An Analysis of Four Performance Techniques for Paraprofessional Direct-Care Staff Working with Developmentally Disabled Adults in Group Homes

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AN ANALYSIS OF FOUR PERFORMANCE TECHNIQUES FOR PARAPROFESSIONAL DIRECT-CARE STAFF WORKING WITH DEVELOPMENTALLY DISABLED ADULTS IN GROUP HOMES

by

L. Martin Grabijas

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
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The habilitation and training of the developmentally
disabled has improved markedly in the last two decades. The
creation of small, community-based living facilities has
allowed these individuals to move from restrictive settings
into the community where training in daily living skills can
occur in a more natural fashion. While this movement has
been positive for the consumer, the preparedness of the
staff working in those facilities has not been adequately
addressed. Many human service agencies use a generic train­
ing package to prepare their staff, yet current research
indicates that such training is less than adequate, both in
terms of preparing the staff, and in terms of client habili­
tation. The current study investigated four distinct
performance techniques for direct care staff working in
group home settings. The use of incentives, performance-
based feedback, specialized instructional tools, and staff
training were all evaluated for their effectiveness at
improving staff skills as behavior modifiers. Further,
secondary effects of these techniques were assessed by
measuring their impact upon client behavior. While all of the techniques demonstrated clear effects on both staff and resident behavior, differential effects were observed for each technique on the respective dependent variables. Providing staff incentives contingent upon client learning produced the greatest effects on client behavior as the staff utilized creative prompting techniques in teaching each resident. The use of performance-based feedback for the staff had a similar positive effect on client learning by causing the staff to adhere to a regimented training format. Providing the staff with specialized instructional tools demonstrated a slight improvement in client learning and allowed the staff to conduct a high rate of training trials, but did not affect the staff's skills as behavior modifiers. Finally, training the staff in generic behavior modification techniques improved their communication and reinforcement skills, yet did not produce the greatest rate of client learning. The results suggest that mental health agencies responsible for resident habilitation should conduct comprehensive staff skill assessments to determine how training resources might be best allocated.
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An analysis of four performance techniques for paraprofessional direct-care staff working with developmentally disabled adults in group homes

Grabijas, Leonard Martin, Ph.D.
Western Michigan University, 1990

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L. Martin Grabijas
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INTRODUCTION

In 1963, the U.S. Congress passed the Community Mental Health Centers Act, originating from a proposal put forth by President John F. Kennedy (Korchin, 1976). The effects of this act were, and continue to be, far reaching and comprehensive. Two effects of this legislation in particular have impacted greatly upon developmentally disabled populations. First, the movement towards deinstitutionalization, or the creation of small community-based living facilities, has allowed mentally retarded individuals to develop and maintain close ties with family and friends, to work or attend school in the community, and to learn and develop independent living skills in a protected environment (Margolis, Meddock & Fiorelli, 1980; Schinke & Wong, 1980). These facilities are described by Bruininks, Kudla, Wieck and Hauber (1980) as:

Any community-based living quarter(s) which provide(s) 24-hour, 7 days-a-week responsibility for room, board, and supervision of mentally retarded persons as of June 30, 1977, with the exception of: a) single family homes providing services to a relative, b) nursing homes, boarding homes and foster homes that are not formally state licensed or contracted as mental retardation service providers, and c) independent living (apartments) programs which have no staff residing in the same facility. (p. 125).

A second major effect, intimately related to the first, has been the evolution of the direct care staff...
person into a new, more demanding role, that of the para-professional (Karan & Knight, 1986; Ziarnik & Bernstein, 1982).

Although the spark for deinstitutionalization was ignited well over 20 years ago, the majority of the development in this area has occurred over the last 10 years (Bruininks et al., 1980). Due to the relatively recent emergence of community-based living facilities, or group homes, as well as the subsequent evolution of the para-professional, many administrators of such community agencies are finding that their staff are ill-prepared to respond to rapidly changing service needs and demands (Karan & Knight, 1986). The response by many agencies has been to augment the training of their staff (Ziarnik & Bernstein, 1982), yet some studies conclude that empirically validated staff training procedures are often ineffectual or non-existent (Schinke & Wong, 1977). Further, due to the decentralized nature of community training, issues such as staff supervision and general home management become increasingly complex (Bruininks et al., 1980; Shaddock, Hattie, Edwards, Bramston & Brummell, 1986).

There is clearly a need for further investigation of methods to improve staff performance, leading to better care and habilitation of group home residents.
LITERATURE REVIEWS

Previous reviews of the literature in community staff training and development have identified several areas for improvement.

Gardner (1973) states that both the quality and the quantity of research in this area has been less than satisfactory. Specifically, previous studies have been lacking in five areas, as highlighted by Gardner:

1. No systematic comprehensive attempt to explore the field.
2. No detailed curricula or detailed procedures have been published, precluding any replication or validation.
3. No follow-up measures for assessment of maintenance of training.
4. Dependent variables are often staff test scores rather than adaptive behavior change in clients.
5. Little concern for personality and attitude variables which may contribute to success of training. (p. 155).

In a subsequent literature review, Ziarnik and Bernstein (1982) found that not much had changed in the ten years since Gardner's review. The dependent measures continued to be staff test scores or subjective ratings rather than client behavior change or organizational change, and generalization and maintenance measures were still not reported. Further, the overall effectiveness of staff training had yet to be proven since the procedures and principles were often incorrectly or inconsistently applied.
Other reviews have, perhaps out of necessity, avoided research methodology altogether and have used observational studies focusing more on staff characteristics and similar variables (Durlak, 1982; James, 1979).

While poor research is certainly not better than no research, several explanations can be made regarding previous investigators' efforts. In Figure 1, the number of staff training studies published in refereed mental health journals per year is presented for both institutional and community settings for the past 25 years. While it is true that the amount of research studies conducted prior to 1973 (Gardner's review) was relatively small, this situation is gradually improving. The reason for this increase is somewhat unclear, although it is reasonable to assert that this trend is partially due to a delayed effect from the Mental Health Centers Act of 1963. This act not only mandated that new residential alternatives be developed, but also, that the current quality of care be improved. Hence the need for continued research in the areas of improving staff skills in direct care has increased.

It is also evident from Figure 1 that as research conducted in institutional settings tapered off toward 1980, studies in community settings began to increase. It may be the case that the research field followed its subjects; as the developmentally disabled move from the institutions to the community, it is becoming difficult to
Figure 1. Training Studies Conducted in Institutional and Residential Settings for the Years 1962 Through 1986.

SOURCE: Studies published in refereed mental health journals. (See bibliography.)
obtain representative research samples from institutional settings.

Finally, as staff begin to develop new roles as community paraprofessionals and engage in increasingly complex forms of client habilitation, the validation of treatment and training procedures in the community has become a necessity.

An argument can also be made with respect to the lack of experimental rigor in recent, community-based studies. Early investigators working in institutional settings were afforded such luxuries as control groups, unobtrusive observation systems and easy access to experimental subjects (Gardner, 1973). As staff begin to work in smaller, community facilities, several experimental controls are lost due to the fact that group homes are not equipped with observation booths, sophisticated measurement devices, or extra staff for collecting reliability data. Further, such investigators are forced into single subject designs due to the decreased availability and accessibility of subjects. Although single subject research is becoming the method of choice in psychological investigations (Kazdin, 1982), staff turnover, absenteeism and other management problems with group home staff may preclude lengthy research studies with generalization and maintenance measures.

It would appear that community-based research in staff training and development is still in its infancy, as prob-
lems of experimental rigor and procedural validation are only beginning to be evaluated and addressed. Before reviewing the current research in staff training procedures and principles, a brief examination of the subjects of these studies is warranted.
THE PARAPROFESSIONAL

Various labels have been provided in the literature for persons who work in group homes including direct care staff (Byrd, Sawyer & Locke, 1983; Ziarnik, 1980), attendants (Gardner, 1972), technicians (Gardner, 1973; Zaharia & Baumeister, 1979), resident advisors (Fiorelli, 1982; Margolis et al., 1980), and paraprofessionals (Durlak, 1982; James, 1979; Karan & Knight, 1986). The term paraprofessional is the preferred label as it connotes the supplementary and complementary relationships between these staff and professionals in the field (James, 1979). That is, paraprofessionals supplement the work of professionals by performing tasks that require less formal education, enabling professionals to devote time to higher level tasks, and they complement the work of professionals by providing many services that are outside of the specialized training of professionals.

The specific duties of the paraprofessional outlined in research studies are several, and vary throughout the literature. There is, however, a general consensus that they spend the most time with the clients in terms of direct care (Zaharia & Baumeister, 1978; Ziarnik, 1980). Other tasks identified include the application of behavior modification techniques (Gardner, 1973), case management,
health and safety duties, program planning, normalization activities, crisis intervention, fiscal management, and general therapeutic activities (Byrd et al., 1983; Margolis et al., 1980).

With respect to the educational and training requirements for paraprofessional staff, again a variety of descriptions exist. The educational backgrounds of paraprofessionals have ranged from high school diplomas (Karan & Knight, 1986) to post baccalaureate training (James, 1979), although recent studies indicate that paraprofessional positions typically require a bachelor's degree in a mental health field (Fiorelli, 1982). In terms of training requirements, most studies report that paraprofessionals are the least trained of all staff, with as much as 70% to 90% never receiving any formal training (Knight, Karan, Timmerman, Griffith & Dufresne, 1986). This situation appears even worse when considering the fact that these staff can represent up to 80% of any agency's work force (Knight et al., 1986). In evaluating the educational and training requirements of paraprofessionals, Ziarnik (1980) states that the direct care staff is the worker who "spends the most time with the client...yet is the least trained, lowest paid and least qualified to provide these services" (p. 290).

Needless to say, the lack of effective training for paraprofessionals has led to a variety of staff management
problems and performance deficits. Further, such problems undermine a supportive and therapeutic social environment within the group home (Knowles & Landesman, 1986). This is not to say, however, that training and development alone will abolish all staff-related problems. As Bricker, Morgan and Grabowski (1972) point out, some of the most common staff problems may result from an inadequately reinforcing work environment. It appears, therefore, that a balance of staff training and performance engineering is needed to alleviate staff problems confronting administrators of community-based agencies. Before discussing the various performance techniques, a closer examination of staff and client dependent measures used in current research is warranted.
DEPENDENT VARIABLES

Staff Behavior

As previously mentioned, staff behavior is the most commonly used measure of a training or development program's success (Ziarnik & Bernstein, 1982). While this may not always be an appropriate indicator, there are instances when such variables are indeed relevant and important (e.g., staff turnover).

Skill Assessments

A widely accepted assumption among administrators is that staff knowledge of basic behavior management goals and practices is an important component in the success or failure of a treatment program (Zlomke & Benjamin, 1983). That is, paraprofessionals working in the direct care of developmentally disabled individuals must not only possess the knowledge of how to effect change in their clients, they must also be able to apply that knowledge through a highly developed skill repertoire (Margolis & Fiorelli, 1980).

With respect to staff knowledge, several paper and pencil assessment tools currently exist. The Behavior Modification Test (BMT) for example, is a 229-item, true-
false test measuring knowledge of behavior modification principles (Gardner, 1972). Further, this scale has correlated well with measures of skill in applying behavior modification principles. Other knowledge tests, including the Attendant Information Survey (AIS), are somewhat shorter and use multiple choice or similar question formats (Schinke & Landesman-Dwyer, 1981). Perhaps the greatest benefit of these tools is their ease of administration and standardized scoring. However, as Gardner and Giampa (1971) point out, they are valid only to the extent that they accurately represent on-the-job behavior.

A variety of skill assessment tools are offered in the literature and appear to be the preferred method for evaluating training programs as well as screening potential employees. The Training Proficiency Scale (TPS) is a 30-item, 5-point rating scale measuring proficiency in applying behavior modification techniques (Gardner, 1972). Specifically, a staff person is observed in a 15-minute role play situation, in which they are rated on shaping, administering reinforcers and communication. The TPS is fairly short, easy to score, and has demonstrated good reliability and validity in terms of accurately assessing a person's skills as a behavior modifier (Gardner, Brust & Watson, 1972). Perhaps the only disadvantage of the TPS is the potential for it to be a reactive or contrived situa-
tion which may not accurately reflect how the staff behaves in authentic training situations.

A similar tool, the Attendant Behavior Checklist (ABCL), is a scale which rates staff behavior on 11 different scales, ranging from behavior management to administrative functions (Gardner & Giampa, 1971). The major differences between this tool and the TPS is that it directly measures on-the-job performance (the rating is conducted while the staff is at work), and is therefore more cumbersome.

A final skill measure is the Critical Incident Technique (Fleming, 1962). With this assessment, observers record incidents between a staff and a resident which are outstandingly related to some aim or criterion. A large sample of incidents is then collected and analyzed (incidents are typically categorized as "effective" or "ineffective"). Thus, two measures evolve over time; one for appropriate staff behavior and the other for inappropriate staff behavior. It is evident that this technique is highly subjective (in terms of which incidents are selected and how they are rated), reactive in nature, and lacks comprehensiveness. It is therefore used infrequently, demonstrating some utility as a tool for experienced staff who are only in need of periodic reviews of certain techniques.
Satisfaction/Attitude

Staff who have moved from institutional settings to working in the community have found themselves removed from their traditional sources of support (Shaddock et al., 1986). This physical distance has also created a less tangible distancing between administrators and paraprofessionals, manifested in inefficient uses of paraprofessionals' talents, overwork, high expectations from administrators, and power struggles (Durlak, 1982). This situation typically leads to staff disgruntlement, ineffective work habits and ultimately, staff turnover. Further, agencies characterized by an unstable work force perpetuate unfavorable working conditions and therefore fail to achieve their goals (George & Baumeister, 1981). For these reasons, measures of job satisfaction are vital for determining the success of performance techniques and other personnel practices.

Perhaps the best indicator of job satisfaction is staff turnover (Bricker et al., 1972). In a review of staff turnover, Zaharia and Baumeister (1978) offered the following as potential causes:

1. low wages
2. use of ineffective labor practices
3. repetitiveness of the job. (p. 580)

In many instances, low wages may be an uncontrollable influence, exacerbated by a lack of professional support,
leading to high turnover (Fiorelli, 1982). In terms of labor practices, Quilitch (1975) maintains that many common staff management procedures are based upon tradition and therefore, it is the administrator who is in need of training. Finally, as mentioned previously, an inadequately reinforcing work environment is often a major cause of job dissatisfaction and staff turnover. In light of the fact that recent attrition estimates have ranged from 30% to 70% per year, this is certainly an area in desperate need of improvement (Knight et al., 1980; Zaharia & Baumeister, 1978).

A related measure of job satisfaction is absenteeism or tardiness. While not as critical a problem as turnover, tardiness and absenteeism do lead to an unstable work force which can undermine the habilitative efforts of the residential facility (Zaharia & Baumeister, 1978). The magnitude of this problem appears to be minimal, as reflected by the lack of data on these topics in the literature (Zaharia & Baumeister, 1979).

A final measure of job satisfaction is a questionnaire. The Attendant Opinion Survey (AOS), for example, is a 115-item, 4-point scale measuring staff attitudes toward the mentally retarded as well as toward their current working environment (Gardner, 1972). As with other measures of this sort, staff may not respond candidly if they suspect that their answers will be viewed by
supervisory staff. In an independent survey of paraprofessional staff attitudes, Sarata (1974) reported the following:

1. Satisfaction with the agency is the crucial component of overall satisfaction in working with mentally retarded.
2. The data do not support the typical administrative view that an employee's level of overall satisfaction is determined principally by his commitment to and satisfaction with the mental retardation field.
3. Agency related matters are the chief determinants of overall satisfaction.
4. High client contact is physically and psychologically fatiguing.
5. Lack of client progress has some impact on satisfaction. (p. 440)

It would appear that overall employee satisfaction with the job is in fact amenable to administrative support and management practices.

Client Behavior

As cited earlier, the most important and often most informative measure of the success of training and development procedures is that of client behavior change (Gardner, 1973). Despite the proven superiority of these measures, however, studies continue to use staff behavior as the exclusive dependent variable. In Figure 2, the number of studies published in refereed mental health journals in the past 25 years using client or staff behaviors as the dependent variable is presented. Staff measures are used with greater frequency, even though the value of client
Figure 2. Training Studies Conducted Using Staff Behaviors and Client Behaviors as the Dependent Variables for the Years 1962 Through 1986.

SOURCE: Studies published in refereed mental health journals. (See bibliography.)

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dependent measures have provided a higher quality and quantity of information than staff dependent measures.

Measures of client behavior can be obtained in a variety of ways. Perhaps the most common methods include the measurement of adaptive behavior (Gardner et al., 1970; George & Baumeister, 1981) and the measurement of maladaptive behavior (Repp & Deitz, 1979). In general, it appears that the former method is preferred, as the focus is on client successes rather than deficits or weaknesses (Ziarnik, 1980).

A more global measure of training effectiveness is the rate of recidivism or reinstitutionalization for the residents of a particular home or agency (Knight et al., 1986; Repp & Deitz, 1979). The major disadvantage of this method, as well as with the two previous methods, is that if the residents' progress is poor, it may not always be possible to discern the exact cause, as well as which parts of the staffs' behavior are errant (Gardner et al., 1970). For this reason, a combination of staff and client measures is recommended. This will not only help pinpoint where training efforts should be focused, but may also help alleviate staff dissatisfaction due to the reciprocal nature of client progress and staff attitudes (Sarata, 1974).

Referring back to Figure 2, it is encouraging to note that of the 32 studies represented in this graph, 25% have made simultaneous use of both types of measures.
Other dependent measures of staff training and development success include administrative costs for replacing staff and charting the reasons for staff turnover (George & Baumeister, 1981). The most exact methods, however, are client progress, direct measurement of staff skill in the application of behavior modification techniques, and staff turnover. Further, it appears that some combination of these techniques would add to the reliability and validity of the data obtained.
RATIONALE FOR STAFF TRAINING AND DEVELOPMENT

The importance of the paraprofessional's role in successful community living for developmentally disabled persons cannot be overstated. As Gardner and Giampa (1971) note, "The most effective and long-lasting relationships which residents experience is with direct care (paraprofessional) staff." (p. 617)

In the majority of the studies reviewed, paraprofessional staff were identified as the chief therapeutic or behavior-change agent within community agencies (Gardner, 1972; James, 1979; Zaharia & Baumeister, 1979). However, they are only as effective as the training they receive. The movement from the institution to the community will only be successful, satisfying and lasting for developmentally disabled persons if the staff in those community residences are thoroughly trained (Margolis et al., 1980; Schinke & Landesman-Dwyer, 1981). Unfortunately, the development of group home training programs have not paralleled current deinstitutionalization trends (Schinke & Wong, 1980).

While deficiencies in the quality and quantity of staff training were identified well over 20 years ago, it has not been until recent years that legislative efforts have come into fruition. In a survey conducted in 1986 by
Knowles and Landesman, 43 of the 50 State Departments of Mental Health were examined for their staff training practices and policies. Of the states surveyed, only 60% had explicit policies about required staff training, and the methods of training, expertise of the trainers and quality of training materials varied considerably. Further, for those states which mandated training for group home personnel, 30% did not monitor the training in terms of efficacy.

It is apparent, therefore, that some agencies continue to place staff in a community facility with the understanding that training will be on-the-job, yet the staff find themselves having to learn to sink or swim, with little or no assistance (Ebert, 1979). While many agencies may condone this "learn as you go" philosophy of staff training, there is considerable data suggesting that such practices lead to turnover before staff have left probationary status (Zaharia & Baumeister, 1979). The first two to three months of employment may be viewed as a "critical period" during which time a process of socialization and orientation takes place. Facilities with manageable turnover are those which rapidly orient and train their new staff, successfully integrating them into the routine of the home.

It should also be noted that agencies which promote on-the-job training may be classified as 'reactive' in that staff problems are continually being solved, but never prevented (Bernstein & Ziarnik, 1982).
The above findings seem to suggest that what is perhaps more vital than inservice training is preservice training (Knight et al., 1986). That is, staff should be oriented to the agency as well as trained in all relevant capacities before they even enter the group home.

A final note regarding the importance of staff training relates to pretraining assessments. Because a successful training provides staff with skills they presently lack, it is imperative to know beforehand which skills they already have (Fleming, 1962). This will not only save valuable trainer time, but will also prevent trainees from becoming bored with the training, potentially missing relevant material.
GOALS OF STAFF TRAINING

A variety of training methods are presented in the literature, with varying degrees of efficacy. Which procedures are utilized is dependent upon fiscal constraints, the target audience, and the goals of the proposed training. As indicated previously, the ultimate goal of any training program should be improved habilitation of the resident (Gardner, 1973). There are, however, important intermediate goals which are briefly addressed below.

The efficacy of behavioral technology in training and performance engineering is well documented in the literature (Davison, 1965; Gardner, 1972). For this reason, Wehman (1976) presents three goals of developing a behaviorally-oriented staff. The first goal is for the staff to acquire a complete understanding, as well as a working knowledge, of the fundamentals and principles of behavior management. This would include making the staff familiar with effective technology as well as developing an understanding of the moral and ethical issues surrounding specific techniques. The second goal identified is to establish a commitment to a data-based system of training and programming. For example, it would be necessary for the staff to demonstrate an understanding of behavioral objectives, behavior observation methods, and data presentation methods.
techniques. Finally, training programs developing behaviorally-oriented staff should sensitize the staff to the population with which they will work by providing a thorough understanding of their clients' disabilities.

In a more client-centered approach to training, Ziarnik (1980) offers six goals toward developing proactive staff:

1. Know the client's history.
2. Know the client presently.
3. Perceive the client in the future.
4. Know the agency.
5. Be professional.
6. Work with and for the client. (p. 290)

If such goals are met, the end product is a client who is treated effectively, efficiently, and with dignity.

Finally, Bernstein and Ziarnik (1982) present several guidelines for creating effective staff training models:

1. The content of training should be determined by what staff are expected to do at the conclusion of training.
2. Staff competence in different skill areas should be defined in terms of exemplary and not average standards.
3. In order to assess the efficacy as well as the necessity of training, current staff skill levels must be known.
4. The measurement of staff skills should be as direct as possible.
5. The ultimate measure of staff competence and the success of training is increased client independence.
6. Skill in using behavior management is a necessary but not sufficient condition for staff competence.
7. Behavioral approaches have proven most effective. (p. 98)

In summary, it is clear that training alone will not resolve all staff and client problems. Further, the
selection and implementation of any training technique must be continuously evaluated to ensure that it is appropriate, effective, and comprehensive (Fiorelli, Margolis, Heverly, Rothchild & Keating, 1982; Parsonson, Baer & Baer, 1974).
TRAINING TECHNIQUES

The training procedures presented in the literature fall into six different groups: didactic methods, modeling, role playing/behavior rehearsal, competency-based (shaping), university affiliated facilities (education), and combined procedures.

Didactic Methods

Very little data are presented on the effectiveness of training through didactic (instructional) methods alone (Durlak, 1982). In fact, several studies report significant results through various combinations of didactic and other methods, although it is unclear exactly how much of the success was due to the didactic approach (Durlak, 1982).

In a study by Panyan and Peterson (1974), didactic methods were compared with feedback and modeling. Specifically, one group of staff was given instructions on how to train mentally retarded individuals. A second group received video taped feedback of their performance, and the third group was trained using modeling. All three groups were subsequently evaluated in live training sessions in which staff were assigned percentages based on the number of times that reinforcement was correctly delivered during
the training. The results showed that under the didactic method, staff delivered reinforcement correctly only 53% of the time, whereas this figure was 75% under the modeling condition (the feedback condition also produced better results than the didactic condition, but the difference was not significant).

In a similar study, the impact of a training workshop on recreational activities initiated by staff was examined (Quilitch, 1975). The workshop, which lasted one day, consisted of telling staff how to organize recreational activities with residents, as well as the importance of such activities. While a feedback condition produced a steady and marked increase in the number of active residents during random time samples, the activities workshop proved completely ineffectual.

Finally, Watson, Gardner and Sanders (1971) present a training program used in an institution serving mentally retarded individuals. The first part of the training is a didactic approach, consisting of a series of textbook, lecture and discussion tasks. The basic design of the training is patterned after programmed instruction in that staff must achieve 90% on the textbook exam in order to attend the lecture, and then achieve 90% on the lecture exam before attending the discussion. Finally, 90% must be attained on the discussion exam in order to move on to the
second phase of training. The benefits of such an approach are that staff move along at their own pace, and trainers are assured that higher level training does not precede the acquisition of basic concepts. The authors present anecdotal data from this training program, indicating that the program is both successful and enjoyable for the students.

Although the data from didactic training methods are not impressive, it is difficult to imagine a training program which does not make some use of such approaches. A possible explanation for these data is that with most didactic approaches, the training is relatively brief, lasting one or two sessions. Other techniques demonstrating greater success, such as behavior rehearsal, offer more opportunities for skills to be added to the staff's repertoire. A second factor is that the studies reported here used staff skill or resident behavior as dependent measures of verbal training. In studies measuring staff knowledge as the dependent variable, didactic methods typically increase this knowledge (Schinke & Wong, 1977). When using a purely didactic method to train a new skill, the vehicle for transferring knowledge into a skill is omitted. It may be said, therefore, that the best use of didactic methods is in teaching verbal skills, and supplementing performance-oriented training techniques.
Modeling

The utility of modeling as a training tool is well documented in the literature (Durlak, 1982; Panyan & Patterson, 1974). Perhaps the greatest advantage of modeling over didactic methods is that it does not require a strong reading or writing repertoire (Gladstone & Spencer, 1977). In addition, a good modeling program provides topographical discriminative stimuli for desired responses that cannot easily be presented vocally or textually. Finally, modeling is often identified as more enjoyable for the trainee, and makes it easy for the trainee to identify the actual use of a learned technique by observing other staff, adding to the credibility of the technique.

In a study previously described (Panyan & Patterson, 1974), modeling was shown to be a superior training technique when compared with feedback and didactic approaches. Further, this study demonstrated the versatility of modeling in terms of mode of presentation. Specifically, the success of the training program was examined for two groups, one which received the training via a live model, and a second group which was trained via a filmed model. The results demonstrated that both methods of presentation were equally effective. However, the use of a film allowed the trainers to not only save time, but it also ensured the uniformity of training across groups.
In a later study by Gladstone and Spencer (1977), staff were trained via a live model on how to shape tooth-brushing skills in mentally retarded residents. The staff not only maintained the skills learned at a two week follow-up phase, but the skills also generalized to a hand and face washing control condition. The authors concluded that when the trainers frequently model the desired response, it affords several opportunities for practice/correction, and teaches trainees to label the relevant features of the modeled response.

Based on the above evidence, trainers will find that whether it is used alone or in conjunction with other procedures, the inclusion of modeling in a training program will significantly improve the success of that training.

Role Play/Behavior Rehearsal

While didactic methods are best at teaching verbal skills, performance skills are best acquired in an active, physical environment such as that provided by role playing (Gardner, 1972). Gardner demonstrated this difference in a study attempting to teach staff the basics of shaping behavior. Group 1 was exposed to a role play and behavior rehearsal condition in which staff were briefly shown how to shape behavior, and were then allowed to practice on each other across six, one-hour sessions. Group 2 was exposed to eight, one-hour lectures on the principles of
reinforcement, shaping, and stimulus control. As expected by the authors, group 1 demonstrated greater skill in shaping behavior while group 2 was better versed in "shaping terminology" and in reciting principles.

In a comprehensive training program, Schinke and Wong (1977) used a combination of lecture and role play/behavior rehearsal in teaching group home staff the fundamentals of applied behavior-change. During all of the eight, 1.5 hour training sessions, staff were first exposed to a brief didactic on some area of social learning theory. This was then followed by role play and rehearsal of the relevant principles, as well as further practice with an actual client, working to modify a simple behavior. Staff scores on a knowledge test improved, as did staff skill levels in applying behavior-change principles. The trainers also noted that the general behavior of the clients in the trainees' homes improved, the overall staff-resident interactions in the homes became more positive, and staff attitudes towards the clients improved as noted on an attitude checklist. The authors conclude that, training content areas aside, the staff benefited greatly from having the training conducted on site, in the homes where they worked. It may be added that by incorporating practice of operant skills acquired with an actual client, the training helped improve staff attitudes towards those residents, perhaps by mandating staff-client interaction, as well as the
realization that progressive client behavior change can add to job satisfaction.

The use of role play/behavior rehearsal, therefore, is clearly an asset to any training program, and appears to fit nicely into a sequential training package of didactic, modeling, role play and behavior rehearsal techniques, with each step building on the one before. While the above study proved effectiveness of role play/behavior rehearsal, more than one research study is needed to confirm the above finding.

Competency-based Training (Shaping)

Several training programs are presented in the literature which, due to their organization and methods, can be referred to as shaping techniques.

McPheeters (1979) describes the fundamental shaping program for teaching staff skills as "competency-based training," in which specific skills are identified for mastery, as well as their criteria and evaluation measures. Some of the advantages of such an approach to training are as follows:

1. Goals are achieved through measurable success of achieving individual skills.

2. Staff can move through training at their own rate.

3. Staff can "comp-out" of areas previously learned.
To this list, Durlak (1982) adds the following:

4. Practice of the current skill occurs as needed, until mastery is achieved (i.e., no over or under practice).

5. Feedback is built in, in terms of progress towards the goal.

6. Clinical competence is broken into operationalized components and learned one at a time.

Finally, competency-based training allows for customized learning (Margolis et al., 1980), and has generally resulted in greater proficiency among staff than traditional approaches (Gardner, 1973).

The only formal competency-based training program presented in the literature was that of Watson, Gardner and Sanders (1971) which was briefly discussed earlier. Throughout the didactic portion of their training, staff needed a 90% on an exam in order to progress to the next segment of the training. Likewise, during performance skill training, staff needed to shape a classmate's behavior with 90% proficiency before being allowed to shape a client's behavior. Once they could demonstrate 90% proficiency in shaping a simple behavior of a resident, they were awarded a permanent staff position. As previously discussed, the authors presented anecdotal data, indicating that this program was highly successful in preparing staff, and was viewed favorably by those staff.
University Affiliated Facilities

Similar to competency-based programs are university affiliated facilities, or training programs offered through universities or similar institutions, which prepare para-professional staff in academic-like fashion to work with mentally retarded persons in group homes (Durlak, 1982). The typical structure of these programs is a two year, associate of arts degree, which prepares the student in a variety of core competencies including behavior management, program planning, and home management (Knight et al., 1986).

While this is a fairly recent trend in staff training and development, it is by far one of the most ambitious attempts to train paraprofessionals, with a variety of advantages as presented below (Durlak, 1982; Fiorelli et al., 1982; Humm-Delgado, 1979; Knight et al., 1986; McPheeters, 1979):

1. Staff receive academic degrees and credentials for completing training.

2. Universities are likely to have greater expertise at training, as well as better access to training resources.

3. Such programs begin to dispel myths regarding the simple, low-level aspects of working in a group home, as these programs are beginning to be recognized as legitimate and respected vocational training.
4. Training becomes more standardized.

5. Training may then be supported by local and state tax revenues.

6. Such programs increase the community's awareness and understanding of people with disabilities and the needs they have.

An example of a university affiliated facility is the Developmental Disabilities Center at Temple University, Philadelphia (Fiorelli et al., 1982). The 14 basic competency areas addressed in the training program are:
(1) advocacy and legal rights, (2) behavior change, (3) case management, (4) definitions and causes, (5) group process, (6) human development, (7) program design, implementation and evaluation, (8) vocational appraisal, (9) instructional analyses, (10) medically complex and multiply handicapped, (11) normalization, (12) problem solving, (13) program maintenance, and (14) severely and profoundly impaired track. (p. 14)

The program was evaluated for two groups of trainees in the areas of cognitive competency, applied behavior change, student perceptions, and professional perceptions. The preliminary data indicate that the training is highly effective across all measures, suggesting that the program is successful in helping students acquire the knowledge and skills requisite to becoming an effective paraprofessional.
Combined Procedures

The difficulty of utilizing any given training technique in isolation of other techniques is indicated by the lack of research on single techniques. The questions which remain to be answered in this portion of the review, therefore, are which combinations of procedures, or "training packages," are most effective, and which components of any training program are most critical for favorable outcomes. Unfortunately, there are not enough data to adequately address either question. It is apparent, however, that among the successful training programs presented in the literature, the procedures most often included in training are some form of lecture, modeling and/or role play, and feedback in the forms of test scores or rating scales (Ebert, 1979; Gladstone & Sherman, 1975; Schinke & Landesman-Dwyer, 1981; Zlomke & Benjamin, 1983). For example, in Schinke and Landesman-Dwyer's (1981) study, a combination of didactic and role play/behavior rehearsal was used in improving staff's knowledge test scores, job satisfaction, attitude, and job skills, as well as improving the residents' behavior. However, no indication was given of which component of training was most responsible for these results. Similarly, Zlomke and Benjamin (1983) almost doubled staff knowledge scores as well as improved client behavior through a combination of lecture, modeling, and role play.
Again, however, the reader is unsure which of the afore-mentioned components was most critical in contributing to the success of training.

Because each of the above training procedures have proven effective for different reasons, the best training program for group home staff is one which is tailored to the individual staff, by assessing what type of skills are needed for their jobs, as well as evaluating which of these skills the staff have before the training begins. This latter notion of a pretraining skill assessment is extremely important in that valuable trainer and staff time can be saved by determining a priori if a staff performance problem is due to a skill deficit, or a motivational/managerial deficit (Quilitch, 1975). As Bernstein and Ziarnik (1982) point out, staff training is an appropriate methodology for performance problems only when staff cannot exhibit needed skills. When these skills are present but not consistently used, ongoing support is necessary to promote their use. Therefore, a brief review of the various performance tactics presented in the literature is warranted.
Durlak's (1982) point that "training is a necessary but far from sufficient condition for successful paraprofessional programs" (p. 446) is well taken. As evidenced by the review of training techniques earlier in this report, staff do not participate in a training program and then perform their respective duties in exemplary fashion; staff are affected by their own behavioral histories, current setting factors, as well as any consequential stimuli (Durlak, 1982; Gladstone & Spencer, 1977). Ensuring that many of these variables impinge on the staff in a planful way will not only improve staff performance, but may also augment the value of any prior training programs (Ziarnik & Bernstein, 1982). Further, in some instances, staff training may be contraindicated if the staff persons in question already possess the needed skills to perform their jobs, but don't perform due to a poor working environment.

A final point can be made concerning the increased popularity of performance engineering. In Figure 3, data are presented for the number of studies published in refereed mental health journals during the last 25 years which examined training and performance techniques. If we can assume that the increased concern and use of training methodology in recent years is reflected by the growth of re-
Figure 3. Training Studies Evaluating Training Techniques and Performance Techniques for the Years 1982 Through 1986.

SOURCE: Studies published in refereed mental health journals. (See bibliography.)
search in this area, then the same argument may be made for performance engineering methodology. Further, there is potential for the usage of performance techniques to surpass that of training techniques, as some authors conclude that greater results (in terms of resident behavior) are being obtained through the use of contingencies on staff behavior (Iwata, Bailey, Brown, Foshee & Alpern, 1976).
GOALS OF PERFORMANCE ENGINEERING

The goals of performance engineering are, for the most part, identical with the goals of staff training, and therefore do not merit further mention. Suffice it to say that the ultimate goal of any performance engineering program should be increased client habilitation (Ziarnik & Bernstein, 1982).

The main difference between training goals and performance engineering goals is that many of the performance engineering goals are more immediately staff related. For example, it is widely accepted that increased job satisfaction leads to increased staff productivity and longevity (Bricker et al., 1972; Sarata, 1974). It is easy to see, therefore, how variables which impinge on paraprofessionals are extremely critical as they can indirectly affect the client (Pomerleau, Bobrove & Smith, 1973). And, as previously discussed, performance techniques should be aimed at improving the value of staff training programs (Durlak, 1982).
PERFORMANCE TECHNIQUES

The various performance techniques presented in the literature fall into three main categories: setting factors/discriminative stimuli, incentive techniques, and feedback systems.

Setting Factors

The impact of environmental stimuli on staff performance is well documented, and is generally discussed in terms of setting factors or environmental cues.

Perhaps the greatest setting factor affecting staff productivity is the overall work atmosphere (Bricker et al., 1972). Variables such as the general demands of the job, organizational communication, salary, and staff respite are believed to affect staff performance and longevity (George & Baumeister, 1981). For example, decreasing staff-client ratios, while increasing staff responsibility, has produced increased interaction between staff and clients and better socialization between clients (Byrd et al., 1983). Similarly, Zaharia and Baumeister (1978) maintain that by altering staff schedules (e.g., 4-day work week), staff are less likely to use sick leave or claim overtime hours.

In preventing rather than solving staff problems,
Fleming (1962) promotes the use of the Critical Incident Technique, described earlier in this review. By using this technique, stress points may be identified which can then be dealt with proactively.

Finally, Rousseau and Foshee (1981) maintain that training for group home staff can be vastly improved by merely modifying the training materials. In their study, staff in one group were given a standard training manual to read, while the staff in the second group were given a modified, easier version of the same text. By increasing the readability level of the printed material, staff comprehension scores rose from 30% to 82%.

In terms of altering antecedent conditions in affecting staff behavior change, the data are somewhat mixed, indicating initial but short-lived success when altering setting factors (Ziarnik & Bernstein, 1982). In other words, staff acclimated to the environmental changes. For example, in a two-part study by Repp and Deitz (1979), staff of a mental retardation institution were informed of a tardiness policy which recommended suspension and dismissal for offenders. Although staff were told that the policy would not be in effect for some time, the percentage of staff coming in late was cut in half. On the other hand, when a loss of pay policy was announced (but not immediately implemented) for staff failing to turn in their timesheets, the percentage of timesheets not completed was
only slightly decreased. Only when the policy was finally implemented did this percentage reach a near-zero level.

Fielding, Erickson and Bettin (1971) demonstrated how a cue or setting factor can be used as a tool for improving the generalization of skills acquired in training. In phase I of the study, staff were trained in how to move residents from one room to another using reinforcement rather than physical assistance. While all staff used the reinforcement program accurately and frequently during the training sessions, they found themselves using physical assistance outside of the training sessions for an average of 7.6 instances per day. In phase II, a poster, referencing the training, was hung outside the staff office. This resulted in a rapid decrease in using physical assistance throughout the day, which was maintained at a zero level for three weeks after implementation.

Overall, the manipulation of environmental variables in affecting staff performance is efficient and moderately successful. It appears that the key to evaluating these methods is by measuring the end-product, rather than the content or process. In other words, a training and development program should not be implemented based on content alone. All variables which impinge on staff behavior must be considered, and the program should then be evaluated empirically.
Incentive Techniques

The use of incentives given contingent upon desired staff performance has not only proven extremely successful altering staff behavior (Warren & Mondy, 1971), but also has the added benefit of focusing on appropriate rather than inappropriate staff behavior (Zaharia & Baumeister, 1978).

Perhaps the most effective incentives are monetary rewards. In a comparative study, Katz, Johnson and Gelfand (1972) examined the effects of three different performance techniques. Staff were first instructed on the basics of positive reinforcement and told that they currently were not adequately reinforcing their residents' behavior. This combination of didactic and feedback did not produce any change in the percentage of staff-dispensed reinforcement. A trained observer then periodically prompted the staff to reinforce the residents when they were appropriate, which produced only a slight increase in reinforcer delivery. Finally, staff were given 15 dollars each day that they delivered contingent reinforcement for at least 50% of the intervals observed. This final phase produced increases in the percentage of reinforcers given of up to 80%. Further, substantial increase in task-oriented client behavior was observed, as well as an increase in general staff-client interactions.
In a similar study, the effects of feedback, supervision, noncontingent monetary rewards, and contingent monetary rewards were compared for their impact on maladaptive client behavior (Pomerleau et al., 1973). Further, three different values of the contingent monetary reward were evaluated. The results clearly indicated that the contingent monetary rewards consistently had the greatest impact on staff behavior as measured by decreased maladaptive client behavior. Also, as the size of the reward grew, the level of maladaptive client behavior decreased.

While the use of monetary rewards as an incentive consistently produces significant results, fiscal constraints within community-based residential facilities preclude their widespread use (Repp & Deitz, 1979). For this reason, other incentives have been used with moderate success. In a study by Bricker, Morgan and Grabowski (1972), staff were shown a video tape of themselves in a 30-minute training session with a client (feedback). Staff were then given trading stamps based on the quality and quantity of their performance. While the mean interaction time per session for all staff ranged from 1.9 to 2.3 minutes during baseline, the use of the trading stamps increased this figure to a range of 13.8 to 29.8 minutes per session. Further, the cost per session for each subject was only 15 cents, making this program affordable.

Hollander and Plutchik (1972) reported similar results.
using trading stamps. During the first phase of the study, staff participated in a six week training course on the application of behavior modification techniques. During phase II, trading stamps were given to staff based on their work performance, followed by a return to baseline conditions in phase III. The dependent measures were the percent of assigned tasks completed each week and the percent of volunteer tasks completed each week. Phase I results were 61% for assigned tasks and 38% for volunteer tasks. Phase II produced a significant increase in task completion, with 94% for assigned tasks and 75% for volunteer tasks. The return to baseline conditions in phase III resulted in a reduction to 50% task completion for both assigned and volunteer tasks. The authors point out that not only was the program successful and relatively inexpensive (total cost = $300.00), but staff also began to initiate more contacts with clients independent of the required interactions.

Although the trading stamp procedures were effective and financially reasonable, there is still a cost involved, and there exists a potential barrier in terms of violating agency policies and practices by providing more benefits or pay (Hollander & Plutchik, 1972). Therefore, other avenues have been explored such as earning time off of work, increased responsibility/authority, or promotions based on attendance, compliance, or other performance measures.
(Watson et al., 1971). In one study, for example, staff earned the opportunity to rearrange their work schedule for the following week by engaging in habilitative and custodial activities with the residents of a mental retardation facility (Iwata et al., 1976). The program was successful in increasing habilitative and custodial activities with residents while producing a reduction in staff off-task behavior measuring more than the equivalent of a staff's entire daily work contribution.

Generally, there are few data that do not support the effectiveness of incentive systems. And, as fiscal and other constraints impose on an agency, new and creative methods of implementation are discovered which demonstrate the versatility of these approaches.

Feedback Systems

The final performance technique, feedback, is perhaps the most important due to its frequent use, as well as its overlap with other training and development techniques (Gardner, 1973). Feedback is considered essential for improving staff performance as it informs the staff as to the appropriateness of their behavior. Further, feedback is crucial for the success of a new staff members' orientation and training (Durlak, 1982; McPheeters, 1979). Unfortunately, feedback is not always systematically programmed into an agency's training and development practices. A
common belief is that a paraprofessional staff person who trains mentally retarded clients receives feedback in terms of the resident's progress towards the desired skill (Panyan, Boozer & Morris, 1970). Whether or not this belief is true, without planned feedback a staff member's behavior can go astray, especially if the client's behavior change is gradual.

Perhaps the easiest and most effective means of providing feedback is through data collection. A very simple procedure, for example, involved handing paraprofessional staff a data sheet based on their performance in working with mentally retarded clients (Parsonson et al., 1974). Merely sharing these data with the subjects of this study increased appropriate staff-client interactions by 20%. The authors conclude that not only did the current procedure increase the use of generalized social contingencies of paraprofessional staff, but also, staff became more consistent in their interactions, and the results were durable over time.

In a similar study, paraprofessional staff recorded the number of shaping sessions with residents which they conducted per day (Panyan et al., 1970). During baseline, staff turned in the data daily, but did not have access to it afterwards. During the experimental phase, the data were compiled and posted for all of the staff to observe. By posting the data, all of the staff percentages increased
to near 100. Staff entering the experimental phase last, and therefore without feedback the longest, took more time to reach 100%. In this case, it would appear that the behavior of the supervisors and counsellors was more effective in improving performance than the behavior or progress of the residents.

It should be noted that while feedback can be provided in a variety of ways, some methods (e.g., video tape) are more costly than others in terms of time and actual cost (Gladstone & Sherman, 1975). Further, it seems that written feedback is the preferred method in that a permanent product is created to which staff can refer, and if a standard form is used, then the feedback is provided consistently and quickly, with little additional costs.

In summary, the use of the performance techniques presented in the literature have all proven successful in increasing desirable staff behavior and indirectly aiding client habilitation. Further, these techniques have been shown to improve the effectiveness of various staff training programs. Thus, whether used alone or as an integral part of a training program, the incorporation of performance engineering practices is crucial.
CONCLUSION

The examination of the mental health system in the early 1960s prompted several articles of legislation (Korchin, 1976). While this movement established great advances in terms of residential and habilitative services for developmentally disabled persons, the impact on preparing paraprofessional staff to provide these services appears minimal. There is considerable evidence, however, that this trend is improving, primarily out of necessity rather than due to federal mandates. As an indirect measure, for example, the number of presentations on staff training at AAMD conventions prior to 1980 averaged less than 10 per year (Ziarnik & Bernstein, 1982). Since that time, these presentations have exceeded 25 per year. Thus, as the move toward deinstitutionalization imposes new and difficult challenges upon community-based agencies, the need to evaluate training techniques for preparing group home personnel continues to grow (Karan & Knight, 1986). As a part of this evaluation, techniques such as modeling and role play have consistently proven effective at training performance skills, while didactic or other educational approaches have demonstrated greater success in teaching prerequisite knowledge to paraprofessional staff. Further, it is clear that behavioral technology is behind
much of the training advances, not only in terms of training program content, but also by the fact that these programs are making increased use of programmed instruction, or competency-based methods of implementation of training.

Although these training programs are improving the preparedness of group home staff (Gardner & Giampa, 1971), there are some performance deficits which are outside the realm of training. Problems such as aggravated turnover or absenteeism are unlikely to change significantly by merely increasing the frequency or intensity of training (Byrd et al., 1983; Margolis et al., 1980). For these performance problems, techniques such as feedback, incentives or the use of cues or setting factors have all proven successful where training has not. In fact, there are few studies which do not promote the use of contingency management techniques in improving staff performance. Clearly, the effectiveness of group home staff in habilitating their clients is intimately related not only to the level of training they receive, but also, the characteristics of the environments in which they work (Sarata, 1974).

It is also evident that an effective training program does not waste trainer or trainee time and energy by teaching unnecessary skills or skills previously acquired. For example, it may be that an agency becomes locked into a required training format in that all staff are exposed to a standardized training program, regardless of their current
skill levels. In such cases, trainees who already possess the necessary skills become bored and perhaps frustrated with the training, while trainer time is wasted and little impact is made upon those staff. As another example, when a performance problem is not properly analyzed by administrative staff, the solution may often be to require additional staff training. While the problem may be as simple as ineffective or poorly applied contingencies, a common practice by administrators is to force training upon those staff, wasting time and money, and creating an atmosphere in which staff are punished for performance problems, rather than being rewarded for competence. Many of these problems can be easily alleviated by using pretraining skill assessments. By making use of such assessments, not only will staff avoid unnecessary training, but they will also receive training specific to their current skill level needs.

Given the current lag between the development of community mental health programs and the development of training and performance engineering practices for staff in those programs, three specific areas for further investigation are indicated.

First, it would be helpful for future studies to focus on specific pretraining assessment tools. Scales such as the Behavior Modification Test and the Attendant Behavior Checklist have been shown to accurately assess staff skill
and knowledge (Gardner, 1972; Gardner & Giampa, 1971), yet are being used in research with decreased regularity. Further, many of these tools were designed for use on institutional wards, focusing on specific custodial duties or generic behavior analysis skills. The challenges and responsibilities of group home staff are vastly different from those of staff in institutional settings. Devices with greater sensitivity to the requisite skills of paraprofessional group home staff are obviously in demand. And, as mental health staff expand their roles to include vocational training in the community (Wehman, 1976), the skills required to perform those tasks will similarly expand.

Second, while staff training techniques and performance engineering practices are indeed intimately related, it would be helpful to examine which of these approaches is most effective for addressing a basic skill deficit. That is, while a thorough training program will in fact give staff the skills they need, it may be possible to achieve the same ends by merely informing staff what performance outcomes are expected (i.e., client habilitation), and then building in the necessary environmental supports.

Finally, it is evident from the current review that more replication of individual training and performance techniques is warranted to not only determine which procedures are the most effective, but also to determine how these procedures can be improved.
Thomas F. Gilbert (1978) offers a model of engineering competent staff performance which can be directly applied to all work and academic environments, including community-based residential facilities. Further, this model offers an efficient means of addressing the deficit research areas suggested above, by providing a method of assessing staff performance problems prior to training, highlighting how to correct those performance problems, and evaluating several performance techniques simultaneously. With Gilbert's model, the performance engineer is instructed how and when to intervene. More importantly, however, the engineer is told what areas of performance should not be altered. Specifically, the model examines six aspects of behavior.

![Figure 4. Gilbert's Performance Matrix (Gilbert, 1978).](image)


All six features fall into the three-term contingency of stimulus-response-consequence. Items 1-3 are environmental variables, while 4-6 are person variables, or as-
pects of behavior in the person's behavioral repertoire. Basically, competent performance is maximized when all six cells are adequately addressed.

As an illustration of these components, consider the behavior of turning on a light. In the simple three-term contingency, we might depict the sequence of events as follows:

\[
\text{SD} \rightarrow \text{R} \rightarrow \text{SR+}
\]

light off flip switch light on

With Gilbert's model, the same sequence is presented in greater detail:

<table>
<thead>
<tr>
<th>ENVIRONMENT</th>
<th>light off is available light on</th>
</tr>
</thead>
<tbody>
<tr>
<td>person perceives</td>
<td>lit rooms are</td>
</tr>
</tbody>
</table>

| REPertoire | darkness flip switch reinforcing |

It is clear that this depiction of the response involves a more comprehensive analysis than the simple three-term contingency. For example, if the above response is not performed, a simple analysis might reveal the following: (1) the light is already on (SD), (2) a light switch is not available (R), or (3) the light is burned out (SR+).

Using the six-celled matrix for our analysis, however, increases the potential reasons for the lack of a response: (1) the light is already on (SD), (2) the person cannot perceive the darkness (SD), (3) a light switch is not avail-
able (R), (4) the person is incapable of flipping the switch (R), (5) the light is burned out (SR+), or (6) the person is reinforced by darkness (SR+).

Thus, with the second analysis, more information is provided in greater detail.

In completing Gilbert's analysis for a performance deficit, the performance engineer would examine the entire situation, including both environmental variables and aspects of the person's behavior repertoire, obtaining answers to the following questions:

Table 1
Assessment of a Performance Deficit

<table>
<thead>
<tr>
<th>ASSESSMENT QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. ENVIRONMENT</strong></td>
</tr>
<tr>
<td>1. DATA: Does the person know how well they are performing against exemplary standards?</td>
</tr>
<tr>
<td>2. INSTRUMENTS: Do they have the tools and facilities to perform well?</td>
</tr>
<tr>
<td>3. INCENTIVES: Are incentives made contingent upon performance?</td>
</tr>
<tr>
<td><strong>II. REPERTOIRE</strong></td>
</tr>
<tr>
<td>4. KNOWLEDGE: Does the person know critical variables such as how, when, where, etc. to perform the response?</td>
</tr>
<tr>
<td>5. CAPACITY: Does the person have the physical capacity to make the response?</td>
</tr>
<tr>
<td>6. MOTIVES: Are the consequences reinforcing to the person?</td>
</tr>
</tbody>
</table>

Once the above assessment is completed, the performance engineer is properly informed as to whether to provide
training, performance engineering (e.g., feedback), new staff (who are capable of performing), or some combination of these three areas.

For the mental health administrator, deficits in the six areas of the matrix would lead to the corrective actions outlined in Table 2.

<table>
<thead>
<tr>
<th>DEFICIT AREA</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DATA</td>
<td>FEEDBACK</td>
</tr>
<tr>
<td>2. INSTRUMENTS</td>
<td>SETTING FACTORS</td>
</tr>
<tr>
<td>3. INCENTIVES</td>
<td>INCENTIVE TECHNIQUES</td>
</tr>
<tr>
<td>4. KNOWLEDGE</td>
<td>TRAINING</td>
</tr>
<tr>
<td>5. CAPACITY</td>
<td>RECRUIT NEW STAFF</td>
</tr>
<tr>
<td>6. MOTIVES</td>
<td>RECRUIT NEW STAFF</td>
</tr>
</tbody>
</table>

Gilbert's model has great implications for improving and maintaining the performance of paraprofessional staff in group homes. While training has typically been the panacea for all performance deficits (Ziarnik & Bernstein, 1982), the six-celled matrix can pinpoint deficit areas, leading to efficient remediation.

But what about situations where several areas are deficit simultaneously? If only one area can be addressed, where are the resources best allocated? If the analysis reveals that training is indicated, many agencies may not be able to afford the costs of training their staff. Are
there other alternatives (e.g., improving feedback) which would alleviate the performance deficit? Finally, is there any overlap, either favorable or unfavorable, between the various cells of the matrix?

The current study investigated these questions, in addition to the questions previously raised, by examining the effectiveness of several of the performance and training techniques presented earlier in this report. Further, these techniques were examined within the framework of Gilbert's six-celled performance matrix.
METHOD

Subjects

The subjects of the study included both paraprofessional staff and mentally retarded residents of group homes in Kalamazoo County, Michigan.

Staff

Four staff members of Residential Opportunities, Inc., Kalamazoo, Michigan, were chosen as the training subjects for the study. All of the staff had been employed with the agency for less than one year, and had educational backgrounds which ranged from high school diplomas through college education. Each staff had not completed any specialized training in mental health, other than the required group home training provided by the Michigan Department of Mental Health. This training provides a basic education in the following seven areas: (1) residential living, (2) physical intervention, (3) health, (4) CPR and First Aid, (5) medications, (6) environmental emergencies, and (7) recipient rights.

Finally, to insure naiveté, none of the subjects had extensive contact with the residents prior to the study (i.e., the staff did not work in the home in which the
residents in this study lived).

Residents

Four developmentally disabled residents living in Residential Opportunities, Inc. group homes were chosen as training subjects for the staff who were participating in the study. All of the residents were diagnosed as moderately mentally retarded, had not attended special education classes within five years prior to the study, and did not have any severe physical limitations. Finally, all of the residents in the current study had good productive and receptive language skills (i.e., no significant impairments).

Setting

The training transpired in the residents' respective group home, to avoid the distraction of stimuli in a novel setting. The training sessions were held in a "programming room", where training in daily living skills often takes place. The room contained a round table and two chairs, a bookshelf and a smaller table off to the side. The video camera was set up approximately six feet from the training table. At the start of each session, the training table had the following items placed in the middle: several sheets of blank, unruled paper, several pencils, and a blank data sheet. When both the staff and resident were
seated, the primary investigator gave instructions to the staff (dependent upon the condition in effect), and would then start the camera and leave the room (except during the Feedback Condition). Each staff/resident pair participated in one to three, 5 minute training session per day, between the hours of 3 pm and 9 pm (normal programming hours).

Dependent Variables

Four dependent measures were used in the current study. The first dependent measure was the number of capital letters of the alphabet correctly drawn by each resident at the end of each training session. All residents were screened prior to the start of the study to insure that they had prerequisite writing skills, but were unable to write more than 8 letters correctly (30% of the capital alphabet). A copy of a task analysis form used to record this data is provided in Appendix A.

The remaining three dependent measures all centered on staff behavior. The first measure was staff scores on the Training Proficiency Scale (TPS) (Gardner et al., 1970). As previously discussed, the TPS is a 37-item, 5-point rating scale which measures how well a staff person applies behavior modification principles in a training situation. Specifically, each baseline and experimental session was video taped. The primary and reliability observer later watched the tape, rating the staff on a scale of 1 to 5 on
each of the items in the scale (see Appendix B). All staff were screened with the TPS prior to the start of the study in a role-play training session to insure the homogeneity of their skills as trainers.

The second staff measure was the number of training trials conducted per session. For the current study, a training trial was defined as the staff issuing a mand to a resident to write a capital letter, followed by the resident writing part or all of a letter.

The final measure was the number of verbal prompts issued per session. Specifically, the staff were evaluated on how frequently they made use of verbal prompts to help the residents write and remember letters of the alphabet. However, because the TPS adequately assesses some verbal prompts (e.g., tacts and mands), this measure assessed the use of other types of verbal prompts, such as intraverbals and extended tacts (see Appendix C for definitions).

Baseline

At the start of each session during baseline, the experimenter would ask the staff member to teach their assigned subject to write the capital alphabet. The staff were given general encouragement for trying, but were not given any additional instruction or assistance. Each session ended when 5 minutes had lapsed, when the resident indicated that they were finished, or when their progress
was otherwise impeded.

Experimental Conditions

Four experimental conditions were implemented, corresponding to cells 1-4 in Gilbert's performance matrix. It should be noted that while cells 5 and 6 (capacity and motives) are typically the most commonly espoused causes of poor staff performance, they are in fact rarely the substantial cause of the problem, and are difficult, if not impossible to alter (Gilbert, 1978, p. 89). For this reason, these two aspects of performance were not addressed in the current study.

Feedback Condition

At the start of each session during the feedback condition, the staff were handed a list of instructions (see Appendix D) and asked to do exactly what was on the list. The instructions specified how to conduct each step of training, and was derived from the Michigan Department of Mental Health's Training Curriculum (Giampa, Walker-Burt & Finger, 1983). Further, the staff was informed that the primary investigator would stay in the room and, at the end of the session, would give the staff feedback on how well they adhered to the instruction sheet. The primary observer would also answer any questions that the staff may have.
regarding their performance.

**Materials Condition**

Prior to the start of training during the Materials Condition, the staff were asked what materials or devices they would like to use in training to help the resident learn the task. These items were then procured for the first training session during the Materials Condition. The following items were also provided, regardless of whether or not the staff requested them: a blank task analysis form, blank A-B-C data sheets (see Appendix E), a box of pennies (to be used as reinforcers), an ABC workbook, and a specialized pencil grip. At the start of each session during the Materials Condition, the staff were asked to teach their resident to write the capital alphabet. No other instructions or feedback were given at any time to the staff.

**Incentive Condition**

At the start of training during this condition, the staff were instructed to teach the resident to write the capital alphabet. Further, the staff were informed that he/she will be paid according to how much of the task the resident learns. Specifically, the staff were paid $1.00 for each letter that their resident learned. The staff
did not have access to the data sheets, nor were they given any other instructions or feedback. They were merely told how many letters the resident correctly wrote and the staff were paid accordingly.

Training Condition

Prior to the start of training under this condition, the staff were required to complete a basic training in applied behavior analysis and programming. The training consisted of eight units of programmed text from the Managing Behavior Series (Hall, 1971). The Michigan Department of Mental Health's Group Home Training Curriculum references these eight units in their advanced training package. All of the staff averaged 85% or better on the eight quizzes for each unit (the group home curriculum training manual stipulates 70% is a passing grade). The staff completed the training immediately prior to the first session of the training condition. The experimenter answered any questions that the subjects had regarding the training, and provided 'booster training' prior to each session during this condition. The booster training primarily consisted of reviewing the major points on behavior modification as presented in the programmed text. At the start of each resident training session, the subject was told to teach the resident to write the capital alphabet.
Experimental Design

The current study incorporated two multiple baselines for two pairs of staff. Staff 1 and 2 experienced the experimental conditions in multiple baseline fashion as follows: A-B-C-D-E. Subjects 3 and 4, on the other hand, experienced the conditions as follows: A-C-B-D-E. Such a configuration allowed for an examination of each individual condition through the multiple baseline presentation, as well as ruled out any potential sequence effects for Conditions B and C. The final two experimental manipulations (Feedback and Training) involved elements which were impossible to withdraw. For this reason, the current study did not address sequence effects with these conditions.

As mentioned previously, the current study involved a task with which mere repetition of resident training could result in some acquisition of the designated task. For this reason, the potential for a ceiling effect in the resident dependent variable precluded lengthy experimental conditions as in reversals or similar designs.

Reliability

Reliability was assessed for both the resident and staff data. For approximately 30% of the sessions across all conditions, a second observer reviewed the letters which the resident wrote, yielding an item-by-item
reliability score of 96.8%.

The reliability observer was also trained with the TPS by scoring staff in role-play situations, until he and the primary observer were trained to 90% reliability.

The reliability observer then scored 30% of the sessions across all conditions using the TPS. The overall percent agreement for the TPS data was 84.3%.

Finally, reliability data was also taken (for 30% of all conditions) on the number of trials per session and the number of verbal prompts per session. The overall percent agreement for this data was 94.0% and 73.8% respectively.
RESULTS

Overall Data

Resident Data

The four staff training procedures each had clear effects upon resident learning. Figure 5 presents the number of letters correctly demonstrated by the residents at the end of each training session. The Incentive Condition consistently produced the greatest change in resident behavior, averaging 67% better than baseline. This effect was similar for the Feedback (64% improvement over baseline) and Training (61% improvement over baseline) Conditions, and less pronounced during the Materials Condition (55% improvement over baseline). It should be noted that fewer sessions were conducted for Resident #4 due to his acting out behavior before or during several of the sessions.

It was anticipated that a learning curve effect might be observed for the residents in that their ability to learn and correctly demonstrate capital letters would gradually and consistently improve regardless of the condition in effect. Such a result is not evident from Figure 5. In many instances, a change in experimental conditions actually resulted in a decrease in the residents' performance. This was observed for all four residents during the Training
Figure 5. Letters Correctly Demonstrated by Residents 1-4 Across the Four Staff Training Conditions.
Condition, for three of the residents during the Feedback Condition, and during the Materials Condition when this condition followed the Incentive Condition (Residents 3 and 4).

Staff Data

Training Proficiency Scale Scores

Figure 6 presents the overall TPS scores for Staff 1-4 across all conditions. It is evident that the use of incentives or specialized instructional tools did not affect staff skill in using behavior modification techniques as measured by the TPS. During the Feedback Condition, however, the TPS scores increased dramatically. This result was due to the fact that during the Feedback Condition, the staff were given instruction and feedback on how to train the residents. Further, the instruction and feedback given were directly relevant to the various subscales on the TPS. This trend in the staff TPS scores continued through the Training Condition, although for each staff there was an initial drop in scores at the start of the Training Condition. This effect is perhaps due to the removal of feedback rather than the onset of training as each staff continued to use much of the feedback procedure during the start of the Training Condition.

Figure 7 is a breakdown of the TPS subscales across
Figure 6. Overall TPS rating for staff 1-4 across the four staff training conditions.
Figure 7. Mean TPS Score on Each of the TPS Subscales for all Staff Across the Four Training Conditions.

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all conditions of the study. The Feedback Condition had the greatest impact on the "shaping," "communication" and "data collection" categories of the TPS, as this condition not only stipulated a regimented teaching and data collection format for the staff, but also provided a script to follow during instruction. On the other hand, the Training Condition had the greatest effect on the "reinforcement" and "rapport and miscellaneous" categories of the TPS. Again, during the Feedback Condition the staff adhered to a rigid teaching format, whereas the Training Condition stressed (among other things) the importance of effective reinforcement and staff-resident relationships.

**Staff Efficiency**

Two areas of training not directly covered by the TPS are how quickly and how efficiently the staff worked within each session. Table 1 summarizes the resident data and staff TPS scores previously discussed. Two additional sets of data are presented. First, the average number of trials per session is presented for each condition. The Materials Condition afforded the greatest number of trials per session, due primarily to the use of an alphabet workbook during this condition. During other conditions in the study, the staff would often have their resident practice a letter once or twice. During the Materials Condition, however, the staff would often have the resident work on a given
Table 3
Overall Resident and Staff Data Across All Conditions of the Study

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Materials</th>
<th>Incentive</th>
<th>Feedback</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Letters</strong></td>
<td>64</td>
<td>137</td>
<td>184</td>
<td>176</td>
<td>149</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>3.05</td>
<td>6.85</td>
<td>9.20</td>
<td>8.38</td>
<td>7.84</td>
</tr>
<tr>
<td><strong>% Change</strong></td>
<td>++55%</td>
<td>+67%</td>
<td>+64%</td>
<td>+61%</td>
<td></td>
</tr>
<tr>
<td><strong>Mean TPS</strong></td>
<td>1.90</td>
<td>2.13</td>
<td>2.05</td>
<td>3.11</td>
<td>3.23</td>
</tr>
<tr>
<td><strong>% Change</strong></td>
<td>++11%</td>
<td>+7%</td>
<td>+39%</td>
<td>+41%</td>
<td></td>
</tr>
<tr>
<td><strong>Trials</strong></td>
<td>254</td>
<td>433</td>
<td>323</td>
<td>373</td>
<td>350</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>12.10</td>
<td>21.65</td>
<td>16.15</td>
<td>17.76</td>
<td>18.42</td>
</tr>
<tr>
<td><strong>% Change</strong></td>
<td>++44%</td>
<td>+25%</td>
<td>+32%</td>
<td>+34%</td>
<td></td>
</tr>
<tr>
<td><strong>Prompts</strong></td>
<td>72</td>
<td>95</td>
<td>158</td>
<td>76</td>
<td>103</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>3.43</td>
<td>4.75</td>
<td>7.90</td>
<td>3.62</td>
<td>5.42</td>
</tr>
<tr>
<td><strong>% Change</strong></td>
<td>++28%</td>
<td>+57%</td>
<td>+5%</td>
<td>+37%</td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>21</td>
<td>20</td>
<td>20</td>
<td>21</td>
<td>19</td>
</tr>
</tbody>
</table>

letter until an entire workbook page was completed. It was this high rate of practice which was most responsible for the resident data during the Materials Condition.

The second set of data presented in Table 1 is the number of intraverbal prompts and metaphorically extended tacts (Skinner, 1957, pp. 92 & 128) used by the staff across all conditions of the study. For example, at times staff would "sing the alphabet" or state, "'A' is for apple" as intraverbal prompts to help the residents remember each letter. Similarly, the staff would make use of metaphorically extended tacts such as "an 'S' looks like a snake," or "an 'A' is a teepee." The staff made the
greatest use of these prompts during the Incentive Condition, accounting for much of the increase in resident learning during this condition.

Individual Data

**Staff/Resident #1**

Resident #1 had limited writing skills at the start of the study. She was able to write her first name (7 letters) but could not tact any of the letters of the alphabet. During baseline, she was able to correctly demonstrate an average of 1.6 letters per session. The use of incentives with her staff trainer produced an increase in letters performed to 5.6 per session, followed by the Feedback Condition (5.0 per session), Training Condition (4.6 per session) and finally the Materials Condition (3.4 per session). This data is presented in Figure 8.

The mean TPS score for staff #1 was highest during the Feedback Condition, suggesting that while the procedure used during this condition was in fact effective in improving staff behavior management skills and maintaining client performance, it was not as effective as merely providing incentives for the staff.

Two factors contributed to the success of client training during the Incentive Condition. First, the number of trials per session during this condition was 12% higher
Figure 6. Letters Correctly Demonstrated by the Resident, Staff TPS Scores, Number of Trials per Session and Number of Prompts per Session for Resident/Staff #1 Across all Conditions.

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than any other condition. Secondly, staff #1 made frequent use of extended tacts and intraverbals during the Incentive Condition (\(X = 7.6\) prompts per session, 42% higher than baseline). Tacts and intraverbals during the Feedback Condition, on the other hand, were used 41% less frequently than baseline. This data suggests that the feedback procedure itself was most responsible for the resident data during the Feedback Condition, while an increased use of tacts, intraverbals, and a generally greater number of trials per session (i.e., practice) were most responsible for the resident data during the Incentive Condition.

**Staff/Resident #2**

Prior to the start of the current study, Resident #2 was able to correctly write and name 8 letters of the alphabet. During Baseline, he correctly demonstrated an average of 4.67 letters per session.

Figure 9 shows the staff/resident data for Resident #2. Similar to Resident #1, the greatest effect in resident data was observed during the Incentive Condition (\(X = 15.6\) letters per session, 70% improvement over baseline), and the greatest effect in staff TPS scores was observed during the Feedback Condition (36% improvement over baseline).

It is also evident from Figure 9 that Staff #2 conducted fewer training trials during the Incentive Condition than in the Feedback Condition (9% fewer trials per ses-
Figure 9. Letters Correctly Demonstrated by the Resident, Staff TPS Scores, Number of Trials per Session and Number of Prompts per Session for Resident/Staff #2 Across all Conditions.
sion). However, she also made extensive use of metaphorically extended tacts and intraverbals ($\bar{X} = 11.8$ per session, 15% higher than any other condition), which accounted for much of the success of the Incentive Condition.

**Staff/Resident #3**

The pretraining assessment for Resident #3 revealed that he was able to correctly write the letters of his name (8 letters), but could not tact any of them, nor any other letter in the alphabet. After five Baseline sessions, Resident #3 was still unable to tact any letters of the alphabet, nor was he able to correctly demonstrate any letters on command.

Consistent with the first two residents, Resident #3 was able to correctly demonstrate more letters during the Incentive Condition than in any other condition (see Figure 10). Further, the Staff TPS scores during the Incentive Condition were once again lower than the other conditions.

With respect to the number of trials per session, Staff #3 used fewer trials during the Incentive Condition than in any other experimental condition, although the rate of trials was still considerably higher than Baseline (30% higher).

Finally, as with the first two staff, Staff #3 made frequent use of extended tacts and intraverbals during the
Figure 10. Letters Correctly Demonstrated by the Resident, Staff TPS Scores, Number of Trials per Session and Number of Prompts per Session for Resident/Staff #3 Across all Conditions.
Incentive Condition ($\bar{X} = 6.0$ prompts per session), although
this rate was slightly higher during the Training Condition
($\bar{X} = 6.4$ prompts per session). Because the number of
letters correctly demonstrated was highest during the Incentive Condition, it may be inferred that this data was
a result of an ideal number of trials per session, coupled
with an ideal number of intraverbals and extended tacts.

**Staff/Resident #4**

The fourth resident was able to write his name (7
letters) and correctly tact 5 letters of the alphabet prior
to training. The greatest increase in the number of letters
performed per session occurred during the Feedback ($\bar{X} = 16.5$
per session) and Incentive ($\bar{X} = 15.5$ per session) Condi-
tions, as shown in Figure 11. The superiori
of the Feed-
back Condition may have been due in part to the regimented
procedure used during this condition. That is, because
Resident #4 was prone to behavior problems both before and
during the training sessions, the routine nature of the
training during the Feedback Condition caused him to focus
on the task at hand.

The TPS scores of Staff #4 were highest during the
Training Condition (46% higher than Baseline). Of all the
experimental conditions, the TPS scores were lowest during
the Incentive Condition for this subject (5% higher than
baseline).
Figure 11. Letters Correctly Demonstrated by the Resident, Staff TPS Scores, Number of Trials per Session and Number of Prompts per Session for Resident/Staff #4 Across all Conditions.
Similarly, the number of trials per session was lowest during the Incentive Condition ($\bar{X} = 17.5$ per session). The greatest number of trials per session for Resident #4 was observed during the Materials Condition ($\bar{X} = 34.5$ per session). During this condition, Subject #4 would often perseverate on writing certain letters (e.g., repeatedly writing letters in his name).

Finally, Staff #4 used intraverbals and extended tacts most frequently during the Incentive Condition ($\bar{X} = 6.25$ per session), while this rate was considerably lower during the Feedback Condition ($\bar{X} = 1.75$ per session).

While the difference in letters performed between the Feedback and Incentive Conditions is negligible, a difference nonetheless exists. Again, this difference may be due in part to the methodical nature of the Feedback Condition, which kept Resident #4 on task more often than in other conditions.
DISCUSSION

The current study has great implications for administrators responsible for the habilitation of developmentally disabled adults in residential settings. These findings will now be evaluated within the framework of Gilbert's model of engineering competent human performance.

Perhaps the most striking finding in this study is the relative independence of the first four cells of Gilbert's performance matrix. That is, the independent variables used in the current study appeared to have mutually exclusive effects on different aspects of staff and client behavior as assessed through the matrix. For example, providing staff with the necessary tools of training (Materials Condition) caused the staff to settle into a routine of training which afforded the highest rate of individual training trials, yet had the smallest impact on resident learning or staff training skills as measured by the TPS. Similarly, the use of incentives with staff contingent on client performance (Incentive Condition) did not affect staff TPS scores. However, this contingency did increase the creativity of the staff involved as determined by an increased use of intraverbal prompts and extended tacts, resulting in the highest resident output.

The Feedback and Training Conditions produced the most
dramatic change in staff behavior as measured by the TPS. Specifically, giving simple instructions and performance-based feedback to staff (Feedback Condition) insured that all four staff conducted similar client training sessions as measured by the procedural categories of the TPS (Shaping, Communication, and Data Collection categories). While this change in staff behavior occurred in conjunction with strong resident output (letters performed), conclusions regarding the resident data must be drawn in light of two potential confounds. First, because the Feedback Condition consistently followed the Materials and Incentive Conditions, a potential sequence effect cannot be ruled out. Further, due to the routine nature of this condition, it was impossible to implement a reversal phase. The second potential confound with the Feedback Condition is that the resident data during this condition was in part a function of the Feedback procedure itself, and was not entirely determined by key staff variables.

The Training Condition also produced a large increase in staff TPS scores, although the specific categorical changes were greatest for the 'Reinforcement' and 'Rapport and Miscellaneous' subscales. Further, this change appeared to be independent of any strong change in resident data. It may be inferred, therefore, that the Training Condition improved the staff's ability to create a desirable therapeutic milieu during training, which was
only partly responsible for improved resident learning. Finally, the same confounds present during the Feedback Condition must be highlighted here as well. A potential sequence effect may have existed as the Training Condition consistently occurred after the other three conditions, and the resident data must be evaluated in light of the structure and content of the training provided during this condition.

The use of a measurement device such as the TPS provided an excellent backdrop for the evaluation of the resident data. It is apparent, however, that the TPS should not be considered comprehensive as two major tenets of the current study were established through data acquired via other means. By adding measures of staff efficiency to the study, such as quantity of trials per session and the use of innovative prompting procedures (i.e., intraverbals and extended tacts), a more thorough analysis of staff behavior could occur. Despite these shortcomings, however, the TPS nonetheless has merit as an indice of the processes of staff-client interactions, rather than the products of those interactions.

The model of human performance espoused by Gilbert suggests that competent performance is maximized when all six cells of the response matrix are adequately addressed. As previously mentioned, the current study has demonstrated that the first four cells of the matrix may in fact be
mutually exclusive. The mental health administrator must therefore decide what defines 'competent staff' for their particular setting and purposes. For example, if the desired goal of client habilitation is a simple, prevocational skill for use in a routine task such as assembly line production, the staff responsible for teaching the resident may only need the necessary tools (materials) to teach that task, such that a high rate of repetition of skill training can be achieved.

If, on the other hand, the agency's prime concern is the quantity of skills acquired by their clients, a sensible and perhaps economical approach would be the use of staff incentives. That is, staff could be paid on commission, based upon the number of skills acquired by their respective clients. The current study clearly demonstrated that if left to their own devices (and if properly motivated), a direct-care staff is capable of teaching skills to clients without prerequisite training, detailed instruction, or specialized tools. The only prerequisite in this case is that the staff must have the target skill in their own repertoire. That is, if the staff has been taught a certain skill at some point, the current study suggests that they are therefore capable of adding that skill to a client's repertoire without extraneous support, training, or other influences.

Some agencies may be primarily concerned with the
quantity of clients trained, or perhaps they must conform to governmental regulations concerning the consistency or format of client training. The most efficient means towards these ends is provided by the structure of the Feedback Condition in the current study. An entire group of staff could be taught to conduct regimented client training through a clear set of instructions, followed up with corrective feedback.

Finally, as with most mental health service agencies, a vital concern is that the staff provide a supportive and therapeutic milieu, regardless of the activities provided in that setting. If this is a desirable attribute of the staff in a given agency, staff training would be most relevant.

Although many agencies do in fact provide specialized services to their clients, there are few agency administrators who would select only one of the aforementioned staff attributes as being their only concern. The model mental health agency would certainly desire a well-rounded staff, capable of achieving several outcomes with their clients. And herein lies the crux of the current study. By using a carefully designed pretraining staff assessment battery, incorporating indices similar to those used in the current study, the mental health administrator could pinpoint deficit staff skill areas, providing only the necessary training and supports, in the necessary quantities. Thus, rath-
er than providing the same staff training or performance techniques to all staff, the training regime is individually tailored to each staff, building on staff strengths while maximizing agency resources. Further, if resources are severely limited, the agency could prioritize the first four cells in Gilbert's model to improve staff skills in only the most relevant ways. Finally, while the current study clearly demonstrated that each experimental condition produced four distinctly different effects on staff behavior, each of those conditions did produce substantial improvements in client learning and performance.

Two areas for further research should be noted. First, a pretraining assessment tool is needed which incorporates comprehensive measures of both staff and client behavior. For example, while the TPS did offer pertinent information concerning staff skill, it did not assess all areas of staff behavior, nor did it assess the impact of staff behavior on resident skill acquisition.

Secondly, the current study evaluated performance techniques widely used in community mental health settings. Future research should examine other performance techniques presented in the literature, within the framework of Gilbert's model of engineering competent human performance.
REFERENCES


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Appendix A

Task Analysis Form
## TASK ANALYSIS FORM

### TASK LABEL

<table>
<thead>
<tr>
<th>SD</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 letter Y written</td>
<td>writes letter Z</td>
</tr>
<tr>
<td>25 letter X written</td>
<td>writes letter Y</td>
</tr>
<tr>
<td>24 letter W written</td>
<td>writes letter X</td>
</tr>
<tr>
<td>23 letter V written</td>
<td>writes letter W</td>
</tr>
<tr>
<td>22 letter U written</td>
<td>writes letter V</td>
</tr>
<tr>
<td>21 letter T written</td>
<td>writes letter U</td>
</tr>
<tr>
<td>20 letter S written</td>
<td>writes letter T</td>
</tr>
<tr>
<td>19 letter R written</td>
<td>writes letter S</td>
</tr>
<tr>
<td>18 letter Q written</td>
<td>writes letter R</td>
</tr>
<tr>
<td>17 letter P written</td>
<td>writes letter Q</td>
</tr>
<tr>
<td>16 letter O written</td>
<td>writes letter P</td>
</tr>
<tr>
<td>15 letter N written</td>
<td>writes letter O</td>
</tr>
<tr>
<td>14 letter M written</td>
<td>writes letter N</td>
</tr>
<tr>
<td>13 letter L written</td>
<td>writes letter M</td>
</tr>
<tr>
<td>12 letter K written</td>
<td>writes letter L</td>
</tr>
<tr>
<td>11 letter J written</td>
<td>writes letter K</td>
</tr>
<tr>
<td>10 letter I written</td>
<td>writes letter J</td>
</tr>
<tr>
<td>9 letter H written</td>
<td>writes letter I</td>
</tr>
<tr>
<td>8 letter G written</td>
<td>writes letter H</td>
</tr>
<tr>
<td>7 letter F written</td>
<td>writes letter G</td>
</tr>
<tr>
<td>6 letter E written</td>
<td>writes letter F</td>
</tr>
<tr>
<td>5 letter D written</td>
<td>writes letter E</td>
</tr>
<tr>
<td>4 letter C written</td>
<td>writes letter D</td>
</tr>
<tr>
<td>3 letter B written</td>
<td>writes letter C</td>
</tr>
<tr>
<td>2 letter A written</td>
<td>writes letter B</td>
</tr>
<tr>
<td>1 ask s to write capital alphabet</td>
<td>writes letter A</td>
</tr>
</tbody>
</table>

### CRITERION:

When asked to write the capital alphabet, the subject will write all capital letters in order, independently and without being shown the capital alphabet.

---

DATE: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
STAFF: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

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Appendix B

Training Proficiency Scale
PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

100
Appendix C

Definitions of Staff Prompts
(Intraverbals and Metaphorically Extended Tacts)
DEFINITIONS OF STAFF PROMPTS

INTRAVERBALS

1. The prompt is verbal.
2. The controlling variables is a letter of the alphabet which the resident is attempting to write.
3. There is no point-to-point correspondence between the stimulus and the response.

METAPHORICALLY EXTENDED EXTENDED TACTS

1. The prompt is verbal.
2. The controlling variable is a letter of the alphabet which the resident is attempting to write.
3. The prompt is a novel stimulus.
4. The prompt has some, but not all, of the relevant features that previously controlled the response. (Peterson, 1978)

NOTE: Both the primary observer and the reliability observer were trained in verbal behavior through graduate level courses at Western Michigan University.
Appendix D

Feedback Condition Prompt Sheet
PROMPT SHEET

1. Establish dominant hand.
2. Place pencil in dominant hand, position correctly for writing.
3. Place blank paper on table in front of subject.
4. Begin with the capital letter A.
5. Establish eye contact.
6. Ask subject to "draw the capital letter ___."
7. Wait 10 seconds.
8. Match response to letter chart on data sheet.
9. If correct response occurs in 10 seconds, praise subject, record response and go to step #5 with the next letter of the alphabet.
10. If no response or partial response occurs in 10 seconds, repeat verbal prompt and trace the letter on the paper with your finger.
11. Wait 10 seconds.
12. If correct response occurs in 10 seconds, praise subject, record response and go to step #5, using the same letter.
13. If no response or partial response occurs in 10 seconds, repeat verbal prompt and write the letter on the paper with the pencil.
14. Wait 10 seconds.
15. If correct response occurs in 10 seconds, praise subject, record response and go to step #5 using the same letter.
16. If no response or partial response occurs in 10 seconds, repeat verbal prompt, use hand over hand guidance to help the subject draw the letter, verbal praise the subject, and go to step #5 using the same letter.
17. After reaching step #16 five times with the same letter, go to step #5 using the next letter of the alphabet.
Appendix E

A-B-C Data Sheet
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ANTECEDENTS</th>
<th>BEHAVIOR</th>
<th>CONSEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PEOPLE PRESENT</td>
<td>ONGOING ACTIVITY</td>
<td>PRECIPITATOR</td>
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Appendix F

Approval Letter From the Kalamazoo County Human Services Department
August 16, 1989

Mr. Scott Schrum  
Executive Director  
Residential Opportunities, Inc.  
1219 S. Park  
Kalamazoo, MI 49007

RE: Research Proposal  
AN ANALYSIS OF FOUR PERFORMANCE TECHNIQUES FOR  
PARAPROFESSIONAL DIRECT CARE STAFF WORKING WITH  
DEVELOPMENTALLY DISABLED ADULTS IN GROUP HOMES.  
L. MARTIN GRABIAS, MA

Dear Scott:

I am granting approval for the implementation of the research proposal titled, "An Analysis of Four Performance Techniques For Paraprofessional Direct Care Staff Working With Developmentally Disabled Adults in Group Homes".

Please ensure that a full report of the findings from this study is forwarded to the Recipient Rights Office upon completion of the project.

Sincerely,

A. Roger Vander Schie, Ed.D.  
Director

pb/arv/s

Providing Mental Health, Public Health, Substance Abuse, Job Training, Transportation and Serves as the Community Action Agency.
Appendix G

Approval Letter From the Human Subjects
Institutional Review Board
Date: September 18, 1989
To: L. Martin Grabijas
From: Mary Anne Bunda, Chair

This letter will serve as confirmation that your research protocol, "An Analysis of Four Performance Techniques for Paraprofessional Direct-care Staff Working With Developmentally Disabled Adults in Group Homes", has been approved by the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application. You must seek reapproval for any change in this design.

The Board wishes you success in the pursuit of your research goals.

xc: G. Alessi, Psychology
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