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The Effect of Achievement Motivation on the Zeigarnik Effect

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A study was conducted to investigate the relationship between achievement motivation and the recall of words in complete and incomplete tasks. Forty undergraduate students from Canadian universities were administered the nAch Scale (Smith, 1973) and were classified as high or low achievers by a median split. Subjects in the complete task condition solved a list of 10 anagrams to completion, after which the items were recalled. Subjects in the incomplete task condition were given a 20-item anagram task, only 10 of which they were permitted to solve. Items were subsequently recalled. A 2 x 2 between subjects ANOVA yielded a significant main effect of achievement motivation on recall of items as well as a significant main effect of task condition on word recall. An insignificant interaction was found. Implications and suggestions for further research are discussed.

According to Kurt Lewin’s Force Field Theory (as cited by Govern & Petri, 2004), human behaviour is motivated by a constantly changing field of forces that act on us. The sum of these forces may be summarized as the life space of an individual, which is composed of the person (P) and his or her psychological environment (E), for which behaviour is a reaction to. According to this model, (P) is made up of two regions; an inner-personal region and a sensory-motor region (Govern & Petri, 2004). The inner-personal region represents potential needs of the individual, some of which are more important and some of which are less important to one’s well-being. The sensory-motor region is the outer region, which represents interactions with the psychological
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environment; external facts the person perceives, and the motor output related to those perceptions (Govern & Petri, 2004).

Tension is thought to be a motivational construct within one’s inner-personal region. It is elicited when a potential need turns into an actual need (Govern & Petri, 2004). Existence of a need causes motivation for the individual to reduce it in order to return to a state of homeostasis, which is where the body would ideally like to be.

Physiological and psychological needs both have the potential to produce tension. The need to finish an uncompleted task is one such example of the psychological type. Therefore, motivation to complete a task will be in place until the behaviour of completing the task is carried out and the tension reduced.

Zeigarnik (as cited by Govern & Petri, 2004) found that interrupted tasks were better recalled than completed tasks, providing evidence for Lewin’s claim regarding tension. The Zeigarnik effect states that incompletion of a particular task instills psychological tension within a person, and in turn the motivation to reduce the tension. Since completion of the task will allow for the tension to dissipate, relevant information to that task will be readily available in memory. As a result, uncompleted tasks tend to be recalled better than completed tasks (Zeigarnik as cited by Govern & Petri, 2004).

Baddeley (1963) conducted a study in which subjects were given a series of anagram problems to solve, each within 1 minute. Solutions not obtained within the allotted time were simply given to subjects. Subsequent recall of all items in the series indicated that recall of items subjects failed to complete was double that of items they had solved. It was concluded that findings for this study were analogous to the Zeigarnik effect.
A similar study by Mantyla and Sgaranella (1997) demonstrated Zeigarnik-like effects in prospective memory. Participants studied a series of anagrams, for which they solved one half or two thirds of the items presented to them. Some items were cued with an underline under the third letter. During the test phase, participants were required to identify whether a target anagram contained the same or different underlined letter. In both conditions, items that were associated with interruption were more often accurately identified. Interruption of the tasks facilitated memory performance due to increased activation and sensitivity to the target aroused by tension (Mantyla & Sgaranella, 1997).

Need for achievement (McClelland as cited by Atkinson, 1953) is the motivation to experience positive feelings brought on by success, and the tendency to experience anxiety regarding failure. It has been demonstrated that an individual’s need for achievement substantially influences his or her responses in experimental situations (Smith, 1973). Since individuals high in need for achievement are thought to possess a greater motivation to achieve, they tend to perform better on tasks when compared to low achievers. Atkinson (1953) sought to determine the effect of need for achievement on the recall of interrupted and completed tasks. The prediction was that the greater one’s motivation to achieve, the greater the Zeigarnik effect will be demonstrated. Assessment of need for achievement was accomplished using projective tests, for which reliability was high. Subjects varying in need for achievement engaged in complete or incomplete tasks, after which the tasks were recalled. High achievers, as determined by a median split, showed an increased tendency to recall incomplete tasks compared to complete tasks. Low achievers demonstrated a trend in the opposite direction, whereby recall of
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completed tasks was greater than incomplete tasks. Greatest recall of tasks was demonstrated by high achievers in the incomplete task condition.

A study conducted by Martin and Davidson (1964) sought to discover the relationship between high-school achievement and the Zeigarnik effect. Achievers were those students with both above median IQ and grade-point total. Underachievers were those who possessed an above median IQ but a grade-point total below the median (Martin & Davidson, 1964). Subjects performed a series of written tasks, which were later recalled. For half of participants, tasks were performed to completion. For the other half of participants, tasks were interrupted and thus uncompleted. It was found that achievers demonstrated better recall of tasks when the tasks were incomplete, both compared to the complete condition and compared to underachievers. Completed task recall demonstrated no significant difference between the groups. The study suggests that academic achievement in high school students is related to recall of incomplete tasks and Zeigarnik scores.

It is the purpose of the present study to test the effect of achievement motivation on the Zeigarnik effect. More specifically, the effect of achievement motivation, as determined by the nAch Scale (Smith, 1973), on the recall of words in complete and incomplete tasks will be examined. Based on the above research, it is hypothesized that overall recall in incomplete tasks will be better than recall in complete tasks due to the increased level of psychological tension experienced in the incomplete condition. Additionally, high achievement motivation will predict better overall performance (i.e. in the complete and incomplete tasks) compared to low achievement motivation, since tension to complete tasks is naturally greater in high achievers. Furthermore, high
achievement motivation will predict strongest performance in incomplete tasks since the combined level of tension will be greatest in this group.

Method

Participants

Students enrolled at Huron University College at the University of Western Ontario in the 2006-2007 academic year served as a large portion of participants for the study. Huron is a small liberal arts college; therefore the majority of its students are oriented in the arts and social science fields. Most Huron students are from the Greater Toronto Area, however some originated in other Canadian regions and few overseas. The remaining number of participants included individuals who were enrolled at the University of Toronto, Queens University, and McGill University for the same academic year. Participation in the study was completely voluntary, and subjects received no reward or credit for involvement. Participants ranged in age typically between 17 and 23 years. The male to female ratio was approximately 1 to 1. Subjects tended to be of middle to upper socioeconomic status, therefore the sample used was likely not representative of the general population. Half of the participating individuals were randomly assigned to the complete task condition, and the other half to the incomplete task condition. Participants were classified into high and low achievement motivation groups based on relative nAch scores. All procedures and conditions of the study were conducted in accordance with the standards of research ethics. Forty participants were tested in total, and data from all 40 were used for the purpose of this study.
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**Apparatus**

A test booklet, compiled by the researcher, was distributed to each subject upon agreement to participate. A consent form, which outlined the general purpose and requirements for participation in the study, was attached to the front of each booklet and was removed once read and signed. The booklet itself contained a simple anagram task; a Need Achievement Scale (nAch) (Smith, 1973); and a blank sheet of lined paper. Each of the three booklet components appeared on separate pages and were stapled together.

Two types of test booklets were created and allowed for the differentiation of the complete and incomplete task conditions. Booklets differed solely on the basis of the anagram task, which will be further expanded on. Aside from the anagram task, booklets were identical.

The anagram task in the complete condition consisted of 10 anagrams constructed by the experimenter (see Appendix A) with adjacent blank lines for the solution to be written. The anagram task in the incomplete task condition consisted of 20 anagrams, the first 10 of which were identical to those in the complete task condition (see Appendix B). All anagrams were of relatively low difficulty.

The nAch Scale consists of 17 true and false items, 10 of which measure an individual's achievement motivation; the rest of which measure one's carelessness (see Appendix C). Only responses to achievement motivation items were scored. An example of an item measuring achievement motivation is "It's never best to set one's own challenges." Based on responses given, a score of 0 to 10 may be tallied for any one individual. A score of 0 represents complete lack of achievement motivation, whereas a score of 10 would indicate absolute highest achievement motivation. Validity of the
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nAch Scale is deemed acceptable based on a correlation of 0.48 with McClelland's projective test, a widely accepted measure of achievement motivation, which itself has been found to have a split-half correlation of 0.58. The split-half, odd-even reliability of the nAch Scale is moderate with a coefficient value of 0.56. Test-retest reliability for this scale has not been established. The test does not explicitly distinguish between the two types of achievement motivation; hope of success and fear of failure, but incorporates both types in its items and presumably does not decrease the reliability or validity.

The final page of each booklet was a lined sheet of paper, which was used by the experimenter to record verbal recall of the solved anagrams for each subject.

Procedure

Consenting participants were randomly assigned to either the complete task condition or the incomplete task condition, based on the flip of a coin, but remained blind to the task designation. Participants were provided with a booklet, which corresponded to their task condition, and were told to carefully read and follow instructions. They were also told that once a page of the booklet is turned over, returning to a previous page is not permitted. Time limits were not assigned for the anagram task or the nAch Scale since they were relatively simple and each typically required only a few minutes. Recall time was assigned as 1 minute.

Complete Task Condition. Participants were instructed to solve all 10 anagrams in the list. After completion, they were required to flip the page and respond to all items in the nAch Scale as accurately and honestly as possible. Once the blank page was turned to, the booklet was given to the researcher, at which point subjects were asked to verbally recall as many of the words from the anagram task as they could in 1 minute.
Incomplete Task Condition. Participants were instructed to solve all 20 anagrams in the list. Once the 10th anagram was completed, participants were told they must stop and flip to the next page in order to complete the provided questionnaire. Upon completion of the nAch Scale, the booklet was returned to the researcher and the subject was asked to verbally recall as many words from the anagram task as they could. Words recalled were recorded by the researcher.

All subjects were thanked for their involvement in the study and were debriefed on the nature and purpose of the study.

Scores from all 40 participants on the nAch Scale were used in the implementation of a median-split to determine the high and low achievement motivation groups. Scores below and including 6 indicated low achievement motivation, whereas scores above and including 7 indicated high achievement motivation.

Results

A 2x2 between subjects ANOVA was performed to examine the interaction and main effects of need for achievement and the Zeigarnik effect (complete or incomplete task engagement) on word recall.

A median split was used to classify individuals as high or low achievers. Relative to the sample, 23 scores above and including a nAch score of 7 were classified as high in need for achievement, and 17 scores below and including 6 were classified as low in need for achievement.

The test of the main effect of need for achievement showed that the mean word recall of high achievers (M=7.39) differed significantly from the mean word recall of low achievers (M=6.00) (F (1,36) = 12.35, p<.05).
Figure 1. Word recall amongst high and low achievers in complete and incomplete task
The test of the main effect of task condition was found to be significant \( F (1,36) = 6.24, p<.05 \). The mean recall for the incomplete task condition was 7.3, and the mean recall for the complete task condition was 6.3.

The test of the interaction effect was found to be insignificant \( F (1,36) = .595, p<.05 \). Cell means are presented in Figure 1.

Discussion

It was hypothesized that achievement motivation and the Zeigarnik effect would influence the recall of words from a list of solved anagrams. Predictions were only partially supported by findings of this study. Results demonstrated significant main effects for each of achievement motivation level and task condition (complete or incomplete) on recall. An insignificant interaction was found between the two variables.

Findings of this study provided evidence to support the Zeigarnik effect, as well as the claim that need for achievement influences performance in memory. Individuals high in need for achievement demonstrated greater recall for words than those low in need for achievement. Additionally, participants in the incomplete task condition recalled more items than participants in the complete task condition. This was the case for both high and low achievers.

As stated in the Zeigarnik effect, incomplete tasks tend to be better recalled than complete tasks. Lewin's motivational model explains this trend as the result of built up tension in one's inner-personal region. When a task is incomplete, the need to finish it to completion is aroused in the form of tension. This tension is the motivational force driving the individual to complete the task, so that the tension can dissipate and be reduced in that specified region. In relation to need for achievement, it is possible that
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those high in need for achievement view successful performance at task as more of a central need within the inner-personal region, in comparison to those low in need for achievement. The more central the need, the more likely behaviour is going to be influenced by that need.

It was predicted that recall of items would be significantly better amongst high achievers in the incomplete task condition compared to any other group. However, results failed to support this prediction.

The insignificant findings may be explained by a number of factors. The way in which complete and incomplete tasks were set up differed from previous research. Past studies had participants recall actual tasks that were interrupted, and therefore not performed to completion. Some had participants recall anagram items that were not solved to completion. The nature of this study set up a seemingly incomplete task, however, each of the items themselves were completed. Previous research set up situations where the items to be recalled were interrupted. This may have contributed to the discrepancy between findings of this study and that of previous research. The sampling pool of 40 individuals is likely not representative of the general population, and is relatively small in size. Therefore, findings may be restrictive to drawing definitive conclusions. Individuals selected are stimulated individuals who use the mechanisms of memory and recall on a daily basis in class, while studying learned material, and when performing on exams. Therefore, tasks involving recall are routine and should demonstrate a trend consistent with findings discussed in the literature. It is possible that the anagram task compiled by the researcher allowed for better recall since items were all associated and therefore more easily remembered. Control was obtained by conducting
testing in a quiet area with minimal distractions. Participants in the complete and incomplete tasks were assigned as such in a random fashion. Instructions and directions given to participants amongst each of the two conditions were uniform.

Practical implications of this study may be applied to the classroom and extend to the workplace. It is evident that those with a higher need to achieve demonstrate greater performance on tasks. Although not confirmed in this study, research has shown that these individuals presumably have a greater inclination to reduce tension aroused by incompletion of a task. As a result, uncompleted tasks remain in memory and are more accurately recalled later on than completed tasks. This suggests that individuals high in the need to achieve are more likely to attend to work that is incomplete and get it done sooner than later.

An idea for further research in this area may be to determine whether varying difficulty of tasks would have an impact on the effects of achievement motivation and the Zeigarnik effect. Those high in need to achieve are said to perform best in moderately difficult circumstances, while those low in need to achieve tend to excel in easy circumstances. Testing this using anagrams ranging in difficulty may be interesting. Additionally, whether or not instruction induced motivation has an impact on performance of complete and incomplete tasks amongst high and low achievers would be a worthy experiment. Studies of this nature have been conducted in psychology, but findings appear to be inconsistent.
Appendix A – Complete Task

Please complete the following task by rearranging the letters to spell the word in the space provided.

1. smmme
2. vataicon
3. snad
4. sailp
5. ecastl
6. heacb
7. trvlae
8. apsm
9. flmiay
10. sutiecas
Appendix B – Incomplete Task

Please complete the following task by rearranging the letters to spell the word in the space provided.

1. srumme
2. vataicon
3. snad
4. sailp
5. ecastl
6. heacb
7. trvlae
8. apsm
9. flmiay
10. sutiecas
11. kackpbca
12. nav
13. swgiminnm
14. hiking
15. sunhies
16. cicnip
17. gema
18. yot
19. bcolks
20. nuf
Appendix C - nAch Scale (Smith, 1973)

Please read each of the following statements. If you think that it is true underline the TRUE. If you think that it is false underline the FALSE.

Please do not miss out any statements. Even though it may be difficult, you must decide one way or the other.

1. I am not clear about the instructions for this test TRUE FALSE
2. When I was young I enjoyed the feeling of accomplishment after I had done something well TRUE FALSE
3. The feeling of a job well done is a great satisfaction TRUE FALSE
4. I don’t think I’m a good trier TRUE FALSE
5. I would sooner admire a winner than win myself TRUE FALSE
6. If it’s worth doing, it’s worth doing well TRUE FALSE
7. Failure is no sin TRUE FALSE
8. Incentives do more harm than good TRUE FALSE
9. In an unknown situation it doesn’t pay to be pessimistic TRUE FALSE
10. I dislike red tape TRUE FALSE
11. I work best when I have a job that I like TRUE FALSE
12. It’s never best to set one’s own challenges TRUE FALSE
13. I don’t care what others do, I go my own way TRUE FALSE
14. Even a good poker player can’t do much with a poor hand TRUE FALSE
15. Modern life isn’t too competitive TRUE FALSE
16. You can try too hard sometimes, it’s best to let the world drift by TRUE FALSE
17. Most people want success because it brings respect TRUE FALSE
References


