Training Mildly Retarded Adults to Generate Effective Solutions to Daily Living Problems

Dennis Munk

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TRAINING MILDLY RETARDED ADULTS TO
GENERATE EFFECTIVE SOLUTIONS TO
DAILY LIVING PROBLEMS

by
Dennis Munk

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1988
Two mildly mentally retarded adults, living in a semi-independent residential program received training in solving common social problems. The subjects were trained to perform five problem-solving component skills: (1) identifying the problem, (2) defining a goal, (3) evaluating a solution, (4) evaluating alternative solutions, and (5) selecting a best solution. The five component skills were trained in sequence, as a multiple baseline across skill behaviors design. It was hypothesized that the training program would successfully improve the subjects' ability to perform the component skills when solving trained and unfamiliar problems. The unfamiliar problems were included to test generalization of skill. The training program was also expected to improve an effectiveness rating given to each solution by the experimenter. Results indicated that the subjects did acquire the five component skills, and that the skills immediately generalized to novel situations. The quality of the subjects' solutions was not affected by the training.
ACKNOWLEDGEMENTS

The author wishes to thank Scott Schrum for helping to establish reliability in the study, and Pam Kingery for allowing me to hold sessions at Life Consultation Center.

Dennis Munk
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Training mildly retarded adults to generate effective solutions to daily living problems

Munk, Dennis Dean, M.A.
Western Michigan University, 1988
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INTRODUCTION

The psychological-behavioral classification of mental retardation is based on the dual aspects of measured intelligence and adaptive behavior. Adaptive behavior refers primarily to the effectiveness with which the individual copes with, and adjusts to, the natural and social demands of his or her environment. Adaptive behavior has two principal facets: (1) the degree to which the individual is able to function and maintain himself or herself independently, and (2) the degree to which he or she satisfactorily meets the culturally imposed demands of personal and social responsibility (Matarazzo, 1972).

The ability to meet the demands of daily living (developing friendships, living independently, etc.) hinges on an individual's ability to solve problems which arise as part of living in the community, often unavoidably and despite adequate prevention. The term "problem-solving" then, refers to the process undertaken to solve problems.

D'Zurilla and Nezu (1982, pp. 202-205) coined the term "social problem-solving" to describe the wide range of problems, situations, and contexts that require an individual to solve problems in order to live successfully in a community. "Social problem-solving" encompasses the solving of problems of an interpersonal nature (e.g., relationships, assertiveness, friendship) and problems of a personal or intrapersonal nature (e.g., financial stress, work difficulties, community mobility, etc.). An individual suffering mental retardation
would encounter all of the aforementioned problems and would be required to solve the problems adequately, or encounter social, legal, or vocational crises.

The obvious deficits in the social problem-solving abilities of the mentally retarded have been identified by mental health practitioners as an area worthy of therapeutic intervention. Typically, interventions designed to improve an individual's social problem-solving skills are considered "training" programs, and may include problem-solving exercises.

Deficiencies in social problem-solving skills are commonly addressed in educational and treatment programs for the mentally retarded. However, while problem-solving has generated a substantial degree of theoretical attention, little applied clinical evaluation has been done (Mahoney, 1974). Hence, while social problem-solving deficits are readily recognized as an area of treatment for the mentally retarded, there appears to be a dearth of clinical evidence to support one technique of training problem-solving over another.

Bramston and Spence (1985) assert that the treatment or training of mentally retarded persons demonstrating difficulties in social problem-solving is still in its infancy. This view may reflect the lack of clinical evaluation of different programs designed to teach social problem-solving. Bramston and Spence (1985) also write that of the training programs being employed to teach social problem-solving, the focus of those programs is typically on the overt behavioral components of social skills, with less attention being paid to the cognitive processes, including problem-solving processes.
Without attempting to define the term "cognitive," the statement by Bramston and Spence (1985) suggests that traditional training programs have focused on the establishment of specific responses to precise stimuli in a social setting. Little effort has been made to teach individuals how to discriminate the common elements of problematic situations covertly, and then engage in the responses necessary to solve the problem. A description of techniques which have been orientated toward the mentally retarded, and which emphasize discrete response training in specific problematic situations, can be found in the work of Ullman and Krasner (1969).

D'Zurilla (1986) describes the discrete-response problem-solving techniques typically employed with the mentally retarded. The techniques focus on the direct facilitation of performance skills in specific problematic situations by manipulating the consequences of specific target behaviors. He asserts that these procedures are very effective in improving performance, but behavior changes are often limited to the specific training situations; generalized improvements in competence tend not to occur.

The ability to apply newly acquired social problem-solving skills to a variety of novel problems constitutes the degree to which those skills "generalize" to other settings. D'Zurilla (1986) asserts that the typical techniques used to teach problem-solving skills to the mentally retarded do not promote generalized improvement in the ability to solve problems in novel settings. The degree to which a problem-solving technique can be generalized to other problems is of paramount importance due to the fact that: (a) it is impossible to
train a specific response to all of the possible problematic situations an individual will encounter over a lifetime; and (b) skills which generalize to other situations are more likely to produce positive outcomes which will reinforce the problem-solving techniques and increase the individual use of the technique.

In addressing the problem of generalization of acquired social problem-solving skills, D'Zurilla and Goldfried (1971) contrast the view of problem-solving as the emitting of an effective response (the goal of most training programs for the mentally retarded), and the view that problem-solving is a process of learning to combine previously acquired responses in the novel way so as to produce a new response or response pattern, and to form a new association between this response pattern and the particular problematic situation in question. The process which D'Zurilla and Goldfried (1971) describe, the combining of previously acquired responses and the forming of new associations between the response pattern and particular situation, are covert, unobservable phenomena, and therefore the term, "cognitive" is a general description of the process.

D'Zurilla and Goldfried (1971) state that the assumption that general effectiveness in handling problematic situations may be best facilitated by training effective responses to one or more situations is not supported by available research.

To address the problem of generalization of acquired social problem-solving skills to novel situations, two models for teaching social problem-solving skills have been developed by D'Zurilla and Goldfried (1971) and Spivack, Platt, and Shure (1976), and shown to
be effective by Edelstein, Couture, Cray, Dickens, and Lusebrink (1980). Although the models are slightly different, they both involve teaching individuals to recognize elements common to all problem situations and to apply learned problem-solving skills to a variety of different, novel problematic situations. Unfortunately, the aforementioned studies have not been applied to the mentally retarded population.

The present study attempts to clarify issues regarding the most efficient and effective method for teaching the mentally retarded to solve social problems. This study involves a model for problem-solving which is comprised of five component skills, similar to those demonstrated to be effective by Edelstein et al. (1980) and Hansen, St. Lawerence, and Christoff (1985). While the problem-solving model presented in this study has been previously defined as a "cognitive" model (D'Zurilla & Goldfried, 1971; Edelstein et al., 1980; D'Zurilla & Nezu, 1982), it is not the intent of the author to attempt to describe or define the "process" of problem-solving, but rather to investigate the relationship between a method of training individuals to solve problems in an organized fashion and their subsequent ability to vocally produce learned skills and solutions. Edelstein et al. (1980) state that from a therapeutic viewpoint accurate knowledge of precisely how a person solves a problem is not essential. A suitable analogue or model may suffice for teaching one how to solve a problem more expediently. In the spirit of Edelstein et al. (1980) statement, the present study will investigate an alternative method of teaching the mentally retarded to solve social problems. Specifically, the
study is intended to demonstrate that (1) a training program can be used to teach mentally retarded subjects problem-solving skills; (2) that once learned, the problem-solving skills will be applied successfully to novel situations indicating generalization of skills; and (3) that as the subjects progress through the training program, the quality of their solutions to problematic situations will improve. The quality or effectiveness of the subjects' solutions will be determined by the experimenter. The quality of the solutions generated by individuals is obviously a valued outcome of any social problem-solving skills program. However, in the current study, the experimenter is primarily concerned with establishing that the training program can be used successfully to teach problem-solving skills to the mentally retarded, and that the skills learned in the training program generalize to unfamiliar situations.
METHOD

Subjects

Subjects were two females diagnosed as mildly mentally retarded according to the criteria established in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1980). Subject #1 was 19 years old, black, single, with an IQ of 64 on the Wechsler Adult Intelligence Scale-Revised (WAIS-R) (Wechsler, 1955). Subject #2 was 21 years old, white, single, with a WAIS-R IQ score of 69. Both subjects were enrolled in special education.

Subjects were referred by case managers from a local Community Mental Health Agency. Case managers were asked to refer subjects who would likely live independently in the future, but have demonstrated difficulties solving problems. The two subjects were selected because they lived in a semi-independent training apartment training program and would likely complete the program and live independently. Neither subject was concurrently receiving other training in problem-solving. However, there was no attempt to control for past training; that is, subjects were not selected or rejected because of any past problem-solving training they had undergone. The subjects were required to exhibit language skills necessary to emit intelligible answers when audiotaped.

Procedure

Training sessions were held at a local community mental health
agency by the author who has had several years experience with
developmentally disabled adults. Training sessions were held twice
weekly, usually in the evening, for one hour, in a large conference
room. The experimenter transported the subjects from their apartment
to the site where training sessions were conducted.

The nineteen training sessions were held according to the fol-
lowing format:

Sessions 1-3. Reviewed expectations of subjects and exper­
imenter. Procedure: No training occurred. Baseline data
were collected. Subjects were presented with six unfamiliar
problem situations, (see Appendix B for problems) followed
by prompt, "How would you figure out what to do, and what
would you do?" The subjects responses were audiotaped and
later scored for the occurrence of the presently untrained
problem-solving component skills. Each solution was also
given a rating indicative of how effective the experimenter
subjectively deemed the solution.

Sessions 4-6. Training for skill component #1--Identifying
the main problem. Procedure: For the first half of ses­
son, subjects were trained to identify the main problem in
three problem situations. During the second half of the
session, subjects were presented with two of the problem
situations covered in training, and two problem situations
which they had never seen or heard previously in training.
The four situations were read aloud, followed by the
prompt, "How would you figure out what to do, and what
would you do?" The responses by subjects were audiotaped
and later scored for the occurrence of the problem-solving
component skills, and also for overall effectiveness using
the 9-point Likert type scale (see Appendix A).

Sessions 7-8. Reviewed previous training on identifying
the main problem. Introduced new component skill--Defining
the goal. Procedure: The first half of the session con­sited of training the subjects to identify a desired out­
come, their goal for resolving the problem situation.
Subjects were again trained on three problem situations per
subject, thus each subject either responded to a problem
situation, or overheard the other subject responding to one
of her three problem situations. During the second half of
the session, the experimenter read aloud two of the problem
situations covered in training, and two unfamiliar situa­
tions. The subjects were prompted to respond to their
responses were audiotaped and scored. The second half of all sessions were identical, with only the presented problem situation differing.

Sessions 9-13. Reviewed previously trained component skills. Introduction and training of new component skill—Evaluating the solution. Procedure: During the first half of the session, subjects received training on how to evaluate their proposed solution. Again, each subject was trained on three problem situations each. The second half of the session was identical to previous sessions, with the subjects' solutions to trained and unfamiliar situations being prompted, audiotaped, and later scored by the experimenter.

Sessions 14-17. Reviewed previously trained component skills. Introduced and trained the fourth component skill—Evaluating alternative solutions. Procedure: During the first half of the session, subjects received training in evaluating more than one solution for each problem situation. Subjects were again trained on three problem situations each. During the second half of the session, the subjects were again prompted to respond to two trained, and two unfamiliar situations, with the experimenter audiotaping and later scoring the responses.

Sessions 18-19. Reviewed previously trained component skills. Introduced and trained the fifth and final component skill—Selecting the best solution. Procedure: During the first half of the session, subjects received training on how to select the best of one or more solutions. The subjects were trained on three problem situations each. During the second half of the session, the subjects were again audiotaped as they responded to two trained and two unfamiliar problem situations.

The apparatuses used were a portable blackboard and a dictaphone. The blackboard allowed the subjects to view a lengthy problem situation, with possible answers, which would have been difficult to remember if simply read aloud by the experimenter. A dictaphone was used to record responses so that the experimenter could review and score them later.
Problem-Solving Components

Five problem-solving component skills, previously demonstrated as necessary elements of problem-solving (Christoff & Kelly, 1985), were selected as dependent variables, with the training program serving as the independent variable. The five component skills were operationally defined as follows: (1) Problem identification—a specific statement of the main problem within a problem situation; (2) Defining a goal—a specific statement of the desired end; (3) Evaluating the solution—a specific cost benefit statement regarding a solution; (4) Evaluation of alternative solutions—a specific cost/benefit statement for each of two or more solutions; and (5) Selection of a best solution—explicit choice of one solution and rationale for the selection.

Table 1 represents a typical response and examples of statements which represent the five component skills.

The five component skills were trained in the order presented in Table 1, based on the experimenters belief that each component skill is a necessary prerequisite to the execution of later skills. It would not be functional to teach the subjects to evaluate a solution to a problem until it was assured that they were capable of correctly defining a problem. Each component skill lends direction to the skill it precedes. Although the component skills were presented in a logical sequence, the subjects were not required to recite the skills in that same order when responding to problem situations. It was not critical that the subject demonstrate each skill in the sequence it
### Table 1
Examples of Five Problem-Solving Components

<table>
<thead>
<tr>
<th>Problem situation</th>
<th>Identify problem</th>
<th>Identify goal</th>
<th>Evaluate solution</th>
<th>Evaluate alternatives</th>
<th>Select best</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;You usually receive your SSI check by the third of the month. It is now the tenth, and your check has not come. How do you figure out what to do, and what do you do?&quot;</td>
<td>Response: My check is late. I need my check.</td>
<td>Response: I want my check.</td>
<td>Response: I could tell my mom. I would feel better but I'm not sure she could help.</td>
<td>Response: Or I could call social security and tell them. They could help me right away.</td>
<td>Response: I think I would call social security because they could help me faster and keep it from happening again.</td>
</tr>
</tbody>
</table>
was presented, but rather that the subjects' responses reflected their ability to apply the learned skills to a problem situation.

The subjects' audiotaped responses were also rated for overall effectiveness on a 9-point Likert-type scale, ranging from 1-very poor, to 9-excellent (see Appendix A for scale). Each solution was rated for quality (effectiveness) by the experimenter, based on the following criteria: (a) the degree to which the solution involved an attempt by the subject to solve the problem as independently as possible, (b) the degree to which the solution addressed the identified main problem, and (c) the degree to which the solution would produce a long lasting change versus a temporary "band-aid" solution which would result in further intervention at a later time. A second rater was used to ensure high reliability of ratings. The raters overlapped on 30% of the rated solutions. The similarities of the ratings of the two raters indicated high reliability.

Problem-Solving Training

A multiple baseline across problem-solving skills design was implemented to distinguish training effects for the problem-solving training.

The training on the five component skills occurred in the aforementioned sequence, and each skill was maintained following its introduction by a brief review at the beginning of each subsequent training session. For example, during session #19, in which subjects were trained to select a best solution, the experimenter opened the session with a quick review of identifying a problem, selecting a
goal, and evaluating solutions.

The training scenario consisted of the subjects entering the conference room together, with a problem situation and three possible responses written on the blackboard. The training procedure was identical for all five component skills: (1) The experimenter provided a written problem situation and three answer options. The experimenter pointed out the best answer and provided a rationale. The subjects were not required to select a response during this initial stage. (2) The experimenter again provided a written problem situation and three possible answers, including one answer considered by the experimenter to be the best. The subjects were required to select a best response and provide a rationale for the selection. (3) The experimenter read aloud a problem situation and the subjects were required to emit a correct response and provide rationale.

Each subject received a different problem situation for each of the three steps of training, for a total of six trained situations per session. Each subject was given primary responsibility for answering three problem situations and was present to overhear or observe the other subject's responses. The subjects were required to perform each of the component skills by answering a set of questions designed to prompt the subject to attend to specific details of a problem situation and the possible ramifications of a selected solution to the problem situation. During training for the first phase, Identifying the problem, subjects were prompted to identify the main problem within the context of a problem situation by answering the following questions: (a) whose problem was it, (b) can it be changed,
and (c) will changing the problem change the entire situation. During the training phase for Defining the goal, subjects were prompted to ask themselves "what do I want"? To train the subjects to Evaluate a solution and the alternative solutions, the subjects were prompted to ask the following questions: (a) how will I feel, (b) how will they feel, (c) what will happen later on. During training for the final component skill, Selecting the best solution, the subjects were prompted to ask: (a) which solution can I do, and (b) which solution will most likely prevent future problems.

The component skills, with questions serving as prompts, are outlined in Table 2. As can be expected, the subjects did not consistently produce a correct response to all questions with a single verbal prompt. The experimenter employed several techniques, in addition to the blackboard models, to help the subjects learn the problem-solving skills. Modeling, which consisted of the experimenter providing a correct response, or acting out a correct response without verbalizing the response, was often used when subjects did not verbalize a correct response. Role-playing was also used to help the subjects comprehend the problem situation and isolate the specific factors, such as the main problem, to generate a solution or predict the outcome of a chosen solution. Modeling and role-playing were not used systematically, but rather at the experimenters discretion to aide the subjects learning of the problem-solving skills.
Table 2
Skill Components and Questions

1. Identify the problem—a specific statement of the main problem within a problem situation.
   A. Whose problem is it?
   B. Can I change it?
   C. Will changing it change the whole situation?

2. Identify the goal—a specific statement of the desired outcome.
   A. What do I want?

3. Evaluate a solution—a specific cost/benefit statement regarding a solution.
   A. How will I feel?
   B. How will they feel?
   C. What will happen right away?
   D. What will happen later on?

4. Evaluate alternative solutions—same as #3 for two or more solutions.

5. Selection of best solution—explicit choice of one solution and rationale for the choice.
   A. Which solution can I do?
   B. Which solution will prevent future problems?

Corrective feedback was delivered consistently throughout the sessions, usually to point out strengths in the subjects responses. The subjects were never told that their responses were "bad," but instead were praised for their efforts and told that there was a response that would be even better than their present choice. Verbal reinforcement, in the form of descriptive praise, was abundantly delivered throughout the training. This served not only to reinforce correct responses, but also to maintain the subjects' motivation in training sessions. A typical training session is illustrated in the
following script.

**Setting—Blackboard with problem situation written:** You are riding the bus and feel tired. A person has been staring at you for a long time and he is making you uncomfortable.

The main problem is:
- a. You are really tired
- b. Someone is staring at you
- c. You might be late for work

**Experimenter:** Subject #1, can you tell us which of the problems listed is the main problem?

**Subject #1:** I think it's (a) I'm really tired!

**Experimenter:** O.K., let's test it; what questions should you ask yourself to find the main problem?

**Subject #1:** Let's see, whose problem is it? It's mine. Can I change it? Sure by getting some sleep! Will not being tired change the whole situation? Well, I'm not sure about that.

**Experimenter:** Let's do a role-play to see if we can find the main problem. I'll be the person staring at you and you be the tired rider who is feeling uncomfortable.

**Subject #1:** It makes me feel weird when you stare at me, I don't like it.

**Experimenter:** You said earlier that the main problem is that you are tired, and that's a good answer. Is there an even better answer?

**Subject #1:** Yes, I think the main problem is that you are staring at me 'cause it makes me feel weird! It's my problem and I could probably change it.

**Experimenter:** Subject #2, which problem do you think is the main problem?

**Subject #2:** I agree, it's (b).

**Experimenter:** Great, you are both correct! Thanks for doing the role-play.
Assessment of Training Effects

During the second half of each training session, subjects were prompted to respond to two problem situations worked on during the first part of the training session, and two situations they had not read or heard before. The unfamiliar situations were incorporated to test generalization of acquired skills to novel situations. The subject's responses to the four problem situations were audiotaped, with only one subject present in the room during taping. During the audiotaping, the subject was not given any written models. The problem situations were read aloud by the experimenter, followed by the prompt, "How would you figure out what to do, and what would you do?" The subject was then encouraged to speak clearly into the dictaphone.

Subjects were given no instruction or feedback during the audiotaping. Because the scoring of the tapes occurred at a later time, the experimenter did not review the responses with the subjects following audiotaping. Table 3 illustrates how a typical response was scored (see Appendix A for actual scoring sheet).

Interrater Reliability

The experimenter and one other rater independently rated the audiotaped responses, overlapping on 30% of the responses randomly selected from all baseline and training sessions. The experimenter orientated the second rater by playing several audiotaped responses and reviewing the criteria for scoring. None of the responses used for training the second rater were included in the overlapping
Table 3
Scoring the Occurrence of Component Skills

| Problem situation: You are riding the bus and are really tired. A person has been staring at you for a long time and it is making you nervous. |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Prompt: How do you figure out what to do, and what do you do? |
| Subject's response: I would look the other way and totally ignore the person. He makes me feel weird and I want him to stop staring. If I tell him to stop he might say something mean to me. I would just pretend he is not there, that way I will feel better and not have to talk to him. |

<table>
<thead>
<tr>
<th>Was problem identified?</th>
<th>Was goal identified?</th>
<th>Was a solution evaluated?</th>
<th>Were alternatives evaluated?</th>
<th>Was best solution selected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes. He makes me feel weird.</td>
<td>Yes. I want to stop.</td>
<td>Yes. If I tell him to stop, he might say something mean to me.</td>
<td>Yes. I would look the other way and totally ignore the person. (Later) I will feel better and not have to talk to him.</td>
<td>Yes. I would just pretend he is not there, that way I will feel better and not have to talk to him.</td>
</tr>
</tbody>
</table>
responses used to determine reliability. Agreement on the occurrence of each component skill ranged from .86 to 1.00, with a mean of .93 for all five skill components. This was computed as the number of responses scored in agreement divided by the total number of responses scored by both raters. The Pearson product-moment correlation coefficient computed for interrater reliability of the overall effectiveness ratings was .88, which is an indication that the experimenter and the second rater rated solutions similarly, and that the ratings assigned were an accurate assessment of the quality of the responses according to the criteria established.
RESULTS

It was hypothesized at the onset of the study that the training program would increase the number of problem-solving skill components, and that this increase would be statistically significant for the problem situations trained during each session, as well as for the unfamiliar problems used to test generalization of skills. Additionally, it was hypothesized that the overall quality of the subjects' solutions would increase as the training progressed.

Represented in Figure 1 are the results of the training on the subjects' ability to demonstrate the five problem-solving component skills on trained situations and unfamiliar situations.

Also represented in Figure 1 are the percentage of opportunities to emit each component skill in which the subjects did demonstrate a component skill. If during the taping of responses to two familiar situations and two unfamiliar situations, the subjects verbalized information representing use of all five skill components, then the graph would indicate 100% for both trained and generalization situations.

The percentage of responses in which the subjects demonstrated the skill components remained near zero during the baseline sessions for each skill component. Characteristic of the multiple-baseline design, the baseline period for each skill component varied in length, depending on the phase in the sequence it was presented. The percentage of responses in which subjects demonstrated a skill component
Figure 1. Total Number of Occurrences of Each Problem-Solving Skill Component by Session.
remained near zero for all skill components, before and after the training of preceding skill components. The drastic increase in the percentage of responses containing skill components upon introduction of a skill component indicates that the change in the subjects' behavior was a direct result of training. The systematic way in which the percentage of responses containing skill components increased at the precise time that training for a skill component occurred indicates that a multiple-baseline design across skill behaviors was an effective design for demonstrating the effectiveness of the training program (Kazdin, 1982).

Perhaps even more critical for the evaluation of the training program is the way in which training affected the subjects' ability to generalize learned skills to novel situations. As shown in Figure 1, the percentage of responses to unfamiliar situations in which the skill component(s) were demonstrated, increased dramatically with the onset of training and remained consistently high as the study progressed to other skill components. The skills learned in the training sessions generalized immediately to unfamiliar situations, strongly suggesting that the problem-solving model is a useful training technique to prepare mentally retarded subjects to solve typical problems.

A statistical analysis was conducted in which the subjects' performance during baseline sessions was compared with their performance during, and following, the training of each skill component. A repeated measure analysis of variance (ANOVA) was computed for each component skill in order to compare the subjects' performance during
baseline with their performance during and after training occurred. This statistical treatment demonstrated how well the skills were maintained once the trainee progressed to later skill components.

Table 4 indicates that the occurrence of each component skill was compared across baseline, trained situations, and generalization situations. Table 4 shows a significant increase in the number of subject responses containing skill components. While it is desirable to establish a level of significance ($p$) which will eliminate questions regarding the nature of effects, the experimenter did not select a target ($p$). Therefore the actual scores and corresponding levels of significance are presented in Table 4.

Table 4
Repeated Measures Analyses of Variance for Problem-Solving Component Skills

<table>
<thead>
<tr>
<th>Skill component</th>
<th>$F$</th>
<th>$p$</th>
<th>Situation (trained vs. generalization)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem identification</td>
<td>70.33</td>
<td>.025</td>
<td>ns</td>
</tr>
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The ANOVA produced no significant differences between the subjects' performance on the situations used in training, and their performance on unfamiliar situations. This finding indicates that the
subjects' ability to demonstrate the newly acquired component skills generalized immediately to unfamiliar situations.

Overall Effectiveness

It was hypothesized at the onset of the study that as the subjects progressively acquired the five problem-solving component skills, the quality of the solutions would improve as a result of an improvement in their problem-solving skills. The effectiveness ratings for solutions to both familiar and unfamiliar situations fluctuated between high and low scores across all skill components for both subjects. To examine more clearly the possible effects of the problem-solving training on the effectiveness of solutions, the data for each subject were analyzed individually.

The $6 \times 1$ ANOVA was computed for each subject to compare effectiveness rating across baseline and the five training phases. Baseline data were compared with data for performance on generalization situations because the situations used in those two phases of the study were unfamiliar to the subjects. The results of the $6 \times 1$ ANOVA indicate that the effectiveness ratings for the solutions proposed by the subjects for unfamiliar situations did not improve from baseline to training. The problem-solving training did not improve the effectiveness ratings of the subjects' solutions to unfamiliar problems used to test generalization.

A $5 \times 2$ ANOVA was computed to compare the effectiveness rating of each subject across the five training phases for trained and generalization situations. The results of the $5 \times 2$ ANOVA indicate that
subject #1 obtained significantly higher effectiveness ratings on trained situations versus generalization situation during the initial training phase--Identifying the problem. This was the only comparison which proved to be statistically significant. The 5 x 2 ANOVA indicates that the effectiveness ratings for each subject's solutions did not differ significantly from phase to phase, or on trained versus generalization situations, with the single exception mentioned above.

The results of the 6 x 1 ANOVA indicate that training did not significantly increase the quality of the subjects' solutions to unfamiliar situations, while the 5 x 2 ANOVA results indicate that only during one phase, for one subject, were effectiveness ratings higher on trained situations than solutions on unfamiliar situations. It can be concluded that in general the problem-solving training had no appreciable impact on the quality of the solutions that subjects proposed for trained situations and unfamiliar situations.

Discussion

The present study applied a social problem-solving training program, previously demonstrated to be effective with psychiatric patients, to mildly mentally retarded adults. It was hypothesized that training would increase the number of problem-solving skills, and that this increase would be statistically significant for both familiar and unfamiliar situations. Additionally, it was hypothesized that the overall quality of the subjects' solutions would increase as training progressed.
Results of the study indicate that a training program which involves the use of written instruction, modeling, role-playing, and positive reinforcement can be effectively employed to teach problem-solving skills to mildly mentally retarded adults. Furthermore, the skills acquired by the subjects generalized immediately to novel situations. The degree and timeliness of the generalization of skills contribute heavily to the perceived efficacy of the training program. A lack of generalization has been cited as a weakness of traditional training programs that emphasize discrete responses to specific stimuli. Generalization is a critical issue in problem-solving programs because it is unfeasible to establish effective responses to the plethora of problems a mentally retarded person would encounter by conditioning responses to specific stimuli in the community. The training methodology in the present study was successful in teaching the skills necessary to react to unfamiliar situations by identifying the elements of the situation.

The effects of the training program on the quality of the subjects' solutions were not as significant as was hypothesized at the onset of the study. Closer scrutiny of the actual role of the training program in increasing the quality of the subjects' solutions reveals a latent, ambiguous process. As a characteristic of the design, the subjects received neither feedback on the quality of a given solution nor training in ascertaining the quality of a given solution until the third phase of training. As a result, at no juncture in the study was an increase in the quality of given solutions detectable. This suggests that a program designed with the intent
of teaching mentally retarded adults to evaluate and improve the quality of solutions to problems should focus on those skills throughout the study, as opposed to introducing them midway through the study. This would guarantee consistent feedback which would likely improve the quality of the subjects' solutions.

An issue in the present study was subject motivation and fatigue. The experimenter did not establish precise criteria for advancing from one training phase to the next. During the third phase, the phase with the most sessions, the subjects became increasingly distracted and restless, stating they would like to "move on." The fact that the experimenter did move to the next phase deserves mention because the data from that third phase revealed a lower level of statistical significance than the other four phases. Further research involving this population and design should address mastery criteria and subject fatigue.

The manner in which the subjects systematically described how they would react to problem situations, and the success they experienced in responding to unfamiliar situations, warrants an optimistic prediction of how the subjects would respond in the natural environment. Further research could establish the degree to which oral responses correlate with "in vivo" responses.
APPENDIX A

Problem-Solving Rating Form

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Situation #  Training  Gen

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<tr>
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Overall Effectiveness

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Situation #  Training  Gen

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APPENDIX B

Problem Situations

Situation 1
You have been feeling very sick all week. Your doctor has given you pills but they don't seem to help. You have followed the instructions on the label and have been taking the prescribed number of pills a day. Today has been a particularly bad day and you have felt dizzy and tired all day. On top of everything else a pesky salesman just called and you feel that you acted kind of weird. It is three o'clock and it will not be time to take another pill until eight.

Situation 2
You have had a couple of problems in your apartment: The roof leaked over your bed, and the thermostat wasn't working very well. When these problems arose you called your landlord and after a lot of complaining on his part, he came and fixed them. This time the washer in your faucet has rusted and the leak is getting worse every day. You pay your own utilities and the water is costing money. You call the landlord and he refuses to fix it. He says you are supposed to fix things around the apartment yourself, as stated in the lease. When you moved in you didn't know that was in the lease, and if it's there, you wonder why he has been fixing things before.

Situation 3
Your landlord is always crabby when he comes to collect the rent. One of the windows in your bedroom was cracked when you moved in and during a cold night, it cracked all the way and a section is now out. When he comes to collect the rent, you mention it to him. He screams at you and accuses you of breaking the window, saying it was never cracked. Whenever he was crabby before you simply let it go, but this time he says you must pay to have the window replaced.

Situation 4
As usual, you are getting on the bus to go to work. You are in a hurry because it is raining and you trip going up the steps. A person you work with makes a rude remark about you. This person says it very loudly, so that everyone on the van can hear it. You feel like everyone is looking at you.

Situation 5
You have a certain amount of money budgeted each month to spend. It's enough to buy what you need, with a few dollars left over to spend on pleasures. Your friend is also on a low budget, but always comes to you to borrow "just a couple of dollars." You know that this
person drinks and never pays you back on time. This person has just asked you if you can spare five dollars and it's only the middle of the month.

Situation 6
You just got your prescription and need to get it filled. You call a cab, and while you're waiting for it to come, a friend offers to take you to the pharmacy. You call the cab company, cancel the cab, and leave with your friend. Your friend drops you off at home with your pills and leaves. You take out the new pills and notice that they are not the same color or size as your old pills.

Situation 7
You are going over your budget and checking to make sure that you've paid this month's bills. You notice that your electric bill, which you paid two and one-half weeks ago, has not been credited against your account. You have received a notice from the electric company that you still owe them for last month's electricity. You've got it written in your checkbook, but you don't have a cancelled check, so you're not certain that you've paid the bill.

Situation 8
You've decided to treat yourself by going home by cab instead of walking. After you've been riding for awhile, you look outside to see how much farther it is until you reach home. You're just reaching the fork in the road, and if you go straight and take the shortcut, you should be home in about 5 minutes. You notice that the driver is signaling for a right turn.

Situation 9
While shopping, you see a great pair of pants that are just what you've been looking for. You want to buy them now because there are only a few left in this particular style. You're kind of rushed, so you just pick out a pair of your usual size and go home. The next morning you put them on to wear to work, and they are too big.

Situation 10
You have a toothache and have been waiting a week for your appointment with the dentist. As you put on your shirt, you notice that the shoulder seam is torn. You don't have another clean shirt, but you do have an hour before you must leave for the dentist's office.

Situation 11
Your stomach looks bloated and you have had pains for the past few days. It's the end of the month, and you have been eating beans a lot.

Situation 12
You've had your phone for some time, and have never had a problem with it. You've always been able to place calls without any
trouble. However, recently some of your friends have said that they have had trouble reaching you at times. The strange thing is, you know that you have been home most of the times that your friends reported that they couldn't reach you.

Situation 13
You go to get a glass of coke and find that it is rather warm. You put the coke in the refrigerator yesterday, so you know it should be cold. On checking the other food you discover it is not very cold either, and the freezer is defrosting and making a puddle on the floor. You check the temperature dial and find it is turned up all the way. You are afraid your food will spoil.

Situation 14
You have just paid the monthly rent on your apartment. On returning home you find that your dog has missed the paper again. You clean up the mess and try to flush it down the toilet. The toilet won't flush, and you recall it hasn't flushed right for the past week.

Situation 15
You are at work. Your supervisor has just explained how to do something. Your supervisor leaves and another staff person suggests another way to do it. You realize that this is not how your supervisor explained it to you, but it might be quicker.

Situation 16
While balancing your checkbook, you find that you and the bank differ. You have just gotten back your cancelled checks, numbered 1, 2, 4, 5, 7, 9. Nine was the last check that you wrote. According to the bank statement, you have more money than what your checkbook indicates. You double-check your math, and still come out with the same answer.

Situation 17
You decide to call one of your friends who lives in another state. It's been awhile since you've talked to her and you think it would be a nice surprise to call. After dialing, while you're waiting for an answer, you discover you've called the wrong number--since it is long distance, you'll be charged for it.

Situation 18
You usually pay 20 dollars a month for electricity. The next bill is for twice this amount--40 dollars. You can't see any reason why your bill should double.

Situation 19
Lately you've been receiving some very annoying phone calls at odd hours of the day and night. You are sure they're all from the same person; you recognize his voice. You've told him to stop calling, but he continues.
Situation 20
You go to the doctor and he asks you a number of questions, along with taking your blood pressure and the usual things. He has to leave for a while and you must wait for his return to get a prescription. When he comes back he tells you he will be changing your medication. You wonder why as he begins to write a new prescription. The nurse comes in and interrupts him again.

Situation 21
You go to the pay phone in Meijers, put your dime in the slot, and nothing happens. You don't hear a dial tone or any sound at all. You hang up the receiver, and then the phone doesn't give you your money back.

Situation 22
After getting your telephone bill, you notice that the amount seems a little high. You look at the description of calls made and notice a long distance call listed that you didn't make. You check to make sure, although you know you couldn't have called since you know no one in that state.

Situation 23
You are spending a quiet evening at home when the door bell rings. It's a door-to-door salesman who begins a long speech about how wonderful the product he's selling is. The product is some item that you have no use for, and you aren't interested in buying it. You say so, but the salesman interrupts to say that the product is so useful, everyone needs one. What's more, it carries a money-back guarantee. If you let him in for a few minutes, he'll tell you all about it.

Situation 24
You normally receive your Social Security check by the third of the month. It's now the tenth, and your check hasn't come. You are out of food and have no money in your account.

Situation 25
You take your laundry to the laundromat. You have to wait 15 minutes for the washing machine. You put the laundry and soap in, and then put your coins in the slot. The mechanism jams and the washer won't come on. You look for the attendant but there is no one around.

Situation 26
You receive a letter from the Social Security office, but you don't understand what it says. The following month you don't receive your check.

Situation 27
You get up and start getting ready to go to Y.O.U. You leave on time to go to the bus stop. When you get to the bus stop, you see
the bus down the road because it came early. You want to go to work, but have no other way of getting there.

**Situation 28**
You have just returned from the doctor's office where he wrote a prescription to refill your medication. You stopped by the pharmacy on the way home and took a pill when you got home. It has been thirty minutes since you got home, and as you watch television you become very nauseous. You notice over the next week that you get nauseous every day.

**Situation 29**
You wrote a check to cover your phone bill. As it turns out, the check bounced. The phone company sends you a notice saying that your service will be terminated if you don't pay the bill within 5 days, and you won't get paid for 7 more days.

**Situation 30**
It is Tuesday and you are preparing to fix dinner. You decide to make some spaghetti. You check to make sure you have all the ingredients for spaghetti and make your dinner. After you have eaten all you can, you find you still have enough spaghetti to last for two more meals. You already have food thawed in the refrigerator for the next two days. If you don't cook the thawed food it will spoil.

**Situation 31**
As you sit reading in the living room, the light burns out. You are looking for coupons in the paper. You don't have anywhere to read except the kitchen, and that is uncomfortable. You don't have any extra light bulbs in the house.

**Situation 32**
Your doctor gave you a prescription for enough medication for a month at your last appointment. On the fifteenth of this month you dropped three on the floor and they rolled under the bureau. Now you have run out of medication and it is three days until your next doctor's appointment.

**Situation 33**
You usually pay all your bills on Saturday. One Saturday, as you're writing up your bills to be mailed on Monday, you run out of checks--and you are only half way through paying the bills.

**Situation 34**
You are out grocery shopping and have selected a few "splurge" items--steak and some center-cut pork chops in place of the "quick-fry's" you usually buy. You add them up mentally, but are getting in the checkout line and discover it will come to about seven dollars more than you budgeted. You do, however, have enough money to cover the bill, even if it will disrupt your budget.
Situation 35
You are in the shower and slip and fall. Your arm hits forcefully against the side. You don't have any other injuries, but there is a severe pain in your arm and your fingers are numb. You call your doctor's office but you can't get an appointment.

Situation 36
You had a good day at Y.O.U. You finished all of your work and now there is nothing to do. It is still one hour before you are to leave Y.O.U.

Situation 37
You are at home. A family member explained a job you were to do. Later, after you had been working hard on it, this person came back to see how you were doing. He got mad and didn't like the way you were doing the job. He shouted at you and called you a "dummy."

Situation 38
You have just moved into a new apartment in a new neighborhood where you know very few people. You would like to get to know some of your new neighbors better.

Situation 39
You have been going to church on Sundays. One day after church you see a person you have met once. You think that you would like to get to know this person better.

Situation 40
You have just started attending a church and do not know any of the church members. You would like to get to know some of these people better.

Situation 41
You would like to attend night school in the evenings. The classes meet two nights a week. You do not own a car and the school is too far from your home to walk to it.

Situation 42
Your rent is always due on the first day of the month and has to be paid on time. It's almost the first of the month, but you are going to be away for two weeks to visit some relatives. You won't be coming back until almost the tenth of the month, which is a good while after the rent is due.

Situation 43
You live in a small, one room apartment. It's nice, but is very small. A person who lives near you has a nicer and larger apartment, and you could afford the rent of her larger apartment. She tells you that she will be moving to another city soon. You'd really like to move into her apartment, if it is not already going to be rented to someone else.
Situation 44
You come home from shopping at Meijers and found that you have lost your watch.

Situation 45
You noticed that your friends seem to be avoiding you. You would like to have friends and be liked.

Situation 46
It is three o'clock in the morning. You have not had a good night's sleep in several nights and you can't get to sleep now. You can't shut your mind off so that you can relax and get to sleep.

Situation 47
You have been sick for a whole week and have made an appointment to see your doctor. Your appointment is at 2:00 p.m. and your friend has agreed to pick you up at 1:30 p.m. and take you to the doctor's office. It is now 5 minutes before 2:00 p.m. and your friend has not shown up.

Situation 48
For the last 2 weeks, someone has been calling your apartment several times per night and when you answer, they just hang up.

Situation 49
While you are riding the bus to visit your friend, you notice that someone is staring at you. You don't know the person and you are feeling uncomfortable.

Situation 50
You have a good friend who you have done lots of fun things with for several years. Lately, your friend doesn't want to do anything with you and she looks unhappy a lot of the time.


