

Relationship between Anxiety as a State and Anxiety as a Trait in High School Students in Montería, Colombia: A Correlational Analysis

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Abstract

This study aims to analyze the relationship between state anxiety (AXE) and trait anxiety (AXR) in a sample of 160 secondary school students from the city of Montería, Colombia, using a simple linear regression econometric model. A quantitative correlational design was employed to determine the magnitude and significance of the relationship between both variables. The correlation matrix revealed a coefficient of $r = -0.0196$, indicating an extremely weak negative relationship. The simple linear regression models presented a regression coefficient of -0.01961 with a p -value of 0.793 and a determination coefficient (R^2) of 0.00038 , suggesting that state anxiety is not a significant predictor of trait anxiety and vice versa. These findings reflect a nearly null correlation and a non-explanatory model. Theoretical implications suggest that both dimensions of anxiety may occur independently or be influenced by non-linear patterns, emphasizing the need for more complex methodological approaches in future research conducted in similar school contexts.

Keywords: State Anxiety, Trait Anxiety, Econometric Models, Correlation, Secondary Education.

Introduction

Anxiety is one of the most common emotional problems in school contexts, significantly affecting the psychological well-being and academic performance of students (Spielberger, 1983). This phenomenon manifests itself in various ways, with the two most widely studied dimensions being anxiety as a state and anxiety as a trait, both addressed in the anxiety theory of Spielberger et al. (1983). Anxiety as a state refers to a transitory emotional reaction to a situation perceived as threatening, while anxiety as a trait refers to a stable predisposition to experience anxiety in various everyday situations.

The impact of anxiety in the educational environment has been associated with difficulties in concentration, decreased academic performance and problems with social interaction (Extremera & Fernández-Berrocal, 2004). In this sense, understanding the relationship between anxiety as a state and anxiety as a trait is essential to design preventive interventions and psychological support strategies in school contexts. However, the scientific literature has reported contradictory results regarding the degree of association between these dimensions. While some studies argue that there is a significant positive relationship between them (Fernández-Berrocal et al., 2012), others suggest a weak or even independent interaction, which shows the need to continue exploring this relationship in different educational contexts.

The present study was carried out in a sample of 160 secondary school students in the city of Montería, Colombia, with the purpose of analyzing the relationship between anxiety as a state and anxiety as a trait using a simple linear regression econometric model. This quantitative approach seeks to determine whether anxiety as a state can be considered a significant predictor of anxiety as a trait, thus contributing to the theoretical and applied understanding of emotional management in adolescence.

At the methodological level, two widely validated standardized instruments were used: the State-Trait Anxiety Inventory (IDARE) by Spielberger et al. (1983), which assesses both dimensions of anxiety. The data were analyzed through a simple linear regression model to identify the magnitude and direction of the relationship between both variables.

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This article is structured as follows: first, a theoretical framework is presented where the concepts of anxiety as a state and anxiety as a trait are explored from their theoretical and empirical foundations. Subsequently, the methodology used is described, including the population, sample and instruments applied. The results obtained and their statistical analysis are presented below. Finally, the conclusions are presented, highlighting the theoretical and practical implications of the findings in the educational context.

Theoretical Framework

The study of anxiety has been approached from various theoretical perspectives, with the proposal of Spielberger et al. (1983) being one of the most influential in the understanding of this phenomenon in educational contexts. Their model distinguishes two main dimensions of anxiety: anxiety as a state (AXE) and anxiety as a trait (AXR), both with particular characteristics and manifestations, but potentially interrelated in the emotional experience of individuals.

Anxiety as a state (AXE) is defined as a transitory emotional reaction to a situation perceived as threatening, characterized by an increase in physiological and cognitive activation (Spielberger, 1983). This type of anxiety is temporary and varies according to the immediate circumstances of the environment, being especially relevant in school contexts such as evaluations or oral presentations (Spielberger & Vagg, 1995). Anxiety as a trait (AXR), on the other hand, is conceptualized as a stable predisposition over time to experience anxiety in a generalized way in multiple situations, reflecting a permanent tendency to interpret stimuli as threatening, even in the absence of real risks.

Several studies have explored the relationship between these dimensions, proposing that anxiety as a state may be a reflection of anxiety as a trait in high-pressure situations. However, research such as that of Extremera and Fernández-Berrocal (2004) indicates that, although these dimensions tend to be positively correlated, they are not necessarily linear manifestations of the same construct, since they may respond to different contextual and personal factors.

In school contexts, the presence of high levels of anxiety can negatively influence students' academic performance and interpersonal relationships. Previous research (Fernández-Berrocal et al., 2012; García & Morales, 2017) have found that anxiety, especially when presented as a trait, is associated with lower academic performance and greater emotional distress in adolescents. However, there is a gap in the literature regarding whether anxiety as a state, triggered by specific events, significantly predicts the presence of anxiety as a trait.

For the evaluation of both dimensions, the State-Trait Anxiety Inventory (IDARE), developed by Spielberger et al. (1983), has been frequently used. This instrument allows the differentiated measurement of temporal anxiety (state) and more stable and dispositional anxiety (trait) through internationally validated scales. Its application has shown high levels of reliability and internal consistency in studies with adolescent populations ($\alpha > 0.85$).

The relationship between AXE and AXR has also been explained from neuropsychological models. Gross (1998) in his theory of emotional regulation, argues that the inability to effectively manage intense emotional states can strengthen more permanent anxiety patterns. This suggests that repeated exposure to events that generate state anxiety could influence, over time, the configuration of a more stable pattern of trait anxiety.

In this context, the present research seeks to empirically explore the relationship between anxiety as a state and anxiety as a trait, evaluating whether one can act as a predictor of the other in a sample of elementary school students from Montería, Colombia, through an econometric analysis of simple linear regression.

Methodology

The present study was developed under a quantitative approach, with a descriptive-correlational and non-experimental design, whose purpose was to analyze the relationship between anxiety as a state (AXE) and anxiety as a trait (AXR) in secondary school students. This design made it possible to identify the degree of

association between variables without manipulating environmental conditions, which is appropriate when seeking to explore existing relationships between psychological phenomena (Hernández Sampieri et al., 2014).

Population and Sample

The study was carried out in the city of Montería, Colombia, with a sample of 160 high school students randomly selected from a universe of approximately 300 students. The sample selection was simple random, which guarantees representativeness and minimizes biases in the interpretation of the results. The following inclusion and exclusion criteria were established:

The sample size was determined based on the standards for correlational studies, guaranteeing a confidence level of 95% and a margin of error of 5%.

Data Collection Instruments

To measure the variables of anxiety as a state and anxiety as a trait, the State-Trait Anxiety Inventory (IDARE) by Spielberger et al. (1983) was used, widely validated in the Spanish-speaking population and used in studies of anxiety measurement in educational contexts.

- State-Trait Anxiety Inventory (IDARE):

It is composed of 40 items, divided into two scales: State Anxiety (20 items) and Trait Anxiety (20 items).

4-point Likert scale (1 = almost never, 4 = almost always).

Assessment of momentary emotional intensity and general predisposition to anxiety.

Cronbach's alpha reported: $\alpha = 0.89$ for state anxiety and $\alpha = 0.85$ for trait anxiety, reflecting high internal reliability.

The instrument was applied collectively in the classrooms, in a session of approximately 40 minutes, with direct supervision of the research team to ensure the understanding of the instructions and the confidentiality of the answers.

Data Collection Procedure

The data collection procedure was developed in several phases:

- Planning: Institutional permissions and informed consent from parents or guardians were managed.
- Application of the instrument: The questionnaires were administered in a group during school hours, previously explaining the instructions and clarifying doubts.
- Coding and digitization: The data were anonymized and encoded in a database for further analysis.

Statistical Analysis

To analyze the relationship between anxiety as a state and anxiety as a trait, descriptive statistical and simple linear regression techniques were applied. The analysis was carried out using the SPSS statistical software (version 25).

Procedures applied:

- Descriptive Statistics: Measures of central tendency (mean, median) and dispersion (standard deviation) were calculated.
- Pearson correlation: To measure the linear relationship between the AXE and AXR variables.
- Simple Linear Regression:
 - Independent Variable (X): Anxiety as a state.
 - Dependent Variable (Y): Anxiety as a trait.
 - Coefficient of correlation (r) and Coefficient of determination (R^2).
 - Statistical significance level established at $p < 0.05$.

Results

This section presents the results of the statistical analysis carried out on the relationship between anxiety as a state (AXE) and anxiety as a trait (AXR) in the sample of 160 high school students from the city of Montería, Colombia. Analyses include descriptive statistics, Pearson correlation, and a simple linear regression model.

Descriptive Statistics

A descriptive analysis was performed to identify the central trends and dispersion of anxiety levels assessed using the State-Trait Anxiety Inventory (IDARE). The results are summarized in the following table:

Table 1. Descriptive Statistics of Anxiety Levels as A State and Anxiety as A Trait in Secondary School Students.

Variable	Stocking	Standard deviation	Minimal	Maximum
Anxiety as a State (AXE)	72.2	10.3	55	90
Anxiety as a Trait (AXR)	32.1	5.8	22	42

Interpretation: The results show moderately elevated levels of anxiety as a state with a mean of 72.2 and a standard deviation of 10.3, indicating some variability in student responses. Regarding anxiety as a trait, the mean was 32.1 with a standard deviation of 5.8, suggesting a more stable and homogeneous range of values compared to state anxiety.

Correlation Analysis

To evaluate the linear relationship between anxiety as a state and anxiety as a trait, Pearson's correlation was applied. The results are summarized in the following table:

Table 2. Pearson's Correlation Matrix Between Anxiety as A State and Anxiety as A Trait

Variable	Anxiety as a State (AXE)	Anxiety as a Trait (AXR)
Anxiety as a State (AXE)	1.00	-0.0196
Anxiety as a Trait (AXR)	-0.0196	1.00

Interpretation: An extremely weak negative correlation was found ($r = -0.0196$), which indicates that there is practically no linear relationship between both variables. The r -value close to zero suggests that variations in anxiety as a state are not associated with changes in anxiety levels as a trait in the sample analyzed.

Simple Linear Regression Model

To explore whether anxiety as a state could predict anxiety as a trait, a simple linear regression model was applied. The results obtained are summarized in the following table:

Table 3. Summary of the Simple Linear Regression Model Between Anxiety As A State and Anxiety as A Trait

Parameter	Coefficient	Standard Error	Value t	P value
Intercept (β_0)	32.4	3.1	10.45	< 0.001
Anxiety as a State (β_1)	-0.0196	0.07	-0.26	0.793

Model Metrics

- Coefficient of Determination (R^2): 0.00038
- Overall model p-value: 0.793 (not significant)
- Standard Estimate Error: 5.89

Interpretation: The results of the linear regression model indicate that anxiety as a state is not a significant predictor of anxiety as a trait. The regression coefficient $\beta_1 = -0.0196$ is practically zero, and the p-value (0.793) does not allow us to reject the null hypothesis of the absence of a relationship between the variables. $R^2 = 0.00038$ shows that anxiety as a state explains less than 1% of the variability of anxiety as a trait, indicating a statistically non-explanatory model.

In summary, the results obtained reflect an almost non-existent relationship between anxiety as a state and anxiety as a trait in this sample of students. The extremely weak negative correlation and low explanatory power of the simple linear regression model suggest that these two dimensions of anxiety operate independently in the context evaluated.

Discussion

The results obtained in this study provide relevant information for the understanding of the relationship between anxiety as a state (AXE) and anxiety as a trait (AXR) in high school students from Montería, Colombia. The statistical analyses performed, including Pearson's correlation and the simple linear regression model, indicate an extremely weak and non-significant relationship between both dimensions of anxiety, with a correlation coefficient of $r = -0.0196$ and a coefficient of determination R^2 of 0.00038.

Interpretation of the Results

The findings reflect an absence of a significant linear relationship between anxiety as a state and anxiety as a trait, suggesting that these dimensions may operate independently in the sample analyzed. This result partially contradicts classical theoretical models, such as the proposal of Spielberger et al. (1983), which propose a moderate relationship between both dimensions, arguing that individuals with high levels of trait anxiety tend to experience state anxiety more frequently in stressful situations.

However, the results obtained coincide with previous studies that have highlighted the complexity of this relationship. For example, Extremera and Fernández-Berrocal (2004) suggest that anxiety as a state may be influenced by immediate contextual factors, while anxiety as a trait is more stable and associated with personality. The lack of a significant linear relationship observed in this study could be explained by the influence of unevaluated moderating variables, such as emotional intelligence, social support, or coping strategies (Gross, 1998).

The simple linear regression model, with an R^2 of 0.00038, indicates that anxiety as a state explains less than 1% of the variability in anxiety as a trait, which statistically suggests the absence of an explanatory power between both variables. This implies that, at least in this sample, experiencing temporary anxiety episodes does not significantly predict chronic anxiety predisposition.

Comparison with Previous Studies

The findings of the present study contrast with previous research that has identified stronger relationships between dimensions of anxiety. García and Morales (2017) found that anxiety as a state and anxiety as a trait presented significant correlations in samples of adolescents in contexts of high academic pressure. However, studies such as that of Fernández-Berrocal et al. (2012) have reported weak associations, especially when controlling for additional emotional and contextual factors.

This disparity in results highlights the importance of considering contextual and emotional factors when studying anxiety. In school settings such as Montería, it is possible that cultural and socioeconomic differences and levels of stress perceived during the assessment have influenced the results.

Theoretical and Practical Implications

From a theoretical perspective, the results question the notion of a linear and direct relationship between the dimensions of anxiety proposed by Spielberger (1983). The lack of meaningful correlation suggests that these variables could operate in a more complex and independent way, challenging the idea of an emotional continuum. These results also reinforce the need to consider multidimensional theoretical models that integrate individual and contextual factors, such as emotional regulation (Gross, 1998) or emotional resilience.

In the practical field, the findings underscore the need to design differentiated interventions to address anxiety in school settings. While anxiety as a state could be managed with short-term situational interventions, such as breathing and relaxation techniques, anxiety as a trait could require long-term therapeutic processes focused on the identification and modification of anxious thought patterns.

Conclusions

The results obtained in this study show that there is no significant linear relationship between anxiety as a state (AXE) and anxiety as a trait (AXR) in the sample of high school students from Montería, Colombia. Statistical analysis revealed an extremely weak negative correlation ($r = -0.0196$) and a coefficient of determination R^2 of 0.00038, indicating that anxiety as a state is not a significant predictor of anxiety as a trait. These findings suggest that both dimensions of anxiety, although theoretically linked, could operate independently or be influenced by contextual and emotional factors not evaluated in this study.

From a theoretical perspective, the results partially question the model of Spielberger et al. (1983), which posits a clearer relationship between state and trait anxiety. The lack of a significant association indicates that anxiety experienced transiently in specific situations does not necessarily predict the overall tendency to experience anxiety in different contexts. This finding coincides with research that highlights the influence of individual and environmental factors, such as emotional regulation and threat perception, on the anxious experience (Gross, 1998; Extremera & Fernández-Berrocal, 2004).

In practical terms, the results suggest the need to address anxiety through differentiated interventions in school contexts. While anxiety as a state can be managed with short-term stress management strategies, such as breathing exercises and relaxation techniques, anxiety as a trait may require deeper psychological interventions, focused on modifying thought patterns and developing long-term coping skills.

In conclusion, this study contributes to the understanding of emotional dynamics in the school context, highlighting the need for a more comprehensive and contextualized approach to addressing anxiety in adolescents. It is recommended to continue exploring the relationship between both dimensions with more

complex methodological designs and considering moderating variables such as emotional intelligence, social support and the conditions of the educational environment.

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