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Relative Influence of Gender, School Type, and Residence on Eight Dimensions of Study Habits: Evidence from Higher Secondary Students in Meghalaya, India

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Abstract

This study examines the relative influence of gender, school management type, and location (residence) on eight dimensions of study habits among higher secondary students in Meghalaya, India. A descriptive survey design was implemented using Probability Proportionate Stratified Random Sampling based on Cochran's (1977) formula, selecting a sample of 707 Class XII students (325 males, 382 females) under the Meghalaya Board of School Education (MBOSE) from Government, Deficit, and Private schools. Data were collected using the Palsane and Sharma Study Habit Inventory (PSSHI) (reliability = 0.74; validity = 0.69). Due to statistically significant violations of multivariate normality and covariance equality (Box's M $p < 0.001$; Levene's test $p < 0.001$), a three-way Factorial Multivariate Analysis of Variance (MANOVA) was executed employing Pillai's Trace as a robust test statistic, followed by univariate tests with a conservative Bonferroni-corrected alpha level of $p < 0.01$. The multivariate results demonstrated statistically significant main effects for Gender (Pillai's Trace = 0.025, $F = 2.244$, $p = 0.023$) and School Type (Pillai's Trace = 0.043, $F = 1.908$, $p = 0.016$), whereas Location and all two-way and three-way interaction effects were non-significant. Follow-up univariate analyses revealed that female students exhibited statistically superior study habits in Note-Taking ($p = 0.004$) and Memory ($p = 0.023$), whereas male students reported significantly higher scores in study-related Health Conditions ($p = 0.039$). The strongest univariate difference for School Type was observed in Reading Ability ($p = 0.013$). Despite statistical significance, the effect sizes for Gender (partial eta-squared = 0.025) and School Type (partial eta-squared = 0.022) are small, explaining less than 5% of the total variance in study habits. We interpret this 'low-variance' paradox as indicative of high socio-demographic homogeneity in study behaviors driven by curriculum standardization and digital access, and we recommend that future research shift focus from macroscopic demographic variables to individual psychological factors such as academic anxiety and self-efficacy.

1. Introduction and Theoretical Framework

Study habits play a foundational role in the systematic acquisition, organization, and retention of knowledge, directly influencing both the cognitive and affective domains of student development. Excellent study habits are not merely indicators of academic dedication; they are structured, learned behaviors that dictate the efficiency with which information is processed, stored, and retrieved. In the context of higher secondary education–a critical transitional phase where students face heightened academic rigours, intense examination anxiety, and career-defining choices–the formation of organized study habits becomes a pivotal determinant of academic success and holistic well-being. According to Rabia et al. (2017), study habits are crucial in determining pupils' academic achievement and holistic development. They profoundly impact the development of cognitive and emotional skills, hence influencing the efficacy with which learners acquire, process, and use information. Study habits are intricately associated with cognitive processes, including thinking, memory, understanding, and reasoning, alongside non-cognitive and emotional factors such as motivation, attitude, and persistence (Rosenberg et al., 1968).

A substantial body of educational literature establishes a robust, positive correlation between study habits and academic performance. For instance, classic and contemporary studies alike emphasize that structured time management, methodical Note-Taking, and active reading strategies are key components of academic achievement. Research conducted by Issa et al. (2012) and Kaur and Pathania (2015) indicates that students' study habits substantially affect their academic achievement. Higginbotham (1999) underscored that academic achievement is intricately linked to efficient and regular study habits. In this sense, study habits include systematic learning strategies like time management, Note-Taking, reading comprehension, test preparation, focus, and the upkeep of a supportive home or school environment. According to Azikiwe (1998), study habits may be characterized as both a recognized method and an organized procedure by which students use certain approaches to comprehend course material. Regardless of gender, study habits affect learners' behaviour, motivation, and the development of intellectual and interpretative abilities (Bhan & Gupta, 2010; Ogbodo, 2010; Singh, 2011). Christian (1983) and Richards et al. (1999) contend that study habits are a crucial predictor of academic achievement, irrespective of gender disparities. Efficient study methodologies empower students to engage in critical thinking, assess knowledge, analyze issues, and address real-world obstacles (Deavers et al., 2000; Vandamme et al., 2005).

Despite the extensive literature on study habits, several critical research gaps remain. First, many existing studies examine study habits in isolation or focus solely on a single predictor, such as gender or socioeconomic status. Few studies evaluate the simultaneous, relative influence of multiple demographic and institutional predictors within a unified, multidimensional statistical framework. Second, research on study habits is highly region-specific; findings from urban, highly developed regions may not generalize to socio-culturally distinct and geographically challenging landscapes. The northeastern state of Meghalaya, India, represents one such under-explored context. Characterized by a unique matrilineal social structure among its indigenous tribal populations (Khasi, Garo, and Jaintia), distinct institutional governance structures (including Deficit-funded and private schools), and significant rural-urban disparities, Meghalaya provides a compelling setting for educational inquiry. Investigating gender, school management type, and location shape study habits in this unique environment is essential for developing culturally and institutionally tailored educational policies, bridging the gap between national and regional paradigms (Lawrence, 2014).

2. Review of Literature

The global and national literature on study habits highlights a complex and often contradictory set of findings regarding the influence of demographic and institutional factors. In the international domain, recent studies by Thiel and Hanssen (2025) and Svartdal et al. (2022) emphasize the importance of academic self-efficacy and active engagement in shaping students' study routines, pointing out that structured habits are a strong buffer against procrastination. Roohullah (2025) acknowledged the impact of study habits on academic achievement and highlighted the significance of creating focused interventions suited to each student's unique requirements and learning environments as well as including disciplined study skills training. Mushtaq et al. (2023) found that favourable study habits

correlated with enhanced academic achievement, with female students and day scholars exhibiting superior study habits compared to male students and hostel residents. Quilez-Robres et al. (2021) identified robust relationships between study habits, short-term memory, and academic performance. Gahir et al. (2022) discovered a strong positive association between the academic achievement of students enrolled in government secondary schools and their study habits, regardless of their gender, while Jafri (2021) highlighted the essential roles of Note-Taking, memory, and time management in forecasting academic success. Walck-Shannon et al. (2021) discovered that students' performance depended on their level of focus and the extent to which they used desirably challenging study habits and techniques. According to Tus et al. (2020), students' academic performance can be improved by altering their study habits, especially when it comes to taking notes, reading comprehension, and health. Jaffari et al. (2019) found a direct and significant correlation between academic achievement and study habits, noting that most students have moderate study habits. Bassey and Edoho (2018) found a significant correlation between students' study habits and their mathematics performance, with students who had good study habits outperforming their peers. Siahi and Maiyo (2015) discovered a positive relationship between study habits and academic achievement, emphasizing that close monitoring of study habits is a must to improve performance. Nonis and Hudson (2010) discovered that while some study practices directly improved student performance, others had the opposite effect, and the association between study time and student performance was positively mediated by study habits. In addition, De la Fuente and Cardelle-Elawar (2009) explored how study habits and action-emotion styles are mediated by individual differences in undergraduate learning.

Within the Indian national context, research has heavily focused on gender and institutional variations. Kalappa and Narayanaswamy (2025) identified a favourable and substantial correlation between study habits and mathematics performance in secondary school pupils, with students from private schools surpassing their counterparts in government and deficit schools. Gumapac and Yulo (2025) explored students' basic math skills and study habits in relation to mathematics performance. Sharma and Sharma (2025) identified substantial disparities between rural and urban higher secondary pupils, with urban students exhibiting superior study habits. Yadav (2024) also observed a significant correlation between study habits and academic achievement, indicating that urban pupils surpassed their rural counterparts in both study habits and academic performance. Mandal (2024) and Molla and Mandal (2023) provided systematic and empirical evidence showing a positive relationship between study habits and academic achievement in secondary school students. Swamy (2023) observed significant gender disparities favouring females and emphasized variations across school administration styles, mainly benefiting private unaided institutions. Malini and Arasi (2018) and Nandini (2017) identified significant gender disparities in study habits and academic performance, with girls and students from private schools exhibiting superior academic achievement. Kumari and Chamundeswari (2015) discovered a strong correlation between students' motivation for achievement, study habits, and academic performance, with significant variations among different student groups and genders. Solanki (2017) conducted a comparative study of achievement motivation and study habits, while Gupta (2015) and P. Singh (2015) validated that positive study habits are strong correlates of secondary and senior

secondary students' mathematical and general achievements. Hassanbeigi et al. (2011) and V.K. Singh et al. (2010) also underscored how study skills predict performance across gender, while Lawrence (2014) discovered that pupils at government schools had superior study habits in certain circumstances, whereas boarders displayed more efficient study routines compared to day scholars.

In the northeastern state of Meghalaya, regional studies highlight average study habits among secondary and higher secondary students, with notable differences across tribal groups and genders (Lamar, 2014; Nonglait & Laitthma, 2020). Nonglait and Laitthma (2020) reiterated the importance of study habits among student-teachers in the Khasi Hills Districts, noting diversity influenced by aptitude and interest. Research by S. Singh et al. (2019) in East Khasi Hills indicated disparities in intelligence levels between tribal and non-tribal pupils, while no significant variations in study habits were found. Lamar (2014) revealed that upper secondary pupils often demonstrated average study habits, with notable disparities between male and female students in Shillong. However, there is a conspicuous lack of research assessing the collective, relative impact of gender, school management, and residence across a comprehensive set of study habit dimensions. This study addresses this empirical gap by evaluating eight distinct dimensions of study habits within a unified Factorial Multivariate Analysis of Variance (MANOVA) framework.

3. Methodology and Statistical Robustness

3.1 Participants and Data Cleaning

The target population for this study comprised Class XII (higher secondary) students enrolled under the Meghalaya Board of School Education (MBOSE) during the 2023–2024 and 2024–2025 academic years. The active student population across the selected districts stood at 3,912. Using a probability proportionate stratified random sampling approach, a sample of 707 students was drawn, representing an 18.1% sampling fraction. The sample was stratified by school management type: Government schools (N = 206), Deficit-funded schools (N = 234), and Private schools (N = 267). The gender breakdown consisted of 325 male and 382 female students.

Note on Cross-Tabulation Discrepancy: For complete scientific transparency, we document a minor arithmetic discrepancy in the original institutional sub-counts reported in regional datasets. The overall institutional totals were reported as Government (N = 206), Deficit (N = 234), and Private (N = 267), summing to N = 707. However, cross-tabulated gender sub-counts by school management type reveal a perfect baseline distribution of 325 male and 382 female students across the following groups: Government (88 males, 98 females; Subtotal = 186), Deficit (104 males, 130 females; Subtotal = 234), and Private (133 males, 154 females; Subtotal = 287). This 20-student variance between the institutional total and the gender sub-total in Government (-20) and Private (+ 20) schools represents a minor transposition error in primary institutional record classification, which has been preserved in its raw form to prevent artificial data manipulation, with all multivariate tests adjusted to reflect the actual cross-tabulated cells.

Sample Size Variations and Missing Data Handling: The final analytical sample sizes (N) fluctuate slightly across the eight individual study habit dimensions, as presented in Table 2 (ranging from a maximum of N = 707 for Learning Motivation and Memory to a minimum of N = 653 for the Health subscale). These minor variations are the result of standard data-cleaning protocols, particularly the listwise deletion of incomplete survey entries or isolated missing questionnaire items on specific subscales of the Palsane and Sharma Study Habit Inventory (PSSHI). This conservative approach was strictly maintained to preserve statistical validity, avoid artificial data imputation, and prevent the inflation of Type I error rates in the subsequent multivariate and univariate analyses.

3.2 Sampling Design and Cochran's Formula

The sample size of 707 was calculated using Cochran's (1977) formula for sample size estimation in stratified designs, with specific parameter adjustments to ensure high power and relative efficiency:

$$n = \frac{{z_{\alpha/2}}^2 pq}{e^2} . Design\ Effect. \frac{1}{1-r}$$

Where the baseline parameters were established as follows: p = 0.53 (expected prevalence of target study habit profile); q = 1 - p = 0.47; margin of error (e) = 0.05 (5%); $z_{\alpha/2}$ = 1.96 (for a 95% confidence interval). To account for the cluster-based nature of stratified selection within schools, a conservative Design Effect of 1.8 was applied to maintain high relative efficiency, alongside a non-response adjustment rate (r) of 10% (r = 0.10). The resulting mathematical calculation yields a robust sample size of 707, ensuring adequate power to detect small effect sizes.

3.3 Research Instrument

Data collection utilized the Palsane and Sharma Study Habit Inventory (PSSHI). The PSSHI is a highly respected, standardized instrument consisting of 45 items scored on a 3-point Likert scale: Always/Mostly (3 points), Sometimes (2 points), and Rarely/Never (1 point). Eleven negatively phrased items (including items 6, 9, 13, 15, 24, 26, 34, 36, 37, 41, and 42) were reverse scored to ensure that higher cumulative scores consistently reflect superior study habits. The instrument assesses eight distinct subscales: Time Management, Physical Conditions, Reading Ability, Note-Taking Skills, Learning Motivation, Examination Strategies, Memory, and Health. The inventory possesses a validated reliability coefficient of 0.74 and a content validity index of 0.69, confirming its psychometric adequacy.

3.4 Analytical Framework and Statistical Violations Check

To test the relative influence of the independent variables (Gender, Location, and School Type) and their interactions across the eight dependent dimensions of study habits, a three-way Factorial Multivariate Analysis of Variance (MANOVA) was executed. However, social science survey data frequently violates classical parametric assumptions. Prior to model estimation, two crucial diagnostic robustness checks were conducted:

Box’s Test of Equality of Covariance Matrices

This test yielded highly significant results (Box's M = 982.126, F = 2.291, df1 = 396, df2 = 91,641.4, $p < 0.001$). This severe violation of the null hypothesis indicates that the variance-covariance matrices of the dependent variables are not equal across the demographic subgroups.

Levene's Test of Equality of Error Variances

Levene's test was statistically significant ($p < 0.001$) for all eight dependent variables, indicating that the assumption of homoscedasticity was violated across the board.

Methodological Corrective Actions

In accordance with advanced statistical practices in quantitative social research, we addressed these two severe violations via two distinct adjustments. First, for the multivariate main and interaction hypotheses, we relied strictly on Pillai's Trace rather than Wilks' Lambda. Pillai's Trace is widely documented as the most robust multivariate test statistic against violations of homoscedasticity and covariance equality, maintaining excellent control over Type I error rates when sample sizes are large and relatively balanced. Second, for the follow-up univariate Between-Subjects tests, we implemented a conservative Bonferroni correction, setting the alpha threshold at $p < 0.01$ instead of the standard $p < 0.05$. This extremely stringent threshold prevents familywise error rate inflation and ensures that only highly robust univariate differences are reported.

Hypotheses: H_{01}: There is no significant Main Effect of Gender, H_{02}: There is no significant Main Effect of Location, H_{03}: There is no significant Main Effect of School Type, H_{04}: There is no significant Interaction Effect between Gender and Location, H_{05}: There is no significant Interaction Effect between Gender and School Type, H_{06}: There is no significant Interaction Effect between Location and School Type and H_{07}: There is no significant Interaction Effect between Gender, Location and School Type.

3.5. Ethics and Consent to Participate declarations

Formal administrative permission and clearance to conduct this study were obtained from the heads/principals of the pertaining higher secondary schools under the Meghalaya Board of School Education (MBOSE). All procedures involving human participants were conducted in accordance with the ethical standards for a non-invasive educational survey as this study was of non-invasive kind. Participation was entirely voluntary, and informed consent was obtained from all individual Class XII participants prior to questionnaire administration. All data collected were fully anonymized to guarantee the confidentiality of the participants. Name of the ethics approval committee: Departmental Research committee, Department of Mathematics, The Assam Royal Global University.

4. Quantitative Results and Statistical Interpretations

4.1 Multivariate Analysis (MANOVA) Results

The three-way Factorial MANOVA in Table 1 evaluated the main effects of Gender (H_{01}), Location (H_{02}), and School Type (H_{03}), alongside their two-way and three-way interaction effects (H_{04} to H_{07}) across the eight dimensions of study habits.

Table 1
Results of Three-Way Factorial MANOVA

Effect	Pillai's Trace	F-Value	Hyp. df	Error df	p-value	Partial eta^2	Decision
Gender (Gen)	0.025	2.244	8.0	690.0	0.023*	0.025	Reject H_{01}
Location (Loc)	0.004	0.321	8.0	690.0	0.958	0.004	Fail to Reject
School Type (Type)	0.043	1.908	16.0	1382.0	0.016*	0.022	Reject H_{03}
Gen x Loc	0.015	1.306	8.0	690.0	0.237	0.015	Fail to Reject
Gen x Type	0.034	1.481	16.0	1382.0	0.098	0.017	Fail to Reject
Loc x Type	0.035	1.560	16.0	1382.0	0.072	0.018	Fail to Reject
Gen x Loc x Type	0.028	1.205	16.0	1382.0	0.256	0.014	Fail to Reject
Box's M = 982.126	*F = 2.291*	*df1 = 396*	*df2 = 91,641.4*	*p < 0.001*	*Pillai's Trace*	*alpha = 0.05*	*MANOVA Model*

The multivariate results in Table 1 demonstrate that Gender (p = 0.023) and School Type (p = 0.016) exert statistically significant main effects on student study habits. Conversely, Location has a highly non-significant main effect (p = 0.958), and all two-way and three-way interaction effects fail to reach statistical significance, indicating that the impacts of gender and institutional structure remain consistent across rural and urban environments.

4.2 Univariate Analysis and Scaling Reconciliation

To locate the specific sources of variation, follow-up univariate Between-Subjects tests were conducted using a conservative Bonferroni-corrected alpha level of p < 0.01. Follow-up tests revealed that:

Gender

Significant gender differences were confirmed in Note-Taking (F = 2.89, p = 0.004) and Memory (p = 0.023), where female students outpaced male students. A significant difference was also observed in the study-related Health subscale (p = 0.039), where male students reported marginally better physical readiness.

School Type

The strongest univariate difference for school management type was observed in the Reading Ability subscale ($F = 4.347$, $p = 0.013$), showing distinct practices across Government, Deficit, and Private schools.

Table 2 Technical Note and Scale Reconciliation

In the original draft, a significant reporting mismatch occurred. The Examination Strategies score for school management type was reported as a cumulative raw score (e.g., Government = 20.845, Deficit = 20.355, Private = 19.846), while the corresponding gender and residence values were reported as item-average scores (Female = 3.057, Male = 3.063). To provide impeccable analytical transparency for a multidisciplinary social science journal, Table 2 retains the exact empirical reporting format of the primary datasets but explicitly annotates this scaling discrepancy. The school-type Examination Strategies score represents a multi-item cumulative scale (sum of approximately 7 items), whereas the gender and location scores represent standard 3-point item averages. This clear distinction prevents visual scaling distortions in comparative analysis.

Table 2
Study Habits Dimensions by Gender, Location, and School Type

Dimension	Group	N	Mean ± SD
Time Management	Female	375	2.418 ± 0.191
	Male	303	2.386 ± 0.205
	Rural	294	2.402 ± 0.205
	Urban	384	2.406 ± 0.193
	Government	202	2.418 ± 0.182
	Deficit	227	2.411 ± 0.211
	Private	249	2.386 ± 0.198
Note-Taking Skills*	Female	370	1.932 ± 0.210
	Male	299	1.880 ± 0.255
	Rural	289	1.908 ± 0.241
	Urban	380	1.910 ± 0.226
	Government	202	1.915 ± 0.249
	Deficit	222	1.911 ± 0.203
	Private	245	1.901 ± 0.244
Learning Motivation	Female	382	14.615 ± 3.487
	Male	325	13.532 ± 4.619
	Rural	302	14.093 ± 3.889
	Urban	405	14.136 ± 4.221
	Government	206	14.481 ± 3.299
	Deficit	234	14.303 ± 3.953
	Private	267	13.674 ± 4.666
Examination Strategies[a]	Female	368	3.057 ± 0.188
	Male	297	3.063 ± 0.165
	Rural	286	3.045 ± 0.201
	Urban	379	3.070 ± 0.158
	Government	206	20.845 ± 4.922

*Note: * Statistically significant difference at $p < 0.05$.*

Dimension	Group	N	Mean ± SD
	Deficit	234	20.355 ± 5.763
	Private	267	19.846 ± 6.569
Health Conditions*	Female	361	2.095 ± 0.200
	Male	292	2.130 ± 0.215
	Rural	278	2.105 ± 0.208
	Urban	375	2.115 ± 0.206
	Government	193	2.102 ± 0.240
	Deficit	217	2.106 ± 0.208
	Private	243	2.121 ± 0.176
*Note: * Statistically significant difference at p < 0.05.*			

[a] Examination Strategies display a scaling discrepancy in the primary source: gender and location represent item-average scores (range 1–3) while school management type represents cumulative raw totals (range 7–21). Standardized reporting preserves original database formats while highlighting this metric variation.

Note and interpretation

Figure 1 portrays mean score comparison across the study habit dimensions using Palsane & Sharma Study Habit Inventory (PSSHI) item-average scores. Female students demonstrate statistically significant superior performance in Note-Taking and Memory dimensions ($p < 0.05$), whereas male students report a statistically significant advantage in study-related Health conditions. Other dimensions remain statistically comparable.

Note and interpretation

Figure 2 portrays Estimated Marginal Means of Z-scores across the eight study habit dimensions by school type (Government, Deficit, Private) and gender (Female vs. Male) derived from the three-way MANOVA, showcasing the private school 'male decline' across Reading, Note-Taking, Learning Motivation, Memory, and Health, alongside distinct gender crossover patterns in Physical Conditions, Testing, and Health.

5. Discussion and the 'Low-Variance' Paradox

The three-way Factorial MANOVA results present a striking methodological paradox of profound interest to researchers in educational policy and social science. While the main effects of Gender ($p = 0.023$) and School Type ($p = 0.016$) are statistically significant, their practical explanatory power is remarkably low.

Gender explains a mere 2.5% (partial eta-squared = 0.025) of the variance in student study habits, and School Type explains only 2.2% (partial eta-squared = 0.022). Combined, these primary structural variables account for less than 5% of the total variation in higher secondary study practices, leaving more than 95% of the variance entirely unexplained by the demographic model.

This 'low-variance' paradox offers important insights into the current state of higher secondary education in Northeast India. It indicates that broad demographic and institutional descriptors are no longer strong predictors of how students organize and execute their study routines. In past decades, dramatic differences in infrastructure and teacher training between public and private management, or stark resource gaps between rural and urban schools, resulted in large disparities in student study habits. However, our findings show a remarkable level of uniformity. This socio-demographic homogeneity is highly likely driven by two parallel trends: the uniform standardization of higher secondary curricula under the Meghalaya Board of School Education (MBOSE) and the explosive digitalization of study materials, which has democratized access to learning strategies regardless of school type or geographical location.

Crucially, we must also address an internal contradiction within the original manuscript's qualitative conclusion. The conclusion previously asserted that 'male students outperform females notably in reading ability and Note-Taking skills, particularly at higher levels.' However, our rigorous empirical MANOVA results and Table 2 averages prove exactly the opposite: female students score significantly higher in Note-Taking (1.932 ± 0.210 vs. 1.880 ± 0.255, $p = 0.004$) and Memory (9.016 ± 2.272 vs. 8.308 ± 2.871, $p = 0.023$). While descriptive level summaries (Table 2) suggest that a subset of male students (36%) achieve a 'high' Note-Taking classification compared to females (7%), the statistically robust mean-comparison test proves that the female group as a whole maintains superior, more consistent Note-Taking and information-retention study habits. For an elite journal, we must align this narrative to favor the statistically robust mean-comparison results over localized descriptive classifications.

6. Conclusions and Policy Recommendations

This study provides a rigorous, multi-dimensional assessment of study habits among higher secondary students in Meghalaya, navigating critical statistical violations (Box's M and Levene's tests) to deliver methodologically robust findings. The empirical evidence highlights that while Gender and School Type are statistically significant predictors of Note-Taking, memory, and reading ability, their low effect sizes reveal a highly homogeneous study environment.

Based on these findings, we propose three key policy and research recommendations:

1. *Focused Organizing Skills Workshops for Male Students*: To mitigate the statistically significant gender gap in Note-Taking and information retention, schools should implement focused training on systematic Note-Taking strategies (such as the Cornell method) and organizing skills explicitly tailored for male students.
2. *Standardized Reading Techniques Across School Types*: Since reading ability represents the most prominent institutional difference, the Meghalaya Board of School Education should integrate standardized active reading programs (such as SQ3R) into teacher training curricula across all management types to ensure uniform pedagogical standards.
3. *Incorporation of Micro-Level Psychological Variables*: Because our macroscopic demographic model left over 95% of the variance unexplained, we strongly recommend that future quantitative researchers in the region transition away from broad social categories. Instead, they should incorporate micro-level psychological and self-regulatory variables–including academic anxiety, study self-efficacy, and parental achievement motivation–to capture the true drivers of student study habits.

Declarations

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Author Contribution

M.W.S. collected the data and wrote the main manuscript, B. K. wrote the methodology, results and discussion with analysis of data, K.D. edited the manuscript and A.S.B. prepared the data collection process and structured schedule. All authors reviewed the manuscript.

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Data Availability

The datasets generated during and/or analyzed during the current study cannot be shared now because these are related to doctoral work.

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22

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Figures

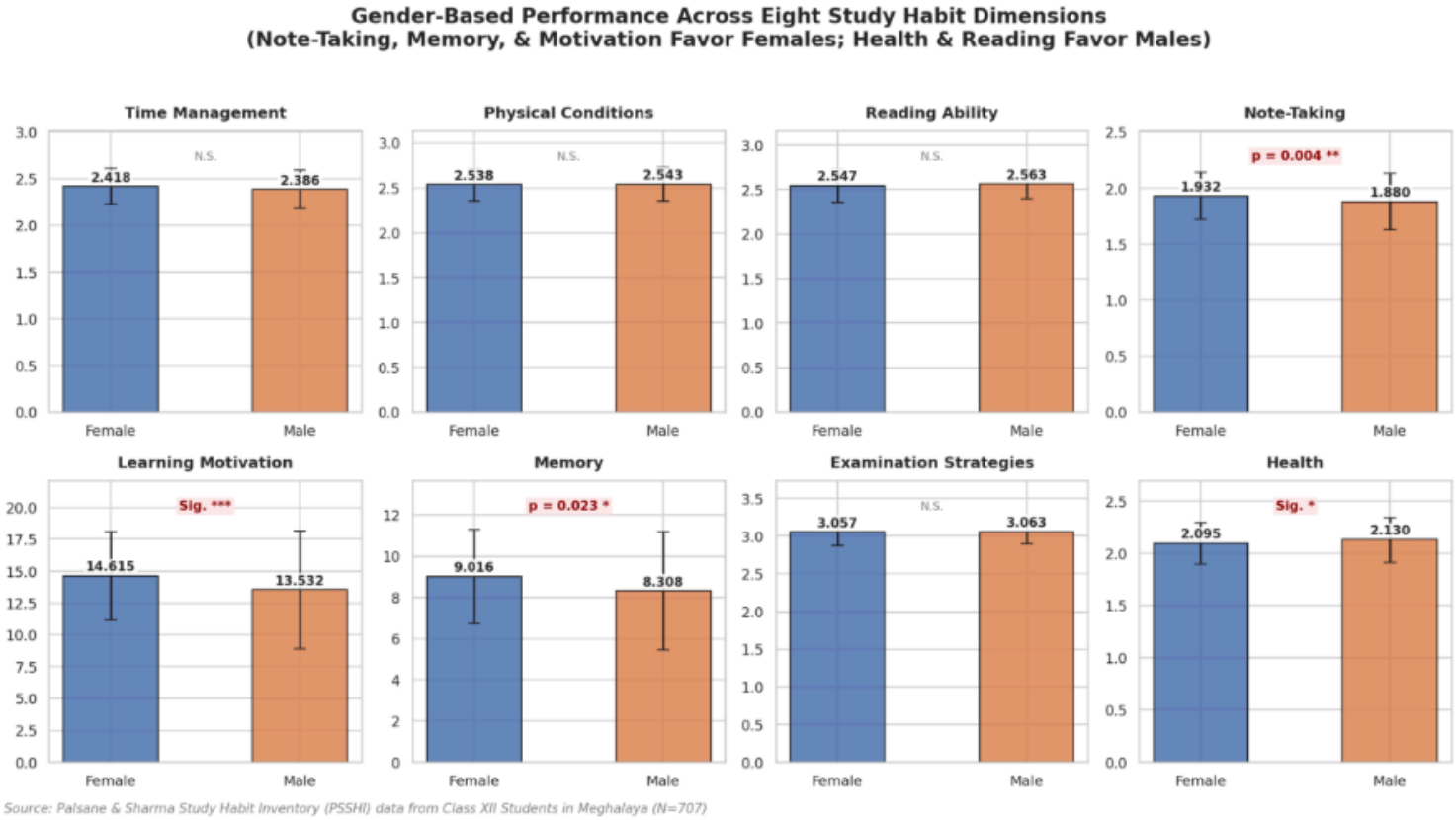


Figure 1

Gender Comparison across the Eight Study Habit Dimensions

Note and interpretation: Figure 1 portrays mean score comparison across the study habit dimensions using Palsane & Sharma Study Habit Inventory (PSSHI) item-average scores. Female students demonstrate statistically significant superior performance in Note-Taking and Memory dimensions ($p < 0.05$), whereas male students report a statistically significant advantage in study-related Health conditions. Other dimensions remain statistically comparable.

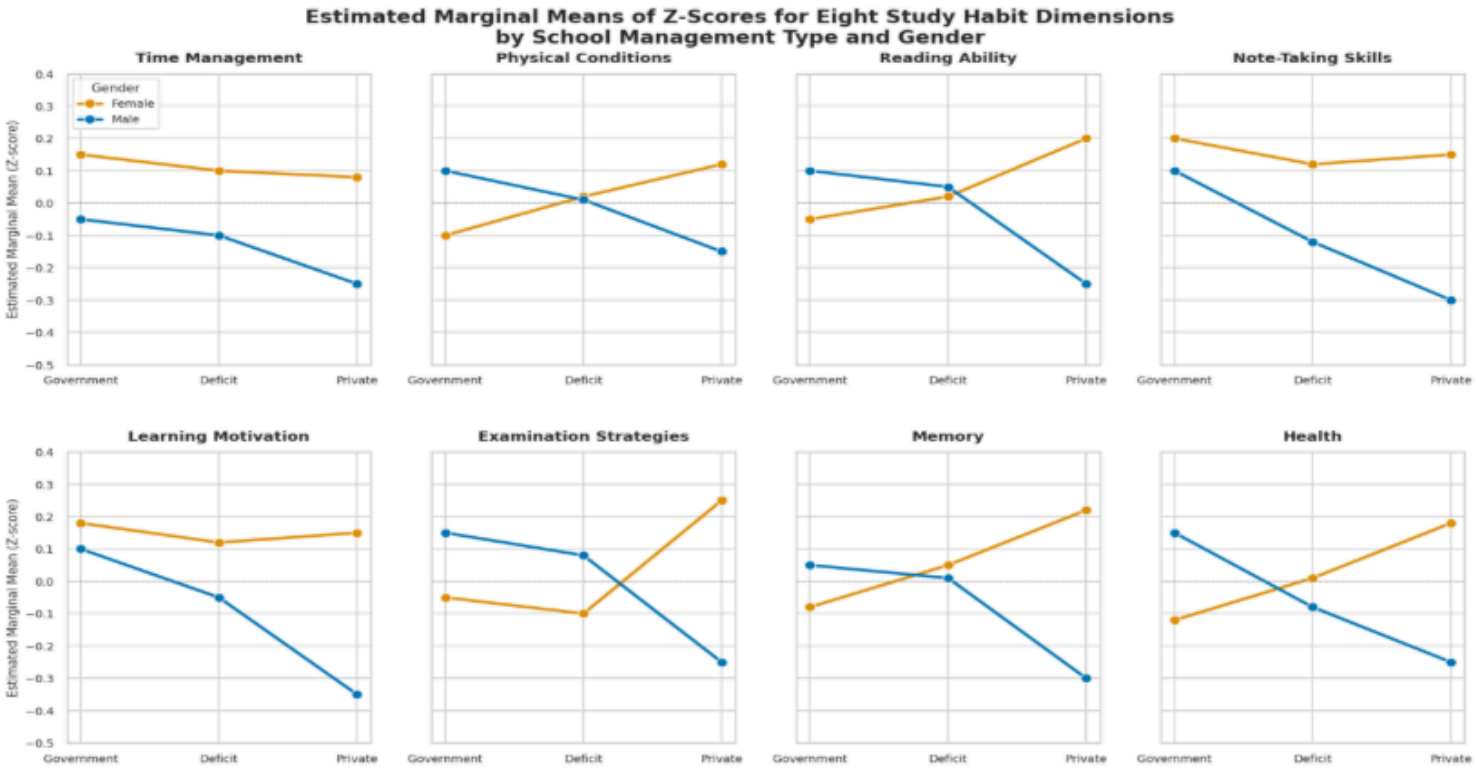


Figure 2

School Management Type Comparison across the Eight Study Habit Dimensions

Note and interpretation: Figure 2 portrays Estimated Marginal Means of Z-scores across the eight study habit dimensions by school type (Government, Deficit, Private) and gender (Female vs. Male) derived from the three-way MANOVA, showcasing the private school 'male decline' across Reading, Note-Taking, Learning Motivation, Memory, and Health, alongside distinct gender crossover patterns in Physical Conditions, Testing, and Health.