

EXPERIMENTAL VALIDATION OF AN INSTRUCTIONAL MANUAL TO TEACH MENTALLY HANDICAPPED PEOPLE FLOWER ARRANGEMENT SKILLS

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Introduction

The principle of normalization (Wolfensberger, 1972) states that mentally handicapped people should be afforded a life which is as normal as possible. In accordance with the principle, a variety of programmes to train independent living skills have been developed and empirically investigated. These include money management (Lowe and Cuvo, 1976); public transportation training (Neef, *et al.*, 1978); janitorial skills (Leaf, *et al.*, 1978); clothes mending (Cronin and Cuvo, 1979); clothing selection (Nutter and Reid, 1978); toothbrushing (Horner and Keilitz, 1975); laundering (Cuvo, *et al.*, 1981); interpersonal skills (Bates, 1980) and many others. All of these programmes are aimed at providing an opportunity for mentally handicapped people to live more complete and normal lives.

Typically, the training of these community living skills has been facilitated through the use of a task analysis, whereby approximation to the skills is

identified and trained successively through the use of prompts, modeling, and reinforcement (Cuvo, 1978; Gold, 1976).

Similar advantages are associated with programmes which make use of pictures to cue certain adaptive skills for mentally handicapped people, (Connis, 1979; Martin and Rusch, 1982; Thinesen and Bryan, 1981).

While the independent living skills which have been taught to mentally handicapped people are many and varied, no empirical research has been conducted in which mentally handicapped people are taught the fundamentals of aesthetic beauty in connection with a functional independent living skill.

It seems that there is a general belief that aesthetic beauty appreciation is somehow too sophisticated for mentally handicapped individuals even though many educators, psychologists, psychiatrists, and art specialists have recognized its importance (Burn, 1977) and (Appell and Weiner, 1978). For example, in a conversation between two experts in the

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creative arts for handicapped individuals, (Appell and Weiner, 1978) a point was made that the intrinsic nature of art activities can serve to enhance the learning of various skills (eg., free-hand drawing can aid in the development of fine motor coordination).

This point was further classified when learning and development were categorised into three domains; motor, affective, and cognitive, and it was stated that art activities draw from each of these.

In support of the importance of developing aesthetic beauty appreciation in conjunction with developing marketable skills as part of the normalisation principle, the aim of the present study was to 1) teach mentally handicapped individuals appreciation of aesthetic beauty; 2) provide training of marketable floral arranging skills (eg. florist aid) and 3) develop a therapeutic and recreational activity for mentally handicapped people.

Method

Subjects:

Three mentally handicapped women participated in the study. All were clients at a sheltered workshop in Murphysboro, Illinois, U.S.A. The subjects were selected from a total of five potential subjects according to various criteria such as having steady hand movement, good attendance, a willingness to participate in the study and an absence of severe behaviour problems which might interrupt the experiment.

Shari was a 34 year old women with an IQ of 68 (WAIS). She could read and lived in a group home.

Ruby was a 30 year old women with an IQ of 60 (WAIS). She could not read nor tell time and lived with her parents.

Jenny was a 43 year old women with an IQ of 70 (WAIS). She could read and lived in an apartment, with minimum supervision, for developmentally disabled adults.

Setting:

The sessions were conducted in a classroom at the sheltered workshop. The classroom was furnished with a large table, several chairs and bookshelves.

Experimental Design:

A multiple baseline analysis across responses (phases of the arrangement) was combined with a multiprobe analysis across subjects to assess the effectiveness of training. A minimum of two pretests, one with fresh flowers, and one with plastic flowers was administered to each subject before training. Training was begun with the first subject, and proceeded sequentially through the flower arrangement phases.

The Classical Triangle Flower Arrangement Task Analysis and Outcome Measure

Information obtained from books on flower arranging (Ascher, 1974; Goldson, 1962), consultation with a professional florist, and the experimenter's experience in floral arrangement were utilised to develop a preliminary task analysis for the construction of the Classical Triangle arrangement. A floral arrangement was then completed by the

experimenter in the presence of a professional florist following the steps of this preliminary task analysis. Her recommendation was solicited and utilised to revise the task analysis. Finally, pilot studies with three subjects also led to revisions.

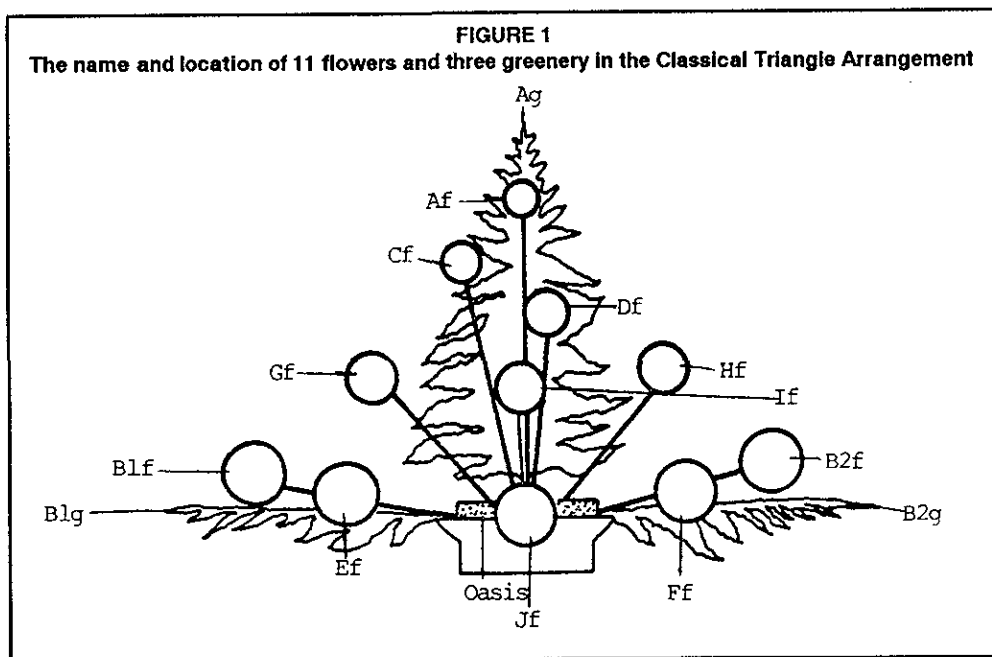
The final task analysis for the Classical Triangle Arrangement included a total of 90 steps for the arrangement of 11 flowers, three pieces of greenery, and whatever additional green pieces and small buds were needed to camouflage the oasis.

Each flower and greenery were given letter codes according to the sequence of the arrangement. Thus, the first piece of greenery to be inserted was coded "Ag" (A-greenery). Flowers were similarly coded (eg. A-f, B-f1, B-f2, etc.).

Figure 1 illustrates the name and location of each 11 flowers and three greenery in the Classical Triangle Arrangement.

An outcome measure (independent from the task analysis) was also developed. The outcome measure was designed to determine the extent to which an arrangement conforming to general characteristics of floral arrangement. The three outcome characteristics which were measured were; a) stability, b) shape and symmetry, and c) harmony and space. These are descriptive terms that identify the essential dimensions or characteristics of an ideal arrangement.

The validity of this outcome measure was confirmed by consulting a professional florist, revising floral design books, and the experimenter's knowledge.



Procedures

Pre-test (Baseline)

Each subject's flower arranging skills were individually tested at least twice, once using fresh, and once using plastic flowers. Each subject was presented with 7 - 8 branches bearing approximately 22 blossoms of chrysanthemum (with large, medium, and small sized flower head), eight stems of leather leaves, a design bowl with wet oasis and scissors. The instructions given were as follows: "I want to know how well you arrange flowers before I teach you. Please arrange these flowers as beautifully as you can. Try to do your best to make it a triangle shape. You can use all of these flowers or some of them if you like. I won't tell you whether you are doing right or wrong". No form of guidance or feedback was provided during the pre-tests.

The subject first arranged the fresh flowers while two observers followed the task analysis and scored each step as correct or incorrect. The subject had to select the appropriate greenery or flowerhead, cut it to correct length (if necessary), clean the end of the stem, and insert into the correct place with the correct angle. A flower that was arranged out of sequence was scored as incorrect. The only exceptions to these were pairs of flowers which were placed in diametrically opposite sides of the oasis (eg., B-f1 and B-f2) when these pairs were handled it was arbitrary which member of the pair was handled first and it was scored as correct on either side of oasis.

The final product was then scored using the outcome measure and photographed with attached codes (including the name of the subject, experimental condition and date).

The subject was then pre-tested a second time using plastic flowers. The subject was presented with ample greenery (plastic) and flowers of all sizes to complete a Classical Triangle arrangement. Materials were plastic oasis (model clay), design bowl, pliers for cutting wire stems. The same procedures for the fresh flower pretest were employed.

Training

Materials

Flowers: plastic flowers were used to train the subjects to arrange flowers. Three different sizes of plastic flowers (daisies, chrysanthemums, roses, and carnations) of various colours such as red, yellow, purple, and white were used for training. A total of 22 flowers, eight pinnate shape greenery, both fresh and plastic, were also used to facilitate generalisation and practice camouflaging the oasis.

Wire: green coloured (electrical) wire was used as a replacement for the plastic flower stems so that subjects could replace the entire flower. That is, after the wire stem had been cut, they were placed with electrical wire on the same flower head.

Design Bowl: a commercially available green coloured design bowl (15cm in circumference) was used.

Model Clay: (plastic oasis) green model clay was served as an oasis. Model

clay was preferred over standard oasis because it was easily re-used and provides a very strong base for plastic flowers.

Pliers: (wire cutting type) pliers were used as a replacement for floral scissors to enable the wire stems of plastic flowers to be cut.

Instructional Manual: the instructional manual consisted of a 16 page photo album. Each page (31cm x 36cm) was laminated in plastic. A cardboard cut-out of a flower (stem and head) appeared on each page. Below the sample was a colour photograph (9cm x 13cm) depicting the proper location of the flower in the arrangement. The arrangement in the photographs contained one or more red rose(s) and one white rose. The red roses represented those flowers that had already been placed to the arrangement while the white flower represented the next flower to be placed in the arrangement. Thus, the photographs displayed the flowers that had been arranged (red roses), as well as the flower that was due to be added (white rose).

At the beginning of the first training session the experimenter explained that the subjects would begin to learn how to arrange flowers. All materials used in the pre-test (plastic arrangement) were placed on the table by the subject. The experimenter turned to the first page of the manual and explained and demonstrated its use.

The subject's task was to select and, if necessary, cut a flower stem to match the sample displayed on the page of the manual. Next, the subject was to examine

the photograph, determine the proper location of the flower, and place the flower in the corresponding location in the design bowl. The subject was then to turn the page and repeat the steps for the flowers shown on the next page. Thus, the photographs on each page of the manual depicted the successive (flower by flower) completion of the arrangement.

As the subject attempted to complete these steps the experimenter provided descriptive praise for correct responses and corrective feedback for incorrect responses. A least to most structured prompts technique was employed. If the subject responded incorrectly, a general verbal prompt was provided (eg, "Is this the same as the picture?"). If the response was still incorrect or there was no response within 5 seconds, a specific verbal prompt was given (eg, "Are these flowers the same in colour or shape?"). If the response was still incorrect, the experimenter repeated the initial explanation and demonstrated how to perform the correct response. If the subject continued to respond incorrectly after modeling, physical guidance was provided. The experimenter placed her hand on the subject's hand and guided it through the correct actions while providing verbal instruction: "This flower should be about here. Let's place it like this" (pointing to the picture in the manual). Correct responses were reinforced with descriptive praise (eg, Excellent! You selected the right flower!).

Each training session lasted for 45 - 60 minutes maximum and criteria for moving from page to page in the manual

was two consecutive trials of correct responding without assistance.

Review Session

Review sessions were conducted at the beginning of each session as well as immediately prior to probe sessions. The purpose of this review was to allow the subject to practice all previously learned skills. Thus, on a review session the subject began at the beginning of the manual and completed all steps up to the point of the last step that had been mastered. The conditions and instructional methods were identical to that of the training sessions.

Probe (plastic flowers)

Probe sessions were administered whenever a subject correctly completed two consecutive review sessions on one or more phases of the arrangements.

Subjects were instructed to respond on tasks involving the entire sequence of flower arranging skills. Neither reinforcement nor corrective feedback procedures were applied during these probes. The subject was asked to arrange the plastic flowers on the table. The subject was allowed to use the instructional manual only through the step that had been last mastered, after which it was removed and the subject was instructed to finish the arrangement.

The subject was told that she would be observed to determine how well she could arrange flowers and that no assistance would be possible.

Two observers recorded the responses according to the task analysis. After the probe was terminated, the

arrangement was evaluated by the observers using the outcome measure.

Post-test (fresh flowers)

When the subject mastered all of the steps involved in the floral arrangement of plastic flowers, and completed two consecutive review sessions at 100% accuracy, a probe session was conducted using fresh flowers. The purpose of the post-test was to assess the ability to generalize the learned skills with plastic to fresh flowers. If the subject responded below 100% correct criterion on the probe with fresh flowers, training sessions using fresh flowers were conducted until the subject responded 100% correct accuracy on review sessions. At that point, another probe was administered with fresh flowers. The conditions and instructions were identical to probe with plastic flowers.

Maintenance Test

Following the completion of all training, a follow-up probe (using fresh flowers) was conducted after one to five weeks period. The purpose of this probe was to assess the degree of maintenance of the newly learned skills.

Reliability

Independent observations were made during baseline, training, post-test, and maintenance test sessions by the experimenter and a post-graduate student. Following data collection, the observers' records were compared. Interobserver agreement was calculated dividing the number of agreements by number of agreements plus disagreements, and

TABLE I
Mean percentage of interobserver agreement of correct responses for the three subjects on probes using plastic and fresh flowers during baseline, training and follow-up conditions

		S1 (Shari)	S2 (Ruby)	S3 (Jenny)
CONDITIONS		RELIABILITY	RELIABILITY	RELIABILITY
BASELINE	TOTAL STEPS OUTCOME MEASURE	R = 96.0% R = 91.1%	R = 85.4% R = 89.33%	R = 87.63% R = 94.87%
TRAINING	TOTAL STEPS OUTCOME MEASURE	R = 94.1% R = 94%	R = 89.67% R = 95.6%	R = 88.5% R = 96.53%
POST-TEST	TOTAL STEPS OUTCOME MEASURE	R = 100% R = 100%	R = 89.9% R = 90.9%	R = 78.6% R = 97%

multiplying by 100. Reliability checks were made on at least 33% of the sessions in each condition for each subject. Table I summarises the mean reliability scores for each subject in each condition.

Social Validation

When the training programme was completed, and after the final follow-up probes were taken for the three trained subjects, the opinions of four professional florists and four consumers were solicited.

Photographs of pre- and post-test arrangements for all subjects were taken. In addition, a classical triangle floral arrangement made by a professional florist was also photographed. The photographs were then ordered randomly and a number was attached to each (from 1 to 7). These photographs were then presented to the four professional and four consumers along with a questionnaire. The questionnaire consisted of six items which asked the raters to evaluate various aspects of the arrangement using

a 5-point scale (strongly agree = 5, agree = 4, neither agree nor disagree = 3, disagree = 2, strongly disagree = 1).

Results

Figure 2 depicts the performance of each of the three subjects on probes with fresh and plastic flowers during baseline, training, and follow-up conditions.

Each data point represents the percent of correct response on all 90 steps with fresh flowers and 75 steps with plastic flowers (with plastic flowers, "cleaning the end of the stem", was not applicable therefore the total steps were 75).

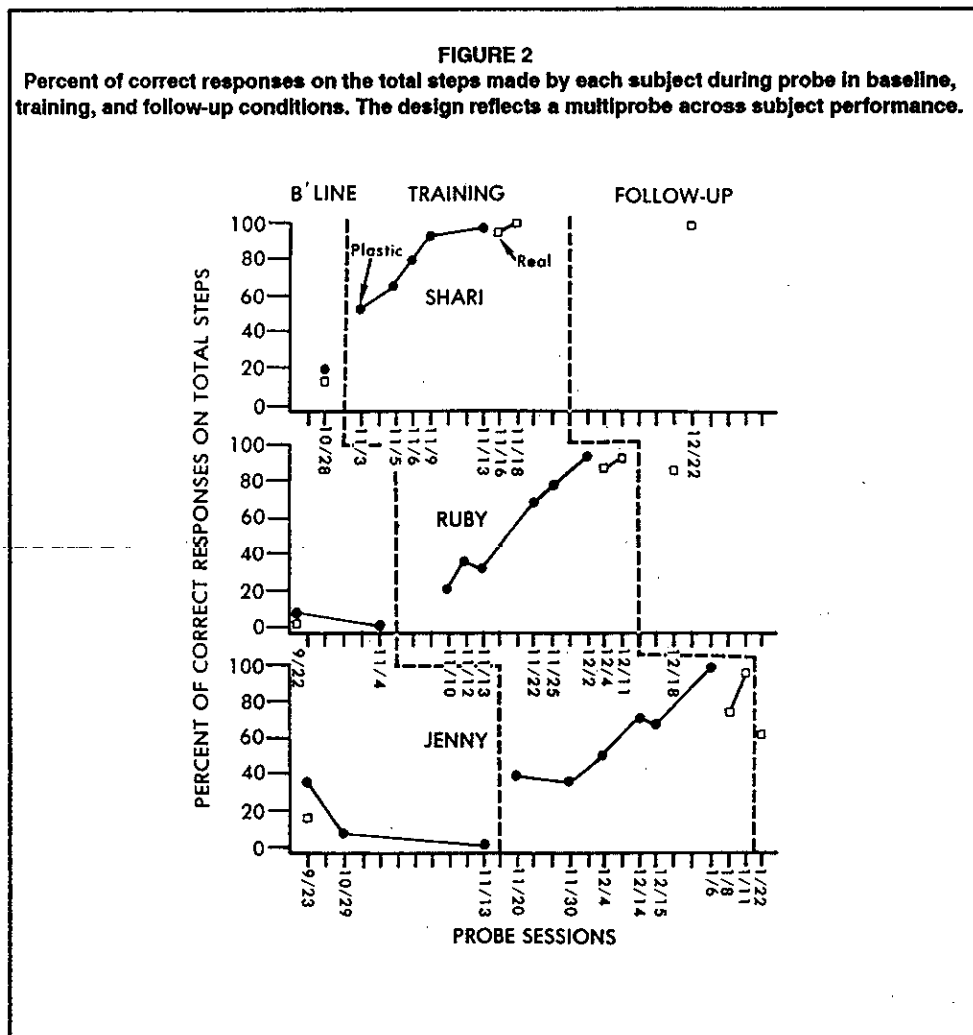
The mean percent of the correct response with fresh and that with plastic flowers during the baseline condition were 15.9% (20) for Shari, 6.7% (12) for Ruby, and 16.6% (21.4) for Jenny.

As can be seen in Figure 2, all subjects' performance with both fresh and plastic flower probes were improved as they were exposed to the training conditions. The mean percent of correct responses with fresh and plastic flowers

respectively during the training conditions were 98.26% (78.26) for Shari, 90.45% (63.12) for Ruby, and 70% (63.25) for Jenny.

Scores on probes following training on final skills were 100% (93.3) for Shari, 90.5% (93.3) for Ruby, and 86.73% (96) for Jenny.

The follow-up probes which occurred between one to five weeks after training indicated that the newly learned skills were maintained after training had been discontinued. The correct responses were 100% for Shari, 86.5% for Ruby, and 73% for Jenny.



All three subjects' flower arranging skills, were generalized from plastic to fresh flowers. After having mastered the skills with plastic flowers, Shari performed 97.8% correctly on the first probe with fresh flowers. Ruby performed 86.6% correctly and Jenny performed 76.8% correctly.

As can be seen in Figures 3 and 5, the first subject, Shari, was trained on the first three phases concurrently, and the third subject, Jenny was trained on two phases during the first training session. In these cases, several phases were trained before probing due to the exceptional mastery of the skills. Thereafter only one phase per session was trained.

The probes administered throughout the training condition indicated that generalisation from trained to untrained phases of flower arranging did not occur for Shari and Jenny. Ruby, however, demonstrated some competence in "camouflaging the oasis" on the probe test.

Responses to the professional and consumer evaluation questionnaire indicated that post-test arrangements were distinguishable from the pre-test products. The four professionals rated the quality of the pre-test arrangements between 1 - 1.25 point while they rated the post-test arrangement between 1 point to 4.25 point range.

On the other hand, the consumers rated the pre-test arrangements between 1 point to 2 point range while they rated the post-test arrangements between 3.25 point to 4.5 point on the average on a 5-point scale.

On average, Shari's post-test arrangement was rated higher than the professional florist's work by the four professionals, the florist's work was rated the second, the third was Ruby's and the fourth was Jennys'.

The consumers rated the florist's work as the first, the second was Shari's and Jenny's work as equal, and the third was Ruby's work.

The response by the four consumers to the most important item revealed that if they have to buy an arrangement, they would prefer to buy Sharis' over the florists'.

Discussion

The results of the present study indicated that inexpensive plastic materials can be used to teach flower arranging skills to mentally retarded people.

The present investigation represents one of the first attempts in teaching an aesthetic skill to mentally handicapped individuals.

Baseline data revealed that all subjects performed poorly in arranging both fresh and plastic flowers. Probe scores were improved after training was initiated and this improvement was maintained after the training had been terminated.

As a whole, generalisation in handling fresh flowers from plastic occurred in selecting the correct size flowers, cutting it to the right length for a given step, inserting it in the right place, and camouflaging the oasis.

FIGURE 3
 Percent of correct probe responses during baseline, training, and follow-up conditions for Shari. The design reflects a multiple baseline across phases of the arrangements.

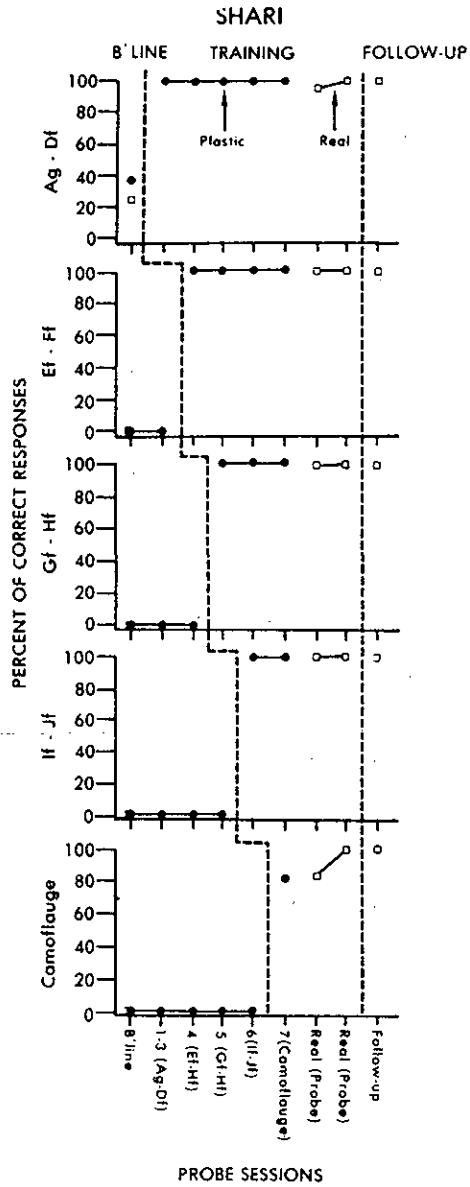
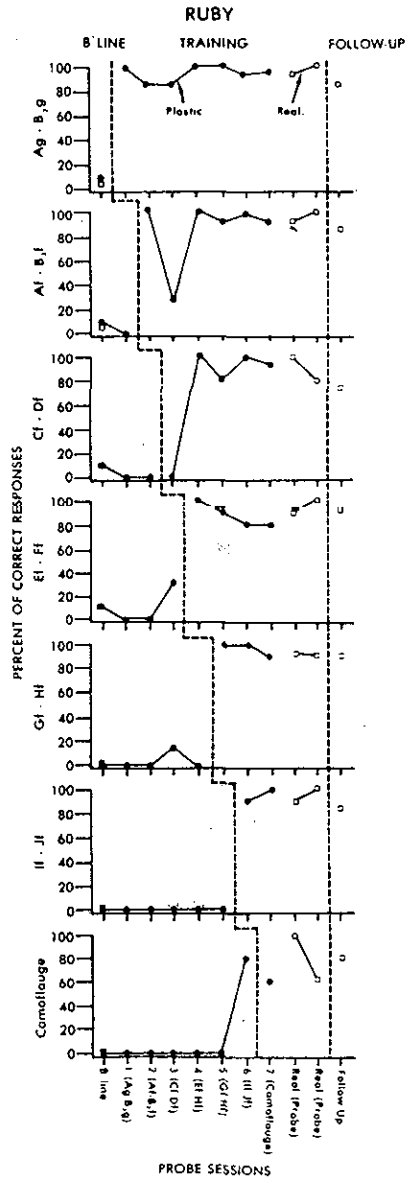


FIGURE 4
Percent of correct probe responses during baseline, training, and follow-up conditions for Ruby. The design reflects a multiple baseline across phases of the arrangements.



A more delicate manner of handling fresh flowers and the oasis had to be taught. Unfortunately the rough handling associated with plastic flowers had also generalised. Ruby and Jenny when they selected correct size heads by matching to the sample in the manual, they handled the fresh flowers as if they were plastic; they pressed too hard and tried to straighten bent stems as if they were plastic flowers.

Jenny handled the oasis as if it was the model clay. As a result, the oasis was damaged.

However, after a few training sessions, their handling of fresh flowers improved.

Overall, Jenny's performance was poor. She was particularly upset by the presence of the observers and openly expressed her anger. Ruby also expressed displeasure with observers presence during the probe sessions. On one occasion, she refused to participate in the probe session.

The participants were very proud of their accomplishments. Most of all, they enjoyed compliments from others.

Shortly after completion of her training, Shari was asked to arrange flowers for Thanksgiving dinner tables for the clients and staff at the workshop. Shari was delighted with the request. She told the trainer "I feel I am a very important person". Shari arranged flowers independently, without any help. Shari's work was greatly admired by the guests, staff and clients.

While Ruby was still on the training programme (final stage of training) she arranged flowers under supervision by

the trainer for the Executive Board meeting. The members of the Executive Board were astonished with the work, and each member praised and congratulated Ruby by shaking hands and complimenting her excellent work. Ruby was proud and happy all day. Ruby was a shy and quiet person in nature but on that day she spoke aloud and openly expressed her joy.

Jenny was unmotivated and less interested than the other two participants. Initially she was very eager to learn and asked to be taught more and faster. Soon she got tired of the task. However, she enjoyed compliments and admiration for her work.

While the present study proposed to expand the vocational opportunities of mentally handicapped people by training them floral arts which might lead to their employment as florist's aids, it has yet to be demonstrated that individuals with a mental handicap are capable of using such skills in a competitive job market. Many aspects have to be considered such as flexibility in applying the general principles of arrangement, colour harmony, the size of the arrangement and the shape of the container. Thus, additional skills would have to be taught to retarded individuals before it is likely that their flower arranging skills prove marketable.

From the response to the social validation questionnaire, it was clearly revealed that the three trained subjects' crafts were acceptable. In one case, the product was superior to the professional florists' and equally marketable (Shari). The four professional florists rated Shari's post-test arrangement as the highest, the

second highest was the florist's arrangement. On the other hand, the consumers rated the florist's work as the highest.

According to the responses of the four consumers as to the most important item, they would be very satisfied to purchase an arrangement like Sharis', the florists' and Rubys'.

All the professionals gave a 1 point rating to the same item (desire to buy an arrangement) for each arrangement. These are typical responses for a professional florists (eg., they would rather make their own arrangement than purchase one from another florists).

The training procedures in the present study have several notable features: First, the procedures are simple to follow. The sequence picture cues indicate where the placement should be. The flower head size and the length of the stem are shown in the instructional manual. Each page of the instructional manual corresponds to a single step. As long as the instructions are followed the success rate is guaranteed.

Second, the training procedure allowed the subjects to learn the complexities of fresh flower arrangement by first using the less expensive and re-useable plastic flowers. Thus, it minimizes the training expenses.

Finally, the training procedures allow for mentally handicapped citizens to acquire some creative skills which could not only provide a source of therapy and recreation but could certainly create a cheerfulness to many home surroundings.

Summary

Three mentally handicapped female adults, aged 27 to 47 were trained using an instructional manual.

The Classical Triangle floral arrangement procedures has been task analysed. Each page of the instructional manual illustrates a step of the task analysis of the Classical Triangle floral arrangement procedures. After the subjects had demonstrated the ability to arrange plastic materials, fresh flowers and foliages were used to assess the generalization of the newly learned skills.

Data collection was based on direct observation of the subject's performance on steps of task analysis and on the "outcome measure" of the quality. A combination of multiple-baseline across phases and multiprobe across subjects design illustrated that the three subjects acquired high level of the skills and they were able to generalise the newly acquired skills and maintained the skills.

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