



Original

Anxiety, emotional regulation and academic performance in early primary students: Impact of an intervention

Raquel Gomis, Núria Garcia-Blanc*, Agnès Ros-Morente, and Gemma Filella

Department of Educational Sciences, University of Lleida, Lleida, Spain



ARTICLE INFO

Article history:

Received 21 November 2024

Accepted 19 March 2025

Available online 10 April 2025

Keywords:

anxiety
emotional regulation
academic performance
primary education
structural equations

ABSTRACT

This study explores the relationship between anxiety, emotional regulation, and academic performance in early Primary Education, examining the effects of an intervention targeting emotional skills. A quasi-experimental design with pre- and posttests was implemented, involving 430 first- and second-grade students. Through a linear mixed model, the interactions between different time points (pretest–posttest) and groups (control and experimental) are analyzed. Additionally, a Structural Equation Model (SEM) is conducted to analyze the relationships between anxiety, emotional regulation, and academic performance before and after the intervention. Intervention, based on an emotional competencies model, enhances emotional regulation. Regarding the SEM model, the results indicate a negative relationship between anxiety and academic performance and a positive relationship between emotional regulation and performance. Emotional regulation acts as a mediator in this relationship, but only after the intervention. These findings highlight the importance of developing emotional competencies in primary education to improve well-being and academic performance, although more specific interventions are needed to reduce anxiety. This study provides new perspectives on how emotional regulation and anxiety influence academic performance in the early school years.

© 2025 Published by Elsevier España, S.L.U. on behalf of Universidad del País Vasco.

Ansiedad, regulación emocional y rendimiento académico del alumnado de ciclo inicial de Educación Primaria: impacto de una intervención

RESUMEN

Este estudio examina la relación entre la ansiedad, la regulación emocional y el rendimiento académico del alumnado de ciclo inicial de Educación Primaria, evaluando el impacto de una intervención en competencias emocionales. Se ha utilizado un diseño cuasi-experimental con pretest y posttest y grupo control, involucrando a 430 niños y niñas de 1^º y 2^º de primaria. A través de un modelo lineal mixto se analizan las interacciones entre diferentes momentos (pretest-posttest) y grupos (control y experimental). Además, se realiza un modelo de ecuaciones estructurales donde se analizan las relaciones entre ansiedad, regulación emocional y rendimiento académico antes y después de la intervención. La intervención, basada en un modelo de competencias emocionales, mejora la regulación emocional. En cuanto al modelo de ecuaciones estructurales (SEM, Structural Equation Modeling), los resultados indican una relación negativa entre la ansiedad y el rendimiento académico, y una relación positiva entre la regulación emocional y el rendimiento. La regulación emocional actúa como mediador en esta relación, pero solo después de la intervención. Estos hallazgos subrayan la importancia de trabajar las competencias emocionales en la Educación Primaria para mejorar el bienestar y el rendimiento académico, aunque para reducir la ansiedad se requieren intervenciones más específicas. Este estudio aporta nuevas perspectivas sobre cómo la regulación emocional y la ansiedad influyen en el rendimiento académico en las primeras etapas escolares.

© 2025 Publicado por Elsevier España, S.L.U. en nombre de Universidad del País Vasco.

Palabras clave:

ansiedad
regulación emocional
rendimiento académico
Educación Primaria
ecuaciones estructurales

DOI of original article: <https://doi.org/10.1016/j.psicod.2025.500166>

* Corresponding author.

E-mail address: nuria.garcia@udl.cat (N. Garcia-Blanc).

Introduction

Anxiety and academic performance in childhood

Students' emotional well-being plays an important role in their academic development. In this context, anxiety (McCurdy et al., 2022) and emotional regulation (Harrington et al., 2020) have emerged as key factors that directly influence academic performance. The relationship between anxiety and academic performance in children is a complex and multifaceted phenomenon, extensively studied in educational and psychological contexts. In this study, anxiety is understood as state anxiety, referring to a temporary reaction of uneasiness or worry arising in situations perceived by children as challenging, both in the school environment and in other aspects of daily life (Leal et al., 2017; Spielberg, 1983). At this developmental stage, state anxiety can manifest through three related dimensions: cognitively, via thoughts of insecurity or doubts about one's abilities; emotionally, through feelings of nervousness or fear in challenging situations; and behaviorally, by avoiding certain tasks, restlessness, or difficulty concentrating (Putwain & Wood, 2023; Voltas et al., 2014).

Academic performance in educational contexts is conceived as a multidimensional construct involving knowledge acquisition and students' progress and success in developing competencies. In this study, academic performance is measured by the average grades reported by teachers responsible for each group (on a scale from 0 to 10), serving as an objective indicator of performance in core subjects during Primary Education. Various studies have indicated that persistent anxiety symptoms during childhood can negatively affect academic performance. For example, Voltas et al. (2014) highlight that chronic anxiety is linked to absenteeism and difficulties maintaining attention during lessons, both of which directly impact learning. Similarly, Zamora-Robles et al. (2023) note that a significant proportion of students experiencing anxiety and depression symptoms have shown negative impacts on their academic development. These findings align with previous research, demonstrating that students with higher levels of anxiety tend to achieve lower grades compared to peers (Ortiz-Padilla et al., 2020; Villamizar-Acevedo et al., 2020). Anxiety not only directly affects academic performance but also interacts with other factors, such as academic stress and mental well-being. Hughes et al. (2007) reveal that children with anxiety disorders face higher risks of poor academic performance and a greater likelihood of school dropout, suggesting a need for comprehensive interventions addressing both anxiety and other mental disorders to improve academic outcomes (Pedersen et al., 2019).

Similarly, McCurdy et al. (2022) emphasize that anxiety may lead to excessive worry about individual abilities, resulting in behaviors such as unnecessary task repetition driven by personal dissatisfaction. These results are consistent with Wood's findings (2006), who observed that high anxiety levels might lead to biased attention toward perceived threats, thereby reducing concentration on academic tasks. However, the relationship between anxiety and academic performance is not always linear. Some studies suggest that moderate anxiety levels might act as motivators, enhancing academic performance. For instance, El-Anzi (2005) found a positive correlation between moderate anxiety and academic performance, highlighting that certain anxiety levels can increase concentration and motivation. Nevertheless, this perspective is tempered by evidence that excessive anxiety tends to produce adverse effects (Brumariu et al., 2022). Colunga-Rodríguez et al. (2021) stress that school anxiety should be understood as a multidimensional construct whose effects on academic perfor-

mance may vary depending on context and the nature of anxiety itself (Pinargote-Macías & Caicedo-Guale, 2019).

Emotional regulation in learning

Regarding the relationship between emotional regulation and academic performance in children, the literature highlights its importance for motivation, self-regulated learning, and overall engagement in classroom environments (Liu et al., 2022; Nadeem et al., 2023). In this context, emotional regulation is the capacity to recognize, understand, and consciously modify emotional responses, thereby managing the intensity, duration, and expression of emotions flexibly and adaptively. According to the emotional competencies model proposed by Bisquerra and Pérez-Escoda (2007), emotional regulation involves specific strategies to transform emotions, thus enhancing well-being and academic performance (Gross & Thompson, 2007; Pekrun, 2006).

Research indicates that children who effectively manage their emotions tend to perform better academically. Valiente et al. (2010), for instance, found a positive relationship between emotional regulation and academic performance in preschool children, suggesting that those who regulate emotions effectively are more likely to achieve good academic results. Similarly, Xu et al. (2015) demonstrated a positive correlation between emotional management and mathematics grades, reinforcing the idea that emotional regulation directly influences academic achievement. Recent studies further underline the integration of emotional processes in cognitive abilities, emphasizing emotional regulation's role as a predictor of academic performance by promoting cognitive engagement, resilience under pressure, and effective problem-solving strategies (Gkintoni et al., 2025; Isohätälä et al., 2019; Li et al., 2020). Additionally, research shows that self-efficacy—the belief in one's capability to overcome challenges—is positively associated with academic performance (Onuigbo et al., 2019; Usán-Supervía & Quílez-Robres, 2021). However, emotional regulation difficulties may hinder study organization and adaptive responses to classroom demands, negatively impacting participation and academic achievement (Sousa et al., 2023).

Other studies indicate that children with anxiety disorders frequently experience significant difficulties in emotional regulation, manifesting as increased emotional instability and maladaptive emotional responses (Folk et al., 2014; Bender et al., 2014). A longitudinal study highlights dysregulated emotions, such as anger and sadness, as strong predictors of anxiety symptoms in children, suggesting that emotional dysregulation may precede the onset of anxiety disorders (Folk et al., 2014). Furthermore, children with better emotional regulation strategies are better equipped to manage stress and anxiety (Quiñones-Camacho & Davis, 2019). Recognizing that altering thoughts and goals can alleviate negative emotions significantly affects how children confront anxiety-provoking situations (Davis et al., 2010).

Interventions in emotional education and their effect

In recent years, there has been a notable increase in interventions in the educational field aimed at developing emotional intelligence. These interventions, based on diverse models and applied across various contexts, share common goals such as enhancing emotional competencies—including emotional regulation—improving well-being, promoting coexistence, reducing stress, strengthening interpersonal relationships, and preventing bullying, all of which positively impact academic per-

formance (Arenilla et al., 2022; Hodzic et al., 2018; Nelis et al., 2011; Rahmawati et al., 2024; Ramdhonee-Dowlot et al., 2021; Ruiz-Aranda et al., 2012). Pioneering studies have evaluated their effects on samples of primary education students. Among these, the Social and Emotional Learning (SEL) approach promoted by CASEL (Collaborative for Academic, Social, and Emotional Learning) stands out, as it aims to equip students with tools to manage emotions, set goals, understand others' perspectives, and make responsible decisions (Elias et al., 1997; Greenberg et al., 2003). Specifically, the RULER program has demonstrated positive outcomes in psychological adjustment and academic performance within Primary Education contexts, including evidence from the Spanish context (Castillo-Gualda et al., 2023).

The present study

Consequently, this study has a dual aim. Firstly, it evaluates the impact of an emotional competencies intervention on emotional regulation, anxiety, and academic performance among children in the first cycle of Primary Education. Secondly, it analyzes the relationships among these variables at this developmental stage. This period is considered crucial for developing emotional competencies, as the high plasticity of these years facilitates the incorporation of self-regulation strategies (Bisquerra, 2006; González-Loor & Vázquez-Avilés, 2023). Intervening during this period can produce lasting effects on learning and school adaptation by establishing foundational emotional regulation skills, essential for academic adaptation and performance (Isohätälä et al., 2019). From this dual perspective, the following specific objectives are proposed:

O1: To analyze changes in anxiety, emotional regulation, and academic performance after the implementation of the intervention in the experimental group compared to the control group.

O2: To analyze the relationship between anxiety, emotional regulation, and academic performance before and after the intervention.

O3: To explore the role of emotional regulation in the relationship between anxiety and academic performance in the experimental group.

Based on these objectives, the following hypotheses are formulated:

H1: There are statistically significant differences in anxiety, emotional regulation, and academic performance between the experimental and control groups following the intervention.

H2: Anxiety negatively relates to academic performance.

H3: Emotional regulation positively relates to academic performance.

H4: Emotional regulation will mediate the relationship between anxiety and academic performance.

H5: The intervention will modify the relationship between anxiety, emotional regulation, and academic performance.

It is important to highlight that few studies specifically address the relationship between anxiety, emotional regulation, and academic performance in children at this developmental stage. This gap underscores the relevance and potential contribution of this research, as exploring these variables in early stages can offer valuable insights for designing preventive interventions that are more effective throughout students' academic development.

Method

Design

This study employed a quasi-experimental design with pretest and posttest assessments, collecting data before and after an emo-

Table 1
Characteristics of the study sample

	Grade	<i>n</i>	Boys	Girls
Control	1st	51	25	26
	2nd	51	26	25
Total control		102	52	50
Experimental	1st	182	81	101
	2nd	146	83	63
Total experimental		328	165	163

tional competencies intervention. The duration between the initial and final evaluations was nine months.

Participants

The sample comprised 430 students from the 1st and 2nd grades of Primary Education attending different public and subsidized schools across three cities in northern Spain (Barcelona, Donostia-San Sebastián, and Pamplona). A total of six schools participated, with five schools forming the experimental group consisting of 328 students (76.3%), and one school constituting the control group with 102 students (23.7%). The average age in the experimental group was 6.35 years ($SD = 0.58$), while in the control group, it was 6.40 years ($SD = 0.601$). Table 1 provides further details on the sample characteristics. The sample was obtained through convenience sampling, based on school availability and their decision to participate and be assigned to either the experimental or control group. The control group was configured as a negative control group.

Instruments

Emotional Regulation. Emotional regulation was assessed using the *Emotional Regulation subscale from the Emotional Development Scale for Early Primary Education* (EDEEPI-28) (Priego et al., 2024). The subscale consists of six items rated on a 5-point Likert scale ranging from 0 = never to 4 = almost always. This subscale is part of a set based on the emotional competencies model proposed by the Research Group in Psychopedagogical Guidance (GROP) (Bisquerra & Pérez-Escoda, 2007), including emotional awareness, emotional regulation, social competencies, emotional autonomy, and life and well-being competencies. It is a hetero-report instrument, designed to be completed by teachers who rate the emotional regulation of first and second-grade students based on their direct observation. An example item is: 'When experiencing an intense negative emotion, the child can distract themselves by engaging in a different activity suggested by the teacher.' In this study, the emotional regulation subscale showed good internal consistency, with Cronbach's alpha values of .94 at pretest (before the intervention) and .93 at posttest (after the intervention).

State Anxiety. State anxiety was measured using the *Child Anxiety Scale* (CAS) (Gillis, 1980; Spanish adaptation by Gillis et al., 2011). The scale consists of 20 dichotomous items that yield a total score for state anxiety. It is a self-report instrument administered with teacher assistance; teachers helped students understand items when necessary. An example item is: 'Do you think people sometimes speak badly about you, or not?' Internal consistency was calculated using the Kuder-Richardson Formula 20 (KR-20), obtaining .61 at pretest and .65 at posttest. After model adjustments, recalculated KR-20 values were .60 at pretest and .68 at posttest. Although these values are below the recommended threshold of .70, the scale was retained due to its previous use in similar studies and its relevance for assessing state anxiety in young children (Córdova & Shiroma, 2005).

Academic performance. Academic performance was measured using quantitative scores (on a scale from 0 to 10), reported by the

teachers responsible for tutoring each group, based on the average of their grades before and after the intervention.

Procedure

Initially, schools interested in participating in the project were contacted and provided detailed explanations of the project's objectives and procedures. Subsequently, informed consent was obtained from the legal guardians of all participating students, ensuring their understanding of the research purposes and participants' rights. Confidentiality agreements were also signed with each participating school to guarantee the privacy and protection of collected data. The questionnaires were administered by the teaching staff under the supervision of the research team, following the ethical recommendations of the Helsinki Declaration and with approval from the Ethics Committee of the University of Lleida (CEIC-2473), thereby ensuring the validity and integrity of the study. The teaching staff in the experimental group received 30 hours of training, including emotional competencies, questionnaire administration methods, and intervention program implementation strategies. Meanwhile, the control group teaching staff received training only on questionnaire administration. Questionnaires were administered as pretests to both groups before the intervention to evaluate initial variables. The intervention program was then implemented in the experimental group schools. Following the intervention, posttests were administered to both groups to measure effects and outcomes. Detailed reports summarizing the research findings were subsequently provided to participating schools, offering insights into the impact of the program within their educational context.

Intervention program

The intervention program used in this study has been previously published by López-Cassà (2023). It consists of 25 activities per academic year, specifically designed for first and second-grade primary students, based on the emotional competencies model proposed by Bisquerra and Pérez-Escoda (2007). The model includes five emotional competencies: emotional awareness, *emotional regulation*, emotional autonomy, social competence, and life and well-being skills. Activities were structured according to students' age and the targeted emotional competencies, with five activities addressing each competency.

The intervention was integrated into the participating schools' tutorial action plan over nine months. Activities were conducted weekly during one-hour tutor-led sessions, ensuring the continuity and systematic development of emotional competencies within regular school routines. The program allowed for some variability in implementation among schools, accommodating organizational specifics without altering its core structure.

The activities employed dynamic, practical methodologies, incorporating group and pair work, role-playing, reflective discussions, relaxation and breathing exercises, games, and storytelling. These activities aimed not only to educate students about emotions but also to equip them with tools to manage their emotions, interact effectively with others, and promote overall well-being.

Data analysis

Statistical analyses were performed using the lavaan package in R software and SPSS version 28. Before data analysis, variables were reviewed and confirmed to be correctly ordered. Mahalanobis distance was used to identify outliers, and six extreme cases from the analysis were removed. Cases with missing data were also excluded using listwise deletion, as missing cases accounted for less than 5% of the total sample.

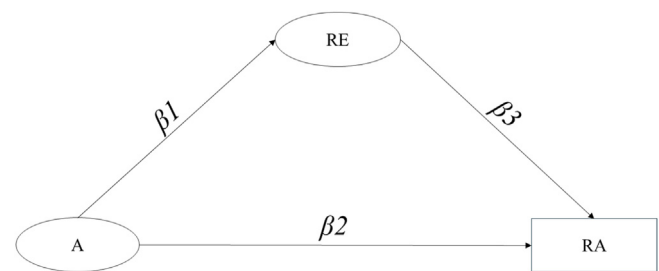


Figure 1. Proposed structural equation model.

Note. A = Anxiety; RE = Emotional Regulation; RA = Academic Performance.

Descriptive analyses were conducted to evaluate group characteristics. A linear mixed model was applied to compare differences between experimental and control groups, considering both group factors (experimental vs. control) and time (pretest vs. posttest). Spearman correlations were calculated within the experimental group to explore relationships between the studied constructs at both measurement points.

A Structural Equation Model (SEM) was developed to analyze relationships between variables. Confirmatory Factor Analysis (CFA) was conducted initially to validate the model at both pretest and posttest, following Anderson and Gerbing (1988). Model fit was evaluated using chi-square (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Values considered adequate were CFI and TLI greater than .90, RMSEA less than .06, and SRMR less than .08, following recommendations by Cho et al. (2020) and Hu and Bentler (1999). Reliability was assessed through Cronbach's alpha (α), McDonald's Omega (ω), Average Variance Extracted (AVE), and Composite Reliability (CR). For dichotomous items measuring anxiety, the Kuder-Richardson Formula 20 (KR-20) was used. Acceptable thresholds were α , ω , and CR > .70; AVE > .50; and KR-20 > .70 (Hair et al., 2017) (Figure 1).

To ensure measurement model equivalence at both time points (pre- and post-intervention), factorial invariance over time was examined. Initially, model fit was assessed separately at each time point. Subsequently, sequential multigroup factorial invariance testing was performed, comparing configural, metric, and scalar invariance models. Changes in CFI, TLI, and RMSEA indices were examined to compare these models. According to Chen (2007), invariance between groups is indicated by $\Delta CFI < .01$, $\Delta TLI < .01$, and $\Delta RMSEA < .015$. The structural model was analyzed using the Diagonally Weighted Least Squares (DWLS) estimation method, suitable for handling dichotomous items. Direct, indirect, and total effects were calculated at both time points, performing a mediation analysis of *emotional regulation* on the relationship between *anxiety* and *academic performance*. Additionally, model fit indices previously described were analyzed. Finally, structural invariance was analyzed to determine differences between pretest and posttest structural models. A freely estimated model was compared with a fully constrained model and three additional models, each focusing on one of the paths comprising the structural model. The chi-square increment ($\Delta\chi^2$) between models was examined to assess statistical significance, indicating potential differences in structural relationships before and after the intervention.

Results

Intervention impact

Table 2 presents descriptive statistics broken down by group (experimental and control) and time (pretest and posttest), dis-

Table 2
Descriptive statistics

		Pretest					Posttest				
		<i>M</i>	<i>SD</i>	Skew.	Kurt.	Miss.	<i>M</i>	<i>SD</i>	Skew.	Kurt.	Miss.
Experimental	RA	7.08	1.21	-0.191	0.268	1	7.42	1.310	-0.049	-0.312	16
	RE	14.98	5.024	-0.026	-0.630	0	16.20	4.654	-0.028	-0.706	0
Control	A	7.31	3.061	0.205	0.139	0	7.15	3.184	0.377	0.052	0
	RA	7.62	1.250	-0.414	-0.412	1	7.88	1.297	-0.050	-1.025	0
	RE	16.15	5.201	-0.418	-0.152	0	18.24	5.358	-0.967	0.318	0
	A	7.32	2.832	-.006	-0.344	0	7.45	3.562	-0.109	-0.745	0

Note. *M* = Mean; *SD* = Standard Deviation; Skew. = Skewness; Kurt. = Kurtosis; Miss. = Missing data; RA = Academic Performance; RE = Emotional Regulation; A = Anxiety.

Table 3
Variable correlations

	Pretest			Posttest		
	1	2	3	1	2	3
1. Academic Performance (RA)	-			-		
2. Emotional Regulation (ER)	0.196*	-		0.185*	-	
3. Anxiety (A)	-0.202*	-0.199*	-	-0.286*	-0.117*	-

Note. * $p < .05$.

Table 4
Factorial invariance analysis between pretest and posttest

Model	χ^2	<i>df</i>	CFI	TLI	RMSEA	Model comparison						
						Comparison	$\Delta \chi^2$	Δdf	<i>p</i>	Δ CFI	Δ TLI	Δ RMSEA
Pretest	444.285	322	.933	.927	.034	-	-	-	-	-	-	-
Posttest	461.193	322	.933	.927	.038	-	-	-	-	-	-	-
1. Configural Invariance	1162.626	644	.871	.859	.051	-	-	-	-	-	-	-
2. Metric Invariance	1180.656	668	.872	.866	.049	2 vs. 1	18.03	24	.801	.001	.007	-.002
3. Scalar Invariance	1240.404	693	.864	.862	.050	3 vs. 2	59.748	25	<.01	-.008	-.004	.001

Note. χ^2 = Chi-square; *df* = Degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation. Model comparison includes $\Delta \chi^2$ (chi-square increment between models), Δdf (change in degrees of freedom between models), *p* (statistical significance level), Δ CFI (CFI increment between models), Δ TLI (TLI increment between models), and Δ RMSEA (RMSEA increment between models).

playing the different constructs included in the model based on original instrument scores.

Results of the linear mixed model showed a statistically significant effect of time on *emotional regulation*, $F(1, 428) = 34.573$, $p < .001$, $\eta^2 p = .075$, and *academic performance*, $F(1, 401) = 42.188$, $p < .001$, $\eta^2 p = .095$, indicating improvement in both variables from pretest to posttest. Additionally, a small interaction effect was found between time and group for *emotional regulation*, $F(1, 428) = 3.831$, $p = .050$, $\eta^2 p = .009$, suggesting that changes in this variable may differ by group. Conversely, no statistically significant effects of time or interaction with group were found for *anxiety* or *academic performance*, suggesting these variables did not experience significant changes from pretest to posttest according to experimental condition. Given that the effects observed mainly pertain to *emotional regulation* within the experimental group, and in alignment with the study objectives, subsequent analyses focused exclusively on this group.

Relationship between anxiety, emotional regulation, and academic performance

Spearman correlation coefficients indicated that *academic performance* is positively related to *emotional regulation* and negatively related to *anxiety* at both measurement points. Additionally, *anxiety* and *emotional regulation* consistently showed a negative correlation. These findings clarify the relational structure among variables, providing a basis for subsequent Structural Equation Modeling (SEM) analyses (see Table 3).

Factorial invariance analysis between pretest and posttest indicated that the factorial structure remained stable over time, with

adequate fit indices at both assessment points. Configural and metric invariance were confirmed, indicating that latent factors and item relationships were consistent across measurement occasions. However, scalar invariance showed differences, which is expected since the same group was evaluated before and after a specific intervention, likely impacting participants' responses (see Table 4). Although TLI did not reach the recommended .90 thresholds, its value remained close, and given that both CFI and RMSEA indicated a good fit, the model can still be considered acceptable (Marsh et al., 2004). The slight decrease in TLI during metric (-.007) and scalar (-.004) invariance is expected when adding constraints and remains within acceptable limits (Chen, 2007).

Results obtained for *emotional regulation* in both pretest and posttest provide evidence supporting the reliability and validity of the instrument used to measure this construct. High Cronbach's alpha, Omega, and Composite Reliability (CR) values— all above the commonly accepted threshold of .70—indicate strong internal consistency at both time points. Furthermore, the Average Variance Extracted (AVE) values, greater than 0.5 at both times, confirm the convergent validity of the construct, suggesting that the items adequately capture the essence of *emotional regulation* (see Table 5).

Regarding the *anxiety* variable, all indicators showed factorial loadings greater than 0.50 with statistical significance levels below .001, except for items A6, A11, A15, and A20. Given their low factorial loadings, these items were excluded from subsequent analyses to enhance precision and validity of the measured construct (Fornell & Larcker, 1981). This decision ensures the robustness of the instrument structure and its appropriate representation of the *anxiety* construct. After removing these items, reliability indices were recalculated, showing that composite reliability (CR) improved to .759 in the pretest and .843 in the posttest,

Table 5
Factor loadings and reliability over time (pretest–posttest)

Indicators	Pretest					Posttest				
Emotional Regulation (ER)	Cronbach's α	Ω	CR	AVE	Factor loadings	Cronbach's α	Ω	CR	AVE	Factor loadings
RE1	.933	.934	.935	.706	1.000	.924	.924	.926	.672	1.000
RE2					0.803					0.871
RE3					0.980					0.918
RE4					1.016					0.992
RE5					1.023					1.048
RE6					0.944					1.063
Anxiety (A)	KR-20	Ω	CR	AVE	Factor loadings	KR-20	ω	CR	AVE	Factor loadings
A1	.605	.610	.876	.156	1.000	.650	.645	.894	.213	1.000
A2					1.428					1.202
A3					0.639					0.670
A4					1.112					1.193
A5					0.929					0.856
A6					0.278					0.348
A7					1.420					1.059
A8					0.828					0.758
A9					1.338					1.223
A10					1.040					0.806
A11					0.379					0.197
A12					0.973					0.741
A13					1.094					0.680
A14					0.795					0.735
A15					1.094					0.300
A16					1.090					1.079
A17					0.706					0.641
A18					1.478					0.968
A19					0.780					0.535
A20					0.525					0.274

Note. α de Cronbach = AI Cronbach's α = Cronbach's Alpha; ω = McDonald's Omega; CR = Composite Reliability; AVE = Average Variance Extracted; KR-20 = Kuder-Richardson Formula 20.

Table 6
Final model fit

	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR	GFI
Pretest	282.586	228	1.24	.967	.963	.027	.095	.990
Posttest	325.254	228	1.43	.951	.946	.038	.105	.989

Note. χ^2 = Chi-square; df = Degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual; GFI = Goodness of Fit Index.

Table 7
Standardized parameters from the model

Path	Pretest				Posttest			
	β	SE	CR (z)	p	β	SE	CR (z)	p
A → RE	-.095	.030	-3.140	.002*	-.104	.035	-2.998	.003*
A → RA	-.695	.254	-2.732	.006*	-.971	.195	-4.976	<.001*
RE → RA	.172	.090	1.911	.050*	.239	.101	2.374	.018*

Note. $p < .05$; A = Anxiety; RE = Emotional Regulation; RA = Academic Performance.

Table 8
Direct, indirect, and total effects on academic performance

	Direct effects	Indirect effects	Total effects
Pretest	-0.695*	-0.105	-0.799*
Posttest	-0.971*	-0.075 *	-1.046*

Note. * $p < .05$.

underlining the strength of the instrument for measuring *anxiety*. However, KR-20 values obtained for the *anxiety* scale remained below the recommended threshold of .70, with .60 at pretest and .68 at posttest, which constitutes a limitation in terms of internal consistency.

AVE values remained low (.177 at pretest and .263 at posttest). This low level could be associated with item complexity, particularly considering the young age of the participants. Certain items, such as ‘Do you sometimes think people talk badly about you or not?’ may pose an abstractness challenge for this population. This limitation should be considered when interpreting results, as it may affect accuracy in assessing *anxiety*.

When examining the fit of the Structural Equation Model at both measurement points (pretest and posttest), the proposed model shows a satisfactory fit with the analyzed data (see Table 6).

Table 7 presents standardized parameters of the relationships comprising the structural model, highlighting the interactions between variables at pretest and posttest. *Anxiety* consistently showed a significant negative relationship with both *emotional regulation* and *academic performance* at both measurement points, with a slight reduction in its relationship to *emotional regulation* post-intervention and an intensified negative relationship with *academic performance*. *Emotional regulation* positively and significantly related to *academic performance* at both measurement points, slightly increasing post-intervention. These results suggest *anxiety* negatively impacts *emotional regulation* and *academic performance*, while improved *emotional regulation* positively influences academic achievement (see Figure 2).

Emotional regulation and its mediating role

To evaluate whether *emotional regulation* mediates the relationship between *anxiety* and *academic performance*, a mediation analysis was conducted. This analysis decomposes the total effect of *anxiety* on *academic performance* into two components: the direct effect of *anxiety* and the indirect effect mediated through *emotional regulation*. Table 8 shows mediation analysis results. Before the intervention (pretest), the indirect effect was not statistically significant, suggesting that *emotional regulation* did not

play a mediating role between *anxiety* and *academic performance*. However, after the intervention (posttest), the indirect effect became statistically significant, indicating that *emotional regulation* acquired a more prominent mediating role. This suggests that, post-intervention, *emotional regulation* influences how *anxiety* impacts *academic performance*. It is important to note that the magnitude of total effects is greater post-intervention compared to pre-intervention, indicating that despite *emotional regulation* having a more significant mediating role, the negative effects of *anxiety* on *academic performance* intensified in the posttest (see Figure 2).

Table 9 presents results from the structural invariance analysis comparing differences between pretest and posttest. Findings showed no statistically significant differences between the unconstrained model and the fully constrained model, suggesting that, in general, structural relationships between variables have not globally changed before and after the intervention. However, statistically significant differences were found specifically for structural path β_2 , indicating that although the overall structural relationships remained stable, the strength or nature of this specific relationship changed between pretest and posttest. This result aligns with the mediation analysis, which indicated that *emotional regulation* acted as a mediator of the relationship between *anxiety* and *academic performance* only at posttest.

Regarding fit indices, although the TLI did not reach exactly .90, it remained within an acceptable range. Considering that other indices, such as the CFI and GFI, showed good fit, the model is deemed valid (Marsh et al., 2004). As highlighted by these authors, cut-off values should be interpreted flexibly, and model fit should not rely on a single index but rather a set of indicators.

Discussion

Emotional well-being is an essential pillar for academic performance (Valiente et al., 2011). Understanding how factors such as anxiety and emotional regulation influence school success has become increasingly relevant (Casares et al., 2024). Therefore, this study aimed to develop and validate a model exploring the influence of anxiety and emotional regulation on academic performance in first-cycle Primary Education students, before and after an emotional competencies intervention.

Regarding the first objective, which examined the effect of an emotional competencies intervention on anxiety, emotional regulation, and academic performance, results showed its effectiveness in improving emotional regulation. This partially confirms the first hypothesis, as significant differences in emotional regulation between the experimental and control groups were found after the intervention. However, the intervention did not achieve a statisti-

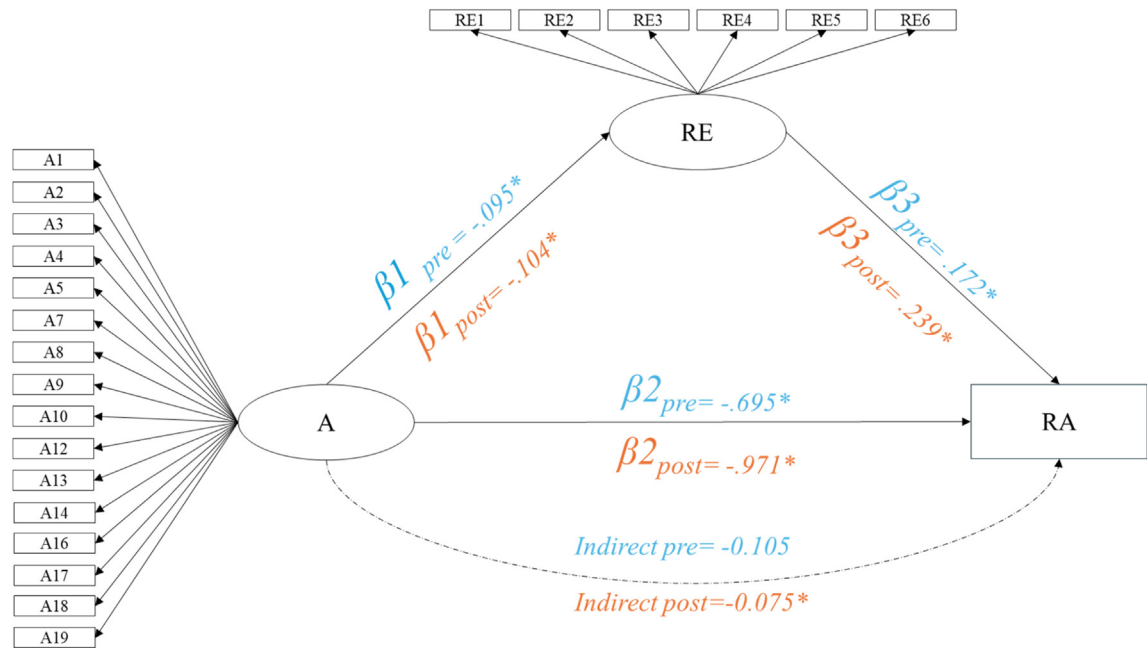


Figure 2. Final SEM model: Direct and indirect effects. Note. $p < .005$; A = Anxiety; RE = Emotional Regulation; RA = Academic Performance.

Table 9
Invariance analysis: Structural differences between pretest and posttest

Model	χ^2	df	χ^2/df	GFI	TLI	CFI	$\Delta \chi^2$	Δdf	p
Fully constrained	947.24	500	1.89	.977	.886	.888	6.058	3	.108
$\beta 1$ unconstrained	946.66	499	1.90	.977	.886	.888	0.574	1	.449
$\beta 2$ unconstrained	942.46	499	1.89	.977	.887	.889	4.780	1	.029*
$\beta 3$ unconstrained	945.20	499	1.89	.977	.886	.888	2.038	1	.153

Note. χ^2 = Chi-square; df = Degrees of freedom; GFI = Goodness of Fit Index; TLI = Tucker–Lewis Index; CFI = Comparative Fit Index; $\Delta \chi^2$ = Increment in Chi-square; Δdf = Increment in degrees of freedom; $p < .05$. The asterisk (*) indicates statistically significant differences compared to the fully constrained model ($p < .05$).

cally significant reduction in students' anxiety levels. This finding aligns with previous studies suggesting that although emotional regulation may buffer anxiety's negative effects, reducing anxiety itself may require more targeted interventions, such as relaxation techniques or mindfulness (Davis et al., 2010; Folk et al., 2014). Anxiety is a more complex phenomenon than emotional regulation, involving deeper cognitive and emotional processes (Rausch et al., 2011).

On the other hand, although academic performance improved, no statistically significant interaction was found between the experimental and control groups, indicating that this increase cannot be attributed exclusively to the intervention. Although emotional competencies influence learning, academic performance is multifactorial and determined by diverse variables. Supporting this, some studies suggest emotional competencies interventions can enhance student well-being and motivation, but their direct impact on academic performance is not always statistically significant or consistent (Cipriano et al., 2023; Durlak et al., 2011).

Regarding the second objective, analyzing the relationships among emotional regulation, anxiety, and academic performance, results confirmed a statistically significant negative relationship between anxiety and academic performance, supporting the second hypothesis. This result aligns with prior studies indicating that children with higher anxiety levels tend to have poorer school outcomes due to issues such as lack of concentration and excessive worry (Voltas et al., 2014; Zamora-Robles et al., 2023). Hughes et al. (2007) further suggest that children with anxiety disorders are at greater risk of poor school performance. However, after the intervention, this relationship remained and even intensified,

suggesting anxiety continues to significantly impact performance despite emotional strategies implemented. This could be explained by the intervention possibly increasing students' awareness of their anxiety. McCurdy et al. (2022) point out that greater awareness of emotional limitations could initially heighten students' worry, potentially explaining this increase.

Additionally, findings show emotional regulation had a positive, statistically significant effect on academic performance both before and after the intervention, confirming the third hypothesis. Children who better manage emotions perform better academically, underscoring emotional regulation's importance in educational settings (Valiente et al., 2010; Xu et al., 2015). Gross and Thompson (2007) and Pekrun (2006) also note that emotional regulation not only enhances academic performance but fosters self-regulated learning and engagement with school. This emphasizes the importance of programs developing this ability from an early age, given its role in academic success. Emotional regulation also impacts stress management and academic resilience, especially under pressure (Liu et al., 2022).

Finally, regarding the third objective, determining emotional regulation's mediating role between anxiety and academic performance, analyses revealed emotional regulation mediated this relationship only after the intervention, partially confirming the fourth hypothesis. This indicates emotional regulation became more relevant post-intervention in shaping how anxiety relates to academic performance. It suggests students may have learned emotional management techniques mitigating anxiety's impact on performance.

Furthermore, these findings confirm the fifth hypothesis, as the intervention altered the relationships among anxiety, emo-

tional regulation, and academic performance. Specifically, after the intervention, emotional regulation not only maintained its positive effect on academic performance but also took on a more significant mediating role. The mediating role of emotional regulation aligns with previous studies (Liu et al., 2022; Tang & He, 2023), which found anxiety primarily affects academic performance by disrupting emotional regulation processes. Students unable to adequately manage anxiety typically perform worse academically (Owens et al., 2012), whereas improved emotional regulation skills can mitigate these negative effects (Daros et al., 2021). Similarly, research by McLeod and Boyes (2021) and Pizzie et al. (2020) demonstrates that specific emotional regulation strategies, like cognitive reappraisal, can reduce anxiety's negative impact on academic performance, emphasizing the importance of emotional regulation training in high-stress academic contexts.

The finding that emotional regulation's mediating effect intensified post-intervention supports the notion that educational interventions designed to enhance these skills directly and positively impact students' capacity to manage anxiety. This not only improves emotional well-being but also academic performance, consistent with studies highlighting emotional regulation training as an effective means to mitigate anxiety and enhance academic achievement (Quiñones-Camacho & Davis, 2019; Ramdhonee-Dowlot et al., 2021).

The present study provides valuable insights into emotional competencies interventions and the complex relationships among anxiety, emotional regulation, and academic performance in early primary education students. However, several limitations should be considered when interpreting results. First, while the quasi-experimental design allowed evaluating the intervention's impact, future research could adopt a longitudinal approach to explore long-term effects. Second, reliability for the Children's Anxiety Scale (CAS) was below expected ($KR-20 < 0.7$), suggesting cautious interpretation. Despite this, it was maintained due to its prior usage and appropriateness for assessing anxiety in children. Given methodological challenges measuring anxiety at young ages, future studies might include additional instruments to enhance evaluation consistency. Lastly, although the intervention effectively improved emotional regulation, anxiety remains a complex phenomenon requiring additional specific measures for direct reduction, presenting an interesting avenue for future research. Moreover, future investigations might explore how variables like gender, age, socioeconomic status, or geographic location affect the effectiveness of emotional competencies interventions and their relationships with anxiety, emotional regulation, and academic performance.

Conclusions

The findings of this study provide a clearer understanding of the relationships between anxiety, emotional regulation, and academic performance among first-cycle Primary Education students following an emotional competencies intervention. In summary, three main ideas emerge from this work. Firstly, the intervention on emotional competencies has proven effective in strengthening emotional regulation, although it did not result in a statistically significant reduction in anxiety levels or improvements in academic performance compared to the control group. Secondly, the negative relationship observed between anxiety and academic performance underscores the importance of addressing anxiety within educational environments. Finally, emotional regulation not only directly and positively impacts academic performance but also acts as a mediator, reducing the negative effects of anxiety after intervention. These findings guide the development of future educational interventions, suggesting the need to integrate emotional competence training with specific strategies for managing anxiety, aiming

to enhance academic performance and promote students' overall well-being.

Author's contributions

Conceptualization: Raquel Gomis & Núria Garcia-Blanc; *software:* Raquel Gomis; *formal analysis:* Raquel Gomis; *investigation:* Raquel Gomis, Núria Garcia-Blanc, Gemma Filella and Agnès Ros-Morente; *resources:* Raquel Gomis, Núria Garcia-Blanc, Gemma Filella and Agnès Ros-Morente; *writing—original draft:* Raquel Gomis and Núria Garcia-Blanc; *writing—review & editing:* Raquel Gomis and Núria Garcia-Blanc; *supervision:* Gemma Filella and Agnès Ros-Morente; *project administration:* Gemma Filella and Agnès Ros-Morente; *funding acquisition:* Gemma Filella and Agnès Ros-Morente.

Funding

This publication is part of the R+D+I project funded by RTI2018-098294-B-I00 / PRE2019-091604, financed by MCIN/AEI/10.13039/501100011033/ FEDER. A way to make Europe.

References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. <https://doi.org/10.1037/0033-2909.103.3.411>
- Arenilla, M. J., Alarcón, D., & Povedano, M. A. (2022). Meta-análisis multinivel de los programas escolares de intervención basados en mindfulness en España. *Revista de Psicodidáctica*, 27(2), 109–117. <https://doi.org/10.1016/j.psicod.2022.04.005>
- Bender, P. K., Sømshovd, M., Pons, F., Reinholdt-Dunne, M. L., & Esbjørn, B. H. (2014). The impact of attachment security and emotion dysregulation on anxiety in children and adolescents. *Emotional and Behavioural Difficulties*, 20(2), 189–204. <https://doi.org/10.1080/13632752.2014.933510>
- Bisqueria, R. (2006). *Educación emocional y bienestar*. Wolters Kluwer.
- Bisqueria, R., & Pérez-Escoda, N. (2007). *Las competencias emocionales*. Educación XXI, 10, 61–82. <https://doi.org/10.5944/educxx1.1.10.297>
- Brumariu, L., Waslin, S., Gastelle, M., Kochendorfer, L., & Kerns, K. (2022). Anxiety, academic achievement, and academic self-concept: Meta-analytic syntheses of their relations across developmental periods. *Development and Psychopathology*, 35(4), 1597–1613. <https://doi.org/10.1017/S0954579422000323>
- Casares, M. Á., Díez-Gómez, A., Pérez-Albéniz, A., & Fonseca-Pedrero, E. (2024). Ansiedad y depresión en contextos educativos: prevalencia, evaluación e impacto en el ajuste psicológico. *Revista de Psicodidáctica*, 29(1), 1–8. <https://doi.org/10.1016/j.psicod.2023.11.002>
- Castillo-Gualda, R., Moraleda, A., & Brackett, M. A. (2023). Preventive initiatives to promote psychological adjustment among primary students: Findings of RULER approach in Spanish public schools. *International Journal of Educational Psychology*, 12(2), 206–232. <https://doi.org/10.17583/ijep.10970>
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Cho, G., Hwang, H., Sarstedt, M., & Ringle, C. M. (2020). Cutoff criteria for overall model fit indexes in generalized structured component analysis. *Journal of Marketing Analytics*, 8(4), 189–202. <https://doi.org/10.1057/s41270-020-00089-1>
- Cipriano, C., Strambler, M. J., Naples, L. H., Ha, C., Kirk, M., Wood, M., Sehgal, K., Zieher, A. K., Eveleigh, A., McCarthy, M., Funaro, M., Ponnock, A., Chow, J. C., & Durlak, J. (2023). The state of evidence for social and emotional learning: A contemporary meta-analysis of universal school-based SEL interventions. *Child Development*, 94(5), 1181–1204. <https://doi.org/10.1111/cdev.13968>
- Córdova, M., & Shiroma, R. (2005). Cuestionarios de ansiedad infantil. Características psicométricas y análisis descriptivo comparativo. *Avances en Psicología*, 13(1), 97–124. <https://doi.org/10.33539/avpsicol.2005.v13n1.2906>
- Colunga-Rodríguez, C., Ángel-González, M., Vázquez-Colunga, J. C., Vázquez-Juárez, C. L., & Colunga-Rodríguez, B. A. (2021). Relación entre ansiedad y rendimiento académico en alumnado de secundaria. *Revista de Estudios e Investigación en Psicología y Educación*, 8(2), 229–241. <https://doi.org/10.17979/reipe.2021.8.2.8457>
- Daros, A. R., Haefner, S. A., Asadi, S., Kazi, S., Rodak, T., & Quilty, L. C. (2021). A meta-analysis of emotional regulation outcomes in psychological interventions for youth with depression and anxiety. *Nature Human Behaviour*, 5(10), 1443–1457. <https://doi.org/10.1038/s41562-021-01191-9>
- Davis, E. L., Levine, L. J., Lench, H. C., & Quas, J. A. (2010). Metacognitive emotion regulation: Children's awareness that changing thoughts and goals can alleviate negative emotions. *Emotion*, 10(4), 498–510. <https://doi.org/10.1037/a0018428>
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405–432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>

- El-Anzi, F. O. (2005). Academic achievement and its relationship with anxiety, self-esteem, optimism, and pessimism in Kuwaiti students. *Social Behavior and Personality: An International Journal*, 33(1), 95–104. <https://doi.org/10.2224/sbp.2005.33.1.95>
- Elias, M., Zins, J. E., & Weissberg, R. P. (1997). Promoting social and emotional learning: Guidelines for educators. *Adolescence*, 35(137), 221.
- Folk, J. B., Zeman, J. L., Poon, J. A., & Dallaire, D. H. (2014). A longitudinal examination of emotion regulation: Pathways to anxiety and depressive symptoms in urban minority youth. *Child and Adolescent Mental Health*, 19(4), 243–250. <https://doi.org/10.1111/camh.12058>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>
- Gillis, J. S. (1980). *Child anxiety scale*. Institute for Personality and Ability Testing.
- Gillis, J. S., Gómez Fernández, D. E., & Pulido García, M. T. (2011). CAS: Cuestionario de Ansiedad Infantil: manual (TEA Ediciones). <https://bit.ly/3JhAbYx>
- Gkintoni, E., Dimakos, I., & Nikolaou, G. (2025). Cognitive insights from emotional intelligence: A systematic review of EI models in educational achievement. *Emerging Science Journal*, 8, 262–297.
- González-Loor, M. I., & Vázquez Avilés, P. A. (2023). Percepciones docentes sobre la importancia de la educación emocional desde edades tempranas. *Revista Espacios*, 44(4), 15–23.
- Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist*, 58(6–7), 466.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). The Guilford Press.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2017). *Multivariate data analysis*. Cengage Learning.
- Harrington, E. M., Trevino, S. D., Lopez, S., & Giuliani, N. R. (2020). Emotion regulation in early childhood: Implications for socioemotional and academic components of school readiness. *Emotion*, 20(1), 48–53. <https://doi.org/10.1037/emo0000667>
- Hodžić, S., Scharfen, J., Ripoll, P., Holling, H., & Zenasni, F. (2018). How efficient are emotional intelligence trainings: A meta-analysis. *Emotion Review*, 10(2), 138–148.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55.
- Hughes, A. A., Lourea-Waddell, B., & Kendall, P. C. (2007). Somatic complaints in children with anxiety disorders and their unique prediction of poorer academic performance. *Child Psychiatry and Human Development*, 39(2), 211–220. <https://doi.org/10.1007/s10578-007-0082-5>
- Isöhätälä, J., Näykki, P., & Järvelä, S. (2019). Cognitive and socio-emotional interaction in collaborative learning: Exploring fluctuations in students' participation. *Scandinavian Journal of Educational Research*, 64(6), 831–851.
- Leal, P. C., Goes, T. C., da Silva, L., & Teixeira-Silva, F. (2017). Trait vs. state anxiety in different threatening situations. *Trends in Psychiatry and Psychotherapy*, 39(3), 147–157. <https://doi.org/10.1590/2237-6089-2016-0044>
- Li, L., Gow, A. D. I., & Zhou, J. (2020). The role of positive emotions in education: A neuroscience perspective. *Mind, Brain, and Education*, 14(3), 220–234.
- Liu, F., Gao, C., Gao, H., & Liu, W. (2022). The automatic emotion regulation of children aged 8–12: an ERP study. *Frontiers in Behavioral Neuroscience*, 16, 1–9. <https://doi.org/10.3389/fnbeh.2022.921802>
- López-Cassà, È. (2023). (coord.). *El desarrollo de la competencia emocional en la Educación Primaria. Programa del GROP revisado y evaluado*. Cuadernos de Pedagogía.
- Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal*, 11(3), 320–341. <https://doi.org/10.1207/s15328007sem1103.2>
- McCurdy, B. H., Scozzafava, M. D., Bradley, T., Matlow, R., Weems, C. F., & Carrion, V. G. (2022). Impact of anxiety and depression on academic achievement among underserved school children: Evidence of suppressor effects. *Current Psychology*, 42(30), 26793–26801. <https://doi.org/10.1007/s12144-022-03801-9>
- McLeod, C., & Boyes, M. (2021). The effectiveness of social-emotional learning strategies and mindful breathing with biofeedback on the reduction of adolescent test anxiety. *Canadian Journal of Education/Revue Canadienne de l'Éducation*, 44(3), 815–847. <https://doi.org/10.53967/cje-rce.v44i3.4869>
- Nadeem, A., Umer, F., & Anwar, M. J. (2023). Emotion regulation as predictor of academic performance in university students. *Journal of Professional & Applied Psychology*, 4(1), 20–33. <https://doi.org/10.52053/jpap.v4i1.157>
- Nelis, D., Kotsou, I., Quoidbach, J., Hansenne, M., Weytens, F., Dupuis, P., & Mikolajczak, M. (2011). Increasing emotional competence improves psychological and physical well-being, social relationships, and employability. *Emotion*, 11, 354–366. <https://doi.org/10.1037/a0021554>
- Onuigbo, L. N., Anyanwu, J. I., Adimora, E. D., Akaneme, I. N., Oforka, T. O., Obiyo, N. O., Ezenwaji, I. O., Enyi, C., Aye, E. N., Chigbu, B. C., Eze, U. N., & Ogbuabor, S. E. (2019). Emotional self-regulation as a predictor of self-esteem and academic self-efficacy of children with visual impairment. *Global Journal of Health Science*, 11(8), 29. <https://doi.org/10.5539/gjhs.v11n8p29>
- Ortiz-Padilla, M., Paredes-Bermúdez, M., Soto-Varela, R., & Aldana-Rivera, E. (2020). Ansiedad matemática y desempeño académico en estudiantes en la formación básica de ingeniería. *Formación Universitaria*, 13(4), 93–100. <https://doi.org/10.4067/S0718-50062020000400093>
- Owens, M., Stevenson, J., Hadwin, J. A., & Norgate, R. (2012). Anxiety and depression in academic performance: An exploration of the mediating factors of worry and working memory. *School Psychology International*, 33(4), 433–449. <https://doi.org/10.1177/0143034311427433>
- Pedersen, M. L., Hølen, S., Lydersen, S., Martinsen, K., Neumer, S.-P., Adolfsen, F., & Sund, A. M. (2019). School functioning and internalizing problems in young schoolchildren. *BMC Psychology*, 7(1), 88. <https://doi.org/10.1186/s40359-019-0365-1>
- Pekrun, R. (2006). The control-value theory of achievement emotions: assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review*, 18(4), 315–341. <https://doi.org/10.1007/s10648-006-9029-9>
- Pinargote-Macias, E. I., & Caicedo-Guale, L. C. (2019). La ansiedad y su relación en el rendimiento académico de los estudiantes de la carrera de Psicología de la Universidad Técnica de Manabí. *Espirales Revista Multidisciplinaria de Investigación Científica*, 3(28), 1–18.
- Pizzie, R. G., McDermott, C. L., Salem, T. G., & Kraemer, D. J. M. (2020). Neural evidence for cognitive reappraisal as a strategy to alleviate the effects of math anxiety. *Social Cognitive and Affective Neuroscience*, 15(12), 1271–1287. <https://doi.org/10.1093/scan/nsaa161>
- Priego-Ojeda, M., López-Cassà, È., Pérez-Escoda, N., & Filella, G. (2024). Construction and validation of the emotional development on early primary education scale (EDEPES-28). *Educación XX1*, 27(2), 253–279. <https://doi.org/10.5944/educxx1.38358>
- Putwain, D. W., & Wood, P. (2023). Anxiety in the mathematics classroom: reciprocal relations with control and value, and relations with subsequent achievement. *ZDM—Mathematics Education*, 55(2), 285–298.
- Quiñones-Camacho, L. E., & Davis, E. L. (2019). Emotion regulation strategy knowledge moderates the link between cumulative stress and anxiety symptoms in childhood. *International Journal of Behavioral Development*, 43(4), 369–374. <https://doi.org/10.1177/0165025419833821>
- Rahmawati, R., Hodijah, D. S., Man Ihsanda, N., Susiyani, N., Sugiarti, S., & Tya, S. (2024). Teachers' strategies: Can it prevent bullying to early childhoods in preschool education? *Journal Corner of Education, Linguistics, and Literature*, 3(4), 368–376. <https://doi.org/10.54012/JCELL.V3I4.287>
- Ramdhonée-Dowlot, K., Balloo, K., & Essau, C. A. (2021). Effectiveness of the Super Skills for Life programme in enhancing the emotional wellbeing of children and adolescents in residential care institutions in a low- and middle-income country: A randomised waitlist-controlled trial. *Journal of Affective Disorders*, 278, 327–338. <https://doi.org/10.1016/j.jad.2020.09.053>
- Rausch, L., Rovella, A., Morales-de-Barbenza, C., & González-Rodríguez, M. (2011). Procesos cognitivos del trastorno de ansiedad generalizada en adolescentes. *Psicología y Salud*, 21, 215–226. <https://doi.org/10.25009/pys.v21i2.574>
- Ruiz-Aranda, D., Salguero, J. M., Cabello, R., Palomera, R., & Fernández-Berrocá, P. (2012). Can an emotional intelligence program improve adolescents' psychosocial adjustment? Results from the INTEMO Project. *Social Behavior and Personality*, 40, 1373–1380.
- Sousa, M., Peixoto, M., Cruz, O., & Cruz, S. (2023). Academic performance in institutionalized and noninstitutionalized children: The role of cognitive ability and negative lability. *Children*, 10(8), 1405. <https://doi.org/10.3390/children10081405>
- Spielberger, C. D. (1983). *Manual for the State-Trait Anxiety Inventory: STAI (Form Y)*. Consulting Psychologists Press.
- Tang, Y., & He, W. (2023). Relationship between emotional intelligence and learning motivation among college students during the COVID-19 pandemic: A serial mediation model. *Frontiers in Psychology*, 14, 1–15. <https://doi.org/10.3389/fpsyg.2023.1109569>
- Usán-Supervía, P., & Quílez-Robres, A. (2021). Emotional regulation and academic performance in the academic context: the mediating role of self-efficacy in secondary education students. *International Journal of Environmental Research and Public Health*, 18(11), 5715. <https://doi.org/10.3390/ijerph18115715>
- Valiente, C., Lemery-Chalfant, K., & Swanson, J. (2010). Prediction of kindergartners' academic achievement from their effortful control and emotionality: Evidence for direct and moderated relations. *Journal of Educational Psychology*, 102(3), 550–560. <https://doi.org/10.1037/a0018992>
- Valiente, C., Swanson, J., & Eisenberg, N. (2011). Linking students' emotions and academic achievement: when and why emotions matter. *Child Development Perspectives*, 6(2), 129–135. <https://doi.org/10.1111/j.1750-8606.2011.00192.x>

- Villamizar-Acevedo, G., Araujo-Arenas, T. Y., & Trujillo-Calderón, W. J. (2020). Relación entre ansiedad matemática y rendimiento académico en matemáticas en estudiantes de secundaria. *Ciencias Psicológicas*, 14(1), 1–13. <https://doi.org/10.22235/cp.v14i1.2174>
- Voltas, N., Hernández-Martínez, C., Aparicio, E., Arijá, V., & Canals, J. (2014). Psychopathological Factors that can influence academic achievement in early adolescence: A three-year prospective study. *The Spanish Journal of Psychology*, 17, E100. <https://doi.org/10.1017/sjp.2014.100>
- Wood, J. (2006). Effect of anxiety reduction on children's school performance and social adjustment. *Developmental Psychology*, 42(2), 345–349. <https://doi.org/10.1037/0012-1649.42.2.345>
- Xu, J., Fan, X., & Du, J. (2015). Homework Emotion Regulation Scale. *Journal of Psychoeducational Assessment*, 34(4), 351–361. <https://doi.org/10.1177/0734282915603542>
- Zamora-Robles, W. E., Talavera-Sánchez, O. J., González-Carrillo, E., Parra-Acosta, H., & Barrio-Echavarría, G. F. (2023). La salud mental durante la pandemia por COVID-19 y su efecto en el desempeño académico en estudiantes de la licenciatura en medicina. *Revista Mexicana de Educación Médica*, 10(1), 3–14. <https://doi.org/10.24875/RMEM.23000002>