Occupationally embedded exercise versus rote exercise in terms of psychosocial effects on college-age females

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FINAL APPROVAL OF SCHOLARLY PROJECT
For the Degree of
Master of Occupational Therapy

Title of Scholarly Project: "Occupationally Embedded Exercise Versus Rote Exercise in Terms of Psychosocial Effects on College-Age Females"

Submitted by

Karla Reppert

In partial fulfillment of the requirements for the degree Master of Occupational Therapy

APPROVED

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Attachment: Abstract

Final Approval of SP MOT
Occupationally Embedded Exercise Versus Rote Exercise in Terms of Psychosocial Effects on College-Age Females

Karla A. Reppert

Medical College of Ohio
Abstract

Objective

The purpose of this study was to examine the effects of occupationally embedded exercise in comparison with rote exercise in thirty college-age females on the following aspects of the psychosocial being: level of meaning, stress and anxiety, and affinity.

Methods

Each participant completed both an occupationally embedded exercise and a rote exercise on different days and in varying orders. While participating in the occupationally embedded exercise condition they stirred cookie dough for the dual purpose of exercise and making cookies. While participating in the rote exercise condition they stirred an unknown substance with no additional environmental stimuli. Basic demographic information such as age, ethnicity/race, and educational program was collected from each of the participants upon completion of each condition of the independent variable. The Osgood short-form semantic differential (Osgood, May & Miron, 1975) was used to measure level of meaning and three, ten-point scales were used to measure levels of happiness, stress, and anxiety.

Results

Paired t-tests and Wilcoxon signed ranks tests were used to determine any significant differences between the two conditions on the dependent variables. Statistical significance was found across all of the dependent variables indicating that participants in the study completed more repetitions and stirred for a longer duration of time, reported higher levels of happiness and lower levels of stress and anxiety, and reported higher scores in the areas of evaluation, power, and action regarding level of meaning when participating in the occupationally embedded condition.
Conclusion

This study is one of the first to provide evidence that occupationally embedded exercise elicits a more positive psychosocial response when compared to rote exercise. The results of this study imply that by engaging clients in occupationally embedded exercise as a means of meeting their goals during occupational therapy treatment sessions, an occupational therapist can elicit a more positive psychosocial response from the client than if he or she were to engage in rote exercise in order to meet their occupational therapy goals. The results of this study imply that future occupational therapy clients will be happier, less stressed, less anxious, and find a higher level of meaning in their occupational therapy sessions if engaged in occupationally embedded exercise as a means to their end result.
Occupationally Embedded Exercise Versus Rote Exercise in Terms of Psychosocial Effects on College-Age Females

The purpose of this study was to examine the effects of occupationally embedded exercise in comparison with rote exercise in college-age females on the following aspects of the psychosocial being: level of meaning, stress and anxiety, and affinity. Prior to reviewing the current study, the importance of occupationally embedded exercise to the profession of occupational therapy, followed by a brief literature review describing past studies that promote the use of occupationally embedded exercise will be addressed. The current study will then be discussed.

Importance of Occupationally Embedded Exercise

Occupationally embedded exercise is of vital importance to the field of occupational therapy. Occupation is defined in Thomas and Nelson (2000) as “the relationship between an occupational form and an occupational performance.” Occupationally embedded exercise is a type of activity with added meaning that the client takes part in for therapeutic reasons. The added meaning in occupationally embedded exercise adds a very important component to the therapy session. While occupationally embedded exercise, dual-purpose activity, and purposeful activity can be used interchangeably, these terms refer to the type of exercise that embeds occupation, or some sort of meaning or added purpose in order to both please and motivate the client. As the following research studies illustrate, occupationally embedded exercise is very important, and contributes a great deal, to occupational therapy as a profession. As noted in the following research studies, occupationally embedded exercise has been proven to elicit an improved physiological response in many populations and during many different occupations in comparison with rote exercise. By using occupationally embedded exercise in place of rote
exercise in occupational therapy treatment sessions, an occupational therapist can improve a client’s physiological response during therapy and therefore increase the value of occupational therapy as a profession.

There have been many occupational therapy research studies conducted in the past that have examined the effects of rote exercise in comparison to occupationally embedded exercise (Bloch, Smith, & Nelson, 1989; Dolecheck & Schkade, 1999; Lang, Nelson, & Bush, 1992; Yoder, Nelson, & Smith, 1989; Miller & Nelson, 1987). For example, Bloch, Smith, and Nelson (1989) researched jumping with a rope (occupationally embedded) in comparison to jumping without a rope (rote exercise) at a given level of exertion in terms of heart rate and duration in thirty college women. The researchers asked the participants how they felt about the jumping activities and which activity they preferred. The affective meaning of each of the occupations also was assessed using Osgood’s Semantic Differential (Osgood, May & Miron, 1975). The authors reported that the increase in heart rate was significantly higher for jumping with a rope in comparison with jumping without a rope. The findings of this study support the notion that occupationally embedded exercise elicits positive physiological effects in those who engage in the occupation. The authors also recommended future research into the affective dimensions of occupationally embedded exercise.

Dolecheck and Schkade (1999) researched whether personally meaningful goal-directed therapeutic occupations for six older adults post cerebral vascular accident (CVA) would facilitate greater improvements in the dynamic standing endurance of the individuals as opposed to the use of occupations that were not personally meaningful. An interest questionnaire and checklist was used to allow the participants to identify their most preferred activity for inclusion in their treatment. This allowed the researchers to be sure that the participant was engaging in an
occupation that he or she found meaningful. The results of the study indicated that the participants showed a statistically significant increase in standing time with personally meaningful activities versus nonmeaningful activities. The authors reported that the older adults stood longer when performing meaningful tasks as compared to their time spent standing during nonmeaningful tasks. This study supports the notion that including meaning in occupations elicits better results in comparison with rote exercises.

Hsieh, Nelson, Smith, and Peterson (1996) researched whether two added-purpose occupations (one added-materials occupation and one imagery-based occupation) would elicit more exercise repetitions than a rote exercise in twenty-one men and women with hemiplegia. The added-materials occupation involved throwing small balls and the imagery-based occupation involved imagining that they were picking up a small ball from the ground and throwing it at a target. The rote exercise simply involved touching the ground with their hand, standing up, elevating the arm, flexing the elbow, and stretching the arm forward quickly. The authors reported that the persons with hemiplegia elicited significantly more exercise repetitions in the two added-purpose occupations as compared with the rote exercise. This study provides evidence that added purpose can enhance motor performance in persons with hemiplegia.

Lang, Nelson, and Bush (1992) compared materials-based occupation, imagery-based occupation, and rote exercise in fifteen nursing home residents. The conditions involved either kicking a balloon, imagining kicking a balloon, or a control rote exercise. It was determined that the materials-based occupation condition elicited significantly more kicking repetitions than the other two conditions. The findings of this study support the notion that the use of physical materials in the occupational form will enhance the client’s occupational performance.
Nelson et al. (1996) compared an occupationally embedded exercise involving a dice game with a rote exercise in twenty-six men and women with stroke who were experiencing pronator spasticity. In the occupationally embedded exercise, the participant turned a rotary handle attached to an apparatus containing three dice. The purpose of the game was to turn the handle enough to make all three dice fall through the handle and score doubles or three in a row. In the rote exercise condition, the participant was instructed to simply turn the handle for two sets of ten trials with no dice or mention of a game. The results showed that participants in the occupationally embedded exercise performed significantly more handle rotations in comparison with the rote exercise. Despite their pronator spasticity, the participants rotated the handle further in the context of a game than in the rote exercise condition. This study adds to the literature that supports the use of occupationally embedded exercise in place of simple rote exercise by showing that occupationally embedded exercise can enhance a specific pattern of therapeutic exercise in bilaterally assisted supination.

Sietsema, Nelson, Mulder, Mervau-Scheidel, and White (1993) tested ten trials of occupationally embedded intervention in comparison with ten trials of a rote arm-reach exercise. The occupationally embedded intervention consisted of the participant leaning forward and reaching out his or her affected arm to play a computer-controlled game that used sequences of flashing lights and sounds. The rote exercise condition consisted of leaning forward and reaching out his or her affected arm on command. Participants included seventeen men and three women with traumatic brain injury with mild to moderate spasticity in their upper extremity. These results indicated that the use of a game as an occupationally embedded exercise elicited more range of motion than a simple rote exercise and lends support to the use of occupationally embedded exercises in the neurodevelopmental treatment of those with traumatic brain injury.
Thomas, Vander Wyk, and Boyer (1999) investigated whether patients undergoing Phase II cardiac rehabilitation would perform differently during materials-based, imagery-based, and rote exercise-based occupational forms. The authors also researched whether the contrasting occupational forms mentioned above hold different affective meanings for the participants using the Osgood Semantic Differential (Osgood, May & Miron, 1975). Fifteen people with cardiac dysfunction were examined in the study. The materials-based group kicked a ball up a ramp, the imagery-based group imagined kicking a ball up a ramp, and the rote exercise group simply exercised their legs. The authors reported that significantly more repetitions of kicking movements were elicited during the materials-based condition in comparison with the imagery-based condition and the rote exercise condition. There were no significant differences found in affective meaning in the three conditions. This study lends support to the use of occupationally embedded exercise, especially materials-based exercise, with cardiac rehabilitation clients. The study also calls for future research in the area of determining affective response from participants regarding various types of exercise.

Yoder, Nelson, and Smith (1989) compared the number of exercise repetitions elicited in stirring cookie dough with the number of exercise repetitions elicited with a rotary arm exercise with no added purpose in thirty elderly female nursing home residents. The results of the study indicated that the occupationally embedded exercise condition elicited significantly more exercise repetitions than the rote exercise condition. This study again supports the use of embedding exercise within occupation by showing that occupationally embedded exercise elicits more exercise in elderly female nursing home residents.

Finally, Miller and Nelson (1987) compared dual-purpose activity to exercise in a sample of thirty female college students. The participants were randomly assigned to one of two groups,
either Group A or Group B. The dual-purpose activity (performed by Group A) had the participants stir cookie dough, while the exercise activity (performed by Group B) had the participants stir simply for exercise. The participants were being measured on duration and exertion along with their feelings in relationship to exercise alone and exercise with a dual-purpose. The Osgood Semantic Differential (Osgood, May & Miron, 1975) was used to assess the participants’ feelings. In terms of affective meaning, the dual-purpose activity was evaluated significantly higher than exercise alone. The difference between dual-purpose activity and exercise alone in terms of exertion approached significance, and there was no significant difference noted on duration. The results of this study lend support to the use of occupationally embedded exercise in terms of affective meaning for future occupational therapy clients. The results also indicated that occupationally embedded exercise was found to be more motivating to the client than exercise alone. The authors felt that if an individual perceives an activity as being more positive, then the individual may participate more vigorously in the treatment process. The authors also called for extended research in the area of affective meaning in order to determine all of the implications of dual-purpose activities for various tasks in different populations.

Description and Rationalization of Current Study

Bloch, Smith, and Nelson (1989), Thomas, Vander Wyk, and Boyer (1999), and Miller and Nelson (1987) all concluded that more research is needed in order to identify psychological effects of added purposefulness in occupations. In addition, Thomas and Nelson (2000) reviewed this area of research and concluded that research has been less definitive when investigating physiological responses to contrasting occupational forms in terms of heart rate and blood pressure changes or psychological responses in terms of eliciting affective meaning. Thomas and Nelson (2000) advocated for more definitive research on psychological response in
terms of eliciting affective meaning and concluded that more qualitative studies are needed in order to enhance our understanding of some of the complex aspects of contrasting occupational forms that do not lend themselves well to quantitative measurement such as meaning and affect. Thomas and Nelson (2000) also suggested that one study in and of itself is not sufficient to support a principle in occupational therapy or to change the way one practices in the clinic setting. Consensus occurs through replications of studies previously done.

In a response to these suggestions, the current study was a modification of the study completed by Miller and Nelson (1987) involving the same methods and procedures. Additional psychosocial dependent variables were also measured. The current study examined the effects of occupationally embedded exercise and rote exercise in terms of the psychosocial variables of level of meaning, stress and anxiety, and affinity. All of these psychosocial variables are important to the profession of occupational therapy. The level of meaning is important to know in order to prove that assigning more meaning to an occupation will increase the level of performance given by the client. Stress, anxiety, and affinity are all important to know in order to assess the psychological status of the client during various occupations, and to show that the client will be less stressed, less anxious, and happier when meaning is assigned to their occupations.

The independent variable in the study was type of exercise with two levels, one being an occupationally embedded exercise (stirring cookie dough) and the other being a rote exercise (stirring for exercise). The dependent variables measured qualitatively were level of meaning, affinity, level of stress, and level of anxiety. The number of repetitions completed while stirring was also measured quantitatively. Another variable, duration of stirring time, was also looked at
for exploratory purposes only. The study was similar to the Miller and Nelson (1987) study and involved thirty college age females.

The following hypotheses outline the expected outcomes of the study:

1. There will be a difference in the reported level of meaning when comparing the occupationally embedded condition and the rote exercise condition.
2. There will be a difference in the reported level of happiness when comparing the occupationally embedded condition and the rote exercise condition.
3. There will be differences in the reported levels of stress and anxiety when comparing the occupationally embedded condition and the rote exercise condition.
4. The number of repetitions made while stirring will be higher in the occupationally embedded condition when compared with the rote exercise condition.

The first three hypotheses were made non-directional in nature due to the lack of research in the field of occupational therapy concerning the areas of meaning, affinity, stress, and anxiety. The fourth hypothesis was made directional in nature due to the extensive previous research that has consistently found occupationally embedded exercise to lead to an increase in the number of repetitions performed in various activities.

Method

Participants

An available sample of thirty college-age females from a Midwest college was used in this study. The participants ranged in age from twenty to twenty-eight ($M = 22.2, SD = 1.69$), and was comprised of twenty-seven Caucasian females, two African-American females, and one
Indian female. Four of these females were medical students, twenty-one were physical therapy students, and five were nursing students from the college. In order to recruit participants for the study, visits were made to classrooms to pass out flyers and talk with students. Participants included in the study were required to be female, eighteen years of age or older, and a current student. The participants also were required to sign an informed consent form in order to be allowed to participate in the study. Males were excluded from the study based on the following reasons given by Miller and Nelson (1987):

1. It seems theoretically likely that men will respond differently to a cooking-related activity, and the study of this difference will require a sample size that is impractical for the principal investigator.

2. The exercise involved might be insufficiently challenging to some males, and they might not believe that cookies need as much stirring as they are able to give.

A randomized table was used to ensure that each participant received both conditions of the independent variable in a counterbalanced manner.

**Apparatus/Materials**

A special mixing apparatus was ordered for this study. The apparatus consisted of two identical mixing bowls and two lids. The lids had identical size holes in the center where a mixing spoon fit through to keep the stirring revolutions consistent for each participant. A dark black material was placed around the mixing bowl and its accompanying lid used in the rote exercise condition to prevent the participant from viewing its contents. Pre-made packages of sugar cookie mix were used. The current study took place on the kitchen side of the occupational therapy lab.

**Instruments**
The Osgood short-form semantic differential (Osgood, May & Miron, 1975) was used to measure the level of meaning that each of the participants reported while completing the occupationally embedded exercise and a rote exercise. A scale with twelve items was given to each participant at the completion of each of the exercises. Each of the twelve straight-line continuums was divided into seven sections, and each section was scored with a corresponding number ranging from zero to six. The left side of the continuum was the positive side and began with a score of six. The right side of the continuum was the negative side and ended with a score of zero. Each of the three factors of affective meaning measured by the Osgood, evaluation, power, and action, have scores that range from zero to twenty-four. The evaluation factor was measured by the following pairs: nice/awful, good/bad, sweet/sour, and helpful/unhelpful. The power factor was measured by the following pairs: powerful/powerless, strong/weak, deep/shallow, and big/little. The action factor was measured by the following pairs: fast/slow, young/old, noisy/quiet, and alive/dead. The higher the reported score; the more positive the feeling of the participant. Information on the reliability and validity of the Osgood short-form semantic differential can be found in Osgood, May and Miron (1975).

Three ten-point scales similar to pain and exercise scales were also used to measure the participants’ levels of happiness, stress, and anxiety while completing both conditions of the independent variable.

Pen and paper were used to record the number of repetitions counted by the researcher in each condition for each participant. Pen and paper were also used to collect basic demographic information from each of the participants such as age, ethnicity/race, and educational program. A stopwatch was also used to record the duration of stirring time in each condition for each participant.
Procedure

This study was counterbalanced in nature, and a randomized table was used to prevent any type of order effect. Each participant completed both the occupationally embedded exercise and the rote exercise on different days and in varying orders.

In order to recruit participants, the researcher went into various classrooms and spoke with the students about the project. If the students were interested in participating they were asked to sign up on a contact sheet and include their name, phone number, and/or e-mail address. Once a participant signed up to participate she was either phoned or e-mailed by the researcher to set up a time to complete each of the two sessions within one week of each other. Once a date for the first session was set, the participant was assigned to a condition using the randomized table in order to determine which exercise she would perform first. Each of the participants initials, randomized order, dates of participation, and times of participation were recorded on a master list which was destroyed after the data was collected and the project was complete.

When the individual participant arrived to complete the first condition, she was greeted by the researcher, re-informed of the purpose of the study, and asked to read and sign an informed consent form. Once the informed consent form was signed, the researcher verbally gave the participant instructions on what she was supposed to do.

When the participant participated in the occupationally embedded exercise condition, she stirred cookie dough for the dual purpose of exercise and making cookies. Similar to the Miller and Nelson (1987) study, environmental stimuli were added to the room in order to help to convince the participant that she was there to make cookies. The stimuli added included a batch of fresh cookies placed into the oven to bake before each of the participants began to stir their cookies and homemade cookies placed in front of the participants with instructions that the
participants were able to eat the cookies. The following directions, taken from Miller and Nelson (1987), were given to the participant:

Occupations are part of the practice of occupational therapy and are often used for rehabilitation purposes. Incorporated into this occupation is an element of exercise, but you will also be participating in the process of making cookies by stirring the cookie batter. I am trying to determine the psychosocial effects felt by a person as they stir cookie dough for the therapeutic value of exercise and cookie making.

When the participant participated in the rote exercise condition, she stirred an unknown substance with no additional environmental stimuli. The mixing bowl in this condition was covered with a dark material so that the participant was not able to view the contents of the bowl. As described in Miller and Nelson (1987), the participants were told:

Exercise is part of the practice of occupational therapy and is often used for rehabilitation purposes. In this research project, I am trying to determine the psychosocial effects felt by a person as they stir a substance for the therapeutic value of exercise alone.

Each participant was told, in each of the conditions, to stir the contents of her pot with her dominant hand for as long as she desired. At the completion of the stirring, the number of repetitions and the duration of the stirring time were recorded by the researcher. The form was then given to the participant and she was asked to complete the rest of the form by filling in the demographic information, the Osgood short-form semantic differential, and the three ten-point scales. Verbal instructions were given to the participant on how to fill out the form correctly. The participant was then reminded of her scheduled time to return in order to complete the other condition within a one-week time frame. The participant was then instructed not to discuss the experiment with any other students that might be participating in the study.
Results

The dependent variables explored in this study were repetitions, duration, happiness, stress, anxiety, evaluation, power, and action. Evaluation, power, and action were the three areas measured by the Osgood short-form semantic differential (Osgood, May & Miron, 1975) to determine level of meaning of the experience. Each participant received a total of six scores from the Osgood, one score in each of the three categories of evaluation, power, and action for each condition. These scores represented the level of meaning experienced by the participant in each condition. Each participant also received a total of six separate scores, three in each condition, based on her responses to the three ten-point scales. These scores represented the levels of stress, anxiety, and affinity experienced by the participants in each condition. Each participant received two separate scores, one in each condition, that represented the number of repetitions made in each condition, and two separate scores, one in each condition, that represented the duration of stirring time in each condition. Means were determined along with standard deviations for each of the eight pairs of dependent variables. Please refer to Table 1 for a description of the means and standard deviations for each of the eight pairs.

Statistical significance was found across all of the eight dependent variables examined in this study in the correct direction (see Table 1). After performing paired t-tests, it was found that happiness, evaluation, power, and action were all statistically significant. This indicates that participants were happier and reported a higher overall level of meaning while participating in the occupationally embedded condition. After performing Wilcoxon signed ranks tests for the remaining skewed variables (repetitions, stress, anxiety, and duration), the four pairs were found to be statistically significant (see Table 1). This indicates that participants performed more
repetitions, reported less stress and anxiety, and stirred for longer durations of time while participating in the occupationally embedded condition.

To test for order effects, a MANOVA was performed on all of the dependent variables. No order effects were found with all of the dependent variables except for anxiety ($p < .04$) and evaluation ($p < .004$). The participants reported a higher level of anxiety during their second visit as compared with their first visit, and participants evaluated their feelings regarding participation in each condition higher on their first visit as compared with their second visit.

**Discussion**

Many of the previous studies researched occupationally embedded exercise and rote exercise in terms of measurable, physical dependent variables such as duration, repetitions, motion analysis measurements, and heart rate. There have been very few studies that have reported qualitatively and psychosocially how participants have felt in regard to both the occupationally embedded exercise and the rote exercise that they were asked to participate in during their research experiences. This study is one of the first to show a true effect with psychosocial variables in addition to the previously studied physiological variables in comparing occupationally embedded exercise to rote exercise. This study is a breakthrough in the understanding of how occupationally embedded exercise affects participants psychosocially in comparison with rote exercise. In addition, this study provides evidence that participants respond more positively psychosocially when participating in an occupationally embedded exercise compared to a rote exercise.

To review, participants in the current study completed more repetitions and stirred for a longer duration of time when participating in the occupationally embedded condition. Participants also reported higher levels of happiness and lower levels of stress and anxiety when
participating in the occupationally embedded condition. In regard to level of meaning, the participants’ scores were higher in the areas of evaluation, power, and action when participating in the occupationally embedded condition as compared to the rote exercise condition. This shows that participants found a higher level of meaning in their participation in the occupationally embedded condition as compared to the rote exercise condition.


Specifically, Miller and Nelson (1987) found that a dual-purpose activity (stirring cookie dough) was evaluated significantly higher than exercise alone (stirring simply for exercise) in terms of affective meaning. This study also called for extended research in the area of affective meaning in regard to the implications of dual-purpose activities for various tasks in different populations. The current study was a replication of the Miller and Nelson (1987) study and added the psychosocial variables of level of meaning, happiness, stress, and anxiety. The current study showed significance in exertion in terms of number of repetitions and in duration in regard to number of seconds spent stirring. More importantly, the current study provides new evidence that participants responded more positively in a psychosocial sense when participating in the occupationally embedded condition. Participants were happier, less stressed, less anxious, and reported a higher level of meaning when participating in the occupationally embedded condition.
This study is one of the first to provide evidence that occupationally embedded exercise elicits a more positive psychosocial response when compared to rote exercise. It can be inferred that patients receiving occupational therapy services will also respond in a more positive psychosocial way when participating in an occupation with added meaning. The results of this study imply that by engaging clients in occupationally embedded exercise as a means of meeting their goals during occupational therapy treatment sessions, an occupational therapist can elicit a more positive psychosocial response from the client than if he or she were to engage in rote exercise in order to meet their occupational therapy goals. Future occupational therapy clients who are given an occupation that is meaningful to him or her may perform better physically at the occupation as well as better psychosocially at the occupation. The results of this study imply that future occupational therapy clients will be happier, less stressed, less anxious, and find a higher level of meaning in their occupational therapy sessions if engaged in occupationally embedded exercise as a means to their end result.

Limitations

A limitation to the current study was the two order effects found on the dependent variables of anxiety and evaluation. There are several possible explanations. First, the participants reported a higher level of anxiety during their second visit as compared with their first visit. It is possible the participants did not have any expectations for the way they performed during the first session. In regard to the second session they participated in, they had already completed one condition and might have formed an idea of what the study entailed and what the desired outcomes would be. This idea could then have led the participants to feel an increased level of anxiety to perform correctly in the second session in order to please the researcher, perform the correct way, and achieve the desired outcomes. This desire to perform
correctly and to please the researcher could have caused the participants to report a higher level of anxiety the second time they came to participate in the study.

The participants also evaluated their feelings toward each condition more positively on their first visit as compared with their second visit. A possible explanation for this order effect is that the participants rated more positively on their first visit because the research was new and novel to them and they enjoyed participating in the project. By the second visit the feeling of novelty might have subsided and their evaluation ratings for the project were therefore lower for the second visit. Recall, the participants also reported an increased level of anxiety the second time they participated in the study, and this could have led to lower ratings regarding the project overall. Participants were also giving additional time to the project by coming in for a second visit, and the strain to fit the time into their schedule to return for a second session may have caused them to rate their feelings about the project lower the second time.

Another limitation to this study was that participation was limited only to college-age, healthy females who were students. This factor limits the generalizability of the study.

A final limitation to this study was the nature of the scales used to measure levels of meaning, happiness, stress, and anxiety. The three ten-point scales used to measure happiness, stress, and anxiety were very basic in nature and did not allow for comment or reasoning behind the values given.

*Future Research*

Suggestions for future research include replicating this study with different populations such as males, psychiatric patients, and stroke patients to determine if the results from this study are generalizable across populations. It is also suggested that this study be replicated using a
different occupation, other than stirring cookie dough, to determine if the psychosocial results found with this study carry over with different occupations as well as with different populations.

Another suggestion for future research includes using different scales. More complete scales that are standardized to measure happiness, stress, and anxiety would add to the effectiveness of the study and allow for the participants to be more thorough in rating specific aspects that make up the feelings of happiness, stress, and anxiety. Other psychosocial variables could also be looked at to broaden the research and add new aspects to the current literature.

Conclusion

In conclusion, this study is one of the first to provide evidence that occupationally embedded exercise elicits a better psychosocial response, as well as a better physical response, than rote exercise on potential occupational therapy clients. More research is needed to show the importance of meaning and purpose in the field of occupational therapy to ensure that the client is performing to their utmost potential both physically and psychosocially.
References


Table 1

*Deposition Data and Statistical Results*

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Rote Condition Mean (SD)</th>
<th>Occupationally Embedded Condition Mean (SD)</th>
<th>Statistical Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitions</td>
<td>61.07 (40.11)</td>
<td>79.53 (58.62)</td>
<td>$z = -2.87$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; .004$</td>
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<tr>
<td>Duration (seconds)</td>
<td>109.36 (86.74)</td>
<td>125.20 (80.12)</td>
<td>$z = -2.50$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; .012$</td>
</tr>
<tr>
<td><em>Happiness</em></td>
<td>6.30 (1.86)</td>
<td>8.56 (0.94)</td>
<td>$t = 7.05$</td>
</tr>
<tr>
<td>(range of scores 1-10)</td>
<td></td>
<td></td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td><strong>Stress</strong></td>
<td>2.83 (2.21)</td>
<td>1.56 (1.07)</td>
<td>$z = -3.09$</td>
</tr>
<tr>
<td>(range of scores 1-10)</td>
<td></td>
<td></td>
<td>$p &lt; .002$</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>2.53 (1.87)</td>
<td>1.33 (0.71)</td>
<td>$z = -3.33$</td>
</tr>
<tr>
<td>(range of scores 1-10)</td>
<td></td>
<td></td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td><em>Evaluation</em></td>
<td>14.50 (3.00)</td>
<td>20.46 (2.70)</td>
<td>$t = 10.43$</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td><em>Power</em></td>
<td>13.43 (2.57)</td>
<td>15.83 (2.97)</td>
<td>$t = 3.50$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; .002$</td>
</tr>
<tr>
<td><em>Action</em></td>
<td>11.40 (3.09)</td>
<td>14.56 (3.63)</td>
<td>$t = 5.11$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; .001$</td>
</tr>
</tbody>
</table>

* Higher scores indicate more positive psychosocial feedback

** Lower scores indicate more positive psychosocial feedback