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Multi-tasking: The Relationship between Watching a Video and Memory

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Abstract

This study investigates the relationship between media multitasking and memory among undergraduate students at a small, liberal arts college in Minnesota. The participants (N=20) were randomly assigned using block randomization to either the experimental group which was asked to study a list of 20 words while watching a video clip or the control group which only studied the set of 20 words. All of the participants were given 2 minutes to study the list of 20 words and then 2 minutes to write as many words as they could recall from their memory. The participants who watched the video clip were asked to answer questions about the video to ensure the independent variable was manipulated correctly. I found that participants who media multitasked by watching a video had a more difficult time recalling words from the list compared to those in the control group ($t(18) = -2.427$, $p\text{-value} = .026$, mean difference = -4.20, and standard error difference = 2.79). These results suggest that people who media multitask while they study may have a more difficult time recalling information from their memory compared to those who do not multitask while they study information.

Keywords: media multitasking, memory

Multi-Tasking: The Relationship Between Watching a Video and Memory

Over the last 30 years, there has been an advancement seen in all forms of technologies which has led to an increase in the use and availability of different kinds of media (Minear, Brasher, McCurdy, Lewis, & Younggren 2013). The ability to have media at the touch of our hands has not only increased the amount of times individuals access media content, but this has allowed individuals to use several different types of devices at the same time to complete tasks (Edwards & Shin, 2017). The advancements in our technology has shown that media multitasking has increased among young people, including adolescents and young adults, by 120% (Edwards & Shin, 2017). It is important to discuss this increase because it has led to arguments about whether the increase in partaking in “media multitasking” could be problematic for individual’s cognitive processes including executive function and working memory (Baumgartner, Weeda, van der Heijden, & Huizinga, 2014).

The two most well-known types of media multitasking that individuals may partake in are multitaskers who use two or more types of media devices and non-media multitasking activity in which participants may multitask by watching TV while they are studying or doing homework (Baumgartner et al., 2014). The exposure to multiple tasks is what researchers question could be problematic to our cognitive function because when you are continuously switching between tasks you have to completely stop focusing on the previous one. There have been mixed results found in the relationship between cognitive functions, especially memory, and multitasking in which some studies show a difference in memory when exposed to more tasks and some show no difference (Rubenking, 2017; Uncapher, Thieu, & Wagner, 2016).

In a previous study performed in 2009, it examined whether chronic media multitaskers could be more attentive to meaningless external factors and whether they are more attentive to irrelevant factors in their memory (Ophir, Nass, & Wagner, 2009). The groups were split into high and low media multitasking habits. The groups were then exposed to cognitive control activities like a filtering task in

which their attention to the environment and working memory were tested. This study showed that high media-multitaskers had a difficult time filtering out unrelated information from their surroundings and were not as likely to ignore the irrelevant depictions in memory (Ophir et al., 2009). This means that individuals with high media multitasking habits could be associated with poorer cognitive abilities including the inability to keep only relevant information in their minds and the inability retrieve information from their memories (Uncapher et al., 2016).

Although, high media multitaskers may have a difficult time filtering out unrelated information in their memory these results may vary depending on the number of media devices they are exposed to. A recent study has examined the outcome of single task (one electronic device) and dual task conditions (more than two devices) on both enjoyment and memory outcomes while multitasking (Rubenking, 2017). The 104 undergraduate students were randomly assigned to either the TV group with no additional distractions or the group who was provided a secondary electronic device. Each of the participant's recognition memory was tested by using a visual recognition task in which they were presented with image on a screen that were from the previous video clips. The results showed no difference in the single task or dual task groups in their memory recognition (Rubenking, 2017). This study sheds light on the idea that perhaps the number of devices that individuals use while multitasking may not affect their cognitive functions such as memory, but the amount of times they partake in multitasking does.

This study will examine whether there is a relationship between media multitasking (watching a video clip) and recognition memory among 20 undergraduate students. All of the participants will receive a list of 20 words in which they are given 2 minutes to study them. The treatment group will have to multitask by watching a 2-minute video and study the list of words, and the control group will be given the full 2 minutes to study the list of words. The participants will all be given 2 minutes to write as

many words as they can remember. I hypothesize that the treatment group will remember less words from the list than the control group because the treatment group is not able to focus on only one task.

Methods

Design

I conducted a simple experiment that used block randomization to assign the 20 participants into the two groups. This experiment was a post-test only design that had one experimental group and one control group. I ran a pilot study to ensure that the manipulation and measurements were run efficiently. The experiment had participants study a list of 20 words for two minutes in which the control group was able to just study the list of words without any distractions and the treatment group had to watch a video clip on a laptop screen while studying the list of words.

Participants

Of the participants, 16 were female and 4 were male. All of the participants were undergraduate students that attend a small, liberal arts college in Minnesota.

Materials and Questions

The participants were each assigned to a group using block randomization. The dependent variable of this simple experiment was memory which was measured by testing the participants on how well they could remember a list of 20 words. The list of words included "park, director, apple, nine, clock, desk, mountain, worm, table, bank, hold, plugs, army, ring, disk, weight, suit, soup, press, employ". The independent variable of this simple experiment is the presence of a video clip playing on a laptop screen. The video clip that played was the first 2 minutes of the TedTalk: "3 things I learned while my plane crashed". The experimental group manipulation was the presence of the video clip while they studied the list of words given to them. The control group was manipulated by having the participants study the list of words without the video clip playing.

A manipulation check was measured for the treatment group where I asked them a set of questions about the video clip to ensure that they were truly multitasking (watching the video and studying the set of words). The questions included “What was he in that crashed?”, “What was unique about the seat the speaker was in?”, “Where were they when they crashed?”, “What was the first thing he learned?”, and “What color was his shirt?”.

Results

Using SPSS, I examined the descriptive statistics of the dependent variable (number of words recalled). The descriptive statistics of the control group (not exposed to video clip) included $M = 14.2$ and $SD = 4.21$. The descriptive statistics of the experimental group (exposed to video clip) included $M = 10.00$ and $SD = 3.5$.

I performed an independent means sample t-test to examine the difference between means of the number of words participants could recall between the experimental (exposed to video clip) and control group (not exposed to video clip). The mean difference in the number of words recalled between the experimental group and the control group was -4.20 . The independent means sample t-test showed a significant difference between the means in which $t(18) = -2.427$, $p\text{-value} = .026$, mean difference = -4.20 , and standard error difference = 2.79 . The 95% confidence interval ranged from -7.84 (LL) to $-.56$ (UL).

The manipulation check results were $M = 2.5$, $SD = 1.43$ with $Min = 0$ and $Max = 5$. The participants answered 5 questions about the video in this check.

Discussion

The present study examined the relationship between media multitasking (watching a video clip) and memory. The study was conducted by having 20 undergraduates randomly assigned using block randomization to either a control group which was told to just study a list of 20 words for 2 minutes and an experimental group which was told to watch a TedTalk while studying the same 20

words. I hypothesized that the treatment group will remember less words from the list than the control group since the treatment group will have to switch between tasks. My results supported my hypothesis in that media-multitasking caused individuals to remember less words than compared to individuals who were not media-multitasking while they studied the words. These results suggest that people who media multitask while they study may have a more difficult time recalling information from their memory compared to those who do not multitask while they study information.

The study at hand randomly assigned individuals to either the control group or the experimental group using block randomization. The participants did not have any questions regarding what they were supposed to be doing which allows me to ensure that the dependent variable was measured correctly. This means that the dependent variable had strong construct validity. I performed a manipulation check in which I added an extra dependent variable to my experimental group. This check had participants in that group answer questions about the video that they were watching while they studied the words. On average, the participants were able to answer the most general questions about the video but only three of the participants were able to answer the question, "what was the first thing he learned?" which was the whole purpose of the video. Since the participants were able to answer the most generic questions about the video and not the more detailed ones it has allowed me to make the assumption that this manipulation check may not be as strong as it could have been. The use of harder questions in the manipulation check would have made my construct validity stronger in that it ensured that my independent variable was manipulated correctly.

The study used a convenience sample of 20 undergraduates (Female = 16; Male = 4) in which 16 of those participants were directly taken from a psychology research methods class. The inability to generalize to the population outside of this small liberal arts college and the use of a convenience sample does not allow for external validity. As well, the internal validity of this study was medium/high due to my manipulation check which ensured that the participants were actually watching the video.

This allows me to rule out the possibility of a potential confound or alternative explanation for the results that could have resulted if participants were not tested on the video.

The sample size of this study was 20 which is not a large sample size. The results showed a significant result between the means of the two groups which tells us that there is a difference in those who only study versus those who study while multitasking. This means that our results did not occur just because of chance. The dependent variable did not have any extreme outliers that would have affected our independent means sample t-test. There is no restriction of range in my study. I did not have to check for curvilinear relationships because my results came out significant. This study has medium to high statistical validity due to the small sample size.

This study expanded upon previous research which found that media multitaskers are associated with poor cognitive abilities like the inability to retrieve information from their memories (Uncapher, Thieu, & Wagner, 2016). In particular, this study supported Ophir, Nass, and Wagner (2009) study in which they found that high media-multitaskers had a difficult time filtering out unrelated information from their surroundings and were not likely to ignore irrelevant depictions in memory. Although, my study did not measure and separate the high media-multitaskers and the low media-multitaskers it still follows the relationship I found in which those who multitask have a more difficult time remembering information from their memories. This means that the current study could go a step further in evaluating how often participant's media-multitask to further support previous research such as Uncapher et al. (2016) and Ophir et al. (2009).

The study at hand has several limitations. The small sample size, convenience sampling, and lack of external validity does not allow myself to generalize these results to a population outside of the small liberal arts college. Secondly, the difficulty level of the questions proposed in the manipulation check could cause not only the construct validity to be weakened but it could lead to possible confounds in my results. The next steps to be taken in this study would be to extend the sample size of this

experiment beyond undergraduate students to see if the differences in media multitasking between all developmental time periods could be significant. As well, it could be important to examine the gender differences and ensure a stronger manipulation check. The results of this study are important to discuss as our society continues to advance in our media and technology. This means that students could show signs of having negative effects on the amount of information they are able to remember if they engage in media multitasking while they study.

References

- Baumgartner, S. E., Weeda, W. D., van der Heijden, L. L., & Huizinga, M. (2014). The relationship between media multitasking and executive function in early adolescents. *The Journal of Early Adolescence, 34*(8), 1120-1144. doi:10.1177/0272431614523133
- Edwards, K. S., & Shin, M. (2017). Media multitasking and implicit learning. *Attention, Perception, & Psychophysics, 79*(5), 1535-1549. doi:10.3758/s13414-017-1319-4
- Minear, M., Brasher, F., McCurdy, M., Lewis, J., & Younggren, A. (2013). Working memory, fluid intelligence, and impulsiveness in heavy media multitaskers. *Psychonomic Bulletin & Review, 20*(6), 1274-1281. doi:10.3758/s13423-013-0456-6
- Ophir, E., Nass, C., & Wagner, A. D. (2009). Cognitive control in media multitaskers. *Proceedings of The National Academy of Sciences of The United States of America, 106*(37), 15583-15587. doi:10.1073/pnas.0903620106
- Rubenking, B. (2017). Boring is bad: Effects of emotional content and multitasking on enjoyment and memory. *Computers In Human Behavior, 72*, 488-495. doi:10.1016/j.chb.2017.03.015
- Uncapher, M. R., Thieu, M., & Wagner, A. D. (2016). Media multitasking and memory: Differences in working memory and long-term memory. *Psychonomic Bulletin & Review, 23*(2), 483-490. doi:10.3758/s13423-015-0907-3