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ABSTRACT

A comprehensive fire safety skills program was evaluated with 32 moderately to mildly retarded adolescents. The program used a fire safety program manual and lessons in basic preventive fire skills, fire safety procedures, and fire escape skills. Across-group comparisons indicated differences in performance between males and females. Fire safety classes were more effective than no classes and more effective than a single exposure to the audiovisual classes. There was no difference between a group tested immediately after receiving the fire safety classes and a group receiving the classes six weeks prior to the testing. All four groups were unable to demonstrate skill retention at the 5-month followup. Appended are a manual on teaching fire safety skills to mentally retarded adults, a training packet on fire safety for mentally regarded persons, and a list of fire safety skille for posters. (CL)

Progress Report
for
Student Research: Fire Safety Skills For Mentally Retarded Children

By

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Statement of the Problem

The vast majority of mentally retarded persons lived in large institutions until the application of the principles of normalization (Nirje, 1969) and the least restrictive alternative. As a consequence, they are at a higher risk for life threatening experiences such as fires. For example, recent data suggest that many adults with mental retardation respond inappropriately to potential fire emergencies in a variety of community facilities (Bell, 1979, 1980, 1981; Best, 1984; Holton, 1981; Timoney, 1984). These data are consistent with reported fire casualties among mentally retarded adults who are residents of community-based residences (Bell, 1981, 1983a, 1983b; Best, 1984; Klem, 1984; NFPA, 1982; "Six men killed," 1983; Stone, 1973).

These casualties occurred because the residents' responses to the emergency were constrained by their mental and/or physical impairments (NFPA, 1982). Typical problems were refusal to use windows as exits (Bell, 1981; NFPA, 1982), refusal to leave their rooms (NFPA, 1982), and insistence on fully dressing or taking belongings with them (NFPA, 1982). Basic fire safety procedures, such as closing doors when leaving a room and not attempting to fight the fire, were sometimes ignored (Bell, 1981). Additional problems were the residents' failure to use the correct exit due to unfamiliarity with the appropriate emergency evacuation exit, and their inability to choose an alternative exit when the primary one was blocked (NFPA, 1982).

These findings indicate a need for some type of fire safety training for children with mental retardation who live in the community and can be extended to mentally retarded persons residing in institutions. Institutionalized persons have a higher incidence of behavior problems and, generally, function at lower levels of mental retardation than those who live in the community (Eyman & Borthwick, 1980; Eyman & Call, 1977). These additional handicaps lower their self-preservation skills and

increase their risk of becoming fire victims despite the more protected environment in which they live. If moved to the community without providing them with training immediately following their move to the less restrictive environment, they may be at even a higher risk for becoming victims of fire than those who presently live in the community.

Both institutionalized and noninstitutionalized populations are frequently given training in independent living and are able to learn a variety of community survival skills (Gollay, Freedman, Wyngaarden, & Kurtz, 1978; Martin, Rusch, & Heal, 1982; Wynagaarden & Gollay, 1976). However, only two studies have been reported which evaluate programs to teach retarded children and adolescents fire safety skills. Jones, Kazdin, and Haney (1981) were the first researchers to develop a multifaceted behavioral program designed to teach emergency fire escape procedures to children. They trained 5 children who were within normal to low normal levels of intelligence to respond correctly to nine home emergency fire situations under simulated conditions. The training program included instructions, shaping, modeling, feedback, and external and self-reinforcement. Training, was carried out in simulated bedrooms at school. They found significant improvements in both overt behavior and self-report of fire safety skills. The gains were maintained at a 2 week follow-up assessment after training had been terminated.

The second study was conducted by Haney and Jones (1982). They assessed a program that included in-home training and assessment, programmed maintenance, incorporated generalization training, and a 6-month follow-up assessment. They used simulated cues to teach one moderately and three severely retarded adolescents the skills needed to exit from their home at night from bedrooms other than their own. Generalization was assessed by periodically testing the subjects in their own rooms. The training included verbal instructions, modeling, behavioral rehearsal, social and tangible external reinforcement,

and self-reinforcement. The results indicated that a multifaceted behavioral program was effective in training retarded adolescents exiting skills in several simulated fire emergency situations in the home. In addition, the maintenance training was effective in maintaining these skills at follow-up time. Although the amount of generalization training varied across subjects, the researchers demonstrated that the subjects were able to generalize the skills subsequent to generalization training.

The previously mentioned studies have provided professionals with preliminary findings that serve as the basis for a closer examination of how to teach fire safety skills to children with mental retardation. For instance, in addition to teaching children the correct procedure to evacuate their residence, they should be taught alternative evacuation routes in case the primary exit is blocked by fire. Furthermore, they should be taught how to respond to a fire emergency regardless of staff presence to provide the necessary verbal and physical cues. Since many fires can be avoided by knowing how to prevent them, adults should also be taught preventive fie safety skills. Further research should be conducted to determine the training components necessary to teach previously mentioned skills.

Purpose of the Study

The purpose of the study was to test a comprehensive training program (Hayden, 1981) that would enable the learning and retention of fire safety skills. As stated in the proposal, the following were seen as appropriate elements in the fire safety program and were initially intended to be incorporated into the training manual:

1. To teach clients basic fire safety techniques such as keeping doors shut at night, crawling, and stop, drop, and roll.

2. To have clients function independently of staff, in order to have clients evacuate during periods of time when the client/staff ratio is low.
3. To teach clients the appropriate manner of acting during a fire emergency.
4. To teach clients to properly use equipment and household objects.
5. To teach the client to evacuate to a specific place.
6. To teach the client to react appropriately to an alarm.
7. To teach the client basic principles of combustion, so that s/he understands the reason behind safety rules.
8. To teach the client fire hazards.
9. To teach appropriate handling of smoking materials.
10. To teach the client more than one fire escape route.
11. To teach the client fire procedure.

Goals and Objectives

The long term goal of this proposal was to reduce the risk from fire for mentally retarded children by increasing their fire safety skills through a training program specifically designed for them. Two questions arise from this goal. First: Can mentally retarded children learn fire safety? Second: If they can be taught, what teaching method is most effective in helping them to acquire and to retain the information and skills imparted? The third objective was to develop fire safety posters and a training manual specifically for the target population that would be available to parents and professionals. Prior to this grant, a program and a number of posters were developed by the senior author (Hayden, 1981). These materials were tested in the pilot study (see Appendix A) and were employed within this study. As a result of the pilot study, the present study omitted teaching the children the principles of combustion and the proper use of equipment and household objects.

METHODS

Setting

The study was conducted in four separate units of a large, community-based, privately operated intermediate-care facility. As residents are admitted to the facility, they are placed in a unit based on their sex, age, and level of mental retardation. As a result, the characteristics of the participants in each cottage were predetermined prior to the study.

Subjects

Eight moderately to mildly retarded white adolescents from each unit were selected by the administrator to participate in the study. Their chronological age and IQ scores were provided by the facility. Group 1 was comprised of 15 to 17 year old boys. Their IQ's ranged from 39 to 67 . Group 2 was comprised of boys who were 14 to 15 years old. Their IQ's ranged from 40 to 55. Group 3 was comprised of girls who were 12 to 15 years old. Their IQ's ranged from 41 to 62. Group 4 was comprised of girls who were 15 to 18 years old. Their IQ's ranged from 41 to 60. See Table 1 for a summary of the subjects' demographic information.

INSERT TABLE 1 ABOUT HERE

Materials

Fire Safety Program Manual. The study employed a program developed by the senior author (Hayden, 1981). The manual (see Appendix B) contains the following components.

Class One: Basic Fire Hazards

Objective: Upon the completion of the first class, the subjects will know basic electrical and cooking hazards. Subjects will increase their awareness of fire hazards throughout the residence.

Classes Two and Three: Basic Preventive Fire Skills and Fire Safety Procedures

Objective: Upon the completion of these classes, the subjects will know the following fire safety procedures: cool a burn; stop, drop, and roll when your clothes catch on fire; over a pan fire; stay low in a smoke-filled area; feel the door for heat prior to opening it; and extinguish an oven fire. In addition, subjects would know the following preventive fire skills: wear tight fitting clothes around stoves and space heaters; keep stove clear from debris; keep matches closed; and keep matches away from children.

Classes Four and Five: Basic Fire Escape Skills

Objective: Upon the completion of these classes, the participants will know the following fire escape skills: roll out of bed; stay low in a smoke-filled area; feel the door prior to opening it; know two fire escape routes; use the "defend in place" strategy when trapped by fire; go to the designated meeting place; do not hide during a fire emergency; and do not refuse to leave the residence.

Class Six: Review

Objective: To review fire safety procedures and fire escape and preventive fire skills.

Fire Hazard Worksheets: Worksheets were distributed to the subjects during Class One. The purpose of the worksheets (See Appendix D) was to help subjects to understand that fire hazards can be found throughout their residence (see Form A of manual-Appendix B). The worksheet was a checklist that listed various fire hazards that could be found in the subjects' bedrooms, living areas, or kitchen areas.

Posters. Fire safety posters (Hayden, 1981) were specifically designed for the training program and were only used in the formal class sessions (see Appendix C). These posters depicted three major skill areas. Preventive fire skills included the following concepts: wear tight fitting clothes around stoves and space heaters; keep a stove clear from debris; keep matches closed; and keep matches away from children. Fire safety skills included the following concepts: roll out of bed during a fire emergency; stay low in a smoke-filled area; feel the door for heat prior to opening it; stop, drop, and roll when you clothes catch on fire; cool a burn; and cover a pan fire. Fire escape skills included roll out of bed during a fire emergency; stay low in a smoke-filled area; feel the door for heat prior to opening it; know two fire escape routes; use the "defend in place" strategy when trapped by fire; go to designated meeting place; do not hide during a fire emergency; and do not refuse to leave the residence.

Slide Program. In addition, the study utilized a slide program, "In Case of Fire: A Fire Safety Program for Mentally Retarded Adults." (National Fire Protection Association, 1983). This program was developed specifically for persons who are retarded. The following segments were used within the following sessions:

Class One:	Segment 15 - Electrical Hazards
	Segment 16 - Cooking Hazards
Classes Two and Three:	Segment 7 - Stop, Drop, and Roll
	Segment 8 - Smoke! Stay Low

Classes Four and Five:	Segment 10 - Test Doors for Heat
	Segment 11 - Trapped by Fire!
Class Six:	Segment 1 - Fire Strikes!
	Segment 6 - Review I
	Segment 12 - Review II

Procedures

Design

The self-preservation skills of all four groups were tested prior to the initial training. Groups 1 and 2 received the classes that were contained within the fire safety program (See Appendix B). Group Two received no classes and Group Four received audio-visual classes that only presented the subjects the slides and the posters (AV). Following the first posttest, Group 1 received no classes. Groups 2 and 3 received the fire safety classes and Group 4 received the AV classes. The study employed a second posttest, which was followed by a five month follow-up test. Figure 1.1 presents the study's design.

Figure 1.1 Research Design

Group 1	O1	T1	O2	T3	O3	O4
Group 2	O1	T3	O2	T1	O3	O4
Group 3	O1	T1	O2	T1	O3	O4
Group 4	O1	T2	O2	T2	O3	O4

Key: O1=Pretest O2=Posttest 1 O3=Posttest 2 O4=Follow-up
T1=Fire Safety Classes
T2=Audio-Visual Classes
T3=No classes

From this design, the following questions were generated:

1. Are classes better than no classes?
2. Are fire safety classes better than audio-visual classes?
3. Is there a difference in performance between males and females?

4. Are two exposures to the fire safety classes better than one exposure?

5. Are two exposures to fire safety classes better than two exposures to the audio-visual classes?
6. Is there a difference in performance between a group who was tested immediately after receiving the fire safety classes and a group who was tested six weeks after receiving the classes?

Pretest and posttests. The pretest and posttests assessed the same material in the same manner and utilized the same forms as those used in training (see Table 2). To assure privacy of all residents who lived on the subjects' living units and to assure that the fire safety training would occur on the units, the rater used one bedroom on each unit for assessment purposes. Prior to the assessments, the rater told the subject the following:

> I am going to tell you some stories. We are going to pretend that we are in the story. After I tell you the story, I am going to ask you what you would do if you were in the story. There are no wrong or right answers. Just show me and tell me what you would do if you were in the Story. Do you understand? (Wait for a response and if there is no response, rephrase the question). What are we going to do?

INSERT TABLE 2 ABOUT HERE

Each situation was tested in the appropriate room of the residence. The rater would read the situation to the subject and ask, "What would you do?" If the subject did not answer, the rater would repeat the question. Upon a verbal or physical response by the participant, each rater would independently

record the responses on the data collection form (see Table 2). Each step provided by the subject was checked. However, the sequence of steps for each situation had to be provided in a defined order for the response to be considered correct. If an incorrect response or other responses were given, the data collector wrote them in the margin of the form. This procedure assured that the rater was in agreement with both correct and incorrect responses. The subject's total score was the sum of all the correct responses.

One person from Group 1 was absent during the second posttest. In Group 2, one subject was not present at followup time. There was one child in Group 3 that was not present during the first and second posttest. Moreover three children from Group 3 were absent at followup. Only one subject from Group 4 was not present at the second posttest.

Task sequence and definition. Correct responses to five task-analyzed situations were identified and assessed (see Table 2). There were 23 different responses (ranging from three to nine steps per situation). Some of the responses occurred in more than one situation. The sequence of each situation was utilized for both instructional and assessment purposes.

Social validation of the behavior. The researchers modified the fire exit responses socially validated by Jones, Kazdin, and Haney (1981) and developed responses for the other fire emergency situations. All of the scenarios, slides, and posters were reviewed and approved by educational personnel of a local fire department. The same personnel participated in the modeling and rehearsal components of the classes.

Rater training. The one rater was a graduate student who was blind to the experimental conditions. The rater was trained by providing her with a manual containing articles on how to interview persons with mental retardation (Sigelman, Budd, Winer, Schoenrock, & Martin, 1982; Sigelman, Schoenrock, Winer, Spanhel, Hromas, Martin, Budd, & Bensberg, 1981; Sigelman, Winer, &

Schoenrock, 1982; Wyngaarden, 1981) and on barriers to communication (Bier, 1977). The senior author and the rater discussed the articles and potential problems involved in a study of this nature. The rater was then provided with data collection forms similar in format to the one presented in Table 1. Additional instructions were also inserted in the raters' forms. The raters were instructed to read the situations slowly and with the necessary affect indicated by the instructions.

Rater reliability. The rater was trained with another student during our pilot study (See Appendix A). They were stationed in the same immediate area simultaneously recorded the behavior of each participant. Inter-rater agreement was calculated for occurrences of correct responses in sequence by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 (Haney & Jones, 1982). Agreement was 100% for the pretest and for all of the posttests. Since inter-rater agreement was high, the study used one rater.

Fire Safety Program. The program consisted of six weekly sessions that focused on specific preventive and evacuation skills and their practical applications under a variety of situations. The audio-visual materials were presented in the living areas of the units. The fire safety training was conducted in either one of the bedrooms on the living units or the unit's kitchen. The format of each class is as follows:

Class One:

A. Presentation of the audio-visual materials
   1. Slide program: Electrical and cooking fire hazards.
   2. Fire hazard posters

B. Distribution of the Fire Hazard worksheets.

C. The trainers distributed the reinforcers and visited with the subjects.

Classes Two and Three:

A. Discussed the Fire Hazard worksheets.

B. Presentation of the audio-visual materials.

1. Slide program: Fire safety procedures
2. Fire safety procedure and preventive fire skill posters

C. Fire Safety Training

1. The two leaders took each subject to the appropriate areas of the residence and describe each fire emergency scenario to the subject.
2. They modeled the correct response option (see Table 3).
3. The subject rehearsed the response option.
4. The trainer provided the subject with verbal and/or physical guidance until the target behavior was performed correctly in three consecutive trials.
5. If the subject was unable to provide a correct response following three consecutive trials, the trainer reviewed the skill with the subject at a later time until it was achieved.

D. The trainers distributed the reinforcers and visited with the subjects.

Classes Four and Five:

A. Presentation of the audio-visual materials.

1. Slide program: Fire escape procedures
2. Fire escape posters

B. Fire Safety Training

1. The two leaders took each subject to the appropriate areas of the residence and describe each fire escape scenario to the subject.
2. They modeled the correct response option (see Table 3).
3. The subject rehearsed the response option.
4. The trainer provided the subject with verbal and/or physical guidance until the target behavior was performed correctly in three consecutive trials.
5. If the subject was unable to provide a correct response following three consecutive trials, the trainer reviewed the skill with the subject at a later time until it was achieved.

C. The trainers distributed the reinforcers and visited with the subjects.

Class Six:

A. Presentation of the audio-visual materials.

1. Slide program: Fire hazards, fire safety procedures, preventive fire safety, and fire escape procedures.
2. Fire hazard, fire safety procedures, and fire escape posters.

B. Fire Safety Training

1. The two leaders took each subject to the appropriate areas of the residence and describe each fire emergency and fire escape scenario to the subject.
2. They modeled the correct response option (see Table 3).
3. The subject rehearsed the response option.
4. The trainer provided the subject with verbal and/or physical guidance until the target behavior was performed correctly in three consecutive trials.
5. If the subject was unable to provide a correct response following three consecutive trials, the trainer reviewed the skill with the subject at a later time until it was achieved.

C. The trainers distributed the reinforcers and visited with the subjects.

INSERT TABLE 3 ABOUT HERE

Maintenance and generalization training. Two aspects of the fire safety classes were manipulated to facilitate response maintenance. First, the schedule of reinforcement was faded both within and across the classes. Similar to Haney and Jones (1982), both feedback and social reinforcement were initially continuous and, eventually, faded to intermittent as the participants demonstrated proficiency in the specific skill.

Second, training was presented in a variety of formats and settings. Initially, information was provided to the participants in their living area through the use of posters and movies. Eventually, the information was presented in-vivo by providing training specific to the various rooms of the residence (e.g., the bedroom and kitchen). To assure privacy of all residents who lived on the living units, the leaders had to use one of the bedrooms on each unit for the fire safety training component of the fire safety classes. The program was structured to increase the probability participants would transfer their training consisted of the following: (a) conducting all of the training in the living units (b) fading of reinforcement, (c) providing appropriate role models by having both male and female leaders during fire safety and audio-visual classes, and (d) presenting cues to the participants that were similar to those that may occur in a real fire during the fire safety classes.

Audio-Visual Program. The program consisted of six weekly sessions that focused on specific preventive and evacuation skills and their practical applications under a variety of situations. This program was presented in the living areas of the unit. The format of each class was as follows:

Class One:

A. Presentation of the audio-visual materials.
   1. Slide program: Electrical and cooking hazards.
   2. Fire hazard posters

B. The leaders distributed the reinforcers and visited with the subjects.

Classes Two and Three:

A. Presentation of the audio-visual materials.
   1. Slide program: Fire safety procedures
   2. Fire safety procedures and preventive fire safety posters

B. The leaders distributed the reinforcers and visited with the subjects.

Class Four and Five:

A. Presentation of the audio-visual materials.
   1. Slide program: Fire escape procedures
   2. Fire escape posters

B. The leaders distributed the reinforcers and visited with the subjects.

Class Six:

A. Presentation of the audio-visual materials.
   1. Slide program: Fire hazard, fire safety procedures, preventive fire skill and fire escape procedures.
   2. Fire hazard, fire safety procedures, and fire escape posters.

B. The leaders distributed the reinforcers and visited with the subjects.

Leader Training. One female undergraduate and one male graduate student were the leaders for both the fire safety and the audio-visual programs. Both students were blind to the experimental conditions. They were provided with a manual containing the same articles that the raters received. In addition, they received the fire safety manual (see Appendix B) and conducted the entire program with near normal to normal women who resided in a community-based group home. The senior author

conducted the first two classes to demonstrate the teaching methods. She attended the remaining classes and provided the leaders with feedback on their performance.

Results

The Wilcoxon matched-pair test and the Wilcoxon two-sample test were employed to test the significance of the results. Where ties were observed in the data, the study employed the tie correction procedure (Marasuilo & McSweeney, 1977). Both tests are known for being more powerful than the *t*-test when the distribution deviates from normality (Conover, 1971) and does not meet the other *t*-test criteria (Blair, 1981; Bradley, 1978). Compared to the *t*-test, the two-sample Wilcoxon test has an asymptotic efficiency of 3/ =95.5% when the assumptions for *t* can be satisfied (Marasuilo & McSweeney, 1977). Under other situations, the efficiency, when compared to the *t*-test, is even greater than unity (Marasuilo & McSweeney, 1977).

Moreover, the study was interested in a small set of specified, planned, nonorthogonal contrasts. Under these circumstances, the multiple matched-pair Wilcoxon tests are appropriate because they are known for their ability to generate powerful tests and to lead to confidence intervals on the scale of the original variable for the median differences (Marasuilo & McSweeney, 1977).

The type of contrasts employed within this study involve redundant information. The outcome of one test is not independent of those for other tests. To decrease the probability that one of the contrasts would be falsely declared significant, the study adapted a larger conceptual unit for error rate that is suggested by Kirk (1982). The study employed the family as the conceptual unit. A description of how the alpha level was distributed is stated in the Across and Within Group Comparison sections.

Across Group Comparisons. For the across group comparisons, the alpha level was divided by the number of contrasts interested

(.05/3=.01667). Each one-tail contrast was tested at an alpha level of .0167 with a critical value (CV) of 2.13. Each two-tail contrast was tested at an alpha level of .0083 (.0167/2=.0083) with a critical value (CV) of 2.40.

The differences (di) between the performance scores of the first posttest and pretest (d1=posttest one scores - pretest score), the second posttest and pretest (d2=posttest two scores - pretest score), and the followup and pretest (d3=followup scores - pretest scores) were compared. The two-sample Wilcoxon test was employed by first combining the differences from both samples, ranking them as an unit, and employing the normal-approximation procedure (Marasuilo & McSweeney, 1977). Hypotheses include the following: (a) the difference in performance scores for subjects in Group 1 will be significantly greater than those for subjects in Group 2 after the first posttest, but the significant differences will not occur in subsequent testing, (b) the differences in performance scores for subjects in Group 3 will be significantly greater than those for subjects in Group 4 at all subsequent testing, (c) the differences in performance scores for subjects in Group 3 would not be different from those in Group 1 after the first posttest, but there would be significant differences at subsequent testing.

As predicted, the difference in performance scores for subjects in Group 1 were significantly larger than those for subjects in Group 2 after the first posttest (TS=3.40; CV=2.13; one tali). In addition, the significant differences did not occur after the second posttest (TS=2.09; CV=2.40; two tail), and at followup (TS=1.40;CV=2.40; two tail). Although the difference in performance scores for subjects in Group 3 were significantly greater than those in Group 4 at the initial posttest (TS=2.36; CV=2.13; one tail), they were not significantly greater at subsequent testing (TS-1.10 and .40 respectively; CV=2.13; c. tail). Contrary to our predictions, the difference in performance scores for subjects in Group 1 were significantly

greater than those in Group 3 after the first posttest (TS=2.96;CV=2.40; two tail). Moreover, there were significant differences among the two groups after the second posttest (TS=2.37; CV=2.13; one tail), but not at followup (TS=1.83; CV=2.13; one tail).

Within Group Comparisons. For the within group comparisons, the alpha level is divided by the number of contrasts interested (.05/4=.0125). All contrasts are one-tail and, as a result, each contrast is tested at an alpha level of .0167 with a critical value (CV) of 2.24.

The matched-pair signed-ranks test employs both the magnitude and the direction of the differences by ranking the absolute values of the differences (di) and attaching to the ranks the signs of the original differences (Marasuilo & McSweeney, 1977). As a result, all samples of n pairs (d1, d2, d3) will have the same set of absolute values associated with the differences. However, the signed values of the ranks will differ with the individual samples. The normal-approximation procedure was also employed with this test. The authors hypothesized that (a) Group One's performance would improve after receiving the fire safety classes, but some deterioration would occur at subsequent testing, (b) Group Two's performance would not improve until after they received the fire safety classes (after the second posttest) and some deterioration would occur at followup time, (c) Group Three's performance would improve at subsequent testing, but some deterioration would occur at followup time, and (d) After receiving the audio-visual classes, Group Four's performance would improve at subsequent testing, but some deterioration would occur at followup time.

As predicted, Group One's performance improved after the initial exposure to the fire safety classes (TS=2.45), six weeks after the initial exposure (TS=2.28). Although not predicted, their performance at followup significantly improved (TS=2.45). For Group Two, their performance did not significantly improve

after receiving no classes (TS=-1.03), but did significantly improve after the second posttest (TS=2.38). At followup, there was no significant improvement in Group Two's performance (TS=1.79). Group Three's results were completely unexpected. There was no significant improvement in their performance at any of the subsequent testing (TS=1.53, 1.86, 1.49 respectively). As predicted, Group Four's performance improved at subsequent testing, but some deterioration over time occurred (TS=2.46,3.55, 2.46).

Discussion

The results from the across group comparisons indicate that there is a difference in performance between males and females. The difference of gender among Groups 1 and 3 may have been the cause for the performance of subjects who received the fire safety classes twice was not significantly larger than those who received the classes only once. Moreover, the leaders and the rater indicated that Group 3 was more active and had more difficulty attending to the classes and the testing than Group 1. Furthermore, Group 1 was two years older than Group 3. These facts may have confounded the results. Additional research should be conducted to analyze the performance of males and female who have different levels of attending skills.

The study indicates that the fire safety classes are more effective than no classes and more effective than a single exposure to the audio-visual classes. However, two exposures to the audio-visual classes appear to be more effective than two exposures to the fire safety classes. This finding may be the result of several confounding factors. First, the leaders and the rater indicated that Group 3 was more active and had more difficulty attending to the classes and the testing than Group 4. In addition, Group 4 was, on the average, two years older than Group 3. The finding may be an indication that the older, more mature adolescent may only need audio-visual materials to learn fire safety.

The results indicate that there is no difference between a group who was tested immediately after receiving the fire safety classes and a group who received the classes six weeks prior to the testing. This finding indicates that (a) Group One was able to retain their significant performance scores six weeks after receiving the classes and (b) Group Two's performance significantly improved after they received the classes. The within group comparisons support this statement. Group One's performance improved after receiving the classes and was able to retain the information at subsequent testing.

Group Two's performance did not improve until the group received the classes, but was unable to retain the information at followup time. The within group comparisons for Groups 3 and 4 clearly indicate that the audio-visual classes were effective for Group 4. However, the fire safety classes were not effective for Group 3. As stated earlier in the section, the fire safety classes may be ineffective because this group was more active, had more difficulty in attending to the materials, was younger, and less mature than the other three groups.

Although the researchers were unable to directly test the generalization and the response maintenance of skills, the results suggest that both probably would not occur. All four groups were unable to demonstrate that they retained the skills at the five-month followup. all of fire safety training and testing occurred in the same bedroom and kitchen. At a <u>minimum</u>, the researchers would expect the subjects to retain and maintain their skills within these two environments. If subjects are unable to meet this minimum, the likelihood of them being able to retain and maintain these skills beyond these environments is very low. The results would indicate that mentally retarded adolescents need frequent exposure to educational materials.

The study tested the efficacy of a multicomponent fire safety training program for mentally retarded adolescents who live in a large, community-based residential facility. The

investigators found that a single exposure to the fire safety program was more effective than no classes and more effective than a single exposure to the audio-visual classes. Furthermore, there appears to be a difference in performance across groups who receive the fire safety classes but who differ in gender. In addition, two exposures to the audio-visual classes seem to be more effective than two exposures to the fire safety classes.

These findings may be the result of a number of confounding factors. The previously mentioned personality characteristics of Group 3 may have been a factor. In addition, the facility's decision to post evacuation procedures may have effected the results. These procedures were different from those taught in the classes. The facility place more emphasis on exiting the living units to a specific meeting place. Their procedures did not emphasize the importance of staying low in a smoked-filled area checking doors for heat prior to opening them, knowing two escape routes, and using the "defend in place" strategy. Moreover, the subjects did not cook or prepare their own meals and snacks in their living unit kitchen. Staff carried out this task for them. Therefore, teaching them preventive fire safety skills in the kitchen may have been meaningless to them and, as a result, they saw no reason to learn those skills.

Table 1: Summary of Subjects Demographic Information

Group	Sex	Type of IQ Test: WISC-R	WASC	BINET L-M	BINET	IQ Range	IQ Mean	Age (Mean)
One n=8	M	7	1	0	0	38-67	48.13	16
Two n=8	M	3	0	4	1	40-55	48.75	15
Three n=8	F	1	0	5	2	41-62	51.5	14
Four n=8	F	3	0	2	3	38-60	48.75	16

Table 2: Fire Safety Situations Data Collection Forms

Instructions: Place a (+) behind each correct response, a (-) behind each incorrect response, and (n/a) behind responses that do not apply to the client. Check "Yes" if the client stated all of the responses in the correct sequence. Check "No" if the client stated the response in an incorrect order.

1. Situation: Say that you are sleeping. You wake up. You you start coughing, your eyes are burning, and you cannot leave through the window. Show me everything you would do. (When the client touches the door tell him/her that the door is hot.)

a. Slide to the edge of the bed.
b. Roll out of the bed.
c. Get into the crawl position.
d. Crawl to the door.
e. Feel the door. Yes:___
f. crawl to the bed No: ___
g. get a blanket
h. crawl to the door
i. push the blanket in the crack
j. crawl to the bed
k. get a blanket
l. crawl to the window
m. open the window
n. place the blanket outside the window
o. close the window
p. stay in the craw position by the window, and
q. wait to be rescued.

2. Situation: Say you are sleeping. You wake up. You hear the fire alarm. Your eyes are not burning, you are not coughing, and you cannot leave through the window. Show me everything you would do. (When the client feels the door, tell him/her that the door is not hot.)

Table 2 (cont.)

a. slide to the edge of the bed
b. roll out of bed
c. get in a crawl position
d. feel the door
e. open the door 1 to 2 inches
f. stand up
g. walk out of the bedroom Yes:_____
h. close the door behind you No:_____
i. walk to the nearest exit
j. go to the designated meeting place.

3. Situation: Say you are cooking dinner one night. You burn your hand on one of the pans. What would you do?

a. Walk to the sink.
b. Turn on the cold water faucet.
c. Run cold water over injured hand. Yes:____
d. turn the water off, and No:____
e. show a staff person.

4. Situation: You are cooking dinner one night. Your shirt sleeve catches on fire. What would you do?

a. Stop. Yes:_____
b. Drop. No:_____
c. Roll.

5. Situation: You are cooking dinner one night. There is grease in one of the pans that you are using. The pan starts on fire. What would you do?

a. Take the cover (or a larger pan than the one that is burning) and place it on the burning pan.
b. Turn the stove off. Yes:____
c. Get a staff person. No: _____

Table 2 (cont.)

6. Situation: Say you are sleeping. You wake up. Your hear the fire alarm. You are not coughing, your eyes are not burning, and you cannot leave through the window. Show me everything you would do. (When the client touches the door, tell him/her that the door is not hot. When s/he opens the door, tell him/her that there is no hot air rushing in. When the client stands up outside of the room, tell him/her that their eyes are burning and they begin to cough. When s/he has gone 5 feet toward the outside of the door, tell him/her that there was a fire in their path.

a. Slide to the edge of the bed.
b. Roll out of the bed.
c. Get into the crawl position.
d. Crawl to the door.
e. Feel the door. Yes:___
f. crawl to the bed No: ___
g. open the door further
h. stand up
i. get back in a crawl position
j. crawl outside the bedroom door
k. crawl back to the bedroom
l. close the door
m. crawl to the bed
n. get a blanket
o. crawl to the door
p. push the blanket in the crack
q. crawl to the bed
r. get a blanket
s. crawl to the window
t. open the window
u. place the blanket outside the window
v. close the window
w. stay in the craw position by the window

Table 2 (cont)

7. Situation: Say you are sleeping. You wake up. You hear the fire alarm. You are not coughing, your eyes are not burning, and you cannot leave through the window. Show me everything that you would do. (When the client touches the door, tell him/her that the door is not hot. When s/he opens the door, tell him/her that hot air is rushing in.)

a. slide to the edge of the bed
b. roll out of bed
c. get in a crawl position
d. feel the door
e. open the door 1 to 2 inches
f. close the door
g. crawl to the bed — Yes: ____
h. get a blanket — No: _____
i. push the blanket in the crack
j. crawl to the bed
k. get another blanket
l. crawl to the window
m. open the window, and
n. stay in the crawl position by the window.

Table 3: Target Situations for Fire Procedures

1. Stimulus Condition: Clothes are on fire.

   Response: (a) Stop (Cover face with hands),
   (b) Drop, and
   (c) Roll.

2. Stimulus Condition: There is a pan fire.

   Response: (a) Take a cover or a larger pan,
   (b) place it on the pan,
   (c) turn the stove off,
   (d) tell a staff person, and
   (e) go to designated meeting place.

3. Stimulus Condition: You have burned your hand.

   Response: Cool a burn
   (a) Go to the sink,
   (b) turn on the cold water,
   (c) run the burn under the water,
   (d) turn the water off, and
   (e) show a staff person.

4. Stimulus Condition: There is smoke entering the room.

   Response: Stay low.
   (a) Kneel on the floor,
   (b) place both hands on the floor, and
   (c) crawl.

5. Stimulus Condition: There may be a fire on the other side of your bedroom door.

   Response: Feel the door
   (a) Place hand on the door,
   (b) place hand on the metal frame of the door,
   (c) open the door 1 to 2 inches,
   (d) see if there is any hot air rushing into the room.
   (e) open the door further,
   (f) see if there is any hot air rushing into the room,

Table 3 (cont)

(g) stand up,

(h) walk out of the bedroom (closing the door behind you),

(i) go to the nearest exit, and

(j) go to the designated meeting place.

Target Situations for Fire Escape Skills

1. Stimulus Condition: Say you are sleeping. You wake up. Your hear the fire alarm. You are not coughing, your eyes are not burning, and you cannot leave through the window. Show me everything you wold do. (When the client touches the door, tell him/her that the door is not hot. When s/he opens the door, tell him/her that there is no hot air rushing in. When the client stands up outside of the room, tell him/her that their eyes are burning and they begin to cough. When s/he has gone 5 feet toward the outside of the door, tell him/her that there was a fire in their path.

a. Slide to the edge of the bed.

b. Roll out of the bed.

c. Get into the crawl position.

d. Crawl to the door.

e. Feel the door.

f. crawl to the bed

g. open the door further

h. stand up

i. get back in a crawl position

j. crawl outside the bedroom door

k. crawl back to the bedroom

l. close the door

m. crawl to the bed

n. get a blanket

o crawl to the door

p. push the blanket in the crack

q. crawl to the bed

Table 3 (cont)

r. get a blanket

s. crawl to the window

t. open the window

u. place the blanket outside the window

v. close the window

w. stay in the craw position by the window

2. Stimulus Condition: Say that you are sleeping. You wake up. You start coughing, your eyes are burning, and you cannot leave through the window. Show me everything that you would do. (The bedroom is on the second floor).

Response: (a) Slide to the edge of the bed,

(b) roll out of bed,

(c) get in a crawl position,

(d) feel the door (the door feels hot),

(e) feel the metal frame of the door (the frame is hot),

(f) crawl to the bed,

(g) get a blanket,

(h) crawl to the door,

(i) place blanket at the bottom of the door.

(j) crawl to the bed,

(k) get another blanket,

(l) crawl to the window,

(m) open the window,

(n) place the blanket outside the window,

(o) close the window on the blanket,

(p) stay in the crawl position by the window, and

(q) wait to be rescued.

3. Stimulus Condition: Say you are sleeping. You wake up. You hear the fire alarm. Your eyes are not burning, you are not coughing, and you cannot leave through the window. Show me everything you would do. (When the client feels the door, tell him/her that the door is not hot.)

Table 3 (cont)

a. slide to the edge of the bed
b. roll out of bed
c. get in a crawl position
d. feel the door
e. open the door 1 to 2 inches
f. stand up
g. walk out of the bedroom
h. close the door behind you
i. walk to the nearest exit
j. go to the designated meeting place.

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APPENDIX A

Teaching Fire Safety Skills to Mentally Retarded Adults Living in the Community

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Abstract

The study was conducted for the following reasons: (a) to train mildly to moderately retarded adults appropriate evacuation procedures, alternative evacuation routes, preventive fire skills and how to respond to a variety of fire emergencies; (b) to program maintenance and generalization; (c) to examine the feasibility of in-home training within a large group setting; and (d) to determine whether a multicomponent program alone or the same program with additional exposure to fire safety materials is the most effective method of teaching fire safety skills to retarded adults. Subjects were assigned to three groups. Group 1 received the program and the booster sessions, Group 2 received only the program and Group 3 served as a wait-list control group. Each group was tested prior to the training, immediately following the initial training program, after the booster sessions and six months after the sessions. Across-group comparisons indicate the initial exposure to the program was effective for both groups. However, the gains made during the initial training were maintained for six weeks for Group 2 but not for Group 1. Moreover, Groups 1 and 2 were unable to maintain their significant performance scores at the six month follow-up. Within-group comparisons indicated that Groups 1 and 2 significantly improved at subsequent testing with some deterioration over time. Implications for clinical application and future research were discussed.

As a result of the deinstitutionalization movement, many formerly institutionalized mentally retarded adults now live in the community (Jacobson, 1982). In addition to providing these individuals with a less restricted environment, the shift from an institutional to a community setting has placed this population in a less protected environment. As a consequence, they are at a higher risk for life-threatening experiences such as fires. For example, recent data suggest that many adults with mental retardation respond inappropriately to potential fire emergencies in a variety of community facilities (Bell, 1979, 1980, 1981; Best, 1984; Holton, 1981; Timoney, 1984). These data are consistent with reported fire casualties among mentally retarded adults who are residents of community-based residences (Bell, 1981, 1983a, 1983b; Best, 1984; Klem, 1984; NFPA, 1982; "Six men killed," 1983; Stone, 1973).

These casualties apparently occurred because the residents' responses to the emergency were constrained by their mental and/or physical impairments (NFPA, 1982). Typical problems were refusal to use windows as exits (Bell, 1981; NFPA, 1982), refusal to leave their rooms (NFPA, 1982) and insistence on fully dressing or taking belongings with them (NFPA, 1982). Basic fire safety procedures, such as closing doors when leaving a room and not attempting to fight the fire were sometimes ignored (Bell, 1981). Additional problems were the residents' failure to use the correct exit due to unfamiliarity with the appropriate emergency evacuation exit and their inability to

choose an alternative exit when the primary one was blocked (NFPA, 1982).

These findings indicate a need for some type of fire safety training for adults with mental retardation who live in the community and can be extended to mentally retarded persons residing in institutions. Institutionalized persons have a higher incidence of behavioral problems and, generally, function at lower levels of mental retardation than those who live in the community (Eyman & Borthwick, 1980; Eyman & Call, 1977). These additional handicaps lower their self-preservation skills and increase their risk of becoming fire victims despite the more protected environment in which they live.

Both institutionalized and noninstitutionalized populations are frequently given training in independent living and are able to learn a variety of community survival skills (Gollay, Freedman, Wyngaarden & Kurtz, 1978, Martin, Rusch & Heal, 1982, Wyngaarden & Gollay, 1976). However, only three studies have been reported which evaluate programs to teach retarded adolescents and adults fire safety skills. Matson (1980) initially taught five institutionalized moderately retarded adults to escape a home fire through a classroom simulation. In the first group (n = 2), the teacher described each step in escaping from a fire around a bed. In response to a question, the subjects then reported how they would react to a fire around their bed area. In addition to the verbal training, the second group (n = 3) received participant modeling that included verbal and/or physical guidance. Sessions for both groups were held each weekday for 20 to 30 minutes. The first group required

seven sessions for both subjects to begin answering all steps of the procedure correctly. The second group, however, required only four sessions. Follow-up data, collected 25 weeks after the completion of the participant modeling, indicated that subjects continued to provide accurate verbal reports without maintenance training, although some deterioration in accuracy was noted. Moreover, the transition from a verbal to a behavioral response was not tested.

Although Matson (1980) demonstrated that institutionalized moderately retarded adults could accurately report how they would respond to a fire, the study was conducted in a controlled simulated environment that had staff present to provide verbal and/or physical guidance to a few subjects. Since training only a few clients can be cost-ineffective for both institutional and community-based residential facilities, research is needed to determine whether mentally retarded adults can be taught fire safety skills in larger groups.

Haney and Jones (1982) assessed a program that included in-home training and assessment, programmed maintenance, incorporated generalization training and a six-month follow-up assessment. They used simulated cues to teach one moderately and three severely retarded adolescents the skills needed to exit from their home at night from bedrooms other than their own. Generalization was assessed by periodically testing the subjects in their own rooms. The training included verbal instructions, modeling, behavioral rehearsal, social and tangible external reinforcement and self-reinforcement. The results

indicated that a multifaceted behavioral program was effective in training retarded adolescents exiting skills in several simulated fire emergency situations in the home. In addition, the maintenance training was effective in maintaining these skills at follow-up time. Although the amount of generalization training varied across subjects, the researchers demonstrated that the subjects were able to generalize the skills subsequent to generalization training.

Rae and Roll (1985) studied the effects of 48 weeks of daily practice sessions on the evacuation time and the amount of assistance needed during fire drills for ten profoundly retarded adults who lived in a group home. Prior to the fire drill, staff persons were assigned to specific areas of the residence to provide verbal and/or gestural cues for the subjects. If the subjects did not respond to the cues in the first 30 seconds of the drill, the staff provided physical guidance. When all subjects reached the evacuation site, staff verbally praised those subjects who evacuated within the criterion time period. The result was that the mean evacuation time for the subjects decreased from 85 seconds to 24 seconds. However, the first noticeable decline in evacuation time occurred after 24 weeks of daily practice. In addition, 57% of the prompts given during the first eight weeks of training were physical cues. For the final eight weeks of training, 80% of the prompts were verbal and only 7% were physical cues.

The Rae and Roll study demonstrated that a combination of daily practice, graduated guidance and social praise were

effective in reducing the evacuation times and the number of staff prompts needed for evacuation. In addition, the study emphasized the importance of persistence in training profoundly retarded adults. Future research may want to examine whether the same amount of time would be needed for mildly to moderately retarded adults.

The previously mentioned studies have provided professionals with preliminary findings that serve as the basis for a closer examination of how to teach fire safety skills to adults with mental retardation. For instance, in addition to teaching adults the correct procedure to evacuate their residence, they should be taught alternative evacuation routes in case the primary exit is blocked by fire. Futhermore, they should be taught how to respond to a fire emergency when staff are unable to provide the necessary verbal and physical cues. Since many fires can be avoided by knowing how to prevent them, adults should also be taught preventive fire safety skills. Further research should be conducted to determine the training components necessary to teach persons the previously mentioned skills. With these concerns in mind, the following investigation was the first in a series of studies to develop a multicomponent training program for residential facilities serving mentally retarded adults. The study's objectives were: (a) to train mildly to moderately retarded adults appropriate evacuation procedures, alternative evacuation routes, preventive fire skills and how to respond to a variety of fire emergencies; (b) to program maintenance and generalization; (c) to examine the feasibility of

in-home training within a large group setting; and (d) to determine whether a multicomponent program alone or the same program with additional exposure to fire safety materials is the most effective method of teaching fire safety skills to retarded adults.

Design

Overview

The study employed a three group pretest-posttest control group design (Campbell & Stanley, 1970). The self-preservation skills of all three groups were tested prior to the initial training. Two experimental groups received the multicomponent fire safety program for six weeks and the control group received no training during this time. Following the first posttest, one group received additional exposure to fire safety materials by attending six weekly booster sessions. The remaining two groups received no training. Each group was tested immediately following the initial training program, the booster sessions and six months after the sessions. After the follow-up assessment, the control group received training.

Multicomponent Training Program

The program consisted of six weekly sessions that focused on specific preventive and evacuation skills and their practical applications under a variety of situations. The objective of the first session was to understand the basic principles of combustion. The second session's objective was to identify and to eliminate basic fire hazards. The objectives of sessions three and four were to learn basic procedures for dealing with

various fire emergencies. The goals of the last two sessions were to learn the appropriate fire escape skills and alternative evacuation routes. Each session included the presentation of a movie and posters that reflected the session's objective and a discussion of their content. The presentation of these materials occurred in the living room of the subjects' residence.

Materials. Posters were specifically designed for the training program and were only used in the formal class sessions. These posters depicted three major skill areas. Preventive fire skills included the following concepts: keep matches closed; keep matches away from flammable liquids; strike matches away from you; keep matches away from children; put matches out in an ashtray; check lighters for cracks; do not smoke in bed; when you are sleepy, do not smoke around furniture; and wear tight fitting clothes around space heaters. Fire escape skills included the following concepts: stay low in a smoke-filled area; feel doors for heat; go to a designated meeting place; do not hide from the staff; and do not refuse to leave the residence. In addition, the following movies were presented during the classes: Learn Not to Burn, Fire Sleuths, EDITH, Exit Drill in the Home, Learn Not to Burn Wherever You Are, and Challenge of the EDITH Superstars. All of the movies were produced by the National Fire Protection Association.

In-vivo training. The last four sessions of the training program included in-vivo training after the presentation and discussion of the audio-visual materials. This training included instructions, modeling, behavioral rehearsal and social

reinforcement. The training was conducted in relevant areas of the residence, such as the bedroom or the kitchen. For these sessions, each group was divided into subgroups.

The senior author and a member of the local fire department were the trainers for this component. During each session, the trainer described a fire emergency scenario to each participant (see Table 1). The trainer modeled the appropriate responses and then each participant rehearsed the responses. All participants were provided with verbal and/or physical guidance until the target behavior was performed correctly in three consecutive trials. If an individual was unable to provide a correct response following three consecutive trials, the trainer reviewed the skill with the participant at a later time until it was achieved.

INSERT TABLE 1

Booster sessions. Booster sessions were held once a week for six weeks at the conclusion of the formal training program. The sessions consisted of a presentation of one of the movies used in the formal classes. The purpose of these sessions was to assess the added effects of repeated exposure to information on fire safety.

Maintenance training. Two aspects of the training program were manipulated to facilitate response maintenance. First, the schedule of reinforcement was faded both within and across the classes. Similar to Haney and Jones(1982), both feedback and social reinforcement were initially continuous and, eventually, faded to intermittent as the participants demonstrated

proficiency in the specific skill. Second, training was presented in a variety of formats and settings. Initially, information was provided to the participants in the living room through the use of posters and movies. Eventually, the information was presented in-vivo by providing training specific to the various rooms of the residence (e.g., the bedroom and kitchen).

Generalization training. The program was structured to increase the probability participants would transfer their training responses to a real fire emergency. Generalization training consisted of the following: (a) conducting all of the training in the appropriate rooms of the residence; (b) fading of reinforcement; (c) providing two different trainers during the in-vivo training; and (d) presenting cues to the participants that were similar to those that may occur in a real fire during the in-vivo training.

Method

Setting

The study was conducted in three of 12 cottages located on the grounds of a large, community-based intermediate-care facility. as residents are admitted to the facility, they are placed in a cottage based on their sex, age, level of mental retardation and the type and degree of maladaptive behavior. As a result, the characteristics of the participants in each cottage were predetermined prior to the study.

Participants

Twelve white adults lived in each of the selected residences. However, one person from each cottage did not complete

the study because of refusal to participate of lack of attendance. Level of mental retardation based on the WAIS, secondary diagnosis based on the Adaptive Behavior-II, the chronological age, the sex and the race of the subjects were obtained from their personal files. Although each cottage had seven to eight residents with secondary diagnoses (e.g., affective disorder, Down's syndrome, conduct disorder, epilepsy and personality disorder), these residents did not display any physical or behavioral problems during the study. More specifically, the residents in each cottage were:

Cottage One. Five mildly and six moderately retarded men participated in the study. They were 20 to 52 years old (mean = 35). The subjects received the program and the booster sessions.

Cottage Two. Eleven mildly retarded women who were between the ages of 29 to 65 (mean = 36). The participants received only the training program.

Cottage Three. the third contained two men who were borderline retarded, eight who were mildly retarded and one who was moderately retarded. They were 22 to 77 years old (mean =40). This group served as a wait-list control group.

Procedures

Pretest and posttests. The pretest and posttests assessed the same material in the same manner and utilized the same forms as those used in training (see Table 1). In addition to the pretest, each subject was tested after Cottages One and Two received the training program (posttest 1), after Cottage One

received the booster sessions (posttest 2) and six months after the second posttest (follow-up). Prior to the assessments, one of the two raters told the participant the following:

> I am going to tell you some stories. We are going to pretend that we are in the story. After I tell you the story, I am going to ask you what you would do if you were in the story. There are no wrong or right answers. Just tell me what you would do if you were in the story. Do you understand? (Wait for a response and if there is no response, rephrase the question). What are we going to do?

Each situation was tested in the appropriate room of the residence. One of the two raters would read the situation to the participant and ask, "What would you do?" If the subject did not answer, the rater would repeat the question. Upon a verbal or physical response by the participant, each rater would independently record the responses on the data collection form (see Table 1). Each step provided by the subjects was checked. However, the sequence of steps for each situation had to be provided in a defined order for the response to be considered correct. If an incorrect response or other responses were given, the data collectors wrote them in the margin of the form. this procedure assured that the raters were in agreement with both correct and incorrect responses. The subject's total score was the sum of all the correct responses.

Task sequence and definition. Correct responses to five task-analyzed situations were identified and assessed

(see Table 1). There sere 23 different responses (ranging from three to nine steps per situation. The sequence of each situation was utilized for both instructional and assessment purposes.

Social validation of the behavior. The researchers modified the fire exit responses socially validated by Jones, Kazdin and Haney (1981) and developed responses for the other fire emergency situations. All of the scenarios, movies and posters were reviewed and approved by educational personnel of a local fire department. The same personnel participated in the modeling and rehearsal components of the classes.

Rater training. The two independent raters were either a staff person and one of the two graduate students or the two students. All of the raters were blind to the experimental conditions. The student raters were trained by providing them with a manual containing articles on how to interview persons with mental retardation (Sigelman, Budd, Winer, Schoenrock & Martin, 1982; Sigelman, Schoenrock, Winer, Spanhel, Hromas, Martin, Budd & Bensberg, 1981; Sigelman, Winer & Schoenrock, 1982; Wyngaarden, 1981) and on barriers to communication (Bier, 1977). The senior author and the raters discussed the articles and potential problems involved in a study of this nature. The raters were then provided with data collection forms similar in format to the one presented in Table 1. Additional instructions were also inserted in the raters' forms. The raters were instructed to read the situations slowly and with the necessary effect indicated by the instructions.

Rater reliability. Raters stationed in the same immediate

area simultaneously recorded the behavior of each participant. Inter-rater agreement was calculated for occurrences of correct responses in sequence by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 (Haney & Jones, 1982). Agreement was 100% for the pretest and for all of the posttests.

Results

The Wilcoxon Matched-Pair test and Two Sample Wilcoxon test were employed to test the significance of the results. Both tests are known for being more powerful than the *t*-test when the distribution deviates from normality (Conover, 1971) and when the distribution does not meet the other *t*-test criteria (Blair, 1981; Bradley, 1978). Ties were observed in the data. As a result, the tie correction procedure was incorporated into both tests (Marasiulo & McSweeney, 1977). The alpha level for both tests was set at .0167 to decrease the probability that one of the comparisons would be falsely declared the probability that one of the comparisons would be falsely declared significant (Kirk, 1968). Therefore, the critical value was 2.12 for both tests.

To test the performance across the two experimental groups and the control group, a series of Two Sample Wilcoxon tests were run. The differences between the performance scores of one group to another group at pretest and the first posttest, at pretest and the second posttest and at pretest and at the follow-up were compared. Hypotheses included: (a) the difference in performance scores for subjects in Cottages One and Two would be

significantly greater than those for subjects in the control group (Cottage Three) at subsequent testing; (b) since the subjects in Cottages One and Two initially received the training program simultaneously, there would be no differences in their performance scores after the first posttest; and (c) since only the subjects in Cottage One received the booster sessions, their performance scores would be significantly better than those in Cottage Two at the second posttest and at follow-up.

As predicted, the change in performance scores for subjects in Cottage One was significantly higher than the change in scores of the control group (Cottage Three) after the first posttest (TS = 3.44). After the subjects in Cottage One received the booster sessions though, their performance scores were not significantly better than those of the control group (TS = 2.03) and were not significantly better six months after the booster sessions (TS = 1.74). The performance scores for subjects in Cottage Two were significantly better than those in the control group after the first and second posttests (TS = 3.88 and 2.33, respectively), but were not significantly better at follow-up time (TS = 1.70). When comparing the experimental group that received the training program and the booster sessions (Cottage One) to the group than only received the program (Cottage Two), no significant differences were found between their performance scores after the second posttest (TS = 1.35) and at follow-up (TS =.57).

Within each group, the authors tested the differences between the performance scores at pretest to those that were

obtained after the first posttest, after the second posttest and after the follow-up. The authors hypothesized the following: (a) the subjects' performance in Cottages One and Two would improve at subsequent testing periods but some deterioration would occur and (B) the subjects' performance in Cottage Three would not improve at subsequent testing.

As predicted, the performance scores in Cottage One significantly improved after the training program (TS = 2.85), after receiving the booster sessions (TS = 2.76) and six months after the sessions (TS = 2.27). similarly, performance scores significantly improved at subsequent testing for Cottage Two (TS = 2.90, 2.85 and 2.63, respectively). Moreover, th performance scores of subjects in both cottages slightly deteriorated over time. As predicted for the control group (Cottage Three), subjects' performance c=scores did not significantly improve after the first posttests (TS = .33) and at follow-up time (TS = .54). However, their scores significantly improved after the second posttest (TS = 2.40).

Discussion

The results from the across group comparisons indicate the initial exposure to the multicomponent program was effective in teaching fire safety skills to retarded adults. The booster sessions, however, were not effective in enabling subjects to retain their high performance scores at the six month follow-up. The results may reflect the need for moderately to mildly retarded adults to receive additional exposure to fire safety materials, but that the materials should be different from those

utilized in this study. considering the fact that the performance scores for subjects in Cottages One and Two were higher than those in the control group after the first posttest, perhaps repeated exposure of the program would be more effective than the booster sessions.

When comparing the three cottages, there is evidence to indicate that the training program is more effective than no training. Moreover, the effectiveness of the program was maintained by the highest functioning group (Cottage Two) for at least six weeks after the initial exposure to the program. In addition, Cottage Two retained significantly higher performance scores than the control group (Cottage Three) after the second posttest while Cottage One did not. Cottage Two also had significantly better performance scores than Cottage One throughout the study. Since Cottages Two and Three were functioning at similar levels, the results suggest that the program most effective for mildly retarded adults. However, repeated exposure (e.g., every six to eight weeks) to the program would be needed to retain high performance scores.

The results from the within group comparisons indicate that the fire safety program was effective for both experimental groups in improving subjects' performance scores immediately following exposure to the multicomponent and at subsequent testing. Although similar results occurred for both groups, Cottage Two's scores were slightly higher at the first posttest. In addition, performance scores of subjects in Cottage One showed greater deterioration than those in Cottage Two at subsequent

testing. These data suggest that the significant improvement in performance scores at subsequent testing probably was not the result of the booster sessions, but the result of the initial effects of receiving the program, as well as differences in the groups' functioning levels.

The unexpected improvement in performance scores for the control group after the second posttest may have been the result of frequent socializing among the three groups and the repeated testing that occurred within a brief period of time. In addition, the improvement may have been the result of the Hawthorne effect, in which the effect of being in the study is strong enough to improve subjects' performance (Achenbach, 1978). Regardless of the cause for the significant improvement, the effect did not result in lasting changes in behavior at the follow-up time.

The finding that the movies were ineffective was unexpected. Although the movies were not specifically developed for retarded adults, all of the subjects indicated that they enjoyed the movies and responded positively to them. As a result, practitioners should not assume that retarded adults understand the content of audio-visual materials simply because they have a positive reaction to the materials. In addition, practitioners should be aware of the time factor involved in employing the multicomponent program. The formal and the in-vivo training components required 30 to 45 minutes. However, the trainers were unabl o conduct the in-vivo training with the larger group. Two smaller groups were created (n = 5,6). Yet, some of the

participants became bored and anxious even within these smaller groups. As a result, some of the subjects received the in-vivo training on an individual basis. Moreover, the attending skills of some of th participants were low. On several occasions, the trainers worked with only one or two subjects while the others waited in the living room. Such problems indicate that large group training may be more difficult than individualized training. These problems must be resolved for large community-based facilities that may prefer to train with large groups rather than on an individual basis.

Another problem with conducting fire safety training in large groups is that individual performance may suffer. Within each group, there was variability in performance. Individuals who are at lower functioning levels, who have limited verbal skills and who have secondary handicaps may not benefit from large group training. Therefore, this graining program may be useful to either the more able adults within a group setting, for the less able adults on an individual basis or for a screener who determines who could benefit from group or individualized programming.

This study tested the efficacy of a multicomponent fire safety training program. The investigation enabled the authors to delete irrelevant and confusing classes and the audio-visual materials. Moreover, the findings of this study have been incorporated into their present research efforts. A project currently in operation will test whether repeated exposure to the multicomponent program is either more effective than repeated

exposure to audio-visual materials that were developed specifically for adults who are mentally retarded or more effective than a single exposure to the multicomponent program.

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Table 1

Task Analysis of Five Fire Emergency Situations and Data Collection Forms

A. Fire Escape Skills

Situation One: The trainer states, "Pretend that you are sleeping. You wake up. Your eyes are itchy, your throat is sore and you smell smoke. Show me everything that you would do."

Response:
1. Slide to the edge of the bed,
2. roll out of bed,
3. get into the crawl position,
4. crawl to the door,
5. feel the door (the door feels hot),
6. open the door one to two inches (there is no smoke),
7. close the door when leaving the bedroom,
8. walk to the closest exit and
9. go to the designated meeting place.

Situation Two: The trainer states, "Pretend that you are sleeping. You wake up. Your eyes are itchy, your throat is sore and you smell smoke. You slide out of bed, crawl to the door and the door feels hot. Show me everything that you would do."

Table 1 (continued)

Response: 1. Crawl to the window,

2. open the window,

3. climb out and

4. go to the designated meeting place.

B. Fire Emergency Skills

Situation One: The trainer states, "Pretend that you are cooking and a fire starts in a pan. Show me everything that you would do."

Response: 1. Take a cover and place it on the burning pan,

2. turn the stove off and

3. tell a staff person.

Situation Two: The trainer states, "Pretend that you are cooking and you burned your hand on one of the pans. Show me everything that you would do."

Response: 1. Walk to the sink,

2. turn on the cold water faucet,

3. run cold water over the injured hand and

4. once the pain has stopped, show a staff person.

Situation Three: The trainer states, "Pretend that you are cooking and your shirt sleeve catches on fire. Show me everything that you would do."

Response: 1. Stop,

2. drop and

3. roll.

APPENDIX B

FIRE SAFETY TRAINING PROGRAM

FOR

MENTALLY RETARDED PERSONS

BY

MARY F. HAYDEN, MSSW, M.A.

INTRODUCTION

Rationale: From 1971 to 1977, there have been 881 deaths caused by fire and flame in residential institutions for the mentally retarded (Vital Statistics, 1977). Eighty-three percent of civilian deaths and 69.9% of civilian injuries occur in residential settings (National Fire Protection Association [NFPA], 1976). Fifty-three percent of all residential multiple-death fires occur between 8:00 PM and 4:00 AM, and 22% between 4 AM and 8 AM (NFPA, 1977). Since most facilities do not have full staff coverage at night, this may be part of the reason for an increase of deaths during a night-time evacuation. The reported cases of mentally retarded persons dying, or being injured, in a fire suggest that the residents were unable to react spontaneously and quickly to the fire emergency (Bell, 1979, 1980; Holton, 1981; "6 Men Killed," 1983; Stone, 1973). Such reactions imply that the residents lacked the knowledge and/or skills to successfully escape. therefore, there is a need to increase their knowledge about fire emergencies.

Goals and Objectives: The following training packet's goals are to teach mentally retarded persons a variety of fire safety skills that they could use when there are no staff present and/or when there is a night-time evacuation. These skills would enable them to react quickly and spontaneously to a fire emergency. The objectives of the following program are to enable participants to understand basic fire hazards, to understand fire procedures, and to understand basic escape skills. The objectives will be obtained by utilizing instructional (discussion and audio-visual materials) and behavioral (modeling, rehearsal, feedback, and positive reinforcement) techniques.

The participants would continue to be taught to always follow staff instructions in a fire emergency and to use the present fire escape routes that the facility presently teaches them. They would be told to use the following skills only when there is no staff person available, or when their normal fire escape route has been blocked by fire or smoke.

Skills: Participants will be taught skills within the following three areas:

I. Procedures

1. Roll out of bed during a fire emergency.
2. Stay low in a smoke-filled area.
3. Feel the door for heat prior to opening it.
4. Stop, drop, and roll when your clothes catch on fire.
5. Cool a burn.
6. Cover a pan fire.

II. Preventive Fire Skills

1. Wear tight fitting clothes around stoves and space heaters.
2. Keep a stove clear from debris.
3. Do not play with matches.
4. When sleepy, do not smoke around furniture.
5. Do not smoke in bed.
6. Keep matchbooks closed.
7. Strike matches away from you.
8. Check lighters for cracks.
9. Put cigarettes out in ashtrays.
10. Keep matches away from flammable materials.

III. Fire Escape Skills

1. Roll out of bed during a fire emergency.
2. Stay low in a smoke-filled area.
3. Feel the door for heat prior to opening it.
4. know two fire escape routes.
5. Use the "defend in place: strategy when trapped by fire.
6. Go to designated meeting place.
7. Do not hide during a fire emergency.
8. Do not refuse to leave the residence.

Classes: The training program is taught within six classes. Each class should be taught once a week. Depending upon the size of the class, each class should be thirty to forty-five minutes in length. Upon the completion of the training program, the author strongly suggests that the caregivers provide follow-up sessions for the participants.

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CLASS ONE: BASIC FIRE HAZARDS

Objective: Upon the completion of the first class, the participants will know basic electrical, smoking, and cooking hazards. Participants will increase their awareness of fire hazards throughout the residence.

Materials: Posters P-093 - P-104
Fire Hazard Worksheet (Form A)
Slide/Tape Program: "In Case of Fire: A Fire Safety Program for Mentally Retarded Adults."*
(Segment 14: Smoking Hazards; Segment 15: Electrical Hazards; Segment 16: Cooking Hazards).

A. Audio-visual Materials

1. Slide/tape program. Present Segments 14-16. Each segment presents a variety of scenes where there are fire hazards. They provide time for participants to find the hazards. The trainer should not move to the next hazard until the participants find the hazard. Therefore, the trainer can turn the tape off in order to provide participants enough time to find the hazards. Only show the segments that are applicable to the facility.

2. Posters. Present those posters that are applicable to your particular group of clients.

P-093 When sleepy, do not smoke around furniture.
P-094 Do not smoke in bed.
P-095 Keep matchbooks closed.
P-096 Strike matches away from you.
P-097 Check lighters for cracks.
P-098 Put cigarettes out in ashtrays.
P-099 Keep matches away from flammable materials.
P-101 Do not play with matches.
P-102 Keep a stove clear of debris.
P-103 Wear tight fitting clothes around space heaters.
P-104 Wear tight fitting clothes around a stove.

B. Fire Hazard Worksheets

The purpose of the worksheet (See Form A) is to help participants to understand that fire hazards can be found throughout their residence. Give each participant a worksheet. Instruct the participants to take the worksheets home, to complete them with their caregivers, to return them at the next class, and that the class will talk about what they found in their residence.

C. Reinforcers

Throughout the class, the trainer should give the participants verbal praise for correct responses. Upon completion of the class, the trainer should give all of the participants edible and verbal reinforcers for their attendance.

*National Fire Protection Association. "In Case of Fire: A Fire Safety Program for Mentally Retarded Adults." Massachusetts Firefighting Academy: Batterymarch Park, Quincy, MA, 1983.

CLASSES TWO AND THREE: BASIC FIRE PROCEDURES

Objective: Upon the completion of these classes, the participants will know the following procedures: cool a burn; stop, drop, and roll when your clothes catch on fire; cover a pan fire (if applicable to the facility); stay low in a smoke-filled area; feel the door for heat prior to opening it; and extinguish an oven fire (if applicable to the facility).

Materials: Posters P-105 - P-110
Slide/Tape Program: "In Case of Fire: A Fire Safety Program for Mentally Retarded Adults." (Segment7: Stop, Drop, and Roll; Segment 8: Smoke! Stay Low).

A. Discuss the Fire Hazards worksheets.

B. Audio-visual Materials

1. Slide/tape program. Present Segments 7 and 8. Discuss the procedures with the participants.

2. Posters. Present the following posters one at a time.

P-105 Stop, drop, and roll when your clothes are on fire.
P-106 Cover a pan fire (if applicable to the facility).
P-107 Cool a burn.
P-108 Roll out of bed during a fire emergency.
P-109 Stay low in a smoke-filled area.
P-110 Feel the door for heat prior to opening it.

The posters should be discussed by the trainer asking the participants to describe the pictures that are depicted on the posters. The trainer should cover half of the poster in order to assure that the participants are discussing the same concept that the trainer wishes to discuss.

C. Fire Safety Training

For each class, half of the problematic stimulus conditions are presented to the participants in the appropriate areas of the residence (See Form B). These stimulus conditions are arranged in hierarchy form from least most provocative. Each training component is repeated until the participant has completed at least two consecutive successful trials. The participant progresses through the components in a sequential manner. If the participant is unable to respond appropriately to a less provocative stimulus condition, s/he does not move to a more provocative stimulus.

1. Introduction. The trainer will explain that the purpose of the training session is to help the participants know what to do in a fire. The participants will learn how to react to a fire emergency (e.g. clothes are on fire), or how to exit safely from the facility during a fire. The trainer will encourage the participants to ask questions and express concerns. The trainer would remain positive and enthusiastic throughout the training sessions.

2. Instructions/Feedback. The trainer will verbally describe a stimulus condition and the appropriate response to the participant. The participant will be asked to repeat the appropriate response. Once the correct response is given within two consecutive trials, the participant will move to the next step. When an inappropriate response is given, the trainer will provide feedback to the participant. The trainer will reinforce the participant for each correct response.

3. Modeling/Rehearsal. Upon the successful completion of the previous step, the following will occur:

   1. The trainer will describe the stimulus condition.
   2. The trainer will model the correct response.
   3. The trainer will present the stimulus condition to the participant.
   4. The participant will rehearse the response.
   5. The participant will evaluate the rehearsal.
   6. The trainer will provide corrective feedback for incorrect responses.

4. Reinforcers. Throughout the class, the trainer should give the participants verbal praise for correct responses. Upon the completion of the class, the trainer should give all of the participants edible and verbal reinforcers for their attendance.

CLASSES FOUR AND FIVE: BASIC FIRE ESCAPE SKILLS

Objective: Upon the completion of these classes, the participants will know the following fire escape skills: roll out of bed; stay low in a smoke-filled area; feel the door prior to opening it; know two fire escape routes; use the "defend in place" strategy when trapped by fire; go to the designated meeting place; do not hide during a fire emergency; and do not refuse to leave the residence.

Materials: Posters P-108 - P-115
Slide/Tape Program: "In Case of Fire: A Fire Safety Program for Mentally Retarded Adults." (Segment 10: Test Doors for Heat; Segment 11: Trapped by Fire).

A. Audio-visual Materials

1. Slide/tape program. Present Segments 10-11. Discuss the skills with the participants.

2. Posters. Present the following posters one at a time.

P-108 Roll out of bed during a fire emergency.
P-109 Stay low in a smoke-filled area.
P-110 Feel the door for heat prior to opening it.
P-111 Know two fire escape routes.
P-112 Use the "defend in place" strategy when trapped by fire.
P-113 Go to designated meeting place.
P-114 Do not hide during a fire emergency.
P-115 do not refuse to leave the residence.

The posters should be discussed by the trainer asking the participants to describe the pictures that are depicted on the posters. The trainer should cover half of the poster, in order to assure that the participants are discussing the same concept that the trainer wishes to discuss.

B. Fire Safety Training

For each class, half of the problematic stimulus conditions are presented to the participants in the appropriate areas of the residence (See Form C). These stimulus conditions are arranged in hierarchical form from least to most provocative. Each training component is repeated until the participant has completed at least two consecutive successful trials. The participant progresses through the components in a sequential manner. If the participant is unable to respond appropriately to a less provocative stimulus condition, s/he does not move to a more provocative stimulus condition.

1. Introduction. The trainer will explain that the purpose of the training session is to help the participants know what to do in a fire. The participants will learn how to react to a fire emergency, or how to exit safely from the facility during a fire. The trainer will encourage the participants to ask questions and express concerns. The trainer should remain positive and enthusiastic throughout the training sessions.

2. Instructions/Feedback. The trainer will verbally describe a stimulus condition and the appropriate response to the participant. The participant will be asked to repeat the appropriate response. Once the correct response is given within two consecutive trials, the participant will move to the next step. When an inappropriate response is given, the trainer will provide feedback to the participant. The trainer will reinforce the participant for each correct response.

3. Modeling/Rehearsal. Upon the successful completion of the previous step, the following will occur:

   1. The trainer will describe the stimulus condition.
   2. The trainer will model the correct response.
   3. The trainer will present the stimulus condition to the participant.
   4. The participant will rehearse the response.
   5. The participant will evaluate the rehearsal.
   6. The trainer will provide corrective feedback for incorrect responses.

4. Reinforcers. Throughout the class, the trainer should give the participants verbal praise for correct responses. Upon the completion of the class, the trainer should give all of the participants edible and verbal reinforcers for their attendance.

CLASS SIX: REVIEW

Objective: Review procedures and skills.

Materials: Posters P-105 - P-115
Slide/Tape Program: "In Case of Fire: A Fire Safety Program for Mentally Retarded Adults." (Segment 1: Fire Strikes!; Segment 6: Review I; Segment 12: Review II).

A. Audio-visual Materials

1. Slide/tape program. Present Segments 1, 6, and 12. Discuss the skills and the procedures with the participants.

2. Posters. Present the following posters one at a time.

P-105 Stop, drop, and roll.
P-106 Cover a pan fire (if applicable to the facility).
P-107 Cool a burn.
P-108 Roll out of bed during a fire emergency.
P-109 Stay low in a smoke-filled area.
P-110 Feel the door for heat prior to opening it.
P-111 Know two fire escape routes.
P-112 Use the "defend in place" strategy when trapped by fire.
P-113 Go to designated meeting place.
P-114 Do not hide during a fire emergency.
P-115 Do not refuse to leave the residence.

The posters should be discussed by the trainer, asking the participants to describe the pictures that are depicted on the posters. The trainer should cover half of the poster in order to insure that the participants are discussing the same concept that the trainer wishes to discuss.

B. Fire Safety Training

Problematic stimulus conditions that participants were unable to master are presented to them (See Forms B and C). These stimulus conditions are arranged in hierarchical form from least to most provocative. Each training component is repeated until the participant has completed at least two consecutive successful trials. The participant progresses through the components in a sequential manner. If the participant is unable to respond appropriately to a less provocative stimulus condition, s/he does not move to a more provocative stimulus condition.

1. Introduction. The trainer will explain that the purpose of the training session is to help the participants know what to do in a fire. The participants will learn how to react to a fire emergency, or how to exit safely from the facility during a fire. The trainer will encourage the participants to ask questions and express concerns. The trainer should remain positive and enthusiastic throughout the training sessions.

2. Instructions/Feedback. The trainer will verbally describe a stimulus condition and the appropriate response to the participant. The participant will be asked to repeat the appropriate response. Once the correct response is given within two consecutive trials, the participant will move to the next step. When an inappropriate response is given, the trainer will provide feedback to the participant. The trainer will reinforce the participant for each correct response.

3. Modeling/Rehearsal. Upon the successful completion of the previous step, the following will occur:

   1. The trainer will describe the stimulus condition.
   2. The trainer will model the correct response.
   3. The trainer will present the stimulus condition to the participant.
   4. The participant will rehearse the response.
   5. The participant will evaluate the rehearsal.
   6. The trainer will provide corrective feedback for incorrect responses.

4. Reinforcers. Throughout the class, the trainer should give the participants verbal praise for correct responses. Upon the completion of the class, the trainer should give all of the participants edible and verbal reinforcers for their attendance.

APPENDICES

FORM A
FIRE HAZARD CHECKLIST

To the Staff: The purpose of this checklist is to help each person become more aware of fire hazards. At the next week's class, we are going to talk about the checklist. If you could help each person fill out this checklist, it would be greatly appreciated. The information will be only used for class discussion. Thank you for your time.

Key: Write in yes, no , or n/a (not applicable) for each question.

Kitchen

_____ Are the cords to the appliances frayed or broken?

_____ Is the excess cord to the appliances rolled up?

_____ Are there any small appliances near the sink?

_____ Is there anything stored above the stove?

_____ Is the wastepaper basket kept away from the stove?

_____ Is the toaster stored under a cupboard?

Living Room

_____ Have you seen worn or frayed extension cords?

_____ Have you seen extension cords run under rugs and carpets?

_____ Have you seen overloaded outlets or extension cords?

_____ Have you seen curtains, furniture, or papers near a space heater or a radiator?

_____ Have you seen matches, lighters, or cigarettes on the tables?

Bedroom

_____ Does your closet have clothes and/or papers on the floor?

_____ Do you store clothes and/or papers under your bed that are not in boxes?

_____ Is there anything blocking the door to your bedroom?

Comments: _____

_____

FORM B
TARGET SITUATIONS FOR FIRE PROCEDURES

1. Stimulus Condition: You have burned your hand.

   Response: Cool a burn.
   (a) Go to the sink,
   (b) turn on the cold water,
   (c) run the burn under the water,
   (d) turn the water off, and
   (e) show a staff person.

2. Stimulus Condition: There is smoke entering the room.

   Response: Stay low.
   (a) Kneel on the floor,
   (b) place both hands on the floor, and
   (c) crawl.

3. Stimulus Condition: There may be a fire on the other side of your bedroom door.

   Response: Feel the door.
   (a) Place hand on the door,
   (b) place hand on the metal frame of the door,
   (c) open the door 1 to 2 inches,
   (d) see if there is any hot air rushing into the room.
   (e) open the door further,
   (f) see if there is any hot air rushing into the room,
   (g) stand up,
   (h) walk out of the bedroom (closing the door behind you),
   (i) go to the nearest exit, and
   (j) go to the designated meeting place.

4. Stimulus Condition: Clothes are on fire.

   Response: (a) Stop (cover face with hands),
   (b) drop, and
   (c) roll.

*Include the following stimulus conditions only if participants cook.

5. Stimulus Condition: There is a fire in the oven.

   Response: (a) Close the oven door with you foot,
   (b) turn the oven off,
   (c) tell a staffperson, and
   (d) go to the designated meeting place.

6. Stimulus Condition: There is a pan fire.

   Response: (a) Take a cover or a larger pan,
   (b) place it on the pan,
   (c) turn the stove off,
   (d) tell a staf[illegible]n, and
   (e) go to desi[illegible]ting place.

FORM C
TARGET SITUATIONS FOR FIRE ESCAPE SKILLS

1. Stimulus Condition: Say that you are sleeping. You wake up. You hear the fire alarm. Your eyes are not burning, you are not coughing, and you cannot leave through the window. Show me everything that you would do. (The bedroom is on the second floor).

   Response:
   (a) Slide to the edge of the bed,
   (b) roll out of bed,
   (c) get in a crawl position,
   (d) feel the door (the door is not hot),
   (e) feel the metal frame of the door (the frame is not hot),
   (f) open the door 1 to 2 inches,
   (g) see if there is any hot air rushing into the room (no hot air),
   (h) open the door further,
   (i) see if there is any hot air rushing into the room (no hot air),
   (j) stand up,
   (k) walk out of the bedroom (closing the door behind you),
   (l) go to the nearest exit,
   (m) go to the designated meeting place.

2. Stimulus Condition: Say that you are sleeping. You wake up. You start coughing, your eyes are burning, and you cannot leave through the window. Show me everything that you would do. (The bedroom is on the second floor).

   Response:
   (a) Slide to the edge of the bed,
   (b) roll out of bed,
   (c) get in a crawl position,
   (d) feel the door (the door feels hot),
   (e) feel the metal frame of the door (the frame is hot),
   (f) crawl to the bed,
   (g) get a blanket,
   (h) crawl to the door,
   (i) place blanket at the bottom of the door.

If the participants are not allowed to open the window:
(j) crawl to the window,
(k) stay in the crawl position by the window, and
(l) wait to be rescued.

If the participants are allowed to open the window:
(j) crawl to the bed,
(k) get another blanket,
(l) crawl to the window,
(m) open the window,
(n) place the blanket outside the window,
(o) close the window on the blanket,
(p) stay in the crawl position by the window, and
(q) wait to by rescued.

*Include the following stimulus conditions only if participants' bedrooms are on the first floor and they are allowed to open the windows.

5. Stimulus Condition: Say that you are sleeping. You wake up. You hear the fire alarm. Your eyes are not burning, you are not coughing, and you can leave through the window. Show me everything that you would do.

   Response:
   (a) Slide to the edge of the bed,
   (b) roll out of bed,
   (c) get in a crawl position,
   (d) feel the door (the door is not hot),
   (e) feel the metal frame of the door (the frame is hot),
   (f) open the door 1 to 2 inches,
   (g) see if there is any hot air rushing into the room (no hot air),
   (h) open the door further,
   (i) see if there is any hot air rushing into the room (no hot air),
   (j) stand up,
   (k) walk out of bedroom (closing the door behind you),
   (l) go to the nearest exit, and
   (m) to the designated meeting place.

6. Stimulus Condition: Say that you are sleeping. You wake up. You start coughing, your eyes are burning, and you can leave through the window. Show me everything that you would do.

   Response:
   (a) Slide to the edge of the bed,
   (b) roll out of bed,
   (c) get in a crawl position,
   (d) feel the door (the door is hot),
   (e) feel the metal frame of the door (the frame is hot),
   (f) crawl to the window.
   (g) open the window,
   (h) go to the designated meeting place.

7. Stimulus Condition: Say that you are sleeping. You wake up. You hear the fire alarm. You are not coughing, your eyes are not burning, and you can leave through the window. Show me everything that you would do.

   Response:
   (a) Slide to the edge of the bed,
   (b) roll out of bed,
   (c) get in a crawl position,
   (d) feel the door (the door is not hot),
   (e) feel the metal frame of the door (the frame is not hot),
   (f) open the door 1 to 2 inches (hot air rushes into the room),
   (g) close the door,
   (h) crawl to the window,
   (i) open the window,
   (j) go to designated meeting place.

B. Stimulus Condition: Say that you are sleeping. You wake up. You hear the fire alarm. You are not coughing, your eyes are not burning, and you can leave through the window. Show me everything that you would do.

Response:
(a) slide to the edge of the bed,
(b) roll out of bed,
(c) get in a crawl position,
(d) feel the door (the door is not hot),
(e) feel the metal frame of the door (the frame is not hot),
(f) open the door 1 to 2 inches (there is not hot air),
(g) open the door further (there is no hot air),
(h) stand up (your eyes begin to burn and you begin to cough),
(i) get back in a crawl position,
(j) crawl outside the bedroom door (there is a fire in your path),
(k) crawl back to the bedroom,
(l) close the door,
(m) crawl to the window,
(n) open the window,
(o) go to designated meeting place.

APPENDIX C

POSTERS

P-093 When sleepy, do not smoke around furniture.
P-094 Do not smoke in bed.
P-095 Keep matchbooks closed.
P-096 Strike matches away from you.
P-097 Check lighters for cracks.
P-098 Put cigarettes out in ashtrays.
P-099 Keep matches away from flammable materials.
P-101 Do not play with matches.
P-102 Keep a stove clear of debris.
P-103 Wear tight fitting clothes around space heaters.
P-104 Wear tight fitting clothes around a stove.
P-105 Stop, drop, and roll.
P-106 Cover a pan fire (if applicable to the facility).
P-107 Cool a burn.
P-108 Roll out of bed during a fire emergency.
P-109 Stay low in a smoke-filled area.
P-110 Feel the door for heat prior to opening it.
P-111 Know two fire escape routes.
P-112 Use the "defend in place" strategy when trapped by fire.
P-113 Go to designated meeting place.
P-114 Do not hide during a fire emergency.
P-115 Do not refuse to leave the residence.