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# Effects of depression, anxiety, and stress on reading self-efficacy in Peruvian adolescents

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**Introduction:** The process of reading encompasses not only cognitive dimensions but also motivational factors, such as self-efficacy, which are crucial for learning among adolescents. These factors can be influenced by adverse physiological and emotional conditions. Consequently, the objective of this study was to ascertain whether depression, anxiety, and stress are negatively associated with reading self-efficacy in Peruvian adolescents.

**Method:** This study employs a quantitative, non-experimental cross-sectional design, utilizing surveys to gather data from 463 adolescent students, aged 12 to 17 years, attending one public and two private schools in Chanchamayo, Junín, Peru. The research instruments include the Abbreviated Scales of Depression, Anxiety, and Stress (DASS-21) and the Self-Efficacy Scale for Reading.

**Results:** The findings indicate that women exhibit significantly higher levels of depression ( $p < 0.05$ ) and anxiety ( $p < 0.01$ ) compared to men. A structural equation modeling (SEM) analysis was performed, demonstrating an excellent fit:  $\chi^2$  scaled = 1.18,  $df = 2$ ,  $p = 0.553$ , CFI = 1.000, TLI = 1.006, RMSEA = 0.000 CI 95% [0.000, 0.069], and SRMR = 0.004. This analysis confirms that depression ( $\beta = -0.20$ ,  $p < 0.05$ ) and anxiety ( $\beta = -0.23$ ,  $p < 0.01$ ) are negatively associated with reading self-efficacy, whereas stress ( $\beta = 0.03$ ,  $p = 0.636$ ) is not associated with reading self-efficacy among Peruvian adolescents. The model accounts for 14.5% of the variance in reading self-efficacy.

**Conclusion:** Depression and anxiety are negatively associated with reading self-efficacy among Peruvian adolescents. Conversely, there is no empirical evidence to indicate that stress is linked with reading self-efficacy.

**KEYWORDS**

adolescents, anxiety, depression, reading self-efficacy, stress

## 1 Introduction

Reading comprehension constitutes a fundamental component of adolescent education and serves as a critical determinant in their learning processes (Wang and Guthrie, 2004). According to the most recent OECD PISA report, Peruvian students fall below the requisite level of global reading competency, indicating an inability to effectively demonstrate their problem-solving capabilities (OECD, 2023). Similarly, a national assessment of learning achievements conducted by MINEDU reveals that fewer than 20% of second-year secondary students attained a satisfactory level in reading (MINEDU, 2023b). Taken

together, these results highlight a persistent problem in the development of reading skills, underscoring the need to examine not only cognitive factors, but also motivational and emotional variables that may be influencing adolescents' reading performance (Yu et al., 2023).

Reading is an intricate process wherein cognitive and motivational factors converge. Among these motivational factors, self-efficacy emerges as a pivotal element in the development of reading skills. Among the latter, self-efficacy emerges as a central element in the development of reading skills; reading self-efficacy is defined as the personal perception of one's own ability to interact successfully with a text, based on judgments of reading competence and efficacy (Schunk and Zimmerman, 1997). In this context, reading self-efficacy facilitates the integration of actions and strategies conducive to effective reading behavior among students in regular basic education (Alpuche and Vega, 2014). Furthermore, these beliefs exert a positive influence on text and reading performance comprehension (Hornstra et al., 2016), thereby establishing a significant and positive correlation between reading self-efficacy, reading comprehension (Solheim, 2011), and reading achievement (Schöber et al., 2018). Taken together, empirical evidence supports the notion that self-efficacy not only accompanies the reading process but also acts as a key motivational determinant of reading performance (Linnenbrink and Pintrich, 2003).

According to Bandura's theoretical framework, physiological and emotional arousal constitutes a significant source in the development of self-efficacy. Within this context, individuals evaluate their capabilities based on somatic cues; consequently, negative psychological states can undermine this motivational perception (Bandura, 1997; Han et al., 2024). Bandura's comprehensive theory of behavioral change has been empirically validated by numerous studies, which have identified depression (Maddux and Meier, 1995), anxiety (Woodrow, 2011), and stress (O'Leary and Brown, 1995) as critical risk factors influencing personal efficacy expectations. This suggests that such adverse experiences may be perceived as indicators of incompetence, thereby impacting one's confidence in successfully executing specific tasks (Pajares and Schunk, 2001). In the aftermath of the recent pandemic, adolescent students experienced routine disruptions that exacerbated their mental health issues; notably, depression and anxiety accounted for nearly 45% of emotional problems diagnosed globally (UNICEF, 2021). In Peru, an online study reported that 30% of adolescents encountered at least one psychological issue (MINSA and UNICEF, 2021). In severe instances, a report by INSM highlighted a significant rise in the prevalence of depressive and anxious episodes among children and adolescents (INSM, 2021). Thus, these findings support the relevance of examining the impact of adverse emotional states on academic self-efficacy in adolescence, especially in areas of high cognitive demand such as reading (Tahmassian and Jalali Moghadam, 2011).

Emotional dysfunctions, including depression, anxiety, and stress, have been identified as potential impediments to the development of reading self-efficacy among Peruvian adolescents. Depression is characterized as a persistent state of reduced self-esteem and a lack of motivation, often associated with

a negative outlook on achieving personally significant goals (Lovibond and Lovibond, 1995). To our knowledge, the extant literature lacks empirical studies directly linking depression to reading self-efficacy in adolescent populations. However, evidence concerning variables related to reading self-efficacy, such as academic self-efficacy, reading comprehension, and reading performance, indicates a possible negative correlation with depression. For instance, a study conducted with preadolescents in Australia demonstrated that depression significantly and negatively predicts reading performance (Cárdenas et al., 2022). Conversely, another prospective study in Australia involving schoolchildren found no association between depressive symptoms and reading performance (Mundy et al., 2023). In Europe, a longitudinal study involving Norwegian students from 16 secondary schools revealed that psychological distress, particularly in its depressive dimension, was significantly and negatively associated with academic self-efficacy; additionally, female students exhibited higher levels of psychological distress with depressive symptoms and lower academic self-efficacy (Kristensen et al., 2023). In Spain, research involving schoolchildren reported an inverse relationship between the dysthymic state of depression and reading comprehension, with female students reporting higher levels of depression (Quevedo-Blasco et al., 2023). However, a study in Chile with adolescents found no evidence of a relationship between depression and academic performance in language, although female students exhibited higher levels of depressive symptoms (Gedda-Muñoz et al., 2023).

Anxiety is recognized as an emotional issue characterized by persistent thoughts concerning adverse or catastrophic future events, which elicit a psychosomatic response (Lovibond and Lovibond, 1995). The academic literature reviewed reveals an absence of empirical studies directly examining the relationship between anxiety and reading self-efficacy. However, research involving variables closely related to reading self-efficacy, such as reading performance, reading comprehension, and academic self-efficacy, indicates a potential negative association with anxiety. In Oceania, a longitudinal study involving preadolescents demonstrated that elevated anxiety levels diminished reading performance, although anxiety did not achieve statistical significance as a predictive factor for reading achievement (Cárdenas et al., 2022). This finding is corroborated by a study of Australian students, which found no significant relationship between anxious symptoms and reading performance (Mundy et al., 2023). Conversely, in the Asian context, a study involving Chinese students with and without dyslexia revealed that reading comprehension was inversely related to reading anxiety and directly related to reading self-concept for both groups (Chung et al., 2024). In Norway, a longitudinal study with secondary school students identified a significant negative relationship between anxiety levels, as a component of psychological distress, and academic self-efficacy. Additionally, it was observed that female students exhibited higher levels of psychological distress with anxious symptoms and a lower perception of academic self-efficacy (Kristensen et al., 2023). In the Americas, a study conducted with Chilean adolescent students found no significant relationship between anxiety and academic performance in

the language domain; however, it was noted that female students exhibited higher anxiety levels compared to their male counterparts (Gedda-Muñoz et al., 2023).

Stress is defined as a persistent state of emotional strain that impairs an individual's ability to handle daily life challenges, often perceived as increased frustration (Lovibond and Lovibond, 1995). While there is no direct empirical evidence linking stress to reading self-efficacy, studies on related constructs of self-efficacy—such as general, academic, coping, and creative—suggest a potential negative relationship. In Asia, research involving Malaysian high school students identified a significant negative correlation between academic stress and coping self-efficacy, with females experiencing higher stress levels than males (Regalado, 2024). In Europe, a longitudinal study of Norwegian adolescents found that academic stress significantly and negatively affected academic self-efficacy, with females reporting higher stress and lower self-efficacy (Kristensen et al., 2023). An Italian study with schoolchildren reported an inverse relationship between stress and general self-efficacy (Commodari et al., 2022). In the Hispanic American context, research with Spanish students revealed a significant negative association between stress and creative self-efficacy (González Moreno and Molero Jurado, 2023). In Chile, a study of schoolchildren found no significant link between academic achievement in language and stress; however, females exhibited higher stress levels than males (Gedda-Muñoz et al., 2023). This empirical inconsistency suggests the need to specifically examine the effect of depression, anxiety, and stress on reading self-efficacy in adolescents, particularly in Latin American contexts where evidence is still limited (Webber et al., 2023).

According to Clark and Watson's tripartite theory, depression and anxiety are closely related emotional dysfunctions, with stress serving as a pivotal factor in their onset (Clark and Watson, 1991). Substantial scientific evidence supports the association between depression, anxiety, and stress in adolescents. For instance, a three-phase longitudinal study conducted in Canada during the pandemic identified a positive correlation among these variables (Afriat et al., 2023). Similarly, a significant positive correlation was observed in a longitudinal study involving two groups, conducted before and during COVID-19, in U.S. public schools (Garthe et al., 2023). In various studies, stress has been positively associated with both depression and anxiety, as demonstrated in research conducted in Australian schools with adolescent students (Zimmer-Gembeck and Skinner, 2024), and in a study involving Italian adolescents from 10 secondary-level educational institutions (Vacca et al., 2023). Depression and anxiety were directly related in a comparative study conducted in public and private educational institutions in South Korea and the United States (Yang et al., 2024); this relationship was also observed in a cross-cultural exploratory survey conducted in Russia and Spain (Shub et al., 2024), as well as in a study involving Spanish schoolchildren (Balluerka et al., 2023). Furthermore, depression and stress exhibited a positive correlation in a cross-sectional trend study conducted at two points before and during COVID-19 in Croatia (Ajduković and Kožljan, 2023). Additionally, anxiety and academic stress demonstrated a significant direct relationship in a study conducted among Portuguese adolescents (Pontes et al., 2024). Taken together, these findings support the relevance of analyzing these variables

in an integrated manner within a structural model, rather than considering them as independent constructs, given their systematic co-occurrence in adolescence (Feiss et al., 2019).

Following the health crisis precipitated by the pandemic, students in regular basic education returned to the classroom exhibiting a significant decline in their reading skills (MINEDU, 2023a). This decline is attributed to the absence of stimulation and interactive motivation, elements that are more prevalent in in-person classes compared to virtual teaching (Alkhashki et al., 2024). Consequently, both direct and indirect effects of this issue continue to be observed in adolescents' mental health and their perception of self-efficacy (Wium, 2024; Bouvard et al., 2025; Sun et al., 2025). Furthermore, age plays a crucial role in the development of self-efficacy, as early adolescence is characterized by changes in attitudes and motivational beliefs; however, these changes persist into middle and late adolescence as students acquire greater autonomy in their activities (UNICEF, 2020). In the context of reading, self-efficacy is a critical component, as it influences students' confidence and their ability to engage with reading tasks and persevere in the face of challenges associated with this activity (Orellana et al., 2020; Cho et al., 2021).

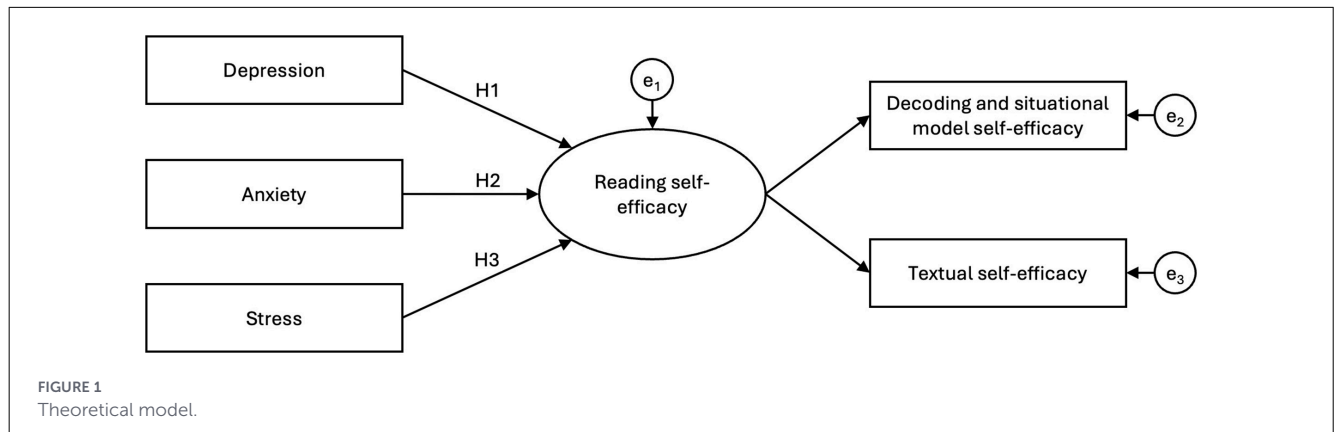
A thorough examination of existing literature reveals that, although the connections between depression, anxiety, stress, and various types of self-efficacy—such as general, academic, coping, and creative self-efficacy—have been extensively explored, there is a discernible lack of research specifically addressing reading self-efficacy. In particular, previous studies have not adopted an explanatory approach that allows the simultaneous examination of the associations between depression, anxiety, and stress and reading self-efficacy within a single analytical framework. Addressing this gap, the present study aims to determine whether depression, anxiety, and stress are negatively associated with reading self-efficacy among Peruvian adolescents, thereby contributing a more integrated understanding of these relationships. To achieve this, the following hypotheses are proposed (Figure 1):

- H1: Depression is negatively associated with reading self-efficacy in Peruvian adolescents.
- H2: Anxiety is negatively associated with reading self-efficacy in Peruvian adolescents.
- H3: Stress is negatively associated with reading self-efficacy in Peruvian adolescents.

## 2 Methods

### 2.1 Design

This study utilized a quantitative research methodology, employing a non-experimental cross-sectional design based on surveys. It is characterized as non-experimental due to the lack of variable manipulation. The study is classified as a survey study, as it investigates the associations between variables within a population by analyzing a representative sample. Furthermore, it is cross-sectional in nature, as data from individuals were collected at a single point in time (Creswell and Creswell, 2023).



### 2.2 Research paradigm

The quantitative method is congruent with the post-positivist worldview, also referred to as positivist/postpositivist research, empirical science, and postpositivism. This paradigm posits that causes are likely to influence effects or outcomes, as observed in experimental contexts. It is inherently reductionist, seeking to distill ideas into a limited, distinct set for testing, such as the variables that constitute hypotheses and research questions. From a postpositivist viewpoint, the rigorous observation and measurement of the objective reality “out there” in the world are emphasized. Consequently, the creation of numerical measures of observations and the analysis of individual behavior are essential for a postpositivist. Ultimately, laws or theories govern the world, and these theories must be tested, validated, and refined to enhance our understanding of the world. Therefore, in the scientific method—the approach advocated by postpositivists—a researcher begins with a theory, collects data to either support or challenge the theory, and subsequently makes necessary adjustments and conducts further tests (Creswell and Creswell, 2023).

### 2.3 Participants

The study sample comprised adolescent students from the secondary level in the province of Chanchamayo, department of Junín, Peru. A non-probabilistic, purposive sampling method was employed. Participants were eligible if they were enrolled in secondary education (first to fifth year) in public or private schools located in the coast, mountains, or jungle regions. Male and female students and from different family structures were eligible. Participants were excluded from the analyses if informed consent or assent, was not provided, or if questionnaires contained substantial missing data or were incomplete.

To determine the sample size, a structural equation model calculator (Soper, 2021) was utilized, considering an anticipated effect size of  $\delta = 0.1$ , a desired statistical power level of  $\beta = 0.95$ , as well as  $k = 1$  latent variable,  $j = 5$  observed variables, and a significance level of  $\alpha = 0.05$ , resulting in a minimum required sample size of 328 participants. However, 463 adolescent students were recruited (female, 55.5%), aged between 12 and 17 years ( $M = 14.7$ ,  $SD = 1.59$ ); the majority of students originated from nuclear

TABLE 1 Sociodemographic characteristics of participants.

Characteristics		n	%
Gender	Male	206	44.5
	Female	257	55.5
Kind of family	Nuclear	177	38.3
	Extended	95	20.5
	Blended (Ensembled)	44	9.5
	Single-parent	147	31.7
Kind of school	Public	219	47.3
	Private	244	52.7
Educational level of Secundar school	First year	91	19.7
	Second year	90	19.4
	Third year	95	20.5
	Fourth year	105	22.7
	Fifth year	82	17.7
Geographical region	Coast	68	14.7
	Mountains	90	19.4
	Jungle	305	65.9

families (38.2%), attended private educational institutions (52.7%), 22.7% were in the fourth year of secondary school, and 65.9% were from the jungle region (Table 1).

### 2.4 Instruments

The Abbreviated Scales of Depression, Anxiety, and Stress (DASS-21) (Lovibond and Lovibond, 1995), as adapted for the Peruvian context (Contreras-Mendoza et al., 2021), serve to evaluate the severity of depression, anxiety, and stress among adolescents. This assessment tool comprises 21 items, each formatted on a Likert format with four possible responses: “it did not happen to me, never” = 0; “it happened to me a little, or some of the time, sometimes” = 1; “it happened to me quite a bit, or for a

good part of the time, often” = 2; “it happened to me a lot, or most of the time, almost always” = 3. The scales exhibit strong reliability across the three domains: Depression (items: 3, 5, 10, 13, 16, 17, 21;  $\alpha = 0.91$ ;  $\omega = 0.91$ ), Anxiety (items: 2, 4, 7, 9, 15, 19, 20;  $\alpha = 0.88$ ;  $\omega = 0.89$ ), and Stress (items: 1, 6, 8, 11, 12, 14, 18;  $\alpha = 0.88$ ;  $\omega = 0.89$ ). The total score for each scale is determined by summing the items it encompasses, with each scale yielding a minimum score of 0 and a maximum score of 21.

The Reading Self-Efficacy Scale (Fidalgo et al., 2013), Peruvian version (Morales-García et al., 2024), is designed to assess reading self-efficacy among children and adolescents. Higher scores on this scale reflect an individual’s enhanced self-efficacy in reading. This scale consists of 15 items presented in a Likert format, offering five response options: 1 = “very sure I cannot do it;” 2 = “sure I cannot do it;” 3 = “somewhat sure I can do it;” 4 = “sure I can do it;” 5 = “very sure I can do it.” The scale demonstrates reliability across its dimensions: Decoding and Situational Model Self-Efficacy (items: 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 14, 15;  $\alpha = 0.94$ ;  $\omega = 0.94$ ) and Textual Self-Efficacy (items: 6, 10, 13;  $\alpha = 0.81$ ;  $\omega = 0.81$ ). To calculate the score for each dimension, one must sum the items pertinent to that dimension. The comprehensive scale score is then derived by summing the scores from all dimensions.

## 2.5 Procedure

Informed consent and assent forms were carefully crafted for parents or guardians and participants, respectively. These documents provided a comprehensive explanation of the altruistic nature of participation, the study’s objectives, the procedures to be followed, and the questionnaires to be completed. They highlighted the ethical use of data, the voluntary nature of participation, confidentiality, anonymity, the exclusive use of data for academic and research purposes, and the participants’ right to withdraw at any time. Furthermore, they addressed data protection and access to results, in alignment with the ethical standards required for conducting research. The socio-demographic data questionnaires and data collection instruments were also developed. Following this, authorization was secured from the educational institutions where the study was conducted to enable data collection. With this authorization, signed informed consent was obtained from the parents, and signed assent was obtained from the participants. Subsequently, the questionnaires were administered in person to the adolescents at the educational institutions.

## 2.6 Data analysis

The data analysis was executed using Jamovi software, version 2.4.14 (The Jamovi Project, 2024), which functions as an interface for the “R stats” software (R Core Team, 2023), with the “lavaan” library (Rosseel, 2012) accessed through the SEMlj module (Gallucci and Jentschke, 2021). Initially, the validity and reliability of the instruments were assessed. The validity of the internal structure was examined using confirmatory factor analysis (CFA). Each instrument underwent independent validation using estimators appropriate to their respective item formats, in

alignment with psychometric standards and previous validation studies. The DASS-21, characterized by four ordinal response categories (0–3), was analyzed using WLSMV, consistent with the ordinal nature of its response options (Finney and DiStefano, 2013) and in accordance with a prior validation study (Contreras-Mendoza et al., 2021). Using WLSMV, degrees of freedom are derived from the number of model-imposed constraints on the polychoric correlation and threshold structure, which are evaluated using an asymptotic covariance matrix (Rosseel, 2012; Muthén and Muthén, 2017). Although the items of the Reading Self-Efficacy Scale are ordinal, the employment of five response categories (1–5) permits their treatment as approximately continuous when robust maximum likelihood estimators are applied (Rhemtulla et al., 2012; Finney and DiStefano, 2013; Kline, 2023). Consequently, MLR was utilized, in accordance with a previous validation study of this instrument (Morales-García et al., 2024). Using MLR, degrees of freedom are derived from the number of freely estimated parameters and model-imposed constraints on the model-implied covariance structure, with test statistics corrected for non-normality using a scaling factor (Satorra and Bentler, 1994; Kline, 2023). For the reliability analysis, the internal consistency method was applied, using the alpha ( $\alpha$ ) and omega ( $\omega$ ) coefficients. A descriptive evaluation of the variables was performed, which included calculating the mean, standard deviation, skewness ( $g_1$ ), and kurtosis ( $g_2$ ) of the variables under examination. It is important to note that  $g_1$  and  $g_2$  values within the  $\pm 1$  range are indicative of a normal distribution. Thirdly, the relationships among the study variables were examined using Pearson’s correlation coefficient (Caycho-Rodríguez, 2017). The Student’s *t*-test was employed to assess differences between variables by sex. Furthermore, Cohen’s *d* was used as a measure of effect size (ES) to compare two independent groups, with values of 0.20, 0.50, and 0.80 denoting small, medium, and large ES, respectively (Cohen, 1988; Sawilowsky, 2009).

In order to assess the proposed model, a content-based parceling method was utilized. This involved summing the item scores for each dimension of the instruments, which enabled their examination as observable variables (Matsunaga, 2008). This approach led to the development of a latent-variable structural equation model (SEM) which incorporates three parcel-based observed predictors alongside a dependent latent variable that is structured from two parceled dimensions.

### 2.6.1 Measurement model specification

Based on the parcel indicators described above, the measurement model specified a single latent construct (*reading self-efficacy*) measured by two parcel-based indicators. Model identification was achieved by fixing the unstandardized loading of the first indicator to 1.0. Paths from the latent variable to the parcel indicators represent factor loadings within the measurement model, whereas paths from the observed predictors to the latent variable represent structural (regression) relations specified in the SEM. Factor loadings of the parcel indicators on the latent construct were estimated as part of the measurement model. Reliability of the parcel indicators was supported by the internal

TABLE 2 Descriptive statistics, internal consistencies, and correlations for the variables.

Variables	M	Min	Max	SD	$\alpha$	$\omega$	$g_1$	$g_2$	1	2	3	4
r												
1. Depression	9.25	1	21	5.10	0.86	0.87	0.25	-0.96	1.000			
2. Anxiety	8.79	0	21	5.09	0.85	0.85	0.32	-0.95	0.81***	1.000		
3. Stress	9.91	1	21	4.74	0.84	0.85	0.17	-0.88	0.77***	0.76***	1.000	
4. Reading self-efficacy	46.25	19	68	11.09	0.93	0.93	0.46	-0.20	-0.34***	-0.35***	-0.28***	1.000

M, Mean; SD, Standard deviation;  $\alpha$ , Cronbach's alfa;  $\omega$ , McDonald's omega;  $g_1$ , Skewness;  $g_2$ , Kurtosis; r, Pearson's correlation coefficient. \*\*\* $p < 0.001$ .

TABLE 3 Depression, anxiety, stress, and reading self-efficacy among males and females.

Variables	Men		Women		t	p	d
	M	SD	M	SD			
Depression	8.70	4.96	9.69	5.18	-2.08	0.038	-0.19
Anxiety	8.09	5.06	9.35	5.05	-2.65	0.008	-0.25
Stress	9.50	4.62	10.23	4.81	-1.65	0.100	-0.15
Reading self-efficacy	46.84	10.66	45.77	11.41	1.03	0.302	0.09

M, Mean; SD, standard deviation; t, student's t; p, p-value; d, Cohen's d.

consistency estimates obtained at the dimensional level during the prior confirmatory analyses of each instrument ( $\alpha$  and  $\omega$ ), given that parcels were constructed by summing items within those validated dimensions.

The model was evaluated using the ML estimator with robust standard errors and a Satorra-Bentler mean-adjusted scaled test (MLM), which is appropriate for numerical variables and demonstrates robustness against deviations from inferential normality (Muthén and Muthén, 2017). Model fit was evaluated using scaled (robust) fit indices, including the scaled  $\chi^2$  statistic, Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR), with the criteria being CFI, TLI > 0.90 (Bentler, 1990), RMSEA < 0.080 (MacCallum et al., 1996), and SRMR < 0.080 (Browne and Cudeck, 1992).

### 2.7 Ethical aspects

The data were collected in compliance with the guidelines outlined in the Declaration of Helsinki (World Medical Association, 2024). The study received approval from the research ethics committee of the Graduate School of Universidad Peruana Unión, with the reference number 2024-CEEPG-00143.

## 3 Results

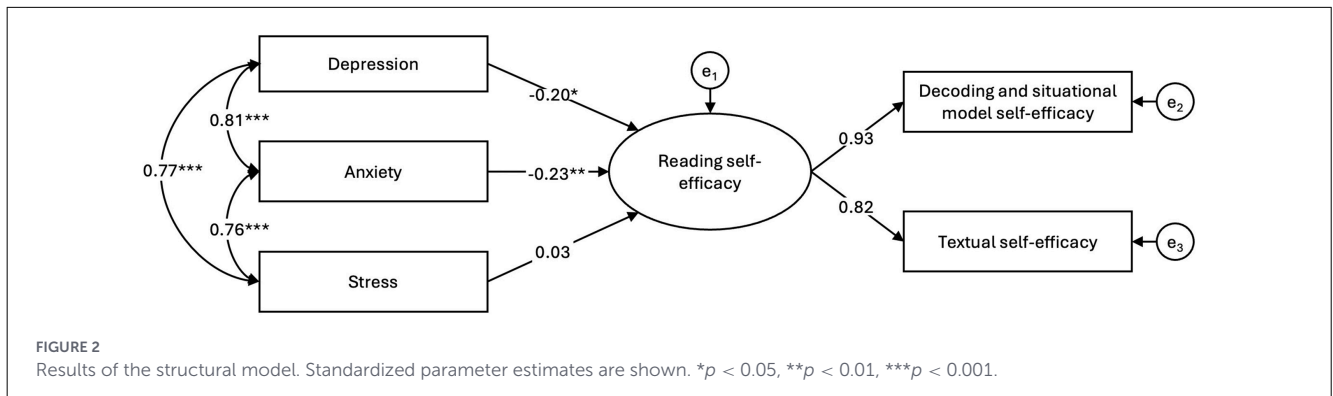
In prior analyses, the internal structure of the scales under investigation was examined. For the DASS-21, which is employed to assess Depression, Anxiety, and Stress, the original 21-item structure demonstrated an adequate fit:  $\chi^2$  scaled = 375, df = 186,  $p < 0.001$ , CFI = 0.983, TLI = 0.981, RMSEA = 0.047 CI 95% [0.040,

0.054], and SRMR = 0.039. Similarly, in the context of reading self-efficacy, the original 15-item structure of the Peruvian version also exhibited an adequate fit:  $\chi^2$  scaled = 248, df = 88,  $p < 0.001$ , CFI = 0.942, TLI = 0.931, RMSEA = 0.063 CI 95% [0.054, 0.071], and SRMR = 0.038. Regarding the reliability analysis, satisfactory values were obtained for Depression ( $\alpha = 0.864$ ;  $\omega = 0.867$ ), Anxiety ( $\alpha = 0.845$ ;  $\omega = 0.846$ ), Stress ( $\alpha = 0.842$ ;  $\omega = 0.845$ ), Decoding and Situational Model Self-Efficacy ( $\alpha = 0.910$ ;  $\omega = 0.911$ ), Textual Self-Efficacy ( $\alpha = 0.744$ ;  $\omega = 0.753$ ), and the overall measure of Reading Self-Efficacy ( $\alpha = 0.926$ ;  $\omega = 0.926$ ).

Table 2 demonstrates that the skewness and kurtosis values are within the range approximating a normal distribution ( $\pm 1$ ), thereby indicating the appropriateness of employing a Structural Equation Model (SEM) for analysis. Statistically significant correlations were identified between depression and anxiety ( $r = 0.81$ ,  $p < 0.001$ ), depression and stress ( $r = 0.77$ ,  $p < 0.001$ ), anxiety and stress ( $r = 0.76$ ,  $p < 0.001$ ), depression and reading self-efficacy ( $r = -0.34$ ,  $p < 0.001$ ), anxiety and reading self-efficacy ( $r = -0.35$ ,  $p < 0.001$ ), and stress and reading self-efficacy ( $r = -0.28$ ,  $p < 0.001$ ). The minimum and maximum scores obtained for each scale are reported.

As shown in Table 3, the independent samples Student's t-test indicates that there are significant differences in depression ( $t = -2.08$ ,  $p < 0.05$ ) and anxiety ( $t = -2.65$ ,  $p < 0.01$ ) between males and females. The analysis of mean values for the significant differences reveals that higher levels of depression and anxiety are found in females. Regarding the effect size calculated using Cohen's d, it is observed that the effect size for the depression variable is close to a small effect size ( $d = 0.19$ ), and for the anxiety variable, there is a small effect size ( $d = 0.25$ ).

The analysis of the structural equation model indicated a satisfactory fit:  $\chi^2$  scaled = 1.18, df = 2,  $p = 0.553$ , CFI = 1.000, TLI = 1.006, RMSEA = 0.000 CI 95% [0.000, 0.069], and SRMR = 0.004. This result corroborates Hypothesis 1, demonstrating that depression is a negative predictor of reading self-efficacy among



Peruvian adolescents ( $\beta = -0.20, p < 0.05$ ). Similarly, Hypothesis 2 is supported, as anxiety is also found to negatively predict reading self-efficacy ( $\beta = -0.23, p < 0.01$ ). Conversely, Hypothesis 3 is not supported, as there is no significant evidence that stress predicts reading self-efficacy in this population ( $\beta = 0.03, p = 0.636$ ). The model accounted for 14.5% of the variance in reading self-efficacy (Figure 2).

Given the substantial shared variance among depression, anxiety, and stress, a more parsimonious model was estimated, wherein these dimensions were conceptualized as indicators of a single latent factor representing general emotional distress. This alternative model demonstrated excellent fit ( $\chi^2$  scaled = 3.94,  $df = 4, p = 0.414$ , CFI = 1.000, TLI = 1.000, RMSEA = 0.000 CI 95% [0.000, 0.066], and SRMR = 0.013), and exhibited a negative association with reading self-efficacy, comparable in both direction and magnitude to the effects observed in the primary model ( $\beta = -0.39, p < 0.001$ ). These findings suggest that the relationship between emotional symptoms and reading self-efficacy is predominantly influenced by shared emotional distress, rather than distinct contributions from each symptom domain. Consequently, the structural coefficients in the primary model should be interpreted with caution, as they represent conditional associations rather than isolated or causal effects.

## 4 Discussion

Self-efficacy in the domain of reading is a crucial element that empowers individuals to engage with diverse texts confidently (Cho et al., 2021). Nevertheless, the presence of emotional dysfunctions can adversely impact this belief, as they constitute a significant source in its development (Bandura, 1997). In the aftermath of the global health crisis, a decline in the reading skills of students in regular basic education was noted (MINEDU, 2023a). These effects continue to influence the mental state and self-efficacy perceptions of adolescents (Bouvard et al., 2025; Wiium, 2024). Within this context, the current study investigated the potential negative association between depression, anxiety, and stress and the reading self-efficacy of adolescents in Peru. To achieve this objective, structural equation modeling (SEM) was employed, alongside various comparative and relational analyses.

The comparative analysis by gender reveals that adolescent girls demonstrate significantly higher depression scores than their male counterparts. Similarly, adolescent girls exhibit significantly elevated levels of anxiety compared to their male counterparts. Although statistically significant differences were observed between males and females in depression and anxiety, the associated effect sizes were small (Cohen's  $d = -0.19$  and  $-0.25$ , respectively). This suggests that while sex-related differences are detectable at the statistical level, they possess limited practical significance, with substantial overlap between distributions. Consequently, gender alone is not a strong determinant of these psychological outcomes in this study. Previous studies indicate that adolescent girls reported slightly higher levels of depression and anxiety than boys, a pattern consistent with previous cross-sectional and longitudinal studies in different educational contexts (Bermúdez, 2018; Frey et al., 2020; Gedda-Muñoz et al., 2023; Kristensen et al., 2023). These differences have been associated with greater sensitivity to social evaluation and greater pressures related to appearance and academic performance (Rudolph, 2002; Johnson et al., 2017). Likewise, factors specific to adolescence, such as pubertal changes and school demands, could contribute to increased anxiety symptoms in women (Patton et al., 2008; Navarro-Loli et al., 2017). However, given that the effect sizes observed in this study were small, these differences should be interpreted with caution, as gender is not a strong determinant of the emotional outcomes analyzed.

Regarding the first hypothesis, it was found that depression is negatively associated with reading self-efficacy in Peruvian adolescents. This result is partially supported by previous research. Kristensen et al. (2023) demonstrated a significant and inverse association between psychological distress in its depressive dimension and academic self-efficacy in high school students. This effect is supported by the theoretical propositions of Bandura (1997), who argues that adverse emotional experiences reduce perceived efficacy in a specific area of mastery, for example, in the reading domain. For their part, Maddux and Meier (1995) empirically showed that depression is a risk factor for the development of personal efficacy beliefs. In line with this, depression is characterized by a loss of motivation and a negative self-assessment regarding the achievement of significant goals (Lovibond and Lovibond, 1995). Along these lines, it can be inferred that adolescents with depressive symptoms tend to negatively evaluate their reading self-efficacy. Complementarily, a

study conducted with 12- and 17-year-old schoolchildren identified an inverse relationship between dysthymic symptoms and reading comprehension, which shows that higher levels of depression are associated with lower development of this skill (Quevedo-Blasco et al., 2023). Similarly, Pekrun et al. (2017) state that emotions are closely linked to academic achievement. One possible explanation is that depression reduces achievement-oriented motivation and limits memory resources, which negatively impacts academic performance (Gotlib and Joormann, 2010). In this respect, it has been observed that students with depressive symptoms tend to focus their attention on irrelevant or intrusive thoughts, which reduces their ability to maintain sustained attention toward learning strategies and academic tasks (Juhari et al., 2010). Consistent with the above, Cárdenas et al. (2022) reported in a study with preadolescents that depression is an inverse and significant predictor of reading performance. Given the evidence that text comprehension and reading performance are closely linked to efficacy beliefs in the reading domain (Hornstra et al., 2016), it can be stated that a depressive emotional state, by negatively affecting these factors, also interferes with the development of reading self-efficacy.

Concerning the second hypothesis, it was found that anxiety is negatively associated with reading self-efficacy among Peruvian adolescents. This outcome partially aligns with the study by Kristensen et al. (2023), which, through a longitudinal approach, revealed a significant negative association between anxiety, defined as a component of psychological distress, and academic self-efficacy. Recognizing panic and fear as indicators of anxiety (Lovibond and Lovibond, 1995), this finding can be interpreted through Bandura's theoretical lens, which suggests that adverse physiological experiences may be perceived as signs of incompetence, thereby undermining individuals' beliefs in their ability to perform specific tasks successfully (Pajares and Schunk, 2001). In the realm of reading, Katzir et al. (2018) observed that children with a diminished sense of reading competence often experience fear of reading, leading to avoidance behaviors; this is supported by the moderate negative correlation between reading anxiety and reading self-concept. Additionally, Graesser and Sidney D'Mello (2012) propose that emotional shifts during reading occur when the text is overly challenging or when conceptual barriers create cognitive imbalance. Thus, it can be inferred that adolescents with heightened anxiety levels are likely to negatively evaluate their reading self-efficacy. Regarding other aspects of reading competence, Chung et al. (2024) identified an inverse relationship between reading anxiety and reading comprehension in adolescents. Similarly, Cárdenas et al. (2022) found that elevated anxiety levels negatively impact reading performance in preadolescents. A well-supported explanation in the literature is provided by Eysenck et al. (2007), who argue that anxiety induces physiological symptoms that impair working memory, thereby limiting information retention and adversely affecting text comprehension and achievement. In this context, considering the direct relationship between reading comprehension, reading performance, and reading self-efficacy (Solheim, 2011; Schöber et al., 2018), it can be concluded that anxiety negatively influences the development of personal efficacy beliefs in reading.

In relation to the third hypothesis, the study revealed that stress is not associated with reading self-efficacy among Peruvian adolescents. These findings stand in contrast to Bandura's (1997) theoretical framework, which posits stress as a critical factor influencing personal competence beliefs. Furthermore, the results diverge from existing empirical evidence, differing partially from the study by Kristensen et al. (2023) which identified academic stress as a significant associated factor of academic self-efficacy. Other research also indicates negative correlations between academic stress and academic self-efficacy (Ye et al., 2018), as well as coping self-efficacy (Regalado, 2024). This inconsistency may be attributed to contextual and methodological variations in the current research, suggesting that specific academic stress is more closely associated with academic self-efficacy than general stress as measured by the DASS-21. An alternative explanation is offered by Clark and Watson (1991), who argue that, unlike other negative dysfunctions such as depression and anxiety, stress is often experienced daily and tends to become normalized, thereby diminishing its impact on variables like self-efficacy. In this context, a study conducted in the Latin American setting partially supports our findings by not identifying a significant negative relationship between academic performance in language and stress levels (Gedda-Muñoz et al., 2023). This may be elucidated by Travis et al. (2020), who suggest that certain stressors, when perceived as relevant and challenging to personal goals, can enhance motivation and performance.

## 4.1 Implications

The present study offers significant theoretical implications. Firstly, it partially corroborates Bandura's (1997) integrative theoretical framework by illustrating that physiological and emotional states, such as depression and anxiety, are pivotal sources of self-efficacy expectations. This framework posits that psychological factors influence the level and strength of reading self-efficacy, thereby affecting coping behaviors and mastery experiences in specific domains. Secondly, within the established conceptual framework, the study questions the role of stress as a risk factor for an accurate perception of reading self-efficacy, proposing an indirect influence through the inclusion of contextual variables. Thirdly, it extends this framework by examining it within an adolescent population and specifically in the domain of reading self-efficacy. The findings of this research have substantial practical implications for educational practice. The evidence that depression and anxiety are negatively linked with reading self-efficacy in adolescents underscores the necessity of integrating socio-emotional support strategies within educational institutions. In this context, it is crucial to implement psychological support programs, as well as tutoring and counseling opportunities, to facilitate the early identification of emotional symptoms that may impede the development of reading skills. Furthermore, educators should be trained in teaching strategies that are attuned to emotional wellbeing, to cultivate a safe and motivating learning environment that mitigates reading avoidance and enhances students' self-perception of competence.

## 4.2 Limitations

This study acknowledges several limitations that should be considered when interpreting the results. Firstly, the use of a cross-sectional design precludes the establishment of causal relationships between the variables, as data were collected at a single point in time, thereby preventing the determination of temporality of effects and the exclusion of other influencing variables. Secondly, given the high inter correlations among depression, anxiety, and stress, the regression coefficients estimated in the structural model may be affected by shared variance among these predictors, which can introduce coefficient instability or suppression effects. Accordingly, the associations observed in this study should be interpreted as conditional relationships reflecting overall emotional distress rather than as strictly independent or unique effects of each symptom dimension. Additionally, the study's specific school and geographical context limits the generalizability of the findings to all secondary school adolescents. Furthermore, data collection through self-reports introduces potential biases related to social desirability or subjective interpretation of the items. Future studies are recommended to incorporate components of reading competence, such as reading comprehension and reading performance, as mediating variables, to provide a more precise explanation of the relationship between depression, anxiety, and stress with reading self-efficacy. It is also advised that future research further distinguishes between general stress and academic stress to more accurately analyze their predictive relationship to reading self-efficacy, while considering the role of contextual factors, which may either mitigate or intensify this relationship. Moreover, it would be beneficial to replicate the study in other Latin American contexts using longitudinal designs to observe the evolution of depression, anxiety, and stress throughout the school trajectory and their impact on reading self-efficacy.

## 5 Conclusion

Despite the acknowledged limitations, this study makes a substantial contribution to the understanding of the relationship between emotional factors and reading self-efficacy among secondary school adolescents. The findings indicate that depression and anxiety are negatively linked to reading self-efficacy, whereas stress does not exhibit a significant effect. These results underscore the necessity of incorporating emotional wellbeing support within the educational environment, not only as a preventive measure against psychological challenges but also as a crucial element in enhancing motivation and confidence in the reading learning process.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by Comité de Ética de la Escuela de Posgrado de la Univesidad Peruana Unión. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

## Author contributions

NM-M: Writing – original draft, Writing – review & editing, Investigation, Resources, Visualization, Data curation, Methodology, Conceptualization. DC-A: Validation, Writing – original draft, Data curation, Methodology, Supervision, Project administration, Software, Funding acquisition, Resources, Writing – review & editing, Formal analysis.

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## Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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