



Cognitive Function and Time of Day

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Introduction

The relationship between cognitive function and time of day was examined. In the following research paper is data gathered from 26 college students in California. Previous studies showed that morning cognitive function yields significantly better results than evening cognitive function (Borella, 2011). Other studies recognized that students who were offered late morning hours vs earlier morning hours, led to maximum cognitive potentiation in terms of studying and memory (Hourihan, 2014)

The purpose of this research study is: can a certain time of day influence or enhance the productivity of students, and if so, can we determine that that time of day is morning.

Hypotheses

We predicted a significant difference between memory retention during the early morning hours versus during the evening hours. Previous studies showed that morning cognitive function yields significantly better results than evening cognitive function

Method

Participants

In this study, we collected data from 26 college students aged 18-30. Out of the 26 participants,, 35.6% were Male and 65.4% were Female, having a M=26 years old.

Measures

We used a very similar online memory test from <https://humanbenchmark.com/tests/memory> . This test was a valid measure for memory as it operated the same way as the Digit Symbol Substitution Test (DSST). We also utilized questions similar to the learning style inventories from Aromons (1995), by asking participants when they take most of their college classes and whether they consider themselves morning or evening people.

Procedure

Students at Cypress College were randomly emailed the survey along with a student informed consent form, ensuring that all answers will be used for scientific data. They started the survey containing questions to find out their time-of-day preference, as well as their circumstances in terms of work, school, and sleep. They were also asked in the survey to take the online memory test and then self-report their scores.

Results

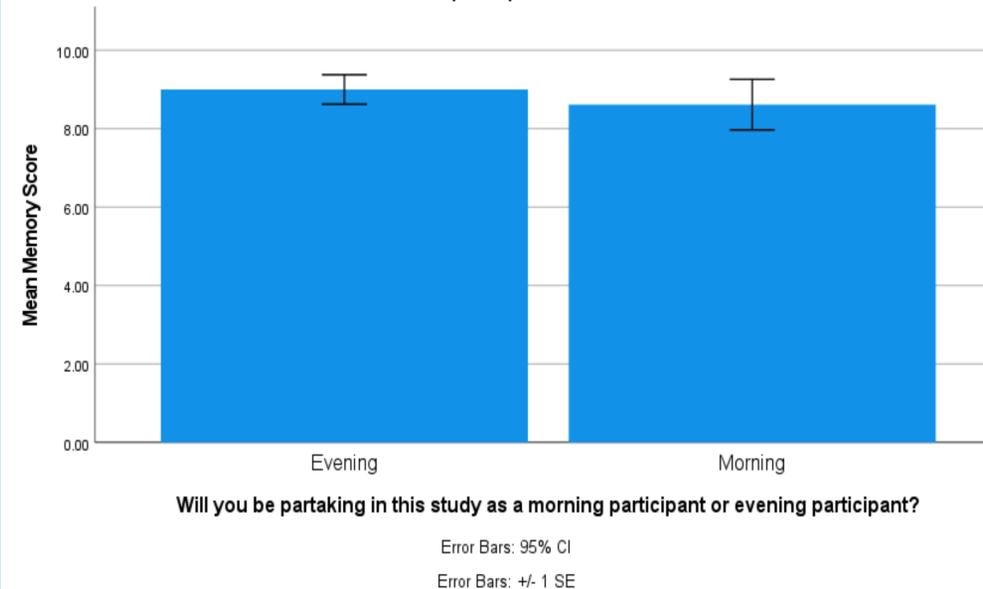
Table 1

Descriptive Statistic for students partaking in the Evening or Morning test

Time	N	M	SD	SEM	Minimum	Maximum
Evening	13	9.00	1.35	.38	6.00	12.00
Morning	13	8.62	2.33	.65	6.00	15.00
Total	26	8.81	1.88	.37	6.00	15.00

Note. Although evening participants had a higher mean memory score than the morning participants, there was not a significant difference in mean between morning participants (M = 8.62, SD = 1.35) and evening participants (M = 9.00, SD = 2.32), $t(19.28)=-.55, p = .61$

Simple Bar Mean of Memory Score by Will you be partaking in this study as a morning participant or evening participant?



Discussion

The main objective of this study was to examine if any correlation exists between memory retention and time of day. Although the initial hypothesis predicted a significant correlation between these two variables, as was also observed from the results of Baddeley et al. (2007), the results obtained in this study demonstrated otherwise. There was no statistically significant correlation between memory and time of day. Our results were similar to that of Borella et al.'s (2011) study, which demonstrated that time of day does not play a role in age-related differences in strength of working memory

Limitations

We were unable to control the testing environment in this study due to inability to meet in person because of COVID-19. So it is highly possible that participants--especially the evening participants--may have been distracted when taking the test since the time frame to take the test was from 7-10pm. If this study was done again, it would be ideal to survey participants using the Digit Symbol Substitution Test (DSST) in-person to ensure that the environment and time is controlled across all subjects and that reported scores are valid and accurate.

Implications

Since no significant results were obtained, we cannot conclude from this study that altering educational methods based on time of day will be effective. However, it is worth revisiting this study under a new lens by changing the study to be more long-term, and by taking into consideration other variables like age, physiological state, and personality type. This will help get a more comprehensive understanding of how various common factors can be adapted to, in order to utilize human memory power and maximize student achievement to the highest potential.

References

Available on Request.