

A Multiple Regression Analysis About Whether Trait Emotional Intelligence and Self-Esteem Can Predict Trait Anxiety in the Greek Population

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ABSTRACT

This study investigated the predictive relationship among Trait Emotional Intelligence (TEI), self-esteem, and trait anxiety within a sample of Greek native individuals (N=136), employing multiple regression analysis. The Trait Emotional Intelligence Questionnaire (TEIQue), The Spielberger State-Trait Anxiety Inventory (STAIT-5), and the Rosenberg Self-Esteem Scale were administered for data collection. Results revealed a robust positive correlation between TEI and self-esteem ($r= 0.61, p<0.001$), with both variables emerging as significant predictors of trait anxiety. Decreases in TEI and self-esteem corresponded to increases in trait anxiety, with the model explaining 33.5% of the variance in trait anxiety. Additionally, the study affirmed TEI's predictive role in trait anxiety and its mediating effect on the association with self-esteem. Moreover, it corroborated the documented negative relationship between TEI and trait anxiety ($r= -0.554, p<0.001$), the positive correlation between TEI and self-esteem, and the negative association between self-esteem and trait anxiety ($r= -0.47, p<0.001$). Despite acknowledged limitations, the findings offer valuable practical and theoretical insights into psychology. Furthermore, the study underscores the importance of TEI in promoting well-being by mitigating trait anxiety, while highlighting self-esteem as a potential risk factor associated with elevated trait anxiety levels. These findings underscore the intricate interplay of psychological attributes and anxiety levels, advocating for the cultivation of emotional intelligence as a preventive measure against anxiety disorders.

Keywords: multiple regression, anxiety, self-esteem, emotional intelligence, Greek population

INTRODUCTION

Anxiety is a part of everyday life in the modern world, precipitated by the perpetual dissemination of fear-inducing narratives via media channels. In the 20th century, psychologists showed significant interest in the concept of anxiety, as that era was labeled

the '*age of anxiety*'.^[1] As mentioned by C. Hoi Yan,^[2] unpleasant emotional reactions usually happen when someone evaluates and considers a certain circumstance to be threatening. Anxiety is the term used to describe this unpleasant emotional reaction. Concomitant with this omnipresent

apprehension is the overarching challenges posed by conflicts, environmental degradation on a global scale, the specter of climate change, and the menace of lethal pandemics. Such collective burdens impose a profound and disproportionate strain on individuals striving to navigate their daily lives. As articulated by the American Psychological Association, anxiety manifests as an emotional state characterized by a palpable sense of tension, apprehensive ruminations, and physiological responses such as heightened blood pressure.^[3] Furthermore, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), when anxiety impairs one's capacity to lead a fulfilling life, it transitions from a transient emotion to a clinical disorder. The World Health Organization underscores the global prevalence of anxiety disorders, citing a recent study conducted in 2019 which revealed that over 300 million individuals worldwide grappled with such conditions, representing an estimated 4% of the global populace.^[4] This alarming statistic is compounded when one considers the implications of earlier research findings. In resonance with the World Health Organization's affirmation regarding the accessibility of highly effective treatments for anxiety disorders, echoes a maxim attributed to the esteemed philosopher D. Erasmus, circa 1500, from the Reformation era. Erasmus advocated the timeless wisdom that "*Prevention is superior to cure.*" Therefore, anxiety can be mentioned as an emotion characterized by an unpleasant state of inner turbulence and feelings of fear over expected events, and it has been divided into state and trait anxiety.^[5,6] The terms "state" and "trait" are commonly employed to characterize anxiety. According to the State-Trait Anxiety Theory presented by Cattell and Scheier, state anxiety denotes an immediate and temporary emotional state that can change over time.^[7] On the other hand, trait anxiety is characterized as a stable personality trait, representing a predisposition to experience anxiety. Thus, trait anxiety is characterized by negative

emotions such as fear, worries, and anxiety through many circumstances.^[8] This trait is determined by an individual's tendency to view stimuli as either threatening or non-threatening.^[9] Some studies seem to have associated *Trait Emotional Intelligence (TEI)* with trait anxiety and *Self-esteem*. For example, Kaliska & Pellitteri demonstrated that trait anxiety and self-esteem are emotion-based aspects of teenage personality that are predicted to be connected to TEI.^[10] Guil et al. also studied the effect of TEI as a mediator in the relationship between self-esteem and both trait and state anxiety.^[9] The TEI theory, as cited by Petrides K.V., acknowledges the subjective nature of emotional experience, avoiding promoting an "emotionally intelligent" archetype that people must copy for success.^[11] Emotions, according to this approach, influence human judgment, decision-making, and basic thought processes.

TEI can be delineated into four distinct subdomains.^[12] Primarily, "Well-Being" denotes the state characterized by the experience of positive emotions.^[13] Secondly, "Emotionality" encapsulates an individual's capacity for empathy, emotional expression, and interpersonal relationships.^[14,15] Additionally, "Sociability" refers to the adeptness in managing others' emotions, social awareness, confidence, effective communication, and participation in social contexts.^[16, 17] Lastly, "Self-Control" encompasses the ability to regulate emotions, manage anxiety, and exercise restraint over impulses and tensions.^[18, 19] In light of the aforementioned, numerous studies have underscored the significance of self-esteem as a fundamental component of emotional intelligence.^[20] Therefore, TEI represents our self-perceived emotional intelligence, indicating our confidence in understanding, managing, and expressing emotions to maintain a satisfactory level of well-being.^[9] Our emotional world's self-perceptions are characterized by TEI. However, research by Park suggests that individuals can use their emotional intelligence to enhance and maintain their self-esteem.^[21] That is, it is

reported that individuals with increased TEI tend to exhibit higher levels of self-esteem. The ability to regulate emotions can serve as a factor in mitigating the impact of negative circumstances while enhancing the impact of positive situations. This, in turn, contributes to a positive effect on the self-evaluation process. Supporting this notion, a study, by Schutte et al. reported on Park's work indicated that TEI relates to a better mood state and higher levels of self-esteem.

Self-esteem, according to Rosenberg, is based on how an individual views his or her identity and is related to the common emotions of self-love, self-esteem, self-confidence, and self-acceptance. [22] Since the mid-1960s, scientists have been studying the relatively new concept of self-esteem, which they characterize as "a result of behavioral processes," "a safeguard against detrimental behavior," or "a self-guidance directing present and future actions". [23] Self-esteem emerges as one of the constructs often associated with anxiety and is thought to act as its protective factor. [9] Zegarra reports research on emerging adults suggesting a positive relationship between self-esteem and positive psychological outcomes. [24] High self-esteem is associated with overall greater happiness. Baumeister et al. referred to high self-esteem as a person's overall positive evaluation and perception of oneself. [25] Additionally, many studies have shown that positive self-esteem can contribute to the individual establishing friendships, having more fulfilling romantic relationships, and experiencing greater psychological well-being. [26] Low self-esteem, on the other hand, is linked to markers of poor mental health and according to Zeigler-Hill, means a negative sense of self, a fundamental sense of inadequacy or worthlessness. [27,28] Nevertheless, many studies have argued that self-esteem is inextricably linked with anxiety. [29]

The question that is raised and caused this study is if there is any correlation between trait anxiety and personal inner traits such as self-esteem and TEI that could be taken into consideration from the developmental stage

and prevent anxiety, as an inner shield. EI abilities are the way people who are considered good, express, perceive, understand, and regulate their emotions, and that reflects their social functioning. [21] G. Mancini by researching the correlation between TEI and trait anxiety suggests a negative correlation, meaning that the more people practice their TEI abilities, the less trait anxiety they will face. [30] On the other hand, self-esteem which according to Maslow is part of people's life pyramid and consists of self-worth, respect, and accomplishment. [31] However, many studies like Benetti's suggested a positive correlation between self-esteem and trait anxiety, meaning that the more people struggle for self-worth and respect, and accomplish more, the more they will be dominated by anxiety. [32]

The current study endeavors to bridge a gap in the existing literature by delving into the intricate relationship between TEI and self-esteem, with a focus on their collective predictive capacity regarding trait anxiety. While previous research has explored the individual associations between TEI and self-esteem, as well as between self-esteem or TEI and trait anxiety, there remains a dearth of studies that comprehensively analyze how these three variables synergistically interact to influence the prediction of trait anxiety. Consequently, the present investigation aspires to contribute significantly to this domain by enriching our comprehension of the interplay between TEI and self-esteem concerning trait anxiety within the Greek cultural milieu. Furthermore, the findings anticipated from this study are poised to not only enrich the scientific discourse but also inform practical interventions tailored to the unique socio-cultural context of Greece. Moreover, examining these variables within the Greek populace assumes paramount importance, given the prevailing inclination towards prioritizing self-esteem enhancement over the development of emotional intelligence competencies. While echoing prior research findings by scholars who have also

investigated the correlations among trait anxiety, EI, and self-esteem, this study introduces a novel dimension through the utilization of newly developed TEI measures meticulously tailored for the Greek populace in the aftermath of the COVID-19 pandemic. [9, 10] By addressing this critical gap in the extant literature, this study endeavors to provide valuable insights into the interplay between TEI, self-esteem, and trait anxiety within the Greek context, thereby contributing to both theoretical knowledge and practical implications.

METHOD

Design

A correlation design was conducted with 3 variables included in the statistical analysis using multiple linear regression. The variables were measured on a ratio scale, with predictor 1 being “TEI”, predictor 2 “Self-esteem”, and the outcome variable being “Trait Anxiety”.

Participants

A convenience sample of 136 native Greek speakers, fluent in English, was included. The sample was mixed gender and consisted of 94 women and 42 men aged between 18-65 years. The participants' average age was 34.036 ($SD=14.147$), and they willingly consented to take part in the research. They were mainly drawn from the researchers' immediate environment, creating a snowball effect as they encouraged others to join. The inclusion criteria ensured that participants were adults in good health, and free from medical conditions that might hinder their ability to complete the experiment. Those with relevant prior experience and those with inadequate English language skills were excluded to preserve objectivity. Additionally, individuals with severe physical or mental illnesses that could compromise the accuracy of their survey responses were not included, ensuring the integrity of the data.

MATERIALS

Three Likert scale, standardized questionnaires were used as the research

materials in this study. The first scale, Spielberger State-Trait Anxiety Inventory (STAIT-5) (Spielberger, 1983), [33] assessed participants' anxiety levels (Cronbach's $\alpha=0.82$). [34] Participants circled the number corresponding to their typical or persistent feelings for each statement. Specifically, the Trait anxiety-only scale (STAIT-5) was used, consisting of five items that described various anxiety-related emotions. Responses were on a scale of 1 to 4, with 1 as "not at all," 2 as "a little," 3 as "moderately," and 4 as "very much." The scale's minimum mean total score for Trait anxiety was 1.00 (low Trait anxiety), and the maximum mean total score was 4.00 (high Trait anxiety).

The second scale, known as Rosenberg's Self-esteem Scale (RSS) developed by Rosenberg in 1965, [22] is a self-report measure consisting of 10 items designed to assess overall self-esteem. It comprises 5 items reflecting higher self-esteem, such as “On the whole, I am satisfied with myself,” and 5 items reflecting lower self-esteem, for example, “At times, I think I am no good at all.” Respondents use a scale from 1 (strongly agree) to 4 (strongly disagree), with higher scores indicating greater self-esteem. The minimum mean total score for self-esteem was 1.00 (indicating low self-esteem), while the maximum mean total score was 4.00 (indicating high self-esteem). The third scale was based on the *Trait Emotional Intelligence Questionnaire-Short Form TEIQue-SF* by Petrides, K.V. et al. [18] The participants were given this scale to express their views concerning various aspects of emotional intelligence. The scale contained 20 items of which 10 questions expressed positive aspects of emotional intelligence e.g. “It is easy for me to find the right words to describe the feelings I feel”, and 10 questions focused on lack of TEI e.g. “I find it difficult to talk about my inner feelings, even with my closest friends.” The questionnaire may be accessed at www.psychometriclab.com. The design of the responses was in numbers from 1 to 5, with 1 representing total disagreement,

progressively moving up to 5 representing total agreement. Each statement was tackled by participants by drawing a circle around the number that best expressed their opinion. The minimum mean total score for TEI was 2.13 reflecting low TEI, and the maximum mean total score was 4.81 reflecting high TEI.

PROCEDURE

Firstly, participants received information sheets containing questionnaires and instructions. Each participant, having volunteered, received a unique identification number for data security. After a detailed explanation, participants were informed about the study's process, objectives, and ethical considerations, including anonymity and the right to withdraw. They signed a consent form with a unique code consisting of the last three letters of their last name and the last three digits of their mobile phone number. They were then asked to sign a statement confirming their understanding of the objectives of the process and expressing their willingness to proceed. Three scales (10-item "RSS," 5-item "STAIT-5," and 20-item "TEIQue") were administered, taking about 10 minutes. A debriefing form was sent afterward. Participants were reminded of a two-week window to retract their data. Mean total scores were analyzed using SPSS Statistics 28.0.0.0 software.

Ethics

The research adhered to the British Psychology Society's ethics code. Participants received forms and codes for privacy, were informed of withdrawal rights, and had the option to exclude their results within a reasonable time frame. The overseeing professor supervised monitoring and ethical approval processes.

RESULTS

First, the internal reliability of the TEI scale was measured, which, at first, did not appear satisfactory ($\alpha=0.742$). However, some of the items should be eliminated because their correlation values between the items and the

total number were below average ($r<0.2$). The overall internal consistency of the scale was enhanced by the sequential removal of items 2, 11, 18, and 19, respectively ($\alpha=0.78$). The final 16 items had an acceptable correlation (lowest $r=0.216$) with the overall scale.

Initially, the total mean scores of all three scales were calculated and from the results obtained, the parametric assumptions were first checked before statistical analysis.^[35] Firstly, the data scores were converted to Z scores to check for outliers (with the criterion of ± 3.29), and no outlier was identified. Thereafter, Z Skewness and Z Kurtosis calculations showed that none of the results exceeded the ± 2.58 criterion (for $N>100$ participants).

Both Kolmogorov-Smirnov and Shapiro-Wilk tests produced statistically significant results ($p\text{-values} < 0.05$), suggesting a non-normal distribution. The TEI boxplot identified outliers for participants 31 and 57. A mean conversion was applied for these outliers (Mean=3.491). Post-conversion, the parametric assumptions were rechecked, revealing no outliers on the boxplot. The Kolmogorov-Smirnov and Shapiro-Wilk tests indicated a non-statistically significant ($p\text{-values} > 0.05$) normal distribution for TEI but not for the other two variables. However, in Multiple Regression, this assumption is less concerning. Histograms and Q-Q plots for all variables demonstrated normality.

Furthermore, the P-P plot displayed a straight line, signifying no significant deviations from normality, meeting the residual normality condition. The Durbin-Watson test^[36] yielded an acceptable result ($DW=2.085$), indicating negative autocorrelation in the residuals without posing issues. The VIF assessment for multicollinearity revealed a value of 1.595 and a corresponding tolerance of 0.627, within an acceptable range, suggesting low multicollinearity. The highest VIF observed was 1.595, affirming that regression coefficients' variance is not unduly inflated due to multicollinearity. These diagnostic checks support the reliability of the regression analysis,

suggesting that the assumptions of independent errors and low multicollinearity have been met."

The data was analyzed using multiple regression analysis. The correlation between the variables is shown in Table 1.

Table 1. Correlation coefficients and significance levels for predictors and outcome variables.

	Self-esteem	Trait anxiety
Trait EI	0.611 (<0.001)	-0.554 (<0.001)
Self-esteem		-0.47 (<0.001)

Table 1 depicts the correlation between TEI, self-esteem, and trait anxiety. More precisely, there is a strong positive linear relationship between TEI and Self-esteem ($r=0.611$, $p<0.001$). As TEI increases, Self-esteem tends to increase. There is a negative linear relationship between TEI and Trait Anxiety ($r=-0.554$, $p<0.001$). As TEI increases, Trait Anxiety tends to decrease. This negative correlation is statistically significant. There is a negative relationship between Self-esteem and Trait Anxiety ($r=-0.470$, $p<0.001$). Higher levels of Self-esteem are associated with lower levels of Trait Anxiety. This negative correlation is statistically significant. TEI and Self-esteem are both inversely related to Trait Anxiety. Additionally, there is a positive correlation between TEI and Self-esteem. The significance levels indicate that these correlations are unlikely to have occurred by random chance.

The regression equation yielded an effect size ($R^2 = 0.335$, $R^2_{adj} = 0.325$), showing that, when combined with TEI, and self-esteem, they significantly predicted trait anxiety, $F(2,133) = 33,483$ with $p<0.001$. There was a significant negative correlation between TEI and trait Anxiety, $t = -4.776$, $df=135$, $p < 0.001$, with the model predicting that a one-unit change in TEI changes the expected value of trait anxiety by 0.622 units. There was also a significant negative correlation between self-esteem and trait Anxiety, $t = -2.343$, $df= 135$, $p < 0.001$, with the model predicting that a one-unit drop in self-esteem, results in a 0.227 -unit change in trait anxiety.

DISCUSSION

This study aimed to examine if the relationship between TEI and self-esteem may predict trait anxiety. The results revealed that these two variables are relatively close with a strong positive correlation ($r=0.61$, $p<0.001$). Consequently, both TEI and self-esteem appeared to be statistically significant predictors of trait anxiety. As TEI and self-esteem decrease, the predicted trait anxiety tends to increase based on the coefficients.

The study drew support from Kaliska & Pellitteri, reinforcing the significance of TEI as a predictor of trait anxiety and self-esteem. [10] Guil et al. further validated these findings, emphasizing TEI's position as a mediator in the link between self-esteem and anxiety. [9] Parallel trends observed in our study and Guil et al.'s research underscored the consistent pattern that higher TEI, and self-esteem correlated with lower trait anxiety. Mancini, Marneli, & Biolcati's investigation into occupational safety provided additional support by revealing a negative relationship between TEI and trait anxiety. [30] This alignment with prior research, and confirmation of the positive relationship between TEI and self-esteem, underscores the robust and generalizable nature of the TEI, self-esteem, and trait anxiety association. [21]

Moreover, studies collectively corroborated the pivotal role of self-esteem in understanding trait anxiety. [2, 23, 24] Our study's consistent pattern of a negative association between self-esteem and trait anxiety found resonance in these investigations, affirming the reliability and generalizability of self-esteem as a predictor of trait anxiety. In summary, this comprehensive examination provides empirical evidence supporting the fundamental role of TEI and self-esteem in predicting trait anxiety, offering valuable insights for theoretical advancement and practical applications in various domains, from education to workplace well-being.

The present study made important steps in understanding the predictors of trait anxiety. With a model that explained 33.5% of the

variance in trait anxiety, it provided valuable insights into the relationship between TEI, self-esteem, and trait anxiety. The uncountable 66.5% of the variance in trait anxiety suggests that a significant proportion of the factors contributing to trait anxiety signal the presence of other complications and variables that logically influence it. This highlights the nuanced nature of this psychological construct, suggesting that additional factors beyond TEI and self-esteem play a role. Another limitation is the small sample size, which requires caution in generalizing the results. A more diverse and extended sample would enhance the external validity of the findings, allowing for wider application. Social desirability bias is also a consideration, as participants may have provided responses that align with social expectations, potentially affecting the accuracy of self-report measures. The use of different data collection methods could mitigate this bias in future studies. Furthermore, the gender imbalance of the study, with a predominantly female sample (69.4% female and 30.6% male), may affect the generalizability of the findings, especially considering the existing literature on gender differences in trait anxiety. [24]

To summarize, this study revealed the significant relationship between Trait TEI, self-esteem, and trait anxiety. The findings reinforce existing knowledge by highlighting how high TEI and self-esteem are related to lower levels of trait anxiety. However, the fact that only 33.5% of the variance was explained reveals the existence of other factors influencing trait anxiety, paving the way for further research. Thus, future research could focus on how the social construction of gender and gender-role dynamics affect the relationships between TEI, self-esteem, and trait anxiety. Research examination of these factors may provide important insight into how social expectations relate to emotional intelligence and anxiety management, with potential implications for the development of tailored interventions and psycho-education programs.

Declaration by Authors

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