Teaching Telephone Skills to Developmentally Disabled Persons Using Positive Reinforcement and Corrective Feedback

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TEACHING TELEPHONE SKILLS TO DEVELOPMENTALLY DISABLED PERSONS USING POSITIVE REINFORCEMENT AND CORRECTIVE FEEDBACK

by

Lou Ann Mayhew

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

Western Michigan University Kalamazoo, Michigan December 1979
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Lou Ann Mayhew
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In recent years there has been an increasing interest in teaching skills to promote community independence of retarded citizens. A variety of techniques have been employed toward this end. Initial success was achieved in training some very basic self-help skills. Azrin, Bugle, and O'Brien (1971) and Azrin and Foxx (1971) used a pants alarm apparatus and a toilet signal apparatus to eliminate wetting in profoundly mentally retarded children. O'Brien and Azrin (1972) and O'Brien, Bugle, and Azrin (1972) used verbal praise and a fading of manual prompts in combination with an interruption of inappropriate behaviors to train appropriate mealtime behaviors. Time-out was used by Barton, Guess, Garcia, and Baer (1970) to eliminate inappropriate mealtime behaviors. Horner and Keilitz (1975) combined a least restrictive prompt system, tokens, and social praise to train proper toothbrushing skills.

Recent research in this area has been directed toward more complex skills. Lowe and Cuvo (1976) trained mentally retarded persons to sum coin values using modeling, physical guidance, feedback, and candy as a reinforcer. Delinquent and mildly retarded youths were trained to fill out biographical information on application forms using tokens, praise, and corrective feedback (Clark, Boyd, and Macrae, 1975).
There is some evidence to indicate that the mentally retarded are more likely to participate in an activity if they know how to. Johnson and Bailey (1977) examined the effects of the availability of materials, prizes for participation, and instructional assistance on leisure behavior and found instruction in leisure activities to be the most effective in increasing the amount of time retarded women spent with these activities.

Strong external contingencies may not be necessary for maintenance of skills already learned. Bauman and Iwata (1977) found self-scheduling and self-recording to be more effective than instructions or experimenter-scheduling in the maintenance of mealtime preparation and housekeeping skills with the mentally retarded in an independent living situation.

Although a wide variety of operant techniques have been used to train these kinds of skills, one combination, social praise and corrective feedback, has been successfully used and reused. Further, skills trained using these techniques have generalized from the classroom setting to the natural environment. Page, Iwata, and Neef (1976) trained mentally retarded males in street-crossing skills in the classroom setting using social praise and corrective feedback. These skills generalized to the natural environment. Subsequently, it was found that these same
techniques could be extended to train clients in the use of a city bus (Neef, Iwata, and Page, 1978). Again, training occurred in the classroom with generalization to the natural environment. Furthermore, it was found that training in the classroom occurred equally as rapidly and as effectively as in the natural environment and at a considerably lower cost. Nutter and Reid (1978) taught severely and profoundly mentally retarded women to select fashionable, color-coordinated clothing using modeling, instruction, and practice in combination with social praise and corrective feedback. Again, these skills were taught in the classroom and generalized to the natural environment.

These kinds of skills are necessary for deinstitutionalization and, further, for independent living in the community. Ray (1974) found that by training parents in methods of behavior change, parents were more capable of caring for their children in the home setting. This gives parents options other than institutionalization—e.g., educational and vocational training programs or group homes. Training the children in the school setting should increase the rate with which this can occur.

Bouruchow and Espenshade (1976) found that increasing the independence of the higher functioning young retardate by teaching self-care skills and the use of public transportation and community facilities increased their level of socialization.
It is this author's hypothesis that training the use of the telephone would further increase the level of socialization of the higher functioning retardate. Very little research has been done in the area of telephone usage. Leff (1974) examined the use of specially designed aids to teach trainable mentally retarded and lower educable mentally retarded persons and found that younger children (below age five) required a color-coded aid, whereas those older than five could learn to use the telephone using an aid with numbers only. The device consisted of a sliding frame which exposed one digit/color at a time in successive order. A disc coded in the same manner was placed over the dial. Dialing consisted of matching the digit/color in the frame to that on the disc, inserting the finger in the dial, and dialing. The frame would then be moved to the next digit/color.

Emergency telephone skills, e.g. knowing when and how to dial the fire department, police department, or ambulance, are important skills. These skills require verbal skills as well as motor skills. With operant teaching techniques, most developmentally disabled persons should be able to acquire these skills.

The primary purpose of the present study was to teach telephone usage (the necessary verbal and motor skills) to developmentally disabled young adults using
social praise and corrective feedback. This included emergency use and casual social use. Further, it was an attempt to determine if these skills could be acquired without the use of any specially designed aids since these aids are generally not present outside the home setting.

METHOD

Subjects

Five students, aged 21 to 26, enrolled at the Kalamazoo Valley Multihandicap Center (KVMC), a program for the physically and mentally impaired, participated as subjects. The subjects' handicaps were as follows:

Subject 1 was totally blind (congenital blindness) and mentally impaired.

Subject 2 was visually impaired (legally blind) and cerebral palsied. Subject 2 had been known to use the telephone by calling the operator and having her obtain the telephone number and make the connection for him.

Subject 3 was trainable mentally impaired and emotionally impaired, with a slight hearing impairment.

Subject 4 was speech and language impaired and educable mentally impaired. Subject 4 left the program halfway through the study. Training and probes were continued in the subject's home.

Subject 5 was trainable mentally impaired, emotionally impaired, and speech impaired.
All subjects received a half-day of classroom instruction and a half-day of prevocational workshop activities each school day.

Setting and Apparatus

All sessions were conducted either in the classroom or in the workshop, except for subject 4, mentioned earlier. The time the session was conducted was held constant for each subject.

A Bell Telephone kit for training telephone skills was used. Two telephones could be plugged into this. Push buttons allowed the experimenter to make the dial tone, busy signal, or ring, as appropriate. Two telephones, a standard dial and a standard push-button, were used.

A 3 inch by 5 inch index card was used to indicate the telephone numbers for the fire department, police department, and ambulance. (See Appendix A). All subjects used the same card with standard lower case letters with the exception of subjects 1 and 2. Subject 2 used all capital letters in training all subject areas in school, so a card with all capital letters was used to maintain consistency. (See Appendix B). Subject 1 used a braille card. (See Appendix C). For the sighted students, picture symbols taken from the Kalamazoo Telephone Directory were used as an additional means of identification.
Procedure

A multiple baseline design across subjects was used. One subject began intervention at a time; approximately one week elapsed before the introduction of intervention for the next subject.

Sessions were approximately one-half hour a day, at the same time each day, five days a week for the duration of the study, with the exception of subject 4. After leaving the program, subject 4 participated in two to three sessions a day, two to three days a week. (Sessions were always separated by at least fifteen minutes of some other unrelated activity.) All responses were recorded (+) for a correct response and (-) for an incorrect response or any approximation of a correct response.

During baseline, probes were conducted which consisted of verbally presenting one of the simulated emergency situations (see Appendix D) to the subject. On the table before the subject were two telephones—a push-button and a dial, as well as the appropriate 3 inch by 5 inch index card. Subjects were allowed to choose which telephone they desired to use. Those who made no choice were trained on the type of telephone present in the home setting. Those who made a choice picked the type present in their home. The behaviors examined were (1) to tell what to do (who to call) in an emergency situation, (2) to pick up the receiver before dialing, (3) to dial all
digits correctly, (4) to state the situation, (5) to express the need for help, (6) to state the correct address, and (7) to hang up. (8) In addition, the phone had to be held to the ear and mouth throughout the time the subject talked with the emergency personnel. All responses were recorded during probes; however, no feedback was given. Subjects were praised for paying attention, sitting still, or other appropriate behaviors not related to correct answers.

After verbally presenting one of the simulated emergency situations, the experimenter would ask, "What would you do?" If the subject answered correctly, the experimenter would say, "Show me." If the subject made any approximation of dialing, the experimenter would perform the role of the emergency personnel. Therefore, if the subject dialed incorrectly, he still had the opportunity to exhibit the verbal skills. If the subject did not answer correctly to "What would you do?", the experimenter would prompt the subject by asking, "Would you call anyone?" If the subject answered "Yes", the experimenter would ask "Who?" If the subject answered correctly, the experimenter would say "Show me." If the subject answered "No" the experimenter would record a (-) in all remaining spaces. (For a sample data sheet, see Appendix E.)

Phase 1 of the intervention consisted of training the subject to identify and read the telephone number for
each emergency service. The experimenter would ask, "What is the telephone number for ____?" If the subject answered correctly, the experimenter would praise him, e.g. "That is right." or "Good!", etc. If the subject answered incorrectly, the experimenter would tell the subject the correct answer and repeat the trial. Criterion for movement to the next phase was 100% accuracy for two consecutive sessions. This criterion was used for all phase changes.

Next, another probe for each emergency department was conducted exactly as in baseline. The probe examined the same eight behaviors as baseline.

Phase 2 consisted of training the verbal skills necessary to make an emergency call, i.e. what to do (call for help), who to call, how to state the situation, ask for help, and to state the subject's home address. A trial consisted of verbally presenting a simulated emergency situation and asking what to do. If the subject answered correctly, praise would follow as discussed previously. If the subject did not answer or answered incorrectly, the experimenter would say the correct answer and the trial would be repeated. When the subject answered correctly, how to state the situation and the subject's address were trained in the same way (forward chaining).

Next, a probe was conducted exactly as the post-Phase 1 probe.
During Phase 3, the subject was trained in the actual telephone usage. A trial was conducted exactly as in baseline except that the subject received praise contingent upon a correct response and was told the correct response when an error or no response was made, and, as before, the trial was repeated.

The manual skills were trained by using forward chaining. The skills were to pick up the receiver, correctly orient the receiver to the mouth and ear, listen for and state that a dial tone was heard, dial the numbers in correct order, listen for and state that the telephone rang, and replace the receiver on the telephone when finished.

During this phase, a prompting procedure was used whenever an incorrect or no response was emitted. The minimal effective prompt (Horner and Keilitz, 1975) was always used, if successful. The most minimal prompt, a verbal prompt, would be to tell the subject what to do. If unsuccessful, a demonstration prompt would be used—the experimenter would demonstrate the correct response. If this, too, was unsuccessful, the subject would be manually assisted (a physical prompt.)

Following Phase 3, subjects were again probed exactly the same as after Phase 1. Initially, any portion of the sequence which was incorrect during these probes was retrained and then probed again. When it became apparent that this procedure was not as effective as desired, it was later changed to continuous (successive) probing until
responding stabilized (responding at exactly the same level for at least five consecutive probes.)

Next, a probe was conducted using the untrained, alternate type of telephone (dial or push-button) exactly as in baseline.

Phase 4 consisted of training the use of this telephone for all subjects who did not respond with 100% accuracy during the probes. This was followed by probes exactly as in post-Phase 3. Again, responding was continued until stable.

Next, a probe was conducted on some "social" telephone numbers. These included a parent's number, friend's or relative's numbers. All subjects were probed on two numbers with the exception of subject 4 who was probed on three and subject 5 who was probed on one.

Phase 5 trained the correct response for any errors made in the probes. Following training, subjects were again probed until responding was stable.

Reliability

A total of 132 reliability checks were taken. Reliability was taken approximately once in each phase for each subject and on about one-half the post-Phase 3 probes and alternate telephone probes. Reliability observers were other staff from the program. Members of the family of the subject did reliability for subject 4 after leaving the program.
Reliability was computed by dividing the total number of agreements by the sum of the total number of agreements plus disagreements. Reliability ranged from 98% to 100% with a mean of 99.9%.

RESULTS

All subjects acquired the necessary verbal and motor skills to make an emergency telephone call at 100% accuracy for at least five consecutive probes. The range in the number of training sessions and probes required to reach this level was 25 to 68 with a mean of 44.6.

All subjects learned to use the alternative type of telephone. Subjects 2 and 4 responded better during pre-training on the second style of telephone than on the one the original training occurred on. Subjects 3 and 5 responded with 100% accuracy on probes with the alternate style telephone without additional training. Subject 1 responded to the alternate telephone prior to training exactly the same as with the original telephone.

All subjects learned to dial at least one "social" telephone number. Subject 5 responded with 100% accuracy on the "social" probes without additional training. Subject 3 accurately responded during during the "social" probes, his only error being a failure to pick up the receiver. An accuracy of 100% was achieved following training. Subjects
2 and 4 made errors during the first few probes but achieved 100% accuracy without training. Subject 1 responded at 0% during probes but achieved 100% following training.

DISCUSSION

Since all subjects acquired the verbal and motor skills necessary to make an emergency telephone call, it is probable that corrective feedback and social praise are effective in training these skills, thus replicating the Page, et. al. (1976) and Neef, et. al. (1978) studies and extending their findings to the training of telephone skills. Since these studies concentrated on motor skills, the present study further extends the successful use of the techniques of social praise and corrective feedback to verbal skills.

Generalization to the home environment is difficult to evaluate in this study. Following completion of the study, subject 1 began further training of telephone skills in the group home where he lived and subject 3 spent much of his time in a state institution where use of the telephone would not be encouraged. Subject 5 was also in a setting where telephone usage would not be encouraged, and, of course, subject 4 completed training in the home setting.

The results of this study are consistent with those of the Leff (1974) study—trainable and educable mentally
retarded citizens can be trained to correctly use the telephone. In addition, in the present study, not only were the subjects trained in the necessary motor skills, subjects also learned to identify an emergency situation, who to call, and the verbal skills necessary to complete that call. Furthermore, this was done without the use of any specially designed dialing aids.

Performance of the emergency probes improved as would be expected from the content of the probe items and that which was trained during each phase. Based on this, it would be expected that the typical subject who performed at a level of less than 50% during baseline would perform at approximately the same level following Phase 1 since the material trained during that phase was primarily pre-requisite skills and was not directly tested in the probes. Following Phase 2, a performance level of approximately 50% would be expected. Following Phase 3, successful training would be indicated by 100% accuracy on the probes. The mean level of responding for all subjects was 27.6% for baseline, 27.8% for post-Phase 1, 54.2% for post-Phase 2, and 100% for the last five probes of post-Phase 3. The probe data sheets indicated that the improvement in performance corresponded to the material trained during that phase. Thus, it is apparent that training was responsible for the improvement in skill levels.
Two subjects, 3 and 5, showed total generalization across telephones, as shown by the level of responding of 100% on the alternate style telephone. Subjects 2 and 4 showed partial generalization across telephones as displayed by an average level of responding of 80% during the alternate style telephone probes. Since both style telephones were present during baseline, it seems likely that the increased level of responding was due to generalization. Subject 1 did not display any generalization. This was probably due to his blindness which made it impossible to read the numbers on the push-button telephone. (He was trained on a dial telephone.)

It is difficult to evaluate generalization across telephone numbers since there was no initial baseline on the "social" numbers. The "social" numbers were added to the end of the experiment to promote maintenance of telephone skills since the frequency of emergency calls the average person makes in a lifetime is near zero. Use of the telephone in a social manner would promote the continued use of the telephone and would therefore aid in the maintenance of general use of the telephone.

Parents of all subjects stated in an interview that their child had not been able to dial these "social" numbers prior to the start of the study. Therefore, it would seem that generalization across numbers occurred
for subjects 2, 3, 4, and 5 as shown by 100% level of responding for subjects 2, 4, and 5 and a 75% level for subject 3. Interestingly, subject 3 dialed all the numbers correctly; his only error was a failure to take the receiver off the hook prior to dialing. Subject 1 did not initially show generalization during the probes. However, he was unable to read the names and numbers. Following training on reading the names and numbers, partial generalization across numbers occurred.

Many of the errors made in the post-Phase 3 probes concerned a confusion of situations. Thus errors frequently consisted of saying a tree was on fire rather than a house, or that someone was breaking into a house instead of the garage. These errors were counted as such, but were not serious since those statements would have obtained the same kind of necessary help provided the rest of the sequence was performed correctly.

Subject 5 appeared to be confused by the fact that the word "house" appeared in both a fire situation and a police situation and frequently erred in determining which emergency department to call. This difficulty was, however, eliminated with continued trials.

Following Phase 3, subjects did not all initially respond with 100% accuracy and yet would respond with complete accuracy on the first trial of retraining. It became apparent that subjects were not responding relia-
ably. Subjects would meet criterion to end Phase 3 but would not achieve 100% accuracy on the post-Phase 3 probes. Upon retraining, subjects would respond at 100% accuracy in the first two trials but again performed at a lower accuracy on the probes. At that time the procedure was changed to one of continuous (successive) probing. Eventually all subjects responded with 100% accuracy for at least five consecutive probes.

There are several skills which would be necessary for continued extensive use of the telephone which were omitted in the present study. These skills were not included since the primary purpose of the present study was to determine if basic telephone skills could be trained. These excluded skills could easily be trained in a similar manner to that used in the present study. One skill which would be important to learn which was not included is what to do when a call does not go through—e.g. when one gets a busy signal or the telephone malfunctions in some way. Another important skill would be to be able to report an address other than a home address in an emergency situation. These skills would be important in future research.

There was a trend for those subjects with visual, motor, or other physical handicaps to require more time to acquire the motor skills whereas those with speech and language impairments tended to require more time to learn the verbal components. However, since all students learned
the necessary skills, it seems that most students can learn these skills. They may just need more time and help, particularly with the skills that are in their deficit areas.

Since the use of the telephone is predominantly a social skill, the ability to use it properly could be an important addition to one's repertoire of social skills and one's independence in community life.
Figure 1: Per cent correct responses per session or probe
Appendix A

Fire
343-2661

Police
385-8111

Ambulance
343-1331
Appendix B

FIRE
343-2661

POLICE
385-8111

AMBULANCE
343-1331
Appendix C

Fire

343-2661

Police

385-8111

Ambulance

343-1331
Appendix D

SIMULATED EMERGENCY SITUATIONS

You are in the yard and someone falls from a ladder and appears to be unconscious.

You hear a crash. You see a car rolled onto its side. Someone is laying on the ground beside it. He is moaning.

You are watching television. You look out your window and see smoke and flames coming from your neighbor's roof.

You get off the bus from school. You see smoke and flames coming from a tree down the road.

You are home alone. The doors are locked. You hear funny noises by your door and look out the window. You see someone trying to pry the door open.

You are home alone. Your parents are not expected home for hours. You hear funny noises in the garage. You look out the window and see someone you have never seen before in the garage.
Appendix E

PROBE DATA SHEET

1. What should you do? (Call _____)
2. Picks up receiver first.
3. Dials correctly.
4. States situation accurately.
5. Asks for help.
6. States address correctly.
7. Hangs up.
8. Held phone to ear through entire call.
REFERENCES


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