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Research Article

Comparative Study on Attention Span among Undergraduate Students

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ABSTRACT

Students face challenges in maintaining attention span, potentially influenced by technology and multitasking habits demanded by the current school environment. Attention is the cognitive process that enables individuals to focus their senses on a specific stimulus, identify its characteristics, and extract meaningful information. This process is crucial in examining human behavior, as it impacts task performance, social interactions, and overall well-being. With the vast amount of information available on the internet, it has become increasingly challenging to navigate and generalize individual attention spans, especially in local contexts. Moreover, there are only a few studies regarding attention span among undergraduate students across year levels. This study employed a quantitative method, specifically a comparative design, to assess Filipino undergraduate students' capacity to sustain attention across different year levels at a private university in Pampanga, Philippines. The researchers employed a Kruskal-Wallis test to analyze data collected from 280 undergraduate students recruited through a quota-sampling technique. Findings revealed that there is no significant difference ($p = 0.14$) in the attention span of undergraduate students, leading to the conclusion that year level does not determine the attentional capacity of students. The findings emphasized the need for inclusive and adaptive teaching strategies that equally cater to all year levels. Furthermore, supporting students' cognitive health across all stages of higher education, regardless of year level, promotes sustained academic performance and mental well-being.

Keywords: *Attention control scale, Attention span, Undergraduate students, Comparative, Year levels*

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Introduction

Attention refers to the process by which individuals focus their senses on a stimulus to encode its features and gather relevant information. Exploring an individual's ability to maintain attention is crucial in studying human behavior, as it influences performance, interpersonal relationships, and overall well-being. Sensory organs produce abundant information to the brain by sending numerous signals, and the brain utilizes attention to exclude unnecessary stimuli (Ryzhkov, 2023). Attention is like a cover that helps students to be redirected in everyday life. In addition, attention span refers to an individual's ability to maintain concentration on a stimulus over a period. Maintaining it many times is necessary to accumulate crucial information and complete tasks in everyday life. In contrast, inattention is characterized by a lack of consciousness towards a task or a shift in concentration from one stimulus to another within a short period, which may suggest a psychological issue. The cause of the phenomenon is complex because there is a variety of perspectives and contexts that should be considered. Few attention difficulties can emerge across the lifespan, and their effects may vary at each stage of life. According to the American Psychological Association (APA), an inability to engage in adult conversations, activities, and responsibilities for 1 to 2 minutes is considered inattention in pre-school and kindergarten settings. With this, children may find attending group discussions complicated, and they will shift from one activity to another. In school-aged children, inattention can deteriorate their ability to initiate and complete school activities. Adolescents' disrupted attention can result in difficulties tracking homework, organization problems, note-taking struggles during discussions, and a lack of readiness for upcoming exams (American Psychological Association [APA], 2021). However, a study investigates attention span across adolescence and adulthood under different cognitive demands and a newly designed self-report checklist. It was concluded that adolescents' attention remains persistent and continuously develops regardless of the test's intensity (Hobbiss & Lavi, 2024).

A comparative study using Bourdon's dot cancellation test emphasizes that traditional adult readers exhibited significantly better attentional capacity than active internet users, suggesting that excessive screen use invites detrimental influence on attentional capabilities (Medvedskaya, 2022). A study by Small et al. (2020) further highlights that prolonged screen time and digital multitasking may lead to cognitive overload and emotional decline. Nonetheless, technology may also provide mental and social-emotional benefits for adolescents, as proposed by Haddock et al. (2022), who argued that the impact of digital engagement on attention is context-dependent and influenced by individual differences. Considering the allocated studies, attention may vary contextually, creating an array of viewpoints, making it necessary to gather information from different angles. Certain factors may reshape an individual's attention, making this an intricate concept to assess and distinguish. APA (2021) highlighted that attentional difficulties may arise throughout people's lifespan and have different thresholds per stage, from difficulties in social engagement to challenges in academic performance. Hobbiss and Lavi (2024) further proposed that during adolescence, individuals exhibit fluctuating attention capacities, and their sustained attention strives to progress even under increasing cognitive demands. Furthermore, technology has been a significant factor in altering an individual's sustained concentration.

Previously underexplored factors can arise and be navigated in students' attention span as they go through different stages in their college journey. Hence, this may allow students, teachers, and future researchers to discover and develop methods and strategies to maintain learners' attention span. Guided by this investigation, the study is grounded in Kahneman's Attention Theory, which pertains to how humans distribute their limited cognitive resources across several tasks. This attention is organized at a limited capacity. As a result, anyone may balance their mental resources between tasks, motivations, and loading in the best possible way (Wickens, 2021). Other factors affecting attention include arousal, com-

plexity, and prior knowledge. It is on this premise that some resources will be used unconsciously to determine the need for directing attention in all cognitive acts. This model helps explore the attention span of different year-group students, as this would further depend on some academic performance in cognitive resource distribution. According to Kahneman, a model exists under which an allocational policy is developed to adjust the distribution of attention among competing demands. The divided attention, then, is controlled by several important parameters, including the stage of arousal, which usually exerts control over the extent of attention capacity; enduring dispositions; automatic attention drawn by certain stimuli, and these could be naturally engaging stimuli; momentary intentions; shifts of attention based on a goal or instruction; and task demand evaluation, during which persons attempt to evaluate the actual attention consumption for a particular task. In this model, attention represents a pool of cognitive resources that are allocated for the performance of tasks; hence, the ability to maintain attention under cognitive load will be limited. Applying Kahneman's attention theory to this study suggests that students' year levels could influence their attention span, as variations in cognitive development and academic exposure may play a role. As students progress in their learning, they encounter increasingly complex information, multitasking, and the need to concentrate for more extended periods. As students develop more sophisticated cognitive skills, they also gain access to building more complex executive functioning and attention regulation.

On the other hand, students in lower year levels may still be building up to the academic context and perhaps more susceptible to distractions and cognitive overload. With limited experience in challenging academic tasks, students may struggle to attend due to either sustained or insufficient demand. It is important to examine how students' ability to sustain attention may vary across year levels since students might be adapting cognitively as they progress through their academic journey. Moreover, this study examined the potential impact of academic progression on attentional capacity, specifically whether higher-year students developed more effective cognitive strategies to enhance their task focus. It is important to understand these differences so that any school intervention taking students' attentional needs into account can meet them along with their educational development. The results of the study offer valuable insights for educational and psychological practitioners aiming to improve the learning environment, especially in managing attention-related challenges that arise across different phases of cognitive growth and academic advancement.

Despite that, most studies about attention span mainly focus on technology, making other factors unseen. There are few to no studies about the attention span of Filipinos over time. The Philippine educational system primarily emphasizes the negative impact of technology on students' cognitive performance; however, most private and public schools in the local context rely heavily on technology. Moreover, Filipino students will be left out of the global development if technology is separated from the curriculum, considering that students use it as a tool for online learning, research, communication, and various academic tasks. With all these obstacles, studying attention and its absence creates an array of perspectives about its preservation, making it a complex behavior to be studied. Given the abundance of information on attention span from various concepts and settings, identifying students' attention span is a challenging task due to the multitude of factors that can influence it. Monitoring changes in attention span is vital, especially for supporting students in their academic journey and well-being.

A difference in academic experience and school load may influence attention span among undergraduate students. Working memory load affects attention control, with increased load leading to longer reaction times in task-switching (Amin & Mohamad, 2021). Differences in curriculum demands, study habits, and cognitive development across year levels can shed light on the interventions that aim to maintain attention span among undergraduate students. First-year students tend to have different expectations and experiences compared

to those in later years (Limniou et al., 2019). Innovative approaches can enhance attention. A brain-computer interface system measuring P300 signals showed improved relaxation and attention span in students during cognitive tasks (Sooda et al., 2024).

This study investigated the attention span of Filipino undergraduate students by year levels at a private university in Pampanga, Philippines. This study addressed two main research questions: the level of attention span among undergraduate students across different year levels, and whether significant differences exist between these groups. To guide the investigation, the researcher formulated the null hypothesis that no significant difference in attention span exists among students when grouped according to their year level. The findings serve as a guide for students, instructors, and scholars in identifying and developing effective methods to sustain and enhance learners' attention span as they navigate various transitions in college life.

Methodology

Research Design

This study utilized a comparative research design to evaluate the attention span of undergraduate students across different academic year levels. A comparative approach is appropriate for identifying whether significant differences exist in attention span among students at various stages of their academic journey (Swargiary, 2023). Unlike experimental designs, this method does not involve manipulation of variables or treatment interventions; instead, it focuses on analyzing naturally occurring differences between groups. This study included four distinct academic year-level groups: first-year, second-year, third-year, and fourth-year students who were compared based on their attention span. All participants completed the same set of standardized cognitive tasks specifically designed to measure attention span, ensuring consistency and minimizing external bias.

Research Locale

The research was carried out in a private university in Pampanga, Philippines, selected for its adequate undergraduate population and organized academic setting. The students within this location are constantly involved in study activities and learning habits, making it an appropriate site for measuring differences in attention span. The computer literacy of the students also made them ideal for conducting online surveys. This method enabled flexible participation while maintaining the integrity and reliability of the answers.

Population and Sampling

The data was collected from undergraduate students in a private university in Pampanga, Philippines. With the utilization of G*Power 3.1.9.7, the researchers identified that the sample size would be equivalent to 280 participants and may exceed the number. G*Power is an instrument to calculate and determine the statistical power of an assumed number of respondents. The instrument has been applied to numerous statistical techniques and has become remarkable because of its simplicity and time-saving capability. The instrument provided an effect size of 0.25, a statistical power of 0.95, and a significance level of 0.05. In this research, there is 95% confidence that the actual value lies within a +5 margin of error of the population. Moreover, the quota sampling technique was used to collect the sample, in which the researchers divided the population of undergraduate students into four strata and determined 70 sample size per stratum. The use of quota sampling in this study ensures that specific subgroups are adequately represented, enhancing the relevance and comparability of the findings, even within a non-probability sampling framework.

Research Ethics

In this study, ethical principles outlined in the APA code of ethics are followed to maintain the participants' rights, well-being, and confidentiality. Before any data gathering, the subjects are requested to provide informed consent specifying the purpose and procedures of the study and their potential risks and benefits before they participate voluntarily (Shah et al., 2024). Confidentiality and anonymity are ensured by providing each participant with a unique code, thereby avoiding any identification by name in the dissemination of findings;

this prevents any unauthorized access to personal information in the handling or publication of data. Participants are free to withdraw from the study at any time without negative consequences, thus respecting their autonomy. In addition, the study protected the respondents from psychological harm, ensuring that the study procedure did not cause undue stress or discomfort. Furthermore, the study complies with the principles of beneficence and non-maleficence, ensuring that findings contribute to knowledge on attention span among undergraduate students at no risk to participants. Finally, since the study is intended for publication in a peer-reviewed journal, the researchers will communicate a summary of the results to the participants upon completion of the study. All data collected was safely stored and applied exclusively for research purposes in compliance with data privacy legislation.

Research Instrument

The researchers gathered data using a demographic survey and the attention span test. The demographic survey solely gauges information about the students' year level. The Attentional Control Scale (ACS), which is the adopted attention span test, was the primary tool used to evaluate the students' ability to maintain and shift attention when required. The Attention Control Scale (ACS) was designed by Douglas Derryberry and Marjorie Reed in 2002. The self-report measure of attentional control consists of two subscales: attentional focusing, which evaluates the capacity to maintain attention and block out distractions; and attentional shifting, which evaluates the ability to redirect focus from one task to another. It is scored through a 4-point Likert scale: 1 means "almost never", 2 means "sometimes", 3 means "often", and 4 means "always". The subscales and item loadings are described as follows: The Attentional Focusing (ATTC_FOC) consists of the items from 1 to 9. The Attentional Shifting (ATTC_SHIF) consists of items 10 to 20. The total of the corresponding items (ATTC_TOT) is used to compute the scale score. The numbers 1, 2, 3, 6, 7, 8, 11, 12, 15, 16, and 20 are reverse-scored. This is to ensure accuracy and control response bias. The scale suggests that higher scores indicate a better, more effective, and efficient attention control system during tasks. According to the original developers of ACS, it demonstrated a reliable internal consistency, with a Cronbach's alpha of 0.88. The test-retest reliability of focusing and shifting was 0.80 and 0.76, respectively. There are no formal age limits in the original scale. Given that ACS was explicitly used for undergraduate students, it was used in this study without modification.

Data Gathering Procedure

The study utilized both a pen-and-paper and an online survey form that contained questions about demographics and the Attentional Control Scale (ACS). The researchers then distributed the survey to representatives of each year's level via a social media application and throughout the campus, accompanied by a consent slip outlining the study's ethical considerations. As of the last week of March 2025, the researchers started gathering data for 280 respondents. The students were given a link to answer the 24-item questionnaire online for accessibility and flexible participation. However, only 40 responded in the 1st year, 63 in the 2nd year, 67 in the 3rd year, and 57 in the 4th year. This made the researchers gather data room-to-room for the remaining 53 students in the respective year levels.

Data Analysis

The data collected were processed using descriptive and inferential statistics through Jamovi software. Data cleaning and coding were done before analysis to ensure consistency and accuracy. Means and standard deviations were obtained to describe attention span scores of undergraduate students by year level. Before conducting inferential analysis, the researchers tested the assumptions of parametric statistics. The Shapiro-Wilk test revealed that the data had a normality violation ($p = 0.03$). However, Levene's Test revealed no violation of the homogeneity of variances ($p = 0.13$). The researchers therefore utilized the non-parametric Kruskal-Wallis test and Dwass-Steel-Critchlow-Fligner (DSCF) pairwise comparison to identify significant differences between groups.

Results and Discussion

Levels of Attention Span among Undergraduate Students

Table 1 presents the analyzed data of the difference in attention span among undergraduate students at a private university in Pampanga, Philippines. The 4th year students had the highest average attention span (*M* = 2.56, *SD* = 0.41), followed by the 1st year students (M = 2.50, SD = 0.424) and 3rd year students (M = 2.43, SD = 0.326). The 2nd-year students possess the lowest average attention span (M = 2.41, SD = 0.34). Nonetheless, a small amount of disparity does not guarantee the significance of the results.

Table 1. Group Descriptive (One-Way ANOVA)

Year Level	N	Mean	SD
1st year	70	2.50	0.43
2nd year	70	2.41	0.33
3rd year	70	2.43	0.33
4th year	70	2.56	0.41

As the researchers explore, there are few contemporary studies published comparing the attention span of undergraduates; most of the studies generalize college students, rather than assessing their attention span by their year level. Furthermore, certain factors could influence attention. Ober et al. (2024) propose that attention span can be influenced by lifestyle and socioeconomic conditions. The research highlights that parental management and technology control promote cognitive development and better functioning at home. The study also emphasizes that higher socio-economic status and enrollment in academically oriented schools are associated with superior attentional performance (Ober et al., 2024).

Kruskal-Wallis Test on Undergraduates' Attention Span

Due to a violation of normality (p = 0.03), the Kruskal-Wallis test was utilized to compare the undergraduate students. The test revealed no significant differences among groups, $\chi^2(3) = 5.51$, $p = 0.138$, collateral information supporting the result provided by descriptive statistics. The data indicate that year level is not statistically significant in comparing the attention span of students, as the p-value (p = 0.14) exceeds the probability threshold of 0.05. This finding supports the findings of Sasi and Hsu (2020), who concluded that there is no significant difference in study habits, including time management and information processing, among students from different undergraduate years. Similarly, a study on impulsiveness found no significant differences across academic years for attentional impulsiveness and other subscales (Abdel Hadi et al., 2023). As year level is recognized as a manipulating variable, the production of short-term videos through social media platforms in the modern era strongly predicts numerous attention gaps, detrimentally affecting individuals' concentration (Haliti-Sylaj & Sadiku, 2024).

Table 2. Kruskal-Wallis Test of Attention Span among Undergraduate Students

	X^2	df	p	Remarks
Attention Span	5.51	3	0.138	Not Significant

Mean Differences Across Year Levels using DSCF-Pairwise Comparison

This table shows that the value of W represents the differences between the year levels compared. A larger W value indicates that there is a substantial difference in the year levels. No differences were observed between the comparisons of the 1st year and the 2nd year undergraduate students. However, slight differences are observed between the comparisons of the 1st year vs the 4th year and the 2nd year vs the 3rd year students. Nevertheless, the

pairwise comparisons between year levels revealed no significant differences as the probability values exceeded 0.05. This corroborates several studies on factors affecting student attention span in classrooms, which revealed a complex interplay of internal and external variables. Classroom design elements significantly impact attention, with lighting having the most decisive influence, followed by color and geometry (Fajardo et al., 2023). Moreover, visual noise, color variability, and display quantity in classrooms were found to affect on-task behavior (Godwin et al., 2022). Furthermore, gender differences play a role in attention regulation and digital distraction, with males exhibiting higher perceived attention problems and females demonstrating more versatile self-regulatory strategies (Wu & Cheng, 2019). These findings underscore the importance of considering multiple factors in understanding attention span, intending to enhance strategies that optimize students' learning outcomes.

Table 3. Differences Across Year Levels via DSCF

Comparison	W	p	Remarks
1st Year vs. 2nd Year	-228	0.37	Not Significant
1st Year vs. 3rd Year	-1.50	0.71	Not Significant
1st Year vs. 4th Year	0.75	0.95	Not Significant
2nd Year vs. 3rd Year	0.62	0.97	Not Significant
2nd Year vs. 4th Year	2.83	0.19	Not Significant
3rd Year vs. 4th Year	2.36	0.34	Not Significant

Conclusion

This study examined whether there are significant differences in the attention spans of undergraduate students across various year levels. It tested the null hypothesis that no significant difference exists in attention span based on academic year, with the assumption that higher year levels might exhibit longer attention spans due to increased academic exposure and cognitive development. The researchers concluded that there are no significant differences in attention span among undergraduate students based on their year level. Fourth-year level students had the highest mean attention span; however, that difference was not significant, and as such, the null hypothesis was retained. While year level was commonly anticipated either to correspond with improved attention control due to increased academic demands or more cognitive maturity, this study concluded no significant difference in attention span among undergraduate students. Furthermore, pairwise comparisons of attention span did not reveal any meaningful differences among the year levels separately. The results suggest that other factors, such as individual learning styles, mental health, classroom environment, teaching strategies, or external distractions, may influence attention span. These findings informed teachers and schools to take a wider variety of cognitive and environmental factors into account in planning interventions that foster the attentional abilities of students, as opposed to focusing on their academic performance or progression. The researchers recommend examining other factors, such as individual habits, environmental influences, and technology use, which could provide further insight and understanding of the factors affecting attention and attention span. This study suggests that attention span challenges are not solely linked to academic year level but are likely influenced by a complex interplay of both internal and external factors. By identifying attention span, which contributes to students' cognitive wellness, this research supports United Nations' Sustainable Development Goal (SDG) 3: Good Health and Well-being by encouraging schools to address student well-being as a critical component of academic success. Additionally, the study contributes to SDG 4: Quality Education by promoting inclusive and responsive educational strategies that recognize learners' needs and profiles.

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