Dual-Purpose Activity Versus Single-Purpose Activity in an Institutionalized Geriatric Population

Rita M. Yoder
Western Michigan University

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DUAL-PURPOSE ACTIVITY VERSUS SINGLE-PURPOSE ACTIVITY IN AN INSTITUTIONALIZED GERIATRIC POPULATION

by

Rita M. Yoder

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Science
Department of Occupational Therapy

Western Michigan University
Kalamazoo, Michigan
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The use of purposeful, goal-directed activity has traditionally been a central theme for occupational therapy. In dual-purpose activity, the participant has two goals: successful task completion and the making of adaptive responses in the activity process. This study compares the extent to which a dual-purpose activity (stirring for the purpose of exercise and baking cookies) enhances performance in contrast to a single-purpose activity (stirring for the purpose of exercise alone) in an institutionalized geriatric population.

Thirty women between 70 and 92 years of age were randomly assigned to either the single- or dual-purpose activity. Duration, exertion, and discontinuities were measured and recorded. Mann-Whitney U tests revealed significant differences in favor of dual-purpose activity on the dependent variables duration and exertion. Statistical analysis on the discontinuities variable was not advisable due to low frequency of occurrence. Implications for clinical practice and future research are discussed.
ACKNOWLEDGEMENTS

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Rita M. Yoder
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INTRODUCTION

The profession of occupational therapy is rooted in the premise that purposeful, goal directed activity has significant value in the functional restoration of a physical or mental condition (Hightower-Vandamm, 1981). Occupational therapists are committed to the use of purposeful activities (AOTA Representative Assembly, 1979). Mosey (1981) asserted that purposeful activity is an important legitimate tool used by occupational therapists and defined purposeful activities as "doing processes directed toward a planned or hypothesized end result" (p. 99). She contrasted purposeful activities to random activities which are undirected and lack a predetermined goal. Fidler and Fidler (1978) stated that purposeful activity or "doing" plays a crucial role in integrating the body's various systems and in verifying one's efficacy as a competent member of one's society (p. 305). Cynkin (1979) concluded that purposeful activity is basic to the total human experience: "Eyes become keener, the hands surer, the muscles stronger, the endurance greater, the mind sharper, the interpersonal negotiations more skilled, the knowledge more comprehensive, the perceptions finer, and the feelings more orderly through engagement in activities" (p. 13). Likewise, Mosey (1981) stated that without purposeful activity there could be no human experiences.

It seems clear that the use of purposeful, goal directed activity has traditionally remained central in the evaluation and treatment process in occupational therapy. However, in recent years there has
developed considerable dissent between members of the profession regarding the exclusive use of purposeful activity as a primary treatment modality in occupational therapy practice. West (1984) observed a growing controversy and denial of traditional occupational therapy media. She stated that traditional media have been replaced with modalities identified with the knowledge base of other disciplines.

This controversy becomes very apparent when the subject of exercise and its inclusion in a definition of purposeful activity is addressed. King (1978) asserted that occupational therapists' use of nonpurposeful exercise, traditionally the realm of physical therapy, dilutes the profession's unique identity. She further stated that purposeful activity creates an adaptive response which she considered the "core of occupational therapy theory" (p. 432) and that exercise alone is not able to elicit this type of adaptive response. Huss (1981) supported King's belief in the importance of purposeful activity in eliciting an adaptive response and asserted that resistive exercise without a purposeful component is not in the realm of occupational therapy.

On the other hand, English, Kasch, Silverman, & Walker, (1982) contended that the distinction between purposeful activity and nonpurposeful activity is ambiguous. They maintained that in occupational therapy practice it is sometimes not appropriate nor effective to confine treatment methods solely to the use of purposeful activity. According to these authors, such a limitation has deleterious effects on the scope of specialized areas of occupational therapy, the number of referrals, the sources of reimbursement, and the quality of patient
care. Others have also supported the inclusion of exercise in a definition of purposeful activity. Trombly (1982) stated that in practice "purposeful activity is limited with regard to control of parameters of gradation needed to effect an improvement in strength, range of motion, or motor control" (p. 467). Likewise, Yerxa (1967) acknowledged that exercise may be the most productive modality in the rehabilitation of some individuals.

Another approach to the issue of exercise and purposeful activity has been proposed by Nelson (1984, p. 148). In reviewing therapeutic treatment modalities used with children, Nelson discussed the concept of dual-purpose activities. According to Nelson, performance of an activity not only concludes in successful completion in and of itself but, in the process, also requires developmental adaptations. The activity is therefore dual-purpose in nature.

Miller in an unpublished master's project (1985) compared single-purpose with dual-purpose activity in a study measuring a stirring activity with normal subjects. She found that subjects evaluated stirring for the dual purposes of exercise and making cookie dough higher than the single-purpose stirring-for-exercise-only activity and that subjects in the dual-purpose group tended to exert more effort.

Another study (Kircher, 1984) investigated the same principle with two jumping activities. It was found that heart rate increase upon indicating fatigue (by stopping jumping) was significantly higher for a group that jumped rope (dual-purpose) as opposed to a group that jumped in place (single-purpose).
There is a need for further research in this area. In the Miller (1985) and Kircher (1984) studies, subjects were healthy young adults. While it is important for occupational therapists to test theoretical concepts using "normal" subjects as their sample, the majority of occupational therapy practice deals with populations which have experienced limitations in their ability to successfully complete daily life tasks.

Institutionalized older adults constitute a large population of individuals who have experienced some difficulty in successful completion of these daily life tasks. Increasingly, occupational therapists have become involved in planning and implementing activity programs for the institutionalized elderly. Rogers (1981) stated that geriatric occupational therapy is an expanding area of practice. In speaking of the philosophical base for treatment of the elderly patient, Johnson (1983, p. 729) referred to the use of goal directed activity. The occupational therapy programs of many nursing homes emphasize purposeful activities to provide meaningful sensory and social stimuli for their residents. Cooking is one such treatment modality often employed in occupational therapy clinics and activity programs with the elderly.

With many activity programs employing the use of purposeful activities into their daily treatment programs, it seems crucial to investigate the effects of such activity. The intent of this study was to determine the extent to which a dual-purpose activity enhances performance in contrast to a single-purpose activity in an institutionalized geriatric population. This study constituted a follow-up of research conducted
by Miller (1985). Like Miller, the study examined the performance of individuals engaged in two different activities: stirring for the single purpose of exercise versus stirring for the dual purposes of exercise and mixing cookie batter. Also like the Miller study, the duration of stirring and the number of stirring rotations were measured. The following were differences between the Miller study and the present study:

1. the present study used institutionalized geriatric patients whereas Miller used normal college students;
2. affective meanings were not measured in the present study;
3. the number of discontinuities or brief stoppages of activity in which the subject was prompted to continue stirring were measured;
4. the mixing apparatus in the present study was somewhat different (in order to adjust to the needs of the subjects);
5. subjects in this study's dual-purpose group were allowed to view the contents of the mixing apparatus and were requested to add an ingredient to the cookie batter; and
6. slight changes in the verbal instructions given to both groups were implemented in the present study.

The hypotheses listed below were tested. Subjects involved in the dual-purpose activity will:

1. Engage in the task longer than those involved in an activity for exercise alone.
2. Have a higher exertion level than those involved in an activity for exercise alone.
3. Display fewer discontinuities (activity stoppages) than those involved in an activity for exercise alone.
METHOD

Subjects

An available sample of 30 female residents, who were living in two nursing homes were studied. Subjects' ages ranged from 70 to 92 years with a mean age of 81.5 years.

The Parachek Geriatric Rating Scale was used as a screening device to determine the overall functional level of potential subjects in three categories:

1. physical capabilities,
2. self-care skills, and
3. social interaction skills.

Persons who demonstrated sufficient physical and communication skills by obtaining a score of 25 or more on the Parachek Scale were included in the study.

Apparatus

Two metal, manual popcorn poppers were adapted for the experiment. These were selected to be used as stirring containers because they were readily available with few adaptations needed. The units were altered in such a way that all visible evidence of their customary use as popcorn poppers was concealed. Each apparatus was a three liter, cylindrically shaped pan, 10 cm. high and 22 cm. in diameter. A wooden stirring handle 20 cm. in length was attached to a metal shaft which, in turn,
was attached to a metal mixing paddle in the middle of the mixing chamber. Rotation of the wooden stirring handle enabled contents in the mixing chamber to be mixed. Each popper's lid was secured with two metal clips so that subjects were not able to view contents of the mixing chamber while stirring.

Measurements

The following dependent variables were measured in the same way as in Miller (1985):

Duration—Total length of time (recorded in seconds) expended in the task.

Exertion—Number of rotations the subject made with the stirring handle.

In addition, this study also measured the following variable:

Discontinuities—Number of hesitations that lasted three seconds or longer.

Observers sat approximately ten feet away from the subject and measured the total duration of time the subject was engaged in the activity with a stopwatch (see procedure). The observers also counted the total number of revolutions the subject made with the stirring handle during the activity. Measurement of the discontinuities exhibited by the subjects were also recorded.

Inter-rater reliability was performed on 16 of the subjects to determine the accuracy with which the measurements were recorded. A high degree of observer reliability was achieved. For the dependent variables duration, exertion and discontinuities inter-rater reliability was 97.81%, 97.93%, and 100% respectively.
to view the contents of the mixing apparatus. Similar to Miller (1985), subjects were told:

All of us need to exercise. I am trying to determine the length of time and how hard a person will stir something for exercise. When I say begin, please stir as long as you can without becoming too uncomfortable. Stop when you are too uncomfortable. Don't let [observer's name] and me bother you. We will be keeping track of how long you stir. Remember, stir as long as you can without feeling too uncomfortable. Stop when you are too uncomfortable. Ready? Begin.

Group B received added environmental stimuli to create an atmosphere of baking cookies. A plate of homemade cookies was placed in view of each subject, and subjects were invited to eat a cookie after the activity. A toaster oven with a pan of cookies which were ready to be baked was also on the table as were a spatula, hot pad, and a measuring spoon to simulate the equipment necessary for baking cookies. The researcher and subject spoke briefly about making cookies. The subject was allowed to view the batter in the mixing apparatus and assisted in adding the remaining ingredient, 15 ml. of vanilla, to the batter. Before beginning, Group B subjects were told:

All of us need exercise. Sometimes we can combine our exercise with some other activity we enjoy, like baking cookies. I am trying to determine the length of time and how hard a person will stir something for exercises and baking cookies. These cookies taste best when stirred for a long time. When I say begin, please stir the cookie batter as long as you can without feeling too uncomfortable. Stop when you
are too uncomfortable. Don't let [observer's name] and me bother you. We will be keeping track of how long you stir. Remember, these cookies taste best when stirred for a long time. Please stir as long as you can without feeling too uncomfortable. Stop when you are too uncomfortable. Ready? Begin.

After the instructions were given the researcher rose and sat in a chair approximately ten feet away. No interaction was initiated by the researcher except planned prompts.

Prompting was given whenever a hesitation lasted three seconds (a discontinuity). When Group A subjects ceased stirring for three seconds, the researcher waited and asked, "Can you stir some more without feeling too uncomfortable? Stop when you are too uncomfortable." The same procedure was followed in subsequent discontinuities. When Group B subjects ceased stirring, the researcher waited three seconds and stated, "These cookies taste best when stirred for a long time. Can you stir some more without feeling too uncomfortable? Stop when you are too uncomfortable." As with Group A subjects, this same procedure was followed with Group B subjects.

For both groups, the procedure took place in a day room of the nursing home.

Data Analysis

A preliminary analysis of data indicated that numerical values for each of the three dependent variables were not normally distributed. An underlying assumption when using parametric statistics is that the variables are normally distributed (Seaver, 1979). Royeen and Seaver (1986)
advocated the use of nonparametric statistics in occupational therapy research. Nonparametric Mann-Whitney U tests were computed to test the research hypotheses.
RESULTS

Table 2 summarizes the results.

Table 2
Age, Parachek Score, Duration, and Exertion in Single-Purpose and Dual-Purpose Activity Groups

<table>
<thead>
<tr>
<th>List of Variables</th>
<th>Group A Single-Purpose Activity (n=15)</th>
<th>Group B Dual-Purpose Activity (n=15)</th>
<th>Probability (p) that the two groups are equal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>M 81.3</td>
<td>81.7</td>
<td>ns(^a)</td>
</tr>
<tr>
<td>Parachek Scale</td>
<td>M 39.2</td>
<td>42.1</td>
<td>ns(^a)</td>
</tr>
<tr>
<td>Duration (in minutes)</td>
<td>M 2.49</td>
<td>6.06</td>
<td>&lt;.01(^b)</td>
</tr>
<tr>
<td>Exertion (in number of rotations)</td>
<td>M 75.27</td>
<td>190.87</td>
<td>&lt;.05(^b)</td>
</tr>
</tbody>
</table>

\(^a\)ns = non-significant statistically as tested by t-tests.
\(^b\)Statistically significant as tested by one-tailed, Mann-Whitney U tests.
Dependent Variable: Duration

For the dependent variable, duration, Mann-Whitney $U=44$, $p<.01$. The mean and median for the single-purpose group (Group A, $n=15$) were 2.49 minutes and 1.60 minutes respectively. The mean and median for the dual-purpose group (Group B, $n=15$) were 6.06 minutes and 4.68 minutes respectively. The overall number of minutes stirred ranged from a minimum of 0.83 minutes to a maximum of 14.48 minutes.

Dependent Variable: Exertion

For the dependent variable exertion, Mann-Whitney $U=58.5$, $p<.05$. The mean and median for the single-purpose group (Group A, $n=15$) were 75.27 rotations and 55 rotations respectively. The mean and median for the dual-purpose group (Group B, $n=15$) were 190.87 and 133 respectively. The overall number of stirring rotations ranged from a minimum of eight rotations to a maximum of 512 rotations.

Dependent Variable: Discontinuities

The number of discontinuities were recorded. There was a slight tendency for subjects in the single-purpose group to stop more often than subjects in the dual-purpose group. However, the frequency of distribution in the variable was so low that statistical analysis was not advisable.
Other Considerations

No significant differences were found between subjects at the one nursing home in comparison to the other nursing home in terms of the dependent variables. There were also no significant differences between the single-purpose and dual-purpose groups in terms of age or scores received on the Parachek Geriatric Rating Scale.
DISCUSSION

Results of the study clearly indicated that in the sample tested, subjects who engaged in the dual-purpose activity (stirring for the purpose of exercise and baking cookies) stirred longer and with more rotations than subjects who engaged in the single-purpose activity (stirring for the sole purpose of exercise). No other significant factor could be isolated to account for the dramatic differences between the two groups.

These cogent results have important implications for all occupational therapists. Historically, occupational therapy has had a strong belief in the benefits of purposeful activity. Results of this study supply empirical evidence to support the concept that dual-purpose activities may enhance an individual's performance in a given task.

Occupational therapy clinicians are aware that single-purpose exercise might be advisable in certain situations and with certain clients. For example, a particular individual might prefer exercise if he or she has a strong history of past exercise experience, if he or she has the belief that exercise is especially important, if he or she prefers to focus efforts in a more singular way, or if the person dislikes a specific activity, for instance, dislikes craft modalities.

First and foremost, individual differences must be respected by the occupational therapist. However, the nature of group experimentation is to show the importance of specific stimuli regardless of individual differences. This study has demonstrated the importance an added stimulus provided via dual-purpose activity.
Just as practicing occupational therapists must structure activities to meet the specific needs of their clients, various elements in the Miller (1985) study were adapted in the present study to better meet the needs of the population. For example, the Osgood Semantic Differential used by Miller to measure affective meanings was not included in this research design since subjects in the study did not possess the skills necessary to complete this type of evaluative instrument. Likewise, instructions given to individuals in this study were simple and included the use of repetition. Also unlike the Miller study, subjects in the dual-purpose group were allowed to view the cookie batter before stirring and were asked if they could smell the remaining ingredient, vanilla, which was added immediately before commencement of the stirring activity. This type of involvement in the task is typical of dual-purpose activity.

There is a need for continued research in the area of single-purpose and dual-purpose activity. The sample used by Miller (1985) consisted of normal young adults while subjects in the present study were females with an average age of 81.5 years who resided in a skilled nursing home facility. Future research could test the same concepts and narrow the sample to include only Alzheimer's or dementia patients. Developmentally disabled subjects might also be sampled using a similar procedure. In addition to measuring duration and exertion, other dependent variables such as affect, number of verbalizations, or eye contact could also be measured. There is a wide range of dual and single-purpose activities which involve various types of gross and fine...
motor, perceptual, and cognitive abilities. These activities could be used to test the same underlying concepts as tested in the present study. Many of the craft modalities commonly used in nursing homes are examples of dual-purpose activities which could be paired with single-purpose counterparts to measure the benefits of dual- versus single-purpose activities.

Another interesting avenue for research was discovered during pilot studies. Ten subjects with characteristics similar to those in the study were measured using the same procedure as outlined except that with those subjects the researcher sat close to the subject and actually assisted the subject in holding the apparatus. The observer also sat at the same table. Under these conditions, no differences seemed to appear between the dual- and single-purpose activities. When close physical proximity was eliminated from the procedure, differences were seen between the two conditions. An explanation for this may be that the attention gained by the subject provided enough motivation for the subject to continue with the exercise activity.
CONCLUSION

This study found that, for the subjects tested, dual-purpose activity exerted a dramatic and positive influence on individual performance. In addition, this study exemplified a way in which previous research using normal subjects could be adapted to test a typical occupational therapy treatment population. It is hoped that the material presented here will serve to spark other similar types of research efforts.
APPENDIX

Letter of Informed Consent
Dear Madam:

I am a graduate student at Western Michigan University in the Occupational Therapy department. Part of my study involves research. I am especially interested in finding out about exercise in adults over 65 years of age.

If you choose to participate in this study, I will ask you to stir something for exercise. You will do this in the day room of the nursing home for approximately ten minutes. I will be measuring your exercise. I will also ask nursing staff about how well you can do everyday things by using the Parachek Geriatric Rating Scale.

The information I collect will be coded so that no one will be able to identify you in any way. There is no risk to you in participating in this study. In fact, most people find this stirring exercise fun and enjoyable. You will also be helping occupational therapists understand how different types of exercise benefit older adults.

Any questions you may have about this study will be answered promptly. Please feel free to contact myself at 375-6499, or my faculty advisor, Dr. David Nelson, at 383-1765. You are free to stop participating in this study whenever you want.

Thank you for your help!

Respectfully,

Rita M. Yoder

I have read and understood all the above information. All my questions have been answered and I agree to participate.

Signature

Date
BIBLIOGRAPHY


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