

Relationship between mathematical anxiety and achievement in mathematics as moderated by coping strategies of grade VI learners

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Abstract

This study examined the relationship between mathematical anxiety and achievement in mathematics as moderated by coping strategies among Grade VI learners in the island schools of San Jose South District, Occidental Mindoro, Philippines, during the school year 2024–2025. A descriptive-correlational design was used, with 115 respondents drawn through stratified fishbowl sampling from a population of 162 learners across five island elementary schools, based on Cochran's formula. Data were gathered using an adapted 10-item Math Anxiety Test and an adapted 81-item Children's Coping Strategy Questionnaire covering fourteen coping-strategy subscales, both of which underwent expert content validation and pilot testing (Cronbach's $\alpha = 0.88$). Achievement in mathematics was taken from learners' second-quarter grades. Data were analyzed using percentage, mean, Spearman rho correlation, and structural equation modeling (SEM) moderation analysis. Results showed that respondents experienced a Moderate level of mathematical anxiety (grand mean = 3.27), particularly around board work and anticipated lesson difficulty, and achieved a Satisfactory level of mathematics performance (composite mean = 82.07), although more than one-third scored at or below the minimum passing standard. A statistically significant moderate negative correlation was found between mathematical anxiety and achievement ($\rho = -0.48$, $p < 0.001$). Learners employed all fourteen coping strategies at a Most-of-the-Time level except Aggressive Actions (Sometimes). SEM moderation analysis revealed that Positive Cognitive Restructuring ($\beta = 0.18$, $p < 0.001$), Support Seeking ($\beta = 0.17$, $p = 0.002$), Self-Calming ($\beta = 0.16$, $p = 0.004$), and Cognitive Decision Making ($\beta = 0.07$, $p = 0.021$) significantly and positively moderated the anxiety–achievement relationship, while Negative Cognition ($\beta = -0.06$, $p = 0.048$) significantly and negatively moderated it. The study concludes that cognitively and emotionally regulative coping strategies buffer the debilitating effect of mathematical anxiety on achievement, providing an empirical basis for targeted school-based guidance and counseling interventions.

Keywords: Achievement in Mathematics; Coping Strategies; Grade VI Learners; Mathematical Anxiety; Structural Equation Modeling

1. Introduction

Mathematics achievement remains a persistent concern in the Philippines, both internationally and locally. Results of the 2022 Programme for International Student Assessment (PISA) placed Filipino 15-year-old students among those exhibiting the highest levels of mathematical anxiety of all participating nations, with the Philippines scoring an average of 355 in mathematics—well below the OECD average of 489 and ranking 77th of 81 participating countries [5,6]. Mathematical anxiety is itself a well-documented global phenomenon rather than a uniquely local one; for instance, a prevalence rate of 11% has been reported among a sample of over 1,700 school children in England [4]. This trend, evident at the national level, is echoed in local assessment data: the Early Language, Literacy, and Numeracy Assessment and the National Achievement Test for Grade VI show that a substantial proportion of learners in Region IV-B and Occidental Mindoro remain at the Low and Nearly Proficient levels in mathematics [11].

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Mathematical anxiety, described as a state of fear, tension, and apprehension experienced when individuals engage with mathematics, has been consistently associated with impaired mathematics achievement [8,9]. It is now understood as a multi-dimensional construct with cognitive and affective components that can manifest as early as the first grade [3] and correlates negatively with achievement across diverse age groups and countries, with meta-analytic evidence placing this relationship in the small-to-moderate range [1]. Contextual factors such as classroom climate and teacher attitudes further shape its prevalence; anxious teachers can transmit anxiety to learners through a phenomenon described in the literature as anxiety contagion [2]. Left unaddressed at the elementary level, mathematical anxiety tends to intensify during secondary education and becomes increasingly resistant to intervention [2,3], making Grade VI—the culminating year of elementary schooling—a pivotal juncture for investigation and intervention.

The relationship between mathematical anxiety and mathematics performance is theoretically explained through complementary mechanisms: anxiety depletes the working-memory resources needed for mathematical problem-solving [13], while poor performance itself can, in turn, generate further anxiety, creating a self-reinforcing cycle of avoidance and underachievement [14,18]. This bidirectional relationship has been documented across age groups and appears even among young children [16], although it is not uniformly experienced; some evidence suggests gender differences in vulnerability to mathematical anxiety [15]. Beyond anxiety itself, motivational and self-regulatory factors—particularly low mathematics self-efficacy and negative cognitive beliefs—have also been linked to poor mathematics performance, even after controlling for prior achievement [17], suggesting that affective and motivational pathways to underachievement, while distinct, may interact and compound one another.

This study is anchored on the Transactional Theory of Stress and Coping (TTSC) of Lazarus and Folkman [19], which frames coping as a dynamic appraisal process in which the impact of a stressor—such as a mathematical task—depends both on the stressor itself and on the individual's available coping resources, and on the Debilitating Anxiety Theory of Alpert and Haber [20], which explains how anxiety interferes with the pre-processing, processing, and retrieval stages of cognitive task performance. Together, these frameworks suggest that whether mathematical anxiety translates into diminished achievement, or is instead effectively managed, depends substantially on the coping strategies a learner employs [21].

Despite growing recognition of mathematical anxiety as a barrier to learning, limited research has examined how specific coping strategies moderate the anxiety–achievement relationship, particularly among elementary learners in geographically isolated and resource-constrained school settings in the Philippines. School guidance counselors play an indispensable role in learners' holistic development, yet their interventions are often designed without empirically grounded knowledge of the coping mechanisms operating in mathematics classrooms [44]. The recent enactment of the Basic Education Mental Health and Well-Being Promotion Act further underscores the growing policy imperative to integrate evidence-based psychosocial support into basic education [45]. Addressing this gap, the present study examined the relationship between mathematical anxiety and achievement in mathematics as moderated by coping strategies among Grade VI learners in the island schools of San Jose South District, Occidental Mindoro, Philippines, during the school year 2024–2025.

Specifically, the study sought to: (1) determine the level of mathematical anxiety of the learners; (2) determine their achievement in mathematics; (3) determine whether a significant relationship exists between the level of mathematical anxiety and achievement in mathematics; (4) determine the extent to which the learners employ fourteen coping strategies—cognitive decision making, direct problem solving, positive cognitive restructuring, expressing feelings, distracting actions, avoidant actions, cognitive avoidance, support seeking, negative cognition, aggressive actions, no coping efforts, withholding feelings, self-calming, and wishful thinking; and (5) determine whether these coping strategies significantly moderate the relationship between the level of mathematical anxiety and achievement in mathematics. It was hypothesized that no significant relationship exists between mathematical anxiety and achievement in mathematics, and that coping strategies do not significantly moderate this relationship.

2. Material and Methods

2.1. Research Design

A descriptive-correlational research design was employed to determine the relationship between the level of mathematical anxiety and achievement in mathematics of Grade VI learners, and to examine whether this relationship was moderated by coping strategies. The design allowed data to be collected at a single point in time and the relationships among variables to be examined without manipulating any factor.

2.2. Study Site

The study was conducted among Grade VI learners enrolled in five island elementary schools of San Jose South District, Occidental Mindoro, Philippines, during the school year 2024–2025: Bangkal Elementary School, Iling Elementary School, Labangan Elementary School, Manga Elementary School, and Ambulong Island Integrated School.

2.3. Population, Sample Size, and Sampling Technique

The population consisted of 162 Grade VI learners across the five island schools. The minimum sample size was computed using Cochran's formula for large populations at the 95% confidence level and 0.05 margin of error, yielding a minimum requirement of 115 respondents. Table 1 presents the population and proportionate sample size per school. Respondents from each school were randomly selected through fishbowl (lottery) sampling.

Table 1 Population and Sample Size

School	Population (SY 2024–2025)	Sample Size
Bangkal Elementary School	28	20
Iling Elementary School	36	25
Labangan Elementary School	32	23
Manga Elementary School	22	16
Ambulong Island Integrated School	44	31
Total	162	115

Of the 115 respondents, 60 (52.17%) were male and 55 (47.83%) were female. Respondents' ages ranged from 11 to 15 years, with the majority (68, 59.13%) aged 11 years, followed by 12 years (32, 27.83%), 13 years (11, 9.57%), 14 years (3, 2.61%), and 15 years (1, 0.87%). By school, respondents were distributed as follows: Bangkal Elementary School, 20 (17.39%); Iling Elementary School, 25 (21.74%); Labangan Elementary School, 23 (20.00%); Manga Elementary School, 16 (13.91%); and Ambulong Island Integrated School, 31 (26.96%).

2.4. Research Instruments

Data were gathered using a three-part researcher-adapted questionnaire translated into Filipino to ensure comprehension among respondents. Part 1 gathered the profile of the learners (age, sex, school). Part 2 measured mathematical anxiety using an adapted 10-item Math Anxiety Test originally developed by Freedman (1997), in which respondents rated each item on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree); mean scores were interpreted as Very Low (1.00–1.80), Low (1.81–2.60), Moderate (2.61–3.40), High (3.41–4.20), or Very High (4.21–5.00). Part 3 measured coping strategies using an adapted 81-item Children's Coping Strategy Questionnaire originally developed by Fedorowicz (1995), covering fourteen subscales: cognitive decision making, direct problem solving, positive cognitive restructuring, expressing feelings, distracting actions, avoidant actions, cognitive avoidance, support seeking, negative cognition, aggressive actions, no coping efforts, withholding feelings, self-calming, and wishful thinking. Items were rated on a four-point scale, interpreted as Never (1.00–1.80), Sometimes (1.81–1.99), Most of the Time (2.00–2.99), or Always (3.00–4.00).

Both instruments underwent content validation by the research adviser and an advisory committee, obtaining an overall mean rating of 4.67 (Excellent). A pilot test was subsequently conducted among 30 Grade VI learners not included in the final sample, yielding a Cronbach's alpha of 0.88, interpreted as good internal consistency. Achievement in mathematics was operationalized as the learners' second-quarter grade in Mathematics for school year 2024–2025, obtained directly from their class advisers and interpreted using the Department of Education's grading scale (Outstanding, 90–100; Very Satisfactory, 85–89; Satisfactory, 80–84; Fairly Satisfactory, 75–79; Did Not Meet Expectations, below 75).

2.5. Data-Gathering Procedure

The researcher first secured ethics clearance from the Open University System–Center for Research Extension. Upon approval, permission to conduct the study was requested from the Schools Division Office of Occidental Mindoro, followed by coordination with the Public Schools District Supervisor, school heads, and class advisers. Prior to data collection, parental or guardian consent was obtained for all respondents, and the purpose, procedures, and rights of

participants were explained to ensure informed and voluntary participation. The research instruments were then administered to the respondents in a single two-hour session per school, preceded by a brief orientation. Confidentiality and anonymity were strictly observed throughout the data-gathering process.

2.6. Statistical Analysis

Data were tabulated, encoded, and analyzed using percentage and mean to describe the profile, level of mathematical anxiety, and extent of coping-strategy use of the respondents. The Spearman rho coefficient of correlation, a non-parametric statistic, was used to determine the significance of the relationship between mathematical anxiety and achievement in mathematics. Structural equation modeling (SEM) moderation analysis was used to test whether coping strategies moderated this relationship, using the model:

$$y = \beta_0 + \beta_1x + \beta_2M + \beta_3xM + \varepsilon$$

where y is achievement in mathematics, x is mathematical anxiety, M is the coping strategy under test, xM is the interaction term between mathematical anxiety and the coping strategy, and ε is the vector of measurement error. A statistically significant interaction coefficient (β_3) indicated that the strength of the anxiety–achievement relationship differed depending on the extent to which a given coping strategy was employed. All hypotheses were tested at the 0.05 level of significance.

3. Results and Discussion

3.1. Level of Mathematical Anxiety of the Respondents

Table 2 Level of Mathematical Anxiety of the Respondents

Statement	Mean	Verbal Interpretation	Level
I cringe when I have to go to math class.	2.88	Neutral	Moderate
I am uneasy about going to the board in a math class.	3.58	Agree	High
I am afraid to ask questions in math class.	3.30	Neutral	Moderate
I am always worried about being called in math class.	3.22	Neutral	Moderate
I understand math now, but I worry that it's going to get really difficult soon.	3.44	Agree	High
I tend to zone out in math class.	3.03	Neutral	Moderate
I fear math tests more than any other kind.	3.19	Neutral	Moderate
I don't know how to study for math tests.	3.37	Neutral	Moderate
It's clear to me in math class, but when I go home it's like I was never there.	3.40	Neutral	Moderate
I'm afraid I won't be able to keep up with the rest of the test.	3.28	Neutral	Moderate
Grand Mean	3.27	Neutral	Moderate

Legend: Very Low (1.00–1.80); Low (1.81–2.60); Moderate (2.61–3.40); High (3.41–4.20); Very High (4.21–5.00).

Table 2 presents the level of mathematical anxiety of the Grade VI learners. Respondents registered High anxiety when performing board work ($\bar{x} = 3.58$) and when anticipating that mathematics will become increasingly difficult ($\bar{x} = 3.44$). The remaining eight items were rated at the Moderate level, with means ranging from 2.88 to 3.40, yielding an overall grand mean of 3.27, interpreted as Moderate.

The prominence of board work as the most anxiety-provoking situation is consistent with the social-evaluative dimension of mathematical anxiety: being called to publicly demonstrate a solution exposes learners' performance to visible peer and teacher scrutiny, a condition intensified in small, close-knit island-school classrooms. The second-highest item—anticipated difficulty of future lessons—reflects an anticipatory dimension of anxiety that is particularly salient for Grade VI learners preparing to transition into junior high school, where compensatory resources such as

tutoring are typically scarce. The overall Moderate grand mean converges with the pattern reported in meta-analytic and systematic-review evidence, in which even moderate levels of mathematical anxiety are already sufficient to meaningfully constrain mathematics performance over time [1,2,7]. These results are consistent with descriptions of mathematical anxiety as a state of fear, tension, and apprehension accompanied by psychological and physiological symptoms such as tension, negative thinking, and avoidance [8,9,10].

3.2. Achievement in Mathematics of the Respondents

Table 3 Frequency and Percentage Distribution of Achievement in Mathematics

Level	Frequency	Percentage	Interpretation
90–100	14	12.17	Outstanding
85–89	25	21.74	Very Satisfactory
80–84	32	27.83	Satisfactory
75–79	37	32.17	Fairly Satisfactory
Below 75	7	6.09	Did Not Meet Expectations
Total	115	100.00	
Composite Mean	82.07		Satisfactory

Table 3 presents the frequency and percentage distribution of achievement in mathematics. Of the 115 respondents, 7 (6.09%) did not meet expectations (below 75), 37 (32.17%) were Fairly Satisfactory (75–79), 32 (27.83%) were Satisfactory (80–84), 25 (21.74%) were Very Satisfactory (85–89), and 14 (12.17%) achieved Outstanding performance (90 and above). The composite mean of 82.07, interpreted as Satisfactory, reflects an acceptable but not exemplary level of performance.

Notably, 38.26% of respondents fell in the Fairly Satisfactory or Did Not Meet Expectations categories—performing at or below the minimum competency threshold. This pattern mirrors regional National Achievement Test results for Grade VI, in which over half of Region IV-B learners fell in the lower proficiency bands. Only 12.17% of respondents achieved Outstanding performance despite the small class sizes characteristic of island schools, which are theoretically conducive to differentiated instruction. This is consistent with prior findings that many learners perform adequately in mathematics but very few reach the highest levels of achievement [12].

3.3. Relationship between the Level of Mathematical Anxiety and Achievement in Mathematics

Table 4 Spearman Rho Coefficient of Correlation between Mathematical Anxiety and Achievement in Mathematics

Variables	Coefficient	Interpretation	p-value	Decision
Achievement in Mathematics × Mathematical Anxiety	–0.48	Negative Correlation Moderate	<0.001	Reject H_0

Note: If the p-value is less than or equal to the level of significance (0.05), the null hypothesis is rejected; otherwise, it is not rejected.

Table 4 presents the results of the Spearman rho coefficient of correlation. The coefficient was –0.48, with a probability of <0.001, indicating a statistically significant, moderately negative relationship between mathematical anxiety and achievement in mathematics. The null hypothesis of no relationship was therefore rejected. A correlation of this magnitude accounts for approximately 23% of the variance in mathematics achievement, indicating that mathematical anxiety is a meaningful, though not singular, determinant of achievement among these learners.

This finding is consistent with evidence that mathematical anxiety consumes working-memory resources needed for problem-solving, thereby impairing concentration and performance [13], and that learners with high mathematical anxiety tend to avoid mathematical tasks, reinforcing a cycle of poor performance and increasing anxiety [14]. The Reduced Competency and Processing Efficiency perspectives jointly explain this bidirectional relationship, in which low performance fosters anxiety and anxiety, in turn, depletes the cognitive resources needed for performance [18]. In geographically isolated school settings where alternative learning opportunities such as tutoring are largely

unavailable, this cycle may be particularly difficult to interrupt, underscoring the importance of school-based, affective interventions targeting mathematical anxiety directly.

3.4. Extent of Coping Strategy Use

Table 5 Extent of Use of Coping Strategies for Mathematical Anxiety

Coping Strategy	Composite Mean	Verbal Interpretation
Cognitive Decision Making	2.80	Most of the Time
Direct Problem Solving	2.82	Most of the Time
Positive Cognitive Restructuring	2.65	Most of the Time
Expressing Feelings	2.26	Most of the Time
Distracting Actions	2.65	Most of the Time
Avoidant Actions	2.36	Most of the Time
Cognitive Avoidance	2.41	Most of the Time
Support Seeking	2.80	Most of the Time
Negative Cognition	2.44	Most of the Time
Aggressive Actions	1.91	Sometimes
No Coping Efforts	2.28	Most of the Time
Withholding Feelings	2.38	Most of the Time
Self-Calming	2.66	Most of the Time
Wishful Thinking	2.61	Most of the Time

Legend: Never (1.00–1.80); Sometimes (1.81–1.99); Most of the Time (2.00–2.99); Always (3.00–4.00).

Table 5 presents the extent to which respondents employed fourteen coping strategies for mathematical anxiety. All strategies were used at the Most-of-the-Time level except Aggressive Actions, which was rated Sometimes ($\bar{x} = 1.91$). Direct Problem Solving obtained the highest composite mean ($\bar{x} = 2.82$), followed by Cognitive Decision Making and Support Seeking (both $\bar{x} = 2.80$), Self-Calming ($\bar{x} = 2.66$), Positive Cognitive Restructuring and Distracting Actions (both $\bar{x} = 2.65$), and Wishful Thinking ($\bar{x} = 2.61$). Item-level analysis showed that the most frequently practiced individual behaviors were deliberate action-taking ("try to make things better by changing what I do," $\bar{x} = 2.95$), deliberate reasoning before acting ("think about what should I do," $\bar{x} = 2.97$), and prayer-centered wishful thinking ("pray for a better outcome," $\bar{x} = 2.97$).

The consistent, spontaneous use of active, cognitive, and relational coping strategies—despite the absence of formal coping instruction in these island schools—suggests that Grade VI learners draw on coping repertoires cultivated by the practical demands of island community life, where deliberate decision making and direct action are everyday necessities [22,23,26,27]. This orientation toward direct, behavioral coping is consistent with evidence that learners facing mathematics-related stress often modify their approach and actively work toward a solution rather than confronting the source of their anxiety head-on [24,25]. Positive cognitive restructuring, the most theoretically salient of the emotion-focused strategies, is consistent with a broadly documented tendency for learners to reframe difficult situations in a positive light, a pattern that has been shown elsewhere to increase motivation to learn mathematics and support academic resilience [28,29].

The moderate use of expressive and distracting strategies further reflects patterns documented elsewhere in the literature: emotional outbursts during mathematics-related distress have been interpreted through the lens of self-determination theory as signals of frustrated psychological needs [32,33], while engagement in enjoyable, low-pressure activities such as games or recreational reading has been shown to provide temporary emotional relief from mathematical anxiety without directly reducing it [34]. Similarly, the moderate but consistent use of avoidant actions is consistent with evidence that avoidance temporarily shields learners from negative emotions but, left unaddressed, can reinforce a cycle of anxiety and underachievement over time [35,36]. The comparatively low use of aggressive actions indicates that most learners do not resort to externalizing or confrontational behaviors when experiencing mathematical anxiety, which is a favorable indicator from a classroom-management standpoint. The predominance of

prayer-based wishful thinking further reflects the influence of faith-based cultural orientations on how these learners process academic stress [42,43].

3.5. Moderation Effects of Coping Strategies on the Relationship between Mathematical Anxiety and Achievement in Mathematics

Table 6 Structural Equation Modeling (SEM) Moderation Results

Coping Strategy	β	SE	t	p	95% CI	Decision
Cognitive Decision Making	0.07	0.03	2.33	0.021	[0.01, 0.13]	Significant (+)
Direct Problem Solving	0.05	0.03	1.67	0.097	[-0.01, 0.11]	Not Significant
Positive Cognitive Restructuring	0.18	0.04	4.09	<0.001	[0.10, 0.26]	Significant (+)
Expressing Feelings	0.04	0.03	1.33	0.186	[-0.02, 0.10]	Not Significant
Distracting Actions	0.02	0.02	1.00	0.319	[-0.02, 0.06]	Not Significant
Avoidant Actions	-0.03	0.03	-1.00	0.319	[-0.09, 0.03]	Not Significant
Cognitive Avoidance	-0.05	0.03	-1.67	0.098	[-0.11, 0.01]	Not Significant
Support Seeking	0.17	0.04	4.25	0.002	[0.08, 0.26]	Significant (+)
Negative Cognition	-0.06	0.03	-2.00	0.048	[-0.12, -0.00]	Significant (-)
Aggressive Actions	-0.04	0.03	-1.33	0.186	[-0.10, 0.02]	Not Significant
No Coping Efforts	0.03	0.03	1.00	0.319	[-0.03, 0.09]	Not Significant
Withholding Feelings	-0.05	0.03	-1.67	0.098	[-0.11, 0.01]	Not Significant
Self-Calming	0.16	0.04	4.00	0.004	[0.08, 0.24]	Significant (+)
Wishful Thinking	0.04	0.03	1.33	0.186	[-0.02, 0.10]	Not Significant

Note: Significant at $p \leq 0.05$. (+) denotes a significant positive moderation effect; (-) denotes a significant negative moderation effect.

Table 6 presents the SEM moderation analysis examining the effects of fourteen coping strategies on the relationship between mathematical anxiety and achievement in mathematics. Five coping strategies produced statistically significant interaction effects: Positive Cognitive Restructuring ($\beta = 0.18$, $SE = 0.04$, $t = 4.09$, $p < 0.001$, 95% CI [0.10, 0.26]); Support Seeking ($\beta = 0.17$, $SE = 0.04$, $t = 4.25$, $p = 0.002$, 95% CI [0.08, 0.26]); Self-Calming ($\beta = 0.16$, $SE = 0.04$, $t = 4.00$, $p = 0.004$, 95% CI [0.08, 0.24]); Cognitive Decision Making ($\beta = 0.07$, $SE = 0.03$, $t = 2.33$, $p = 0.021$, 95% CI [0.01, 0.13]); and Negative Cognition ($\beta = -0.06$, $SE = 0.03$, $t = -2.00$, $p = 0.048$, 95% CI [-0.12, -0.00]). The remaining nine coping strategies did not produce statistically significant moderation effects.

These results reveal a coherent hierarchy of coping effectiveness. The three strongest positive moderators—Positive Cognitive Restructuring, Support Seeking, and Self-Calming—share the feature of directly regulating the cognitive or emotional experience of anxiety itself, either by transforming how learners appraise mathematical situations, mobilizing relational support to reduce perceived threat, or regulating physiological arousal. By comparison, the weakest positive moderator, Cognitive Decision Making, requires deliberate strategic planning, a cognitively demanding process precisely when anxiety is at its peak—consistent with evidence that anxiety competes with working memory for the cognitive resources needed for such deliberate processing [13,18]. The significant positive moderation of Positive Cognitive Restructuring, the strategy learners already practice most naturally among the emotion-focused subscales, aligns with prior evidence that cognitive restructuring techniques are effective in reducing mathematics test anxiety and in replacing maladaptive thought patterns with adaptive ones [30,31]. The significant positive moderation of Support Seeking is consistent with evidence that peer and family support reduce feelings of isolation and improves both anxiety management and achievement [37,38]. Likewise, the protective role of Self-Calming techniques—simple, low-cost, and readily teachable—echoes findings that breathing- and mindfulness-based regulation strategies meaningfully reduce academic stress [40,41].

Conversely, the significant negative moderation of Negative Cognition indicates that self-blaming, catastrophizing, and worry-focused thinking amplify the damaging effect of mathematical anxiety on achievement, consistent with evidence that negative emotional responses are linked to avoidance behaviors and impaired academic performance [39]. The nine non-significant coping strategies—including Direct Problem Solving, Expressing Feelings, Distracting Actions,

Avoidant Actions, Cognitive Avoidance, Aggressive Actions, No Coping Efforts, Withholding Feelings, and Wishful Thinking—should not be interpreted as irrelevant to learners' overall coping repertoire; rather, as currently practiced, these strategies neither meaningfully buffer nor amplify the anxiety–achievement relationship, suggesting that they may be redirected toward more constructive application through guidance and counseling rather than discouraged outright.

Overall, these findings extend the theoretical propositions of the Transactional Theory of Stress and Coping [19] by empirically identifying which specific coping strategies function as protective moderators of the anxiety–achievement relationship among elementary learners, and they lend support to the Debilitating Anxiety Theory's account of how unmanaged cognitive interference—here operationalized as negative cognition—can compound the disruptive effect of anxiety on performance [20]. Some limitations should be noted. The cross-sectional, single-locality design restricts the generalizability of these findings to Grade VI learners from other districts or grade levels, the reliance on self-report instruments introduces the possibility of response bias, and achievement was captured through a single grading period rather than a longitudinal trajectory. Future studies employing longitudinal designs, multi-site samples, and qualitative approaches would help confirm and extend these findings.

4. Conclusion

Grade VI learners in the island schools of San Jose South District, Occidental Mindoro experienced a Moderate level of mathematical anxiety, driven primarily by the social-evaluative demands of board work and anticipatory concerns about increasing lesson difficulty. Their achievement in mathematics was generally Satisfactory, although more than one-third of learners performed at or below the minimum passing standard, indicating that achievement remains a genuine concern in this locale. Mathematical anxiety was found to exert a statistically significant, moderate, negative effect on achievement, confirming that higher anxiety is consistently associated with lower mathematics performance.

Learners naturally drew upon a wide range of coping strategies to manage their anxiety, most frequently through direct problem solving, cognitive decision making, and support seeking, even without prior structured guidance instruction. Importantly, this study contributes new empirical evidence that not all coping strategies function equally as protective buffers: Positive Cognitive Restructuring, Support Seeking, Self-Calming, and Cognitive Decision Making significantly and positively moderated the anxiety–achievement relationship, weakening the negative effect of anxiety on performance, whereas Negative Cognition significantly worsened it. Strategies that are cognitively and emotionally regulative in nature—reframing thoughts, seeking support, calming the body and mind, and deliberate decision making—therefore emerge as the most powerful levers for protecting mathematics achievement from the debilitating effects of anxiety, while passive or maladaptive strategies, despite being frequently practiced, do not meaningfully alter this relationship.

These findings provide school administrators, teachers, and guidance counselors with an evidence-based basis for designing targeted interventions. Curriculum planners and school heads are encouraged to integrate coping-strategy instruction—particularly cognitive restructuring, structured peer- and family-support programs, and brief self-calming routines—into mathematics instruction and school-based guidance and counseling programs, while explicitly addressing self-blaming and catastrophizing thought patterns through attribution-focused counseling. The designation or hiring of qualified guidance counselors in geographically isolated school districts, together with continuing professional development for teachers in basic counseling skills, would help operationalize these findings where formal counseling services remain limited. Future research should extend this investigation to other grade levels, districts, and regions; employ longitudinal designs to trace the development of mathematical anxiety and coping strategies over time; and incorporate qualitative approaches to further contextualize how island-school learners experience and manage mathematical anxiety.

Compliance with Ethical Standards

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Disclosure of Conflict of Interest

The author declares no conflict of interest.

Statement of Ethical Approval

Ethics clearance was obtained from the Open University System–Center for Research Extension, Polytechnic University of the Philippines, prior to data collection. Permission to conduct the study was likewise secured from the Schools Division Office of Occidental Mindoro. The study was conducted in accordance with the ethical principles applicable to research involving minors.

Statement of Informed Consent

Informed parental or guardian consent was obtained for all learner-respondents prior to data collection, and assent was likewise obtained from the learners themselves. Participants were informed of the purpose, procedures, and voluntary nature of the study, and confidentiality and anonymity were maintained throughout.

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