

P.p1 particular test, the picture memory interference



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span {white-space: pre}The effect of diurnal variation on cognitive performance: Does our working memory differ between the morning and the afternoon? IntroductionAt the University of California, Los Angeles (UCLA), midterms and final examinations are scheduled arbitrarily at different times throughout the day.

Some tests are administered in the morning whereas other examinations are given in the afternoon. Current research proposes that young adults' attentional processes attain their peak performance in the afternoon (Knight & Mather, 2013). In fact, diurnal variation may lead to a 20% fluctuation in attention, alertness, and vigilance in young adults (Kelly, 1996). Other studies have shown that certain biological factors correlate highly with <https://assignbuster.com/pp1-particular-test-the-picture-memory-interference/>

individual's chronotype (Hines, 2004). While studies have established the relationship between response time and time of day, scientific literature on the relationship between working memory and diurnal variation is lacking. It is therefore interesting to evaluate whether or not the time at which young adults are tested has an effect on their working memory, which is the purpose of this study.

We hypothesize that there is a statistically significant difference in the number of correct answers between students who took the test in the morning and students who took the test in the afternoon. Conversely, our null hypothesis argues that there is no statistically significant difference in the number of correct answers between students who took the test in the morning and students who took the test in the afternoon.

Materials and Methods

In this experiment, a sample of college students aged 18 to 26 years participated in the Computerized Memory Interference Test (CMIT), a computerized program that utilizes visual cues to test respondents' short term memory and reaction time. For this particular test, the Picture Memory Interference Test (PMIT) was chosen. Before students took the test, they were asked to fill out a questionnaire consisting of detailed questions about their demographics and mental and physical states at the time of the test. These background questions about the subjects and the conditions in which they are taking the test served as variables for the CMIT to analyze and compare different subjects' performance by grouping them based on their answers.

This preliminary questionnaire included the time of day at which the subject started the test. The answer choices for this question were: morning, pre-
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noon, noon, afternoon, evening, and night. Our study compared the performance of the 3266 subjects who answered morning and the 2365 students who answered afternoon. The answers to the questionnaire were then recorded and stored on a database for later analysis along with the cognitive results, collected during the next component of the test. The first four tests aimed to evaluate each subject's working memory performance. The first three tests (Test 1, Test 2, Test 3) of the PMIT were the exact same. In these tests, subjects were required to memorize a set of twenty pictures of everyday items. Then, subjects were presented with a second set of fifty pictures and were asked to recognize which pictures from the second set were repeated from the first.

In Test 4, the respondents' were presented a set of sixty pictures and tasked with identifying whether or not each picture in the test was repeated from one of the prior tests. Finally, subjects' reaction time was evaluated in Test 5. In this test, subjects were presented with a shape, either a square or a circle, and had to click the right or left arrow key with their index finger once they identify the shape of the figure. The CMIT recorded the time that it took the subject to click the arrow keys for every figure. The parameters of the collected data were the amount of correct pictures remembered and the average response time. The number of correct pictures was measured on a scale of 0-150.

The average response time was the mathematical mean of the times recorded in Test 5. Since we were testing working memory, our experiment concerned itself primarily with the results of Test 1, Test 2, Test 3, and Test 4. The data was then analyzed in conjugation with the questionnaire to <https://assignbuster.com/pp1-particular-test-the-picture-memory-interference/>

determine if the test results varied with respect to the time of day. The type of test used is a T-test. The CMIT computer software automatically recorded the response times and then took the mean and standard deviation to calculate a T-value.

The T-value was then applied to a T-distribution chart, which contained conversions for the T-value to be converted into a respective p-value. The p-value measured the probability of the difference in the test results occurring due to pure chance. If the probability value calculated turned out to be less than 0.05, then the test score differences would be regarded as significant. The experiment gives a t-test value of 1.470. Inserting this value into a T-distribution with 5628 degrees of freedom results in a p-value in between 0.1 (10%) and 0.

2 (20%). Given that the p-value is superior to 0.05 (5%), we fail to reject the null hypothesis.

Therefore, there is no statistically significant difference in the number of correct responses between students who took the test in the morning and students who took the test in the afternoon. In summation, we can conclude that, unlike response time, the working memory of young adults does not differ between the morning and the afternoon. References Hines, C. B. (2004).

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