The Impact of Reward on Task Performance in Individuals of High and Low Need for Achievement

Tamille Richardson

Follow this and additional works at: https://ir.lib.uwo.ca/hucjlm
Part of the Psychology Commons

Recommended Citation
Richardson, Tamille (2010) "The Impact of Reward on Task Performance in Individuals of High and Low Need for Achievement," The Huron University College Journal of Learning and Motivation: Vol. 48 : Iss. 1 , Article 9.
Available at: https://ir.lib.uwo.ca/hucjlm/vol48/iss1/9

This Article is brought to you for free and open access by the Psychology at Scholarship@Western. It has been accepted for inclusion in The Huron University College Journal of Learning and Motivation by an authorized editor of Scholarship@Western. For more information, please contact tadam@uwo.ca, wlswadmin@uwo.ca.
REWARD AND NEED FOR ACHIEVEMENT

The Impact of Reward on Task Performance in Individuals of High and Low Need for Achievement

Tamille Richardson

Huron University College

The purpose of the study was to determine whether individuals with high need for achievement would outperform those with low need for achievement in the absence of extrinsic reward, and whether both groups would perform at the same level when provided with extrinsic motivation. Forty-two students at Huron University College completed a measure of achievement motivation, and were given 3 minutes to complete an anagram task. Half of the participants were rewarded for each correct answer on the task, and half were not. The results were not significant. There was no main effect for Need for Achievement, $F(1, 36) = .04, p > .05$, and no main effect for Reward, $F(1, 36) = .22, p > .05$. There was also no significant interaction effect, $F(1, 36) = .27, p > .05$. Possible reasons for the lack of significant reasons, including small sample size and low desirability of reward are discussed.

An individual's performance on any given task is driven by a number of factors. Both intrinsic (characteristics or states within the individual) and extrinsic (factors external to the individual, such as the availability of reward) sources of motivation influence how people perform in different contexts. One major source of intrinsic motivation on performance tasks is need for achievement (nAch), a concept first introduced by Murray (1936/2008). Murray proposed that the need for achievement, or the "will to power over things, people and ideas" (p. 80) formed one aspect of personality. The concept of an achievement motive was later developed by McClelland (1961) in his book The Achieving Society, which examined how nAch influenced...
achievement based entrepreneurial behaviour. According to McClelland (1985), individuals who are high in nAch strive to excel in tasks and take pride in their successes. Numerous studies have examined how nAch correlates with performance in various aspects of life, including school, jobs, and sports. Higher need for achievement has been associated with stronger job commitment and performance in enriched environments (Steers & Spencer, 1977), and striving for perfection in athletes (Stoeber, Stoll, Pescheck, & Otto, 2008). Interestingly, the need for achievement is not entirely generalized across all types of situations, but rather, it has been found that people who are high in nAch actually work harder on tasks when the challenge being presented is moderate in difficulty rather than easy or exceptionally challenging (McClelland, 1985).

People are also motivated by extrinsic factors. This is evident in school contexts when students strive to achieve high grades, and in work situations, when individuals work hard in the hopes of earning a raise. Research by Wimperis and Farr (1979) has demonstrated that the presence of extrinsic rewards can increase task performance, particularly on tasks that are not intrinsically motivating. The foundation of behavioural psychology rests in the fact that behaviours can be developed and encouraged through reinforcement (reward) and discouraged or eliminated through punishment. While the power of extrinsic motivation to influence performance depends on the subjective value attributed to it by the individual, there is no question that rewards can enhance performance.

The majority of research on the relationship between extrinsic and intrinsic motivation has emphasized the polemical nature of the two forces (Covington & Müeller, 2001). Extrinsic motivation is often thought of as the antithesis to intrinsic motivation in
that its presence has been demonstrated to decrease an individual's internal motivation to complete a task. Research by Deci (1971) found that providing individuals with monetary rewards for completing tasks that they initially found intrinsically motivating caused a decrease in intrinsic motivation. This has been extended to bring into question the impact that rewarding students with grades has on their motivation to learn. It has been suggested that rewarding students for good academic performance in the form of grades may interfere with intrinsically motivated learning (Covington & Mueller, 2001). For this type of reason, extrinsic motivation is often considered disadvantageous in many contexts.

While this research provides important insight on one aspect of the relationship between intrinsic and extrinsic motivation, its scope is quite limited. Rarely are individuals offered rewards for their performance on tasks that they find intrinsically motivating. In practice, extrinsic motivation is generally offered for non-intrinsically rewarding behaviours. While some individuals are intrinsically motivated on performance tasks by personality characteristics such as nAch, others need additional motivation to exert their maximum effort. One study by Covington & Mueller (2001) suggests that extrinsic rewards can in fact be used to increase intrinsic motivation. In the context of education, rewards can be used to reinforce learning if they target task-oriented objectives rather than the enhancement of an individual's status or self-esteem. The two sources of motivation do not need to be viewed as antagonistic.

It is also essential to recognize that research conducted by Deci (1971) addresses a decrease in intrinsic motivation to perform recurring tasks over time. It does not account for performance tasks that are intended to occur only once. In many work and
school contexts, there are specific tasks that need to be done that can be seen as isolated projects. In a study by French (1955), one group was asked to complete a digit substitution task in order to demonstrate their knowledge (activating nAch), and another group was asked to do the same task, being told that the men with the best scores could go home early (extrinsic motivation). Individuals who were low in nAch performed better in the extrinsic reward condition than they did in the achievement arousal condition. While the best performance was demonstrated by the high nAch group in the achievement arousal condition, the fact that extrinsic motivation increased the performance of those with low nAch is important for understanding how extrinsic motivation can increase performance on an isolated task in individuals with low nAch.

The current study seeks to further develop the research on how intrinsic motivation and extrinsic motivation interact to influence an individual’s performance. The hypothesis is that individuals with a high nAch will outperform those with low nAch in the absence of any extrinsic motivation, but that people with low nAch and high nAch will perform equally as well when they are given extrinsic motivation for their performance.

Method

Participants

The participants were 42 undergraduate students from Huron University College at the University of Western Ontario. They ranged from approximately 18-24 years of age. The majority of the participants were Caucasian and came from a Western background, though a variety of ethnicities were represented. Participants were from a mid to high socioeconomic status.
REWARD AND NEED FOR ACHIEVEMENT

Materials

Need for achievement was measured using a *Quick Measure of Achievement Motivation* (Smith, 1973). The scale includes 17 true/false items, 10 of which measure the nAch construct and 7 of which comprise a carelessness scale. This measure has been demonstrated to have adequate reliability and validity. At the time of its development, Smith (1973) determined a split-half Spearman-Brown corrected reliability of .56. The test yielded a correlation of .48 with McClelland’s projective measure of achievement motivation. In addition, it demonstrated correlations with other variables (Age, Neuroticism, Sociability, Mill Hill Vocabulary Test Score, Raven’s Score, Educational Level, Social Class, and Number of Words Used to Tell Stories) that were similar to McClelland’s test and discriminated between men listed in *Who’s Who* and a group of men drawn from the M. R. C. volunteer panel with significance at the .02 level.

A 20-item anagram task was used to measure Task Performance. The anagrams were selected from an online website (see www.manythings.org/anagrams), and ranged in difficulty from easy to hard. The anagrams contained between 5 and 8 letters. Each anagram was presented in the form of a word, and the participants were required to rearrange the letters to form a new word. The same anagram task was used in the Reward and Non-Reward condition, with the exception of one slight variation in the instructions (see Appendices A and B). The instructions used in the Reward condition described how candy or chocolate would be rewarded for every correct answer.

These two items were presented to the participants in the form of a two-page booklet. In half of the booklets (10 in the Reward condition and 10 in the Non-Reward condition), Smith’s (1973) *Quick Measure of Achievement Motivation Scale* was
presented first. In the other half of the booklets (10 in the Reward condition and 10 in the Non-Reward condition), the anagram task was presented first.

An assortment of chocolates and candies were used for a reward. Participants in the Reward condition were presented with a bag that contained a mixture of miniature Nestle chocolate bars, including Aero (7.5 g), Kit Kat (16 g), Smarties (12 g), and Coffee Crisp (16 g), and Life Saver Lollipops (10 g) in the following flavours: Orange, Grape, Lime, and Wild Cherry. At the initiation of the study, the bag contained approximately 120 chocolate bars and 100 suckers. Resources depleted throughout the progress of the study, but the bag always contained an adequate and diverse supply of these items.

The timer function on a Fifth Generation 30 Gigabyte Ipod was used to keep track of time during completion of the anagram task.

Procedure

Prior to data collection, participants were divided into Reward and Non-Reward conditions using a random number table based on their participant number. As the study was conducted, this order was occasionally diverged from in instances where participants were in sitting in groups of two or more. In these cases, booklets were skipped in order to ensure that all participants in a group were in the same condition. Participants were approached in the Student Activity Centre at Huron University College and were presented with the opportunity to take part in the study. Those who were interested were provided with a letter of information outlining the details of the study, and those who agreed to participate signed a consent form. Participants whose booklet began with the need for achievement scale (Smith, 1973) were asked to complete the questionnaire and to refrain from turning the page until the researcher had been notified, since the next task
was to be timed. Upon completion of the nAch scale, the researcher described the
anagram task to the participant and notified the individual that he or she would have 3
minutes to complete as many anagrams as he or she could. The researcher then indicated
that the participant may begin the task and started the timer. After 3 minutes had passed,
the participant was notified that his or her time was up. If the participant was in the
Reward condition, the researcher counted the number of correct anagrams and then
offered the bag of chocolate and candy to him or her, allowing the participant to choose
one item for every correct answer. In the Non-Reward condition, the researcher collected
the booklet and thanked the participant for his or her participation without providing any
reward.

In instances where the anagram task was presented first, the researcher described
the task and the time limit before giving the participant the booklet. Immediately after
giving the participant the booklet, the researcher began the timer. The participant was
notified when 3 minutes had passed and was asked to turn the page and complete the
nAch questionnaire (Smith, 1973). Upon completion of the questionnaire, the researcher
collected the booklet. If the participant was in the Reward condition, correct answers
were counted and he or she was given the opportunity to select the appropriate number of
items from the bag of candy and chocolate. If the individual was in the Non-Reward
condition, the researcher collected the booklet and the participant was thanked for his or
her participation.

Results

The data from two participants (#25 and #26) were not included in the analysis,
in one case because the individual failed to complete the achievement motivation scale
REWARD AND NEED FOR ACHIEVEMENT

(Smith, 1973), and in the other case because the individual exceeded three atypical answers on the integrated carelessness scale. A median split was conducted on the remaining 40 participants to designate them into either Low or High groups for need for achievement. Participants scoring 6 or less on nAch were designated to the Low nAch condition, and those scored 7 or higher were designated to the High nAch condition. The results are displayed in Table 1. A 2 X 2 between subjects ANOVA was conducted using Need for Achievement (High nAch/Low nAch) and Extrinsic Motivation (Reward/Non-Reward) as the independent variables and Task Performance as the dependent variable (see Table 2). Figure 1 demonstrates the outcomes of the analysis. The results were not significant. No main effect was found for Need for Achievement, $F(1, 36) = .04, p > .05$, with no significant difference in performance between those with Low Need for Achievement ($M = 6.00, SD = 2.64$) and those with High Need for Achievement ($M = 6.20, SD = 2.41$). There was no main effect found for Extrinsic Motivation, $F(1, 36) = .22, p > .05$, with no significant difference in performance between those in the Non-Reward condition ($M = 5.90, SD = 2.51$) and those in the Reward condition ($M = 6.30, SD = 2.50$). There was also no significant Need for Achievement by Extrinsic Motivation interaction effect, $F(1, 36) = .27, p > .05$.

**Discussion**

The results failed to support the hypothesis. There were no significant main effects for Need for Achievement or Extrinsic Reward, and there was no significant interaction. Rather than yielding significant variation in performance between conditions, the results suggest that there was a general skill for anagrams that determined
Table 1

Participant Data for Need for Achievement, Carelessness Scale, Anagram Task, and Reward/Non Reward Condition

<table>
<thead>
<tr>
<th>Participant #</th>
<th>nAch</th>
<th>Carelessness</th>
<th>Anagrams</th>
<th>Reward/Non-Reward</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>R</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>1</td>
<td>8</td>
<td>R</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>R</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>0</td>
<td>2</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>0</td>
<td>6</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>0</td>
<td>11</td>
<td>R</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>N</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>R</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>1</td>
<td>10</td>
<td>R</td>
</tr>
<tr>
<td>13</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>R</td>
</tr>
<tr>
<td>14</td>
<td>9</td>
<td>0</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>15</td>
<td>9</td>
<td>0</td>
<td>6</td>
<td>R</td>
</tr>
<tr>
<td>16</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>N</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>R</td>
</tr>
<tr>
<td>18</td>
<td>7</td>
<td>0</td>
<td>9</td>
<td>R</td>
</tr>
<tr>
<td>19</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>20</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>R</td>
</tr>
<tr>
<td>21</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>R</td>
</tr>
<tr>
<td>22</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>23</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>R</td>
</tr>
<tr>
<td>24</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>25</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>26</td>
<td>Incomplete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>28</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>N</td>
</tr>
<tr>
<td>29</td>
<td>6</td>
<td>0</td>
<td>4</td>
<td>R</td>
</tr>
<tr>
<td>30</td>
<td>5</td>
<td>2</td>
<td>8</td>
<td>R</td>
</tr>
<tr>
<td>31</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>R</td>
</tr>
<tr>
<td>32</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>R</td>
</tr>
<tr>
<td>33</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>R</td>
</tr>
<tr>
<td>34</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>R</td>
</tr>
<tr>
<td>35</td>
<td>8</td>
<td>0</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>36</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>37</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>R</td>
</tr>
<tr>
<td>38</td>
<td>8</td>
<td>1</td>
<td>5</td>
<td>R</td>
</tr>
<tr>
<td>39</td>
<td>7</td>
<td>0</td>
<td>11</td>
<td>N</td>
</tr>
<tr>
<td>40</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>N</td>
</tr>
<tr>
<td>41</td>
<td>8</td>
<td>1</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>42</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>N</td>
</tr>
</tbody>
</table>
Table 2

ANOVA Summary Table for Performance on Anagram Task

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>(\eta^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>nAch</td>
<td>0.26</td>
<td>1</td>
<td>.26</td>
<td>.04</td>
<td>.845</td>
<td>.001</td>
</tr>
<tr>
<td>Reward</td>
<td>1.46</td>
<td>1</td>
<td>1.46</td>
<td>.22</td>
<td>.643</td>
<td>.006</td>
</tr>
<tr>
<td>nAch * Reward</td>
<td>1.72</td>
<td>1</td>
<td>1.78</td>
<td>.27</td>
<td>.608</td>
<td>.007</td>
</tr>
<tr>
<td>Error</td>
<td>239.96</td>
<td>36</td>
<td>6.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>243.40</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 1: Performance task means for individuals in Reward/Non-Reward conditions with High/Low nAch.
performance irrespective of whether the individual was high or low in nAch and whether or not they were rewarded for their performance.

The results of the study do not undermine the work done by McClelland (1961) and other nAch researchers. Instead, they suggest that in some performance tasks, having a high nAch is not enough to produce success. In concrete tasks, particularly those that focus on limited linguistic or mathematic skills, it may be the case that people are either skilled in an area or they are not. Some people struggled to complete even 1 anagram in the 3 minute period, while others completed as many as 11. This is a notable difference in a small time period. Despite a more generalized achievement motivation, ability on specific tasks that are not relevant to an individual’s area of work or study may be low.

As evident in Figure 1, it should be noted that the direction of the results is in line with the prediction. On average, those who were low in nAch performed better when they were rewarded, and individuals who were high in nAch performed essentially the same irrespective of whether or not they were rewarded. However, the differences were minute and failed to yield significance. It may be the case that a larger sample size would have been enough to increase the difference in performance between the groups.

Though the results were not significant, the small increase in performance demonstrated in the low nAch group when offered a reward for their performance parallels the work of Covington and Müeller (2001), which claims that extrinsic motivation can work in a way that compliments rather than opposes intrinsic motivation. In many instances, engaging in non-intrinsically rewarding behaviours is necessary for learning and development as an individual. For those who are not already motivated by
nAch, extrinsic motivation may be the driving force they require to initiate engagement in these tasks.

A number of methodological issues may have influenced the results of the study. Firstly, the achievement motivation scales available to date provide less than desirable reliability and validity. Though the *Quick Measure of Achievement Motivation* (Smith, 1973) was demonstrated to be adequate in these areas, a scale with better psychometric properties may have led to better results.

In addition, the candy and chocolate offered for each correct anagram in the Reward condition were not attractive to everyone who participated. Some people chose to take only one reward despite the availability of more to them, and some individuals did not take any. This indicates that for some people in the reward condition, the reward offered was not a powerful motivator. Given the relatively small sample size, this may have had a profound impact on the results.

As has been noted, achievement motivation is not equivalent across situations, but rather people with high need for achievement tend to excel the most in tasks of medium difficulty (McClelland, 1985). The anagrams presented on the performance task varied in difficulty, but it is possible that difficulty was subjective for this task. It may have been easy for individuals who excel on word tasks, and quite difficult for those who do not have this ability. This ambiguity in difficulty could have influenced the results.

The implications of this type of research are vast and important. Issues surrounding the relationship between intrinsic and extrinsic motivation are directly relevant to educational and employment settings. In school contexts, this relates to understanding how extrinsic motivation should be used to stimulate and enrich the
learning of students who lack intrinsic achievement motivation. While the work done by Deci (1971) has cautioned about the dangers of external reinforcement for activities that may be intrinsically rewarding, it is clear that the requirements of the educational system are not intrinsically rewarding for many students. While those who have a high nAch may be able to motivate themselves, those who lack this quality need additional help to interact with the learning tasks.

In work settings, understanding how extrinsic rewards motivate behaviour is essential, particularly as it pertains to the type of work involved. For tedious work that is not intrinsically rewarding, external reinforcement in some form is essential for optimal performance. This type of research is also of great value for parenting. Understanding a child's attitudes related to achievement motivation, their strengths, and their weaknesses can help parents to encourage desirable intrinsically motivated behaviours and use extrinsic motivation when necessary to motivate the child to perform in necessary tasks.

Future research should be done using larger samples to determine if rewarding people with low nAch can increase their task performance, and to test for any implications, either positive or negative, on individuals who are already intrinsically motivated. Research should also be done to develop an understanding of the contexts in which extrinsic motivation can be useful in developing rather than decreasing intrinsic motivation. This is of crucial importance in school related contexts, where extrinsic motivation is build into the framework of the educational system in the form of grades. Additionally, research should be done to determine whether Need for Achievement can be generalized to all scenarios or if it is exclusive to specific areas. The lack of difference in performance between individuals who were high in nAch and those who
were low in nAch on the anagram task suggests that its application may be limited to certain contexts. As this research continues, parents and educators will be more equipped to enable young individuals to excel in various aspects of life. Its importance cannot be emphasized enough, for it is people's motivations that direct their future and allow them to reach their full potential as human beings and contributors to society.
References


REWARD AND NEED FOR ACHIEVEMENT

Appendix A

Anagram Task

The letters of the following words can be rearranged to form other common words in the English language. Please do your best to successfully solve the following anagrams. You will be given three minutes to complete this task.

1. tired
2. robed
3. items
4. lures
5. eager
6. dealer
7. zoned
8. waste
9. stove
10. viral
11. markers
12. manures
13. recital
14. relayed
15. arising
16. salting
17. disease
18. vowels
19. wordier
20. lessened
Anagram Task

The letters of the following words can be rearranged to form other common words in the English language. Please do your best to successfully solve the following anagrams. You will be given three minutes to complete this task.

1. tired
2. robed
3. items
4. lures
5. eager
6. dealer
7. zoned
8. waste
9. stove
10. viral
11. markers
12. manures
13. recital
14. relayed
15. arising
16. salting
17. disease
18. vowels
19. wordier
20. lessened