one time per month. A three month follow-up indicated the acquired responses were being maintained.

A difficult discrimination, comparable to one that would be required in a vocational setting, was taught to moderately and severely retarded adults by Gold and Barclay (1973). Their procedure utilized fading of prompts and performance based feedback. No artificial prompts (e.g., templates) or contrived reinforcers (e.g., candy) were used.

Many other reports have been published documenting that the severely and profoundly retarded are able to learn, given proper environmental support (cf. Thompson & Grabowski, 1977). Still, behaviors acquired by (especially the severely or profoundly) retarded under "programmed" conditions are usually acquired by non-retarded persons without special environmental manipulations. This is evidence for the need to provide special training to those working directly with the retarded.

Retarded Person's Generalization of Behavior. Once acquired it is
often desirable that a new skill or behavior generalize, across other behaviors, settings, trainers, or times. Generalization of acquired behaviors is a concern for all populations (cf. Walker & Buckley, 1972; or Stokes & Saer, 1977). The admonition; "...generalization should be programmed rather than expected or lamented." (Baer, Wolf, & Risely, 1968, p. 97) is worth heeding regardless of the characteristics of the target population. However there is some evidence that retarded individuals often experience particular difficulty in generalizing acquired behaviors. Kohl, Karlan, and Heal (1979) conducted receptive language training for four severely retarded students all of whom possessed general imitative skills. The training involved pairing complete, or partial manual sign prompts with verbal instructions and praise of correct performances. The training regime facilitated learning, and generalization (across behavior) of instruction following to expressive manual language for all subjects. In two of the four students generalization across behavior was also evident to expressive verbal language. However this generalization, as measured by the number of words and signs produced during the expressive probe trials varied considerably across students. (Words produced varied from a high of 12 to a low of 0, signs produced varied from a high of 12 to a low of 2.) Of course, these findings do not indicate those subjects who generalized few words or signs could not generalize across behaviors, only that these training conditions were not adequate to support generalization.
Two profoundly retarded youngsters, Adam and Bobby, were taught three social responses: smiling, vocalizing, and sharing, by Burney, Russel, and Shores (1977). Modeling procedures were used to prompt, and edibles and praise to reward appropriate responses. Results showed that Adam's rate of each of the three social responses increased when, and only when prompts and reinforcers were directed toward that behavior. The same was true for Bobby, except his rate of vocalizing stayed near baseline throughout the training. No prompts or consequences were dispensed by the experimenters during the generalization sessions which were conducted during 15 minute periods immediately following training. A third, somewhat more able, student (Carol) was present to (hopefully) facilitate generalization across time by the other two students. Results showed a moderate amount of maintenance by Adam for two of the three target responses (sharing and vocalizing). No maintenance was evident in Bobby's behavior. Carol, the third student, showed a modest trend upwards in vocalizing, smiling, and sharing corresponding to increases in Adam's behavior, perhaps indicating some reciprocal reinforcement. The authors conclude; "...for profoundly retarded youngsters, a more controlled environment is probably required to facilitate generalization of social behavior. (Burney et al. 1977, p. 123). They go on to suggest future research involving reinforcement programmed by the experimenter to supplement the (apparently) low amount of peer reinforcement which occurs naturally among this population.
As a final example, Vogelsburg and Rusch (1979) taught three severely retarded, ambulatory students to cross a fairly busy traffic intersection (about 1.5 cars per minute went through the intersection). Instructional feedback in the form of verbal prompts, modeling, partial and full physical assistance were used to cue performance. No (potentially reinforcing) consequential stimuli were reported. After training the students to a high level of competence at the original intersection, generalization across settings was probed for at three intersections that were new to the students. In this case generalization did occur. No more prompting was needed at the new street-crossings than at the original training site to facilitate crossing streets safely. The authors did report that if any novel stimuli were introduced to the training site (such as a dog, or the need to carry an umbrella), they, "...presented an obstacle to the students' attending to the relevant aspects of the training sessions." (Vogelsburg & Rusch, 1979, p. 271). The authors expressed the view that novel stimuli serving as distractions indicated a lack of community involvement by the students, and recommended an increase in communities activities.

It may be that training sufficient for (these) severely handicapped students' behavior to generalize to the same or similar settings under varying stimulus conditions should include planned distractions. In any case it seems apparent that generalization of newly acquired behaviors is a problem especially for more severely retarded individuals. Thus to promote generalization it would be desirable for those
working directly with the retarded to train their charges persistently, in many different settings, and across many behaviors.

**Training and Management of Parents and Staff**

Given these problems in acquisition of behavior, it seems evident that parents or staff who work directly with the retarded, especially the profoundly or severely handicapped, would be competent in basic teaching techniques. Ample evidence exists in the literature of the feasability of training staff and parents to carry out behavioral teaching programs with developmentally disabled children or adults including the retarded, autistic, and behaviorally disordered. For example parents and staff have been trained to teach self-help skills (Barnard, 1968, Koegel, Glahn, & Nieminen, 1978; Panyan, Boozer, & Morris, 1970), manage problem behaviors (Hawkins, Peterson, Schweid, & Bijou; Whaler, 1969; Zeilberger, Sampen, & Sloane, 1968), and increase academic or preacademic skills (O'Leary, Becker, Evans, & Saudergas, 1968; Whitman, Hurley, Johnson, & Christen, 1978).

Paramount in this literature is the assumption that the parents or staff are in the best position to change the person's behavior, as they can arrange and consistently apply contingencies in the environment in which it occurs (O'Dell, 1974; Shearer & Shearer, 1976).

Other advantages of parent or staff training are that it may promote generalization across settings (Berkowitz & Graziano, 1972; Shearer & Shearer, 1976), and across behaviors (Shearer & Shearer,
1976, as well as increase the cost-efficiency of treatment (Hawkins et al. 1966). This section briefly reviews a sample of parent then staff training reports. This is followed by a review of some of the literature on parent and staff management as that topic is also important.

Parent and Staff Training. Hawkins et al. (1966) presented one of the earliest reports in which a parent was involved as a therapist. In this study the mother of a four year old non-compliant boy was given hand signals telling her how to behave in order to more adequately manage her son’s behavior. The experimenters were present in the home for two to three training sessions per week. These sessions lasted about one hour each. The experimenters did not interact with the child at all during the sessions. They collected data and signalled the mother when to praise or stop the boy's behavior, and when to institute time-out from positive reinforcement. The boy became more compliant as a result of the training his mother received. Data were presented documenting maintenance of the behavior change 24 days after the training had ceased.

Two non-cooperative children and their parents were studied by Whaler (1969). He posited that if the parents' reinforcement value could be increased the children would be more likely to comply with requests. All adaptation, training, and observation sessions took place in the home. Parents were trained in the use of the time-out and differen-
tial reinforcement. Training occurred immediately before observation sessions and was terminated for the day when an observer recorded prompt time-outs, within 10 seconds of the target behaviors, and correct contingent attention. Parents were told to think of themselves as; "...mechanical reinforcement and punishment dispensers, operable by specific actions of the children." (Whaler, 1969, p. 162). Interestingly, the number and length of training sessions varied considerably across the two sets of parents. The data showed that instances of cooperative behavior, defined as number of non-favored commands carried out (e.g., child might be told to clean his room), increased as a result of the parent training.

Shearer and Shearer (1972, 1976) have published reports on the Portage Project. This project employed professionals and para-professionals from the disciplines of special education, speech, and psychology as "home teachers." The home teachers went to homes of pre-school handicapped children and assessed them in five areas; socialization, gross motor, language, self-help, and cognitive skills. Then one to three behaviors were targeted for parents to teach their child during the following week. Home teachers trained parents via modelling and used verbal feedback to modify parents' performances. One week later the home teachers would probe the target behavior(s). If the goal had been met a new objective would be set; if the goal had not been met the original goal could be carried over to the next week or broken into its component parts. It was reported that on the aver-
age 91% of the goals were met, and significant IQ gains were made by children involved in the project compared to matched controls. However, no experimental design was used to validate the experimental procedures.

Revill and Blunden (1979) essentially replicated the procedures used in the Portage Project. The only difference was that no more than one behavior per week was targeted for teaching. These experimenters did use an experimental design, a multiple baseline across (two) groups. Their data showed children whose parents were receiving training progressed faster on both targeted and non-targeted behaviors.

Written materials, in addition to or in place of training by professionals have been examined as a means of training parents. Baker and Heifetz (1976) reported on the development and assessment of instructional texts for parents with retarded children, as part of the Read Project. The ten manuals written for the project were based on behavioral principles and cover many areas of concern for parents of retarded children including how to teach language, toileting, and play skills as well as managing behavior problems. The major questions of their evaluation of these manuals were: (a) "How affectively can parents learn teaching skills and teach their children with manuals only?", and, (b) "How much does varying amounts of professional help enhance the childrens' learning?" Over 100 families were recruited for this experiment, and are typified as white, upper
middle class families with a retarded child ages 2 to 14, ranging from mild to severe in degree of retardation.

Parents were assigned to one of five experimental conditions: (a) controls who received delayed training, and those who received, (b) manuals only and were contacted only by mail, (c) manuals plus bi-weekly consultation by phone, (d) manuals plus group training, and (e) manuals plus group training plus home visits. Parents in training conditions were asked to turn in weekly progress reports. All subjects, for the purposes of the experiment, focused on either self-help skills or management of problem behaviors.

Many data of interest were taken and reported. Parents' knowledge of behavior modification was measured on a multiple choice test pre and post training. Only in condition "e" (manuals, plus group training, plus home visits) did both mothers' and fathers' scores improve significantly compared to controls. However, if fathers' data are not included in the evaluations, the mother's scores significantly improved compared to controls in every treatment condition except "c" (manuals plus phone consultation). Parents who did not have any face to face contact with professionals mailed in 45% of their progress reports while parents who did handed in 59% of theirs. Parents in condition "b" (manuals only) were significantly less confident in their teaching skills than any other treatment group.

All children involved in the project made statistically significant gains during the project. Each group of children in a treat-
ment condition made gains that were statistically significantly greater than the gains realized by children in the control group. About half the gains made by the children in treatment groups were in the four or so skill areas (of possible) on which their parents worked. Only those children whose parents received manuals only with communication via mail significantly outperformed control children on non-trained self help skills. Those parents who received the most professional contact were more likely to choose to work on a behavior problem and more likely to be successful managing it.

Kaufman (1978) also presented a study in which written materials in addition to or in place of training by professionals were examined as a means of training parents. The report describes how parents of autistic children were trained using written materials alone or using written materials and receiving in-home training from an expert. The dependent variables were parents' teaching behaviors and the children's behaviors. Results showed parents' teaching skills were slightly better when they received training from an expert. The children's behaviors were not differentially affected, as improvement was shown in both conditions.

Fowler, Johnson, Whitman, and Zukotynski (1978) reported on the use of a "sequenced instructional training technique." This process involved breaking the complex tasks which the parent was to teach the child into the component responses which both practiced. These com-
ponents were then trained sequentially until teacher and student were emitting the appropriate chains of behavior. In the instance reported the mother of a profoundly retarded young woman was trained to teach her daughter two pre-academic tasks (e.g., stacking blocks), and three hygiene tasks (e.g., hairbrushing). The mother was given highly specific written instructions in the use of differential reinforcement of other responses and verbal feedback on her performance. A multiple baseline across behaviors design was used to validate the procedures. The young woman made good progress on all the target behaviors even though the mother did not always follow instructions precisely.

A final example of parent training is presented by Whitman et al. (1978). In this study a mother was trained to deliver consequences for two of the behaviors of her 10 year old profoundly retarded son. She reinforced a pre-academic behavior (manipulation of an object) with fruit juice, and punished non-compliance with physical restraint. The training took place four times a week for 17 weeks while the child was in an institutional setting. The child then returned home. A multiple baseline across behaviors and withdrawal design clearly showed the effect of the procedures in improving the two target responses. It is reported that a non-target response, aggression, was also reduced over the course of the study. Follow-up measures collected in the home up to 16 weeks later showed the behavior changes were maintained.
As mentioned, evidence also exists of the feasibility of training staff who work directly with retarded or other handicapped persons. For example, in an institutional setting five foster grandmothers were trained to engage in specific teaching activities with severely handicapped, profoundly retarded youths (Fabry & Read, 1978). The foster grandmothers, each of whom worked with one young woman, were trained by a teacher to teach four basic behaviors to their female charges. These behaviors were, moving head and neck, reaching for an object, manipulating an object, and moving body parts. The dependent variables were the percent of intervals foster grandmothers spent training their charges in the four basic behaviors. The teacher gave instructions for one teaching behavior at a time (e.g., reaching for an object) until three of the four target behaviors had been trained. The experimental design was a multiple baseline across behaviors. After the three teaching behaviors had been taught, the teacher reduced her presence from five to three, to two, to no days per week. An observer was present during all sessions even when the teacher was not available. Results showed that the young women's behaviors increased in the three skill areas taught. Two of the three behaviors worked on by the foster grandmothers continued to be trained up to 45 days after the teacher was no longer present. No changes occurred in the young women's ability to perform nor was training ever engaged in by foster grandmothers for the fourth behavior.

The social problems of delinquency were addressed in reports by
Phillips, Phillips, Fixsen, and Wolf (1971; Note 1). In these reports the Achievement Place program was described and data provided validating the token procedure used. (The token program is one of several procedures used in Achievement Place homes.) Youths, ages 12 to 16, who had had run-ins with the law, but who had not committed a serious crime, were brought to live in a home with other boys with similar problems. The youths were trained in pro-social behavior via a token program by staff called Teaching-Parents. The Teaching-Parents were generally graduate students in the behavioral sciences, and received up to one year of training and on-going supervision in parenting and teaching skills.

Lieberman, Ferris, Salgado, and Salgado (1975) reported on a successful systematic replication token program element of the Achievement Place system. In this instance high school graduates with two years experience in counselling young people were given intensive training in behavioral techniques and received on-going consultation from professionals. The data supported the effectiveness of these (para-professional) Teaching-Parents in implementing a token system similar to the one used at Achievement Place. Five pro-social behaviors, identical to ones taught at Achievement Place, were targeted (e.g., saving money, promptness at the evening meal, etc.). In most cases receiving tokens which could be traded for a variety of objects or events appealing to adolescents was effective in accelerating the rate of the youths' pro-social behaviors.
Evidence of the need to program for generalization of behaviors across time when doing staff training is provided in a study by O'Leary, Becker, Evans, and Saudargas (1969). In this report a second grade teacher was taught to use a token economy to manage the disruptive behavior of seven of her students. Student and teacher behaviors were recorded by observers who were present in both morning and afternoon classes. The teacher was encouraged to use the token system throughout the day, but the experimental conditions were formally in effect only in the afternoon. Implementation of the token system was effective in decreasing students' disruptive behaviors (e.g., wandering about the room, hitting others) and increasing the teacher's positive behaviors (e.g., contingent praise). However these behavioral gains were evident in the afternoons only. The teacher did not generalize the skills in which she had been trained to the morning classes although the stimulus conditions were largely the same. Differences undoubtedly existed in the time of day and curriculum being taught.

Upper level undergraduate college students were trained in behavior modification skills as members of a Community Technician Team (Mendelsohn, 1978). This program was developed to provide an alternative to institutionalization as well as to train families whose retarded child was receiving little or no services from the local mental retardation center. In all, 54 families were referred and 45 accepted for service. Most training centered around self-help skills or be-
behavior management issues. Though only summary data were presented, for example the average amount of progress made per degree of mental retardation, the results indicate the project was a success.

As noted earlier, the primary reasons for exploring parent and staff training as a means of changing the behavior of retarded youngsters were to use available resources more effectively (O'Dell, 1974) and efficiently (Hawkins et al. 1966). The trend towards deinstitutionalization has undoubtedly also prompted research of these options. In summary the literature shows the feasibility of training parents or staff to effectively teach skills and/or manage the problem behaviors of retarded and behavior disordered children and youth.

Parent and Staff Management. Given current economic conditions it may be expected that the human services will have to fight to maintain recent funding advances which have aided the deinstitutionalization and education for all children movements. An effective argument in support of maintaining these resources would be to demonstrate their effective and efficient utilization.

There may be benefits to clients and funding agencies inherent in the deinstitutionalization movement, such as more normal environments in which to live and learn for the former, and reduced costs for the later. However, this movement also creates challenges for administrators and professionals serving the retarded. An example may be useful.
A psychologist working in an institution for the retarded might have a caseload of 30 to 50 clients. The psychologist would be responsible for providing services such as behavioral assessment, behavior management programs, IQ testing, and perhaps counseling. Since all of these clients live at the institution, and most or all of them receive their educational services at the institution, we could reasonably assume that the provision of services would account for the bulk of professional time. This situation may be contrasted with one in which the same professional is asked to provide the same services to the same population, but in this case the clients, having been deinstitutionalized, or never institutionalized in the first place, live and attend school in 50 different locations dispersed over an area of hundreds of square miles. Effective and efficient professional service would necessitate designing a creative service delivery system. Parent and staff training would be a crucial element. However the challenge also needs to be conceptualized as one of parent and staff management. A review of some relevant articles follows.

Payan et al. (1970) presented one of the first reports on management of staff behavior in an institution for the retarded. Performance based graphic feedback was publicly posted to increase and maintain the documentation of operant self-help programs carried out by attendants who had recently been trained to deliver those kinds of programs. The validity of attendants' records was determined by matching the level of client performance recorded by the attendants
with that recorded by independent observers. The attendants did not regularly document their efforts when simply given instructions to carry out and record their training sessions. The authors noted that the training behaviors of staff working with severely or profoundly retarded clients on self-help type skills may be on a thin and delayed schedule of reinforcement. Thus we would not expect the naturally occurring contingencies to increase and maintain the attendants' training behaviors unless supplemented by some effective, albeit artificial, contingencies. The promising results led the authors to conclude that, "...the behavior of the staff's supervisors and co-workers operated as a more powerful reinforcer than the behavior of children in training." (Panyon et al. 1970, p. 13). It is difficult to judge the degree of social importance of the results in the absence of a concurrent record of progress by the clients who received the programs.

Katz, Johnson, and Gelfand (1972) measured psychiatric aides' use of rewards (verbal and tangible) and their clients' rates of on-task behavior during a one-hour training session. Measurements were made under baseline conditions and when aides received written, then verbal prompts to increase their use of reinforcement. Finally they were offered a monetary reward ($15.00) if they were recorded by an independent observer reinforcing clients' behaviors, in 50% of the recorded intervals for two days in a row. A quasi-experimental design (A-B-C-D) across 3 aide-client pairs showed that aides
rates of reinforcement only reliably increased when they were offered the monetary reward. In two of the three cases this dramatic increase in the aides use of reinforcement resulted in a comparable gain in clients' on-task behavior. In the third case no comparable gain could have been expected since the client was already on-task a high percent of the time.

Pomerleau, Bobrove, and Smith (1973) also found a cash reward to psychiatric aides contingent on their clients' appropriate behavior changes to be an effective way to increase clients' desirable behaviors (No aide behaviors were measured). The authors compared varying amounts of cash rewards ($10.00, $20.00, $30.00) to a non-contingent $20.00 cash reward, and to contingent cash rewards plus required consultation on clients' behaviors. A true experimental design was not used. The conditions were varied every four weeks. Clients' behaviors were rated by two observers on a standard psychiatric behavior inventory. The most salient feature of the results was that clients' behavior was most improved when the highest reward was available. When cash rewards were terminated clients' behaviors deteriorated still further to the lowest levels recorded in this experiment (which spanned almost one year). The authors also reported the aides complained when cash rewards were decreased and then terminated.

An alternative low-cost system for managing staff behaviors was presented by Iwata, Baily, Brown, Foshee, and Alpern (1976). They instituted a performance based lottery in an institution for the re-
tarded to decrease attendants' off-task behavior. All attendants were required to work at least some weekends, (an aversive situation for most people). Thus the winner of the lottery was allowed to re-arrange his or her days off for the following week. In order to be eligible for the lottery, attendants had to meet a weekly criterion for several behaviors (e.g., delivering dental care to clients, or trying to teach a client a new skill). The effect of the lottery on the attendants' off-task behavior was compared to baseline conditions and a staff assignment condition. During baseline all staff were responsible for performing various tasks with all clients. No specific assignments were made according to the standard operating procedure in the institution. The staff assignment condition consisted of assigning each attendant the responsibility for daily care and training of four or five clients. The results indicated that the staff assignment condition was superior to baseline conditions in terms of decreasing attendants' rate of off-task behavior and increasing their rates of direct custodial care (e.g., performing dental care for the clients). The lottery system was superior to the assignment condition by a small margin in decreasing attendants' off-task behavior and increasing their delivery of direct custodial care. The lottery system was superior by a large margin in increasing attendants' rates of delivering training to clients. The authors documented that losing an attendant on the weekend (the typical days off chosen by the lottery winner) was more than made up for by the remaining attendants' in-
creased on-task behavior. There can however, be problems with lottery systems. A recent attempt to implement a lottery system comparable to the one described by Iwata et al. (1976) in a local institution was vetoed by the institution's union administrators (Brown, Note 2).

Performance based feedback to staff or parents serving the retarded may be an attractive alternative to other management procedures. In 1967, Millenson discussed the use of feedback as a possible behavior change procedure. He linked the procedure of feedback to the principle of reinforcement: "When an organism operates on it's environment by emitting operants, the changes in the environment produced by the organism's own responses can be considered to be fed back to the organism. The word "feedback"...is analogous to those special consequences that we have called primary and secondary reinforcement." (Millenson, 1967, p. 276). Feedback may also be explained as rearranging the environment in order to put an organism into more direct contact with the results of some operant(s) it has emitted.

The article by Panyan et al. (1970) previously reviewed used performance based feedback to reinforce and manage the behavior of staff working with the retarded. Since that publication many others have reported using feedback to manage the behavior of staff in human service organizations.

Welsch et al. (1973) noted that the success of a behavior modification program per se may not be a sufficient reinforcer for the behavior of staff carrying out that program with a retarded client. (We
must realize that competing contingencies always exist). Thus the rate of completing behavior modification projects may not maintain. These authors followed Panyan et al. (1970) in trying to increase institutional staffs' rates of carrying out behavior modification projects with their retarded clients through performance based feedback. Large charts (two by four feet) showing the percent of behavior modification programs carried out by individual staff were displayed in central locations on two wards. Baseline and public feedback conditions were compared in the two wards via a modified A-B design. The same number of data points were obtained for baseline and public feedback conditions in both wards but at different times.

The data showed the percent of programs reportedly carried out increased from an average of 61% to 98% in one ward (with 11 staff) and from 28% to 83% in the second ward (18 staff). No data were reported on client behaviors in this study. Thus it is difficult to judge the importance of the increased number of behavior modification programs reported to have been carried out.

In the Welsch et al. (1973) study the feedback system seemed to act to supplement the stimuli available for carrying out the program with the clients in the "natural" environment. The effect of the system was to reinforce staff's behavior of (at least) reporting carrying out behavior modification programs. Whether the system acted as a negative or positive reinforcer for staff's behavior is unknown. It may have been the case that it functioned in different ways for dif-
ferent staff.

Verbal and graphic feedback were shown to be effective in encouraging geographically dispersed parents of severely and profoundly handicapped children to, (a) participate in daily academic home training with their children, (b) record the results of these sessions, and (c) return the records to the experimenter daily (Hunt & Sulzer-Azaroff, Note 3). Once parents were carrying out and documenting the programs, the frequency of feedback was faded from a daily schedule to every other day, to every third day, then finally to once a week. During this fading of feedback condition the parents rate of responding decreased somewhat but not to baseline levels.

In the above instance feedback again seems to have acted to reinforce the (parents') target behaviors. It may have also been the case that the feedback system served to punish parents' non-participation behaviors (e.g., not running a teaching session).

Quilitch (1975) compared the effects of three procedures on institutional ward staff's rates of engaging their clients in recreational activities. A memo from the attendants' supervisor urging them to carry out recreational activities was compared to the effect of a one day workshop on how to lead recreational activities for clients, and to a concurrent scheduling and feedback condition. Only the latter condition, which consisted of assigning specific attendants to lead activities with groups of residents and publicly posting in-
individual attendants' rates of carrying out assigned programs, reliably changed attendants' rates of leading recreational activities. In all four wards in which the scheduling and feedback procedures were implemented, the number of residents rated as active by observers at least tripled over baseline, memo, or workshop conditions.

This interesting study would have been enhanced had the author presented some report on the effect of the scheduling and feedback system on the attendants. Their perception of the procedure as constituting a positive or negative reinforcement paradigm may have little effect on their performance within an experiment of eight or nine weeks duration, but may be vitally important if such a system were permanently adopted.

The rates at which mental health technicians carried out group and individual therapy session, and daily routine tasks on an adult psychiatric ward were increased over baseline conditions via performance based feedback (Kreitner, Reif, & Morris, 1977). Feedback took the form of a memo reporting the individual technicians' weekly performance on the three target responses. The memo was posted near a favorite gathering spot of the technicians. Interestingly the system:

...was not preceded by any formal introduction or announcement of what was to take place. As far as the technicians were concerned the memos just started appearing. The shift supervisor was careful not to differentially reinforce improvement with praise, recognition, or other forms of
positive reinforcement. (Kreitner et al. 1977, p. 107).

Given the nature and logistics of the feedback system, this study would seem to have provided good information on how powerful the technicians' peers were as reinforcers. Dramatic increases were obtained on all three target behaviors when the feedback system was implemented. Unfortunately no data or anecdotal reports were presented on the psychiatric residents' behaviors, or on the technicians' perceptions of the feedback system.

Shook, Johnson, and Uhlman (1978) reported on two experiments they carried out with staff in a center serving multi-handicapped children. The target response in both experiments was the number of graphs of child behaviors completed by staff who had been selected for their initial low rates of graphing. The experimenters noted completion is analogous to many responses required of staff, and: "This class of behaviors typically has few reinforcers associated with the task itself and, therefore, must be maintained through management imposed contingencies." (Shook et al. 1978, p. 207.) In their first experiment they compared three procedures. (a) Reduced effort, in which the experimenter posted the graphs, (b) Reduced effort and instructions, in which staff were also given written instructions on completing graphs, and (c) Reduced effort, instructions, and group feedback, in which the staff were also given data on the percent of graphs they were completing as a group. Only the reduced effort and instructions condition had a marked improvement on the subjects' rate
of graphing, and this effect diminished over time. In the second experiment, group and individual feedback coupled with instructions was found to be more effective than either instructions or instructions and group feedback. It should be noted that two different sets of subjects were used in the two experiments although the characteristics of both sets of subjects were similar—graduate students from a local university working at the center, with a very low base rate of graphing. No data were presented on client behaviors or staff's perception of the system, but the authors did call for long term studies on these types of staff management systems.

In summary, feedback systems have been shown to be effective for managing selected staff or parent behaviors. Although it is unclear whether feedback acts as a positive reinforcer, a discriminative stimulus, or even as a punisher for other behaviors which interfere with the targeted responses, it is clear that feedback can be effective. It should be noted that this author has encountered no reports of a feedback system producing high anxiety or unrest among staff or parents.

**The Problem Addressed**

As previously noted deinstitutionslization is occurring nationwide. In Massachusetts large state institutions are gradually being depopulated via several routes. Some (very capable) retarded persons have been released outright under their own recognizance. Others have moved to semi-independent or supervised apartments. Perhaps the
largest number have moved into group homes, in which typically four to eight retarded persons live. The general trend has been towards providing services in the community.

The Specialized Home Care Project (SHCP) is one example of a community based residential alternative for the mentally retarded in Massachusetts. It is a program of the Department of Mental Health (DMH), and is mandated to provide services for mentally retarded persons in a home setting in the community (Massachusetts Department of Mental Health, Note 4). Services are contracted with families yearly. Before a client moves into his or her new home, members of the host family must become licensed as "care-providers." This is accomplished via a screening process to determine if a family would be capable of providing services, and completion of training in relevant areas which may include first aid, behavior modification, and mental retardation.

Care-providers are responsible for direct care and supervision of their client(s), including provision of shelter, food, and other services essential to the well being of the client. Care-providers are also responsible for in-home developmental training of their charges. An in-home training program for one client may involve increasing his or her self-feeding skills while for another increasing social skill such as entertaining a guest in the home may be the goal. Care-providers receive $150.00 per month for providing direct care and supervision to their client. Additionally they are paid the
minimum hourly wage to carry out developmental training. Training is compensated up to five hours per day per client depending on the clients' need for training.

Care-providers are supported and monitored in the home by SHCP staff called "placement-coordinators." These staff monitor the placement as needed. Thus they may visit the home daily, weekly, or monthly. The placement coordinators gradually reduce their contract with the families after six months to one year, and turn their duties over to a Department of Mental Health "follow-up worker." The follow-up worker's role is similar to the placement-coordinators; that is to provide support to the care-providers and monitor the placement. No clear guidelines exist as to how often a follow-up worker must visit the home, but an informal rule is at least once every two months. Even though their placement-coordinators are no longer regularly following the placement, the SHCP remains responsible for yearly re-contracting with the care-providers, and thus retains a vested interest in the quality of the services provided.

In years past the provision of in-home developmental training for clients was handled informally. Yearly training goals were agreed upon and written into the care-provider's contract. However the client's entering behaviors were not assessed, no specific teaching strategies were identified, and data collection consisted of a quarterly checklist on which the care-provider was to check whether the client had made substantial, good, or minimal progress towards each
goal. The difficulty of monitoring such a system is readily apparent. It would probably be impossible to tell whether the in-home training a client was reportedly receiving was happening and if it was how much progress was being made.

In attempting to encourage care-providers to participate formally in more client training, keeping data and following programs, three half-time "in-home educators" were hired by the SHCP of Region 1, (Western Massachusetts), on June 1, 1979. Each in-home educator was given the responsibility of assessing and developing in-home training programs for up to ten clients.

According to the process outlined by the SHCP administration a client's placement-coordinator or follow-up worker was to convene and coordinate a meeting of themselves, the care-provider, in-home training consultant, and any other professionals (e.g., physical therapist or teacher) who had extensive interaction with the client. The purpose of the meeting was to outline an Individual Service Plan for the client. The plan was to be the home based equivalent of the client's education plan. Care-providers were to play an active role in this group and follow written programs agreed to at these meetings.

In fact, virtually no meetings of this nature were ever convened. The SHCP placement-coordinators and DMH follow-up workers were unable to add these duties to their already busy schedules. The in-home educators did, however, assess clients and develop training programs for them with the care-providers' help. No official procedure was devel-
oped for delivery of these services, but typically programs were modeled by the in-home educator, revised if needed, and any questions answered prior to asking the care-provider to implement the program. One follow-up visit was generally scheduled by the in-home educator about a month later so that the program might be modified as needed.

The SHCP administration has also adopted the policy of requiring care-providers to submit progress reports on their client's programs along with their monthly vouchers requesting payment for services rendered.

Recently the Massachusetts Department of Mental Health published new guidelines on mental retardation. These guidelines went into effect September 1, 1980 (Massachusetts Department of Mental Health, Division of Mental Retardation, Note 5). They make those agencies responsible for the residential placement of retarded children (e.g., SHCP) also responsible for developing residential Individual Service Plans for each client. Given this mandate, agencies such as the SHCP will increase their efforts to develop a system to generate and maintain the implementation of residential Individual Service Plans. A critical element of this process will be the maintenance of the care-providers implementation and documentation of their clients' programs.

According to O'Dell (1974) maintenance has been an overlooked part of many parent training programs. Given that the client population served by the SHCP includes severely and profoundly retarded persons we may expect problems in maintenance of training programs carried out by care-providers. Due to the slower rate of behavioral
change seen in these clients (e.g., Barret, 1979) the amount of reinforcement available to the care-providers for conducting the training may be limited. This problem has been encountered and to some degree solved in an institutional setting. As noted earlier Panyan et al. (1970) used publicly posted performance feedback to maintain the number of operant self-help programs staff reportedly carried out with their severely or profoundly retarded clients. Others in researching methods to maintain gains in student performance achieved via behavioral programs suggested that unless systematic fading procedures were used with clients their behavioral gains would not generalize and maintain (Walker & Buckley, 1972). Berkowitz and Graziano (1972) in a review of the parent training literature cited the lack of follow-ups in most research in this area and questioned the value of these reports. They also specifically noted as an important issue the inclusion of maintenance strategies in parent training.

In summary, there is evidence in the literature that parents or para-professionals working directly with the retarded should, and can be trained to carry out behavioral programs. Similarly, the literature suggests that management of parents or staff, especially in terms of implementation of behavior change programs and data collection has been and will continue to be an important issue. This is especially true given the current trend of deinstitutionalization resulting in the need to deliver services to a geographically dispersed population. Also, when the target population consists of severely or profoundly handi-
capped persons the frequency of reinforcement for the trainers efforts may be low. Thus maintenance of program implementation could be a critical issue. Finally it has been shown that different forms of performance based feedback can function to reinforce and maintain behavior in different settings.

Applying this knowledge to the problems faced by the SHCP led to the development of the following research questions: (a) Can a program consisting of conceptual and on-hands training in teaching techniques, in-home observation, and feedback be used to train geographically dispersed care-providers of severely or profoundly retarded youths to teach their charges effectively and maintain their teaching and data collection? (b) Would over-the-phone feedback maintain the care-providers' teaching and data collection?

A subordinate objective of this project was to analyze the costs of the program in order to inform agencies of this important concern.

A major consideration in selecting the program strategies included in the first research question, beyond reports of their effectiveness, was that it was felt that they would be viewed by all parties involved as ethically acceptable and consonant with the normalization principle (Wolfensberger, 1972). It was also felt that by offering the care-providers training in (three) behavioral teaching techniques, and guiding their application of this new knowledge to (two) client behaviors, both care-providers and clients would realize some on-going benefit from participating in this project.
Over-the-phone feedback was investigated based on its expected acceptability, and reports in the literature that compared to in-person feedback this would be a relatively low-cost yet effective way of cueing and reinforcing behavior (Holden & Sulzer-Azaroff, 1972). Others had used phone contact as a means of collecting data and reported no significant disadvantages (Baker & Heifetz, 1976; Hake & Zane, in press; Morse, 1980).
Three females who contracted with SHCP of Region-1 to provide services to moderately or profoundly mentally retarded youths served as the subjects in this experiment. A fourth woman volunteered, but was not used as a subject because her client was so much more capable than the others included in this study.

Subjects were selected from among the approximately 100 care-providers working for the SHCP in Region-1 on the basis of the following criteria; (a) Their placement-coordinators's subjective judgement that the family had sufficient time to participate, and that participation would be of potential benefit to them. (b) That they served one child or adolescent whose primary diagnosis was moderate, severe or profound retardiation. (c) That after hearing and reading a description were willing to serve for the entire experiment.

All care-providers including the three who participated in this project have shared many common experiences. For instance, to become licensed as a care-provider all needed to attend the SHCP training series and be interviewed at length by a placement-coordinator.

A description of demographic and other relevant data on the three care-providers (subsequently referred to as subjects 1, 2, and
their clients (referred to as clients 1, 2, and 3) and the families follows. It should be noted that no systematic survey was made of the subjects' initial teaching skills. However, all were considered to have clients that were difficult to teach, and reported having difficulty teaching their client new skills.

Subject-1 lived in a suburban town of approximately 10,000 in far western Massachusetts. She was approximately 40 years old, a Caucasian, and had been a care-provider for three years. Last January, just before the start of this experiment, she and her husband legally adopted their client.

Subject-1 and her husband had no children of their own, but they have had extensive experience with very young children. In the past ten years they had taken about 50 foster children into their home for periods of from two weeks to two years. According to subject-1 these children had been abandoned by their parents or removed from their parents' home. The children were placed with this family by a DMH social worker, and remained in their care until a permanent home was found for them. Subject-1 and her husband no longer provide this service to DMH.

This family has three adopted children. Their (former) SHCP client is their latest, youngest, and only handicapped child. Their oldest adopted child is a young woman, 18 years old, who has graduated from high school and works in a group home serving retarded residents. Their second adopted child, is a 15 year old male who attends the local high school.
Subject-1 is congenitally missing her right hand. She does not seem self conscious about it nor did it seem to impair her ability to manage a large house and hold a part time job as an evening receptionist at a local hospital. In fact, during the course of the study a profoundly handicapped two year old boy was placed in her care by the SHCP.

At the beginning of the project clients were assessed using the SHCP Skills Assessment for Children. Thus the following notes on clients' behavior were obtained via a structured format.

Client-1 was three years old during the project. He had been placed with this family at three months of age. He was diagnosed as (probably moderately) mentally retarded, secondary to Down's syndrome. He was reported to have a congenital heart defect that was not apparent nor of immediate concern to his mother. He was also violently allergic to all milk products.

At the start of the project client-1 was capable of walking on flat surfaces, though he sometimes fell; he could not go up or down stairs. He could vocalize a few words, and tried to say others but was difficult to understand. He was not able to dress or undress himself. Although he seemed to have the requisite motor skill, such as the ability to grasp small objects and bring them to his mouth, he did not feed himself.

The second subject lived on the same street only a few houses from subject-1. Subject-2 was approximately 40 years old, Caucasian, and had been a SHCP care-provider for a year and a half at the start of the study.
Subject-2 and her husband had no children together but her husband had four by a previous marriage. (All were married and lived in other states.) Both had previously worked for a number of years with mentally ill adults in a public institution in another state.

Subject-2 worked part time as a clerk in a neighborhood drug store and one hour per day as a school crossing guard. She was anxious to have a second SHCP client placed in her home so she would be able to quit her jobs and devote more time to the training and care of her SHCP clients. At the very end of this project this family and their placement-coordinator had initiated the placement process for a second SHCP client.

Subject-2's client was a 17 year old young woman who had resided with the family for one and a half years. She was diagnosed as profoundly mentally retarded, secondary to Down's syndrome. Previously she had lived for over 10 years on a locked ward in a state institution for the retarded.

At the start of the project this client was noted to walk independently (though slowly) on all surfaces including stairs. She had no verbal language but could vocalize some sounds and could imitate the rythmical patterns of simple songs or multi-syllable words. She was reported by her school teacher to have an imitative sign vocabulary of about 40 words, however, she was rarely reported to initiate signs. Her primary mode of making her needs known was to point to or get objects she wanted, or to whine and refuse to cooperate until some-
one found out what she wanted. This client was independent in toileting, and could dress herself though she could not tie her shoes. Subject-2 reported this client exhibited several types of obnoxious behaviors including extreme slopiness at meals, folding and tearing pages in magazines, and pulling grass out of the lawn.

Subject-3 lived in a suburban community of approximately 30,000 in west-central Massachusetts. She was a Caucasian woman of about 40 who, at the start of the project had been a SHCP care-provider for about one year.

This woman and her husband had two children of their own. Their first was a 21 year old young man who was mildly mentally retarded and who had always lived at home. He worked part time at a sheltered workshop, and received counseling from a psychologist due to occasional temper tantrums. Their second child was a 16 year old young woman. She attended the local high school.

Subject-3 was not employed but was very active in advocating for both her retarded son and her SHCP client. Prior to the completion of this project she had, with the aid of her placement coordinator, initiated plans to take in a second SHCP client, and had begun visiting several prospective clients.

Client-3 was a six year old boy who had been diagnosed as mentally retarded and brain damaged, probably due to anoxia at birth. He had lived with this family for about one year. Previously he had lived with his own family.

At the start of this study client-3 was able to walk on flat
surfaces or rough terrain without falling, and could negotiate several stairs on his own. He had almost no verbal language, but occasionally said complete intelligible words (e.g., car, up). He was not able to perform any component of dressing independently. He also engaged in fairly high rates of stereotypic play when left alone. For example he might turn a toy ferris wheel repeatedly. (According to the records available his rates of stereotypic play had decreased dramatically since becoming a member of this SHCP household.)

Of the three clients who were involved in this project, two, client-2 (the seventeen year old young woman), and client-3 (the six year old boy), were involved in full day educational programs during the summer. Client-3 also received speech therapy two days a week, one hour per session. Client-1 (the 3 year old boy) began attending a pre-school program part time, two mornings a week near the end of the study.

Ethical provisions. In order that the subjects' rights would be respected, and to follow University and SHCP regulations, the details of the study were explained to those subjects who were recommended as potential candidates by the SHCP placement-coordinators. If after hearing an explanation of the study the potential subjects still expressed an interest in participating in the study, they were given an informed consent form to read and sign if they so desired (appendix 1).

Others Involved

In addition to the subjects and their clients, three observers
were involved in this project. Two were University of Massachusetts under-graduates; one, a sophomore male, the other, a female senior. Their third observer was a female graduate student, and was also the experimenter's wife. The undergraduate observers were selected on the basis of their response to an ad for research assistants and received course credit for their work. The experimenter served as a fourth observer for the purpose of collecting reliability data. All observers were trained by the experimenter.

**Materials**

**Observer Training Materials.** In order to train the observers to a high level of accurate recording, they participated in Reese's "Observing, Defining and Recording Behaviors" workshop (Note 6). The workshop materials include a movie and programmed text. This training packet helps teach novice observers to master several types of observational recording. The observers were also given training in recording with data sheets similar to those to be used in their actual observations, and in recording behaviors similar to be recorded in subjects' homes. For these training sessions a film made by the SHCP for the purpose of helping care-providers learn objective recording techniques was used. The film, "A Longer Look," includes several short vignettes of care-providers socializing or working one on one with their clients.

**Behavioral Checklist.** A checklist, (appendix 2) helped the care-
providers select two skills that they wanted to teach their client. This checklist was composed of items from standard behavioral or developmental checklists (e.g., the Denver Developmental Screening Test) as well as many original items. The items were divided into 18 categories including: Attending, Communication, and Dressing Skills. The items were sequenced in a developmentally logical order within each category. Subjects were asked to indicate whether their client could do each skill independently, with a verbal prompt, with a physical prompt, or whether the client could not perform the skill due to a handicap or lack of opportunity. For example, subjects rated their clients as independent on the first item of Motor Skills category: "Reaches for object in view." The checklist also had a section that requested relevant demographic data on the clients, for example their date of birth, and diagnosis.

Written Materials. In order to train the subjects in behavioral teaching techniques they were asked to read three chapters from an introductory level text on behavior modification (Martin & Pear, 1978). These chapters were selected by the experimenter due to their anticipated relevance to the subjects' instructional needs. There was one chapter each on shaping, chaining, and fading. The subjects were given a pre-quiz and (optional) study questions and glossaries to help guide their studying for each chapter. A parallel form post-quiz on the chapter measured their (verbal) mastery of the material. This quiz was given immediately after the subjects finished the unit. A review quiz constructed from several items from each quiz was
administered two months after the last unit quiz had been passed.

The experimenter developed all the study questions, glossaries, and quizzes. Examples of these materials constitute appendix 3.

**Data Sheets.** The data sheets reflected the important dimensions of the behavior for which they were to be used. Most were used to record the number of sub-steps of a skill that the client performed independently. (For example "Takes off pullover shirt" was one such skill; a sub-step was "Pulls hem of shirt from waist to armpits.") The other measure gathered was the rate of some behavior (for example making total communication signs) in the absence of any prompts. (See appendix 4 for a sample data sheet.)

Steps completed independently for those skills to be trained served as the major measure. The steps were derived from a collection of programs for teaching the developmentally disabled (Wheeler, Miller, Duke, Salisbury, Merritt, & Horton, Note 7).

**Programs.** Individual program formats were modelled after those described by Fowler et al. (1978). Specific directions were included for both the care-provider's and client's behavior. (For an example see appendix 5.) Data sheets used were based on ones in the Wheeler et al. (Note 7) text.

**Feedback Checklist.** Finally, in order to apply systematic consequences, a feedback checklist was used by the experimenter. Each feedback checklist was divided into two sections, a social and a task agenda, and was developed by the experimenter prior to a visit or call.
to the subject. All social and task items on a given checklist were based on the experimenter's most recent information on the subject. For example if the subject had just returned from a three day weekend at the beach, or had recorded on her most recent data sheet that the client had mastered a new step an item covering that information would be included. The intended function of the social items was to relax the subject and to help establish the experimenter as a conditioned reinforcer. The task items were intended to give the subjects feedback on their data collection and programming. For example if the subject had mailed in or given all her weekly data to the experimenter on time, one of the task items would be to praise that behavior.

**Measurement**

A brief description of the six dependent variables follows.

**Percent of Client Programs Carried Out.** These data were calculated by dividing the number of days available to carry out the program that week (seven minus the number of days the client or subject was sick). Subjects were expected to carry out programs at least 70% of the time (five days a week) when no illness occurred.

These data were recorded by the subject and then handed or mailed to the experimenter depending on whether the in-person or over-the-phone feedback phase were in effect.

**Client Progress as Rated by Observers.** These data were collected by the trained observers at (usually) weekly sessions lasting about twenty minutes. During these sessions subjects would work on the target skills
with their clients. The subject was usually asked to follow the program sequence with the client twice. (Due to reliability problems during observer-training sessions the type of prompts delivered by subjects were not recorded.)

Client Progress as Rated by Subjects. These data were collected by the subjects on the training skills(s). Subjects were asked to record either the frequency of a given behavior, or more typically, the number of steps their clients performed independently according to a task analysis of the skill. Subjects used data sheets which were identical to those used by observers.

Costs. Costs were calculated for all phases of the project. The SHCP supplied information on the salary of in-home educators and their rates of mileage reimbursement. The telephone company supplied information on the rate of long distance calls. The experimenter kept records on all relevant variables during the intervention phase (e.g., the length of feedback visits, time to prepare for feedback contacts, etc.). Costs for the assessment and training sessions are estimated. More precise data were not collected.

Travel and telephone costs were calculated from where the SHCP in-home educators have their offices. Actual travel time and mileage were halved under the assumption that visits to two different homes could always be made on the same trip. Furthermore 20% of all actual travel time was not counted as it was assumed that it would ordinarily be done after hours (8:30-5:00). At these times the in-home educator would be paid for mileage but not travel time since they would be viewed as commuting times as per the SHCP general policy.
Subjects' Quiz Scores. Subjects were asked to take two quizzes on each unit of study (shaping, chaining, and fading). One quiz was administered before the care-provider received the reading, study questions, and glossary and one immediately after the material for a unit was completed. Two quiz forms were made up for each unit in case a subject did not master a unit on the first try. A final summary quiz was given at the end of weekly data collection.

Subjects' Program Implementation Accuracy. These data consist of observers' ratings of the number of steps on which the subjects followed the suggested program sequence of the total number of steps.

Experimental Design

A multiple baseline across behaviors and across subjects design was used to demonstrate the effects of the experimental procedures on the dependent variables. The multiple baseline design, common in the behavioral literature, allows individual subjects to serve as their own controls (Hersen & Barlow, 1976: Kratochwill, 1978). The intervention package was introduced to subjects based upon when they finished the preliminary portion of the project that involved mastery of the reading materials. (The presentation of the package was to be counterbalanced. However, due to a lack of subjects and one subject's early withdrawal this was not done.)

Subjects 1 and 2, (who lived near each other), received the package with in-person feedback first, then received over-the-phone feedback. The third subject received only the package with over-the-phone feedback than expressed a desire to terminate her involvement.
Subjects' varied pre-experimental histories were also controlled by having an extended baseline period during which performances on the target behaviors were monitored. In addition, while each subject had extensive prior experience with some special needs population their actual experiences differed widely.

Due to the applied nature of this project the experimenter could not exercise a lot of control over the behavior of the subjects and not all relevant variables were controlled. For instance a subject's phone might ring in the middle of a recording session, or other household members might be present during some but not all sessions.

Only two incidents were probably confounding in more than a minor sense. Subject-3 selected two behaviors to teach her client (as did all subjects). These were; makes total communication signs, and takes off a pullover shirt. Her client had begun receiving speech therapy, in which he was learning total communication, about one month before subject-3 began her involvement in the project. Subject-3 was not receiving formal instruction in total communication, but she had been encouraged to watch the therapist work with her client (through a one way mirror) and reported she did watch the therapy about once a week.

The other potential confound occurred with subject-2. She had chosen shoe-tying as one of the behaviors to teach her client. After she had helped draw up a written program for shoe-tying she sent her only copy of the program to school with her client so the teacher could also work on shoe-tying.
Procedure

Subject Identification and Recruitment. Once the necessary approvals had been obtained the experimenter met with the SHCP placement-coordinators in order to secure their support of the project and to enlist their aid in identifying suitable research subjects. The experimenter and placement-coordinators agreed upon a process by which the placement-coordinators would help identify possible subjects. They took home information they had received from the experimenter which explained what the project would require from a subject, and what kind of clients the experimenter wanted to include. They were to contact potential subjects to sound out their interest in becoming involved with the project. If the potential subject expressed interest the placement-coordinator was to inform the experimenter. A time line of two weeks was set for these activities.

Unfortunately at the end of two weeks none of the placement-coordinators had called the experimenter (a variety of reasons were given). Calling each placement-coordinator resulted in the names of a few potential subjects. The experimenter then requested that the placement-coordinators call these potential subjects right away. This was judged to be the best (if not the most expedient) process since the experimenter knew only a few of the care-providers and did not want to pressure any into participating in the study.

Several weeks later seven potential subjects had been identified and screened for interest by the placement-coordinators. The experi-
menter then called all potential subjects and made appointments to meet with six of them to explain the project in more detail. (One care-provider told the experimenter over the phone that she was no longer interested in being in the study.) Of these six potential subjects four agreed to participate in the project. One of these four was dropped because her client was so much more capable than any of the others.

**Selection of Behaviors.** Once recruited subjects were asked to select two behaviors to teach their clients. This was done in cooperation with the experimenter who used the SHCP assessment tool as a guide. The criteria followed in selecting behaviors were; (a) they were important for the client to learn, and (b) the subject judged that the client would be capable of learning the skill in a few months.

**Data Collection.** Once a subject had selected two behaviors she was observed attempting to teach the behaviors to her client at every meeting thereafter. The subject was asked to repeat the training sequence twice unless some event made that impossible. Each subject was observed on two separate occasions for a total of four trials, two per observation, before the unit mastery phase was begun. Since the experimenter considered mastery of the units a requisite for successful teaching, data points during unit mastery are included in baseline.

When recording observers sat or stood from three to ten feet from the subject and client (depending on the behavior being observed).
If more than one observer were present, care was taken to position observers so that they could not see each other's data sheet.

Unit Mastery. After each subject had identified two behaviors to teach her client, she was also given a pre-quiz on the first unit (shaping). Next she received the reading on shaping and a set of (optional) study questions and a unit glossary to guide her as she progressed through the material. Then she selected a date on which to take a quiz on the material. (Usually a week or two was selected.) One to three days prior to the next visit the experimenter phoned to check on the subject's progress and to answer any questions about the material.

At the following meeting if the subject indicated she were not ready the experimenter would ask how far she had progressed and if she were having difficulty with the material. If the problem were simply that she had not finished the material she was encouraged to complete it for the next meeting. If it were a case of inability to understand the material she was directed to the relevant study guide questions and original examples and explanations were provided.

When a subject indicated that she was ready to take the quiz on shaping the experimenter asked if she wanted to review any of the material or had questions she'd like answered before taking the quiz. If the subject asked questions on the material they were answered. If she responded to this offer of assistance by summarizing the material the experimenter would give feedback on the discussion in terms
of it's accuracy. If important points were missed or confused, the experimenter would guide her to the relevant study questions, or provide original examples or explanations. If the subject indicated that she were ready to take the quiz but had no questions and did not discuss the material the experimenter asked if she would mind answering a few questions on the material. If the subject said "no" the experimenter would ask her to define key words or concepts and/or give examples illustrating important elements of the reading. The experimenter would then give her feedback on her answers as described above. If the subject did not want to answer any questions on the material she was given the quiz. All subjects were given as much time as they needed to complete every quiz. The experimenter was always present during the quiz to clarify questions if necessary.

Once the quiz was completed the experimenter would immediately correct it. The subject was given feedback on each answer. Quiz feedback consisted of either praise for correct answers, an acknowledgement that an item had been missed, or a request for a clarification if the answer were unclear or incomplete. If the subject scored 80% or above she was informed that she had "mastered" the material and could go on to the next unit. If the quiz score was less than 80% the subject was asked to study the material again for the following week (at which time the alternate form would be given). These procedures were then repeated until the subject had mastered all three units.

A different procedure was followed when the final review quiz
was given. The subjects were not told ahead of time that they would be asked to take a review quiz, nor were they given the opportunity to discuss the material with the experimenter prior to the quiz. These quizzes were corrected in the usual way but subjects were not asked to re-take the review quiz if they scored less than 80%.

Program Planning. After the final unit had been mastered the subject was asked which of the two behaviors she wanted to try to change first. After a behavior had been selected (the decision was always made very quickly), the experimenter sat down with the subject at the next meeting and verbally reviewed a potential program. In all cases it was stressed that the subject knew the client best and knew enough about behavioral teaching techniques to be a full partner in the program planning process.

The experimenter wrote-up the program after the subject had tried it out with her client and agreed to do it. The original copy of the program was left with the subject while the experimenter took a copy home. The programs consisted of a step by step guide which the subject was to follow in order to cue and/or apply consequences to the client's performance. This process was repeated several weeks later with two of the three subjects for their client's second target behavior. The third subject never reached this stage because she expressed a desire to end her involvement with the project before a program was written for the second behavior.
Data collection by subjects. On the visit, during which the first client program was written, the subject was given a supply of data sheets. She was asked to record the client's daily performance by checking off the steps of the program the client performed independently. The experimenter also explained the purpose of the data sheet, how to fill it out, and asked the subject to practice filling it out once during a practice trial. The subject's data were then compared to the experimenter's and any differences discussed. The experimenter would then perform the program with the client two times for the purposes of clarifying the program procedure and to allow the subject to practice, and receive feedback on data collection.

In Person Feedback. After the program planning and data collection training meeting described above, if the subject was entering the in-person feedback condition she was asked to give the completed data sheet to the experimenter at his next visit one week later. Prior to visiting the subjects to give feedback, the experimenter drew up a detailed agenda consisting of social and task items as described above.

During in-person feedback meetings the experimenter: (a) Greeted the subject and socialized with her briefly (up to ten minutes). (b) Requested any completed data sheets. (c) Reviewed the amount of data that had been collected smiling and praising her for evidence of five or more completed sessions or remaining neutral for fewer. Examples of praise statements might include "Thanks very much for
taking the time to record this data." "I'm glad you did it (nearly) every day, it's important to collect this kind of information."

Examples of neutral statements might include: "I see you didn't collect much data last week." or, "Oh, you collected data two days last week." The problem was then addressed. Examples of problem solving statements might include: "Is there any reason you can think of why you couldn't collect more data this week?" or, "What do you think you can do to remind yourself to collect data this week?"

When the data sheets were incomplete and the subject indicated that either the client or subject had been ill, or some family problem had interfered with their execution of the program and data collection the experimenter tried to be understanding. An example of a statement made in this situation might be: "I'm sorry you've been ill, I hope you'll start doing the program and taking data on it again as soon as you feel better, but of course your health comes first."

(d) Reviewed the quality of the data, that is the client's progress and any written comments besides those already reviewed (i.e., those that explained why data had not been collected). The experimenter's comments were largely controlled by the data and could be characterized as 'praise' or 'problem solving' depending on the nature of the client's progress. An example of a praise statement in this context might be: "All your work seems to be paying off." or, "According to your records (client's name) is really making progress on this, you should be proud of yourself." An example of a problem solving statement might be: "Well, (client's name) doesn't
seem to be making progress on this skill, what do you think we should do?" or, "I'm not sure why (client's name) isn't making progress, maybe you should try using a different reward. What do you think about that?"

(e) After the research assistant arrived (they were never present for the feedback session) the experimenter would ask the care-provider to work on each skill with the client two times. The rationale for this was to decrease reactivity and thus increase the accuracy of the measure. (f) Finally the time of the next meeting was confirmed.

Over-the-Phone Feedback. After the program planning and data collection training meeting described earlier, if the subject was entering the over-the-phone feedback condition the following would occur. (a) The experimenter would explain that due to increased demands on his time he would not be able to come to the subject's home for several weeks. (b) Permission was gained for the research assistant to continue visiting the house at the regularly scheduled time. (c) The subject was given data sheets and a set of stamped envelopes addressed to the experimenter, and asked to mail each completed data sheet to the experimenter on a specified day of the week. (d) A time for the experimenter to call the subject to discuss the data that she had collected was agreed upon. (It was explained that calls would take from ten to fifteen minutes.) (e) The subject was told that if the experimenter had not received the data sheet in the mail by a
certain date he would call to remind her to mail it.

Following this meeting the subject could be called for two reasons; the data had not arrived by the date set, or the data had arrived and the experimenter was calling to give feedback. If the data had not arrived by the date set a "reminder call" was made. Any necessary reminder calls consisted of the following: (a) Drawing up a brief checklist with specific social and task items. (b) Calling the subject. (c) Appraising the subject of the situation (no data), and asked if she had mailed the sheets. (d) If she said they were in the mail she was thanked and told she'd be re-contacted when the data arrived. (e) If she said the data had not been mailed, she was encouraged to do so immediately and told she'd be contacted again when the data had been received.

If the data arrived on time the experimenter called at the regularly scheduled time. If the data arrived late, the feedback call was made on the day data were received. Prior to giving feedback, a detailed checklist covering social and task items was drawn up as in the in-person condition. (An advantage of the phone condition was that there was more time to look at the latest data before delivering feedback.) Then a feedback call consisting of the following was made. (a) When the subject was contacted the experimenter asked if she had time to talk. (b) If she said "no" the call was rescheduled. (c) If she said "yes," feedback was given essentially as described for the in-person condition. (It should be noted that it was more
difficult to problem-solve with the subject as when the client was not making progress in this condition.)

**Termination.** At the conclusion of data collection, the subjects were thanked and the nature of the study explained to them. Any questions posed by the subjects were answered. No indication was given at this time by the experimenter that he would contact the subjects in the future. It was noted that it would be a good idea for the subject to keep on trying to teach the client the skill(s) targeted for the study.

**Follow-up Data.** Three months after the last data collection session, each subject was contacted and asked if she would allow a final session. This session was scheduled for two to seven days after the call had been made so the subjects' would not have lots of time to practice target skills with their clients. These sessions were identical to the standard data collection sessions.

**Inter-Observable-Agreement**

Inter-observer-agreement (IOA) scores were calculated on four dependent variables; (a) percent of programs subjects' carried out, (b) client progress as rated by observers, (c) subjects' quiz scores, and (d) subjects' program implementation accuracy.

The formula used to calculate IOA was: Agreements divided by agreements plus disagreements times 100. Only occurrences of behavior
were counted in determining these scores, and agreement was determined on a point-by-point basis. Thus if on a ten step task analysis one observer rated the client as independent on steps one through five and the second observer rated the client as independent in steps one through four the IOA score would be 80%. If the second observer had rated the client as independent in steps three through six the IOA score would be 50%.
CHAPTER III

RESULTS

General Trends

Inter-observer agreement scores all averaged over 87%. Inter-observer-agreement was not assessed for the client progress data submitted by subjects. The reliability and validity of these data can be estimated by comparing them to the observers' client progress data (see Discussion). It was not considered necessary to calculate inter-observer-agreement for the cost data.

The data indicate that: (a) Subject's reported carrying out 76.9% of their clients' programs as a function of the maintenance procedures, in-home observation and feedback combined; (b) Clients' made moderate progress on those skills for which the whole training package was implemented; (c) Subjects' and clients' performance did not suffer when feedback was switched from in-person to over-the-phone, a procedure that cost approximately 42% less; (d) Subjects mastered the units on teaching skills and retained most of this knowledge for at least three months; and, (e) Subjects' rates of carrying out client programs exactly according to written instructions was generally low.

Inter-observer-agreement data will now be reported followed by a detailed review of the data for each of the six dependent variables. Any supplementary evidence supporting or contradicting the data will be noted.
Inter-Observer-Agreement

Percent of client programs carried out. Six of the thirty-two weekly data sheets submitted by subjects were re-scored by a research assistant. All IOA scores were 100% (Table 1-a).

Client progress as rated by observers. Over 100 IOA measures were made on these data. Due to the (conservative) procedure of only including occurrences of behavior in the IOA formula some scores were quite low, however, the overall average agreement was 88.4%. These data are reported in detail (Table 1-b).

Subjects' quiz scores. Inter-observer-agreement was calculated on a random sample of four of the twenty-two quizzes (18%). One quiz was selected from each of the units including the review. The IOA average was 91.3% (Table 1-c).

Subjects' program implementation accuracy. Eleven of the thirty trials on which subjects' accuracy was rated were scored by two observers. The IOA calculation produced an average score of 87.5% (Table 1-d).

The Dependent Variables

Percent of client programs carried out. Overall, subjects reported carrying out 76.9% of the client programs. During the in-person feedback condition they reported carrying out 73.3% of the programs. The
Table-1

Inter-Observer-Agreement Estimates

a. Percent of client programs carried out:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Weeks</th>
<th>Percent Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 and 13</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>3 and 5</td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>1 and 5</td>
<td>100%</td>
</tr>
</tbody>
</table>

Average 100%

b. Client progress as rated by observers:

<table>
<thead>
<tr>
<th>Client</th>
<th>Skill</th>
<th># of measures</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Stair-climbing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Task analysis</td>
<td>17</td>
<td>83%</td>
<td>50-100%</td>
</tr>
<tr>
<td></td>
<td>2. Stairs crawled</td>
<td>11</td>
<td>99%</td>
<td>83-100%</td>
</tr>
<tr>
<td></td>
<td>B. Takes off shirt</td>
<td>16</td>
<td>81%</td>
<td>0-100%</td>
</tr>
<tr>
<td>2</td>
<td>A. Shoe tying</td>
<td>20</td>
<td>89%</td>
<td>75-100%</td>
</tr>
<tr>
<td></td>
<td>B. Looks at Mag.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Tasks analysis</td>
<td>3</td>
<td>100%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2. Pages ripped</td>
<td>6</td>
<td>97%</td>
<td>94-100%</td>
</tr>
<tr>
<td></td>
<td>Signing</td>
<td>1</td>
<td>100%</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>A. Takes off shirt</td>
<td>20</td>
<td>95%</td>
<td>67-100%</td>
</tr>
<tr>
<td></td>
<td>B. Signing</td>
<td>23</td>
<td>82%</td>
<td>60-100%</td>
</tr>
</tbody>
</table>

Average 88.4%

c. Subjects' quiz scores:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Percent Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaping</td>
<td>90%</td>
</tr>
<tr>
<td>Chaining</td>
<td>90%</td>
</tr>
<tr>
<td>Fading</td>
<td>100%</td>
</tr>
<tr>
<td>Review</td>
<td>85%</td>
</tr>
</tbody>
</table>

Average 91.3%

d. Subjects' program implementation accuracy:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Skill</th>
<th># of measures</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stair climbing</td>
<td>5</td>
<td>93%</td>
<td>67-100%</td>
</tr>
<tr>
<td>2</td>
<td>Shoe tying</td>
<td>4</td>
<td>79%</td>
<td>50-100%</td>
</tr>
<tr>
<td>3</td>
<td>Takes off shoe</td>
<td>2</td>
<td>91%</td>
<td>83-100%</td>
</tr>
</tbody>
</table>

Average 87.5%
figure was slightly higher, 78.8% during the phone feedback condition. Subjects' rates of carrying out client programs ranged from 54.6% to 91.4%. Consistently, any week during which the subjects' reported carrying out less than the criterion amount of training sessions (five of seven days) were followed by increases in the number of programs carried out (Figure 1).

Client progress as rated by observers. At least a small amount of progress was made by each client on every skill for which the full training package was implemented. According to the follow-up assessments, this progress was maintained or extended.

(a) Client-1 made more progress on one of his target skills, stair climbing, than the other, takes off shirt. Two measures were taken on the stair climbing skill, the number of steps on a task analysis performed independently, and the number of stairs climbed independently. During baseline the boy averaged 2.7 of 9 steps done independently on the task analysis, and 0 stairs climbed independently. The initial stair-climbing program resulted in no change in this client's behavior over six trials. The program was revised prior to data point 17 resulting in his performing 3.6 steps on the task-analysis and crawling up an average of 12 of the 14 stairs independently. These gains were extended during the phone feedback phase to an average of 4.9 steps on the task analysis and 13.9 stairs crawled up independently. This progress was maintained through the time of the follow-up measure (Figure 2).
Figure 1. Percent of training sessions carried out by foster-parents with their client.
Figure 2. Client l's progress as rated by his foster-parent and an observer.
It should be made clear that this child was never observed to walk up the stairs. However, he was informally observed by those involved in the project to have more and more closely approximated walking. He progressed from crawling on his hands and knees to crawling on his hands and feet.

Less progress was made on client's second target behavior: takes off a pull-over shirt. On a 10 step task analysis the child averaged 0.14 steps done independently per trial during baseline and 1.3 after the program package was implemented. The rate of steps performed independently was higher during in-person than over-the-phone feedback, but there are too few data points for the in-person phase to permit a valid comparison. The gains made during the program phase were maintained over three months (Figure 2). On several occasions the child yelled and began to cry when asked to remove his shirt. However, he always participated in the task and always stopped protesting the moment it was finished.

(b) One of client 2's original target behaviors 'looks at a magazine' was abandoned about one-third of the way through the experiment (see Discussion). Her other behavior, 'puts on and ties shoes,' was observed for the duration of the experiment. The number of steps that she completed independently increased slightly when the training package was instituted. Of 12 steps she averaged 3.1 performed independently during baseline and 4.0 during the first intervention phase when in-person feedback was given. This gain was extended during the next phase, over-the-phone feedback, when an average of
5.1 steps were performed independently, and increased further, to 7.5 by the time follow-up data were gathered (Figure 3).

Another training objective, 'makes total communication signs,' was selected towards the end of the experiment. According to observers' data she made no progress on that skill.

(c) Two skills, 'takes off a pull-over shirt,' and 'makes total communications,' were targeted for client-3. No program was ever written for the second skill, as his care-provider, subject-3, withdrew from the study before it was completed.

The boy did make progress on the first skill, 'takes off a pull-over shirt,' for which the full training package was implemented. On a ten step task analysis he averaged 0.13 steps done independently during baseline versus 2.63 steps during the program phase. This gain was maintained according to follow-up data collected three months later (Figure 4). (Due to subject-3's early withdrawal, the in-person feedback phase of the implementation was not implemented.)

The data on the boy's signing indicate that he averaged 2 independent signs during the first four trials, before subject-3 begin to master the teaching units, and 3.8 signs per trial afterwards. However these data are highly variable. It should be noted that the boy's repertoire of signs was limited to a maximum of four in any one trial. Only one follow-up trial was performed on signing because the boy refused to remain in the training area during the second trial. Subject-3 noted that he probably wasn't hungry as he had been on a school trip to a local mall that day and she suspected he had eaten
Figure 3. Client 2's progress as rated by her foster-parent and an observer.
Figure 4. Client 3's progress as rated by his foster-parent and an observer.
several snacks. Thus the usual food reinforcers had temporarily lost their effectiveness.

Client progress as rated by subjects. These less rigorous data (no inter-observer-agreements were collected) depend for their credibility on the degree of correspondence with the data collected by the observers. They are also displayed in figures 2, 3, & 4. In general the two sets of data roughly correspond, but subjects tended to report less variability and higher scores than the observers.

(a) The data submitted by subject-1 for stair climbing agreed in level and trend with the observers' and her overall range matched the observers'. However, within any given week this subject usually reported her child's performance as varying by no more than one step on the task analysis.

She regularly credited the boy with independence on about five (of ten) more steps than did observers on the second skill, takes off a pullover shirt. She also reported little variability in any given week, usually indicating that the boy performed the same number of steps independently every day (Figure 2).

(b) Subject-2 collected data on her client's shoe-tying and signing. Compared with observers she reported the young lady as performing independently on about three more steps on the shoe-tying task during the intervention. She always rated her client as performing seven to eleven (of twelve) steps on the task analysis inde-
pendently. The observers rated the young women's performance as lower and her range slightly wider: two to seven steps.

This subject consistently rated her client as independently making about two more total communication signs per trial than did observers (Figure 3).

(c) Subject-3 was only asked to submit data on her client's shirt removal. According to her data the boy reached independence on about one more step on the task-analysis than he was credited with by the observers. Unlike other subjects, she reported a substantial amount of day to day variability in her client's performance (Figure 4).

Costs. Costs were calculated for assessment, training, in-home observation, and both feedback procedures. According to the formula used (see Methods) an assessment cost $17.88 and training cost $129.30 ($99.63 for unit mastery and $29.67 for on-hands training). Observers costs per visit were calculated to be $4.19. An in-person visit by an in-home educator cost $10.79, while one phone contact cost $6.22, 42% less. A detailed breakdown of these data is presented in tables 2 and 3.

Subjects’ quiz scores. In general each subject scored low on all pre-quizzes, improved their score dramatically on the post-quiz, and retained their knowledge of this material at a fairly high level up to three months later.
### Table 2

**AVERAGE ESTIMATED ASSESSMENT AND TRAINING COST**

**I. ASSESSMENT**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>CALCULATION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment Time</td>
<td>1\text{(visit)} \times 2\text{(hrs)} \times 5.88\text{(per hr)}</td>
<td>$11.76</td>
</tr>
<tr>
<td>2. Mileage</td>
<td>1 \times 0.14\text{(per mi)} \times 47.5\text{(mi)}</td>
<td>3.33</td>
</tr>
<tr>
<td>3. Travel Time</td>
<td>1 \times (71.2 \text{ min} - 2) \times 20% \times 5.88\text{(per hr)}</td>
<td>2.79</td>
</tr>
</tbody>
</table>

**TOTAL ASSESSMENT COSTS** $17.88

**II. TRAINING**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>CALCULATION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Unit Mastery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Training Time</td>
<td>6.67\text{(visits)} \times 1.5\text{(hrs)} \times 5.88\text{(per hr)}</td>
<td>$58.83</td>
</tr>
<tr>
<td>2. Mileage</td>
<td>6.67 \times 0.14\text{(per mi)} \times 47.5\text{(mi)}</td>
<td>22.18</td>
</tr>
<tr>
<td>3. Travel Time</td>
<td>6.67 \times (71.2 \text{ min} - 2) \times 20% \times 5.88</td>
<td>18.62</td>
</tr>
<tr>
<td>TOTAL</td>
<td>Sum 1 + 2 + 3</td>
<td>$99.63</td>
</tr>
</tbody>
</table>

| **B. On-Hands (Program and Data Collection)** |                                                             |       |
| 1. Training Time            | 1.67\text{(visits)} \times 2\text{(hrs)} \times 5.88\text{(per hr)} | $19.52|
| 2. Mileage                  | 1.67 \times 0.14\text{(per mi)} \times 47.5\text{(mi)} | 5.52  |
| 3. Travel Time              | 1.67 \times (71.2 \text{ min} - 2) \times 20\% \times 5.88\text{(per hr)} | 4.63  |
| TOTAL                       | Sum 1 + 2 + 3                                                | $29.67|

**TOTAL TRAINING COSTS** $129.30
| ITEM                          | CALCULATION                          | COSTS |  |  |
|------------------------------|--------------------------------------|-------|  |  |
|                              |                                      | In-Person | Phone |  |
| 1. Preparation:             | $5.88(per hr) x 17.34(min)           | $1.71   | $1.71 |  |
| 2. Mileage:                 | 0.14(per mi) x 47.5(mi) - 2          | 3.33    | ---- |  |
| 3. Travel Time:             | 5.88 x (71.2 min - 2) - 20%         | 2.79    | ---- |  |
| 4. Feedback visit Time:     | 5.88(per hr) x 20(min)              | 1.96    | ---- |  |
| 5. Feedback Calls:          |                                      | -       | 0.88  |  |
| A) Cost of Time             | 5.88(per hr) x 8.94(m9n)             | ----    | 0.88  |  |
| B) Cost of Call             | Distance for Time Called             | ----    | 1.76  |  |
| 6. Reminder Calls:          |                                      | -       | 0.21  |  |
| A) Cost of Time             | 5.88(per hr) x 2.1(min)              | ----    | 0.21  |  |
| B) Cost of Call             | Distance for Time Called             | ----    | 0.51  |  |
| 7. Follow-up Time:          | 5.88(per hr) x 10.07(min)            | 0.99    | 0.99  |  |
| 8. Mailing Costs:           | Envelopes & Stamps                   | ----    | 0.16  |  |
| PER CONTACT TOTALS          |                                      | $10.78  | $6.22 |  |
Subjects' scores ranged from 5% to 50% on pre quizzes, and averaged 29%. Their post-mastery quiz scores ranged from 80% to 90% and averaged 86%. (This is excluding one post-mastery quiz on which subject-2 scored a 30%. She scored an 85% on the re-take.)

Scores on the unannounced follow-up review quiz ranged from 65% to 72% and averaged 69% (Table 4).

**Subjects' program implementation accuracy.** Subjects' accuracy in carrying out client programs was calculated by comparing their teaching performance with the written program procedure (on which they had collaborated). Two of the three subjects had consistently low accuracy scores. The third subject's scores were much higher.

(Accuracy was only assessed on the first program which each subject was asked to conduct.) (Figure 5)

(a) Subject-1's overall accuracy average was 48%. She averaged 50% during in-person feedback and 44% during the phone feedback phase.

(b) Subject-2 had the lowest accuracy average, 24%. During the in-person feedback phase her accuracy scores averaged 20%. When phone feedback was instituted her accuracy average rose to 27%.

(c) Subject-3 averaged 88% accuracy during the phone-feedback condition. She did not participate in the in-person feedback condition.
<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>QUIZ</th>
<th>Shaping</th>
<th>Chaining</th>
<th>Fading</th>
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Figure 5. Foster-parents' accuracy carrying out programs according to written guidelines.
CHAPTER IV
DISCUSSION

Relationship of Outcome to the Research Questions

Two experimental questions were posed in the introductory section of this paper. (a) Can a program package be developed to train geographically dispersed care-providers of handicapped youths to teach their charges effectively and maintain their teaching and data collection? (b) Would over-the-phone feedback maintain the subjects' teaching and data collection? A subordinate objective of this project was to analyze the costs of this type of system.

Each of the above will now be discussed in light of the data obtained.

Effects of the program package. The client progress data (Figures 2-4) showed that the program package was effective in promoting subjects' effective teaching of their clients. The fairly high rate at which subjects' reported carrying out client programs, and the fact that any progress made was maintained, strongly suggest that the program was also effective in prompting subjects to maintain their teaching efforts. The data turned in by subjects clearly showed the program was effective at promoting and maintaining data collection.

There were several interesting but unprogrammed results of the program package. One was subject-1's independent development of two successful programs for her client. Utilizing the principles of rein-
forcement and fading she taught him to descend stairs and feed himself soft foods with a spoon. Another, reported by this same subject was her increased ability to function as a team member at her client's IEP meeting due to her understanding of some basic terminology and teaching procedures.

The quality of the subjects' data can be challenged. The general trend was for their data to reflect greater client progress and show less variability than that of the observers'. (Recall that subject and observers did not record data simultaneously.) It might have been the case that the in-home observations had the effect of surprising clients' and/or subjects' usual performances. Alternatively data collection training may have been inadequate causing them to fail to collect data as instructed. (The lack of variability in their data suggest one of the latter possibilities.) The fact remains that most of the data were roughly equivalent to those gathered by highly trained research assistants. Also, even though subjects were given short notice that follow-up data collection sessions were to occur, the clients were observed to have at least maintained their progress. This of course suggests that subjects continued to teach the skills in the absence of any experimenter contact.

The effectiveness of phone feedback. The data (Figure 1) show that the subjects' teaching and data collection were maintained by phone feedback. The client progress data shows that when phone feedback was in effect clients' performances on the target behaviors did not
deteriorate.

**Costs.** The tabulation of assessment, training, in-home observation, and feedback costs may be useful to the SHCP and other organizations responsible for delivering services to geographically dispersed clients.

The cost to deliver phone feedback was substantially lower than that of in-person feedback. This was the case even though the formula used for calculating in-person costs was conservative and the cost of phone feedback was inflated by the SHCP's lack of discount phone service (i.e., Wide Area Telephone Service or WATS line).

**Relation of Findings to Previous Research**

This work again demonstrates the need for special training for the retarded and their primary care-givers in order to facilitate the acquisition and generalization of skills (e.g., Koegel et al. 1978; Whitman et al. 1978). These findings are also consistent with other studies that have shown that feedback could be used to maintain the implementation of programs (e.g., Panyan et al. 1970; Welsch et al. 1973), and extends these findings to residential non-institutional staff.

This research directly follows Holden and Sulzer-Azaroff (1972) and Hunt and Sulzer-Azaroff (Note 3). These studies investigated the use of feedback to reinforce program implementation and data collection by the primary care-givers of handicapped children. The present study
extends these findings to persons in a foster-parent role, and shows that they needn't be asked to submit data daily.

The usefulness of the telephone to permit cueing and reinforcing of data collection was again shown as had been by Holden and Sulzer-Azaroff (1972). Based on these findings and those presented by other researchers, (Hake & Zane, in press; Morse, 1980), it seems likely that the telephone will be utilized more in applied research and service.

Fowler et al.'s (1978) findings are also supported by this study. In that work the mother of a profoundly handicapped young woman was shown to be able to teach her daughter several skills even though she did not follow the experimenters' teaching program precisely.

**Limits of Generality**

Several factors limit the generality of the results obtained. Foremost was the lack of a baseline period for the subjects' program implementation data (Figure 1). This omission limits any statement about the power or necessity of the program package to increase and maintain the subjects' teaching and data collection. It may have been the case that these behaviors would have occurred at the same rate as was obtained in the absence of the program. This is an unlikely possibility on the basis of previous literature (cf. Panyan et al. 1970).
Very few subjects participated in this study. Lack of subjects casts doubts on the representativeness of the sample and limits the power of the results. If the same pattern of results had been obtained with eight or ten subjects we could have much more confidence in the program.

Subject-3's early withdrawal also limits the generality of the results. This was due to the experimenter's underestimation of the length of the project, and personal problems this person was experiencing.

The need to abandon one of the client-2's target behaviors, 'looks at magazine,' came about for two reasons. (a) This behavior was not suitable for observation, the client would sometimes hand the magazine to an observer rather than be observed. (b) Subject-2 decided that it was not an important behavior on which to work. (Initially she had stressed how important it would be for her client to stop ripping pages in magazines and learn to look at magazines.) The result of this is that subject-2's data are incomplete.

The inaccuracy of two subjects in implementing their charges' programs is a problem. This was not a primary focus of this project however, and the client whose care-provider was most accurate did not make substantially more progress than the other clients. This problem of compliance could perhaps have been remedied by including a feedback loop providing subjects with data on their accuracy in implementing programs. The opportunity for this existed since observers were in the homes regularly.
A further issue is the correspondence between the feedback procedures as they were used and how they might be used by agencies. In the study the two forms of feedback were implemented separately to facilitate the study of their effects. It seems probable that agencies would be more interested in finding the most cost-effective mixture of these two forms of feedback.

Another issue is the lack of agreement indices for the client progress data submitted by the subjects. It was suspected that simultaneous recording (by observers and subjects) would have been highly reactive, thus observations were made at similar but not identical times. The assumption was that if equivalent results were reported by both sets of observers the observations of each would have greater credibility.

A final problem is one which is generic to all interventions which utilize "program packages." There were five different elements in the intervention: in-home observations, conceptual and on-hand training, in-person and phone feedback. Because of the manner in which the "package" was implemented it is not possible to separate the specific contributions of each of the elements.

Implications and Conclusions

The results of the study suggest three major conclusions. (a) The program package was moderately effective in promoting subjects' effective instruction of their retarded charges and in maintaining their teaching and data collection. (b) Phone feedback was effective
in maintaining subjects' teaching and data collection. (c) The cost of delivering phone feedback was much less than delivering in-person feedback.

Given these findings it may be tempting to minimize the importance of in-person feedback and mastery of written materials in this type of training/documentation system. A system which depended primarily on mail and over-the-phone contacts to maintain and evaluate itself, however, might be limited in the following ways: (a) Problem solving if a client were not making progress or was presenting some unusual problem, (b) Monitoring the accuracy and validity of the service-providers' data, and (c) Developing exemplary service-providers. Whether these would actually be problems are, of course, empirical questions.

Variables affecting the long term success of training/documentation system. The long-term success of a program package such as the one implemented in this study would be dependent on a number of variables including the subjects' subjective experience of the programs' contingency arrangement. In his anecdotal records the experimenter noted on several occasions that the subjects' had implied that they had done their weekly teaching and data collection because they knew that someone was coming to observe them and collect their data, or was going to call to discuss their efforts. From the tone of their statements it seems that positive and negative reinforcement paradigms were in effect. For example, when handing the experimenter
one week's data a subject who had collected almost no data the
week before said, "I knew I better get my work in this week."
Another time the same subject interrupted the experimenter's in-
troductory statement during a phone call to say, "Aren't you proud
of me? I got my data in on time." It seemed subjects were perform-
ing as requested in order to escape some real or imagined aversive
stimuli, or in order to earn some valued stimuli. Future studies ad-
dressing similar issues would be well advised to monitor more closely
the subjects' formal or informal reports on the program contingencies.

Another variable likely to affect the long term success of this
type of system would be the clients' progress. In this project client
progress was minimal to moderate. Ample evidence exists that more
dramatic results can be obtained with similar populations. The experi-
menter believes that a defect of the present system existed in the
selection of reinforcers for the target skills. Subjects' always re-
commended social rewards for their clients when the written programs
were designed. The experimenter deferred to their judgement based on
their long involvement with the client, but in the absence of any
evidence that these stimuli (e.g., praise) were effective reinforcers.
Validation of the effectiveness of reinforcers is a critical step,
especially with a severely handicapped population.

It would be important to monitor a great many other variables
in a system like the one developed here. (For example the effort
required by an agency to maintain a training and documentation pro-
gram.) Thus it may be beneficial to adopt a systems approach (Church-
man, 1968) in order to facilitate development of an exemplary training/documentation system. The following are the experimenter's suggestions for elements of such an exemplary system. These ideas have been influenced by the experimenter's experiences as well as by readings on systems analysis and the development of competent performance (Gilbert, 1978).

(a) Establishment of short and long term objectives for the organization (e.g., the SHCP) as well as for each of its subsystems (e.g., the training/documentation subsystem). This should be done in order to facilitate short and long term planning (e.g., how to invest finite resources), and so that the activities in which the subsystem engaged in would be likely to be valued by the organization. Setting reasonable short and (especially) long term objectives may be very difficult. The alternatives of working toward general goals or setting no goals at all seems less tenable, especially if organizational accountability and coordination are goals.

(b) Assessment of resources available to help attain objectives. This element is necessary in order to develop reasonable strategies for deployment of resources. Both fiscal and personnel resources would be assessed here. Thus the funds available for travel or phone expenses as well as service-providers teaching skill would be evaluated.

(c) Establishment of meaningful and accessible measures of performance for those within the system (e.g., service-providers, clients), as well as the system itself. This is desirable in order to identify exemplary performances and those elements of the system which may need
to be "remodelled." This is easier said than done. Identification of relevant permanent products and unannounced checks can help to establish the validity of data submitted by, for example, those providing training in their homes.

(d) Conducting training based on the organizational objectives, resources available, and the service-providers' and clients' needs. Whether this training were "hands-on" or conceptual would be based on the results of the assessments. At this step the service-provider could also be trained in objective data collection. Training would be competency based, assuming that sufficient personnel and fiscal resources existed.

(e) Ongoing monitoring and feedback to reinforce and maintain or correct performance as needed. This element might utilize direct (e.g., home observation) and indirect (e.g., data collected by service-providers) monitoring, in addition to in-person and over-the-phone feedback. Monitoring and feedback would be directed toward the most important processes and outcomes (e.g., client progress). The percent of direct monitoring and in-person feedback would probably be faded as the service provider demonstrated competence in teaching and data collection and the client began to make regular progress. Service-providers would receive objective feedback on their performance and (ideally) incentives would be offered to reward competence. It would seem to be in the system's best interests to support exploration of low cost procedures to reinforce and correct performance. Research endeavors might include extensive use
of phone, mail, or peer contacts in an attempt to limit "expert" contacts and thereby reduce costs.

(f) Establishment of a management function to coordinate and monitor this subsystem's activities. The person(s) charged with managing this subsystem must be able to exert some control over the elements of their subsystem such as hiring, giving merit raises, etc. In turn these managers could be subject to control by those within (e.g., service-providers, their supervisors), and outside (e.g., community advocates) of this subsystem.

In Summary

This study analyzed a program consisting of training in teaching concepts, hand-on training in teaching and data collection, feedback, and direct observation. The program was demonstrated to have promoted subjects' effective teaching of their retarded charges, and maintained subjects' teaching and data collection. It also showed that phone feedback was a procedure sufficient for maintaining teaching and data collection, and was far less costly than in-person feedback.

The inclusion of acquisition, generalization, and outcome measures sets this effort apart from many other research efforts in parent and staff training and management. Acquisition measures included the subject's quiz scores and demonstrations of their ability to implement programs and collect data. Generalization data included the subjects' rates and accuracy of program imple-
mentation. Outcome measures included the client's progress and the cost data. It is this author's contention that a mature applied behavior analysis must account for data on all three levels.

This study adds to the growing body of literature which demonstrates that some important challenges of providing services to the handicapped in the community can be met. Subsequent research might investigate the timing and nature of maintenance procedures, the amount and types of training needed by service providers, the collateral effects of this type of program, and the subjects' perceptions of the contingencies operating in this type of system.
Reference Notes


4. Massachusetts Department of Mental Health, Division of Mental Retardation. Specialized Home Care orientation, trainers' manual: Module IV Specialized Home Care, issues and guidelines. (Available from: 160 North Washington Street, Boston, Ma. 02114.)

5. Massachusetts Department of Mental Health, Division of Mental Retardation. Department of Mental Health Retardation Regulations. (Available from: 160 North Washington Street, Boston, Ma. 02114.)


REFERENCES


Barnard, K. Teaching the retarded child is a family affair. American Journal of Nursing, 1968, 68, 305-311.


Gold, M. W. and Barclay, C. R. The learning of difficult visual


Repp, A. C. and Barton, L. E. Naturalistic observations of


Vogelsburg, R. T. and Rusch, F. R. Training severely handicapped students to cross partially controlled intersections. *The
APPENDICES
Appendix-1

Informed Consent Form

Retarded individuals are slow learners and often difficult to teach. Of course they are capable of learning many things given the right circumstances. If you are experiencing difficulty in teaching your client new skills you may be interested in participating in this research project. This project is designed to improve your teaching skills, and see how this affects your client's learning of skills that have been hard for them to learn. Briefly, your role in the study would include: 1) Identifying the area(s) you want help teaching your client in, (for example language skills); 2) Assessing your client's current skills in this area; 3) Learning three teaching techniques; 4) Designing with the experimenter, a program for your client in the area(s) indentified. Then carrying out and documenting the client's progress in the program; 5) Allowing an observer into your home weekly, for a short period, at a time convenient to you, to check on the program; and 6) Talking with the experimenter weekly about the program.

If you think you might be interested in participating in this study please read over the attached detailed description of the study or ask the experimenter to explain it more thoroughly. Your participation in this study is completely voluntary. Please do not feel pressured to participate. If you choose to participate you may withdraw from the study at any time, with no penalty. If you do choose to participate your identity as well as your client's, would be kept
confidential by the use of code numbers rather than names in any report of the results.

If you are willing to be part of the study please sign below. Remember that it is voluntary and you may withdraw at any time.

_________________________________________  __________________________
Signature                                           Date
### Skills Assessment - Children

**up to age 16-17 (approximately)**

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**Address**

**Handicaps/Diagnoses**

**Today's Date**

**Training Consultant**

**Directions:** Use a **IND VP PP NA H** or **NO** to rate the client's current level of functioning on each of the skills according to the following key.

- **IND:** Independent, rating is appropriate when the client can perform the skill without assistance.
- **VP:** Verbal Prompt, rating is appropriate when the client has skill but needs verbal reminding.
- **PP:** Physical Prompt, rating is appropriate when the client has skill but needs verbal reminding.
- **NA:** Not attained, rating is appropriate when the client does not have skill and needs to learn skill step by step.
- **H:** Handicap, rating is appropriate when physical handicap prevents client from engaging in the skill.
- **NO:** No opportunity, rating is appropriate when client has not had opportunity to demonstrate mastery of skill. When this is checked, please note as to whether it will be necessary for client to learn this skill.
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<td>4) Hygiene</td>
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<td>7) Dressing Skills</td>
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<td>9) Food Preparation</td>
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<td>11) Clothing Care</td>
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<td>16) Health Maintenance</td>
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<td>17) Self Preservation</td>
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<td>18) Behavior Checklist</td>
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Apppendix-3

SHAPING #3 – Unit Mastery Materials

Training Materials Unit 1-Shaping

The readings in this unit are from a book called, "Behavior Modification: What it is and how to do it." Here are a few things to keep in mind when reading this material.

1. We'll discuss and I'll demonstrate Shaping the next time we meet. Don't worry if some of the material is unclear to you, we'll go over it in as much detail as is needed to make it clear.

2. All underlined words are defined in the glossary attached to the end of the reading.

3. Study questions for you to answer as you go through the reading are also attached. The study questions are optional. If you can answer the study questions, on paper or in your head you'll have no trouble with the quiz.

4. Once you feel comfortable with the material in this unit you'll be asked to take a short written quiz on it.

5. Shaping may not be the right technique to teach the skills your client or child is working on for this study. Chances are you're already using this kind of teaching technique to help your client learn some new behavior or skill, hopefully this reading and our discussion of it will help you become more expert at shaping.
GLOSSARY

1. **Behavior** - Any observable and measurable act of a person or animal. Also called a response.

   *Example:* Writing a letter, drinking a glass of water, or walking are all behaviors. They can all be observed and measured.

   *Nonexample:* Thinking about something, or feelings cannot be observed or measured. Thus they are not considered behaviors.

2. **Emit** - A verb that describes the occurrence of a non-reflexive behavior.

   *Example:* Eating, sleeping or typing may all be referred to as "emitted."

   They are non-reflexive behaviors.

   *Non-example:* If your knee is tapped and your leg jerks a reflexive action has been caused. We would not say your knee jerk was emitted.

3. **Extinction** - To withhold the rewards that used to be given for a certain behavior.

   *Example:* Mrs. Smith used to give her son Charlie a cookie every time he asked for one. Now because he is overweight Mrs. Smith has put the behavior on extinction. When Charlie says, "Mama, I want a cookie." she ignores his request, and continues to do whatever she had been doing.

   *Non-example:* Charlie says, "I want a cookie." Mrs. Smith continues to do what she had been doing, Charlie again asks for a cookie, Mrs.
Smith gives in and gives him a cookie.

4. **Final desired behavior** - The goal of a teaching program. Also called the *terminal behavior*. The final desired behavior is very clearly specified.

   Example: A final desired behavior for your client or child may be:
   He will brush his teeth and rinse his mouth after every meal without being asked.

   Non-example: He will brush his teeth better. (This is too vague.)

5. **Frequency of behavior** - How many times a behavior occurs in a given period of time.

   Example: Belinda makes her bed once a day. Pamela grinds her teeth 20 times an hour, or Nicky does 50 push-ups a day.

   Non-example: Belinda makes her bed all the time. or Pam constantly grinds her teeth.

6. **Intensity of behavior** - The strength of a response.

   Example: When you tip toe you are walking with low intensity. If you are stomping your feet when you walk, you are walking with high intensity.

7. **Reinforcer** - Any object or event that increases or maintains the
the rate or intensity of a behavior when it occurs as the result of that behavior. Different objects or events will serve as reinforcers for different people's behavior.

**Example:** Currently your client only makes his bed about once a week even though you ask him to make the bed every day and praise him right after he makes the bed. You decide to give your client a quarter each time he makes the bed. Very quickly he is making the bed every day. Receiving money reinforced the behavior of making the bed.

**Non-example:** In the above example praise did not serve to reinforce bed making. The client was praised when he made his bed but the rate of his making his bed did not increase. Thus praise was not a reinforcer.

8. **Shaping** - A procedure through which new behaviors are developed in a person by reinforcing successive approximations of the final desired behavior.

**Example:** Currently Janice scribbles all over her coloring book disregarding the lines between which she is to color. The final desired response, or terminal behavior is: "Janice will color between two lines that are one inch apart." Her teachers might try to shape her coloring by reinforcing closer and closer approximations of the final desired behavior. The first step might be to reinforce Janice for coloring between two lines that are seven inches apart, then two lines that are six inches, apart, etcetera.
Non-example: If Janice could currently only scribble all over the page, and the terminal behavior was for her to color between two lines one inch apart, we would not be using shaping if we started by trying to get her to print her name.

9. **Shaping steps** - The steps between a person's initial way of behaving and the final desired behavior.

**Example:** Currently Jimmy will only watch the water when asked to wash his hands. The final desired behavior is "Jimmy will wet, soap up and rinse his hands." The shaping steps might include: 1. Jim brings his hands up to the level of the sink; 2. Jim puts his hands under the water, etc. Another example of shaping steps is given in the example for number 8, above.

Non-example: For the above situation, Jim walks to the table, would not be a shaping step since it is not a step between his initial way of behaving and the final desired behavior.

10. **Topography of behavior** - What a behavior looks like when it is being performed. The form of the response.

**Example:** Right now you are an example of the topography of reading. You are probably sitting, with your head bent forward towards the page, and your head is periodically moving back and forth.

Non-example: The topography of walking is not; the person is sitting in a chair, their legs are up on a coffee table, they are holding a magazine.
Study Questions

These questions are optional. If you do them, all that's needed is a one or two sentence answer.

1. What is shaping?

2. What are the 4 major factors that influence the effectiveness of shaping?

3. a) Is the following an example of shaping? Tommy is an auto mechanic. He has never worked on a transmission before. You bring your car to the station where he works to get the transmission on your car fixed. Tom's boss says; "Tom it's about time you learned how to repair a transmission. How about rebuilding this transmission?"
   b) What major factors of shaping are present or absent in this example?

4. Mrs. Jones wants to increase her daughter Lisa's rate of making total communication signs during a one-half hour teaching session she has with her every day. If you were her what would you choose as a reinforcer for Lisa?
   a) Marshmallows, given for every correct sign.
   b) Praise, such as "Real good job," for correct signs.
c) Whatever you find that increases Lisa's signing when it's given for a correct sign.

5. Give an example of the frequency of a behavior.

6. What does extinction mean?

7. If you wanted your pet dog or cat to learn to sit when you said "Sit," how would you go about specifying the final desired behavior?

8. Give two shaping steps for the cat or dog whom you're teaching to sit.

9. What are the rules for moving along at the correct pace when trying to shape a new behavior? (Just summarize them.)

10. How would you choose a starting behavior in a shaping program?
Quiz

Please complete this quiz before you do any of the reading.

Thanks

1. What is shaping?

2. What are the 4 major factors that influence the effectiveness of shaping?

3. a) Is the following an example of shaping? Tommy is an auto mechanic. He has never worked on a transmission before. You bring your car to the station where he works to get the transmission on your car fixed. Tom's boss says, "Tom it's about time you learned how to repair a transmission. How about rebuilding this transmission?"

4. Mrs. Jones wants to increase her daughter Lisa's rate of making total communication signs during a one-half hour teaching session she has with her every day. If you were her what would you choose as a reinforcer for Lisa?
   a) Marshmallows, given for every correct sign.
   b) Praise, such as "Real good job," for correct signs.
   c) Whatever you find that increases Lisa's signing when it's given for a correct sign.
5. Give an example of the frequency of a behavior.

6. What does extinction mean?

7. If you wanted your pet dog or cat to learn to sit when you said "Sit," how would you go about specifying the final desired behavior?
SHAPING QUIZ—Alternate

1. Identify the three basic steps in any shaping procedure, as presented at the start of this chapter.

2. Define Shaping.

3. What do we mean by the topography of a response? Give an example.

4. Tell how you might teach your child to wipe his mouth with a napkin using shaping.

5. What does the phrase, terminal behavior, refer to?

6. Why bother with shaping? Why not just learn about the use of positive reinforcement to increase a behavior?

7. Might someone accidentally shape up an undesirable behavior using shaping? Tell why this wouldn't happen or how it might happen.

8. What can happen if you reinforce a shaping step, (not the final one) too many times?

9. How is the procedure of extinction used?
10. Jimmy plays basketball six days a week. This is an example of:

a) Positive reinforcement.

b) An effective example of shaping.

c) The frequency of a behavior.

d) An appropriate starting behavior for a shaping program.
II. Takes off pullover shirt or t-shirt

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<th>OPERATION</th>
<th>Ind.</th>
<th>P.</th>
<th>N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pulls shirt hem above stomach.</td>
<td></td>
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<tr>
<td>2. Bunches shirt under arms.</td>
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<tr>
<td>3. Pulls collar to back of head.</td>
<td></td>
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<tr>
<td>4. Pulls collar to top of head.</td>
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<td></td>
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<tr>
<td>5. Pulls shirt over head.</td>
<td></td>
<td></td>
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<tr>
<td>6. Pulls shirt sleeve of preferred arm to below elbow.</td>
<td></td>
<td></td>
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<tr>
<td>7. Pulls shirt sleeve off preferred arm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Pulls shirt sleeve of non-preferred arm to below elbow.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Pulls shirt sleeve off non-preferred arm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Gives shirt to Mrs. A.</td>
<td></td>
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</tbody>
</table>
Subject Accuracy Data Sheet

Subject 3

Trial #

Date:

I. Takes off a pull over shirt.

Check each behavior that Subject 3 engages in.

___1. Starts by asking client to take off his shirt.

___2. Asks him to pull his shirt up (body of shirt to armpits). If he doesn't do this in about 5 seconds gives him a physical assist.

___3. Asks him to pull his right arm out of his shirt. If he doesn't do this in 5 seconds gives him a physical assist.

___4. Asks him to pull his left arm out of his shirt. If he doesn't do this in 5 seconds gives him a physical assist.

___5. Asks him to pull his shirt over his head. If he doesn't do it in 5 seconds gives him a physical assist.

___6. Asks him to give the shirt to her.

___7. Does she praise him every time he completes a step independently?

Observer: Please make notes when items are not checked.
Appendix-5

Individual Program

Skill to be taught: Taking off a pull-over shirt.

What the learner should do:  What the teacher should do:
1.  1. Ask him to take off his shirt.
2. Pulls body of shirt to armpits.  2. Asks him to pull his shirt up.
   If he doesn't do it in 5 seconds give him a physical assist. (Fade)
3. Pulls his shirt off over his right arm.  3. Ask him to pull his right arm out, if he doesn't do it in 5 seconds, give him a physical assist. (Fade)
4. Pulls his shirt off over his left arm  4. Asks him to pull his left arm out, if he doesn't do it in 5 seconds, give him a physical assist. (Fade)
5. Pulls shirt off over head.  5. Ask him to take his shirt off over his head, if he doesn't do it in 5 seconds give him a physical assist. (Fade)
6. Give the shirt to her.  6. Ask him to give the shirt to you. If he doesn't do it in 5 seconds take it from him.

Materials needed: Pull-over shirt, one size too large.

Reinforcer: Clapping and praise (e.g., "What a good boy!") for each step done independently.

Approach: Backward chaining and fading of prompts.