TEACHING HOME SAFETY AND SURVIVAL SKILLS TO LATCH-KEY CHILDREN: A COMPARISON OF TWO MANUALS AND METHODS

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I evaluated the influence of two training manuals on latch-key children's acquisition of home safety and survival skills. The widely used, discussion-oriented "Prepared for Today" manual was compared with a behaviorally oriented "Safe at Home" manual. Data were scored by response criteria developed by experts and by parents' and experts' ratings of children's spontaneous answers. With both methods of scoring, three behaviorally trained children demonstrated clear and abrupt increases in skill following training in each of seven trained modules, and these increases largely persisted in real world generalization probes and at 5-month follow-up. Smaller and less stable increases in skill were found in the three discussion-trained children across the seven modules; lower skill levels were also seen in real world generalization probes and at follow-up. Neither group of children demonstrated skill increases in home safety areas that were not explicitly trained. Both training methods produced small decreases in children's self-report of general anxiety and anxiety concerning home safety. Results are discussed in terms of their implications for cost-effective training of latch-key children.

DESCRIPTORS: safety skills training, accident prevention, maintenance, latch-key children

The absence of appropriate child supervision, especially during the portion of the day when the child is home from school but the parent is not yet home from work, has been cited as the most pressing national problem in the social policy and health care of children (Zigler, 1982). Increasing numbers of children are left to self-care or to the care of only slightly older siblings, as more and more primary caretakers of children join the labor force (e.g., Belsky & Steinberg, 1978). Some researchers have used the term "latch-key children" to describe children who come home alone and let themselves in with a latch-key, often worn around their neck to prevent its loss during a day of play

and schoolwork (e.g., Garbarino & Sherman, 1980).

Data from a variety of sources suggest that such children may form an at-risk population (Roberts, Elkins, & Royal, 1984). For example, latch-key children may be more susceptible to accidents, the leading cause of death in children (Haller, 1970; Marcus, Wilson, Kraft, Swander, Southerland, & Schulhofer, 1960). Children's accidents occur most often in the home and more frequently in the absence of parental supervision (Tokuhata, Colflesh, Digon, & Mann, 1972). Unsupervised children are also more likely to be the victims of home fires (Wheatley, 1973). Furthermore, unsupervised children are easy targets for child molesters (Forcione, 1976) and typically show naive and trusting reactions to adult strangers (e.g., Poche, Brouwer, & Swearingen, 1981).

A small number of behavioral programs have attacked different facets of the problems unsupervised children may face. Children have been trained to recognize emergencies such as fires and personal injury of others and to contact relevant authorities to report such emergencies (e.g., Jones & Kazdin, 1980; Rosenbaum, Creedon, & Drabman, 1981). Other programs have increased children's ability

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to escape in case of fire (e.g., Jones, Kazdin, & Haney, 1981a, 1981b) and to avoid contact with strangers who might be child molesters (e.g., Poche et al., 1981). These programs have typically been used with preschool-age children to prepare them for later situations in which they may not have an adult available to intervene for them. Although each of these programs has demonstrated the ability to prepare children for a single aspect of a "latch-key" existence, there is no research evidence for a comprehensive and yet cost-effective behavioral program that might cover the majority of problems faced by unsupervised children.

Some largely nonbehavioral programs have also evolved to deal with such broad training, although the effectiveness of these programs has rarely been evaluated. In some cases, community mental health centers have made training available to both parents and children, often combining didactic lectures to parents, exercises for children, and reading materials (e.g., Swan, Briggs, & Kelso, 1982). Another approach that has been promoted is the use of a "do-it-yourself" training manual to be used at home by the child and an accompanying adult. Perhaps the most widely used training manual at this time is the "Prepared for Today" manual, currently being distributed to scouting troops across the country as well as schools and to other civic groups by the Boy Scouts of America (1982). The parental or professional effort required for such a program appears to be less than organized didactic programs, as all training is conducted from the manual and the parent is required only to discuss topics in the manual with the child, not to attend any functions outside of the home. Although the opportunity to discuss such issues with an adult is undoubtedly a useful adjunct to home safety training, it is unclear how efficient either didactic lectures to parents or child-parent discussions would be in producing behavioral changes in latch-key children.

In contrast, researchers in applied behavior analysis have uniformly used discrimination training to increase home safety skills (e.g., Jones et al., 1981a; Poche et al., 1981). Because of the uniform success of such approaches, this technique seems a more

proven strategy than group lectures or checklists of items to discuss with the child currently used in many commercial or community sponsored training programs. Yet such training programs have not yet used these techniques. One reason behavioral methods may not have been used in the commercial manuals now being produced is the apparent cost of behavioral training. Some past programs have used as many as 15 training sessions to deal with a single training area (e.g., Jones & Kazdin, 1980) and have used professional teachers as training agents (e.g., Jones & Kazdin, 1980; Rosenbaum et al., 1981). If many areas of training required similar temporal and professional investment, busy working parents might regard the training as intolerable in terms of cost, regardless of the program's ultimate superior effectiveness. Because implementation of behavioral preventive programming should be viewed as an important consideration in its own right (Stolz, 1984), the major goal of this project was the production and evaluation of a behaviorally based training manual which would allow paraprofessionals to teach children a range of home safety skills in a small number of training sessions, comparable to the number of sessions required by other commercially available training manuals.

Several behavioral researchers (e.g., Azrin, 1977; Goldfried, 1980) have recently argued for the tack of comparing new research methods with the best and most widely used current method of intervention, the strategy used in this investigation.

The use of a widely distributed nonbehavioral, discussion-oriented training manual (The Boy Scouts of America's "Prepared for Today" program) was compared with a manual that described the "Safe at Home" program, a behavioral program used by Peterson (in press). Both manuals covered at least four major topic areas: (a) self-care activities (two individual training modules focused on safely preparing snacks and on selection of safe and positive after-school activities), (b) dealing with strangers (two individual training modules focused on how to answer the door and how to answer the telephone when a stranger called), (c) handling emergencies (two individual training modules fo-

cused on how to treat a serious cut and how to react to a fire), and (d) looking after younger children (one individual training module focused on ways of safely and effectively "babysitting" a younger child). These topic areas were selected as representative of areas of expressed parental concern (e.g., Peterson & Scissors, 1983), as including areas considered by some past researchers as important, and as a reasonable sampling of problems to which unsupervised children might be exposed.

METHOD

Participants

Participants were recruited from a community agency which sponsored a "big brother, big sister" program. This program matched qualified volunteer adults with community children. The majority of children in the program were from lower socioeconomic status families, all were attending regular public school classrooms, and four of the six children selected were from single parent families. Parents of prospective participants were randomly selected from a list of children ages 8–10 (because 8 is the youngest age at which a child can legally be left unattended in Missouri; Masters, 1978) who were not yet matched with a big brother or big sister. Six of the first eight parents contacted agreed to allow their child to participate. Of the three boys and three girls who participated, all spent some time at home unsupervised by an adult. The children were randomly assigned to groups: Training group 1 (the "Prepared for Today" group) was composed of a white 7½-year-old girl (Ann), a white 9-year-old boy (Bob), and a black 9-year-old girl (Cathy); Training group 2 was originally composed of a white 9-year-old girl (Debbie), a black 8½-year-old boy (Eddie), and a white 8½-year-old boy, who lived in a rural area some 20 miles from the laboratory and due to repeated transportation problems with training and testing was replaced by a white 10-year-old boy (Frank) after the project had begun. Frank's mother had been among the first eight contacted and had changed her mind about not participating. The

child missed training on two of the modules because of his late start in the program.

Experimenters and Observers

Two male and four female undergraduate students served as experimenters. None had extensive experience with child care or training and none was aware of experimental hypotheses, of the existence of a second training manual, or of the exact content or method of testing.

One male and two female undergraduate students served as observers and performed the testing. The observers were misinformed by the author concerning the need for repeated testing and they believed that the project was an attempt to ascertain the stability of home safety skills in community children. In most cases a child rotated through the entire group of observers twice during the testing sequence so that the observer did not test the child two times back to back. Debriefing at the end of the project indicated some knowledge that the children had changed across the semester but no definite knowledge about either the form or the content of training. The observers believed the experimenters to be volunteers who were providing transportation for the children.

General Training Procedures

Training for both groups was broken into an 8-week sequence and one follow-up training session 5 months after training had ceased. Each week of training involved two afternoon or early evening sessions with each child. One session was used for training only, a second session on a different day was used for testing. Training sessions were considered complete when the child had successfully completed the steps required by the manual (role playing all six correct answers for the behavioral group several times and completing discussion of the problem for the discussion group), and the experimenter felt that the child understood the necessity for each step. Training past 100% criteria was used in both groups to ensure children's ability to access the skills automatically and rapidly after training. Training sessions for both groups ranged from 20 to 90 minutes, and averaged approxi-

Table 1
Schedule for Training and Testing

		Module tested								
Week	Module trained	Activities	Phone	Door	Food	Fire	Cut	Child	Burn	Stranger
1	None	x	x	x	x	x	x	x	x	x
2	Activities	*	x	x	x					
3	Phone		*	x	x	x			x	x
4	Door			*	x	x	x		x	x
5	Food				*	x	x	x		
6	Fire	x	x			*	x	x		
7	Cut			x	x	x	*	x		
8	Child	x	x	x	x	x	x	*	x	x
5-month follow-up	None	x	x	x	x	x	x	x	x	x
5-month follow-up	Review	x	x	x	x	x	x	x	x	x

Note. x indicates a module was tested during a week; * indicates a module was both trained and tested during a week.

mately 40 minutes. Children were typically given a small food treat (e.g., apple, raisins) or a chance to participate in an activity (e.g., taking a walk, playing a board game) after completion of training and testing sessions, as a reward for participating. The reward was not contingent on correct responding.

As can be seen in Table 1, training and testing followed a multiple-baseline design. During the first week, no official training took place. Instead, the experimenters met individually with the child to establish rapport and to go over the training materials with the child's primary caretaker (in all six cases this was the child's mother). Experimenters who would be using the "Prepared for Today" manual went over each checklist item for discussion with the parent, outlining what they intended to discuss with the child and soliciting parental feedback. Thus, the content of training was mutually determined by the parents and experimenters. Experimenters who would be using the behavioral "Safe at Home" manual presented 114 behavioral items which had been selected as optimal responses, acceptable responses, or unacceptable responses (the method for selection and validation of these responses is presented in the next section on *Training Criteria*). All mothers approved the training programs outlined by the experimenters during the first week.

In the subsequent weeks, experimenters from both groups trained the same seven modules: (a) safe after-school activities (labeled *Activities*), (b) safe answering of the telephone (*Phone*) and (c) the door (*Door*), (d) safe selection and preparation of food (*Food*), (e) appropriate responses to a fire in the home (*Fire*), (f) effective intervention for a badly cut hand (*Cut*), and (g) the safe babysitting practices for looking after a young child (*Child*). The final week was spent reviewing all seven modules, in addition to training the *Child* module. Finally, 5 months after training, the children were retested without any review, then they experienced one review session and were retested.

Each group of experimenters met separately with me for a 1 hour (or less) consultation meeting before beginning each new training module. I did not formally train the experimenters in either group. Their knowledge of how to intervene with the children was entirely drawn from the manuals, although they could ask questions to clarify a point if necessary. Typically, the child's performance in the past week was discussed in the meeting and any questions on the present training module were considered. If questions arose on what experimenters using the "Prepared for Today" manual might discuss with the child, I asked the experimenter to use his or her own judgment and to check with the child's parent for further clarification.

tion. The "Prepared for Today" experimenters had no behavioral criteria specified by others (with the exception of parental consultation), whereas the "Safe at Home" manual listed clear behavioral responses to be trained. With this exception, the experimenters were treated similarly. My consultation with both groups dealt with operant training techniques such as the use of small steps, contingent praise, extinction of off-task responding, and the resolution of training and testing scheduling problems. A single meeting after the first 5-month follow-up testing session concluded my consultation.

Selection and Validation of Training Criteria

Because the "Prepared for Today" manual relies on an adult interacting with the child to specify optimal behavior, no preprogrammed criteria were presented to this group. The manual specifies only a list of discussion topics (e.g., "Talk with an adult about how you should answer a stranger who calls on the telephone when you are alone."). Experimenters for these three children were encouraged to use their own judgment, and explicit consultation with the parents was scheduled to produce the criteria for correct responding that they would discuss with the child.

The "Safe at Home" manual used criteria that were initially drawn from past research (e.g., Jones & Kazdin, 1980), parental, teacher, and school counselor suggestions, and from my own experience. Each response was then checked for external validity with relevant experts. The six target behaviors identified as the correct criteria for treatment of a cut hand were approved by a family practice physician and the six target behaviors identified as the correct criteria for responding to a fire were approved by the local fire department officer charged with training fire safety in local elementary schools. The criteria for answering the door and telephone safely were approved by a local police official whose speciality was crime prevention. The criteria for food selection and food preparation were approved by a pediatric nutritionist and the criteria for appropriate after-school activ-

ities and caring for a younger child were approved by several parents not participating in the study. Table 2 shows two examples of the complete six behavior criteria for two modules; the entire sample of 114 criteria can be obtained from me. Finally, a separate panel of 12 volunteer parents who sometimes left their child unattended was drawn from university classrooms. This panel agreed with the final listing of correct criteria to a large degree, with an average of 94% of the parents rating the criteria as correct (range 67% to 100% across items).

Specific Training Methods

The "Prepared for Today" manual specifies a list of discussion topics to be completed by an adult and the child in checklist form. In this case the adult was the experimenter who had discussed the topics with the parent. Occasionally, the manual would specify a subset of the material to be presented (e.g., "Discuss *two* of the four following activities"). In such cases, the experimenter discussed all four rather than just two items. The discussion typically took the form of the child attempting a correct solution to the problem presented, the adult offering some suggestions for change to the child's solution, and the child then demonstrating the corrected solution. Solutions were repeated until both the adult and the child were satisfied with the solution repeatedly offered by the child. Thus, the discussion continued until the adult judged that the child had a clear understanding of the solution.

The "Safe at Home" manual contained a brief description of the rationale for the training and the validation of the criteria and a listing of all 114 criteria. That is, there were 18 criteria (6 optimal, 6 acceptable, and 6 unacceptable responses) for food selection, food preparation, and after-school activities and 12 criteria for each of the other five modules in which there were no merely acceptable categories, only right and wrong responses. The next section described the general methods for teaching the criteria, or the "behavior rules" as the manual labeled them, to the children. The manual again emphasized the importance of frequent ver-

Table 2
Training Criteria

Food selection		
Best response (nutritious, won't spoil meal)	Acceptable (some nutritional value)	Unacceptable (high in sugar, salt, and empty calories)
1. Orange	1. Ice cream	1. Jelly beans
2. Banana	2. Pudding	2. Potato chips
3. Cheese spread	3. Life cereal & milk	3. Marshmallow
4. Carrot	4. Popcorn in a box	4. Candy bar
5. Raisins	5. Homemade cookies	5. Soda pop
6. Glass of milk	6. Pickles	6. Twinkies
Food preparation		
Best response (nutritious, can't injure)	Acceptable (somewhat nutritious, can't injure)	Unacceptable (uses can opener, stove top, or knife, can injure)
1. Grapes	1. Bologna	1. Fry an egg
2. Celery	2. Bread & jelly	2. Can of peaches
3. Peanut butter sandwich	3. Fruit pie	3. Milk shake in blender
4. Orange juice	4. Peanuts	4. Fry a hamburger
5. Cottage cheese	5. Cocoa Puffs and milk	5. Slice a hard sausage
6. Apple	6. Pretzels	6. Open a can of tuna fish
Emergency—cut hand		
Best response	Unacceptable	
1. Wrap a clean cloth around the cut	1. Wash the cut with lots of soap and water	
2. Press firmly on the cut so that it closes and slows the bleeding	2. Clean up the glass	
3. Call the number Mom says to call	3. Shake your hand if it hurts	
4. If you are going to wait a little while, put some ice on the cloth over the cut	4. Wait for Mom to come home	
5. Stay really quiet until someone comes; lie down	5. Call the Operator and say "I need a doctor" and hang up	
6. While lying down, keep your hand a little higher than the rest of your body	6. Walk into town to find some help	

bal reward, the use of a small tangible reward contingent on good performance during learning sessions, extinction rather than punishment of inappropriate responses, and the use of small steps. Then, it noted that for each correct response, a visual cue in the form of an illustrated 3" × 5" card would be presented. The card served as an attention-getting way of initially presenting the criteria to the child. There were several card games suggested by the manual to introduce the correct responses to the children. Details of these games can be found in Peterson (in press). The cards were eventually faded out, and in the last part of training, the child was asked to act out all the correct

behaviors, with the adult role playing the other participant in the scene (for modules like phone, door, fire, and younger child) as necessary. Training was considered complete when the child could rapidly and repeatedly execute all the correct behavioral responding to a given stimulus situation. The manual gave specific instructions for the rationales to be offered the child for each training module, a detailed role play example of a typical training session and some other suggestions for healthy at-home behavior such as the need for continued adult supervision, the need for similar training when other areas of need arise, the need to place emergency numbers near the telephone, the

need for safety containers for poisonous and flammable substances, and the need for home fire inspection and safety drills. Finally, the need for follow-up training was stressed.

General Testing Procedures

Children from both groups were brought to the testing room by the experimenters to minimize the number of strangers picking the children up from school or home. The observers met the individual child at the door of the laboratory and led the child into the testing room. The testing room was introduced as a life-sized "pretend house." Children were asked to demonstrate their responses to different situations just as they would actually behave at home, using objects in the "pretend house." After children had been introduced to the testing room, they were initially exposed to all seven problematic situations. First, they were asked to show in detail several responses they might make when alone after school. Next, a toy telephone "rang" and the children demonstrated how they would handle a persistent adult caller (role played by the observer) who asked such questions as "Is your mother home? Are you home alone? What is your address?" Similarly, children demonstrated how they would deal with a familiar person and a stranger at the door, how they might fix several after-school snacks, how they would deal with a badly cut hand, and how they would look after a small child who might cry, play with matches, refuse to put away toys, or attempt to wander off alone. In each case in which another individual (stranger, 911 operator, young child) was present, the observer enacted this role. The observers wrote the children's responses down in long hand, which extensive pretesting suggested could be done with 100% reliability. These answers were later coded by raters who believed they were coding interviews from 48 different children.

After the children had been tested on the modules for which they would later receive training, children were asked how they would respond to a serious burn on their arm and to a stranger who approached them outside the house with the message that he was supposed to take them to their

mother. These two episodes were presented on pretest, following two training episodes, posttest, and on two follow-up interviews. These two untrained modules were designed to yield an estimate of the extent to which the training might generalize to untrained but similar problem situations. In this study, I sought to assess such generalization from trained to untrained situations because one argument which might be made in favor of the discussion training is that the broader and less specific approach used in the "Prepared for Today" manual might result in children acquiring a more general understanding of the problem areas. Thus, although this group might do less well on the specifics of a given situation, they might perform better than the behavioral group on situations for which they had not received explicit training.

Finally, children were asked a series of questions that attempted to assess possible emotional side effects of training because some local school board members and principals had indicated their reluctance to offer such training which exposed children to problematic situations that might frighten them. Children responded to the Children's Manifest Anxiety Scale (Castaneda, McCandless, & Palermo, 1956) and the Fear Survey Schedule—Children's Form (Scherer & Nakamura, 1968) to assess the children's level of general fears. The Children's Fear Survey Schedule was presented with an "afraid" thermometer which children learned to use: "If you were really afraid of something, you would point to the top of the thermometer scale (5), if you were kind of afraid you would point to the middle (3), and if you were not at *all* afraid you would point to the bottom (1)." All children demonstrated proficiency with the scale prior to the Fear Survey Schedule. Children then used the "afraid" thermometer to answer how afraid they were to deal with five problem situations at home (i.e., being alone when you come home, being left alone around dinner time, being home alone when the telephone rings, being home alone when someone comes to the door, and being home alone), how afraid they were to deal with five emergencies (fire, cuts, babysitting, tornado, getting hurt), how afraid they were in general of

something happening while at home alone and not knowing what to do, how afraid they were of taking care of themselves, and finally, how prepared they felt to stay home alone. After they finished this set of questions, the children were thanked, praised for their efforts (feedback concerning correctness was not given because observers were blind to correct answers), and the children were reunited with the experimenters.

The entire set of problem situations typically required over an hour to complete and was quite tiring for the children. To minimize resistance to testing and practice effects which might occur due to repeating every situation every week, testing was presented in a multiple-baseline fashion as shown in Table 1. The follow-up testing was conducted in an identical manner to the pretesting, testing during training, and posttesting. Children were recontacted after 5 months and were retested on all nine problem situations without any retraining. Then, a single session of less than an hour of retraining was instituted and children were tested on all nine problem situations again. All children completed all testing sessions.

At the end of training, two generalization probes were conducted to assess generalization to the real world environment. The modules selected as the only modules that could be unobtrusively duplicated in the real world were a telephone call from a stranger and a stranger coming to the door. For each child, the experimenter arranged for an individual who was a stranger to the child to call on the telephone and a second stranger to come to the door, posing as a repairman. These individuals used a prepared script and wrote down in detail each response made by the child. These responses were rated in the same fashion as the laboratory responses. Because one parent refused permission for another stranger to come to the house and two families had their telephones temporarily disconnected, it was not possible to conduct the generalization probes at follow-up.

General Evaluation of Performance Procedures

The most logical way of evaluating the children's performance in the "Safe at Home" manual

group was to use the training criteria of six behaviors approved by the experts and parent-panel for each module. This method of evaluation is referred to as the Expert Ratings Scoring Method in the Results section. For the modules of food and after-school activities, children received 1 point for each optimal response, $\frac{1}{2}$ point for each acceptable response, and they lost a point for every unacceptable response. For the other modules in which the criteria were categorized as either acceptable or unacceptable, children received 1 point for each acceptable response and lost 1 point for each unacceptable response. Children received zero credit for responses which occurred out of order (one must look through the peephole *before* answering the door and call the fire department *after* exiting from the house). To compare the performance of the "Prepared for Today" manual children, their performance was also evaluated in this same fashion. It does not seem illogical to examine how closely children in this group were able to replicate the sequence of behavior suggested by parents and experts. However, it could be argued that this method might be biased in favor of the behavioral manual. Thus, a second method of scoring was generated by having parents and experts assign point values to the children's actual responses, rather than assigning points by using the correct responses suggested by the experts. Details of this scoring can be obtained from me. This scoring method will be referred to as the Children's Categorical Rating Method in the Results section.

RESULTS

Interrater Reliability

The three raters were randomly assigned testing data sheets on which the names and other identifying material were covered; they believed they were rating the responses of many children each observed once rather than a few children observed several times. Separate reliability statistics were calculated for each of the nine problem situations, with consistently acceptable coding reliability. Cohen's (1960) Kappa was used as a conservative measure of agreement; it averaged 0.94 and ranged from 0.85 to 0.99.

Figure 1. Expert rating scores on *Activity*, *Telephone*, *Door*, *Food*, *Fire*, *Cut* and *Child* modules for children receiving the discussion-oriented "Prepared for Today" manual and for children receiving the behaviorally oriented "Safe at Home" manual. Panels from left to right represent baseline, treatment, situational generalization (SG), and follow-up (FU). Scores can range from -6 to +6.

Scoring Method 1: Expert Ratings

Discussion group training. The children receiving the "Prepared for Today" manual training demonstrated small but relatively unstable improvements following training; only one child's performance ever reached six out of six potential

points possible on only one of the seven modules trained. As can be seen in Figure 1, a little improvement was seen in children's choice of after-school activities following training for after-school activities, with most children scoring around the midpoints of the scale during training, with slightly higher scores at follow-up. Similar improve-

ments from negative (more unacceptable than acceptable answers) to low positive scores were seen following training on answering the telephone, with greater improvement again on follow-up. This group showed their largest improvements on answering the door, with two of the three children achieving near full criteria scores following training and one of the two children demonstrating sustained effects on follow-up.

Figure 1 demonstrates little stable improvement on children's choice and preparation of food, with predominant fluctuations toward the lower end of the scoring scale during training and low positive scores appearing on follow-up. These children showed slightly more improvement in dealing with fires, with a shift from negative and low scores of 0 and 1 to no negative scores and primarily low and midrange scores following training and at follow-up. Children did not show much improvement on dealing with a cut or looking after a younger child, with the exception of Cathy, who demonstrated near full criteria performance following training but who again had low scores on both follow-up measures.

For the most part, children either maintained or slightly improved on their posttraining performance at the 5-month follow-up but did not show additional gains following the retraining session prior to the last follow-up testing session. Similarly, the generalization from the laboratory situation to the real world probes used for the modules dealing with answering the telephone demonstrated slightly better performances than had been apparent during testing. However, children demonstrated worse performances during the answering the door probe than they had during testing. In summary, the influence of the "Prepared for Today" manual might best be described as having a mild, positive influence.

Behavioral group training. Children receiving the behavioral "Safe at Home" manual showed a different pattern of response. They typically responded at low levels in baseline and near full criteria levels in the first or second testing session following training. One child, Eddie, showed a particularly unstable performance. He was the only child who occasionally refused to respond to a

problem situation when asked to do so and he often quit responding prior to the completion of a problem. Due to Frank's late start, he did not participate in the modules dealing with after-school activities or food preparation (selected by me as the least vital training areas) and he did not receive all of the testing sessions received by the other children. However, enough of his data are presented on the other modules to enable one to evaluate his skill acquisition.

As can be seen in Figure 1, the two children participating in the after-school activities module show low performance in baseline, with Debbie demonstrating criteria performance directly after training and Eddie demonstrating improvements in performance. Eddie refused to complete this first module on both follow-up sessions, and Debbie demonstrated clear maintenance at 5-month follow-up. Clear improvements on answering the telephone were demonstrated as well, with Debbie and Eddie improving from very low or negative scores to near criteria and Frank improving from moderate to full criteria responding. Dealing with strangers at the door also improved, with children increasing scoring from low or moderate levels prior to training to full criteria levels posttraining. Only Eddie did not demonstrate immediate improvement from training (he may have experienced such improvement but it was never measured as Eddie prematurely terminated the role play in the seventh session). All children demonstrated near full criteria responding for this module on both of the follow-up measurement sessions.

Figure 1 shows the children's improvements on food selection, dealing with a fire, a cut hand, and looking after a young child. The two children participating in the food selection module showed low to moderate scores on food selection and preparation prior to training and criteria performance in the two sessions following training and at follow-up. All children showed low level responding to a fire prior to training and criteria or near criteria responding after training, and two of the three children demonstrated near criteria responding at the first follow-up measure, with all children responding at criteria levels following the one-session retraining. Similar responding was seen in response

to the cut hand emergency, with all three children showing very low levels of responding prior to training and criteria levels immediately after training and 2 weeks after training. The same two children demonstrated near criteria performance at follow-up, with all three children scoring at full criteria after one retraining session. Finally, all children demonstrated low initial levels of performance when looking after a young child, with the exception of one moderate score in the fifth testing week by Frank. All children scored at criteria for this module following training. Two of the children remained at criteria at 5-month follow-up and all children scored at or near criteria after one session of retraining.

This group of children responded at full criteria levels to the real world generalization probe of answering the telephone. They performed at greater than baseline levels but at less than full criteria levels for the answering the door probe. For this probe, all three children neglected to ask explicitly to take a message, although two of the three children telephoned their mother to report what the man at the door wanted. Thus, their performance, although not strictly at full criteria levels, appeared to be quite safe and thoughtful.

Comparison of training results. A comparison of the results from children receiving the two kinds of training indicates that the groups were comparable to one another in baseline, across the different training modules, and that neither group improved substantially in baseline. Following training, however, the discussion-oriented "Prepared for Today" training demonstrated either no effect or a slight positive effect on children's responses in problematic situations, whereas the behavioral "Safe at Home" training consistently resulted in abrupt and large increases in effective responding to home problems. The multiple-baseline design, at least for the latter group, demonstrates that training rather than any other external experiences is responsible for children's improved skill. The skills shown during training for both groups were maintained 5 months after training and where maintenance was incomplete, retraining in a single session increased the skill to the levels shown during training for both groups.

Finally, the two real world generalization probes typically demonstrated that children performed much the same in answering the telephone and the door as they had in the laboratory, although both groups demonstrated better performances on the telephone than they did on the door. It is of interest in the latter case that none of the children in the behavioral training group allowed the persistent stranger access to the house without first contacting their mother, whereas two of the three discussion training children did ultimately allow the stranger inside without contacting a parent. All of the children neglected to try to take a message for the stranger.

Cross situational generalization probe. The results from the cross situational generalization probes were quite disappointing for both training methods. Although some transfer of training might be expected from dealing with a badly cut hand to a bad burn, the correct responses to such situations differ greatly (for example, running cold water over a badly cut hand is a dangerous response whereas running cold water over a burn is a suggested response). Similarly, the responses which keep a child safe in the encounters with strangers on the telephone and at the door are not the same responses one should make to a stranger encountered outside the home. As can be seen in Table 3, children showed mostly unstable and low level responding to the *Burn* situation, with children in the discussion group showing a slight decrease in performance from pretest to follow-up and the children in the behavioral group showing a slight increase from pretest to follow-up. The *Stranger outside* module showed a slight improvement in performance for the discussion group and no change for most of the behavioral group from pretest to follow-up. Overall, there was little evidence that either training method affected competent or skillful behavior either positively or negatively in areas that had not been trained directly.

Scoring Method 2: Children's Categorical Ratings

Because it could be argued that using the criteria obtained from safety experts to score the children's answers presented a bias that favored the

Table 3

Children's Criteria Rated Scores on Cross Situational Generalization Tasks of Burn and Stranger Outside (Maximum possible score = 6)

	Burn						Stranger outside					
	Pretraining		Posttraining			Follow-up	Pretraining		Posttraining			Follow-up
	1		2	3	4	5 6	1		2	3	4	5 6
Discussion												
A	2		1	0	X	2 1	2		3	1	X	2 3
B	3		2	1	X	3 3	1		1	0	X	2 2
C	1		2	1	X	0 0	2		4	4	X	4 4
Behavioral												
D	2		3	2	3	3 4	3		3	3	3	3 3
E	1		0	0	0	0 3	2		2	1	2	0 2
F	2		2	0	2	2 3	2		3	3	2	2 3

Note. Due to a clerical error, children in the behavioral group received one more posttraining test than the discussion group.

behaviorally trained group, this second method of scoring was imposed. Raters categorized children's individual responses to the problems and then a panel of parents and experts rated the children's responses. The results of this second method were very similar to the first method of scoring; the correlation between children's responses scored by the Expert Rating Method and the Children's Categorical Rating Method was $r = 0.67$. The results using this open-ended scoring method show more random fluctuation across observation sessions but they tended to parallel the expert criteria evaluated results of training. Specifics from this scoring method can be obtained from me.

Measures of Children's Self-Reported Fears

Several measures of children's self-reported fears were taken at the end of each testing session. These measures were collected for each testing session to evaluate whether or not a training module resulted in abrupt increases or decreases in self-reported fear or confidence. No such changes were noted. In fact, no large-scale changes were noted across the 10 measurement occasions, although a slight decrease was seen on most of the measures of anxiety. Specifics of these findings may be obtained from me. For the most part, these measures suggest mild improvement in children's self-report of general fears and fears of specific home safety situations as

a result of both kinds of training. They do not support the concern that such training may sensitize children of this age or cause them to worry more about their safety.

DISCUSSION

The purpose of this study was to compare a behavioral training manual with a widely used discussion oriented manual, and to demonstrate that the behavioral manual could produce more effective training at the same low cost as the discussion-oriented manual. Untrained paraprofessionals used either the behavioral or discussion-oriented manual for a relatively small number of sessions. Regardless of the method used to evaluate children's behavioral responses, it was clear that the behavioral "Safe at Home" format was superior to that of the discussion-oriented "Prepared for Today" training manual program. Prior to training, both groups demonstrated low levels of correct responding. After training, the children receiving behavioral training consistently demonstrated a higher number of optimal behaviors. Although the discussion-oriented trained children did demonstrate some improvements in performance, the improvements were neither large nor stable. Because the cost for both training programs was equivalent in terms of the paraprofessionals' time, effort, and

reinforcers employed, this comparison would suggest the superiority of the behavioral methods used in past studies dealing with child safety (e.g., Jones & Kazdin, 1980; Rosenbaum et al., 1981). Although with only three participants per group, generality cannot be assured, the consistency within the behavioral group and the comparability of these results to past behavioral studies suggest a general superiority for most participants of the behavioral approach. Such methods typically use a distinct set of correct responses which are shaped and a list of situations in which children are trained to discriminate correct from incorrect responses. This study expanded on this methodology with the use of visual aids which were gradually faded out. Such aids assisted the paraprofessionals in presenting and structuring the very large number (criteria responses $N = 114$) of discriminations to be trained.

The most telling criticism of the present behavioral training method might be that although the children clearly improved their skill levels, they did not uniformly reach 100% correct responding following training. There are two or three potential responses to such a criticism. First, although each child did not emit all six correct responses during each posttraining testing session, no child in the behavioral group behaviorally or verbally suggested a single dangerous response (e.g., no child tried to put out the fire himself, put her badly cut hand under running water, or allowed a stranger into the home . . . all responses which were seen prior to training), and to a great extent children responded near to the 100% correct level. Second, some of the less-than-full criteria responding may represent a measurement artifact. For example, each behaviorally trained child at least once neglected to ask to take a message for the persistent stranger at the door, probably because they had already inquired what the stranger wanted and they had been taught to call their parent in the event that the stranger persisted. Thus, less than criteria level responding does not necessarily mean that the child responded incorrectly. Future work in this field will be challenged by the task of keeping the responses sufficiently flexible to deal with a stranger who does not always give the same cues and yet using

criteria in which each trained behavior is a necessary part of the whole. Finally, it could be argued that if the children could acquire four or five of six correct responses within 1 hour of training, only a small amount of additional training should be required to reach 100% of the trained responses. Future research will also need to deal with the issue of diminishing cost-effectiveness, noting if and when additional training for a few additional responses is a logical solution. The best overall answer to such criticisms might be that the children's safety behaviors were obviously improved and greatly enhanced by this behavioral training and that less than 100% of criterion responding may be acceptable in this preliminary study, with better performance as a reasonable goal for future work in this area.

When considering the probes used for assessing generalization, there was some good and some bad news. The good news was that the probes used to assess the generalization from the laboratory to the real world demonstrated that children performed much the same when encountering a real stranger on the phone or at the door when home alone as they performed in the laboratory role play. Like the maintenance data, these data suggest that at least the behaviorally trained children have acquired a set of skills that they could continue to use in the real world.

The bad news concerning the generalization data assessing the influence of training on other non-trained problems was that little benefit was seen for either training method on areas for which the child had not received explicit training. There was no support for the speculation that the less behaviorally specific and concrete method of training would show an advantage in cross situational generalization.

There was also no support for the concern that training in-home safety skills would somehow provoke worry and fear in children. If anything, increased competence in home safety seemed to result in slight decreases both in general anxieties and in specific fears related to home safety issues.

This research constitutes more than a variation on a theme of home safety skill training. It illus-

trates that it is not necessary to employ a professional teacher or trained research assistant to teach one kind of responding over multiple sessions, but that an untrained paraprofessional can use a training manual in brief consultation with a professional to train children in a large variety of dissimilar home safety skills in relatively few sessions. The study is a demonstration of the cost-effectiveness of a behavioral approach when compared with another commercial manual that is already being used on a nationwide basis, and an illustration that the training has good maintenance, especially when recommended booster sessions are used once a month or so. Finally, the limits of such training are demonstrated—although children's competency is not limited to the training or testing setting but extends to the real world, children's competencies are largely limited to the areas that have been explicitly trained.

Future research is needed to assess other limitations of this method. It is unclear whether younger children could acquire this information so rapidly or if training in large groups would be feasible. It would be useful to assess ways of involving parents in the training of their own children or of evolving methods by which older children could train themselves. Finally, it is important to continue to attempt to develop training methods that will promote better cross situational generalization and maintenance.

The need exists for programming cost-effective training for the child who is placed at risk by being home alone; and this need is steadily increasing (e.g., Garbarino & Sherman, 1980). Many of the methods currently used for such training are un- or underevaluated. The problems of latch-key child safety training constitute an area in which applied behavioral analysts have important contributions to make, in evolving new training methods, in performing behavioral evaluations on existing treatment programs, and in assessing means of implementing cost-effective programming.

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