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A Structural Equation Modeling Approach to Exploring the Role of Emotional Factors in Student Anxiety amid Public Demonstrations

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ABSTRACT

This study investigates the role of emotional factors in student anxiety amid public demonstrations using a Structural Equation Modeling (SEM) approach. The study focuses on emotional intensity and emotional regulation as key psychological constructs within a socio-political context. The sample consisted of approximately 202 students from the Mathematics Department of the Faculty of Mathematics and Natural Sciences at Universitas Negeri Medan, selected through stratified random sampling. Data were collected using standardized instruments, including the Affect Intensity Measure (AIM), the Emotion Regulation Questionnaire (ERQ), and an adapted student anxiety scale measured on a five-point Likert scale. The SEM analysis indicates that the proposed model achieved an acceptable level of fit based on established goodness-of-fit criteria. However, the findings reveal that environmental stressors related to public demonstrations, emotional intensity, and emotional regulation do not have a significant direct effect on student anxiety. These results suggest the presence of adaptive psychological mechanisms, such as resilience and desensitization, among students in response to recurring socio-political disturbances. This study highlights the importance of considering contextual and psychological complexity when modeling student anxiety using SEM.

INTRODUCTIONS

Students are particularly vulnerable to psychological distress, including anxiety, during the critical transitional phase of university life (Saraswati et al., 2022). Anxiety disorders are among the most prevalent mental health conditions globally, with young individuals being the most affected group (World Health Organization, 2022).

In addition to academic pressures, students are also exposed to external environmental influences arising from socio-political events. Public demonstrations, which frequently occur in urban university settings, may create uncertainty through road congestion, crowd noise, and perceived safety risks (Fauzi et al., 2025). Such conditions function as environmental stressors that can influence individuals' psychological responses (Siswandi & Caninsti, 2020).

However, students do not respond uniformly to environmental stressors. Emotional intensity and emotional regulation are important psychological factors that shape how individuals react to external stimuli (Gross & John, 2003; Gross, 2014). Students with higher emotional sensitivity tend to exhibit stronger emotional reactions, whereas those with better

emotional regulation are more capable of managing psychological pressure (Kraiss et al., 2020).

Despite the growing body of research on student anxiety, most studies have focused primarily on academic stressors, while socio-political environmental factors such as public demonstrations remain underexplored (Triwahyuni & Prasetio, 2021). Furthermore, prior studies often examine these variables separately rather than simultaneously, limiting the understanding of their complex relationships (Majdina et al., 2024).

Therefore, this study aims to examine the impact of public demonstrations as environmental stressors on student anxiety while considering the roles of emotional intensity and emotional regulation. A Structural Equation Modeling (SEM) approach is employed to analyze the simultaneous relationships among these variables within an integrated framework. Structural Equation Modeling (SEM) is a multivariate statistical analysis technique developed to combine factor analysis and path analysis to simultaneously test complex relationships, such as cause-and-effect relationships, among variables that cannot be directly measured and their indicators. (Sholihin & Ratmono, 2021) The use of Structural Equation Modeling allows for the estimation of measurement error and the relationships among multiple dependent and independent variables simultaneously (Westland, 2015). The findings are expected to contribute to the development of student psychological stress models and provide an empirical basis for contextually relevant psychological interventions.

RESEARCH METHOD

This study employed a quantitative approach with a correlational design analyzed using Structural Equation Modeling (SEM). This method was selected because it enables the simultaneous examination of relationships among multiple variables in a measurable and objective manner, as well as allowing generalization to a broader population (Hutahaean & Perdini, 2023). A stratified random sampling technique based on academic programs was applied to ensure proportional representation of each subgroup within the population, thereby enhancing the representativeness and reliability of the data (Majdina et al., 2024).

Data were collected using a structured digital questionnaire measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Likert scale was selected due to its ability to effectively capture variations in respondents' perceptions in psychological research (Dewi & Sudaryanto, 2020). The study included four main variables:

a. Environmental Stressors (X1), defined as students' exposure to public demonstrations around the campus environment, including road congestion, noise disturbances, and perceived safety concerns;
b. Emotional Intensity (X2), measured using the Affect Intensity Measure (AIM) to assess individuals' sensitivity to emotional stimuli (Revelia, 2019);
c. Emotional Regulation (X3), measured using the Emotion Regulation Questionnaire (ERQ), which includes cognitive reappraisal and expressive suppression strategies (Gross & John, 2003); and
d. Student Anxiety (Y), measured using an adapted version of Ryff's Psychological Well-Being Scale to assess students' psychological conditions in response to external stressors (Ryff, 1989).

Data analysis was conducted using Structural Equation Modeling (SEM) with AMOS software, which allows for the simultaneous testing of relationships among latent variables within an integrated model. The analysis followed two main stages in accordance with SEM procedures (Kwak & Kim, 2017).

The first stage involved testing the measurement model using Confirmatory Factor Analysis (CFA) to evaluate the validity and reliability of the indicators. Indicators with standardized factor loadings below 0.50 were removed, as they did not meet the criteria for convergent validity (Mahkotawati et al., 2025).

The second stage involved testing the structural model to examine the relationships among latent variables. The significance of the relationships was assessed using the Critical Ratio (CR) and p-values at a significance level of 0.05 (Mahkotawati et al., 2025).

The goodness-of-fit of the structural model was evaluated using several indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), Goodness-of-Fit Index (GFI), and Adjusted Goodness-of-Fit Index (AGFI), based on established SEM criteria (Kwak & Kim, 2017; Majdina et al., 2024).

Table 1. SEM Model Goodness-of-Fit Criteria

Fit Indices	Marginal Fit	Good Fit Criteria	Model Results
CFI	$\geq$ 0,80	$\geq$ 0,95	0,894
TLI	$\geq$ 0,80	$\geq$ 0,95	0,871
RMSEA	$\leq$ 0,08	$\leq$ 0,05	0,057
GFI	$\geq$ 0,80	$\geq$ 0,90	0,863
AGFI	$\geq$ 0,80	$\geq$ 0,90	0,842

Source: adapted from Majdina et al. (2024)

Based on Table 1, the RMSEA value of 0.057 falls within the acceptable range (≤ 0.08), and the CFI value of 0.894 meets the marginal fit criterion (≥ 0.80) (Kwak & Kim, 2017). The TLI value of 0.871 further indicates an acceptable model fit. Additionally, the GFI (0.863) and AGFI (0.842) values support the conclusion that the model adequately represents the empirical data. Overall, these results indicate that the structural model demonstrates an acceptable level of fit and is suitable for explaining the relationships among environmental stressors, emotional intensity, emotional regulation, and student anxiety (Majdina et al., 2024).

RESEARCH FINDINGS AND DISCUSSION

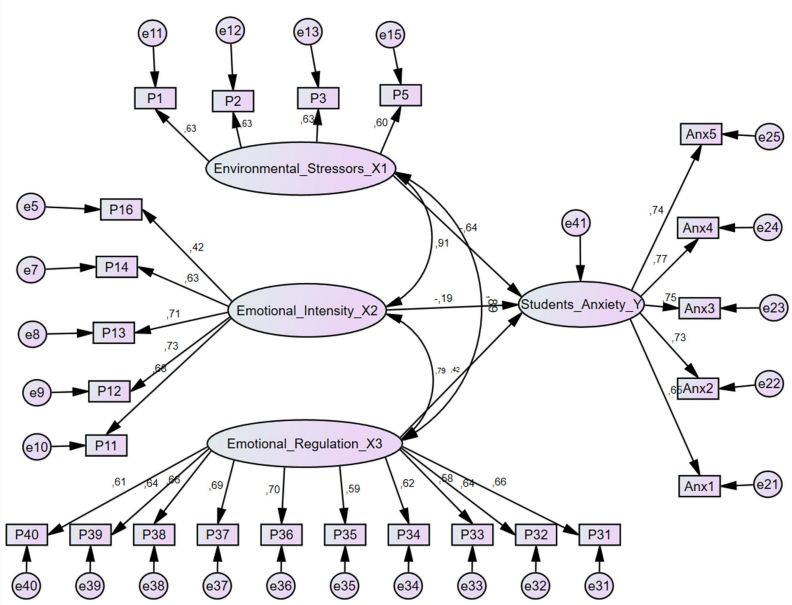
Research Findings

1. Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted as the first stage of SEM analysis to evaluate the convergent validity and internal consistency of the measurement model. During the initial evaluation, iterative respecification was performed to remove

indicators with standardized factor loadings below the threshold of 0.50, as they did not meet the criteria for adequate convergent validity (Mahkotawati et al., 2025).

Image 1. *Standardized Path Diagram* Model Struktural Akhir



Following the respecification process, a total of 24 indicators across four latent variables were retained in the final measurement model. The results indicate that nearly all indicators have standardized factor loadings above 0.50 and are statistically significant, confirming that the measurement model satisfies the criteria for convergent validity, as presented in Table 2.

Table 2. Standardized Loading Factors for the Final

Measurement Model	Indicator	Standardized Loading Factor	Notes
Environmental Stressors (X1)	P1	0,63	Valid
	P2	0,63	Valid
	P3	0,63	Valid
	P5	0,60	Valid
Emotional Intensity (X2)	P16	0,42	Marginal Limit
	P14	0,63	Valid
	P13	0,71	Valid
	P12	0,73	Valid
	P11	0,65	Valid
Emotional Regulation (X3)	P40	0,61	Valid
	P39	0,64	Valid
	P38	0,66	Valid
	P37	0,69	Valid
	P36	0,70	Valid
	P35	0,59	Valid
	P34	0,62	Valid
	P33	0,58	Valid
	P32	0,64	Valid
	P31	0,66	Valid

Students Anxiety (Y)	Anx5	0,74	Valid
	Anx4	0,77	Valid
	Anx3	0,75	Valid
	Anx2	0,73	Valid
	Anx1	0,65	Valid

Source: Output AMOS

One indicator (P16) in the emotional intensity variable exhibited a loading value of 0.42. Although slightly below the recommended threshold, it was retained based on theoretical considerations to preserve the conceptual representation of the construct (Hair et al., 2019). Among all constructs, the student anxiety variable demonstrated the highest consistency, indicating that the adapted measurement instrument has strong reliability within the research context.

2. Model Fit Evaluation (Goodness of Fit)

Prior to hypothesis testing, the overall fit of the structural model was evaluated using several Goodness-of-Fit (GoF) indices. The evaluation results are presented in Table 3.

Table 3. Results of the Structural Model Goodness-of-Fit Index Evaluation

Fit Index	Model Results	Marginal Fit Criteria	Good Fit Criteria	Notes
CFI	0,894	≥ 0,80	≥ 0,95	Marginal Fit
TLI	0,871	≥ 0,80	≥ 0,95	Marginal Fit
RMSEA	0,057	≤ 0,08	≤ 0,05	Marginal Fit
GFI	0,863	≥ 0,80	≥ 0,90	Marginal Fit
AGFI	0,842	≥ 0,80	≥ 0,90	Marginal Fit

Source: Output AMOS

The CFI value of 0.894 and the TLI value of 0.871 exceed the minimum threshold for marginal fit (≥ 0.80), indicating an acceptable level of model fit. The RMSEA value of 0.057 falls within the acceptable range (≤ 0.08), suggesting that the model does not exhibit substantial misfit (Kwak & Kim, 2017). In addition, the GFI (0.863) and AGFI (0.842) values indicate that the model adequately explains the variance and covariance structure of the observed data. Overall, these results suggest that the structural model demonstrates an acceptable level of fit and is suitable for further hypothesis testing (Majdina et al., 2024).

3. Hypothesis Testing (Structural Path Analysis)

Hypothesis testing was conducted by examining the standardized path coefficients, Critical Ratios (CR), and p-values for each structural relationship. A path is considered statistically significant if it meets the criteria of CR ≥ 1.96 and p < 0.05 (Mahkotawati et al., 2025). The results are presented in Table 4.

Table 4. Results of Structural Path Coefficient Testing

Hypothesis Path	Std. Estimate (β)	S.E.	C.R.	*p*-value	Decision
X1 (Env. Stressors) → Y (Anxiety)	−0,64	0,655	−0,965	0,334	H_1 *Rejected*
X2 (Emotional Intensity) → Y (Anxiety)	−0,19	0,617	−0,457	0,647	H_2 *Rejected*
X3 (Emotional Regulation) → Y (Anxiety)	−0,08	0,318	1,254	0,210	H_3 *Rejected*

Source: Output AMOS

The findings indicate that none of the hypothesized relationships are statistically significant. Specifically, environmental stressors (X1), emotional intensity (X2), and emotional regulation (X3) do not have a significant direct effect on student anxiety (Y). Furthermore, the model reveals a strong correlation between environmental stressors (X1) and emotional intensity (X2), indicating a potential multicollinearity issue. This condition may inflate standard errors and reduce the statistical significance of individual path coefficients, even when the variables collectively influence the dependent variable (Hair et al., 2019).

Discussion

1. The Effect of Environmental Stressors on Student Anxiety

The findings indicate that environmental stressors, particularly those related to public demonstrations, do not have a significant direct effect on student anxiety. At first glance, this result appears to contradict classical stress theories, such as the stress appraisal model proposed by Lazarus and Folkman, which suggests that exposure to external stressors typically triggers anxiety responses. However, a deeper interpretation reveals a more nuanced understanding of students' adaptive psychological processes.

One possible explanation for this finding is the presence of adaptive desensitization. Students who are frequently exposed to public demonstrations in urban environments may gradually develop cognitive and emotional coping mechanisms. Repeated exposure to such socio-political disturbances can reduce the perceived threat and unpredictability of the stimulus, thereby weakening its impact on anxiety responses (Siswandi & Caninsti, 2020).

Furthermore, although not statistically significant, the negative direction of the path coefficient suggests that higher exposure to demonstrations may be associated with lower levels of anxiety. This pattern may indicate the development of psychological resilience among students, enabling them to cope more effectively with environmental uncertainty. This finding is consistent with previous studies showing that student anxiety is often more strongly influenced by internal academic pressures than by external environmental disturbances (Triwahyuni & Prasetio, 2021).

2. The Effect of Emotional Intensity on Student Anxiety

The results also indicate that emotional intensity does not have a significant effect on student anxiety. This finding differs from theoretical perspectives suggesting that individuals with higher emotional intensity are more likely to experience increased anxiety when exposed to stressors (Gross & John, 2003).

A key methodological explanation for this result is the presence of multicollinearity between environmental stressors and emotional intensity. The strong correlation between these variables suggests that a substantial portion of the variance in emotional intensity is already explained by environmental stressors. Consequently, the unique contribution of emotional intensity to anxiety becomes statistically insignificant within the model (Hair et al., 2019).

From a substantive perspective, emotional intensity may not necessarily lead to anxiety, but can instead be expressed in alternative psychological responses. In the context of public demonstrations, students with higher emotional intensity may experience engagement, curiosity, or a sense of collective identity rather than anxiety. This suggests that

emotional intensity may manifest as eustress, a form of positive psychological activation rather than distress.

3. The Effect of Emotional Regulation on Student Anxiety

Emotional regulation was also found to have no significant effect on student anxiety. Although previous studies consistently show that effective emotional regulation is associated with lower levels of anxiety (Gross, 2014; Kraiss et al., 2020), this relationship was not observed in the present study.

One possible explanation lies in the characteristics of the study population. As first-year university students, respondents may still be in the early stages of developing emotional regulation skills. Consequently, the variation in emotional regulation capacity may not be sufficiently pronounced to produce significant effects within the SEM model.

Additionally, the ERQ measures emotional regulation by combining both adaptive (cognitive reappraisal) and maladaptive (expressive suppression) strategies. The integration of these opposing mechanisms within a single construct may reduce the overall statistical effect on anxiety, as their influences may counterbalance each other.

Another possible explanation is that emotional regulation tends to play a significant role only when individuals experience stressors that exceed a certain psychological threshold. Since environmental stressors in this study were not perceived as sufficiently threatening, emotional regulation may not have been fully activated as a coping mechanism.

4. Theoretical and Practical Implications

Overall, this study contributes to the development of student stress theory by demonstrating that socio-political environmental stressors, such as public demonstrations, do not necessarily lead to increased anxiety. This finding challenges deterministic assumptions in traditional stress models and highlights the importance of contextual and adaptive psychological mechanisms.

The strong correlation between environmental stressors and emotional intensity also suggests a potential overlap between these constructs, indicating the need for further investigation into their discriminant validity in future research.

From a practical perspective, the findings indicate that students demonstrate a certain level of psychological resilience in coping with environmental disturbances. This suggests that existing formal and informal support systems within the academic environment may already function as effective buffers against anxiety. However, institutions should remain attentive to the possibility that cumulative exposure to stressors may have delayed psychological effects, particularly during periods of increased academic pressure.

CONCLUSION

This study employed Structural Equation Modeling (SEM) to examine the role of emotional factors in student anxiety amid public demonstrations. The findings indicate that environmental stressors related to public demonstrations, emotional intensity, and emotional regulation do not have a significant direct effect on student anxiety.The results further suggest that other contextual or internal factors beyond the scope of this study may play a more substantial role in influencing student anxiety. These findings imply that students may possess adaptive psychological mechanisms, such as resilience and desensitization, which enable them to cope with recurring socio-political disturbances.

From a theoretical perspective, this study contributes to the understanding of student anxiety by emphasizing the importance of contextual and adaptive processes in interpreting the effects of environmental stressors. From a methodological perspective, the use of SEM provides a comprehensive framework for analyzing complex relationships among psychological variables.

Practically, the findings suggest that universities should continue to strengthen psychological support systems while considering both internal and external factors affecting student well-being. Future research is recommended to explore additional variables and alternative modeling approaches to better capture the complexity of student anxiety.

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