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Effects of age and gender on time management and academic performance of students in senior high schools

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Abstract

Timely completion of academic programs is considered essential for students' educational success, yet limited studies have explored how demographic factors influence the connection between time management and academic performance. This study examined the moderating effects of age and gender on the relationship between time management and academic performance among Senior High School students. A total of 292 participants were selected through proportionate and random sampling techniques and completed standardized instruments measuring time management, while academic performance was assessed using test results. The analysis revealed that age and gender did not significantly influence or moderate the relationship between time management and academic performance. These findings suggest that the link between managing time effectively and achieving strong academic outcomes remains consistent across demographic groups. The study highlights the importance of integrating structured time management programs into educational curricula to enhance students' organizational, prioritization, and scheduling skills, ultimately promoting academic success and self-regulated learning.

Keywords: Academic performance; age differences; gender differences; secondary education; time management.

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1. INTRODUCTION

Around the world, completing education is regarded as an important objective for learners (Subramanian, 2016). Time is a precious non-renewable resource. It is therefore most acceptable to finish the work on schedule. The amount of work is growing daily. For this reason, effective time management is crucial to finishing all assignments. The purpose of time management is to intentionally and effectively manage the amount of time used on a task, to maximize skill, production, and efficiency (Waks & Frank, 1999; Sevari & Kandy, 2011). Family, work, social life, hobbies, and other time-sensitive duties are all incorporated into time management. A person may finish all types of work on time if they know how to manage their time well (Swart et al., 2010). People in today's world have many duties that they need to do; therefore, they must manage their time well. For students to succeed academically, effective time management is essential (Balduf, 2009; Uzunboylu et al., 2022; Uzunboylu & Gönül, 2020). Contrarily, Lertputtarak (2008) emphasized that to attain research productivity, time management must be recognized as a critical element of academic performance at the school level. Eliminating pointless activities will be possible with effective time management. Time management skills dictate the likelihood of success. However, different people have different time management philosophies (Claessens et al., 2007; Alay & Kocak, 2003).

Learning time management skills is crucial for students as they move through the educational system, from elementary school to college and beyond. Studies have indicated a strong link between students' academic performance and proficient time management and well-being (Wolters & Brady, 2021). Students can decrease stress, increase focus, and improve learning results by effectively arranging their time for academic obligations, extracurricular activities, and personal responsibilities (Agormedah et al., 2021). Effective time management is a talent that can be developed and improved with practice and self-awareness; while it is not innate, the ability to manage one's time well is pivotal for academic success and progress (Claessens et al., 2007). This suggests that a particular task sets priority for tasks that need to be completed to satisfy demands and preferences. Currently, despite students' talents, it is frequently observed that their academic performance is hindered by a deficiency of appropriate time management knowledge. Therefore, effective time management is necessary to finish all assignments while juggling daily responsibilities (Yilmaz et al., 2010). Effective time management is crucial for students enrolled in secondary education programs. Therefore, the researchers set out to look into how time management affects secondary school students' academic performance.

According to Agrawal (2008), gender describes the socially constructed distinctions between males and females. Prioritizing and managing one's time have historically been impacted by gender norms and societal expectations. Male and female students may experience these expectations in different ways, which may affect how they manage their time and are productive. For instance, research indicates that female students frequently experience increased pressure to juggle their academic goals with caregiving duties and household activities, which may make it difficult for them to manage their time well (Bolzendahl & Myers, 2004). Moreover, prejudices and stereotypes based on gender might affect how well people view a person's ability to manage their time; men are frequently seen as being more forceful and efficient with their time than women (Eagly & Karau, 2002). These misconceptions might put female students up against more obstacles, which would lower their self-efficacy and confidence in their ability to manage their time well. However, a study by Rueger et al. (2008) indicated that gender might have a big impact on how students view and use their time. The ability to manage one's time well is commonly acknowledged as being essential to high school students' academic performance. Nonetheless, there is ongoing discussion and study on the connection between gender and time management in academic settings.

While Jones & King (2015) pointed out that there are no gender variations in time management habits, other studies have shown contradictory results. According to Smith and Johnson (2020), a non-significant main effect of gender on time management among university learners was revealed. This finding suggests that there are no significant deviations in time management behaviors between female and male students. Contrary to expectations, gender was not found to be an evidential predictor of time management skills (Smith et al., 2018). Similarly, in a thorough investigation of students' time management activities, Jones and King (2015) recovered no appreciable variations in the time management activities of male and female participants.

Their analysis found comparable levels of adherence to time management strategies, including goal setting, task prioritization, and study time allocation. These results show that gender may not be a significant predictor of time management behaviors among SHS students. However, a study conducted by Smith et al. (2018) presented conflicting findings, suggesting potential gender disparities in time management practices. Through surveys and interviews with SHS students, the researchers observed that female participants reported feeling greater time pressure and encountering more difficulty in balancing academic and personal responsibilities compared to their male counterparts. These findings suggest that gender-related factors may affect students' perceptions and management of time, potentially leading to differences in time management effectiveness.

The conflicting findings concerning the link between time management and gender underscore the complexity of this issue and emphasize the need for further research to elucidate underlying factors. While some studies propose that gender may not exert a significant influence on shaping time management behaviors among secondary school students, others indicate the presence of potential disparities that require closer examination. Possible explanations for these discrepancies include societal norms and expectations regarding gender roles, variations in time management styles and preferences, and differences in individual experiences and circumstances. Additionally, contextual factors such as academic major, socioeconomic status, and cultural background may interact with gender to influence time management practices among SHS students.

Understanding how individuals from different age groups approach time management can offer valuable insights into effective strategies and challenges faced by students at various stages of development. Research in developmental psychology suggests that time management skills undergo significant changes throughout childhood and adolescence (Eccles & Roeser, 2011). Younger children may rely on parental guidance and external structures to manage their schedules effectively, while adolescents begin to develop autonomous strategies influenced by factors such as peer relationships, extracurricular activities, and academic pressures (Sawyer et al., 2018). As students transition into young adulthood, they encounter new challenges that shape their time management practices. The transition to higher education often requires greater independence and self-regulation as students navigate a more complex academic environment with competing demands (Vieira et al., 2019). Balancing coursework, social activities, and personal responsibilities can pose significant challenges, highlighting the importance of effective time management skills (D'Agostino et al., 2020).

Time management is crucial for academic success, yet the approaches and priorities of individuals from different age groups remain a subject of ongoing research (Fang et al., 2024). While some studies suggest that older students tend to excel at managing their time effectively (Kim & Chun, 2020), others present conflicting findings, indicating potential disparities across age cohorts. Kim and Chun (2020) investigated the time management habits of students across different age groups and found that older students demonstrated higher levels of time management skills compared to their younger counterparts. The work revealed that older students were more likely to engage in proactive planning, goal setting, and task prioritization, resulting in better academic performance and reduced stress levels. These findings suggest that age may significantly influence time management behaviors among students. In contrast, a study by Lee et al. (2021) presented contradictory findings, suggesting that age alone may not reliably predict time management proficiency among students. As indicated by Lee et al. (2021), through surveys and interviews, the researchers observed considerable variability in time management practices within each age group, with some younger students exhibiting exemplary skills while some older students struggled to allocate their time effectively. These findings challenge the notion that age inherently equates to superior time management abilities and underscore the importance of considering individual differences and contextual factors. The relationship between age and time management among students is multifaceted and subject to considerable variability. While some studies suggest that older students may exhibit superior time management skills, others present contradictory findings, indicating that age alone may not reliably predict proficiency. Further research is needed to explore the underlying factors contributing to age disparities in time management and to inform the evolution of targeted interventions to support all students in managing their time effectively.

Scholarly discourse often delves into the multifaceted nature of academic performance, encompassing various metrics such as grades, standardized test scores, and overall scholastic performance (Almagro, 2023). Within this domain, gender disparities have garnered considerable attention from researchers, policymakers, and practitioners alike, with recognition of socially defined distinctions between male and female individuals and their consequential impacts (Rankin-Wright et al., 2020). While academic success is influenced by an array of factors, including socioeconomic status, parental involvement, and institutional resources, gender's role in shaping educational outcomes remains a focal point of educational inquiry (Else-Quest et al., 2010). Across different academic levels and regions worldwide, studies consistently reveal gender disparities in academic performance, albeit with variations in the extent and manifestation of these differences across different subject areas and grade levels (Voyer & Voyer, 2014; Bradley et al., 2025). While some research suggests that biological and cognitive dissimilarities may contribute to these gender gaps in specific disciplines, others emphasize the impact of social and cultural factors such as gender stereotypes, teacher expectations, and peer dynamics. Moreover, the way that gender intersects with other identity markers, including ethnicity, race, and socioeconomic status, adds further complexity to our understanding of gender-related variations in academic performance (Lee et al., 2018). A plethora of studies have examined gender differences in academic performance, yielding varied findings. For instance, research by Orabi (2007), Dayioglu & Türüt-Aşik (2007), and Khwaileh and Zaza (2011) emphasizes the propensity of female students to achieve higher academic performance compared to their male peers. Conversely, studies such as Vincent-Lancrin (2008) and Fortin et al. (2015) suggest that males may exhibit greater academic performance in certain contexts. Conversely, Goni et al. (2015) found evidence of male students achieving higher academic success. Notably, Reilly et al. (2019) reported no significant gender differences in performance among students in the United States.

Academic performance encompasses a myriad of factors, including cognitive development, learning preferences, emotional well-being, and external influences (Kizilcec et al., 2017). Of these factors, age emerges as a prominent determinant, as students encounter distinct challenges and opportunities at various developmental stages that can shape their educational outcomes. During early childhood and elementary school years, foundational learning and skill development lay the groundwork for academic success (Parker & Thomsen, 2019). Research indicates that factors such as early literacy and numeracy skills, socio-economic background, parental involvement, and readiness for school significantly influence academic performance during this critical period (Duncan et al., 2007). Moreover, differences in cognitive development, attention span, and executive functioning due to age may affect students' ability to engage in learning activities and acquire essential academic skills (Eccles et al., 2004).

As students transition into middle school and adolescence, they grapple with significant physical, cognitive, and socio-emotional changes. Puberty onset, increased peer interactions, and academic demands present challenges for academic performance (Eccles et al., 2004). Studies suggest that factors such as academic motivation, self-efficacy beliefs, and peer relationships play pivotal roles in shaping academic outcomes during this phase. Additionally, age-related variances in time management, study habits, and goal setting can influence academic success as students prepare for the transition to higher education (Bene et al., 2021). In high school and university, academic performance assumes greater importance as students embark on the culmination of their educational journey. Recent research underscores the significance of non-cognitive factors such as perseverance, resilience, and growth mindset in predicting academic success among high school students (Duckworth et al., 2007). Furthermore, differences in academic engagement, motivation, and study strategies due to age may affect students' ability to meet the challenges of higher education and achieve their academic aspirations (Kizilcec et al., 2017).

According to Tuckman and Harper (2012), the intricate topic of age and performance in school has received a great deal of attention in the realm of educational studies. Contrary to popular belief, which holds that experience and maturity may help older students succeed, empirical research yields different results. While some studies display no discernible link between age and performance, others show that older students do better than younger ones (Smith et al., 2019; Johnson & Brown, 2021).

1.1. Theoretical framework

The study adopted the Time Management Matrix theory, also known as the Eisenhower Matrix, which was made widely known by Stephen Covey in his renowned book "The 7 Habits of Highly Effective People," first publicized in 1989 (Covey, 2020). While Covey (2020) did not create the concept, he played a significant role in bringing it to widespread attention and providing practical guidance on its implementation. The matrix sorts tasks into four groups according to how important and urgent they are.

1. Important and Urgent: Activities in this group are both urgent and essential for achieving one's goals or objectives. They require prompt attention and should be prioritized appropriately.

2. Not Urgent but Important: Activities in this quadrant are crucial for long-run success and contribute to achieving one's goals. Even though they don't need to be done right away, these tasks should be planned and handled early to stop them from becoming urgent later.

3. Urgent but Not Important: Activities in this quadrant are usually distractions or interruptions that need immediate attention but don't help much with long-term goals or priorities. It's best to minimize or delegate them whenever possible.

4. Not Urgent and Not Important: Projects in this group are neither urgent nor important and often serve as time-wasters that provide little value. They should be avoided or minimized to focus on more meaningful endeavors.

The Time Management Matrix provides a framework for individuals to prioritize their responsibilities and allocate their time and resources efficiently. By centering on activities that are important and align with long-term goals while minimizing time spent on distractions and low-value tasks, individuals can enhance their productivity, efficiency, and overall effectiveness.

Here's how each quadrant of the matrix relates to this study:

1. Urgent and Important (Quadrant 1): Tasks in this group, such as studying for an upcoming exam or completing an assignment with a looming deadline, are crucial for academic success. Students who prioritize tasks in this quadrant efficiently are more likely to meet academic requirements and achieve good grades. Neglecting tasks in this quadrant can lead to stress, last-minute cramming, and subpar performance.

2. Important but Not Urgent (Quadrant 2): Tasks in this area include long-term academic goals, such as developing study plans, conducting research, and working on projects. While these tasks may not have immediate deadlines, they are very important in academic success. Students who invest time and effort in Quadrant 2 activities tend to perform better academically by staying ahead of deadlines, managing workload effectively, and maintaining a balanced approach to their studies.

3. Urgent but Not Important (Quadrant 3): Tasks in this group, such as attending to non-academic emergencies or responding to unimportant emails, may seem pressing but do not directly contribute to academic performance. Students who spend excessive time on Quadrant 3 activities risk sacrificing valuable study time and may experience a decline in academic performance due to distractions and time mismanagement.

4. Not Urgent and Not Important (Quadrant 4): Tasks in this group, such as excessive social media use or engaging in unproductive activities, are neither urgent nor important for academic success. Students who prioritize Quadrant 4 activities over academic responsibilities may experience a decline in performance due to procrastination, lack of focus, and time wasted on non-essential tasks.

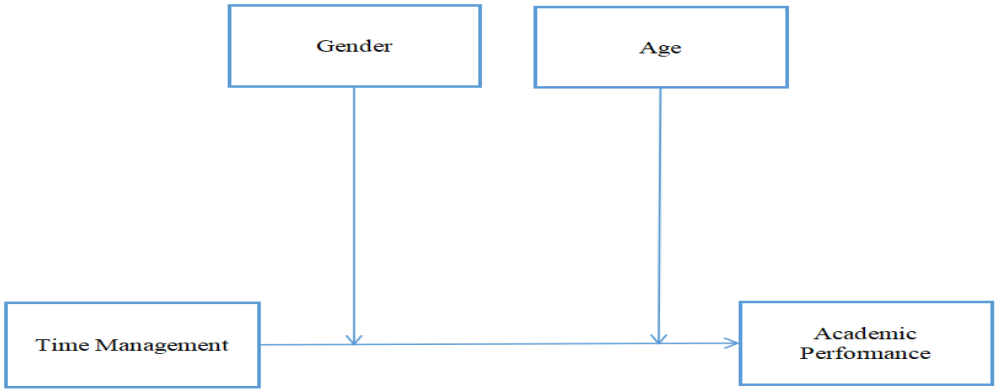
Overall, the Time Management Matrix theory encourages students to rank work by how important and urgent they are, thereby enabling them to use their time and resources wisely to achieve academic success. By focusing on Quadrant 1 and Quadrant 2 activities while minimizing Quadrant 3 and Quadrant 4 distractions, students can optimize their academic performance and reach their full potential.

1.2. Conceptual framework

The main factors and their relationships are investigated and clarified by the study framework. This paradigm tries to make clear how age and gender affect students' time management and academic performance. This study framework may direct further investigations and function as a useful tool for comprehensive intervention programs intended to improve students' academic performance. Research indicates that effective time management is favorably related to performance (Jones & Smith, 2022). Nevertheless, earlier studies mostly ignored the possible impact of variables like gender and age in favor of explicitly examining the relationships between time management and academic performance. A conceptual model was created for the study based on the previously mentioned literature (see Figure 1).

Figure 1

Conceptual framework showing the moderating role of gender and age on time management and academic performance



To understand the underlying mechanisms and contextual factors influencing the association between age groups and performance, further investigation is necessary. This study, therefore, assesses the interaction effect of age and gender on time management and academic performance of SHS students.

1.3. Purpose of the Study

The purpose of this study was to investigate the moderating effects of age and gender on the relationship between time management and academic performance among Senior High School students. Specifically, it aimed to determine whether demographic factors influence how effectively students' time management skills contribute to their academic success. The objectives of the study are to:

1. Examine gender and age on the time management of SHS students.

2. Examine gender and age on the academic performance of SHS students.

3. Determine the moderating role of gender and age on time management and academic performance of SHS students.

The research hypotheses are as follows:

1. H0: Gender and age will not affect the time management of SHS students.
2. H0: Gender and age will not affect the academic performance of SHS students.
3. H0: Gender and age will not moderate the linkage between time management and academic performance of SHS students.

2. MATERIALS AND METHODS

2.1. Research design

This work utilized a quantitative investigative approach employing a cross-sectional design to examine the interaction effect of gender and age on both time management and academic performance among students.

This methodological choice was considered appropriate due to its capacity to yield valuable insights and understanding of the examined topics through statistical analysis, drawing on data gathered directly from students (Suter, 2012). Furthermore, the quantitative approach and cross-sectional survey design are pivotal in research endeavors, offering distinct advantages for data collection and analysis. The quantitative approach helps researchers to gather numerical data that can be analyzed with statistics, thereby furnishing objective and quantifiable insights into the phenomena under scrutiny (Bryman, 2016). This approach facilitates hypothesis testing, pattern identification, and generalization based on a representative sample of the population, thereby enhancing the reliability and validity of research findings (Creswell, 2014).

Similarly, the cross-sectional survey design is instrumental in capturing data at a specific period in time, enabling researchers to explore connections between variables and draw conclusions regarding population characteristics or phenomena (Fowler Jr, 2014). This design allows for data collection from a diverse sample of participants, providing a snapshot of attitudes, behaviors, or experiences at a particular point (Creswell, 2014). Additionally, the cross-sectional survey design proves to be cost-effective and efficient, particularly for studying large populations and identifying trends or patterns within a condensed timeframe (Fowler Jr, 2014). Employing a survey approach was deemed advantageous and appropriate as it facilitated the recruitment of numerous participants through proportional representation and the utilization of random numbers generated via a simple random sampling technique.

2.2. Participants

The examination targeted the entire population of public SHS students in the Okere District, which currently comprises three accredited institutions, namely Nifa Senior High School, Presbyterian Senior High Technical School, and J Gknol Senior High School. These three public SHS were purposively selected as they represent the complete set of public SHS within the Okere District. Utilizing the sample size determination table formed by Krejcie and Morgan (1970), a sample of 313 students was chosen from a population of 1712 to ensure a representative sample. Two students in the school were used for the study. The choice of two SHS students for the study was based on their prolonged residence on campus, which likely provided them with diverse insights and experiences related to academic performance. The study participants comprised 189 male students (64.7%) and 103 female students (35.3%), with ages categorized into four groups: 13-15 (n = 9; 3.1%), 16–18 (n = 235; 80.5%), 19-21 (n=47; 16.1%), and 22 and above (n = 1; .3%).

To select the sample from the population of SHS students in the three selected schools in the Okere District, the Krejcie and Morgan (1970) sample size determination table was employed. Based on Krejcie and Morgan's (1970) sample size calculations, a sample of 313 students was chosen from a population of 1712. Hence, the sample size that was used in the study was 313 SHS students. A multi-technique was used, which is as follows;

Firstly, a purposive sampling procedure was used to select the three SHS for the study. Purposive sampling was chosen because it allows the researcher to intentionally select participants or groups that are most relevant to achieving the study's objectives. There are three (3) mixed SHS in the Okere District, which were the researchers' focus. Purposively, the researcher selected all the SHS that were within the district.

Secondly, the proportional sampling procedure was used to obtain the total number of students from each of the three SHS (see Table 2). The proportional sampling procedure was used because the researcher wanted to ensure a fair representation of the various schools in terms of their class size. Also, in order to ensure a representation of the various gender groupings, it was imperative to use a proportional sampling procedure. For example, proportionate sampling was employed at Nifa Senior High School to determine the number of respondents required at SHS Two. For SHS two students of Nifa Senior High School, the proportion was given by the total number of SHS two students in Nifa Senior High School (945) divided by the total number of SHS two students in the population (1,712) multiplied by the sample (313). Using the formula, a sample of one hundred and seventy-three (173) out of 945 students was selected for the Nifa Senior High School. This consisted of one hundred and eighteen (118) males and fifty-four (54) females. The sample distribution is illustrated in Table 1.

Finally, the students were selected using the table of random numbers of the simple random sampling with the list of each grade level as the sampling frame. To select one hundred and seventy-three (173) from 945 students in Nifa Senior High School, the table of random numbers was used. The list that contained the names of all the SHS two students was taken from the three SHS. The table was entered randomly, and the numbers were labeled from 1 to 945 (where 945 is the total population of SHS two students in Nifa Senior High School). Moving in a vertical direction on the table of random numbers, the numbers that fell within the range were selected one after the other until all 173 students were accounted for in Nifa Senior High School. The same approach was used in selecting the rest of the respondents.

Table 1

Distribution of samples based on senior high school students

SHS	Population			Sample		
	Male	Female	Total	Male	Female	Total
Nifa SHS	647	298	945	118	54	173
Presbyterian SHTS	327	235	562	60	43	103
J Gknol SHS	138	68	205	25	12	37
Total	1112	601	1712	203	109	313

Source: Field Data, 2023

2.3. Measurement of variables

2.3.1. Time management

The participants' time management was assessed using 18 items devised by Britton and Tesser (1991). The survey tool rates time management on a 5-point Likert-type scale in the range of 5 "never" to 1 "always". Some are: “Do you make a list of the things you have to do each day?”, “Do you often find yourself doing things which interfere with your schoolwork simply because you hate to say "No" to people?”, Others were “When you have several things to do, do you think it is best to do a little bit of work on each one?”, In addition, “On an average class day do you spend more time with personal grooming than doing schoolwork?”. The time management questionnaire was made up of 3 subscales: Short-Range Planning, Time Attitudes, and Long-Range Planning. Cronbach’s alpha procedures showed a reliability estimate of .89.

2.3.2. Academic performance

Students' academic performance was measured using their test scores in core areas (Mathematics, English, and Science). The questions were developed by the researchers for the students to answer. The results were used to measure their performance.

2.4. Ethical consideration

Before commencing data collection, approval was obtained from the Head Masters of the designated schools to enable the involvement of their students in the study. This authorization was granted after receiving ethical permission from the Institutional Review Board. Before administering the questionnaires, participants were briefed on the study's objectives and procedures at their respective schools. These briefing sessions, conducted both individually and in groups, covered topics such as confidentiality, the importance of respecting participants' rights, and the alternative to retreat from the study without facing any consequences. Participants were given detailed information regarding the study's objectives and potential emotional risks and were asked to give informed consent by signing consent forms before completing the questionnaires. Three hundred and fifty questionnaires were distributed, with participants instructed to respond accurately and honestly, without any external influence. The administration of the questionnaires lasted for 12 weeks, during which participants were instructed not to include their names to ensure anonymity. Out of the 313 questionnaires distributed, 292 were returned. The remaining 292 valid questionnaires were utilized for subsequent analysis.

2.5. Data analysis strategy

The initial phase of data analysis involved conducting descriptive statistics on the variables, encompassing participant demographic information. Subsequently, a factorial ANOVA was employed to assess the interaction effect of age and gender on time management and gender and age on academic performance. Furthermore, a moderation analysis was carried out to explore the interactive effects of age and gender on time management and academic performance. Specifically, moderation analysis was done using Model 1 of Hayes' PROCESS structure and the bootstrapping method, with 5000 bootstrap samples utilized for robustness. These analytical procedures were conducted using SPSS software (International Business Machines (IBM) Corporation, version 25, NY, New York, USA), supplemented by the PROCESS add-on package.

3. RESULTS

3.1. Preliminary analysis

To satisfy the test model for the SEM strategy used, an already time management questionnaire was verified. A pilot test was done to thus 150 students were used in piloting the instrument. The validity of the construct, inter-dimensional correlation, and the fit of the model were investigated. Tables 2 and 3 and Figures 2 and 3 present the results.

Table 2

Item loadings, Average Variance Extraction (AVE), and Composite Reliability (CR)

Dimensions	Items	Loadings	AVE	CR
Short Range	SR1	.460	.37	.71
	SR2	.653		
	SR3	.502		
	SR4	.640		
	SR5	.511		
	SR6	.424		
	SR7	.336		
Time Attitude	TA8	.125*	.09	.64
	TA9	.460		
	TA10	.303		
	TA11	.309		
	TA12	.385		
	TA13	.051*		
Long Range	LR14	.412	.11	.61
	LR15	.467		
	LR16	.398		
	LR17	.183*		
	LR18	.318		

In Table 2, items TA8, TA13, and LR17 had a factor loading of less than .30 (Pallent, 2010); hence, they were deleted before the main data collection. All of the AVEs for the various dimensions were less than .50 (Fornell & Larcker, 1981). However, the CR was above .50. This indicated that the dimensions were more reliable (Roland & Idsoe, 2001). The original measurement model with 18 items is presented in Figure 2.

Figure 2

Initial first-order CFA with a three-factor structure model of the Time Management Scale (18 items)

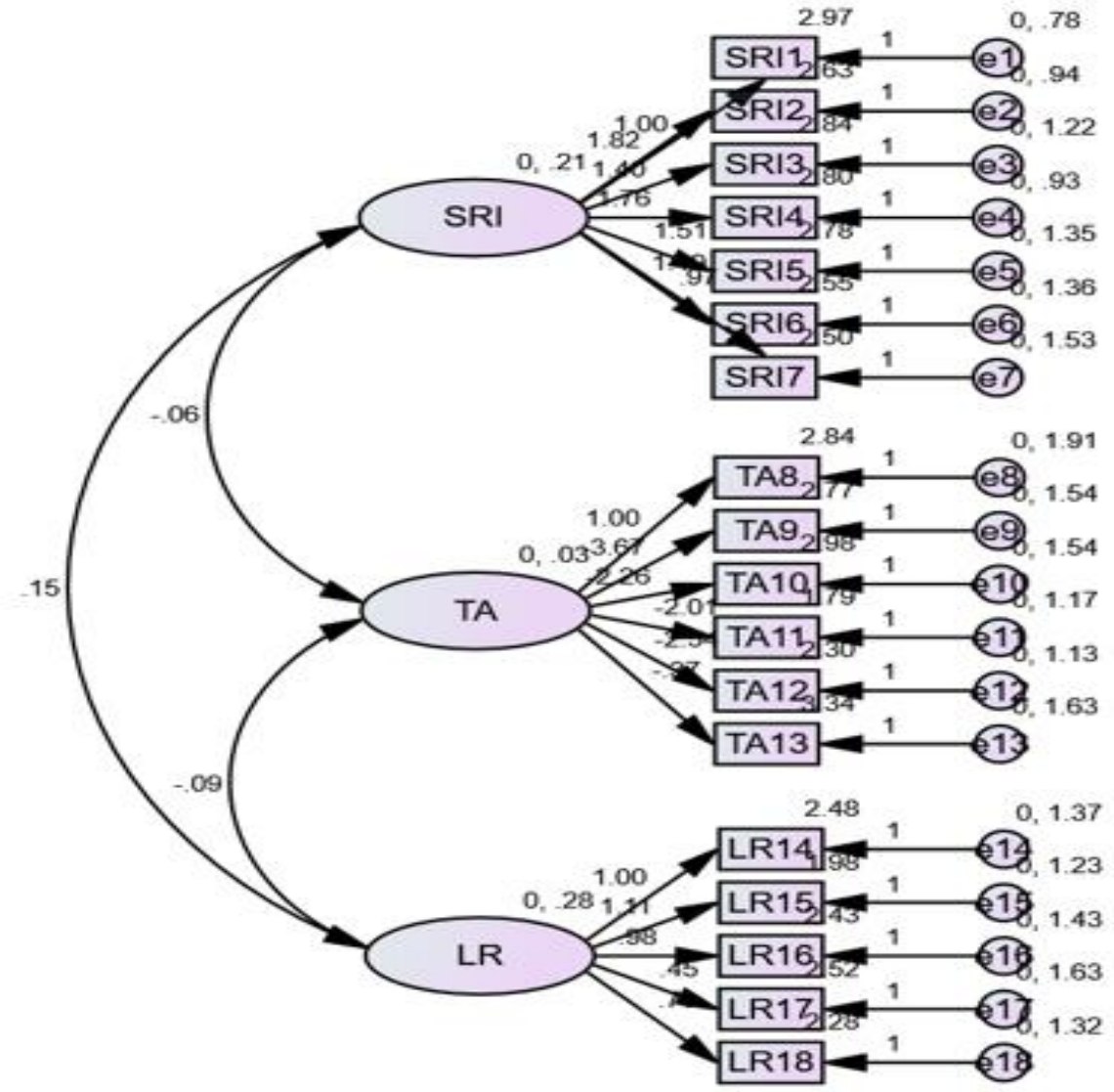


Table 3

Discriminant validity

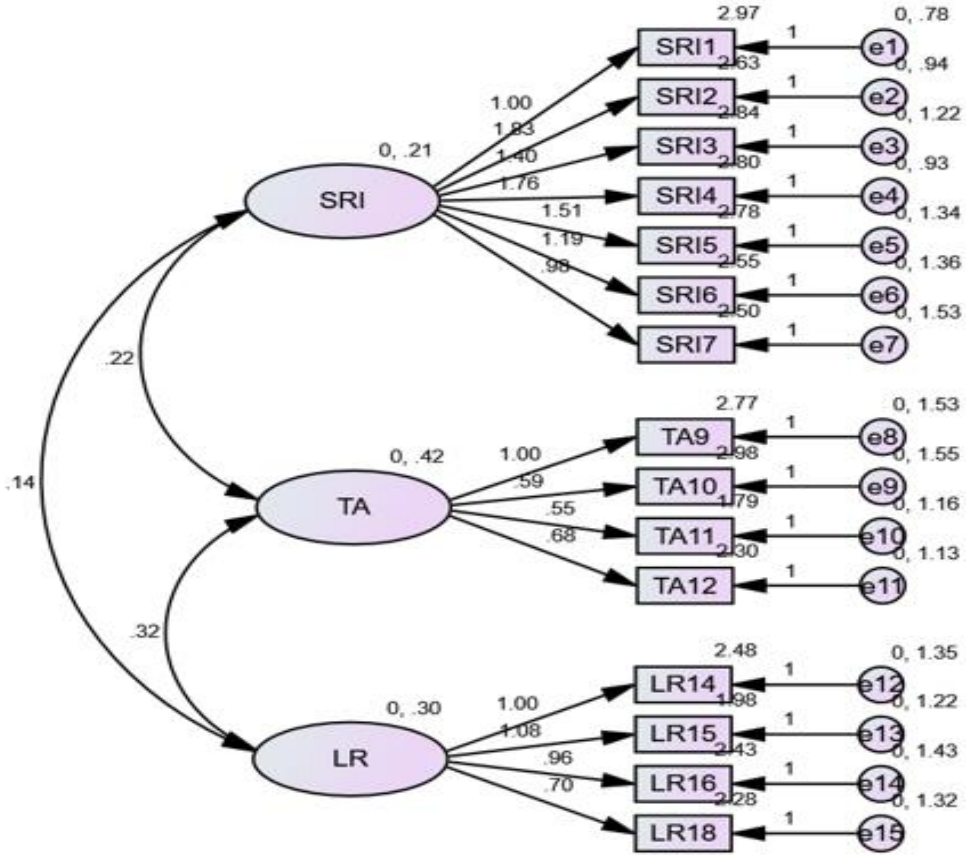
Variable	Short Range	Time Attitude	Long Range
Short Range	(.61)*		
Time Attitude	.74	(.31)*	
Long Range	.60	.89	(.34)*

*Values in parentheses are the square roots of Average Variance Extraction (AVE)

In Table 3, apart from the link between short-range and long-range (.60), all the dimensions were bigger than the square roots of AVEs. In addition, the intercorrelation value (.74 and .89) of the sub-scale of time management was lower than the value of .85 or .90 (Hair et al., 2006; Awang, 2012, 2014). It was concluded that discriminant validity has been established as a result of this. The new measurement model for the time management scale is shown in Figure 3.

Figure 3

Final first-order CFA with a three-factor structure model of the Time Management Scale (15 items)



3.1.1. Model fit

The model fit indices are presented in Table 4

Table 4

Goodness of fit indices of the time management scale

Fit Indices	Values (18-items)	Values (15-items)	Threshold
Chi-square (χ2)	162.733, p<0.000	116.761, *p*<0.000	> .05
CMIN/DF	1.233	1.342	≤ 2 or 3
CF	.898	.901	≥.90
NFI	.656	.722	≥.90
IFI	.910	.911	≥.90
TLI	.868	.863	≥.90

RMSEA	.028	.034	≤ .08
AIC	276.733	212.761	

The model fit indices for the new model (15 items) appeared better than the original model with 18 items (Table 4). The AIC index for the 18-item model was 276.733, and that of the 15-item model was 212.761, indicating that the new model (15-item) is the model that is closer to reality and demonstrated sufficient fit (Civelek, 2018). Although the 15-item model showed adequate fit as compared to the 18-item model, the model fit indices for the model (15 items) failed to meet the standards of the selected scholars. It is concluded that future researchers who intend to reproduce or re-examine the time management scale in the Ghanaian settings should use the final or the new model (15 items) instead of the original model (18 items) and re-validate the new model (15 items) in their settings due to cultural differences and aspirations (Britwum et al., 2022).

3.2. Summary of the participants' demographic information

The demographic information of the study participants' age and gender is presented in Table 5.

Table 5

Demographic data of study participants

	Subscale	Frequency	Percentage (%)
Gender	Male	189	64.7
	Female	103	35.3
Age	13-15	9	3.1
	16-18	235	80.5
	19-21	47	16.1
	22 and above	1	.3
	Total	292	100.0

Concerning gender, most of the participants identified as male, comprising 64.7% of the sample, whereas 35.3% identified as female. Regarding age distribution, a substantial proportion of participants (80.5%) fell within the 16-18 age bracket, followed by 16.1% in the 19-21 age group, with a smaller segment falling within the 13-15 age range (3.1%). Merely one participant (0.3%) was aged 22 or older.

3.3. Gender and age will not affect time management

This study looked into whether there were deviations in time management among students based on their gender and age. The results are presented in Table 6.

Table 6

Gender and age differences in time management

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
TM	Corrected Model	279.222[a]	6	46.537	.648	.692
	Intercept	28343.513	1	28343.513	394.633	.000
	Gender	141.837	1	141.837	1.975	.161
	Age	52.012	3	17.337	.241	.867
	Gender *Age	102.290	2	51.145	.712	.491
	Error	21977.691	306	71.823		
	Total	469378.000	313			
	Corrected Total	22256.914	312			

The analysis found no significant interaction impact between age and gender on time management, F(2, 306) =.712, p =.491 (see Table 6). This shows that there is no interaction effect of gender and age on time management. Similarly, there was no significant main outcome of age on time management (F(3, 306) =.241,

p =.867. Furthermore, a non-significant main effect of gender on time management was found, F(1, 306) = 1.975, p =.161 (see Table 6). This data suggests that there is no variation in time management between males and females among SHS students, irrespective of age. In essence, age is not a predictor of time management for female and male students.

3.4. Gender and age will not affect academic performance

This research investigates whether there were variations in time management among students based on their gender and age. The findings are given in Table 7.

Table 7

Gender and age differences in academic performance (AP)

	Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
AP	Corrected Model	1975.818[a]	6	329.303	1.131	.344
	Intercept	876336.009	1	876336.009	3010.773	.000
	Gender	2.185	1	2.185	.008	.931
	Age	1038.430	3	346.143	1.189	.314
	Gender *Age	297.136	2	148.568	.510	.601
	Error	89066.431	306	291.067		
	Total	13308905.000	313			
	Corrected Total	91042.249	312			

The analysis found no evident interaction impact of age and gender on performance, F (2, 306) =.510, p =.601 (see Table 7). This shows that there is no correlation between gender and age groups in terms of academic performance. Similarly, there was no fundamental main outcome of age on academic achievement, F(3, 306) = 1.189, p = 0.314. Furthermore, a non-significant main effect of gender on time management was found, F (1, 306) =.008, p =.931 (see Table 7). This result demonstrates that there is no variation in academic performance between females and males in SHS, regardless of age. In essence, age is not a predictor of academic performance for female and male students.

3.5. Time management and academic performance as moderated by gender and Age

This work examined the interaction effect of age and gender in moderating the link between time management and the academic performance of students. The moderators were gender and age. The predictor was time management, whilst the outcome variable was academic performance. The details of the outcome are shown in Table 8.

Table 8

Moderating Role of Gender and Age in the Link between Time Management (TM) and Performance

Variable	B	SE	t	P	LLCI	ULCI
(Constant)	197.876	13.2971	14.8812	.0000	171.7120	224.0406
TM	.3244	.3434	.9445	.3457	-.3514	1.0001
Gender	2.3783	9.5400	.2493	. 8033	-16.3934	21.1499
Int_1.	-.1530	.2446	-.6257	.5320	-.6343	.3282
(Constant)	176.1528	22.0066	8.0045	.0000	.0000	219.454
TM	.5488	.5771	.9510	.3423	-.5867	1.6842
Age	11.8717	10.0565	1.1805	.2387	-7.9162	31.6596
Int_2	-.2070	.2630	-.7869	.4319	-.4319	.3105
Int_3	-.1353	.2443	-.5538	.5801	-.6160	.3454
Int_4	3.5506	2.3173	1.5322	.1265	-1.0092	8.1105

Underscore (_) represent interaction sign; Int_1—Gender*TM; Int_2— Age*TM; Int_3—Gender*Age; Int_4—TM*Sex*Age.

The results, as presented in Table 8, revealed a non-significant effect of gender-age interaction on the link between time management and academic performance (b = 3.5506; SE = 2.3173 Boot95percentageCI (-1.0092, 8.1105).

4. DISCUSSION

The findings of the analysis examining the effects of gender and age on time management among SHS students revealed several important insights. Firstly, there was no evidence of an interaction effect observed between age and gender on time management. This suggests that the relationship between time management skills and age does not vary significantly between males and females. Similarly, there was no notable main effect of age difference on time management, indicating that, regardless of age, students exhibit similar levels of proficiency in managing their time effectively. Furthermore, the investigation pointed to a non-significant main outcome of gender on time management, indicating that there are no significant variations in time management practices between male and female SHS students. The lack of significant disparities in time management between females and males suggests that both genders may face similar challenges and opportunities in managing their time effectively, regardless of age. While there is limited empirical evidence available regarding the interaction effect between gender and age concerning time management, these findings are consistent with previous investigations that have found little to no gender differences in time management skills among students (Jones & Smith, 2021). The findings by Lee et al. (2021) supported the current findings, suggesting that there is no age variation in the time management of students and no gender variations in time management habits (Jones & King, 2015).

Similarly, gender differences were not found in time management skills (Smith et al., 2018). However, these findings are at odds with other research suggesting that gender might have a big impact on how students view and use their time (Rueger et al., 2008). Similarly, Smith et al. (2018) presented conflicting findings, suggesting potential gender disparities in time management activities. The results of the current work may contradict other findings because of methodological differences between studies, such as the variations in sample size, sampling methods, measurement instruments, and statistical analyses. Additionally, contextual components such as socio-economic status, cultural differences, and geographic location are considered. Furthermore, the timing of data collection and changes in societal or environmental conditions may have impacted the findings.

Similarly, the analysis examining the effects of gender and age on academic performance yielded comparable results. There was no evidence of an interaction effect observed between gender and age difference in performance, indicating that the link between academic performance and age does not vary significantly between males and females. Additionally, there was no notable main effect of age on academic performance, suggesting that age alone does not significantly influence students' academic performance. The non-significant main effect of gender on performance further reinforces the notion that there are no fundamental disparities in academic performance between female and male SHS students. While there is limited empirical evidence available regarding the interaction effect between age and gender differences in academic performance, these outcomes are consistent with former research that has found no significant gender variations in academic performance among students (Reilly et al., 2019). Moreover, Smith et al. (2020) also found limited evidence of age-related differences in academic performance among students. However, the results of the current study contradict other research highlighting female students' tendency to exceed their male counterparts (Orabi, 2007) and conversely suggesting that males may exhibit greater academic performance in certain contexts. The difference in the current study result and other research may be due to researchers' preconceived notions about the topic under investigation. Moreover, there is a tendency among researchers to selectively report results that align with their hypotheses, which may lead to overestimation or underestimation of effects, potentially resulting in contradictory findings compared to studies with more objective approaches.

Moreover, the examination of the interaction effect of age and gender in moderating the connection between time management and performance revealed a non-significant effect. This suggests that regardless of age and gender, the link between time management skills and performance remains consistent among SHS

students. Independently, gender did not moderate the link between time management and the performance of students. These current results are consistent with previous research, which found no gender difference in time management (Jones & Smith, 2021) and no significant gender differences in academic performance among students (Reilly et al., 2019). The outcome suggests that time management may be equally important for academic success across different genders.

Additionally, the findings revealed that age did not moderate the link between the performance and time management of students. These current outcomes are consistent with former research, which found no evidence of age-related differences in performance among students (Smith et al., 2020) and no age difference in the time management of students (Lee et al., 2021). The result implies that, regardless of the age of the learner, the connection between performance and time management of students remains consistent. This suggests that time management may be equally important for academic success across different age groups, from adolescents to adults. In addition, the age range and demographic composition in this study were narrow (13 years to 22 years) and could justify why the investigation revealed non-significant results.

5. CONCLUSION

The findings of this study provided a valuable perspective into the link between gender, age, time management, and performance among SHS students. The analysis disclosed no evident interaction effect of age and gender on time management. This result implies that the relationship between gender and time management does not vary significantly across different age groups. Again, the impact of gender on time management practices remains relatively consistent regardless of age. This finding implies that factors such as social expectations, gender norms, and individual differences in time management skills may influence time management behaviors similarly across different age cohorts.

Additionally, it suggests that interventions aimed at improving time management skills among students may need to address gender-related factors consistently across all age groups. Furthermore, the investigation indicated a non-evidential interaction effect of gender and age on performance, implying that the relationship between gender and age does not significantly influence academic performance. Alternatively, the outcome of gender on performance does not vary significantly across different age groups, and vice versa. This implies that factors other than gender and age may play a more prominent role in determining academic performance among the studied population.

Moreover, gender and age were not found as moderators of time management and performance. The result implies that neither gender nor age plays a moderating role in the link between time management and performance among the studied population. In other words, regardless of gender or age, the extent to which students manage their time effectively does not significantly influence their academic performance, and vice versa. This suggests that other factors may be more influential in determining the link connecting time management and academic performance. Additionally, when investigating the relationship between time management and academic outcomes, it is critical to examine individual characteristics as well as social factors.

Based on the findings, this work's recommendations are crucial to the organization of the education system and educational practice to incorporate time management training programs into academic curricula to equip students with prioritization, task scheduling, and time management skills, and to help students optimize their study habits and academic performance. Again, teachers need to create a supportive learning environment that promotes collaboration, peer support, and mentorship to enhance students' time management and academic performance.

Furthermore, educators should receive training and professional development workshops, counseling sessions, or online resources tailored to meet the diverse needs of students. This may involve providing teachers with strategies for providing individualized support to students to heighten their time management skills and academic performance.

One strength of this study is its focus on exploring the interplay between gender, age, time management, and academic performance among SHS students. By examining multiple variables simultaneously, the study gives a broad understanding of the factors influencing student success. Additionally, the use of quantitative analysis techniques and an ample sample size enhances the reliability and generalizability of the findings. Furthermore, the inclusion of both time management and academic performance as outcome measures allows for a holistic assessment of student outcomes.

Despite its strengths, this study has several limitations that warrant consideration. Firstly, the information was gathered using self-report surveys, which could be influenced by how people want to be seen and what they think is expected of them. Moreover, the research only looked at SHS students, so we can't say for sure if these results would be the same for other groups of people.

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