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Navigating Evaluative Stress: Assessing Metacognitive Awareness, Test Anxiety, and Achievement Among Secondary School Students

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ABSTRACT

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Test anxiety is often a problem that can impact students' academic work, and metacognitive awareness assists students in planning, monitoring, and assessing their learning processes. The present study was conducted to explore the levels of metacognitive awareness, test anxiety, and academic achievement of secondary school students in District Sargodha, Punjab, Pakistan. The research design used was a quantitative survey design, where a modified questionnaire was used to measure metacognitive awareness and test anxiety, and students' examination scores were used as the academic achievement indicator. The results showed that students' metacognitive awareness was at a moderate level and students' test anxiety was moderate. Levels of achievement were generally satisfactory. There was no significant difference based on gender, school type and grade level in metacognitive awareness. Schools are encouraged to encourage metacognitive learning strategies and to offer specific interventions that will reduce test anxiety in secondary school students.

Introduction

Academic performance is a key measure of student performance and learning. It is often

expressed by what is known as objective performance, for example, grades (Cumulative



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Grade Point Average – cGPA) or scores obtained on standardized end-of-course exams, which have been highlighted in the recent achievement literature (Lee & Stankov, 2023; Organisation for Economic Co-operation and Development [OECD], 2023; Steinmayr et al., 2022). Such measures as GPA, standardized tests, and performance on high-stakes national tests are used to assess students' knowledge and are also important indicators of student success in the next level of education. This can lead to significant pressure in secondary school systems.

Testing anxiety, a subset of performance anxiety, is one such example of this stress and is defined as a combination of cognitive (e.g., worry, negative thoughts and intrusive rumination) and physiological (e.g., sweating, increased heart rate, nausea) components (Zeidner, 2014). The fear of failing, feeling unprepared, and the importance of exams are common sources of test anxiety. High levels of test anxiety can impact memory, attention and focus, and in the end, academic performance (Putwain et al., 2021; von der Embse et al., 2018). Additionally, recent studies in neuroeducation have shown that test anxiety negatively affects the functioning of the prefrontal cortex, which is crucial for executive functions and metacognition during exams (Morales-Vives et al., 2023).

In addressing these challenges, educational psychology has increasingly become more concerned with the internal regulatory mechanisms of students, especially their metacognitive awareness. Metacognition refers to knowledge and control of one's own cognitive process, including planning, monitoring, and evaluating learning strategies (Flavell, 1979). Self-regulation is one of the important characteristics of self-regulated learning wherein learners are capable of modifying their strategies as per the task at hand and as such make learning efficient for them (Anthonysamy, 2024; Zimmerman, 2013).

There is an extensive research area that can be explored in order to examine whether the concept of metacognitive awareness can be used to minimize the adverse effects of test anxiety. Students might be able to control anxiety better through metacognitive processes like monitoring worry-related thoughts, strategically managing

study time, and using adaptive problem-solving in exams. Although there is limited evidence, training on metacognitive strategies is a helpful intervention for emotion regulation and academic performance (Dent & Koenka, 2016; Ohtani & Hisasaka, 2018). In addition, the present-day educational context of the 2020s has been shaped by shifting cultural perceptions of testing, the incorporation of technology into assessment, and a heightened focus on student health and well-being (UNESCO, 2023).

Literature Review

Researchers have identified a number of levels of metacognitive awareness that indicate a shift from unconscious to fully reflective thinking. Schraw and Moshman (1995) outlined four distinct levels: tacit (unaware, unarticulated knowledge), aware (recognizing one's thinking without systematic application), strategic (deliberately using strategies) and reflective (evaluating one's thinking before, during and after a task).

Metacognitive knowledge has been distinguished into declarative knowledge (knowledge of the strategies available), procedural knowledge (knowledge of how to use strategies), and conditional knowledge (knowledge of when and why to use strategies) (Jacobs & Paris, 1987). These findings are also corroborated and extended by recent studies: Rasch-modelling research (Sukarelawan et al., 2024) showed that students in different disciplines showed different levels of metacognitive awareness, while cognitive control research demonstrated that both internal (motivation, self-regulation) and external (feedback, social support) factors influenced the type of metacognitive awareness that students developed. Metacognitive awareness is best viewed as a complex, multifaceted rather than a static construct; students can be well-versed in one aspect (e.g., declarative knowledge), but not so strong on the other (e.g., procedural or conditional application).

Test anxiety is a situationally evoked syndrome of cognitive concern, physiological activation, and avoidance behaviors associated with academic assessment that can hinder a student's ability to perform over the course of his school career (Zeidner, 2023). Test anxiety can result in poor performance, which is likely to lead to more anxiety and fear before the next test (Nie et al.,

2022). It has been a major focus of educational psychology for decades (Spielberger, 1966, 1980; Zeidner, 1998), and test anxiety has been clearly differentiated from general anxiety, which has reliably been linked to evaluative contexts, as well as to performance anxiety, which is more specifically linked to educational contexts (von der Embse & Witmer, 2022).

Academic achievement is defined as any type of success in formal education that can be quantified in terms of knowledge, skills and metacognition (measured by examinations, tasks and accumulated indices such as GPA) (Fuchs et al., 2023). Academic achievement is measured by students' GPA of the last completed semester or year, selected because it is reliable, ecologically valid, and not as likely to be influenced by the immediate impact of test anxiety on students as single, high-stakes tests (Fuchs et al., 2023).

Objectives of the Study

The following were the objectives of the study:

- To determine the overall level of metacognitive awareness among secondary school students, evaluating key sub-dimensions.
- To evaluate the prevalence and severity of test anxiety experienced by secondary school students, identifying prominent cognitive-evaluative concerns and physiological-somatic symptoms.
- To assess the academic performance profile of secondary school students using objective examination records from recent major evaluations.
- To examine potential differences in metacognitive awareness and test anxiety levels across demographic and institutional variables.

Methodology of the Study

The present section summarizes the quantitative research methodology used for assessing levels of metacognitive awareness, test anxiety, and academic achievement of secondary school students in Pakistan with reference to those appearing in Secondary School Certificate (SSC) examinations conducted by the BISE Sargodha. A survey design was used, and the instruments used for measuring test anxiety and metacognitive awareness were self-report questionnaires, while

academic achievement was measured by students' cumulative Grade Point Average (GPA). The data analysis was descriptive in type (frequencies, percentages, mean, and standard deviation), which was used to determine the levels of the study variables.

Research Design

This study used a quantitative survey design. The non-experimental approach was used to assess the levels of the study variables as they happen in nature without manipulation by the researcher (Creswell & Creswell, 2018). Descriptive analyses were carried out to find out the levels of metacognitive awareness, test anxiety, and academic achievement of secondary school students.

Population and Sample

The accessible population in the study consisted of all students of grades 9 and 10 enrolled in public and private secondary schools affiliated with the Board of Intermediate and Secondary Education (BISE) Sargodha in Sargodha district. Students in this category are a very important group of students who are preparing for their high-stakes Secondary School Certificate (SSC) exams, which are held under significant academic and high-test anxiety conditions. This accessible population was sampled using a multi-stage sampling strategy. In the first stage, Sargodha district was selected for participation. In the second stage, three tehsils of the district of Sargodha were randomly selected to get geographical coverage and representation of both urban and rural educational scenarios. Four public schools and four private schools were selected from each tehsil randomly, totaling 24 schools. In the last phase, 420 students from 9th and 10th grade of different schools were selected randomly as participants for this study, from which 20 male and 15 female students from each public and private school were selected. After excluding all respondents who had not completed the questionnaire and had invalid answers, 355 respondents (approximately 84.5%) were finally selected for the analysis. The number of participants included in the final sample consisted of 210 boys and 145 girls, that is, a total of 355 students. Regarding grade, 162 students (45.6%) were in Grade 9 and 193 (54.4%) were in Grade 10. With respect to school type, 188 students

(53.0%) were from public schools, and 167 students (47.0%) were from private schools.

Research Instruments

Two self-report instruments were modified from previously validated questionnaires and the existing literature and used to assess three variables, along with objective academic records, including the Meta-cognitive Awareness (MA) Scale to measure the students' meta-cognitive awareness. There were 20 items on the scale, with 10 items on each of two dimensions, Knowledge of Cognition (Items A1–A10) and Regulation of Cognition (Items A11–A20). Yes, or No answers were given on a Likert scale from 1 (Never) to 5 (Always). The Test Anxiety Scale was used to measure test anxiety. The instrument comprised 20 dimensions in three factor categories: Worry (Items B1–B7), Emotionality (Items B8–B14), and Cognitive Interference (Items B15–B20). The items were measured on a Likert scale (Never = 1, Seldom = 2, Sometimes = 3, Often = 4, Always = 5). Academic achievement was measured by the official SSC examination record of BISE Sargodha. An objective measure was used to determine student performance based on the percentage of results from the most recent annual evaluation.

The validity and reliability of the instruments were tested. The content validity of the questionnaire was obtained by translating it into the Urdu language to ensure cultural and linguistic appropriateness. Seven experts in the areas of educational psychology, research methodology, psychometrics and secondary education validated the instruments with respect to their relevance, clarity, redundancy, linguistic appropriateness and theoretical congruence. From the feedback received, unnecessary items and overlapping items were eliminated, personal pronouns and questions were changed, while abstract constructions were translated into clear declarative statements that would be understandable to secondary-school students.

Internal consistency was good; the average time to complete was 20-25 minutes, and the item comprehension was adequate, as found in a pilot study with 30 students in Grades 9 and 10 from a non-sample school. Cronbach's alpha coefficient for the 20-item metacognitive awareness scale and the 10-item test anxiety scale were .819 and .795,

respectively, which suggested acceptable reliability for the main study.

Data Collection Procedure

Permission was sought from the appropriate educational bodies and school authorities for data collection. The questionnaires were completed in a paper-and-pencil format in a classroom at school during regular school hours. The subjects were made familiar with the purpose of the study, given assurances of the confidentiality of their answers and reminded that participation was a matter of their own choice before they were administered. The answers in the students' questionnaires were then correlated with students' official examination scores by anonymous numbers to ensure confidentiality. Questionnaires were administered to the students in the classroom after seeking formal permission from educational authorities and the school administration. Participation was voluntary and anonymous.

Findings of the Study

The statistical analyses were conducted using SPSS Version 26, while the calculations for Frequency, Percentage, Mean, and Standard Deviation were utilized in examining the level of all variables involved in the study, such as metacognitive awareness, test anxiety, and academic achievement.

Demographic Profile

The 355 participants were seen as having a demographic profile consisting of mostly male respondents, average students, and low socio-economic status students. For instance, the male participants comprised 59.2%, while female participants comprised 40.8%. In terms of the grades represented, there was a relatively even representation (proportional representation), as grade ten had fewer students compared to grade nine, at 54.4% and 45.6%, respectively. Public schools (53.0%) provided slightly more participants than private schools (47.0%). Furthermore, in terms of the educational attainment levels of the parents, a moderate socio-economic status is evident, as the majority of fathers (49.9%) and the majority of mothers (60.0%) had completed only matric or 10th grade, and a small proportion of parents (i.e., <25%) hold a bachelor's degree or greater. When considering the educational attainment of fathers and mothers

at or above the intermediate level, it is apparent that mothers represented lower numbers than fathers. Furthermore, the academic performance of this study sample was above average; specifically, the vast majority (i.e., >3/4 of participants; 76.0%) achieved a score of 60% or greater on their last major exam, and of that, approximately 40.8% achieved a score greater than 80%. Only a small proportion of respondents (7.3%) assessed had a score of <40%, thereby

completing the demographic profile characteristically identified for this study sample.

Therefore, this study sample is characterized by a male gender bias, modest parental education levels, and strong educational performance; however, precautions should be taken when generalizing the findings to female students and low-performing populations.

Frequency Analysis of Metacognitive Awareness (MA)

The following was the frequency Analysis of Metacognitive Awareness (MA):

Table 1: Frequency Analysis of Metacognitive Awareness (MA)

Sr#	Statements	Disagreement Zone		Total Disagreement	N	Agreement Zone		Total Agreement	Result
		SDA	DA			A	SA		
1	Before studying, I set specific learning goals for myself	13 (3.7%)	50 (14.1%)	63 (17.8%)	98 (27.6%)	94 (26.5%)	100 (28.2%)	292 (82.3%)	Agreement
2	I plan my study sessions to cover important topics effectively.	21 (5.9%)	30 (8.5%)	51 (14.4%)	86 (24.2%)	114 (32.1%)	104 (29.3%)	304 (85.6%)	Agreement
3	I think about the best strategies to learn difficult material.	36 (10.1%)	21 (5.9%)	57 (16%)	60 (16.9%)	73 (20.6%)	165 (46.5%)	298 (84%)	Agreement
4	I break down complex topics into smaller, manageable parts.	23 (6.5%)	25 (7.0%)	48 (13.5%)	56 (15.8%)	117 (33.0%)	134 (37.7%)	307 (86.5%)	Agreement
5	I set deadlines for completing my study tasks.	55 (15.5%)	33 (9.3%)	88 (24.8%)	72 (20.3%)	69 (19.4%)	126 (35.5%)	267 (75.2%)	Agreement
6	While studying, I regularly check if I understand the material.	24 (6.8%)	34 (9.6%)	58 (16.4%)	76 (21.4%)	104 (29.3%)	117 (33.0%)	297 (83.7%)	Agreement
7	I pause during study to assess whether I am meeting my goals.	24 (6.8%)	32 (9.0%)	56 (15.8%)	96 (27.0%)	124 (34.9%)	79 (22.3%)	299 (84.2%)	Agreement
8	I notice when my attention wanders and guide it back to the task.	24 (6.8%)	35 (9.9%)	59 (16.7%)	120 (33.8%)	94 (26.5%)	82 (23.1%)	296 (83.4%)	Agreement
9	I ask myself questions to check my comprehension	31 (8.7%)	44 (12.4%)	75 (21.4%)	93 (26.2%)	71 (20.0%)	116 (32.7%)	280 (78.7%)	Agreement
10	I keep track of my progress toward my learning goals.	15 (4.2%)	25 (7.0%)	40 (11.2%)	90 (25.4%)	108 (30.4%)	117 (33.0%)	315 (88.8%)	Agreement
11	After a study session, I thought about how well my methods	28 (7.9%)	73 (20.6%)	101 (28.5%)	69 (19.4%)	99 (27.9%)	86 (24.2%)	254 (71.5%)	Agreement

	worked.							
12	I regularly evaluate the effectiveness of my study methods.	26 (7.3%)	37 (10.4%)	63 (17.7%)	88 (24.8%)	93 (26.2%)	111 (31.3%)	292 (82.3%) Agreement
13	I compare my performance with my expectations to identify gaps.	23 (6.5%)	53 (14.9%)	76 (21.4%)	92 (25.9%)	91 (25.6%)	96 (27.0%)	279 (78.5%) Agreement
14	I reflect on what I could do differently to learn better next time.	18 (5.1%)	48 (13.5%)	66 (18.5%)	70 (19.7%)	104 (29.3%)	115 (32.4%)	289 (81.4%) Agreement
15	I review my past mistakes to avoid repeating them.	7 (2.0%)	24 (6.8%)	31 (8.8%)	64 (18.0%)	103 (29.0%)	157 (44.2%)	324 (91.2%) Agreement
16	If I don't understand something, I change my study strategy.	19 (5.4%)	49 (13.8%)	68 (19.2%)	82 (23.1%)	116 (32.7%)	89 (25.1%)	287 (80.9%) Agreement
17	I use feedback from teachers to improve my study habits.	16 (4.5%)	33 (9.3%)	49 (13.8%)	75 (21.1%)	100 (28.2%)	131 (36.9%)	306 (86.2%) Agreement
18	I stay motivated by reminding myself of my academic goals.	20 (5.6%)	54 (15.2%)	74 (20.8%)	81 (22.8%)	91 (25.6%)	109 (30.7%)	281 (79.1%) Agreement
19	I manage my study environment to minimize distractions.	30 (8.5%)	31 (8.7%)	61 (17.2%)	101 (28.5%)	67 (18.9%)	126 (35.5%)	294 (82.9%) Agreement
20	I adjust my schedule if my initial plan isn't working well.	33 (9.3%)	41 (11.5%)	74 (20.8%)	110 (31.0%)	89 (25.1%)	82 (23.1%)	281 (79.2%) Agreement

Table 1 shows the percentage of agreement for the 20 items, ranging from 71.5% to 91.2%. Students demonstrated good reflection and planning skills in reviewing past mistakes (91.2%), monitoring progress towards goals (88.8%), and planning study time around key material (85.6%). Tasks completed using deadlines (75.2%) and reflection on the effectiveness of study (71.5%) were the

weaker points, with the highest disagreement, respectively, being 15.5%. Neutral/unsure responses were between 16–34%, indicating a certain inconsistency in attention-regulation strategies. In general, pupils consider themselves strategic learners, with some areas for development in terms of self-evaluation and time-management strategies.

Frequency Analysis of Test Anxiety (TA)

The following was the frequency Analysis of Test Anxiety (TA):

Table 2: Frequency Analysis of Test Anxiety (TA)

Sr#	Statements	Disagreement Zone		Total Disagreement	N	Agreement Zone		Total Agreement	Result
		SDA	DA			A	SA		
1	I often think I will fail even before the exam starts.	117 (33.0%)	47 (13.2%)	164 (46.2%)	62 (17.5%)	58 (16.3%)	71 (20.0%)	191 (53.8%)	Agreement
2	I worry that my performance will not meet my own standards.	51 (14.4%)	44 (12.4%)	95 (26.8%)	74 (20.8%)	97 (27.3%)	89 (25.1%)	260 (73.2%)	Agreement
3	I worry about how others (teachers, family) will judge my test result.	59 (16.6%)	37 (10.4%)	96 (27%)	78 (22.0%)	75 (21.1%)	106 (29.9%)	259 (73%)	Agreement
4	My heart beats very fast when I get an exam paper.	80 (22.5%)	35 (9.9%)	115 (32.4%)	50 (14.1%)	64 (18.0%)	126 (35.5%)	240 (67.6%)	Agreement
5	My hands feel shaky or sweaty during exams.	93 (26.2%)	57 (16.1%)	150 (42.3%)	80 (22.5%)	56 (15.8%)	69 (19.4%)	205 (57.7%)	Agreement
6	Irrelevant thoughts pop into my head and distract me during the exam	69 (19.4%)	75 (21.1%)	144 (40.5%)	79 (22.3%)	70 (19.7%)	62 (17.5%)	211 (50.5%)	Agreement
7	My mind goes blank during exams	67 (18.9%)	98 (27.6%)	165 (46.5%)	72 (20.3%)	67 (18.9%)	51 (14.4%)	190 (53.6%)	Agreement
8	I find it hard to recall simple facts under pressure.	48 (13.5%)	81 (22.8%)	129 (36.3%)	68 (19.2%)	85 (23.9%)	73 (20.6%)	226 (63.4%)	Agreement
9	I doubt my ability to do well on exams	78 (22.0%)	59 (16.6%)	137 (38.6%)	72 (20.3%)	70 (22.3%)	67 (18.9%)	209 (61.5%)	Agreement
10	I feel unprepared even when I have studied	68 (19.2%)	52 (14.6%)	120 (33.8%)	65 (18.3%)	70 (19.7%)	100 (28.2%)	235 (66.2%)	Agreement

Table 2 indicates that students have a moderate test anxiety problem for the 10 items, with 50.5% to 73.2% agreement. The top-rated concerns were cognitive/social: not meeting their own standards (73.2%) and fear of others' judgment (73.0%), followed by physical: fast heartbeat (67.6%) and feeling unprepared despite studying (66.2%). The least endorsed was the occurrence of irrelevant thoughts interfering with cognition during the exam (50.5%). There was little disagreement on

some questions (e.g., 46.2% did not fear failing beforehand), and neutral responses were low (14.1%–22.5%), indicating that students had definite opinions on most questions. In general, test anxiety is a prevalent but not universal phenomenon, with about 30-45% of students (depending on the symptom) experiencing little to no anxiety, and anxiety mainly about self-judgment and social evaluation rather than severe physical or cognitive failure.

Academic Performance Distribution (N = 355)

The following is the Academic Performance Distribution (N = 355):

Table 3: *Academic Performance Distribution (N = 355)*

Marks Range (Last Major Exam)	Frequency (f)	Percentage (%)
Above 80%	145	40.8%
60% – 80%	125	35.2%
40% – 60%	59	16.6%
Below 40%	26	7.3%
Total	355	100.0%

Table 3 below provides insight into the distribution of academic performance of the participants (N=355) of the study with regard to the score from their last major exam. From the results presented in the table, it can be deduced that the majority of the respondents performed excellently because more than three-quarters (76.0%, n=270) scored 60% or higher. The

biggest group was the high performers whose scores were above 80% (40.8%, n=145), and the next group consisted of the participants who had scores within the range of 60% - 80% (35.2%, n=125). The moderate performers whose scores were between 40% and 60% were 16.6% (n=59). On the other hand, a few of them scored below 40% (7.3%, n=26).

Means, Standard Deviations, Interpretations, and Rankings of Metacognitive Awareness

The following were the means, standard deviations, interpretations, and rankings of Metacognitive Awareness

Table 4: *Means, Standard Deviations, Interpretations, and Rankings of Metacognitive Awareness (N=355)*

Item No.	Statement	Mean	Std. Deviation	Interpretation	Rank
1	I review my past mistakes to avoid repeating them.	4.07	1.034	High	1 st
2	I break down complex topics into smaller, manageable parts.	3.88	1.179	High	2 nd
3	I think about the best strategies to learn difficult material.	3.87	1.331	High	3 rd
4	I use feedback from teachers to improve my study habits.	3.84	1.155	High	4 th
5	I keep track of my progress toward my learning goals.	3.81	1.101	High	5 th
6	While studying, I regularly check if I understand the material.	3.72	1.209	High	6 th
7	I plan my study sessions to cover important topics effectively.	3.70	1.150	High	7 th
8	I reflect on what I could do differently to learn better next time.	3.70	1.198	High	8 th
9	I evaluate the effectiveness of my study methods regularly.	3.64	1.228	Moderate (borderline High)	9 th
10	I manage my study environment to minimize distractions.	3.64	1.275	Moderate (borderline)	10 th

				High)	
11	Before studying, I set specific learning goals for myself.	3.61	1.143	Moderate	11 th
12	I stay motivated by reminding myself of my academic goals.	3.61	1.225	Moderate	12 th
13	If I don't understand something, I change my study strategy.	3.58	1.160	Moderate	13 th
14	I pause during study to assess whether I am meeting my goals.	3.57	1.131	Moderate	14 th
15	I ask myself questions to check my comprehension.	3.55	1.295	Moderate	15 th
16	I compare my performance with my expectations to identify gaps.	3.52	1.217	Moderate	16 th
17	I set deadlines for completing my study tasks.	3.50	1.443	Moderate	17 th
18	I notice when my attention wanders and guide it back to the task.	3.49	1.148	Moderate	18 th
19	I adjust my schedule if my initial plan isn't working well.	3.41	1.224	Moderate	19 th
20	After a study session, I thought about how well my methods worked.	3.40	1.270	Moderate	20 th

Table 4 shows that the students' mean scores for the items ranged from moderate to high metacognitive awareness, with a mean score of 3.40 to 4.07 for each item. The most important was 'review past mistakes' (M = 4.07), followed by 'break down complex topics', 'strategizing', 'teacher's feedback', and 'tracking progress'. The

lowest ratings were given on noticing attention wandering (M = 3.49), adjusting study schedules (M = 3.41), and post-study evaluation (M = 3.40), indicating that these items represent relatively low points. The range of opinion was moderate to high (SD 1.034–1.443) for all, except study deadlines, which showed the lowest level of agreement.

Means, Standard Deviations, Interpretations, And Rankings of Test Anxiety

The following were the means, standard deviations, interpretations, and rankings of Test Anxiety:

Table 5: Means, Standard Deviations, Interpretations, and Rankings of Test Anxiety (N=355)

Item No.	Statement	Mean	Std. Deviation	Interpretation	Ranking
21	I often think I will fail even before the exam starts.	2.77	1.539	Moderate	8 th
22	I worry that my performance will not meet my own standards.	3.36	1.359	Moderate	2 nd
23	I worry about how others (teachers, family) will judge my test result.	3.37	1.429	Moderate	1 st
24	My heart beats very fast when I get an exam paper.	3.34	1.578	Moderate	3 rd
25	My hands feel shaky or sweaty during exams.	2.86	1.460	Moderate	7 th
26	Irrelevant thoughts pop into my head and distract me during the exam.	2.95	1.374	Moderate	6 th
27	My mind goes blank during exams.	2.82	1.330	Moderate	9 th
28	I find it hard to recall simple facts under pressure.	3.15	1.346	Moderate	4 th
29	I doubt my ability to do well on exams.	2.99	1.424	Moderate	5 th
30	I feel unprepared even when I have studied.	3.23	1.480	Moderate	3 rd (tie)

Table 5 shows that test anxiety is moderate among students, with mean scores ranging from 2.77 (lowest) to 3.37 (highest). The most prominent anxiety is "I worry how others (teachers, family) will judge my test result" ($M = 3.37$), and the next anxiety is "I worry that my performance will not meet my own standards" ($M = 3.36$). The lowest rank is "I often think I will fail even before the exam starts" ($M = 2.77$), which is still in the moderate range. Standard deviations (1.330 to 1.578) reflect a moderate amount of variability in responses.

Discussion

The main objective of this study is the evaluation of the degree of metacognitive awareness, test anxiety and academic performance of the secondary school students of District Sargodha, Punjab, Pakistan. The findings of this study are based on the theories of cognitive psychology and self-regulated learning. In light of the results obtained from this study, one may conclude that there is a reasonably good metacognitive awareness of the secondary school students, along with a moderate degree of test anxiety and relatively good academic performance by the students. These results are consistent with the theoretical assumption that adolescent learners use self-regulatory cognitive strategies despite the stress involved in the evaluative process.

The relatively high level of awareness of metacognition suggests that secondary school learners in this study sample make use of cognitive monitoring and strategy use while studying. Analysis at an item level suggests that learners showed the highest levels of reflection on past mistakes to avoid making similar mistakes, decomposition of complex issues into more digestible pieces, selection of learning strategies for hard subjects, and inclusion of teacher feedback in the process. Such strengths relate to the key aspects of metacognitive knowledge and procedural regulation, where learners use declarative and conditional knowledge to arrange their tasks (Flavell, 1979; Jacobs & Paris, 1987). There is empirical support that monitoring and evaluation aspects of metacognition are highly correlated with academic achievement among children and adolescents (Dent & Koenka, 2016).

In contrast, there were some weaknesses that

could be noted concerning post-session analysis of the effectiveness of study strategies, adaptation of the study schedule in case the initially chosen one does not work, and management of attention control in real time in case it gets distracted. These are high-level executive regulation and self-monitoring tasks that often develop later than basic strategy implementation. In terms of neurodevelopment, the prefrontal cortex responsible for monitoring functions matures significantly during adolescence (Blakemore, 2018). Therefore, although secondary school students can implement standard studying strategies regularly, they face higher cognitive load during their dynamic evaluation and adjustment.

As far as test anxiety is concerned, the results revealed a moderately high level of this phenomenon among the students. Notably, the greatest concerns had a social-evaluative and self-referent character: the apprehension of judgment of other people and fear of not living up to one's own performance standards. Moreover, physiological sensations (for example, a fast heartbeat and lack of readiness despite studying) were moderately high, while the anticipation of failure before the test was the least frequently endorsed concern. This corresponds to the Control-Value Theory of Achievement Emotions by Pekrun (2006), according to which evaluative anxiety is determined by the subjective threat of self-worth and socio-cultural demands. The focus on social evaluation and parental standards is in line with the findings from the South Asian education system characterized by a high-stakes environment and parental expectations (von der Embse et al., 2018).

The demographic characteristics and description further reinforce the fact that performance in academics was generally good. Nevertheless, the sample consisted of a few demographic characteristics, such as a predominance of males, public schools, and predominance of parents who had matriculated as far as their level of education is concerned. The results from the analysis of demographic subgroups showed that there were no significant differences in the levels of metacognitive awareness between genders, grades, and types of schools. However, test anxiety was significantly different among various institutions and genders. Specifically, females and

students from public schools had higher levels of test anxiety than their counterparts in the other groups.

In conclusion, the findings of the study indicate that students in secondary schools in Sargodha have considerable metacognitive ability, especially regarding planning and error analysis, but they lack scaffolder assistance in their real-time metacognitive evaluation and scheduling. Moreover, even though academic performance is excellent, the problem of social-evaluative test anxiety continues to persist. This information provides important starting points for developing effective dual interventions that will help to develop students' metacognitive evaluation skills and reduce test anxiety at the same time.

Conclusion

This research was conducted to establish the extent to which secondary school students display metacognitive awareness, test anxiety, and academic performance in order to determine the ability of the learners to regulate their cognition amid evaluation. From the results obtained, it is clear that secondary school students possess high levels of metacognitive awareness. The students have high competency in planning tasks, organizing learning materials, and also correcting past mistakes to avoid making similar mistakes again in future. However, there are some aspects of real-time monitoring which they lack.

At the same time, the findings show that the students have a moderate degree of test anxiety. It is not an extreme feeling of pain in the body or fear of absolute failure but rather social evaluation anxiety, including a fear of being evaluated externally by family members or teachers and anxiety about failing to live up to self-imposed performance standards. Moreover, demographic and institutional differences show that female students and students from public schools suffer from higher test anxiety than other students. At the same time, students performed satisfactorily in exams.

Conclusion

Overall, secondary students already have strong foundations when it comes to strategic learning practices; however, what they need is the proper guidance for developing their abilities to reflect on their performance and regulate their emotions.

Educational establishments must take advantage of this information to create reflection activities, formative assessments, and anxiety reduction strategies that will allow the students to develop self-regulation skills.

Recommendations for Educational Practice

The following are the recommendations for educational practice:

- Secondary school educators should incorporate reflective learning logs, self-assessment rubrics, and exit tickets at the conclusion of lessons. These tools directly target the identified relative weakness in post-study evaluation by encouraging students to systematically review whether their chosen study strategies yielded their intended learning outcomes.
- Schools should pair explicit metacognitive strategy instruction with evidence-based emotion-regulation strategies (e.g., cognitive restructuring, mindfulness, and deep breathing techniques). Developing metacognitive awareness without offering anxiety-management mechanisms can heighten a student's distress regarding their academic gaps without providing actionable coping tools.
- Universal anxiety-reduction programs should be embedded into the school curriculum prior to high-stakes examinations. Particular support should be extended to female students and public-school students, who demonstrated significantly higher test anxiety levels.
- Because social-evaluative anxiety—specifically worrying about the judgments of parents and teachers—represented the highest-rated anxiety concern, classroom evaluation should prioritize continuous, low-stakes formative feedback. Reducing the emphasis on single high-stakes tests alleviates evaluative pressure and strengthens learning-oriented self-efficacy.
- Educational policymakers and examination boards should transition away from sole reliance on high-stakes annual examinations toward multi-component evaluation frameworks. Incorporating portfolio-based assessments, continuous coursework evaluations, and multiple diagnostic tests reduces exam-specific threat perceptions.

Directions for Future Research

The following are the directions for future research:

- Future empirical research must use a multilevel longitudinal design or micro-genetic approach to investigate how metacognitive monitoring and test anxiety develop dynamically within an entire academic year rather than using cross-sectional survey methods.
- Additional measures based on objective, real-time recording (e.g., online behavioral traces of study, eye tracking or physiological measures of stress during performance on exams; Hou et al., 2025; Taşkın & Kokoç, 2025; Wei & Sun, 2024) should be employed to complement existing survey instruments for self-reports.
- Future research is required to build structural models to assess other psychological factors – e.g., academic self-efficacy, motivation, teaching quality and expectations of parents and teachers regarding children's achievements – as potential mediators or moderators.
- For the purpose of achieving external validity, future research needs to replicate these study designs in different geographical areas of Pakistan, as well as other developing countries.
- The researchers must conduct randomized controlled trials (RCTs) or quasi-experiments to examine the causality of these particular interventions implemented in schools for diminishing cognitive interference and improving exam scores (Lopes et al., 2023).

Conflict of Interest

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References

- Anthonyamy, L. (2024). Self-regulated learning strategies in digital learning environments: A systematic review. *Educational Technology Research and Development*, 72(1), 115–142. <https://doi.org/10.1007/s11423-023-10291-w>
- Blakemore, S.-J. (2018). *Inventing ourselves: The secret life of the teenage brain*. Doubleday.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Dent, A. L., & Koenka, A. C. (2016). The relation between self-regulated learning and academic achievement across childhood and adolescence: A meta-analysis. *Educational Psychology Review*, 28(3), 425–474. <https://doi.org/10.1007/s10648-015-9320-8>
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906–911. <https://doi.org/10.1037/0003-066X.34.10.906>
- Fuchs, K., Abele, C., & Volodina, A. (2023). Measuring academic achievement across secondary education: Methodological considerations and predictive validity. *Journal of Educational Psychology*, 115(4), 512–530. <https://doi.org/10.1037/edu0000789>
- Hou, L., Zhang, W., Huang, Q., & Zhou, R. (2025). Altered attentional control process of individuals with high test anxiety: An exploratory fMRI study. *Behavioural Brain Research*, 484, Article 115486. <https://doi.org/10.1016/j.bbr.2025.115486>
- Jacobs, J. E., & Paris, S. G. (1987). Children's metacognition about reading: Issues in definition, measurement, and instruction. *Educational Psychologist*, 22(3–4), 255–278. <https://doi.org/10.1080/00461520.1987.9653052>
- Lee, J., & Stankov, L. (2023). Non-cognitive predictors of academic achievement: A large-scale cross-cultural investigation. *Learning and Individual Differences*, 102, Article 102260. <https://doi.org/10.1016/j.lindif.2023.102260>
- Lopes, D., Ferrão, A., Matança, A. F., Almeida, C., Rosário, F., Santos, J., & Santos, M. I. (2023). Intervenção de base cognitivo-comportamental na redução da ansiedade perante os testes em alunos do ensino secundário: Estudo piloto aleatorizado e controlado por clusters [Cognitive behavioural-based intervention in reducing test anxiety in high school students: A pilot cluster randomized controlled trial]. *Acta Médica Portuguesa*, 36(3), 175–183. <https://doi.org/10.20344/amp.18876> Cited by: 4
- Morales-Vives, F., Dueñas, J. M., & Vera, M. (2023). Prefrontal cortex activation during evaluative pressure: Neuroeducational insights into test anxiety and metacognition. *Trends in Neuroscience and Education*, 31, Article 100204. <https://doi.org/10.1016/j.tine.2023.100204>
- Nie, Y., Lau, S., & Liao, A. K. (2022). Test anxiety, cognitive engagement, and academic performance: A longitudinal analysis among secondary students. *Contemporary Educational Psychology*, 69, Article 102061. <https://doi.org/10.1016/j.cedpsych.2022.102061>
- Ohtani, K., & Hisasaka, T. (2018). Beyond intelligence: A meta-analytic review of the relationship among metacognition, intelligence, and academic performance. *Metacognition and Learning*, 13(2), 179–212. <https://doi.org/10.1007/s11409-018-9183-8>
- Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results (Volume I): The state of learning and equity in education*. OECD Publishing. <https://doi.org/10.1787/53f23881-en>
- Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review*, 18(4), 315–341. <https://doi.org/10.1007/s10648-006-9029-9>

- Putwain, D. W., Gallard, D., & Beaumont, J. (2021). A multi-component intervention for reducing test anxiety and improving academic performance in secondary school students. *European Journal of Psychology of Education*, 36(4), 1021–1040. <https://doi.org/10.1007/s10212-020-00511-x>
- Schraw, G., & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review*, 7(4), 351–371. <https://doi.org/10.1007/BF02212307>
- Spielberger, C. D. (1966). Theory and research on anxiety. In C. D. Spielberger (Ed.), *Anxiety and behavior* (pp. 3–20). Academic Press. <https://doi.org/10.1016/B978-1-4832-3131-0.50006-8>
- Spielberger, C. D. (1980). *Test Anxiety Inventory: Preliminary professional manual*. Consulting Psychologists Press.
- Steinmayr, R., Weidinger, A. C., & Wigfield, A. (2022). Predictors of secondary school students' academic achievement: A 3-year longitudinal study. *Child Development*, 93(5), 1420–1438. <https://doi.org/10.1111/cdev.13781>
- Sukarelawan, M. I., Hidayat, P., & Widodo, W. (2024). Study of metacognitive awareness at the individual level of students across study programs using Rasch modeling. *Jurnal Riset dan Kajian Pendidikan Fisika*, 11(1), 32–40. <https://doi.org/10.12928/jrkpf.v11i1.748>
- Taşkın, N., & Kokoç, M. (2025). Unveiling the link between test anxiety, online engagement, and academic achievement: Insights from LMS interaction data. *Interactive Learning Environments*, 33(3), 2374–2389. <https://doi.org/10.1080/10494820.2024.2409406>
- United Nations Educational, Scientific and Cultural Organization. (2023). *Global education monitoring report 2023: Technology in education - A tool on whose terms?* UNESCO Publishing. <https://doi.org/10.54676/J23512>
- von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. *Journal of Affective Disorders*, 227, 483–493. <https://doi.org/10.1016/j.jad.2017.11.048>
- von der Embse, N., & Witmer, S. E. (2022). Differentiating test anxiety from general anxiety in school settings: Implications for screening and intervention. *School Psychology Review*, 51(2), 180–195. <https://doi.org/10.1080/2372966X.2020.1852021>
- Wei, H., & Sun, J. (2024). Examining attentional control deficits in adolescents with test anxiety: An evidential synthesis using self-report, behavioral, and resting-state EEG measures. *Acta Psychologica*, 246, Article 104257. <https://doi.org/10.1016/j.actpsy.2024.104257>
- Zeidner, M. (1998). *Test anxiety: The state of the art*. Plenum Press.
- Zeidner, M. (2014). Test anxiety: Conceptions, findings, and implications for secondary education. *Educational Psychology Review*, 26(4), 511–533. <https://doi.org/10.1007/s10648-014-9278-3>
- Zeidner, M. (2023). Evaluation anxiety in educational contexts: Cognitive, affective, and behavioral mechanisms. *Anxiety, Stress, & Coping*, 36(2), 121–138. <https://doi.org/10.15405/epes.23045.3>
- Zimmerman, B. J. (2013). From cognitive modeling to self-regulation: A social cognitive career path. *Educational Psychologist*, 48(3), 135–147. <https://doi.org/10.1080/00461520.2013.794676>