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TEACHING FUNCTIONAL MONEY SKILLS
TO MENTALLY RETARDED ADULTS

A Thesis

by

DAVID LOUIS GERHARDT

Submitted to the Graduate School
Appalachian State University
in partial fulfillment of the requirements for the degree
of
MASTER OF ARTS

MAY 1984

Major Department: Special Education

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ABSTRACT

TEACHING FUNCTIONAL MONEY SKILLS TO MENTALLY RETARDED ADULTS. (May 1984)

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The past twenty years have seen a dramatic change in the treatment philosophy for our institutionalized handicapped population, from the custodial care of the past, to the normalized, least restrictive environment that now attempts to prepare handicapped individuals for life back in the community. Although many skills are trained during the community preparation process, one of the most important has been found to be money skills, in terms of both usage in the community and problems caused by the lack of adequate skills.

This study was conducted to determine whether six institutionalized mentally retarded adults could be taught functional money skills in a classroom through the use of a total task presentation procedure paired with a decreasing assistance prompt sequence in a small group setting, and then generalize these skills to making purchases in community fast-food restaurants. A multiple probe design

across two training groups plus a control group was used to evaluate behavior change as a function of the intervention applied, which resulted in a significant and consistent increase in skills demonstrated independently by all subjects receiving training. Further, the skills acquired in the classroom generalized to community settings without additional training. Such increases in the personal independence of institutionalized persons not only better prepares them for community living and boosts their self-esteem, it also takes us as caregivers a further step away from the antiquated care philosophies of our past.

ACKNOWLEDGEMENTS

This study was a team effort in that it would not have been completed without the technical and moral support of several people. First and foremost I would like to thank the members of my thesis committee. Drs. Dennis Reid and Fred Spooner, who provided the much needed praise and encouragement along with the technical know-how and editorial advice. They got me off the ground as well as safely landed me. Oh, what a flight! Sincere appreciation is also due to Dr. Max Thompson, who guided me through the curricular maze and provided editorial assistance.

In addition, I would like to thank Paul Rasmussen for his frequently needed expertise and assistance in fighting the computer wars. And lastly, my appreciation for Bob Jones must be mentioned, who allowed me the flexibility in my work to carry out this research, and provided additional support and encouragement.

DEDICATION

I could not have gotten as far as I have in this field if it had not been for the values instilled in me as I grew up, and the support my loved ones have provided me throughout my life. Therefore, I would like to dedicate this effort to my loving parents, Norbert and Mildred Gerhardt, and to my wonderful wife Jeanne. May I be wise enough to pass this support and value system on to our family jewels, Christopher, Matthew, Sarah, and Benjamin, as they carve their own paths through life.

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Chapter 1
Introduction

The one-two punch of normalization and treatment in the least restrictive environment has been a primary force behind the push for deinstitutionalization of services for mentally retarded persons over the past decade (Kindred, Cohen, Penrod, & Shafer, 1976). The normalization concept, which would allow mentally retarded individuals to live as normally as possible, grew out of social theories of the 1960's which no longer viewed the developmentally disabled as being "hopeless" (Amicus, 1977). Evidence of poor care and lack of habilitative efforts in many of our institutions, paired with these social theories, created an impact in legislative and litigative thinking that evolved into the principle of the least restrictive alternative (Amicus, 1977). Indeed, as the principle of the least restrictive environment is now supported by the Due Process Clause of the 14th Amendment, as well as by decisions in the Pennhurst (Halderman v. Pennhurst, 1977), Willowbrook (New York State Association for Retarded Children v. Rockefeller, 1973), Partlow (Wyatt v. Stickney, 1972), and other cases, the argument for deinstitutionalizing the mentally retarded populations within our institutions and

moving them into our communities becomes stronger and stronger.

As we place more and more individuals out of the sheltered world of the institution and into the community, as well as begin preparing more institutionalized individuals for community placement, the need becomes increasingly greater to develop functional training programs and procedures which will arm retarded persons with the daily living skills essential for successful adaptation to new, less sheltered lifestyles. Some of these functional community survival skills are cooking, money handling, telephone usage, community mobility, time management, and normative clothing selection (van den Pol, Iwata, Ivancic, Page, Neef, & Whitley, 1981), of which money handling is one of the most important (Borakove & Cuvo, 1976; Lowe & Cuvo, 1976; Trace, Cuvo, & Criswell, 1977).

Successful adaptation to the more normalized, less restrictive environment of community settings means less dependence of staff and more dependence on self. This includes mastering those critical skills used on a daily basis in the community, such as money handling and money management. Community group home residents usually spend their weekdays earning wages through some sheltered or semi-competitive employment. They may also receive additional monies from parents and/or government funding.

They then have the opportunity to spend that money on a myriad of personal and recreational goods and services. Yet, the lack of skill in handling and managing that money can spell the difference between successful and unsuccessful community placements (McCarver & Craig, 1974).

Deinstitutionalizing mentally retarded persons should imply an inherent responsibility to prepare them adequately before such a move is made, a responsibility not often met. Edgerton (1967) found that most deinstitutionalized retarded persons were having serious financial problems, due primarily to a lack of proper monetary skills training. Bell (1976) found that in retarded individuals discharged from ten Texas institutions, the most frequently reported problem was the lack of money handling skills. Lastly, Aanes and Moen (1976) assessed Minnesota group home residents as having low functional levels in money handling skills, with no significant improvement after living for one year in the community. Aanes and Moen, as well as Edgerton, recommended pre-community money skills training for institutionalized persons being prepared for community placement.

Questions Under Investigation

As the push for deinstitutionalization continues and the need for pre-community training in functional community survival skills becomes more evident, questions arise as to

how to best train these skills. With money skills being one of the most important skills necessary for survival in the community, it should evoke a high priority within methodological research for community skills. Yet, little data have been published which demonstrates how to train for the utilization of money skills in a functional situation in the community. In response to this need, this study investigates whether institutionalized mentally retarded adults can be taught functional money skills in order to independently complete a food purchase in a fast-food restaurant. It is hypothesized that by utilizing a training package consisting of several independently successful training techniques not previously combined, the question under investigation concerning functional money skills can be answered.

Chapter 2

Literature Review

This study investigates how functional money skills that are to be used in a fast-food restaurant can be taught to institutionalized mentally retarded adults by utilizing a package of various training procedures. With this in mind, the first purpose of this review is to chart the progress researchers have made in recent years in creating and refining successful training programs for teaching monetary skills to retarded persons. Due to the paucity of applied behavior research in this area, practically the entire assemblage of such studies are reviewed herein. The majority of these studies are designed around only one task or set of skills out of the continuum of sequential monetary skills. These tasks, coin identification, coin summation, coin equivalence, and change computation, are separate topical sections within this chapter.

The second purpose of this review is to look at how money skills have been employed within studies which trained community skills. These studies were examined to disclose any new techniques, or new methods for utilizing established techniques, which are applicable within functional community settings.

The third purpose of this review is to scrutinize the various procedures contained within the training package utilized within this study. Additional topical sections cover the experimental design, training procedure, response prompt sequence, instructional setting, and generalization. Within topical sections, the training programs discussed are evaluated as to the functionality and benefits of the terminal behaviors, as well as the success of previous studies.

Money Skills

Coin Identification

The task of identifying the various denominations of coins has usually been the first major link to be learned in the progressive chain of money skills leading to functionality and independence. Miller, Cuvo, and Borakove (1977) studied the teaching of verbally identifying coin values by comparing two processes, comprehension before production, versus production alone. By employing a matched groups pretest-posttest design paired with a within-group multiple baseline across responses, significant improvements were demonstrated in both mean group performance levels as a function of training, and were maintained across the followup period. However, the "production only" group achieved the target behavior, verbally producing coin values, in less than half the

trials it took the "auditory comprehension then verbal production" group. Additionally, comprehension generalized from the "production only" training, but production did not generalize from the comprehension training.

Cuvo and Riva (1980) used the same two processes, comprehension plus production versus production alone, to compare verbal identification of coin denominations between nonretarded and retarded persons. They utilized a multiple baseline across responses to achieve high levels of acquisition and maintenance across both groups and both IQ levels. Again, the "production only" groups, both retarded and nonretarded, achieved the target behavior of verbally producing the coin names in about half the trials it took the "comprehension plus production" groups. However, the results show significant generalization occurring in both directions, comprehension to production as well as production to comprehension, which is contrary to the generalization findings of the previous Miller, Cuvo, and Borakove (1977) study.

These skills, recognizing and naming coin denominations and coin values, are motoric and linguistic responses to (usually) auditory stimuli, and are prerequisite skills of and internalized within more complex and more functional money handling skills, such as coin summation and equivalence, and change computation. As such, recognizing and naming coins and values are seldom overtly utilized

during actual financial transactions, but provide the foundation on which to stack the tower of sequential money handling competencies.

Coin Summation

Although being able to sum the total of your coins and bills is not an indispensable prerequisite to a successful transaction (van den Pol, Iwata, Ivancic, Page, Neef, & Whitley, 1981), it is a much more exacting procedure for ascertaining how much you do have to spend. Bellamy and Buttars (1975) taught monetary counting to five mildly to moderately retarded adolescents. Utilizing a modeling procedure, they first taught a sequence of rote counting skills that were then applied in identifying and counting coins.

Lowe and Cuvo (1976) taught four mildly to moderately retarded adolescents to sum the value of coin combinations. The subjects were first taught to finger count the number of multiples of five in the value of a single target coin, and then to sum that coin in combination with previously trained coins. A form of decreasing assistance prompt sequence was employed, beginning with modeling before the subject's effort, modeling concurrently with the subject's effort, and then counting independently.

Borakove and Cuvo (1976) utilized a pretest/posttest matched groups design with a multiple baseline across

responses to teach 14 moderately retarded adolescents to sum coins. One group replicated Lowe and Cuvo's (1976) training conditions, and the other group did the same but removed each coin from the column as it was summed (coin displacement). The average subject results demonstrated that the displacement group was taught more efficiently and effectively than the non-displacement group.

Coin Equivalence

Once the ability to sum coin combinations is attained, mastering coin equivalence skills can further expand the functionality of money skills used in daily transactions. Wunderlich (1972) taught eight mildly to moderately retarded children to identify coin values, and then to discriminate between combinations of coins whose amount was and was not equivalent to a single sample coin value. The match-to-sample procedure used a double responding training technique to increase discrimination skills.

Trace, Cuvo, and Criswell (1977) trained fourteen mildly to moderately retarded adolescents to form equivalent combinations of coins (different combinations which total the same target amount). This skill is important for making purchases in a store or at most vending machines, where the specific combination of coins is irrelevant as long as the total purchase price is

arrived at. A pretest-posttest design paired with a multiple baseline across responses was employed.

Change Computation

The ability to compute change owed is a useful skill, although not a necessity (van den Pol et al., 1981). Cuvo, Veitch, Trace, and Konke (1978) taught three mildly to moderately retarded adolescents to make change using up to \$1.00 in coins in the most efficient combination available. All purchase prices and change amounts to be computed were less than \$1.00. Only three subjects out of thirty referrals were accepted, primarily due to the expansive and relatively difficult prerequisite skills which were required. A multiple baseline across subjects combined with the essential features of a multiple baseline across responses was used.

Community Skills

Finding out what works in the community is essential. No matter how successful a training program is in the classroom, its usefulness is limited at best if it cannot be replicated in or generalized to a functional situation. Marholin, O'Toole, Touchette, Berger, and Doyle (1979) taught four moderately to severely retarded men to ride a bus, purchase an item, and pay for a fast-food meal. Training was implemented despite two of the subjects

lacking the numerical skills necessary to consistently pay for items correctly. There was no apparent phase of training aimed at ameliorating this deficiency, and no details specifying how purchasing and paying skills were trained.

van den Pol et al. (1981) taught three mildly retarded, multiply handicapped young men fast-food restaurant skills. Money skills were strongly addressed, with the Paying response cluster being one of four major components of the task analysis. This cluster was comprised of combining bills to overpay the cost of the meal, paying the cashier, and estimating and collecting the correct change. Matson (1981) also used an overpay technique in training grocery shopping skills. However, the study was designed so the subjects had only to be able to count to ten to successfully complete the target task.

Several studies have substituted prosthetic devices in place of money skills in shopping programs (Smeets, 1978a; Smeets, 1978b; Smeets & Kleinloog, 1980; Smeets, van Heteren, & Bouter, 1978; Wheeler, Alison, Nietupski, Loomis, & Brown, 1980). The primary skills trained were how to operate a slide rule or pocket calculator. None of the money skills previously covered were trained or needed.

Method Analysis

Experimental Design

Although there are many research designs utilized in single-subject studies, the most commonly used are the multiple baseline design and the reversal-replication design. The multiple probe design, as a modified form of the multiple baseline, shares the many advantages of the multiple baseline design. The multiple baseline design is a very powerful tool for evaluating the success of instructional procedures (Horner & Baer, 1978). Its experimental control demonstrates that where intervention is applied, change occurs, and where intervention is withheld, change does not occur. The experimental control can be applied across more than one individual, setting, or behavior (Alberto & Troutman, 1982). The multiple baseline design is not inflicted with having to replicate baseline conditions, as is the reversal-replication design, which creates a strategical error when treating acquisition behavior, or an ethical problem when treating aggressive behavior (Cuvo, 1979).

Yet, potential problems can occur which would substantially weaken the experimental control within a multiple baseline. The use of a lengthy assessment instrument can produce less than optimal test performance due to subject boredom or fatigue. This can be avoided by dividing the test into portions to be administered over

multiple sessions (Cuvo, 1979). Also, baseline data collection incorporates extinction, which could become aversive after repeated testing. While this too could create less than optimal performance, either of two procedures can minimize the threat. The first would be to minimize the length of the continuous baseline period. Two or three data points would be adequate if a zero-response rate is displayed, but a minimum of five data points would be necessary to provide a predictable baseline trend if any correct responses are demonstrated (Strain & Shores, 1979). The second procedure would be to utilize a multiple probe design (Horner & Baer, 1978), which would minimize the number of baseline assessments given, but not the length of the baseline period. The procedure for a multiple probe design is slightly different than its parent, the continuously repeated assessments of the multiple baseline. Using this variation, baseline data are taken occasionally instead of daily. The trainer probes every few days to demonstrate that the subject still can not perform the target behavior (Alberto & Troutman, 1982). The advantages of multiple probe over multiple baseline occur when measurement during extended baselines (a) could cause a distorted performance reaction, (b) becomes so unwieldy as to be impractical, and/or (c) a strong "a priori" assumption of stability can be made, due to the type of behavior typically improving only with training (Horner &

Baer, 1978). The multiple probe design was chosen for use in this study due to its many intrinsic advantages over other designs.

Training Procedure

There are two primary training procedures used most often in acquisition training, chaining and total task presentation. Chaining is split into forward and backward chaining, of which backward chaining is usually accepted as the more effective training procedure of the two. In backward chaining, the last step of the task analysis is trained to criterion first and the subject performs the step(s) learned plus a new training step further up the chain. Forward chaining trains the first step of the task analysis to criterion first and adds new training steps from successively further down the chain. A variation of forward chaining is total task, in which the trainer begins with the first step of the task analysis, but each step of the chain is trained during each session until the subject performs the whole task to a predetermined criterion (Gold, 1976).

Few studies have compared the effectiveness of backward chaining versus total task. Based strictly on the theory that a training procedure that produces fewer errors is a more effective training procedure, backward chaining has been found to be more effective than total task (Walls,

Zane, & Ellis, 1981; Zane, Walls, & Thvedt, 1981). This is because the subject is exposed to a greater number of stimulus presentations during each training session with the total task procedure than with backward chaining, which increases the probability of more errors. However, Lindsley (1981) suggested, and Spooner, Weber, and Spooner (1983) confirmed that higher rates of learning are achieved under conditions that allow the subject to make more errors. When additional aspects of effectiveness and efficiency in training are examined, the greater number of stimulus presentations within total task also allow greater overall improvement in the target behavior during each session. In addition, errors and the need for trainer assistance are reduced over time.

Although not a comparison study, Gold (1972) used a total task presentation to successfully train 64 moderately to severely retarded persons to assemble a complex vocational task. He replicated that study (1976) with 22 severely to profoundly retarded blind and deaf persons who also learned to assemble a complex vocational task using the total task procedure.

When the dependent measure is changed from the number or percentage of correct or incorrect responses produced to the celeration (correct or incorrect response rate), trials to criterion, and bounce (variability of the data from the median celeration line), the results change significantly.

Celeration is defined as the rate of behavior change, or as the change in frequency per unit of time, i.e. the number of movements/minutes/week (Pennypacker, Koenig, & Lindsley, 1972; White & Haring, 1980).

Spooner, who has provided the majority of the comparative studies (Spooner, in press; Spooner & Spooner, 1983; Spooner, Weber, & Spooner, in press), has repeatedly demonstrated that total task not only facilitated quicker learning (celeration) and less trials to criterion than did backward chaining, but also maintained less bounce (range of data variance), which means tighter control of the dependent measure.

Spooner et al.'s data encourages trainers to consider replacing backward chaining with total task presentation as the more effective and efficient training procedure. As such, total task was the training procedure chosen to be used in this study.

Response Prompt Sequence

A response prompt is any one of several types of assistance given by the trainer to the subject after the initial cue, either before the subject's response as a response assistance or after the response as a correction procedure to gain instructional control (Cuvo & Davis, in press). It may be verbal, visual, gestural, demonstrative, or physical, and the prompts (except for verbal itself) may

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or may not be paired with corresponding verbal prompts (Glendenning, Adams, & Sternberg, 1983). A response prompt is added to the natural cue to which the subject is expected to eventually respond (Billingsley & Romer, 1983). Its purpose is to increase the probability that the target behavior will be performed, and thereby provide the opportunity to consequence the response (Snell & Smith, 1978). Response prompts must be faded out so that control of the target behavior transfers from the prompts to the natural discriminative stimulus. Liberty, Haring, and Martin (1981) viewed the effort to achieve this transfer as possibly "the most difficult and important task required to promote independent functioning" (p.8).

The sequence in which the prompts are presented may be in the form of increasing assistance (from least to most intrusive) or decreasing assistance (from most to least intrusive) (Billingsley & Romer, 1983), and the prompts in either sequence may or may not be paired with verbal prompts (Glendenning, Adams, & Sternberg, 1983). Increasing assistance first offers the natural cue (no prompt), then verbal prompts, modeling, and physical prompts, until the target behavior is exhibited. Verbal prompts can be verbalizing instructions, a rule, a hint, or even a single word or sound. Modeling is the demonstration of the desired response by the trainer or another model to provide the subject with a response pattern to imitate.

Physical prompts can be faded from full physical guidance, where the subject is manually put through the response, to a light touch (Alberto & Troutman, 1982). Increasing assistance has been successfully utilized as a teaching strategy for many meaningful skills: (a) card assembling (Brown, Bellamy, Perlmutter, Sackowitz, & Sontag, 1972); (b) functional reading (Brown, Jones, Troccolo, Heiser, Bellamy, & Sontag, 1972); (c) mealtime behaviors (O'Brien & Azrin, 1972); (d) toothbrushing (Horner & Keilitz, 1975); (e) counting money (Bellamy & Buttars, 1975); (f) independent living skills (Lent & McLean, 1976); (g) janitorial skills (Cuvo, Leaf, & Borakove, 1978); and (h) independent arrival behavior (Spears, Rusch, York, & Lilly, 1981). However, consideration should be given to the caution that extensive use of this sequence may well teach subjects that there is no reason to respond to an initial cue since they will ultimately be physically guided through the desired response (Falvey, Brown, Lyon, Baumgart, & Schroeder, 1980).

Decreasing assistance usually first provides physical prompts, then modeling, verbal prompts, and the natural cue, as correct responses dictate the successive fading. Like its inverse, decreasing assistance also has been successfully demonstrated to promote learning: (a) toilet training (Foxx & Azrin, 1972); (b) eating skills (O'Brien, Bugle, & Azrin, 1972); (c) self-care (Cuvo, 1973); (d)

vocational training (Hunter & Bellamy, 1976); (e) janitorial skills (Cuvo, Leaf, & Borakove, 1978); (f) money skills (Wheeler et al., 1980); and (g) response fluency (Csapo, 1981). In addition, Falvey et al. (1980) have recommended decreasing assistance as the better of the two sequences for fading instructional assistance so as to facilitate skill performance in response to natural cues and/or correction procedures.

Despite the paucity of applied behavioral research into the effectiveness and efficiency of these two sequences, the evidence so far leans toward the decreasing assistance sequence as being better than the increasing assistance sequence. Gentry, Day, and Nakao (1980) compared both sequences and found decreasing assistance to be the more effective for acquisition of skills. Csapo (1981) replicated the Gentry et al. study, but found increasing assistance to be the better of the two for fluency training. Most recently, Glendenning et al. (1983) compared increasing assistance with two forms of decreasing assistance, with and without paired verbal prompts. The results showed decreasing assistance to be more effective and efficient than increasing assistance, and that all prompts in the decreasing assistance sequence became even more effective when paired with verbalization.

Although current data favor decreasing assistance as the better sequence, much more research needs to be done

to determine which prompt sequence is more effective under what conditions before practitioners can feel secure under the weight of the evidence. Until these answers are found, the choice of sequence selection will continue to be based on trainer preference or intuition (Walls, Zane, & Thvedt, 1980). For this study, decreasing assistance was chosen as the prompt sequence to use, based on available data.

Instructional Setting

Individualized instruction has often been considered as the optimal method for training retarded persons (Gardner, 1971; Wagner & Sternlicht, 1975). However, small group programming has been utilized successfully in many skills over the past twenty years, such as: (a) shaving (Tobias & Cortazzo, 1963); (b) arts and crafts (Davis, 1969); (c) play, self-help, and group activities (Bigelow & Griffiths, 1972; Kimbrell, Kidwell, & Hallum, 1967); (d) lining up and following (Fielding, 1972); (e) reading and arithmetic (Engelmann, 1971; Fink & Sandall, 1978); (f) play therapy (Newcomer & Morrison, 1974); (g) motor imitation (Koegel & Rincover, 1974; Storm & Willis, 1978); (h) picture naming (Biberdorf & Pear, 1977); (i) token usage (Mansdorf, 1977b); (j) sign language (Kohl, Wilcox, & Karlan, 1978); (k) word recognition (Brown, Hermanson, Klemme, Haubrich, & Ora, 1980; Favell, Favell, & McGimsey, 1978); (l) verbal labeling (Fink & Sandall, 1980); (m)

dressings, color discrimination, and receptive language skills (Alberto, Jobes, Sizemore, & Doran, 1980); (n) adjective concepts (Oliver & Scott, 1981); and (o) Bliss symbol identification (Oliver, 1983).

Many studies have been conducted to explore the success of small group versus individual instruction. Of those, some found individual instruction to be more effective (Jenkins, Mayall, Peschka, & Jenkins, 1974; Westling, Farrell, & Swenson, 1982), several have found both strategies equally effective for acquisition (Alberto et al., 1980; Favell et al., 1978; Fink & Sandall, 1980; Koegel & Rincover, 1974; Storm & Willis, 1978), and still others found small group instruction to be the more effective arrangement (Brown et al., 1980; Kohl et al., 1978; Oliver, 1983; Oliver & Scott, 1981).

In addition to seeming to be at least as effective as individual instruction in promoting acquisition, small group instruction offers fringe benefits that individual instruction can not match. Storm and Willis (1978) found that group programming provided substantial peer contact and interaction, as well as "shared modeling" (p.287). Oliver and Scott (1981) found that group instruction elicited 45% more generalization than did individual instruction. Favell et al. (1978) and Fink and Sandall (1980) found that the equal effectiveness of group instruction was accomplished with two-to-three times the

efficiency of individual instruction in utilizing teacher time.

Alberto et al. (1980), Favell et al. (1978), and Oliver (1983) credited the effectiveness of group instruction to a process known as vicarious or observational learning, in which the group-programmed subjects learn by observing the performance of and the feedback received by the other group members. Bandura (1971) and Thoreson and Stuhr (1972) feel that such social models provide much information and are critical to the development of both appropriate and inappropriate behaviors. Researchers feel that observational learning offers many advantages over operant technology. Altman and Talkington (1971) note that social modeling does not have to be as concerned with breaking tasks into small steps as many operant techniques do; no reinforcement is necessary to prompt learning; and observational learning maintains itself longer and generally more than does operant learning. Bandura (1973) reports that utilizing appropriate models within acquisition training using operant techniques can substantially shorten the training time to criterion, thereby increasing training efficiency. Due to the collective advantages of group over individual training, small group instruction was chosen as the preferred setting for this study.

Generalization

Traditionally, generalization has been considered a passive consequence of modifying some behavior -- often hoped for, but seldom planned. But the notion of generalization as an active process has come of age, and the need to develop its own active technology is becoming more and more evident (Stokes & Baer, 1977).

The need for generalization of skills is well recognized. But due to the embryonic developmental stage that generalization technology has currently evolved to, it is not always fully understood that generalization does not automatically happen just because a behavior change is achieved. With this in mind, perhaps the most practical orientation for behaviorists to act under is that generalization does not occur except through some form of programmed instruction aimed at producing generalization (Baer, Wolf, & Risley, 1968; Stokes & Baer, 1977; Wehman & Hill, 1982).

Generalized behavior may occur across stimuli, over time, or across behaviors (Baer et al., 1968). The first of these, stimulus generalization, takes place when a conditioned stimulus which increases the probability of a specific response occurring is replaced by a similar but unconditioned stimulus, which in turn also promotes the same specific response. The second of these, response

maintenance, takes place when a trained response continues to occur after programmed contingencies have been withdrawn. The third, response generalization, takes place when a change in stimulus results in not only a change in the conditioned response, but also in similar but unconditioned behaviors (Alberto & Troutman, 1982). Each of these types of generalization have from one to four categories of documented successful programmatic techniques that produce such generalizations (Stokes & Baer, 1977).

Wehman and Hill (1982) suggested that educators are going to have to change traditional curriculum content and training if we are going to properly prepare handicapped persons for life in a less restrictive environment. And one of those changes must be the inclusion of early, systematic generalization training in natural community settings. Stokes and Baer (1977) described two categories of training techniques that would promote this stimulus generalization and then maintain it. First, by designing the training to include stimuli that are common and/or similar to the stimuli found in the natural community setting, the probability of both stimulus generalization and response maintenance occurring is increased. Second, by introducing stable, naturally occurring contingencies into the training and transferring behavioral control from the training reinforcers to these natural contingencies, response maintenance is greatly enhanced.

Summary

The subjects in this study could already sum some amounts, but not all coin combinations. As such, this skill was refined within the structure of the overall package outlined below, which was not utilized within any of the money skill studies previously reviewed.

Of the community skill studies examined, this study most closely approximates the van den Pol et al. (1981) study, which provided a partial framework upon which to build this study's task analysis. The other community skill studies which addressed money skills, Marholin et al. (1979) and Matson (1981), did not provide enough emphasis or information on money skill training to be of benefit.

Training was implemented using a total task procedure, due to its being more effective overall than chaining procedures. The prompt sequence used was decreasing assistance, due to current data showing greater effectiveness over increasing assistance, and not as likely to teach subjects to ignore initial cues. The instruction was presented in a small group setting, since it is at least as effective as individual instruction, and much more efficient. The instruction was programmed for generalization across settings, in order to ensure the functionality of the skills trained is transferred to the natural setting in the community. The results were examined by using a multiple probe design across subject

groups to best assess the relationship of the intervention applied across several subjects to the behavior change that occurs.

Chapter 3

Method

Subjects

The subjects selected for this study were residents at a state-operated residential and training facility for mentally retarded persons. All were chosen from the same living unit, which had the highest skilled residents out of the twelve living units in the facility, and was geared toward acquisition and refinement of community living skills. The subjects were selected on the basis of four criteria: (a) demonstrated ability to correctly name a penny, nickel, dime, and quarter, as well as one and five dollar bills; (b) demonstrated ability to correctly verbalize at least two out of ten written prices up to five dollars; (c) demonstrated inability to correctly count at least eight out of ten amounts of change up to one dollar; and (d) demonstrated inability to independently complete a financial transaction involving the purchase of ready-to-eat food and drink items. The first three criteria were completed during individual money skill assessments done on all residents in the living unit by this study's trainer in the living unit's classroom. Those residents who met all three criteria were further assessed in the facility's canteen as to their performance of the

fourth criteria. The results of this prerequisite screening produced nine candidates for the study, all of whom were accepted. Table 1 profiles some of the characteristics of the subjects for comparison.

The subjects' medical/behavioral descriptors were many and varied. Medically, four subjects had seizure disorders, of which two were not under full chemical control. Several other descriptors were exhibited by only one subject each: psychosis in remission, blind in one eye, nearsighted, farsighted with astigmatism, mild bilateral hearing loss, moderate to severe scoliosis, and moderate to severe speech defect. Behaviorally, six subjects exhibited aggressive behaviors, five of which were serious enough to warrant formal programming. Three subjects exhibited destructive behaviors, two had poor impulse control, and two demonstrated inappropriate attention-seeking behaviors. A few other descriptors were exhibited by only one subject each: larcenous, disruptive, and hyperkinetic syndrome.

All nine subjects were ambulatory, and had good to very good gross and fine motor skills (i.e. required no adaptive fixtures to complete any vocational or other daily living activities). They could all perform their basic self-care skills independently. During this study, all nine were also receiving training in more advanced self-care and other skills, such as laundry, cooking, fine

Table 1

Subject Profile

Subject	Individual Characteristics				
	Sex	Age	Years Inst*	IQ & Test	Functioning Level
Chris	male	31	8	48 WISC	moderate
Perry	male	31	17	56 Stanford-Binet	mild
Peter	male	28	19	68 WAIS	mild
Fred	male	32	17	34 PPVT	severe
Max	male	27	14	<40 WAIS	moderate
Kim	female	26	19	35 Stanford-Binet	severe

* Institutionalized

Table 1 cont'd.

Subject Profile

Individual Characteristics					
Subject	Sex	Age	Years Inst*	IQ & Test	Functioning Level
Rita	female	18	10	47 WISC	moderate
Corey	male	26	14	<40 WAIS	moderate
Brenda	female	24	13	46 WAIS	moderate

* Institutionalized

arts, and academics, and made gains in skill acquisition while being externally reinforced with social praise only.

Their receptive language skills ranged from two of them understanding simple sentences to seven of them understanding complex sentences. Expressively, only Corey had a difficult time speaking and being understood. His moderate articulation disorder made the majority of his utterances unintelligible. He often became mildly frustrated when he was not understood, but he would repeat what he said until he was understood. Of the other eight subjects, four were usually intelligible enough to be understood without repeating what they said, despite noticeable stuttering and/or misarticulations. The other four were completely intelligible. Five of the nine subjects used up to a 9 word sentence length utterance, two used up to a 12 word utterance, and two used up to a 15 word utterance.

All of the subjects received weekly wages earned through a variety of vocational training placements within the facility. All were dependent on the facility's canteen staff when making purchases at the canteen, and on accompanying cottage staff when making purchases in the community. Staff assistance was needed in counting available money, deciding if the purchase was affordable, appropriately handling the transaction, and/or assuring the correct change was received.

Setting

Training occurred daily Monday through Friday, with each training session limited to a maximum of 30 minutes. Acquisition training was conducted in a 4.5m by 3.5m resource classroom in the subjects' cottage, initially, to minimize unnecessary distractions during this phase of training. The training room contained a 1.8m couch, a 1.8m by 1.2m table, a 0.9m by 0.5m two-shelf rolling cart, four chairs, a cash register, and an easel-hung menu in order to simulate a community setting. The cash register shared the top shelf of the cart with a 0.5m by 0.4m countertop. The bottom shelf stored the items for sale. The cart was enclosed on all but the cashier's side to eliminate unintentional visual prompts when the subject was ordering. The cart was placed in the center of the room to simulate the restaurant counter, with the menu on the easel behind the cart, facing the subject. The table was placed to the left of the cart. The four chairs were placed around the table simulating a dining environment. The couch was placed to the right of and facing the side of the cart to allow group members an adequate view of the entire customer transaction sequence.

Upon completion of the acquisition phase, training for generalization, if found to be needed, would have begun first in the facility's canteen, which is 14.3m long by 9.7m wide, and whose counter service is in part a fast-food

service. The canteen contains a 3.7m long counter with full-time staff serving drink and food items, 12 tables with booth seats, six vending machines, a coin change machine, a microwave oven, a video game, and a jukebox. Upon completion of the canteen generalization phase, further generalization training, if needed, would have been carried out in a fast-food restaurant in the community.

Response Definitions

The task analysis and observational cues were in part derived from the table of operational definitions in the study conducted by van den Pol et al. (1981). But, whereas their study was aimed at restaurant skills in toto, this study emphasized money skills used within a restaurant.

Task analysis development. After this study's task analysis was initially designed, it was assessed in the canteen by observing how closely one staff and four residents (all from the same cottage as the study subjects) followed the task analysis when making purchases. A second instructor was inserviced on the task analysis' correct and incorrect responses. He also observed the purchases being made, which resulted in 96% interobserver reliability (48 agreements and 2 disagreements over 50 target behaviors observed). Through this observation it was found that the staffperson counted her money beforehand, bought multiple items at the same time that were all affordable, counted

out adequate money to pay for the purchase, but pocketed the change without counting it to see if it was correct. Of the four residents, none counted their money beforehand; two of the four bought multiple items, but each item was purchased through a separate transaction; of the eight separate purchases by the residents, three were paid for correctly and independently, two the residents attempted but had to be corrected by the canteen staff, and three were done for the residents by the canteen staff without the residents doing any more than pulling their money out of their pockets; and none of the four residents waited for change nor had any coming to them.

The task analysis was subsequently modified to include having the subject verbally inform the cashier of the amount of spending money available, ask the cashier what the total cost of all the items wished to be ordered is, and then delete any item(s) as necessary to remain under the spending limit. Also, the subject would no longer be expected to calculate the amount of change when due, but would only be expected to understand if change is due or not, and to wait for it if it is due. The final skills sequence of twelve target behaviors, or steps, is paired in Table 2 with the incorrect responses, which help clarify the expected target behaviors.

Table 2

Task Analysis

Target Behaviors	Incorrect Responses
*1. Retrieves money from wallet or pocket.	1. Wallet and/or money remains in pocket.
2. Counts out total amount of money.	2. Counts out none/part of total amount of money.
3. Approaches counter within 10 seconds after counting money.	3. Approaches counter before finished counting, or 11 or more seconds after.
*4. Begins to make ordering response within 10 seconds after cashier's verbal cue to order.	4. Responds before cue, or 11 or more seconds after cue.
5. Verbally informs cashier of total spending money available.	5. Does not inform cashier of total money available, or says the wrong amount.
6. Asks the cashier how much the total bill will be for all items ordered.	6. Does not ask the cashier how much the total bill will be when ordering.

* Requisite Behavior

Table 2 cont'd.

Task AnalysisTarget BehaviorsIncorrect Responses

- | | |
|---|--|
| *7. Orders food item(s) that total the same or less than the spending money available. | 7. Orders items totalling more than the spending money available. |
| 8. Completes ordering within 45 seconds after beginning response. | 8. Completes ordering 46 or more seconds after beginning response. |
| *9. Counts out exact/adequate (not more than one coin more, of the least denomination available) amount of money to meet/cover the order total. | 9. Counts out less than the exact amount to meet the order total, or more than an adequate amount of money to cover the total. |
| *10. Places money on counter within 30 seconds after cashier's cue to pay. | 10. Releases money before cue, or 31 or more seconds after the cue. |

* Requisite Behavior

Table 2 cont'd.

Task Analysis

Target Behaviors	Incorrect Responses
11. Waits for money to be put in cash register, and the cash register to be closed.	11. Leaves counter area before money is put in cash register, and the register is closed.
*12. Pockets change before leaving counter area, if any is due, and leaves counter area within 15 seconds after receiving change; or, leaves counter area within 5 seconds if none is due.	12. Leaves counter area without collecting change due, stands for 16 or more seconds at counter area after receiving change, or stands for 6 or more seconds at counter when no change is due.

* Requisite Behavior

Measurement

Data recorded were the subject's percentage of steps completed independently in performing the skills sequence, with each step equalling 8.3%. Data were charted using the percentage of independence over time on an equal-interval graph.

During the baseline phase, the trainer recorded each occurrence of correct as well as incorrect responding. Baseline data were taken several times a week until a stable baseline, such as at least five consecutive data points comprising a generally nonascending trend (Alberto & Troutman, 1982), became evident.

Training occurred daily Monday through Friday, with posttest probes given about once every two weeks during training. Acquisition phase posttest probes were given in the classroom under the same experimental conditions as the baseline pretests. If generalization training was shown to be needed in the canteen setting, posttest probes in the canteen would have been given about once every two weeks. If generalization training was shown to be needed in a community setting, posttest probes would have been given in a fast-food restaurant.

Reliability

Interobserver agreement is defined as both observers scoring the same code (i.e., correct or incorrect) as to

whether a particular behavior occurred or not. The reliability coefficient is arrived at by dividing the number of agreements by the total number of agreements plus disagreements (Alberto & Troutman, 1982). This formula was used to provide the measure of reliability for both correct and incorrect responses. Reliability was checked during baseline, posttest, and generalization probes.

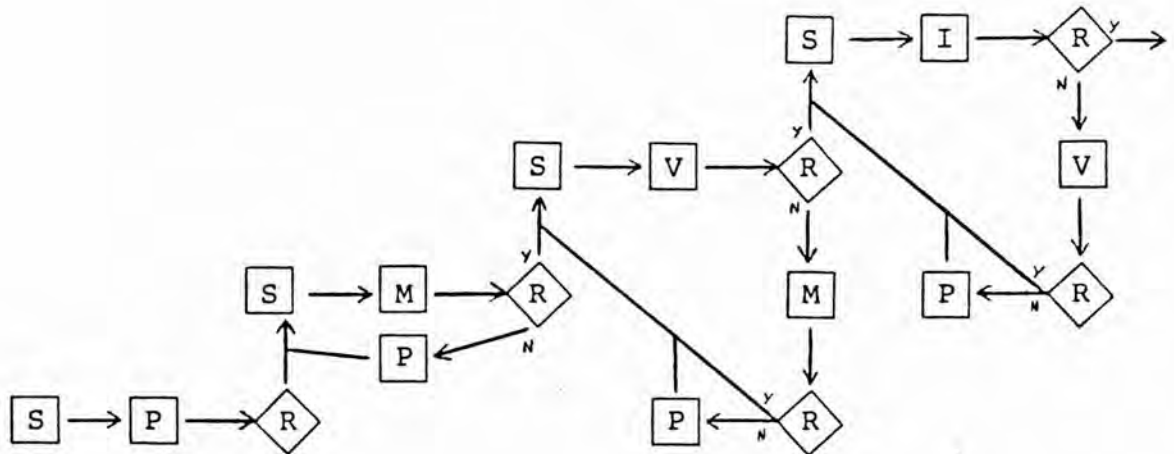
Experimental Conditions

Acquisition baseline. Each subject was pretested individually in the classroom setting. The subject was seated on the couch, initially, with the trainer standing behind the counter table. The subject was given a known but undisclosed amount of money between \$0.50 and \$5.00 to use for the duration of the session, and a wallet in which to place the currency (and the coins as well if the subject so chose). The trainer reviewed the items and the prices listed on the menu. The trainer cued the subject to stand up, face the counter, and make a purchase. This was the cue for the first target behavior, "retrieving money from wallet/pocket". The subject was then allowed to complete the transaction independent of prompts, praise, or feedback, but with minimal corrections given if required to complete a step which provided the cue for the next step, after which the subject would leave the classroom. The

trainer remained behind the cash register throughout the pretest trial.

At the end of a subject's baseline, intervention could have gone in either one of two directions, depending on whether the criterion was met. Criterion was met (for each intervention phase) when a subject independently performed at least 85% (six out of seven) of the requisite target behaviors during three consecutive probes (baseline, posttest, or generalization), and required no more than one verbal prompt to perform each of the rest of the twelve target behaviors. If criterion was met, intervention moved to canteen generalization probes. If criterion was not met, acquisition training began.

Acquisition training. Training in the classroom was conducted under the same conditions as baseline, with the inclusion of prompts, corrections, praise, and feedback. After each discriminative stimulus was presented, which may be a verbal cue from the cashier (trainer) or the completion of the previous target behavior, the trainer gave the subject a prompt, if needed, to assist the response. The level of prompt given, physical, modeling, or verbal, depended on the subject's performance and prompt required on that specific target behavior during the previous trial (see Figure 1). If the subject exhibited the correct response after a prompt during a trial, the trainer offered descriptive social praise (i.e., "Very



- [I] = Independent, requiring no prompt
 [V] = Verbal prompt
 [M] = Modeling prompt
 [P] = Physical prompt
 [S] = Stimulus discriminative
 {R} = Response correct
 Y = Yes
 N = No

Figure 1. Decreasing assistance prompt sequence begins with the most restrictive prompt, physical (P), and ends with no prompt (I) when the subject becomes independent.

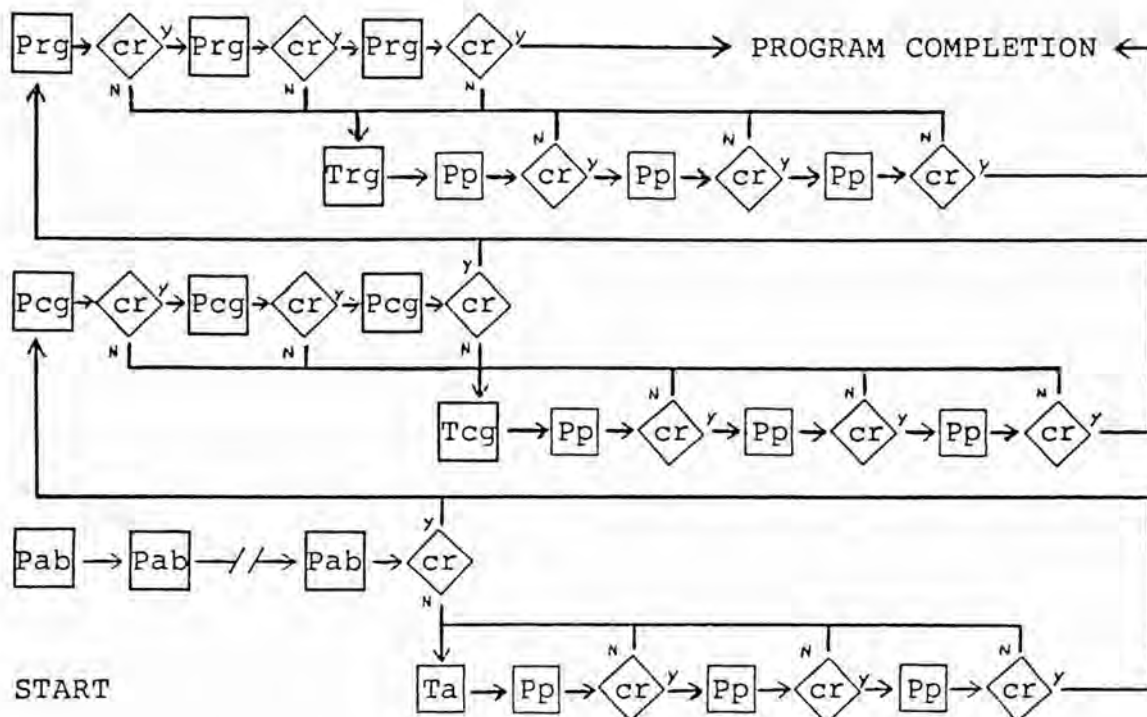
good, Chris, you counted all your money correctly"). The trainer also provided a lesser prompt for the same response during the next trial. If the subject exhibited an incorrect response after a prompt during a trial, the trainer provided a stronger prompt for correction. If the subject then performed correctly, the trainer said "That is right", without any praise. If the subject still responded incorrectly, the subject was physically prompted to perform the correct response, with the trainer offering no praise or feedback. If a subject did not perform a specific response correctly after the response prompt during three consecutive trials, training on that particular target behavior regressed one prompt level on the subsequent trial.

At the completion of the seventh target behavior, order item(s) within spending limit, the cashier placed actual but empty food containers (i.e., soft drink paper cups, foam hamburger box) either on the counter or on a tray on the counter. At the end of the subject's trial, the subject left the counter with the items purchased and sat at the dining table. The trainer then asked the other group members to give the subject feedback on his performance, followed by feedback from the trainer. The trainer then retrieved the purchased items, wallet, and money from the subject, returned the items to behind the counter table, and gave the wallet to the next subject,

with an amount of money different from the previous subject's amount. The amount given to each subject was taken from a predetermined list of random values between \$0.50 and \$5.00.

If criterion was met during a posttest probe, training was temporarily suspended while a second posttest probe was given. If criterion was again met, a third posttest probe was given. If criterion was met on all three consecutive posttest probes, acquisition training ended, and the subject was ready to move on to canteen generalization probes. If performance fell short of criterion on any of the three posttest probes, intervention returned to acquisition training at that point (see Figure 2). Once a subject met acquisition training criterion, he or she remained in that training phase, receiving additional practice and acting as a model for the other group member(s) still under criterion, until all three group members met criterion and were ready to move on to the canteen generalization phase together.

Canteen generalization. Prior to training and probes in the canteen, the canteen staff was inserviced on the necessary testing technique for accurate behavior measurement. This included: providing a list of the subjects; explaining the task analysis and measurement technique; list, explain, and model the expected cashier cues and responses corresponding to the twelve target



Pab = acquisition baseline Probe

Ta = acquisition Training

Pp = posttest Probe

cr = reached criterion? Y = Yes N = No

Pcg = canteen generalization Probe

Tcg = canteen generalization Training

Prg = restaurant generalization Probe

Trg = restaurant generalization Training

Figure 2. Training and probe sequence begins with baseline in the classroom (Pab), and ends with independence in the community (program completion) after successively meeting criteria in the classroom, canteen, and community.

behaviors of the task analysis (Table 2), and engage their cooperation to provide those cues and responses when the study subjects enter the canteen accompanied by the trainer.

The canteen generalization phase could have begun with one, two, or three probes for generalization of the acquisition training to the canteen setting. If the subject met criterion in all three probes, training for canteen generalization was bypassed, and intervention moved to restaurant generalization probes. However, if any of the three consecutive generalization probes in the canteen were performed below criterion level, generalization training would have begun in the canteen at that point. Posttest probes in the canteen would have been given biweekly approximately. Intervention would have always returned to canteen generalization training after a posttest probe unless criterion was reached on that posttest probe. Canteen generalization training would have ended and intervention would have moved on to restaurant generalization probes once all three group members reached criterion on three consecutive posttest probes each (see Figure 2).

Canteen generalization probes consisted of escorting each subject to the canteen, and then moving a short distance (eight feet or less) to the side of the subject to observe. The subject was then free to attempt to purchase

whatever he or she chose, without any interaction (prompts, corrections, or praise) from the trainer, and only minimal assistance from the canteen staff as needed. No feedback was provided to a subject after any probe.

Canteen generalization training would have utilized the same training procedure as in acquisition. However, the subject group would have been initially seated at a dining table with a view of the counter and cash register. Since the trainer was no longer the cashier as well, the trainer would have stood beside or behind the subject while training in the canteen to deliver the necessary prompts, corrections, and praise. At the completion of the seventh target behavior, the canteen staff placed the item(s) ordered on the counter in front of the subject. Feedback by the other group members and the trainer would have been given to each subject when the subject returned to the table with the item(s) ordered after the trial was completed. After the trial was over and feedback was received, the subject returned the item(s) to the canteen staff, exchanged the item(s) for the training money spent, and returned the money and wallet to the trainer.

Restaurant generalization. This phase was structured the same as the canteen generalization phase, with the following exceptions. Upon reaching criterion after three consecutive generalization or posttest probes, intervention would not have moved to another level of training and

setting, but was instead completed (see Figure 2). The subjects utilized their own money, and the trainer had to determine the total amount of each subject's spending money available before each trial, without sharing that information with the subject. Since the subjects purchased the food with their own money, feedback would have been given after all group members have purchased their meals and are sitting down eating.

Experimental Design

The multiple probe design (Horner & Baer, 1977) was the design chosen to optimally confirm that the learning which took place was a function of the intervention being applied. The intervention was applied across two groups of three subjects each. Group 1 contained Chris, Perry, and Peter. Group 2 contained Fred, Max, and Kim. A third group, which contained Brenda, Corey, and Rita was utilized as an additional experimental control. This third group received no training, but was given probes concurrently with the two training groups. The subjects were placed into groups based on their availability for training in deference to their daily schedules.

Summary

This summarization should provide a clearer comprehension of the relationship between the experimental

conditions and the experimental design. Baseline data were recorded during seven successive daily class sessions for Group 1, and during the same seven days plus an eighth session on the 16th class day for Group 2 (Table 3). Training for Group 1 began on the eighth class day, and on the 17th class day for Group 2. Bimonthly posttest probes were given on the 16th class day for Group 1, and on the 27th, 40th, 48th, and 59th class days for both Groups 1 and 2. Group 3, which remained under baseline conditions during the entire study, received baseline probes on the same days that Group 2 received baseline and posttest probes. Group 1 received additional probes on the 41st, 42nd, 49th, 50th, 54th, and 63rd days in order to meet the criterion (for each intervention phase) of independently performing at least 85% of the prerequisite target behaviors during three consecutive probes, and requiring no more than one verbal prompt to perform each of the remaining five behaviors.

Table 3

Probe Ocurrence

Day of Study	Number of Probe Groups		
	#1	#2	#3
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
16	8	8	8
27	9	9	9
40	10	10	10
41	11		
42	12		
48	13	11	11
49	14		
50	15		
54	16		
59	17	12	12
63	18		

Chapter 4

Results

The individual percentage of the twelve steps performed independently per probe per subject is displayed for all nine subjects in Figure 3. This graph presents an overall picture of both individual and group performance across all intervention phases of the study. Data for the nine subjects are broken into three sets of group data corresponding to the two training groups and the one control group. Each set of group data is made up of three sets of individual data.

In Group 1, Peter's baseline began at 25% independence, ranged between 17% and 33%, and ended at 33%. After eight days of classroom acquisition training, his first posttest probe scored 50% independence, rose to 100% after three more probes, and met criterion in the classroom setting on the fifth posttest probe. Chris' baseline began at 33%, ranged between 8% and 33%, and ended at 17%. His first posttest probe scored 67%, reached 100% four probes later, and met criterion. Perry's baseline began at 8%, ranged between 8% and 33%, and ended at 25%. His first posttest probe scored 67%, hit 100% twice in the next four probes, and also met criterion.

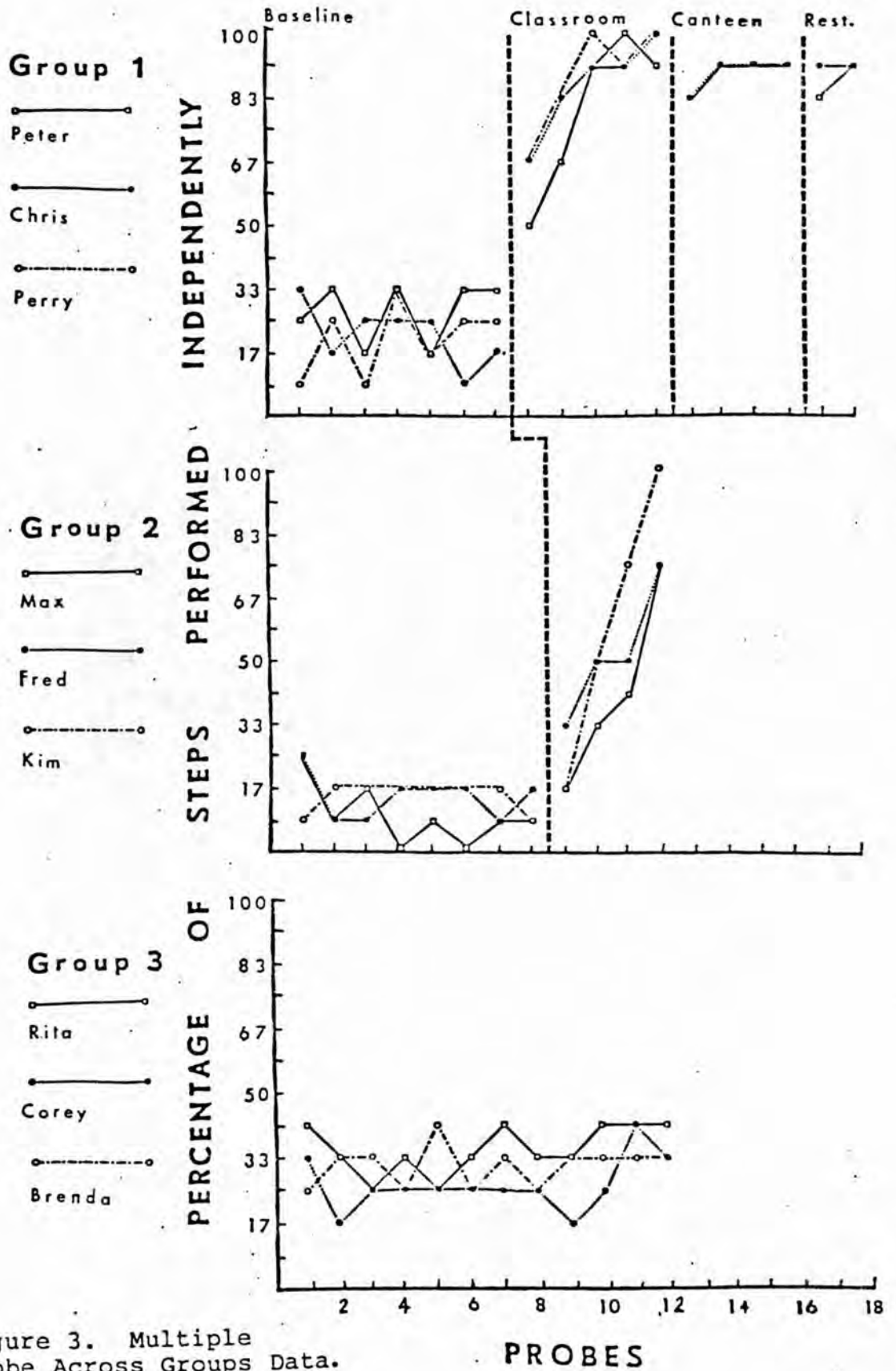


Figure 3. Multiple Probe Across Groups Data.

After Group 1 completed the classroom acquisition phase, Perry seized in the cottage, fell, and broke his arm. He spent the remainder of the study in the infirmary. Peter and Chris continued on to the canteen setting. Both scored 83% independence on their first generalization (13th successive) probe, and both scored 92% on each of their next three probes to meet criterion in that setting.

In the restaurant setting, Peter scored 83% and 92% on his two generalization probes before time in the study ran out. Chris scored 92% on both of his restaurant generalization probes.

In Group 2, Max's baseline began at 25% independence, ranged between 0% and 25%, and ended at 8%. After ten days of acquisition training in the classroom setting, his first posttest probe scored 17%. After 29 additional days of training and three more posttest probes, he scored 67% independence at the end of the study. Fred's baseline began at 25%, ranged between 8% and 25%, and ended at 17%. He scored 33% on his first posttest probe, and also reached 67% three probes later at the study's end. Kim's baseline began at 8% independence, was maintained at 17% consistently over the next six probes, and ended back at 8%. She scored 17% on her first posttest probe, and progressed on to 50%, 75%, and finally 100% independence on her last acquisition posttest probe. Time ran out in the

study before the Group 2 subjects could meet criterion in any of the intervention phases.

Group 3 was the control group, and remained under baseline conditions for the duration of the study. Rita's baseline began at 42% independence, ranged between 25% and 42%, and ended twelve probes later at 42%. Corey's baseline began at 33%, ranged between 17% and 42%, and ended at 33%. Brenda's baseline began at 25%, ranged between 25% and 42%, and ended at 33% independence.

Reliability

Interobserver reliability agreement scores were calculated by dividing the number of agreements by the number of agreements plus disagreements (Alberto & Troutman, 1982). This formula provided the reliability coefficients for both the correct and incorrect responses measured during baseline, posttest, and generalization probes. Table 4 displays the mean coefficient for each type of response within each setting.

Table 4

Reliability Coefficients

Response	Settings			Mean
	Baseline	Posttest	General- ization	
Correct	.96	1.00	1.00	.99
Incorrect	.99	1.00	1.00	.99

Chapter 5

Discussion

This study was conducted to assess the effectiveness of teaching money skills to institutionalized mentally retarded adults by employing a training package of techniques that have been proven to be individually successful, but have not been previously applied together. Once these skills were acquired in the classroom, this study further examined how well these acquired skills seemed to have generalized to community settings. Although all subjects were informally observed in both canteen and community settings at various times during the year previous to the study, no empirical data were collected that could be compared against this study's skill sequence. Without such, the subjects' successful performances in both settings can not be credited to generalization of the training with complete conviction.

Although all subjects did not achieve criterion in all settings, significant progress and success were displayed by the six subjects receiving training. All three subjects in Group 1 met criterion in the classroom acquisition phase. Although one subject was forced to drop out of the study due to medical reasons, the remaining two subjects met criterion in the canteen generalization phase without requiring any training, and both were on the verge of

meeting criterion in the restaurant generalization phase without requiring any training when time in the study ran out.

None of the three subjects in Group 2 met criterion in the classroom acquisition phase before time in the study ran out. However, Kim had performed the task sequence once 100% independence already, which was a 92% gain over her last baseline probe, and would only have had to replicate that performance during the next two successive sessions to have met criterion. Max had demonstrated 58% greater independence than his last baseline probe, and Fred exhibited a 50% increase. Such increases by these six subjects suggest that the learning which has taken place may well be due to the intervention applied.

Examination of the characteristics of each individual subject's data produces a much stronger case for giving credence to the assumption that the learning is a consequence of the intervention. By scrutinizing the stability and directionality of each baseline, as well as the variability within and across phases and the overlap between phases for each subject, a very strong relationship can be seen between training and subject performance, and should allay much doubt as to the effectiveness of the intervention.

In Group 1, all three baselines were somewhat stable within a fairly consistent range of points. Directionality

varied from slightly increasing to slightly decreasing. Yet, none showed a significant gain over the week and a half's time that would indicate an increase in skills acquired. Once acquisition training was implemented, all three subjects made equally rapid progress, and met criterion after seven weeks of training. Although only two of the three Group 1 subjects were available for the generalization phases, both of them maintained their previously attained criterion-level performance without further training. Peter and Chris both met criterion in the canteen setting after their first three generalization probes. The fourth probe charted was given to assess interobserver reliability, as the opportunity to do so was not available during the first three probes. In the restaurant setting, Peter and Chris both were one probe short of meeting criterion, assuming they maintained their consistent performance.

In Group 2, the baselines overall displayed even less variability and directionality, and more stability than Group 1's baselines. The initial classroom acquisition gain made as displayed on the first posttest probe was not as dramatic as Group 1's, yet their overall rate of progress was just as rapid. Kim's rate of progress was the fastest of the six subjects receiving training. Based upon the progress made by the end of the study and the rate at which it was made, the Group 2 subjects may well have

reached acquisition criterion after another two-to-four weeks of classroom training.

In Group 3, the baselines remained very stable for the duration of the study, with only moderate variability. All three baselines exhibited zero directionality. For example, Rita's and Corey's baselines ended at the same level at which they began. Brenda's baseline rose 8% over the length of the study, but her last four probes scored the same level of independence.

Lastly, by studying the correlation of the group performances to the time of training implementation (or lack thereof), the significance of the resultant effects should expel any possible doubt that might be left after examining the characteristics of each subject's data. As evidenced by Figure 3's graphic display, the first significant gain in skills acquisition by Group 1's subjects occurred after training began, as shown on the eighth probe. During this same time, Group 2 was still under baseline conditions. When Group 1's subjects made their initial gain, Group 2's subjects maintained their stable baseline skill levels, and thus demonstrated an absence of interaction between Group 1's training and Group 2's probe scores. Acquisition training was then implemented in Group 2, after which Group 2's subjects made their first significant skills gains, as shown on the ninth probe. As Group 3's subjects maintained their stable

baseline skill levels, they also demonstrated an absence of interaction between Groups 1 and 2's training and Group 3's probe scores.

Implications for Future Research

Many studies have addressed money skills which are prerequisite knowledge to completing a functional transaction. Yet, very few have trained these skills during actual community transactions. Beyond the transactional realm, the research community has not even broached many other money skills such as managing pocket money from day to day, budgeting from payday to payday, using a layaway plan for purchases, and simple banking skills. Clearly, the need is seen for researchers to answer the questions of how to best train handicapped persons to acquire and utilize these skills.

Many of the training procedures used within the experimental conditions were chosen for use backed by a paucity of documented successes. Additional comparison research is needed to better establish which procedure is better -- total task presentation or chaining, decreasing or increasing assistance prompt sequence, training in a simulated setting or in the community first -- and under what conditions each procedure is optimal. Further, as the training procedures used in this study were used together in a package, credit for the study's success can not be

given to any one procedure. Future research needs to also look at how the various procedures combine with each other, and what the potentially best combinations are for specific skills and training situations.

Implications to the Practitioner

This study was successful for several reasons, all of which could be of benefit to many other acquisitional situations.

1. Total task presentation. This procedure was at least in part responsible for the rapid progress made by the six subjects who received training, due to the greater number of stimulus presentations and opportunities for greater overall improvement inherently provided, as compared to chaining. The rapidity of progress made could not be matched by using a chaining procedure, which would require a greater number of training sessions to deliver the same number of stimulus presentations and same opportunities for overall improvement provided within each training session.

2. Decreasing assistance prompt sequence. The low performance levels of the subjects' baselines pointed to the need for acquisition rather than fluency training. The decreasing sequence begins with physically prompting each subject through the skills sequence, followed by modeling for the subject. It would seem to be much better to get

the training off to a quickly successful start, rather than building in the potential frustration of each subject having to endure one or more inadequate prompts before being able to successfully complete a target behavior.

3. Small group instruction. With three subjects in each group, this technique provided each group member with two modeling examples complete with prompts, corrections, feedback, and praise as he or she observed the other members receiving training. Further, the competitive spirit within most individuals seemed to have provided strong motivation to do one's best, preferably better than the other group members.

4. Peer feedback. Within the small group setting, this additional technique was an unexpected plus. By requiring the observing members to provide feedback as to what the performing member did correctly or incorrectly, the observers had to pay close attention to the modeling example provided by the performer, thereby reinforcing their own learning.

5. Simulated community setting. Training for generalization to the community was built into the experimental conditions. However, perhaps due to the similarity of the classroom setting to the community, the subjects in Group 1 seemed to have generalized the skills learned in the classroom to both the canteen and the community without requiring such training. Even if the

classroom skills had not completely generalized to the community, the training time in the community would have been minimized.

Conclusion

The importance of successfully training community skills lies at least in part with the step away from the previously traditional philosophy of custodial care in our institutions that each success takes us as caregivers. In addition, each success takes those individuals who have completed a training program a step closer to realizing their full potential and competence. Further, each success puts our institutionalized handicapped people a milestone closer to being adequately prepared for community living, especially when the success achieved is in such an important community survival skill area as money skills. Finally, the importance of improving the quality of life and self-esteem of an individual through experiencing such a personal success can not be underestimated. These are the reasons that researchers and practitioners must continue to strive to find new and better ways to increase the personal independence of our institutionalized handicapped people as they are prepared for living in the community.

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VITA

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