

**EMPOWERING LEISURE SKILLS IN ADULTS WITH AUTISM:
AN EXPERIMENTAL INVESTIGATION THROUGH THE MOST TO LEAST
PROMPTING PROCEDURE**

Sezgin Vuran
Anadolu University

The aim of this study is to examine the effectiveness of a most to least prompting procedure in the learning of practical leisure skills for adults with autism. The selected activity was making a basket form from clay and was carried out with two adults in the clay studio at a private center for special education for individuals with autism. A multiple probe design was used and the dependent variable was the skill to make a basket from clay. The independent variable was to teach the skill with the most to least prompting procedure. The research results showed that the method was effective not only in teaching to make a basket from clay, but also in maintaining the learned skill.

Introduction

Shaping clay, as one of the important art activities, offers an important way for individuals with disabilities to use their leisure functionally. Therefore, like shaping clay, art activities can empower leisure skills for individuals with autism. Leisure means free time during which one may indulge in voluntary activities. Leisure activities afford individuals with disabilities countless benefits, however, these individuals require systematic instruction in order to fully develop leisure skills (Wilson & Arnold, 1997).

A literature review yielded no study regarding the systematic instruction of skills to shape clay in this field. Kahn (1996) described clay as a forgiving, tactile, non-verbal, non-invasive, inexpensive, easy-to-recycle and a perfect teacher, and she also mentioned that a clay therapy program had a staff development manual that covered organizational layout, course plans, necessary materials, goals, assessment procedures, resources, and clues to work with clay. Kahn reported that the program was applied across seven different settings, with noted reductions on some negative behaviors along with improvements on self-image and self-confidence.

As highlighted by Piotrowski (1996), almost all the evidence in the literature concerning shaping clay is anecdotal or derived from personal opinions. However, the authors do not offer information about the level of skill acquisition and instructional methods. A considerable amount of these opinions support the idea that shaping clay improves self-confidence, self-image, and self-expression while reducing negative behaviors of individuals with disabilities (Davalos, 1999; Henley, 1991, Kahn, 1996) whereas the literature review, undertaken as part of this study, revealed criticisms that teachers use direct instruction methods that focus on the product rather than the process (Osborne, 2003). Working on the acquisition of shaping clay skills by individuals with autism requires the use of systematic instructional methods at least in the initial phase to teach the basic skills (Vuran & Vuran, 2001), and then opportunities should be offered to individuals to develop their own creativity. Since clay-based activities can empower the leisure skills of the individuals with autism, in Turkey, some special education centers have established clay studios and shaping clay is integrated into the programs of individuals with autism and learning disabilities as leisure activities.

Most to least prompting is one of the errorless teaching techniques which is also known as the decreasing assistance procedure. It is an instructional strategy that progressively reduces teacher' assistance from the

point of the most amount of help needed to ensure correct responses to the point of the student's independent performance of the target behavior (Wolery et. al., 1992). The most to least prompt procedure is effective in teaching both single step and chained behaviors to individuals in early childhood through to adulthood. The level of incorrect responses during errorless teaching tends to be very low. Accordingly, the probability of reinforcement occurring more frequently is higher when compared to other procedures (Tekin & Kircaali-İftar, 2001).

There are many studies concerned with most to least prompting which have been used with individuals with mild and severe impairments, including autism. For example, teaching pedestrian skills (Batu, et.al., 2004), preparing and ordering food (Mc Conville et.al., 1998), categorizing clothes (Cuvo, et.al., 1981), shopping at a market (Wheeler et.al., 1980), laundry skills (Miller & Test, 1989), and banking skills (Mc Donnel & Ferguson, 1989). All of the above mentioned studies revealed that most to least prompting was easy to use for practitioners and was an effective way of teaching the skills to individuals with moderate and severe disabilities.

When people first encounter clay they tend to shape rolls, coils, and slabs, which are the three main methods of shaping clay (Zakin, 1995) and these were activities which were included in this study. The most to least prompting method was selected because; firstly, clay shaping is a chained skill, secondly, the probability of reinforcement is more frequent, and finally no research on the application of this procedure applied to teaching clay shaping skills was found in the literature. In short this study examines the effectiveness of a most to least prompting procedure in the instruction of clay shaping skill to adults with autism.

Method

Participants

The two participants were diagnosed as having autism when they were 2 to 3 years old by medical doctors; and they attend a private special education center; they left the center to attend a regular school from the age of 7 however, they had to leave the school, because of their limited academic and social skills in a school year; finally, they came back to the private special education center.

Both male participants of the study were given pseudonyms to preserve their privacy. Cem was 21 years old and Emre was 23 and both were in good health and physical condition. The participants were capable of performing tasks of personal care (e.g., shaving) and some skills used in everyday life (e.g., making tea, laying the table) under adult supervision. According to their mothers and teachers neither participant liked tasks that took a long time to complete however, they were capable of focusing on one task for five to ten minutes.

The participants were able to express their likes and dislikes. Sometimes, Emre showed aggressive behavior. Although most individuals with autism do not like playing with clay since they will have their hands dirty, both Cem and Emre did like playing with clay. Their parents stated that their sons had a lot of free time which they should use with enjoyment and functionally and complained but they had no leisure skills. The programs for these participants included basic ceramics skill acquisition for leisure activity. The ceramics and special education teacher were responsible for their programs.

Setting and Materials

In this study, to empower leisure skills in adults with autism, the techniques of most to least prompting used to teach making a basket shape from clay. This item was chosen since a basket shape covers the three main methods of shaping clay; making rolls, coils and slabs. To teach making a basket from clay, a task analysis was implemented by both the ceramics teacher and the researcher, then the two analyses were compared and the consensus for the analysis was developed as given below in Table I.

For Cem and Emre, all sessions were conducted individually in the clay studio at the private special education center. A video camera was installed for the purpose of collecting data. The studies were carried out in the afternoon every weekday. A ceramics teacher, a special education teacher and a researcher were present in the studio.

Table I
Task analysis of making a basket shape from clay

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1. Take the clay
 2. Knead the clay
 3. Tear off a small piece of clay
 4. Form a ball
 5. Press the clay ball with your fingers on the workbench
 6. Take the roller and roll out the dough
 7. Draw a circle onto the dough with a modeling pen
 8. Remove the clay outside the circle
 9. Tear a small piece from the clay
 10. Form a coil
 11. Place the coil on the base
 12. Tear a small piece from the clay, and form a coil
 13. Merge the coil
 14. Make a new coil
 15. Merge the coil
 16. Make a new coil
 17. Make the coil into a handle
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A set of materials was prepared for the teacher and each adult on the table. Each set of materials included: a rolling pin, a modeling pencil, clay, newspaper and a basket model. Finally, the prompt hierarchy was determined through negotiation between the ceramics teacher and the special education teacher. They agreed with the use of all model prompts for all steps in the task analysis, except the 7th and 8th steps and they decided to use physical prompts for these two steps. This was because the skills in the 7th and 8th steps were those that both participants would encounter for the first time, and the other skills were included in their program separately (e.g., tear a small piece of the clay, form a roll). On the other hand, the physical and model prompts were reduced after two consecutive correct trials whereas the verbal prompts were not a matter of this restriction. The verbal prompt was not presented providing that the participants had responded correctly prior to this prompt.

Experimenters

The author systematically explained the practice of using the most to least prompting procedure to the ceramics teacher. A practice intervention session was carried out with another student with autism who was not part of the. The ceramics teacher conducted the probe and intervention sessions.

The special education teacher and the author of this study participated as reliability observers. The special education teacher was trained by the author on the procedures for data collection for this study. The training included recording the making of a basket from clay which was continued until three consecutive sessions, and an 80% agreement was achieved.

Experimental Design

A multiple probe design across the participants was used to evaluate the effectiveness of the most to least prompting method in teaching the skill of making a basket from clay. For both participants, the baseline data was gathered individually. After reaching the stabilization of data for three successive sessions for the first participant, the teacher started the intervention sessions. After the first participant reached the criterion of 75%, probe sessions were arranged for the second participant to determine the baseline performance. After obtaining the data from three successive sessions for the second participant, the teacher started the intervention sessions with him.

Procedure

Baseline and Daily Probe Sessions

Daily probe sessions were arranged to determine the baseline level and to gather the probe data before the intervention sessions. In the daily probe sessions, a single opportunity format was used for the assessment. Accordingly, the trial was stopped when the first wrong response/no response occurred and the remainders of the steps were marked as (-) negative. The baseline and the daily probe sessions were conducted as

follows: (a) the participant's attention was drawn to the task by introducing the materials, and showing the basket model, (b) then the participant was asked to perform the skill, (c) five seconds were allowed for the participant to perform the first step, (d) the steps, which were achieved independently by the participant, were recorded as '+', (e) five seconds were allowed for the next step, (f) if the participant responded incorrectly the steps were recorded as '-' and the assessment was interrupted. For each correct response, the participants were reinforced with verbal praise. Hitting the clay so strongly that it stuck to the table, shaping and rolling out the clay until it crumbled, rolling the clay under a hand or hands for a longer period than normally accepted (more than 20 seconds), seeking help from the teacher was defined as incorrect response.

Instruction

The intervention sessions were carried out immediately after the baseline sessions. In the instructional sessions, most to least prompting was employed. Instruction consisted of teaching skill using the total task format. That is, instruction started with the first step of the skill and continued until the last step. In the intervention sessions, the sets of materials for the teacher and the participant were set up on the table.

The instruction sessions were conducted as follows: (a) the teacher introduced the materials to the participant for the purpose of drawing attention to the task, (b) the skill instruction Let's make this basket was presented and followed by the verbal and the model (the teacher making it with their own materials) prompt for steps of 1-6 and steps 9-17. For steps 7-8, instruction was presented by verbal and physical prompt (hand on hand), After each model and verbal prompt, a response interval of 8-10 seconds was given for the task to be achieved, (c) when the whole skill sequence was completed participants were given verbal reinforcement and offered a drink of their choice. A fixed ratio reinforcement system was used during the baseline and daily probe session, also for the instructional sessions. The participant's behavioral problems were ignored. If the questions asked by the participant were reasonable, brief answers were given. For example: I will finish and want to drink coke. The teacher responded with yes.

After conducting the skill steps, except 7-8, the model prompts for two sessions, the instruction was continued using only verbal prompts. The conducting steps 7-8 were continued physical and model prompts for two sessions, and then verbal prompts without any restrictions. The instruction was given as verbal prompts: roll the clay between your hands may be reduced to Roll the clay, or the question forms Did you roll the clay to form coils?, or What should we do to form a coil?

The participants' performance in making a basket from clay were evaluated 6 weeks after the intervention sessions finished.

Interobserver Agreement

Inter-observer agreement data were collected on 30% of the days in which probe and/or instructional sessions were conducted. A point by point method (the number of agreements divided by the number of agreements plus disagreements multiplied by 100) was used to calculate the interobserver agreement percentages (Cooper et. al., 1987). Interobserver agreement was found to be 100%.

Procedural reliability data for both participants was collected for 40% of the probe sessions and instructional sessions. A graduate student analyzed the data from randomly selected video records using a numerical table. Data was calculated with the formula of the number of trainer behaviors observed divided by the number of behaviors planned multiplied by 100 (Tekin & Kircaali-Iftar, 2001). The steps assessed were as follows: (a) presenting the materials, (b) attention, (c) delivering the task instruction, (d) giving appropriate response for negative behavior (e) presenting reinforces, and (f) waiting for sufficient time for student response. For daily probe sessions, the procedural reliability was found to be 100% for the first participant. For the second participant, the procedural reliability was found to be 94.4%.

Social Validity

Social validation research involves assessing the social importance of the effects, the social significance of the goals, and the appropriateness of the procedures (Kazdin, 1982). Social validation procedures are important because they tie research results to the social context (Storey, 1991). In this study, to assess social validity, a meeting was conducted individually with the participants' parents after the last probe. The

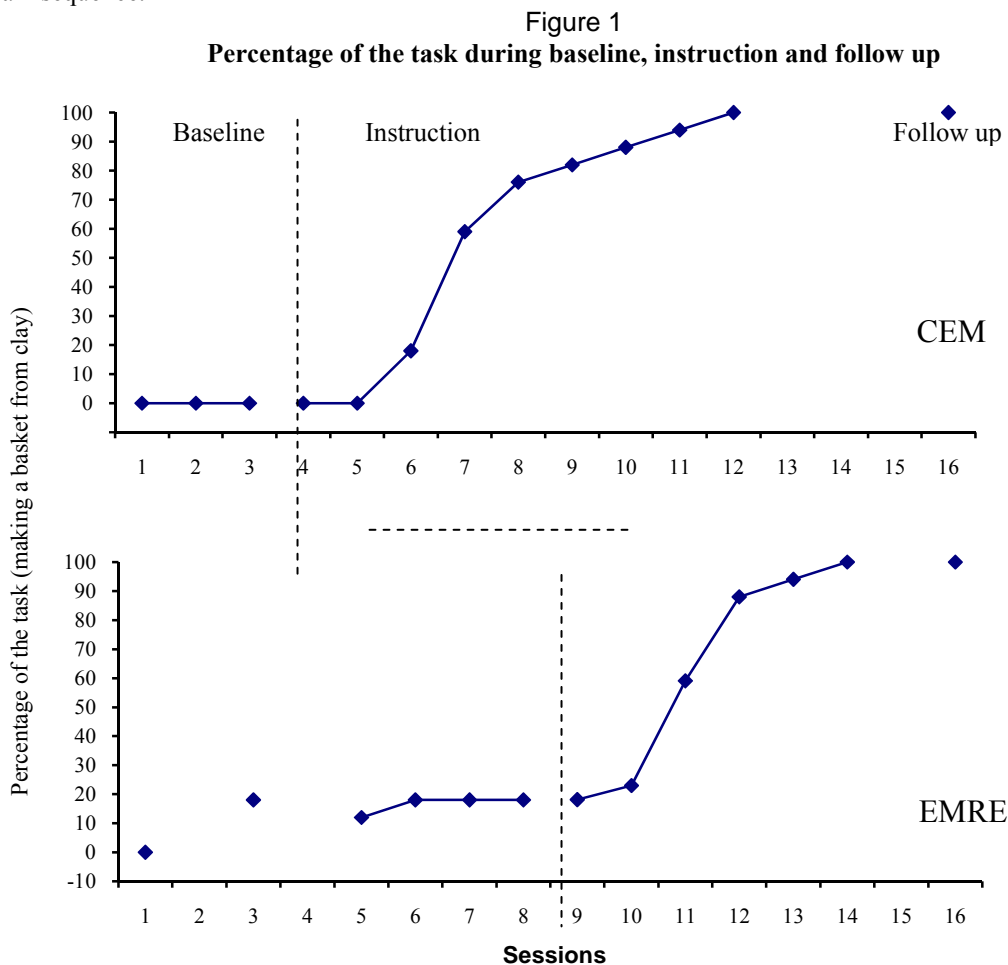
father of the first participant and the mother of the second participant joined these meetings. Random sessions were chosen from the video records of the instructional sessions for the parents to watch. After watching the videos, the researcher asked the following five questions: (a) Do you think it is important to teach shaping clay skills? (b) In your opinion, which are the important parts of the study that the ceramics teacher conducted with your son? (c) Are there any parts of the study that you didn't like? If yes, please specify. (d) During the study was continued and when it was completed, were there any behavioral changes for your son? (e) Are you satisfied with the method used to teach shaping clay?

Other teachers working at the same center were asked to watch random video recordings from the probe and instructional sessions of both participants to determine the social validity. Teachers were asked to complete the questionnaire (see appendix), after watching the videos.

Results

Baseline and daily probe data

The data collected during the daily probes with the most to least prompting were compared with the baseline data. Both participants achieved the task of making a basket shape from clay with full independence. Six weeks after the instruction with the most to least prompting, the skill of making a basket from clay continued independently. It is possible that the dramatic increase, shown in Figure 1, of both participants after the 2nd instructional session might be due to the repetition of steps in the skill analysis in a certain sequence.



Instructional Data

Ten instructional sessions were conducted for the first participant, Cem, who waited for the prompts during the first two days of instructional sessions, and responded correctly following the prompts. During the 3rd

instructional session, Cem achieved the 14th, 15th and 16th steps of the skill in an appropriate way before the presentation of the verbal prompts. During the 4th session, it was not necessary to present the verbal prompts for the second time for some steps (1, 2, 4, 5, 6, 11, 12, 14, 15, 16 and 17). On the other steps, Cem needed verbal prompts for next four sessions. Cem succeeded making a basket shape from clay with 90% accuracy after the 8th instructional session.

The second participant, Emre, achieved the first three steps independently during the baseline. Control prompts were not presented for these steps during the instruction. In the 3rd instructional session, Emre achieved only the fourth step before the presentation of the verbal prompt, and this response was appropriate. In the 4th instructional session, Emre performed the 6th, 13rd, 14th, 15th and 16th steps before the presentation of verbal prompts. Seven instructional sessions were conducted for Emre and he was able to make a basket shape from clay with 90% accuracy after the 5th instructional session.

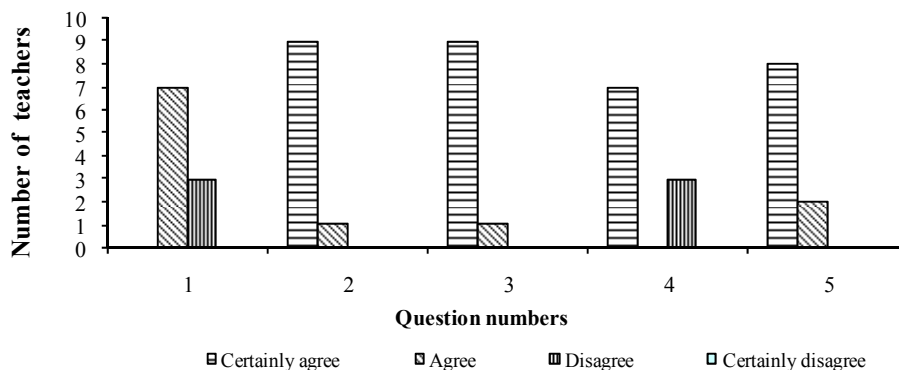
Some other behaviors that had not been targeted also appeared during this study. For instance, the participants counted the layers of the baskets that they made. They wanted to put their baskets in the kiln, after their first products dried.

Social Validity

The interviews with the two participants' parents indicated that their children communicated with them more and showed less behavioral problems. One of the parents stated that this increased her positive beliefs in her child, and also that her child gained confidence.

Seven of the teachers stated that the identification of baseline performance was definitely appropriate. All of the teachers agreed that the students were eager during the activities and that the way prompts were used was appropriate. Seven teachers pointed out that using the most to least prompting procedure was definitely appropriate for the instruction of clay shaping skills, whereas three teachers disagreed. The opposing teachers might be advocating the use of creative procedures in teaching clay-shaping skills. All teachers think that teaching clay-shaping skills to individuals with autism is suitable. The social validity results are shown in Figure 2

Figure 2
Teachers' answers to the social validity questionnaire



The ceramics teacher stated, verbally, that the students enjoyed and looked forward to working in the clay studio saying *When are we going to make a basket; we'll make a basket, we'll make a basket* all day long. The teacher confirmed that Cem and Emre's self-confidence had grown as they acquired the skills, and that they improved their ability to shape the clay creatively.

Discussion

When the data collected during the most to least prompt procedure instruction - analyzed and compared to the baseline data, the research findings indicate that both adult participants with autism achieved the task of

making basket shapes from clay with full independence. Six weeks after the instruction, the skill to make the baskets from clay continued to develop independently. These results reveal that the procedure of most to least prompting is effective not only in the teaching, but also in the maintaining of the shape skills of shaping clay.

For this study, the social validity data collected through interviews with both teachers and families are quite positive. Future studies may examine what the related nontargeted behaviors are. Moreover, other errorless teaching methods may be tested in the instruction of skills to shape clay and other leisure activities. In addition, the effectiveness of various errorless teaching methods in the instruction of skills to shape clay may be compared.

In this study, a most to least prompting procedure was found to be effective in teaching adults with autism to make a basket shape from clay. Additionally, this study focused on the teaching process rather than the product quality. Although the teacher did not expect any aesthetic values, it could be said that forms of student products became more attractive over time.

This research did not include any generalization data it may be useful for future research to be conducted on the generalization of the skills using different forms, trainers, or settings containing small groups.

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Appendix

Questionnaire for social validity

	certainly agree	agree	disagree	certainly disagree
Identification of baseline is in accordance with the aim.				
Students participated voluntarily during the instruction.				
The use of prompts utilized for instruction is appropriate.				
Using the most to least prompt procedure for the instruction of skills to shape clay is appropriate.				
Teaching how to shape clay to individuals with autism is appropriate.				