

# A FIELD TESTED SYSTEM OF TRAINING MEAL PREPARATION SKILLS TO THE RETARDED

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*Twenty-four moderate-severe mentally retarded adults were trained in a variety of meal preparation skills using modelling, instructions, feedback and social reinforcement. Acquisition of targeted skills occurred in a matter of weeks with maintenance reported at 6-12 months. Generalisation of training to other meal preparation skills and settings was also observed.*

A number of experimentally validated training procedures for the mentally retarded have appeared with most of the studies dealing primarily with rudimentary skills such as eating behaviour (Azrin and Armstrong, 1973) and self-dressing (Martin, Kehoe, Bird, Jensen and Darbyshire, 1971; Treffry, Martin, Samuels, and Watson, 1970). A few studies have also appeared in which "advanced skills:" such as understanding coin equivalence (Trace, Cuvo, and Criswell, 1977), leisure behaviour, and self-monitoring (Matson, in press) have been taught. While many procedures for training critical skills such as those referenced, have been developed, one critical behaviour that has not been trained is meal preparation. Because of the importance of training the mentally retarded to independently prepare food, and the proven effectiveness of social learning oriented behavioural approaches, the present paper was devoted to the description of a field tested method of training meal preparation emphasising modelling, instructions, feedback and social reinforcement.

## METHOD

**Participants and setting.** Twenty-four mentally retarded adults (twelve males and twelve females in the moderate to severe range of retardation based on the Stanford-Binet or WAIS, and AAMD adaptive behaviour scale) were trained. Subjects were chosen from one hundred and fifty retarded adults of similar intelligence. Subjects were selected because they had the most adaptive skills and because they had a desire to learn to cook. Other assets of the subjects were appropriate toileting, dressing skills (putting on shirt, blouse, shoes, etc.) and the lack of major maladaptive responses such as physical and/or verbal aggression. Subjects also had a knowledge of basic colours (e.g. red, green, blue) which was an important skill for training food preparation. Deficits included lack of vocational skills, pedestrian and shopping behaviour and meal preparation skills. All subjects were ambulatory, had the use of their arms and hands, and had sufficient manual dexterity to manipulate common kitchen utensils.

Training was done in an area (20' x 40') specifically designed for meal preparation by the retarded. The room consisted of two complete sets of appliances and utensils such as electric stoves, kitchen cabinets, wash basins, can openers, dishes, silverware, etc. which had been colour coded for ease of discrimination.

**Target Behaviours and Assessment.** Twenty-one behaviours were trained in five units. These behaviours were a simple and intermediate breakfast or lunch and prerequisite skills in kitchen maintenance. Subjects were taught socially appropriate food to eat and were among those in the training facility closest to placement in the community, a less restrictive setting as defined by the concept of normalisation (Wolfensberger, 1972). Training was done by teaching the preparation of a number of foods simultaneously which would make up a nutritionally balanced meal and that would be socially appropriate for the time of day the food was eaten.

Behaviours were selected which taught methods of cooking (e.g. boiling and frying), and preparing liquids involved mixing either a dried powder (Kool-aid), a frozen concentrate (orange juice), or making a hot liquid (coffee). This training was aimed at increasing the probability that responses would generalise to the preparation of a number of like foods. For example, if a person was taught to make frozen orange juice it would be highly probable that this would aid the person in making other frozen juices. Each target behaviour was task analysed so that all necessary responses needed for accurate performance of the target behaviours were provided. For example, for preparing a boiled egg the steps used were: (1) place egg, boiler, and lid at work station after getting them from their storage area; (2) fill boiler half full of water; (3) open egg carton; (4) remove egg; (5) close egg carton; (6) place egg in boiler; (7) place lid on boiler; (8) place boiler on stove; (9) turn handle for right front burner to high; (10) wait for water to boil; (11) turn burner to medium when water boils; (12) set timer for ten minutes; (13) turn burner off when timer rings; (14) remove boiler from stove; (15) pour water from boiler into sink; (16) fill boiler with cold water; (17) wait for egg to cool; (18) get container out for egg to be put in; (19) get out paper towel; (20) pour cold water out of pan and/or remove egg from boiler; (21) place egg on paper towel to dry; (22) place egg in container; (23) clean work area. In all cases definitions of target behaviours encompassed steps involving getting items placed out at the work area on the kitchen cabinets to washing and cleaning the dirtied pots dishes and utensils, and placing them back in their respective storage areas. The target behaviours and groupings were as follows:

**I Simple Breakfast**

- (a) Preparing Coffee (Stove Top Perculator, electric coffeemaker, dripolator).
- (b) Instant Cereal.
- (c) Frozen Juice (Orange and Lemon).
- (d) Preparing Toast.

**II Intermediate Breakfast.**

- (a) Preparing Bacon and Sausage.
- (b) Preparing Canned Biscuits.
- (c) Preparing Fried or Scrambled Eggs.

**III Simple Lunch.**

- (a) Fixing a Sandwich.
- (b) Making Canned Soup.

**IV Intermediate Lunch.**

- (a) Preparing Hot Dogs.
- (b) Making Kool-Aid.

Other skills taught were prerequisite to meal preparation and included operation of the toaster, using the stove, a can opener, and washing and drying dishes. Also, some food care skills were taught such as food storage and being able to identify spoiled edibles.

Behaviours were assessed by the trainer. All target behaviour were baselined initially and trained when less than 90% of steps were performed correctly. The criteria for termination was 100% on steps of a target behaviour on two consecutive displays of targeted skills. As criterion was met the behaviour was dropped from training. Interrater reliability was not taken for the baseline and treatment phases, however three trainers were rotated from group to group daily. As a result, two trainers had to agree that the behaviour had been passed before criterion was reached. With respect to follow-up two staff were asked questions about target behaviours for particular subjects. Their agreement provided interrater reliability of data for this phase of the study.

**Baseline.** All target behaviours were tested. Staff asked the subjects to perform the target behaviours one at a time and following this the behaviour was performed without staff comment. No training was provided (i.e. verbal or physical guidance) and measurement was done with a novel trainer each day.

**Training.** Training was done in a group of four to six subjects. Initially subjects were gathered in the training area and the teacher modelled the target behaviour step by step (a sheet with the behaviour and steps of the behaviour was kept in a convenient place as a reference for the trainer). Following this a subject was randomly selected from the group and was asked to perform the skill just modelled. While performing a target behaviour the trainer stopped the subject when a step was performed incorrectly. The minimal prompting (e.g. verbal instructions and graduate guidance if necessary) was used to ensure that the resident performed each step correctly. Every step was repeated until performed correctly without prompting before moving to the next step in the sequence. (Colour coding of items was frequently used to help subjects discriminate the appropriate object). This procedure was continued until each behaviour in the unit was completed. Frequent encouragement by the trainer and other students (prompted by staff if necessary) was provided. Following this subjects in the group who observed training were asked questions about the performance of the target behaviours. Reinforcement was provided by the instructor when the subject answered correctly and was told no, then required to repeat a correct answer following an inappropriate response. For example, the trainer might say, "OK, after filling the pan with water when boiling an egg what should you do?" If the subject answered correctly the trainer would say, "Yes, that's right, very good." If the subject answered incorrectly the trainer would say, "No, you should open the egg carton instead of pouring the water out of boiler. Now, you repeat after me, pour the water out of the boiler."

Following the questioning of subjects who had observed the performance of their classmate's training a second subject was taught targeted skills using identical procedures. Training continued for a sixty minute training session with target behaviours recorded only for subjects who had performed the unit. Half the subjects averaged performing a unit each session (sessions were conducted on Monday, Wednesday and Friday) with the persons trained being rotated each session so that no person in a training group was more than one session ahead or behind their fellow students.

## RESULTS AND DISCUSSION

Substantial increments in performance were noted with all target behaviours when a subject had an opportunity to be trained on a given behaviour for three or more sessions. Improvement may be due in large part to the fact that the moderate and severe subjects were a "select" group who were both motivated and had considerable adaptive skills in comparison to their peers. A mean number of 4.5 trials was needed to reach criterion on a given behaviour following the initiation of treatment (mean baseline scores were 52% of steps completed correctly) with 90% of the behaviours being trained for the subjects. Those which fell short were due in large part to the placement of residents in group homes before the conclusion of the programme resulting in a disproportionate number of intermediate meal preparation target behaviours which were not trained to criterion.

Informal reports from staff in group homes six months to a year after the conclusion of training showed generalisation to different setting and related meal preparation skills. This finding was ascertained by requiring subjects to help in various meal preparation skills and noting how well they were carried out. Assessment was done by having group home personnel who supervised meal preparation answer specific questions regarding the performance of targeted behaviours and related meal preparation behaviours. Maintenance of target behaviours was observed although target behaviours were not formally trained. However, instructions of a haphazard nature were provided and residents had the opportunity to practice the targeted skills which may have enhanced maintenance of these behaviours. Due to practical considerations it was not possible to collect follow-up data in the same manner as that used for data collection during baseline and treatment. This method would have made data more comparable. However, since reliability data was taken during follow-up by having two persons rate scores, interrater reliability was consistently high (90% and above). Similarly, reliability data consisting of different raters independently scoring two different trials was used during baseline and at the conclusion of treatment. These measures suggest that an accurate record of subject responses to target behaviours was obtained.

Data lend support to the notion that independent living skills can be taught to the retarded (Martin, Kehoe, Bird, Jensen and Darbyshire, 1971; Stimbart, Minor and McCoy, 1977; Trace, Cuvo and Criswell, 1977) and show the feasibility of preparing selected retarded persons to perform meal preparation skills in the community. This training has advantages over more "standard" operant procedures which have less of an emphasis on cognitive skills (Dalton, Rubino and Hislop, 1973; Keiltz, Tucker and Horner, 1973; Weisberg, Passman and Russell, 1973). For example, social reinforcement was heavily emphasised as an alternative to edible reinforcers. This was considered important because social reinforcement is cheaper, it decreases the possibility of developing dependence on edible reinforcers, and is more likely to generalise to other setting, behaviours and persons around whom subjects exhibit appropriate behaviour (e.g. persons in the normal environment are more likely to compliment a person on their performance than to give an edible). Another advantage was that this procedure saved staff time because several subjects could be included simultaneously and because it allowed for a good deal of verbal input by residents, an important consideration due to the limited verbal skills of the subjects. Also, this training provided an opportunity for peer reinforcement and allowed all subjects to participate. These latter two points proved to be potent reinforcers.

All retarded persons will not be capable of the complex behaviours taught in this study, and modifications of the existing procedure may be necessary before training of meal preparation skills can be done. Other areas for study are more precise analysis of maintenance and generalisation of these procedures and a comparison of other training methods to this approach to determine which is the most beneficial.

#### References

- Azrin, N. H. and Armstrong, P. M. The "mini-meal" - a method for teaching eating skills to the profoundly retarded. *Mental Retardation*, 1973, February, 9-13.
- Dalton, A. J., Rubino, C. A. and Hislop, M. W. Some effects of token rewards on school achievement of children with down's syndrome. *Journal of Applied Behaviour Analysis*, 1973, 6, 251-259.
- Keilitz, I., Tucker, D. J. and Horner, D. Increasing mentally retarded adolescents' verbalisations about current events. *Journal of Applied Behaviour Analysis*, 1973, 6, 621-630.
- Mahoney, M. J. and Mahoney, K. Self-control techniques with the mentally retarded. *Exceptional Children*, 1976, March 338-339.
- Martin, G. L., Kehoe, B., Bird, E., Jensen, V. and Darbyshire, M. Operant conditioning in dressing behaviour of severely retarded girls. *Mental Retardation*, 1971, 9 (3), 27-31.
- Matson, J. L. Training socially appropriate behaviour to moderately retarded adults: A social learning approach. *Scandinavian Journal of Behaviour Therapy*, in press.
- Stimbert, V. E., Minor, J. W. and McCoy, J. F. Intensive feeding training with retarded children. *Behaviour Modification*, 1977, 1 (4), 517-530.
- Trace, M., Cuvo, A. J. and Criswell, J. L. Teaching coin equivalence to the mentally retarded. *Journal of Applied Behaviour Analysis*, 1977, 10 (1), 85-92.
- Treffry, D., Martin, G., Samuels, J. and Watson, C. Operant conditioning of grooming behaviour of severely retarded girls. *Mental Retardation*, 1970, 8 (4), 29-33.
- Weisberg, P., Passman, R. H., and Russell, J. E. Development of verbal control over bizarre gestures of retardates through imitative and nonimitative reinforcement procedures. *Journal of Applied Behaviour Analysis*, 1973, 6, 487-495.
- Wolfensberger, W. *Normalisation. The principle of normalisation in human services*. National Institute on Mental Retardation, 1972.

#### FOOTNOTE

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