

IMPACT OF ATTENTION SPAN ON ACADEMIC PERFORMANCE: DOES GENDER PLAY A ROLE?

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ABSTRACT

This study examined the relationship between attention span and academic performance among university students and explored whether gender differences exist in these variables. A sample of 50 undergraduate students aged 18–25 years participated in the study. Correlation analysis revealed a strong positive relationship between attention span and academic performance ($r = .881$, $p < .01$). Regression results indicated that attention span significantly predicted academic performance, explaining 77.6% of the variance. Independent sample t -tests showed no significant gender difference in academic performance ($p = .056$), although a moderate effect size was observed. However, a significant gender difference was found in attention span ($p = .013$), with males showing higher scores. The findings highlight the importance of attention span as a key cognitive factor influencing academic success. The study suggests that educational interventions aimed at improving students' concentration may enhance learning outcomes.

Keywords: Attention span, academic performance, university students, gender differences, cognitive functioning, learning outcomes, educational psychology

INTRODUCTION

Attention span has become an increasingly important construct in understanding students' academic success in contemporary educational settings. In today's fast-paced and information-rich environment, students are constantly exposed to multiple stimuli that compete for their focus. The ability to sustain attention over time plays a crucial role in learning, comprehension, memory retention, and overall academic performance. In aims of this study, the relationship between attention span and academic performance is examined, with particular emphasis on whether gender plays a moderating role in this association. Understanding how attentional capacity influences scholastic achievement can provide insight into

cognitive and behavioral factors that contribute to educational outcomes.

In classroom environments, students are required to concentrate on lectures, complete assignments, follow instructions, and engage in problem-solving tasks for extended periods. A strong attention span enables students to process information effectively, minimize distractions, and perform better in examinations and coursework. Conversely, limited attention span may result in reduced academic engagement, incomplete tasks, lower grades, and diminished academic confidence. Researchers have increasingly focused on attention as a foundational cognitive process that underlies executive functioning, self-regulation, and learning efficiency,

making it a central variable in educational psychology.

Moreover, gender differences in cognitive functioning and learning styles have been widely discussed in psychological and educational research. Some studies suggest that boys and girls may differ in attentional control, classroom behavior, and academic achievement patterns due to biological, social, and environmental influences. These differences may shape how attention span impacts academic outcomes across genders. Exploring whether gender plays a significant role in the relationship between attention span and academic performance can help educators design targeted interventions and supportive learning strategies.

The primary goal of this research is to analyze the impact of attention span on academic performance among students and to determine whether this relationship varies between male and female students. By investigating these dynamics, the study aims to contribute to a deeper understanding of cognitive factors influencing academic success and to provide practical implications for improving student learning experiences. Ultimately, identifying the role of attention span and gender in academic achievement may assist educators, parents, and policymakers in fostering more effective educational environments that support diverse student needs.

Background

Attention span is considered a fundamental cognitive ability that plays a vital role in students' academic success, as it directly influences learning, comprehension, memory retention, and task completion. In modern educational settings, students are frequently exposed to various internal and external distractions that may reduce their capacity to sustain focus for extended periods, thereby negatively affecting their academic performance. Strong attentional control enables students to follow instructions, engage actively in classroom activities, and perform effectively in examinations, whereas limited attention span is often associated with poor concentration, incomplete assignments, and lower grades. In addition to its direct impact on achievement,

emerging research suggests that gender differences may influence attentional patterns and academic outcomes due to biological, developmental, and socio-cultural factors. For instance, boys are often reported to exhibit higher levels of inattentiveness and impulsivity, while girls may demonstrate comparatively better sustained attention and classroom compliance. Therefore, examining the impact of attention span on academic performance, while considering the potential role of gender, is essential for understanding cognitive and behavioral influences on students' educational success and for developing targeted strategies to enhance learning outcomes.

Theoretical Framework

The study is grounded in Cognitive and Executive Function Theory, which suggests that attention is a core component of executive functioning responsible for regulating learning, self-control, and information processing. According to this framework, sustained attention enables students to process information effectively, resist distractions, and achieve better academic outcomes. Gender differences in attentional control may arise from biological, developmental, and socio-cultural influences, which may indirectly affect academic success.

Study Variables

Independent Variable: Attention Span

Dependent Variable: Academic Performance

Grouping Variable: Gender (used for comparison analysis)

Rationale

Attention span is a key cognitive process that influences students' ability to learn, retain information, and perform academically. In modern educational environments filled with distractions, understanding how attentional capacity affects academic success is essential. Furthermore, examining gender differences can help identify whether interventions should be tailored differently for male and female students. This study

therefore contributes to understanding cognitive factors underlying academic achievement.

Significance

This research is significant for several reasons. It highlights attention span as a major predictor of academic success. It provides evidence useful for teachers to design concentration-enhancing strategies. It helps educational institutions develop targeted academic support programs. It contributes to local research on student cognition and performance. It offers practical implications for improving learning environments

Literature Review

Attention span is considered a fundamental cognitive ability that significantly influences academic performance, as sustained and selective attention enable students to focus, process information efficiently, and complete academic tasks effectively. Grounded in cognitive and executive function theories, prior research consistently demonstrates that attentional control predicts educational outcomes. For example, Blair, C. and Razza, R. P. (2007) found that executive function, including attention control, directly predicts early math and literacy skills, while Duncan, G. J. et al. (2007) reported that early attention skills strongly forecast later academic achievement, particularly in mathematics. Similarly, Gallen, C. L. et al. (2023) and Lentz, T. H. et al. (2010) demonstrated that sustained attention significantly predicts academic performance even after controlling for intelligence, highlighting its independent contribution. From a cognitive neuroscience perspective, Stevens, C. and Bavelier, D. (2012) emphasized that selective and sustained attention form the foundation of reading, language, and mathematics skills. Research has also explored gender differences in attention, with Efrat, B. and Tzischinsky, O. (2022) and Riley, E. et al. (2017) identifying significant gender variations in sustained attentional control across developmental and sociocultural contexts, although findings regarding gender differences in academic performance remain mixed. Local evidence from Pakistan by Bhatti, H. F. et al. (2025) further underscores variability in attention span within academic settings. Collectively, existing

literature supports the strong relationship between attention span and academic performance while suggesting that gender may influence attentional processes, providing a solid foundation for the present study examining the impact of attention span on academic performance and the potential role of gender.

Impact on Self-Efficacy

Self-efficacy, defined as an individual's belief in their ability to successfully perform tasks (Albert Bandura, 1997), plays an important role in the relationship between attention span and academic performance. Students with high self-efficacy are more confident in their academic abilities, which helps them sustain attention, stay motivated, and persist in challenging tasks, leading to better academic outcomes. In contrast, students with low self-efficacy may struggle to maintain focus, avoid difficult tasks, and experience anxiety, which can shorten their attention span and negatively affect performance. Gender differences in confidence and academic beliefs may further influence how self-efficacy shapes attentional control and achievement among male and female students.

Impact on Self-Control

Self-control refers to an individual's ability to regulate thoughts, emotions, and behaviors in order to achieve long-term goals (Roy Baumeister et al., 1994). In the context of attention span and academic performance, self-control plays a critical role in helping students manage distractions, resist impulses, and maintain focus on academic tasks. Strong self-control supports sustained attention, effective time management, and task completion, which positively influence academic achievement. Conversely, low self-control may lead to impulsivity, procrastination, and difficulty concentrating, thereby shortening attention span and negatively affecting performance. Additionally, gender differences in behavioral regulation and impulse management may shape how self-control influences attentional capacity and academic outcomes among male and female students.

Study Aims and Objectives

- To investigate the role of attention span in predicting academic performance among university

students and to examine whether gender differences exist in attention span and academic outcomes.

- To examine the relationship between attention span and academic performance.
- To determine whether attention span predicts academic performance.
- To investigate gender differences in attention span.
- To examine gender differences in academic performance.

Research Design

The study used a quantitative, cross-sectional correlational research design. This design was appropriate because it allowed the researcher to examine relationships between variables and compare gender groups at a single point in time without manipulating any variables.

Research Questions

- Is there a significant relationship between attention span and academic performance?
- Does gender influence attention span?

Hypotheses

- **H01 (Null Hypothesis):** There is no relationship between attention span and academic performance.
- **H1 (Alternative Hypothesis):** There is a positive relationship between attention span and academic performance.

Operational definition of variables

Attention Span

The ability of a student to maintain focus on academic tasks for a certain period without distraction.

Academic Performance

The level of achievement a student obtains in studies, measured through GPA or exam scores.

Gender

The biological classification of participants as male or female, examined to see its role in the relationship between attention span and academic performance.

Sample Characteristics and Selection Criteria

- The total sample consisted of 50 university students.
- Among them, 30 were females and 20 were males.

Inclusion Criteria

- Participants were required to be university students.
- Only undergraduate students were included in the study.
- The age range of participants was 18 to 25 years.

Exclusion Criteria

- Married students were excluded from the study.
- Individuals with any diagnosed psychiatric illness were not included.

Sampling strategy

A non-probability convenience sampling technique was used to recruit participants. Undergraduate students from universities were selected based on accessibility and willingness to participate. The final sample consisted of 50 students, including 20 males and 30 females aged between 18 and 25 years.

Statistical Analysis

Data were analyzed using SPSS.

The following statistical tests were applied:

- Descriptive statistics (Mean, Standard Deviation).
- Pearson correlation to assess relationships.
- Linear regression to examine predictive strength.
- Independent samples t-test to compare gender differences.
- Effect size (Cohen's d) and confidence intervals to assess practical significance.

Ethical Considerations

Participants were informed about the purpose of the study and provided voluntary consent before participation. Confidentiality and anonymity were ensured by not collecting identifying information. Participants were informed of their right to withdraw at any time without penalty. The study followed standard ethical guidelines for

psychological research involving human participants.

RESULTS

Table 1

Correlation Analysis between attention span and academic performance (N=50)

Variables	1	2
Attention span	-	0.881**
Academic performance	0.881**	-

Note. ** $p < 0.01$

The table shows analysis between attention span and academic performance. The result shows that attention span has a strong positive and significant

correlation with academic performance ($r=0.881$, $p < 0.01$).

Table 2

Regression analysis between attention span and academic performance (N=50)

Adjusted R square	R	R-square	Std.Error of estimate	Durbin Watson
1	0.881 ^a	.776	.771	2.886 1.615

The regression analysis examined the relationship between attention span and academic performance among students ($N = 50$). The results showed a strong positive relationship between the two variables, as indicated by a high correlation coefficient ($R = .881$). The R-square value (.776) revealed that approximately 77.6% of the variance in academic performance can be explained by attention span, suggesting that attention span is a strong predictor of academic performance. The

adjusted R-square (.771) further confirms the stability and good fit of the model after adjusting for sample size. The standard error of estimate (2.886) indicates a relatively low prediction error. Additionally, the Durbin-Watson value (1.615) falls within the acceptable range, suggesting no serious issue of autocorrelation in the residuals. Overall, the findings indicate that higher attention span is associated with better academic performance among students.

Table 3

Independent Sample t-test Analysis of comparison of academic performance between male and female (N=50)

Variable	Male		Female		t	p	d	95% CI	
	M	S.D	M	S.D				L.L	U.L
Academic performance	15.65	6.442	12.33	5.454	1.959	.056	.565	-.088	6.721

An independent samples t-test was conducted to examine gender differences in academic

performance among students ($N = 50$). The results showed that male students ($M = 15.65$, $SD = 6.44$)

scored higher on academic performance than female students ($M = 12.33$, $SD = 5.45$). However, this difference was not statistically significant, $t = 1.96$, $p = .056$. Since the p-value (.056) is greater than .05, the null hypothesis is retained, indicating that there is no significant difference in academic performance between male and female students. The effect size (Cohen's $d = .565$) suggests a

moderate effect, meaning that although the difference was not statistically significant, it may still have practical relevance. Additionally, the 95% confidence interval ($LL = -0.088$, $UL = 6.721$) includes zero, which further supports the conclusion that the difference is not statistically significant.

Table 4

Independent sample t test analysis of comparison of attention span between male and female (N=50)

Variable	Male		Female		t	p	d	95% CI	
	M	S.D	M	S.D				L.L	U. L
Attention span	16.10	5.619	12.03	5.359	2.578	.013	.744	.896	7.238

An independent samples t-test was conducted to compare attention span between male and female students ($N = 50$). The results indicated that male students ($M = 16.10$, $SD = 5.62$) had a significantly higher attention span than female students ($M = 12.03$, $SD = 5.36$). This difference was statistically significant, $t = 2.58$, $p = .013$. Since the p-value is less than .05, the null hypothesis was rejected, indicating a significant gender difference in attention span. The effect size (Cohen's $d = .744$) suggests a moderate to large effect, showing that gender had a meaningful impact on attention span. Additionally, the 95% confidence interval ($LL = 0.896$, $UL = 7.238$) does not include zero, which further confirms the significance of the difference.

Discussion, Conclusion and Future Direction

The present study aimed to examine the relationship between attention span and academic performance among students, as well as to explore gender differences in these variables. The findings provide important insights into how cognitive focus contributes to students' academic success.

The correlation analysis revealed a strong positive and statistically significant relationship between attention span and academic performance ($r = .881$, $p < .01$). This indicates that students with higher attention spans tend to achieve better academic

results. The strength of this relationship suggests that attention span plays a crucial role in students' learning outcomes. These findings are consistent with previous research emphasizing that sustained attention enhances information processing, comprehension, and retention, which ultimately leads to improved academic achievement. Students who are able to maintain focus during lectures, study sessions, and examinations are more likely to understand course material effectively and perform better academically.

The regression analysis further supported this relationship. The results showed that attention span significantly predicted academic performance, explaining approximately 77.6% of the variance ($R^2 = .776$). This high proportion indicates that attention span is a strong predictor of academic success among the sampled students. The adjusted R^2 (.771) confirmed the stability of the model, suggesting that the results are reliable even after accounting for sample size. Moreover, the acceptable Durbin-Watson value (1.615) indicated no serious autocorrelation issues, strengthening the credibility of the regression model. These findings highlight the practical importance of enhancing students' attentional abilities to improve academic outcomes.

Regarding gender differences, the independent samples t-test showed that male students scored higher in academic performance ($M = 15.65$, $SD =$

6.44) compared to female students ($M = 12.33$, $SD = 5.45$). However, this difference was not statistically significant ($p = .056$). Although the effect size ($d = .565$) indicated a moderate practical difference, the confidence interval included zero, suggesting that the observed difference could have occurred by chance. Therefore, academic performance appears relatively comparable across genders in this sample.

In contrast, a significant gender difference was found in attention span. Male students demonstrated a significantly higher attention span ($M = 16.10$, $SD = 5.62$) than female students ($M = 12.03$, $SD = 5.36$), with a statistically significant p -value ($.013$). The effect size ($d = .744$) indicated a moderate to large difference, and the confidence interval did not include zero, confirming the robustness of this finding. This suggests that gender may influence attentional capacity, which could indirectly affect academic outcomes.

Overall, the results suggest that attention span is a critical factor in determining academic performance. While academic achievement did not significantly differ between male and female students, attention span showed meaningful gender variation. These findings emphasize the importance of implementing educational strategies and interventions aimed at improving students' attention span, such as structured classroom activities, reduced distractions, and cognitive training programs. Future research may explore additional variables, such as motivation, learning strategies, and environmental factors, to gain a more comprehensive understanding of academic success determinants.

Conclusion

This study examined the relationship between attention span and academic performance among university students and explored whether gender differences exist in these variables. The findings demonstrated a strong positive relationship between attention span and academic performance, indicating that students who are able to maintain focus for longer periods tend to achieve better academic results. Regression analysis further confirmed that attention span is a strong predictor

of academic success, explaining a substantial proportion of variance in students' performance.

With regard to gender differences, the results showed no statistically significant difference in academic performance between male and female students, suggesting that both groups perform similarly in academic settings. However, a significant difference was observed in attention span, with male students reporting higher attention scores than female students in this sample. This finding suggests that gender may influence attentional capacity, which could indirectly affect learning processes.

Overall, the study highlights attention span as an important cognitive factor contributing to students' academic success. The results emphasize the need for educational strategies that enhance students' concentration and reduce distractions in learning environments. Future research should include larger samples, additional psychological variables, and longitudinal designs to better understand the mechanisms linking attention and academic achievement.

Implication and limitations

The findings of this study have important implications, as the strong positive relationship between attention span and academic performance indicates that improving students' attentional abilities may significantly enhance their academic success. Since attention span explained a large proportion of variance in academic performance, educational institutions should implement strategies such as structured classroom management, interactive teaching methods, and concentration-enhancing activities to foster better focus among students. Additionally, the significant gender difference in attention span suggests that targeted interventions may be beneficial in addressing attentional challenges. However, the study has several limitations, including a small sample size ($N = 50$), which limits generalizability, and a cross-sectional design that prevents causal conclusions. Furthermore, academic performance is influenced by multiple factors beyond attention span, such as motivation, intelligence, and environmental influences, which were not examined in this study. Therefore, future research

should use larger, more diverse samples and longitudinal designs while incorporating additional variables to provide a more comprehensive understanding of academic achievement.

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