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An Empirical Investigation Of Subject Interest And Emotional Tolerance Among Secondary Students

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Abstract: This study investigated the influence of subject interest on emotional tolerance among secondary school students. Using a descriptive survey design, 135 students from Sree Krishna Higher Secondary School, Guruvayur, Kerala, India, were assessed using a validated 50-item emotional tolerance scale covering five dimensions: tolerance, appraisal, absorption, regulation, and physical versus psychological tolerance. Students were categorized by their primary subject interest: Languages (n=37), Mathematics (n=37), Science (n=31), and Social Studies (n=30). The scale demonstrated excellent reliability (Cronbach's $\alpha = .963$) with significant item-total correlations ($p < .001$). Results revealed no statistically significant differences in emotional tolerance scores across subject interest groups ($H = 3.209$, $p = .360$), with mean scores ranging from 172.51 (Mathematics) to 183.13 (Science). These findings suggest that emotional tolerance levels remain consistent across different academic interests, indicating that subject preference does not significantly influence students' capacity to manage emotional distress. The study contributes to understanding the relationship between academic preferences and emotional regulation in adolescent populations, with implications for educational interventions targeting emotional competence development.

Index Terms - emotional tolerance, distress tolerance, subject interest, secondary school students, adolescent development, academic engagement.

1. INTRODUCTION

Emotional tolerance, conceptually related to distress tolerance, represents a critical psychological construct in understanding adolescent development and well-being. Distress tolerance has been defined as (a) the perceived capacity to withstand negative emotional and/or other aversive states (e.g., physical discomfort) and (b) the behavioral act of withstanding distressing internal states elicited by some type of stressor (Simons & Gaher, 2005). This construct has gained significant attention in recent years due to its implications for mental health, academic success, and overall functioning during the critical developmental period of adolescence.

1.1 Defining Emotional Tolerance in Adolescents

Emotional tolerance in secondary school students can be understood as the ability to experience, withstand, and effectively manage negative emotional states without resorting to maladaptive coping strategies. This capacity is particularly crucial during adolescence, a period characterized by heightened emotional sensitivity and ongoing brain development (Casey, Getz, & Galvan, 2008; Galván, 2010).

The developmental context makes the study of emotional tolerance particularly relevant for secondary school students, who must navigate complex social, academic, and personal challenges while their emotion regulation systems are still maturing. Understanding how emotional tolerance relates to academic preferences and engagement becomes essential for developing targeted educational interventions.

1.2 Dimensions of Emotional Tolerance

Based on extensive research and theoretical frameworks, emotional tolerance in secondary school students encompasses five key dimensions:

1. **Tolerance Dimension**: The perceived ability to experience and tolerate negative emotions, fundamental to maintaining goal-directed behavior during stressful academic and social situations.
2. **Appraisal Dimension**: The subjective assessment of aversive emotions, where negative appraisals of emotions as unbearable or catastrophic can reduce tolerance capacity.
3. **Absorption Dimension**: The level to which negative emotion occupies attention, affecting students' ability to engage in academic tasks or maintain social relationships.
4. **Regulation Dimension**: The degree to which students use strategies to manage emotional distress, including both adaptive (mindfulness, problem-solving) and maladaptive strategies (avoidance, self-harm).
5. **Physical vs. Psychological Tolerance**: The distinction between tolerance of physical discomfort and psychological distress, important for understanding how students manage different types of stressors in school environments.

1.3 Study Objectives and Hypothesis

Despite the growing body of research on emotional tolerance in adolescents, the relationship between students' subject interests and their emotional tolerance remains largely unexplored. This study aims to identify the influence of subject interest on emotional tolerance among secondary school students.

1.4 Hypothesis H01: The distribution of emotional tolerance scores is the same across categories of subject interest (Languages, Mathematics, Science, and Social Studies).

2. LITERATURE REVIEW

2.1 Studies on Emotional Tolerance in Secondary School Students

The construct of emotional tolerance has emerged as a critical factor in understanding adolescent psychological development and academic functioning. Foundational research by Simons and Gaher (2005) established the Distress Tolerance Scale (DTS) through comprehensive studies (N = 642 and N = 823), demonstrating strong psychometric properties and establishing four first-order factors indicative of an overarching distress tolerance construct.

Building upon this foundation, subsequent research has examined distress tolerance specifically in adolescent populations. Cummings, Caporino, and Kendall (2014) proposed that distress tolerance develops across childhood and becomes stable during early adolescence. This developmental trajectory is particularly important given that rates of depressive disorders rise sharply across adolescence (Avenevoli et al., 2015; Kessler et al., 2005).

Recent neurobiological research has provided important insights into the mechanisms underlying emotional tolerance. Del Giacco et al. (2023) conducted a longitudinal study with 40 participants (mean age = 17.5

years) using functional magnetic resonance imaging during an emotional Go-NoGo task. Their findings revealed that greater inferior occipital gyrus activation was associated with less distress tolerance at follow-up, suggesting that individuals who allocate greater visual resources to emotionally salient information tend to exhibit greater challenges in tolerating distress.

The relationship between emotion regulation and academic engagement has been extensively documented. De Neve et al. (2023) examined 136 secondary school students using psychometric network models, revealing that difficulties in emotional awareness, emotional clarity, and access to emotion regulation strategies were differentially related to behavioral and emotional engagement, establishing indirect links with teacher and peer relations.

Gender differences in emotional tolerance have emerged as an important area of investigation. Daughters et al. (2014) found that maternal distress tolerance significantly predicted adolescent distress tolerance in daughters but not sons, suggesting that socialization processes and gender identification play crucial roles in developing emotional tolerance capacities during adolescence.

Cross-cultural validation has expanded our understanding globally. You and Leung (2012) adapted the DTS for Chinese adolescents (N = 5,423, aged 12-19 years), supporting the four-factor structure while noting developmental and cultural variations in emotion regulation processes.

School-based interventions targeting emotion regulation have shown promising results. Pedrini et al. (2022) conducted a systematic review revealing small to moderate effect sizes (d = 0.16 to 0.40) across various intervention approaches, with both cognitive-behavioral therapy and mindfulness-based interventions demonstrating effectiveness.

2.2 Emotional Tolerance and Students' Subject Interests

Despite the importance of emotional tolerance in academic achievement, the relationship between emotional tolerance and students' subject interests remains understudied. Research demonstrates strong connections between emotion regulation and subject-specific outcomes. Pizzie et al. (2021) found that cognitive reappraisal strategies reduced the negative association between physiological arousal and mathematics performance, suggesting that students with better emotional tolerance demonstrate improved engagement in anxiety-inducing subjects.

Gender differences in emotional responses to academic subjects significantly influence engagement patterns. Frenzel, Pekrun, and Goetz (2007) found that female students reported higher anxiety levels in mathematics, correlating with lower interest and achievement. This suggests that emotional tolerance may differentially impact subject preferences across genders, potentially contributing to disparities in STEM fields.

Ben-Eliyahu and Linnenbrink-Garcia (2013) demonstrated that emotion regulation strategies are differently employed based on course preferences, suggesting bidirectional relationships between emotional tolerance and subject interests. This finding highlights the complex interplay between emotional competence and academic preferences.

3. METHODOLOGY

3.1 Research Design

This study employed a descriptive survey design to examine the relationship between subject interest and emotional tolerance among secondary school students.

3.2 Variables

- **Independent Variable**: Subject Interest (Languages, Mathematics, Science, Social Studies)
- **Dependent Variable**: Emotional Tolerance

3.3 Sample

The study included 135 secondary school students from Sree Krishna Higher Secondary School, Guruvayur, Kerala, India, selected through purposive sampling. The sample comprised students with varying subject interests: Languages (n=37, 27.4%), Mathematics (n=37, 27.4%), Science (n=31, 23.0%), and Social Studies (n=30, 22.2%).

3.4 Instruments

A self-developed emotional tolerance questionnaire was constructed comprising 50 items covering the five dimensions of emotional tolerance. The scale underwent rigorous validation through item-total correlation analysis and reliability testing using Cronbach's Alpha.

3.5 Statistical Analysis

Data analysis was conducted using IBM SPSS Statistics (Version 20.0). Statistical techniques included:

- Item-Total Correlation for scale validation
- Cronbach's Alpha for reliability assessment
- Frequency and percentage analysis
- Group-wise descriptive statistics
- Kruskal-Wallis Test for hypothesis testing

4. RESULTS

4.1 Scale Validation

The emotional tolerance scale demonstrated excellent psychometric properties. Table 1 presents the item-total correlations for all 50 items of the scale.

Table 1. *Item-Total Correlations for Emotional Tolerance Scale*

Item	r	p	Item	r	p	Item	r	p	Item	r	p	Item	r	p
I1	.572**	<.001	I11	.564**	<.001	I21	.636**	<.001	I31	.671**	<.001	I41	.511**	<.001
I2	.583**	<.001	I12	.647**	<.001	I22	.454**	<.001	I32	.610**	<.001	I42	.467**	<.001
I3	.538**	<.001	I13	.573**	<.001	I23	.620**	<.001	I33	.622**	<.001	I43	.549**	<.001
I4	.637**	<.001	I14	.720**	<.001	I24	.597**	<.001	I34	.635**	<.001	I44	.576**	<.001
I5	.568**	<.001	I15	.516**	<.001	I25	.543**	<.001	I35	.685**	<.001	I45	.578**	<.001
I6	.642**	<.001	I16	.709**	<.001	I26	.573**	<.001	I36	.713**	<.001	I46	.650**	<.001
I7	.708**	<.001	I17	.605**	<.001	I27	.494**	<.001	I37	.629**	<.001	I47	.687**	<.001
I8	.628**	<.001	I18	.562**	<.001	I28	.603**	<.001	I38	.641**	<.001	I48	.574**	<.001
I9	.600**	<.001	I19	.640**	<.001	I29	.605**	<.001	I39	.567**	<.001	I49	.594**	<.001
I10	.559**	<.001	I20	.615**	<.001	I30	.632**	<.001	I40	.556**	<.001	I50	.578**	<.001

Note. N = 135. **p < .01.

All 50 items showed significant positive correlations with the total score ($p < .001$), with correlation coefficients ranging from .454 to .720, indicating strong item-total relationships.

4.2 Scale Reliability

Table 2 presents the reliability statistics for the emotional tolerance scale.

Table 2 *Reliability Statistics for Emotional Tolerance Scale*

Measure	Value	Number of Items
Cronbach's Alpha	.963	50

The scale achieved high internal consistency with a Cronbach's Alpha of .963, indicating excellent reliability.

4.3 Descriptive Statistics

Table 3 presents the distribution of students across subject interest categories, and Table 4 presents the descriptive statistics for emotional tolerance scores across these groups.

Table 3 *Frequency Distribution of Subject Interest*

Subject Interest	Frequency	Percent	Valid Percent	Cumulative Percent
Languages	37	27.4	27.4	27.4
Mathematics	37	27.4	27.4	54.8
Science	31	23.0	23.0	77.8
Social Studies	30	22.2	22.2	100.0
Total	135	100.0	100.0	

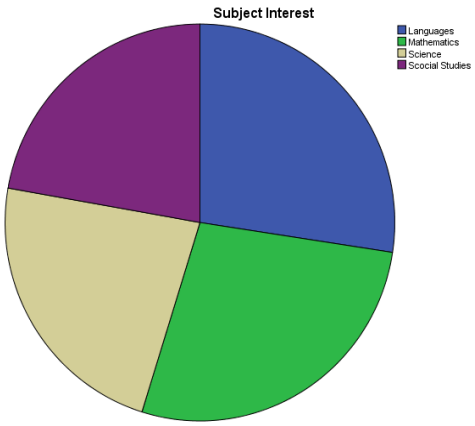
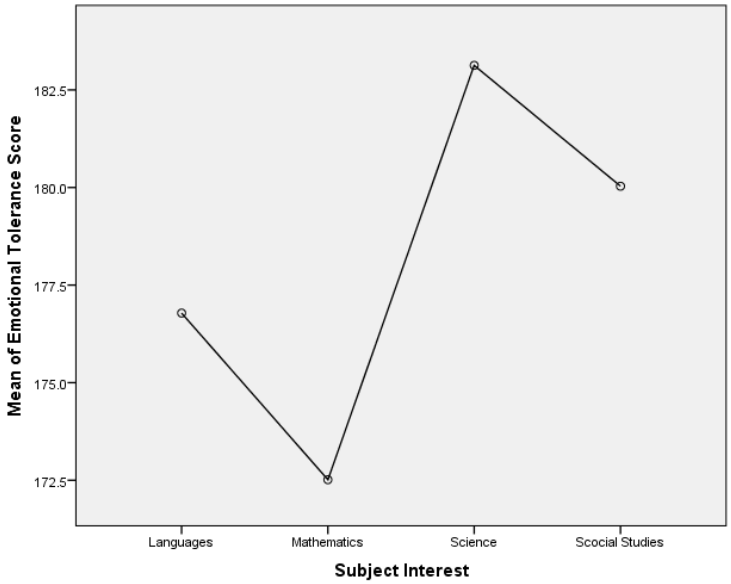


Table 4 *Descriptive Statistics for Emotional Tolerance Scores by Subject Interest*

Subject Interest	n	Mean	SD	SE	Minimum	Maximum
Languages	37	176.78	33.707	5.541	115	250
Mathematics	37	172.51	30.528	5.019	120	250
Science	31	183.13	29.502	5.299	124	250
Social Studies	30	180.03	27.922	5.098	117	250
Total	135	177.79	30.576	2.632	115	250



Science students demonstrated the highest mean emotional tolerance score (M = 183.13), followed by Social Studies (M = 180.03), Languages (M = 176.78), and Mathematics (M = 172.51).

4.4 Hypothesis Testing

The Kruskal-Wallis test was employed to examine differences in emotional tolerance across subject interest groups. Table 5 presents the results of this analysis.

Table 5 *Kruskal-Wallis Test Results for Emotional Tolerance by Subject Interest*

Test Statistic	Value
Kruskal-Wallis H	3.209
df	3
Asymp. Sig.	.360

Note. Grouping variable: Subject Interest

Results indicated no statistically significant difference in emotional tolerance scores across the four subject interest categories (H = 3.209, df = 3, p = .360). Therefore, we fail to reject the null hypothesis, concluding that the distribution of emotional tolerance scores is similar across all subject interest groups.

5. DISCUSSION

The present study investigated the relationship between subject interest and emotional tolerance among secondary school students. The primary finding-that emotional tolerance levels do not significantly differ across subject interest groups-provides important insights into the nature of emotional regulation during adolescence.

5.1 Uniformity of Emotional Tolerance Across Subject Interests

The absence of significant differences in emotional tolerance across subject interests suggests that this psychological capacity may be a more general trait rather than domain-specific. This finding contrasts with previous research suggesting that emotion regulation strategies vary by academic domain (Ben-Eliyahu & Linnenbrink-Garcia, 2013). Several explanations warrant consideration:

First, emotional tolerance may represent a fundamental developmental capacity that transcends specific academic preferences. As Cummings et al. (2014) noted, distress tolerance stabilizes during early adolescence, potentially creating a baseline capacity that operates consistently across different academic contexts.

Second, the slight numerical differences observed-with Science students showing the highest mean scores and Mathematics students the lowest-align with previous findings about math anxiety (Frenzel et al., 2007; Pizzie et al., 2021). However, these differences did not reach statistical significance, suggesting that while subject-specific emotional challenges exist, overall tolerance capacity remains relatively stable.

Implications for Educational Practice

These findings have several important implications for educational interventions. The consistency of emotional tolerance across subject interests suggests that general emotion regulation programs may be equally beneficial for all students, regardless of their academic preferences. Rather than developing subject-specific emotional support programs, schools might focus on comprehensive emotional tolerance training that addresses the five dimensions identified in this study.

The high reliability of the emotional tolerance scale ($\alpha = .963$) supports its potential use as a screening tool in educational settings. Early identification of students with low emotional tolerance could facilitate targeted interventions before academic performance is affected.

5.2 Theoretical Contributions

This study contributes to the theoretical understanding of emotional tolerance by demonstrating its domain-general nature during adolescence. The five-dimensional framework-encompassing tolerance, appraisal, absorption, regulation, and physical versus psychological tolerance-provides a comprehensive model for understanding how students manage emotional challenges across different academic contexts.

6. LIMITATIONS AND FUTURE DIRECTIONS

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inferences about the relationship between subject interest and emotional tolerance. Longitudinal research could illuminate whether emotional tolerance influences subject choices or vice versa.

Second, the sample was drawn from a single school in Kerala, India, potentially limiting generalizability. Future research should include diverse populations across different educational systems and cultural contexts.

Third, subject interest was assessed as a categorical variable based on students' primary preference. Future studies might benefit from examining subject interest as a continuous variable or investigating multiple subject interests simultaneously.

Finally, the study did not examine potential moderating variables such as academic performance, socioeconomic status, or parental support, which might influence the relationship between subject interest and emotional TOLERANCE.

7. CONCLUSION

This study provides empirical evidence that emotional tolerance levels remain consistent across different subject interests among secondary school students. The finding that students interested in Languages, Mathematics, Science, and Social Studies demonstrate similar emotional tolerance capacities suggests that this psychological construct operates as a domain-general skill during adolescence.

The development and validation of a comprehensive 50-item emotional tolerance scale with excellent psychometric properties offers a valuable tool for future research and educational practice. The five-dimensional framework provides a nuanced understanding of how adolescents manage emotional challenges in academic settings.

These findings emphasize the importance of implementing universal emotional tolerance interventions in secondary schools rather than subject-specific approaches. As emotional tolerance appears to be a general capacity that supports academic engagement across all domains, comprehensive programs targeting all five

dimensions-tolerance, appraisal, absorption, regulation, and physical versus psychological tolerance-may benefit all students regardless of their academic interests.

Future research should explore the developmental trajectory of emotional tolerance, investigate potential moderating factors, and examine how interventions might enhance this critical capacity during the vulnerable period of adolescence. Understanding and supporting emotional tolerance development remains crucial for promoting academic success and psychological well-being among secondary school students.

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