

2015

Effects of Objective Recall-Difficulty and Size of Rewards on Motivation and Ability to Recall Words

Manuel Glanz
Huron University College

Follow this and additional works at: <http://ir.lib.uwo.ca/hucjlm>



Part of the [Psychology Commons](#)

Recommended Citation

Glanz, Manuel (2015) "Effects of Objective Recall-Difficulty and Size of Rewards on Motivation and Ability to Recall Words," *The Huron University College Journal of Learning and Motivation*: Vol. 53: Iss. 1, Article 6.
Available at: <http://ir.lib.uwo.ca/hucjlm/vol53/iss1/6>

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 administrator of Scholarship@Western. For more information, please contact jpater22@uwo.ca.

**Effects of Objective Recall-Difficulty and Size of Rewards
on Motivation and Ability to Recall Words**

Manuel Glanz

Huron University College at Western

The present research experiment, which mostly used undergrad university students as subjects, was aimed to investigate how instant rewards / no rewards affect task performance on easy and difficult memorization tasks. A list with easy and a list with complicated words were created as audio files, and participants had to listen to either one, then recall and write down as many as they could. One condition received chocolate eggs as reward for each correct word, the other condition did not. After collecting data from 40 subjects (with 10 in each correlational design group: easy/reward, easy/no reward, difficult/reward, difficult/no reward), an ANOVA done with SPSS revealed that there was a significant main effect of rewards, $F(1, 36) = 8.42, p < .05$, as well as due to difficulty, $F(1, 36) = 21.55, p < .05$. No interactions were found. The assumption is that the results came to be due to the nature of the rewards and the kind of task. Opinions, ideas and future proposed research on the topic are further discussed in the Discussion section of this research report.

Keywords: Motivation, Instant Rewards, Word Memorization, Task Difficulty

Successful accomplishment of tasks and good performance in general is not always related to only skill, although it may seem so at times. A major aspect people often forget about is the degree of motivation an individual tackles a task with, which is a deciding factor in regards to the outcome. A lot of research in the past has been dedicated to find out more about the complicated processes in the human psychology affecting motivation, which can be held partially responsible for variation in task performance. For example, a paper by Gavin Kilduff in 2014 looked at how rivalry affects motivation and performance through two separate studies.

The first one, a long-term study on runners, revealed that performance was increased when an identified rival is competing as well. Data for this analysis had been pulled from archived runner times. The second study, which was short term, found that people will be more motivated to put effort in, and perform better on their tasks if there is an identified rival of theirs partaking in the same competition as well (Kilduff, 2014).

Another study done by A. Kruglanski, C. Mueller, and C. Dweck, in 1998 focused their research on the effects different kinds of parental academic encouragement fifth grade students received, and how it affected their motivation to perform and therefore their performance. It returned that praising children based on effort leads to much higher motivation and better performance than praising them based on perceived intelligence. Furthermore the children praised for effort displayed more task persistence following failure whereas those praised for intelligence seemed to lose their motivation after failure (Kruglanski et al., 1998).

In 1990, Arzi, N., Erez, M., and Gopher, D. did research on how monetary rewards affect internal motivation and therefore task performance. Their results returned findings which imply that internal motivation (self-set goals) diminishes (measured through performance) if incentives are provided (Arzi, et al., 1990). Interestingly enough the data from an article published by Wuhrmann, M. in 2008 contradicts Arzi et al. and says incentives have no effect on intrinsic motivation, whether it be in internal or externally motivated individuals (Wuhrmann, 2008).

These findings led me to take the research a bit further and investigate how task difficulty and incentives/rewards affect each other. The hypotheses would be that performance on easy tasks is better than on difficult tasks, however that motivation (and performance) diminishes if rewards are given for easy performances, and it increases for difficult performances.

Thus, the current study is set up to research how motivation, and therefore task performance (*ceteris paribus*) are affected by task difficulty and rewards. In order to test the hypotheses, a 2 X 2 ANOVA research design that is able to showcase how these factors affect motivation/task performance overall has been set up.

Method

Participants

Those who acted as participants in this study were 40 randomly selected people. The participants varied in age and gender, but were mostly undergrad university students from the University of Western Ontario. Some of them were adult working professionals from the London Ontario area. The subjects were recruited solely based on availability and convenience, and approached about the research either in person or online. No data about the participants themselves were collected, as well as no demographic knowledge exists, as selection of participants was random. There were 4 research conditions, and participants were assigned groups randomly.

Materials

The research for the current experiment was always conducted in a quiet environment without distracting stimuli. A few materials and instruments were used in collecting data and conducting the experiment. This included a phone with two pre-recorded lists of 20 words each. One consisted of 20 simple words such as “tree” or “house”, while the difficult one included rather difficult and/or abstract ones such as “cupidity” and “commensurate” (Refer to Appendix 1 for word lists). Then a set of headphones was provided for the subjects to wear while listening to word groups. A pen and paper was necessary so the subjects could write down words. Lastly,

small, individually wrapped chocolate eggs were provided as rewards to those participants who had been selected for the reward groups.

Procedure

All participants were approached either in person or via online media such as E Mail messages or Facebook. If they verbally agreed to partake in the study they were provided with a letter of information and a participant consent form. The letter of information outlined the research process and ensured the individuals were aware of their data being handled in a confidential manner. Once I received the signed consent form back from the participants, I proceeded by flipping a coin twice in order to sort them into one of four experimental groups, which had the two dimensions of either reward/no reward, and easy task/difficult task. The participants were then asked to put on the headphones and listened to the list of words respective to their experimental group. After the audio stopped, they were allowed to write down as many of the words as they remembered and they had as much time as they wanted to take. Spelling of the words did not count towards criterion. Once they were done writing down the words and if the individual was in a 'reward' group, they received a chocolate egg for each word they remembered correctly. Before they were let go, each participant was offered a debriefing form, which completed the research process.

Results

The results of the collected data can be seen in a good visual representation in Figure 1. Adding a reward to both the easy and difficult tasks appears to have increased the remembered word count in both cases. Also, in both, reward and non-reward groups of the easy task, more words appear to have been remembered on average than in both of the difficult

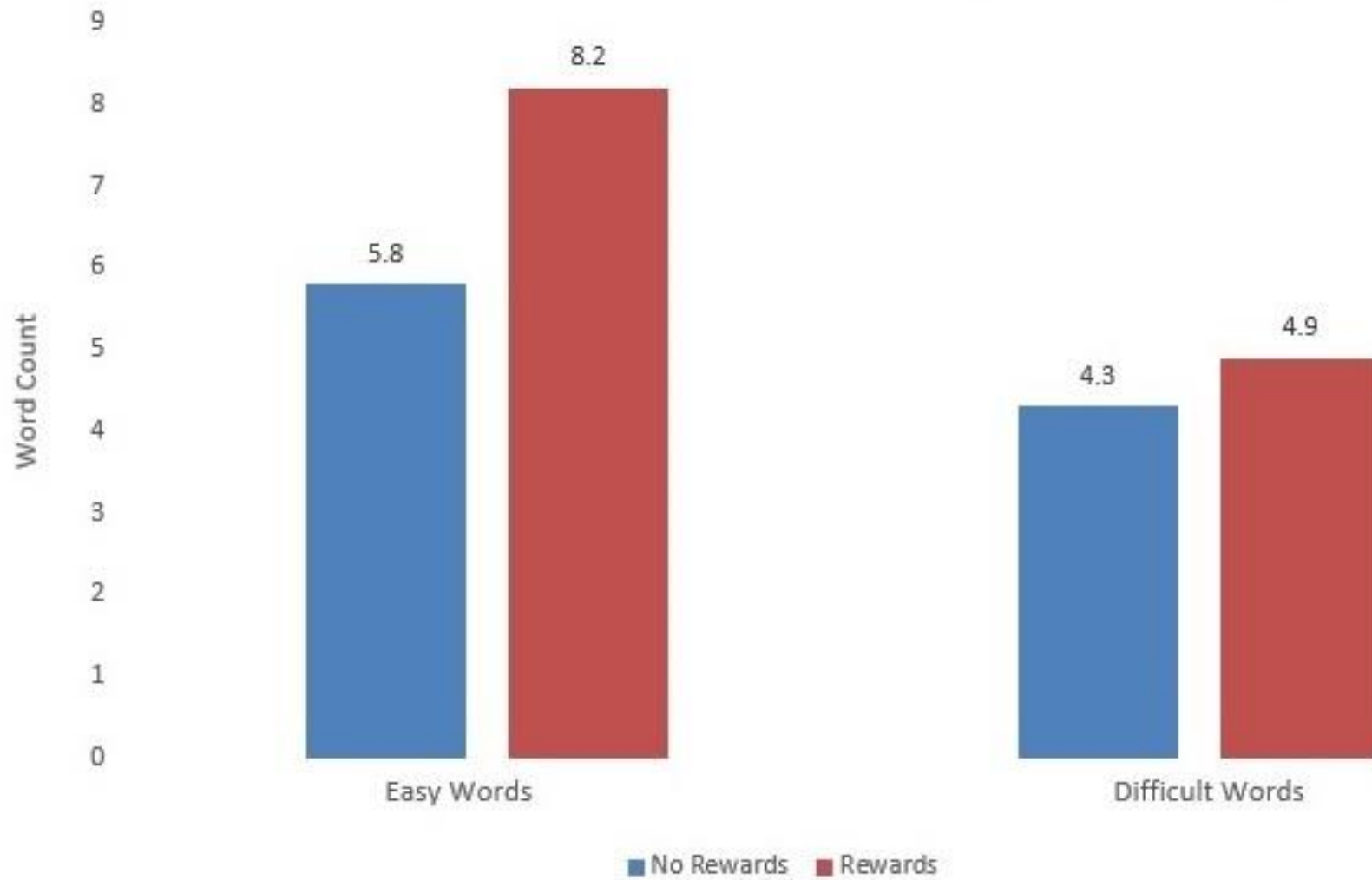


Figure 1. Average word counts of all 4 experimental groups, sorted into 'easy words' on the left and 'difficult words' on the right.

task groups. Under Appendix 2, a summary chart can be found of a two-way, between-subjects ANOVA, which helped analyze the impact rewards and task difficulty had on performance, and therefore through implication on motivation. The analysis shows that there was a significant difference between rewards over no rewards, $F(1, 36) = 8.42, p < .05$, with rewards ($M = 6.55, SD = 2.35$) having a significantly higher word count than no rewards ($M = 5.05, SD = 1.73$). Further there was a significant difference between easy and difficult words, $F(1, 36) = 21.55, p < .05$, with easy words ($M = 7.00, SD = 2.27$) having a higher word count than difficult words ($M = 4.6, SD = 1.23$). A large main effect of $\eta^2 = 0.37$ was observed for difficulty, which implies that difference in difficulty of words accounted for 37% of variance between the two groups. Then there was also a smaller main effect of $\eta^2 = .19$ found for rewards. An interaction between rewards and difficulty, $F(1, 36) = 3.03, p < .05$, was not observed.

Discussion

The results of this experiment were somewhat what was expected, but on some levels different. The easy word groups performed better than the difficult groups, which was in line with projections. However, rewards led to better performance in both the easy and the difficult categories. Based on Arzi et al.'s 1990 article, which found that incentives diminish motivation and performance, the findings of this current study were originally expected to show somewhat similar results, but the opposite was the case. This also contradicts the argument Wuhrmann (2008) made, when he suggested that incentives have neither positive nor negative effect on motivation and performance. A quite large main effect was found for difficulty, which implies that much of the difference between groups was due to that factor. A smaller, but still noteworthy main effect was found for rewards, which tells us that some of the difference in

performance is due to rewards. On the other hand it also lets us know that rewards didn't play as much of a role as difficulty did.

There are no validity issues about this study that could be of significance, since the only data collected was the number of words which people remembered. There was no problem measuring this variable. On the reliability side of things, improvements to the study could have been made by conducting the experiment in the same location with every subject. Due to the nature of the research however, which didn't take more than a few minutes per subject, the researcher often came to the subject's location to conduct the study. This led to variations in locations, as in they were indoors vs. outdoors, in public/on university campus and at people's homes. Possibly this led to different performances due to different environments and possible distractions (although distractions were always kept to a minimum).

A few issues that were encountered when reflecting on the study include the thought that chocolate eggs may not be an equally motivating award for everyone. Some females were encountered while collecting data who claimed to be on a diet and did not claim all their earned rewards after completing the study. This raises the question whether their performance would have been better if the reward had been something they truly want, or whether it would have barely made a difference (considering the main effect for rewards is "only" $\eta^2 = .19$). Furthermore, although only fluent English speakers were picked to participate in the study in order to ensure they don't have language troubles, a significant amount of people in the difficult word group still had troubles with at least a few of the words. This ranged from not knowing what they mean or how to spell them, to never having heard them before. This is important because without knowledge of a word's meaning it is more difficult to remember it, which in return affects the results. It can be considered an uncontrolled variable since the difficult aspect

of those words were supposed to be that it takes more memory processing to remember long and difficult sounding words, and not the fact that people simply didn't know them.

What can be taken away from this research and the results which the ANOVA returned is that at least in this scenario rewards for performance lead to a much bigger performance-increase if the task is easy compared to if it is difficult. What this could mean is either that people intrinsically sense a higher pay-off for comparably less work if they try harder on easy than on hard tasks, or it could imply that difficult tasks simply have less room for improvement regardless of incentives. As this study focused on motivation and task performance, the findings could hypothetically be relevant for endless different purposes. Any institution providing education, such as schools and universities, would benefit of ways to teach knowledge more effectively. Government institutions such as the police or military can develop ways to train their employees/troops faster which benefits society overall in terms of less tax money spent and more security provided. And of course important to mention are all the companies and businesses whose HR departments would benefit indefinitely from findings in the field of workplace-psychology, which motivation, rewards, and task performance are aspects of.

In terms of future research there is many ways this study could be altered or improved. One interesting aspect to explore for example might be whether there is a difference in terms of gender and motivation. Surely men and women have character aspects that often differ significantly, such as the ego. Men tend to be more easily insulted in their pride through failure and in order to avoid that could it be that they are motivated to try harder by nature? Or instead of task difficulty, one could research whether motivation and performance are affected by the kind of task as well. Possibly a certain category of tasks leads to extremely poor performance while another one leads people to excel. It could even be that there is different ways to ask

people to do the same task (asking in friendly manner vs. asking in a desperate manner vs. asking in an authoritative manner), which then still affects motivation and thus performance in different ways.

References

- Arzi, N., Erez, M., Gopher, D. (1990). Effects in goal difficulty, self-set goals, and monetary rewards on dual task performance. *Organizational Behaviour and Human Decision Processes*, 47, 247-269.
- Kilduff, G. (2014). Driven to win: Rivalry, motivation, and performance. *Social Psychological and Personality Science*, 5, 944-952.
- Kruglanski, A. W., Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, 75, 33-52.
- Wuhrmann, M. (2008). The Effects of Expected Reward and Locus of Control on Intrinsic Motivation. *The Huron University College Journal of Learning and Motivation*, 46, Article 9.

Appendix 1

Easy Word List:

Tree, running, floor, green, house, jumping, front, car, free, tennis, sun, riding, act, book, sweeping, cold, table, writing, forest, smelly

Difficult Word List:

Asphyxiation, cognizant, subsequently, endeavor, commensurate, leverage, ameliorate, inception, commence, prescribed, materialize, proficiency, hydrogen peroxide, promulgate, vindictively, seductive, equilibrium, charitable, scrofulous, cupidity

Appendix 2

Summary Chart: Two-Way Between-Subjects ANOVA

Source	SS	df	MS	F	F crit
Rewards	22.5	1	22.5	8.42	4.11
Difficulty	57.6	1	57.6	21.555	4.11
Interaction	8.1	1	8.1	3.031	4.11
Error	96.2	36	2.672		
Total	1530.0	40			