The Effect of Keeping an End-Product on Intrinsic Motivation

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Key Words: activity analysis • therapeutic activities

Objective. According to literature in occupational therapy and psychology, intrinsic motivation is thought to be enhanced if people can keep the end-product of an activity. The purpose of this study was to examine the effect of keeping an end-product on intrinsic motivation.

Method. Fifty participants chose one of four activities (painting a ceramic vase, decorating cookies, stringing beads for a necklace, creating stationery) and performed two conditions (keep, no-keep) in counterbalanced order. Participants were timed in each condition and, after each condition, ranked their self-determination and competence, which are psychological needs underlying intrinsic motivation. Participants were interviewed at the end of the study to examine their experiences.

Results. Participants worked significantly longer on a chosen activity when the end-product could be kept and rated themselves significantly more self-determined and competent after performing the keep condition. However, further analysis revealed that these results depended on the activity chosen.

Conclusion. The findings support that keeping an end-product can enhance performance of an activity. However, because results were not consistent across all activity choices, further research is needed to characterize the meaningfulness of particular activities.

Since the beginning of the profession, occupational therapy practitioners have attempted to motivate the performance of clients by engaging them in meaningful activities (American Occupational Therapy Association, 1995; Dunton, 1925; Fidler, 1981; Florey, 1969; Humphrey, 1925; Sands, 1928; Trombly, 1995). One strategy used to enhance meaningfulness of therapeutic activity is to give clients the opportunity to keep the end-product, with the assumption being that an activity with an end-product will be more absorbing, challenging, and competency promoting than one without an end-product. The two studies that have investigated the meaning of keeping end-products suggest that participants viewed end-products as meaningful, but the research was inconclusive (Jacobshagen, 1990; Rocker & Nelson, 1987).

Rocker and Nelson (1987) found that participants who were not able to keep an end-product reported feeling more hostile than those who could keep an end-product, which may have been facilitated by the group nature of the activity context. Jacobshagen (1990) evaluated the meaning of keeping a finished versus an unfinished end-product and found that participants who were interrupted during a card-making activity and were unable to finish the end-product felt less powerful and less active, two factors of affective meaning. In both studies, the researchers used a
short form of the Osgood Semantic Differential Scale (Osgood, May, & Miron, 1975), a measure of affective meaning, whereby an activity is rated along a continuum anchored by each extreme of 12 pairs of opposite adjectives. This instrument has been criticized, however, for having pairs of opposite adjectives that may not actually be polar opposites, such as the continuum of nice—awful (Green & Goldfried, 1965). In this case, a person may feel differing degrees of both nice and awful but can mark only one X along the continuum. Additionally, this instrument may be difficult to complete because some of the pairs seem obscure or unrelated to the activity. For example, if the activity to be rated is hitting a balloon with a bat, pairs such as alive—dead or sour—sweet may be difficult to rate.

Another assumption about keeping an end-product is that it promotes client engagement in an activity for a longer time, with little external prodding from the practitioner. Thibodeaux and Ludwig (1988) found no significant difference in the time participants spent sanding a cutting board that could be kept versus sanding wood that could not be kept; however, the 15 participants had no choice in the task they performed and may not have viewed either condition as meaningful. Additionally, the two activity conditions in the study were not sufficiently similar in occupational form to assess the effect of keeping the end-product. A third limitation was that the small (N = 15) sample size may have resulted in a Type II error. In effect, significant differences between performance time for the two activities could not be determined because of the small number of participants.

One purpose of the current study was to examine the effect that keeping an end-product has on engagement in activity, operationalized as intrinsic motivation and measured by an assessment designed specifically for this use. We assumed that keeping an end-product affects intrinsic motivation, which is characterized by absorption in an activity on the basis of anticipated feelings of competence and self-determination (Deci & Ryan, 1985), rather than affecting extrinsic motivation, which is characterized by doing an activity for some desired outcome, such as praise or other incentive (Deci & Ryan, 1985). A second purpose of this study was to replicate and extend Thibodeaux and Ludwig’s (1988) study, correcting for the flaws (i.e., no choice of activities, different occupational forms, low power) and, unlike their study, using activities in which exertion would be minimal.

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The current study sought to answer the following questions:

1. Will participants work longer on an activity of their choosing when told in advance that they can keep the end-product than they will work on the same activity when told in advance that they cannot keep the end-product?

2. Will participants feel higher levels of self-determination and competence after an activity of their choosing when they can keep the end-product than they will feel after the same activity when they cannot keep the end-product?

3. Will the feelings of self-determination and competence be positively associated with the duration of performance of the activity in which participants can keep the end-product?

4. Will participants’ subjective experiences and feelings, reported after both conditions are completed, vary relative to whether the end-product was kept or not kept?

Method

A repeated-measures, counterbalanced research design was used. AB represents the no-keep condition followed by the keep condition, and BA represents the keep condition followed by the no-keep condition.

Participants

Participants were recruited from undergraduate occupational therapy and entry-level master’s physical therapy programs at Boston University. None of the participants had preexisting neurological or orthopedic problems or experience with any of this study’s activities. To reach our calculated power of .80, 50 participants were recruited. All were women ranging in age from 19 to 31 years (M = 21.9). After informed consent was obtained, the sample was randomly assigned to the AB (n = 25) or BA (n = 25) group.

Instruments

Duration of performance of each activity condition was measured in seconds, beginning when the first object was picked up and ending when the participant indicated that she was finished. Intrinsic motivation was measured with two of the four subscales of the Activity-Feeling States (AFS) Scales (Reeve & Sickenius, 1994). The Self-Determination subscale that assesses the capacity to have choices and determine one’s action has four questions, and the Competence subscale that assesses the ability to use skills effectively and pursue challenges in the environment has three questions. Reliability of these two subscales was calculated by Cronbach’s alpha, a measure of internal consistency. Internal consistency was acceptable (.61 for the Self-Determination subscale, .90 for the Competence subscale) (Reeve & Sickenius, 1994). We decided not to use the Tension subscale because the instrument’s authors determined that it has low predictive validity. The Relatedness subscale also was not used because it assesses relationships with others during activity, which does not apply to this study. In a study of predictive validity, the Self-Determination and Competence subscales were signifi-
显著地与一个自我报告的度量相关，该度量评估了兴趣和享受以及一个行为度量，该度量评估了再参与活动的自主选择期间（Reeve & Sickenius, 1994）。

参与者对每个七项陈述的七个陈述在AFS量表上的反应（1表示强烈不同意，7表示强烈同意）。对于这个研究，自主性动机的确定是通过评估答案对自我决定性问题和平均答案对能力问题。因为该工具的创建者没有具体的标准，我们推断一个分数为4.5或更高的子项目表示了内在动机。

一个结构化的开放式问题的访谈被用来评估参与者的情感和活动条件。访谈者似乎探索了参与者在完成这些活动时的意义，以帮助解释数据。所有访谈都以磁带方式记录。

**Procedure**

在进入测试区域时，参与者有选择的权力。第一次调查（n = 33）包括四个活动：制作手工制品，用海绵作画。第二次调查（n = 26）包括10个活动。根据调查结果，最高的两个活动是制作手工制品和装饰饼干。根据两个调查的发现，砂纸活动的得分远低于其他活动。在研究中，装饰饼干被增加了。

**Activity choices were based on two surveys given to female undergraduates who were not study participants, that asked them to rate their interest in several activity choices.** The first survey (n = 33) included four activities: stringing beads for a necklace, painting a ceramic figurine, making stationery, and sanding a plaque to make a picture frame; the sanding activity was rated far lower than the other activities. The second survey (n = 26) included 10 activities. Those ranked the highest were making stationery, painting ceramics, and decorating cookies. On the basis of the findings of the two surveys, sanding was eliminated from the study whereas decorating cookies was added.

**Instructions were given as follows:**

You will do the activity you choose two times with a half-hour break between sessions. Please work at a comfortable pace until you feel that you are finished, and please alert me the moment you are done. Please do not ask me questions or talk while doing the activity because it may affect the validity of the experiment. You may use any of the materials in front of you to complete the activity. You may (or may not) keep the product that you create.

If the participant asked what would happen to the end-product that she could not keep, the researcher said, “I will answer all questions after the experiment is completed.”

The AFS Scales were administered after each activity condition. Refreshments were provided during the 30 min between sessions in which the participant had the option of doing homework or playing computer games. The time was filled to prevent fatigue or planning for the next condition. The interview was conducted when both conditions were completed.

**Data Analysis**

Sequence-by-order analyses of variance (ANOVAs) were used to analyze the treatment effect of keeping or not keeping the end-product on duration of performance, self-determination, and competence. A sequence-by-order ANOVA is an analysis that compares two conditions by examining effects associated with group assignment or with the order in which the activity occurs (Rosenthal & Rosnow, 1991). For example, a sequence effect may be seen if performance time was longer for participants in the AB group than for participants in the BA group, and an order effect may be seen if performance time was longer for all participants in the first condition (whether it was A or B) than in the second condition. A sequence-by-order effect is the test of whether one treatment was superior to another. The effect size $d$, a measure of the difference between two conditions, was calculated for each analysis of the research questions. In general, a small effect size is .20, a medium effect size is .50, and a large effect size is .80 (Cohen, 1997). Large effect sizes can be found without yielding significant $p$ values because of small subgroup sizes; however, the $d$ indicates whether an effect would be significant if applied to larger subgroups.

A Spearman rank order correlation was calculated to determine the strength of association between self-determination and competence, as measured by the AFS Scales, and duration of performance in the keep condition. A Spearman correlation was used because of the abnormally distributed data, and all participants scored themselves at 4.5 or higher on the 7-point scale.

**Results**

**Duration of Activity**

Participants worked significantly longer on an activity of their choice when they could keep the end-product. The mean performance time in the keep condition was 21.22 ± 9.47 min, and the mean in the no-keep condition was 16.91 ± 6.99 min. This difference was significant, $F(1, 48) = 18.17, p = .0001$. No significant order effects ($p = .49$) or sequence effects ($p = .57$) were found.

Table 1 shows the means and standard deviations of performance time according to the chosen activity. The difference in the time invested seems to be influenced by activity. Participants worked significantly longer during the keep condition in the ceramics activity, $t (20) = 4.65, p = .0002$, and during the necklace activity, $t (11) = 2.08, p = .06$, although this latter result is of borderline significance. The effect sizes of keeping the end-product on performance time were large for the ceramics activity, $d = 2.09$, and for the necklace activity, $d = 1.25$. However, the other two activities did not show similar results. There was no significant difference in performance time between the two...
conditions in the cookie activity, $t(9) = .73, p = .48$, or the stationery activity, $t(6) = -.20, p = .85$. A moderate effect of keeping the end-product on performance time was seen in the cookie activity, $d = .60$, and a small effect was seen in the stationery activity, $d = -.15$, with the keep condition having a shorter duration than the no-keep condition.

**Intrinsic Motivation Responses**

Table 2 shows the means and standard deviations for the self-determination and competence ratings. Participants scored themselves as significantly more self-determined for the activity in which they could keep the end-product $F(1, 48) = 8.61, p = .005$. A sequence effect of borderline significance was seen, $p = .056$, indicating a difference in the scoring of the AB and BA groups. Participants in the BA group, who kept the end-product in the first condition, rated themselves less self-determined overall than participants in the AB group, who did not keep the end-product in the first condition. No significant order effect was seen, $p = .12$. Participants felt more self-determined during the keep condition than during the no-keep condition in the necklace activity. This difference was of borderline significance and the effect was of large magnitude, $t(11) = 2.13, p = .06, d = 1.28$. There were no significant differences in self-determination ratings between the two conditions in the stationery activity, $t(6) = 1.65, p = .15$; the cookie activity, $t(9) = 1.09, p = .30$; or the ceramics activity, $t(20) = .81, p = .42$. A large effect of keeping the end-product on self-determination was seen in the stationery activity, $d = 1.35$, and a moderate effect was seen in the cookie activity, $d = .73$. A small effect was found in the ceramics activity, $d = .36$.

Participants also had higher ratings on the competence measure when they could keep the end-product as revealed by a sequence-by-order ANOVA, $F(1, 48) = 4.42, p = .04$. No significant sequence, $p = .33$, or order effects, $p = .79$, were found. Participants felt more competent during the keep condition than during the no-keep condition in the cookie activity. This difference approached significance, and the effect was of large magnitude, $t(9) = 2.03, p = .07, d = 1.35$. There were no significant differences in reported ratings of competence for the stationary activity, $t(6) = 2.05, p = .09$; the necklace activity, $t(11) = 1.66, p = .13$; or the ceramics activity, $t(20) = -.06, p = .66$. A large effect of keeping the end-product on competence was seen in the stationery activity, $d = 1.67$, and in the necklace activity, $d = 1.0$. Participants who selected the ceramics activity rated themselves as more competent in the no-keep condition than in the keep condition, although this was not significant, and a small effect was seen, $d = -.20$.

A Spearman rank-order correlation tested the relationship between time invested in the keep condition and each of the two subscales of the AFS Scales that measure intrinsic motivation. Neither correlation was significant. In fact, in the keep condition, there was little to no association found between duration of performance and self-determination, $r = .02, p = .85$, and duration of performance and competence, $r = .09, p = .49$.

**Descriptions of Activity Meaning**

Several themes emerged from the interview regarding the experience of keeping or not keeping an end-product (see Table 3). Eight participants reported more stress during the keep condition, and 10 reported positive feelings regarding the no-keep condition (i.e., felt more free, more daring, “got crazy” with the activity). Eighty percent of the sample was concerned with the end-product.

**Discussion**

One purpose of this study was to correct the design flaws in Thibodeaux and Ludwig's (1988) study and, contrary to their findings, we found a strong significant effect of keeping the end-product on duration of performance. Another purpose was to examine the effect of keeping an end-product on intrinsic motivation by using an assessment designed for this use. Our results suggest that assessment of intrinsic motivation can provide insight into participants' engagement in activity in addition to performance measures.

This study found little to no relationship between the measures of intrinsic motivation and duration of performance, in contrast to the findings of Kircher (1984) and Thibodeaux and Ludwig (1988). These researchers deduced that participants who worked longer and harder were more intrinsically motivated during an activity, but they did not specifically measure intrinsic motivation. Our findings of no relationship may have resulted from the lack of variability in ratings on the AFS Scales. More than half ($n = 27$) of the participants rated themselves at 6.0 or higher out of 7 on the Self-Determination and Competence...
Table 2
Self-Determination and Competence Ratings Related to Keeping or Not Keeping the End-Product of Four Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Keep</th>
<th></th>
<th></th>
<th>No-Keep</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Self-Determination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painting ceramics</td>
<td>21</td>
<td>6.58</td>
<td>0.46</td>
<td>6.49</td>
<td>0.65</td>
</tr>
<tr>
<td>Stringing beads for a necklace</td>
<td>12</td>
<td>6.48</td>
<td>0.34</td>
<td>5.88</td>
<td>0.98</td>
</tr>
<tr>
<td>Decorating cookies</td>
<td>10</td>
<td>6.50</td>
<td>0.74</td>
<td>6.28</td>
<td>1.11</td>
</tr>
<tr>
<td>Creating stationery</td>
<td>7</td>
<td>6.75</td>
<td>0.43</td>
<td>6.26</td>
<td>0.92</td>
</tr>
<tr>
<td>Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painting ceramics</td>
<td>21</td>
<td>5.86</td>
<td>1.13</td>
<td>5.92</td>
<td>1.21</td>
</tr>
<tr>
<td>Stringing beads for a necklace</td>
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<td>5.97</td>
<td>0.77</td>
<td>5.64</td>
<td>1.12</td>
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<tr>
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<tr>
<td>Creating stationery</td>
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<td>6.57</td>
<td>0.37</td>
<td>6.00</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Note. The ratings are based on a 7-point scale.

subscales, indicating high levels of intrinsic motivation in both the keep and no-keep conditions. In the ceramics activity alone, 13 of the 21 participants rated themselves at 6.0 or higher for both conditions but worked significantly longer on the end-product that could be kept. Therefore, it appears that intrinsic motivation cannot be inferred from the quality or length of performance, and the relationship between performance and intrinsic motivation should be studied further.

Similar to other studies that have measured meaningfulness of activity involving an end-product (Jacobshagen, 1990; Rocker & Nelson, 1987), responses from the interview appear to support the belief that producing and keeping an end-product is meaningful. The use of open-ended questions permitted a richer understanding of meaning than might have been obtained with quantitative scales such as the Osgood Semantic Differential. For example, some participants revealed both positive and negative feelings in the keep and the no-keep conditions.

Conclusion

The results of this study suggest that people may work longer and harder and be more motivated if choices are provided and if they are allowed to keep the end-product of an activity. Because these results depended on the activity chosen, further research is needed to explore the meaning of particular activities. Additionally, there were some limitations to this study. The first author conducted the experiment and, therefore, may have unintentionally introduced bias into the study. In addition, because this study used only college student participants, its results should not be generalized to a clinical population. Whether similar results would be found with a different population within the context of rehabilitation is unclear.

To assess a clinical population, additional surveys with several activity choices would need to be conducted to assess interests within that population. It is also necessary to explore whether keeping an end-product has an effect on functional outcomes. For example, would keeping an end-product motivate clients with low endurance to work longer and harder during treatment? Would these clients achieve higher levels of endurance in a shorter amount of treatment time than clients with low endurance who are not given a choice or are unable to keep an end-product? This study is only a preliminary step into the research of meaningfulness and engagement in activity. However, our results suggest that engagement in activity, operationalized as intrinsic motivation, may be a useful method to investigate keeping an end-product.

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