

# The influence of adolescent attachment styles, anxiety, and adverse childhood experiences (ACE) on school performance

La influencia de los estilos de apego en la adolescencia, la ansiedad y las experiencias adversas en la infancia (ACE, por sus siglas en inglés) en el rendimiento escolar  
A Influência dos Estilos de Apego na Adolescência, Ansiedade e Experiências Adversas na Infância (ACE) no Desempenho Escolar



Marta Pous Sastre  
Marc Pérez Burriel  
Marta Sadurní Brugué

Universitat  
de Girona

Niño con sensación de fracaso escolar: [Rip](#)

**Rip**  
**181**

Volumen 18 #1 ene-abr  
18 Años

ID: [10.33881/2027-1786.rip.18102](https://doi.org/10.33881/2027-1786.rip.18102)

**Título:** La influencia de los estilos de apego en la adolescencia, la ansiedad y las experiencias adversas en la infancia (ACE, por sus siglas en inglés) en el rendimiento escolar

**Title:** The influence of adolescent attachment styles, anxiety, and adverse childhood experiences (ACE) on school performance

**Titulo:** A Influência dos Estilos de Apego na Adolescência, Ansiedade e Experiências Adversas na Infância (ACE) no Desempenho Escolar

**Alt Title / Título alternativo:**

**[en]:** La influencia de los estilos de apego en la adolescencia, la ansiedad y las experiencias adversas en la infancia (ACE, por sus siglas en inglés) en el rendimiento escolar

**[es]:** The influence of adolescent attachment styles, anxiety, and adverse childhood experiences (ACE) on school performance

**[pt]:** A Influência dos Estilos de Apego na Adolescência, Ansiedade e Experiências Adversas na Infância (ACE) no Desempenho Escolar

**Author (s) / Autor (es):**

Pous Sastre, Pérez Burriel & Sadurní Brugué

**Keywords / Palabras Clave:**

**[en]:** Academic performance, Adolescence, Adverse Childhood Experiences, Anxiety, Internal Working Model of attachment

**[es]:** Adolescencia, Ansiedad, Experiencias Adversas de la Infancia, Modelo de Trabajo Interno de apego, Rendimiento Escolar

**[pt]:** Adolescência, Ansiedade, Experiências Adversas na Infância, Modelo Interno de Trabalho de Apego, Desempenho Escolar

**Submitted:** 2024-04-04

**Accepted:** 2024-08-29

## Resumen

El propósito de este estudio es profundizar en la comprensión del fracaso escolar y la baja motivación para el aprendizaje que presentan algunos estudiantes de secundaria y bachillerato. En concreto, analizamos variables que podrían estar relacionadas con este fenómeno, como el Modelo de Trabajo Interno de apego (IWM), el nivel de ansiedad y las Experiencias Adversas de la Infancia (ACE), así como otras características sociodemográficas y familiares. La muestra estuvo compuesta por 109 estudiantes entre 13 y 20 años, 65 niños y 74 niñas, matriculados en el mismo colegio de educación secundaria. Se realizó un estudio descriptivo correlacional utilizando el cuestionario CAMIR-R para la evaluación del modelo de apego interno, el STAI para el nivel de ansiedad y el cuestionario ACE para Experiencias Adversas de la infancia. El rendimiento escolar se midió a partir de la nota media obtenida en las materias cursadas en el segundo cuatrimestre del curso. Los resultados muestran una relación significativa entre un modelo de apego seguro y un mejor rendimiento escolar. Los estudiantes con modelos de apego inseguro obtienen puntuaciones más altas en ansiedad y han estado expuestos a un mayor número de experiencias infantiles adversas. Por otra parte, el estilo de apego evitativo de los adolescentes actúa como mediador entre las experiencias vividas en su infancia (ACE) y su rendimiento académico actual. Se discuten estos resultados en relación a la importancia de los modelos operativos de seguridad interna en los procesos de aprendizaje.

## Abstract

The purpose of this study is to improve understanding of school failure and low motivation for learning observed in some secondary grade students. Specifically, we analysed variables that could be related to this phenomenon, such as the Internal Working Model of attachment (IWM), anxiety levels, and Adverse Childhood Experiences (ACE), as well as other sociodemographic and family characteristics. The sample consisted of 109 students aged between 13 and 20 years, 65 males and 74 females, enrolled in the same secondary school. A descriptive correlational study was conducted using the CAMIR-R questionnaire to evaluate the internal attachment model, the STAI for anxiety level, and the ACE questionnaire for Adverse Childhood Experiences. Academic performance was measured based on the average grade obtained in the subjects taken during the second semester of the course. The results show a significant link between a secure attachment model and better academic performance. Students with insecure attachment models score higher in anxiety and have been exposed to a greater number of adverse childhood experiences. Additionally, the avoidant attachment style of adolescents acts as a mediator between the experiences they had in their childhood (ACE) and their current academic performance. These results are discussed in relation to the importance of internal security operational models in learning processes.

## Resumo

Objetivo do Estudo: O propósito deste estudo é aprofundar a compreensão do fracasso escolar e da baixa motivação para a aprendizagem apresentados por alguns estudantes do ensino médio e secundário. Em particular, analisamos variáveis que podem estar relacionadas a esse fenômeno, como o Modelo Interno de Trabalho de apego (IWM), o nível de ansiedade e as Experiências Adversas na Infância (ACE), além de outras características sociodemográficas e familiares. Método: A amostra foi composta por 109 estudantes entre 13 e 20 anos, sendo 65 meninos e 74 meninas, matriculados na mesma instituição de ensino secundário. O estudo seguiu um delineamento descritivo correlacional, utilizando os seguintes instrumentos: CAMIR-R: Para avaliar o Modelo Interno de Apego; STAI: Para medir o nível de ansiedade.; Questionário ACE: Para identificar Experiências Adversas na Infância.; O desempenho escolar foi avaliado por meio da média das notas obtidas nas disciplinas cursadas no segundo semestre do ano letivo. Resultados: Os resultados indicaram uma relação significativa entre um modelo de apego seguro e um melhor desempenho escolar. Estudantes com modelos de apego inseguro apresentaram níveis mais elevados de ansiedade e maior exposição a experiências adversas na infância. Além disso, verificou-se que o estilo de apego evitativo nos adolescentes funciona como um mediador entre as experiências adversas vividas na infância (ACE) e o desempenho acadêmico atual. Discussão: Os resultados são discutidos à luz da importância dos modelos operativos de segurança interna para os processos de aprendizagem. Um modelo de apego seguro parece oferecer maior resiliência emocional e cognitiva, impactando positivamente o desempenho escolar. Esses achados reforçam a relevância de intervenções voltadas para o fortalecimento da segurança no apego e o suporte emocional no ambiente escolar e familiar

## Citar como:

Pous Sastre, M., Pérez Burriel, M. & Sadurní Brugué, M. (2025). The influence of adolescent attachment styles, anxiety, and adverse childhood experiences (ACE) on school performance. Revista Iberoamericana de Psicología, 18 (1), 15-25. Obtenido de: <https://reviberopsicologia.iberu.edu.co/article/view/2947>

Marta Pous Sastre, Psi

ORCID: [0000-0002-3056-1461](https://orcid.org/0000-0002-3056-1461)

**Source | Filiación:**

Funcionaria de gobierno

**BIO:**

Licenciada en Psicología y Filosofía. Especializada en vínculo afectivo

**City | Ciudad:**

España [es]

**e-mail:**

[mpous4@xtec.cat](mailto:mpous4@xtec.cat)

Marc Pérez Burriel, Psi

ORCID: [0000-0001-9147-5498](https://orcid.org/0000-0001-9147-5498)

**Source | Filiación:**

Universidad de Girona

**BIO:**

Doctorado con intereses investigativos en motivaciones y capacidades intersubjetivas y su relación con la salud psicológica. También participa en investigaciones sobre el vínculo afectivo, competencias parentales y aprendizaje reflexivo.

**City | Ciudad:**

Girona [es]

**e-mail:**

[marc.perez@udg.edu](mailto:marc.perez@udg.edu)

Marta Sadurní Brugué, Psi sp

ORCID: [0000-0003-3731-2430](https://orcid.org/0000-0003-3731-2430)

**Source | Filiación:**

Laboratorio de Apego y Desarrollo Humano. Universidad de Gerona

**BIO:**

Doctora. Especialista en Psicología Clínica y psicoterapeuta. Docente investigadora con intereses en Psicología Evolutiva, Vínculo Afectivo y Desarrollo Humano

**City | Ciudad:**

Girona [es]

**e-mail:**

[marta.sadurni@udg.edu](mailto:marta.sadurni@udg.edu)

# The influence of adolescent attachment styles, anxiety, and adverse childhood experiences (ACE) on school performance

La influencia de los estilos de apego en la adolescencia, la ansiedad y las experiencias adversas en la infancia (ACE, por sus siglas en inglés) en el rendimiento escolar  
A Influência dos Estilos de Apego na Adolescência, Ansiedade e Experiências Adversas na Infância (ACE) no Desempenho Escolar

Marta Pous Sastre

Marc Pérez Burriel

Marta Sadurní Brugué

Adolescence is an evolutionary period in which important changes take place in young people's physical, mental, and emotional development. Some of these changes involve neuroendocrine alterations and others affect brain structures that in turn have repercussions on the processes of emotional inhibition and regulation, reasoning capacity, reflective thinking, motivation, and learning ability (Blakemore, 2018; Burunat, 2004; Oliva, 2004; Sadurní & Rostan, 2004). Neuroendocrine alterations include the well-known transformations in the mesolimbic dopaminergic system that affect the production and transmission of dopamine, a neurotransmitter related to pleasure and the motivation to explore. According to studies by Berridge and Robinson (1998) or Lambe et al., (2000) the adolescent brain needs greater dopamine activation to enjoy life and not experience boredom and dysphoria. This need has been linked to the attraction of risky behaviour for young people (Spear, 2000), which must be controlled by the maturation of the circuits of the orbitofrontal and prefrontal cortexes and striatum, among others (Burunat, 2004).

The myelination of the connection pathways of the previously mentioned prefrontal cortex structures is not yet mature in adolescence. There appears to be a temporary imbalance between the primary reward centres involved in motivating behaviour – hyperactive at this stage – and the prefrontal regions responsible for controlling behaviour and allowing or inhibiting desire (Casey et al., 2000).

In this transition, affective and educational experiences are crucial for shaping the brain during development (Blakemore & Mills, 2014). Concern from parents and educators is activated by the conflict generated by adolescents' behaviour. The goal of parental concern is to encourage adolescents to examine their conduct, acquire the capacity to delay rewarding responses, and transform them into alternative forms of pleasure that don't involve danger, seeking a balance between the most immediate sources of pleasure, such as drugs, driving fast, or risky sexual behaviour, and other more elaborate ones, such as the pleasure of an adventure sport, traveling, volunteering, or others that imply a desire to explore, discover and share this knowledge with their peers (Sadurní and Rostan, 2014)

In this drive to explore and share, there is room for artistic and technical-scientific experiences that foster a community of interests and stimuli to continue learning and aiming towards a future with more possibilities (Trevarthen, 2011). Therefore, it is crucial that we consider the reasons why some adolescents lose the motivation to explore, discover, and learn, resulting in attention problems in school, anxiety, and difficulties with impulse control, ultimately leading to poor academic performance and school failure.

John Bowlby, creator of the pioneer of attachment theory, considered that the basic principles of care, attention, and shared joy between the mother (or maternal surrogate) and the infant are necessary to develop a feeling of trust and security, producing a feeling of internal security in the infant (Bowlby, 1969). The mother, with her sensitivity, adapts to the natural rhythms of her child, is attentive to his or her needs, discovers what is satisfying, and acts (to behave?) accordingly to achieve a state of shared joy. By making this move towards the other, not only does this make the baby happy, but cooperation is also achieved. Other authors (Fonagy et al., 2004; Stern, 1977; Trevarthen & Aitken, 2001) have stated that human babies are preprogrammed to develop in a socially cooperative way. In fact, social exclusion and non-cooperation is perceived in the anterior cingulate cortex of our brain by the same neural areas as pain (Eisenberger et al., 2003).

These attachment relationships are also the fundamental pillars for the generation of basic psychological processes of self-regulation that include the regulation of stress states, focal attention as well as the ability to interpret one's own and others' emotions and mental states (Fonagy & Target, 2002). According to Pérez Burriel & Sadurní Brugué (2014) and Sadurní & Pérez-Burriel (2016), attachment relationships not only involve protection and care within the family, but are also fundamental for psychological structuring and the development of inter-subjective attunement capacity. This understanding of the world, in relation to both ourselves and others, is based on mental representations known as internal working models. These cognitive structures allow us to anticipate events and adopt behaviours that promote our survival and security, both personally and in our interactions with others.

The organisation of attachment appears to be related to a variety of domains of psychosocial functioning in adolescence (Allen et al., 2004; Sroufe et al., 2005b). Bowlby hypothesised that during infancy people develop representations of the functioning of close relationship and intimate experiences with attachment figures (Bowlby, 1973, 1980). The person's beliefs and expectations about how attachment relationships operate are called the Internal Working Model (IWM). According to Feldman (2020), if the adolescent has not developed an IWM that allows the mental representation of parents or caregivers as figures of secure attachment, their motivation to initiate exploratory behaviours will decrease, and it will be more difficult to inhibit their impulsivity with reflection or emotional regulation processes. Likewise, their social behaviour will not conform to the demands of the environment.

Recent studies also indicate that attachment styles have an effect on cortical activity in adolescents with secure attachment during reflexive function assessment tests or mentalisation and decreased activation of the right upper temporal cortex in adolescents with an insecure attachment style (Baskak et al., 2020). The weight of adverse experiences in students' history of parenting and the insecure attachment model that characterises their affective relationships results, according to several authors, in high levels of anxiety, behavioural health problems, a lack of attention in the classroom, and poor school performance (Chen, 2017; Kurland & Siegel, 2016; Schickedanz et al., 2018; Sheinkopf et al., 2017).

There is scientific consensus regarding the effects of adverse childhood experiences on the structures and functioning of the brain at cortical level but especially at the level limbic system, with a reduction of the hippocampus and an increase in the amygdala, which could be related to responses of rage or fear for no apparent reason and a lack of interest and motivation. It is postulated that this reduced hippocampus volume could lead to memory difficulties, affecting the ability to process and retain information, and consequently, decreased academic performance. (Teicher et al., 2016). Other studies highlight that a childhood full of adverse experiences that generate internal operating models of insecure functioning increases the size of the amygdala and anxiety symptoms (Roth et al., 2018).

The impact of childhood adversity and maltreatment on educational outcomes is becoming more widely recognised and empirically supported (Kostić et al., 2019). Furthermore, academic difficulties are perceived as an urgent problem among maltreated children because academic success contributes significantly to resilience (Schelble et al., 2010). In this sense, the figure of the teacher seems to have a certain compensatory power. Even teenagers who were hurt and neglected when they were young can do better in school if their teachers give them emotional support. The aim of this study was to seek a greater understanding of the problems of underperforming students and their relationship with anxiety, adverse experiences suffered and the internal attachment model. We understand that academic performance is only a contributing factor, one indicator among others, to failure at school and that the analysis of other possible factors can contribute not only to a better understanding but also to the development of intervention programmes within the school context.

## Methodology

### Participants

The participants consisted of 109 students attending a secondary school in a medium-sized city in the north of Catalonia (Spain) studying in their 4th and last year of compulsory secondary education period or post-compulsory secondary education course in all of the four types (art, science, technology, humanities and social sciences). The final sample consisted of a majority of females (78%) and a minority of males (22%). This situation is explained by the higher number of females in the secondary school. The adolescents ranged in age from 13 to 20 years old (M<sub>age</sub> = 16.6).

Other sociodemographic and environmental information is provided in Table 1.

**Table 1**  
Demographic and environmental variables reported by the students.

Variable	M	SD	n	%	Max	Min
Age	16.61	1.00			20	15
<b>Gender</b>						
Female			85	75.9		
Male			24	21.4		
Other			3	2.7		
Father's age	49.60	5.84			68	33
Mother's age	47.12	5.53			63	32
No. siblings	2.25	1.10			6	0
No. people in cohabitation unit	3.73	1.03			7	2
<b>Economic stability</b>						
Yes			37	33.0		
No			64	57.1		
Doesn't know / Doesn't answer			8	7.1		
Missing			3	2.7		
<b>Types of family</b>						
1 nuclear			64	57.1		
2 single parent			28	25.0		
3 adopted			4	3.6		
4 compound			11	9.8		
5 LGBTQ+ parenting			2	1.8		
6 extensive			3	2.7		
<b>Parents' employment status</b>						
1 both work			83	74.1		
2 only one works / temporary jobs			25	22.1		
3 neither work			4	3.6		

## Procedure

We gathered a sample of school students to administer tests during teaching hours. All tests were conducted during school hours in groups. Aspects of wording were discussed and any of the participants' doubts were clarified. Alternative materials were distributed to those students who had not consented to participate in the study. The average grades of the last two school years were collected. The grades were classified, as is usual in academic assessments, into the following categories: Fail-grades between 0 and 4.99; Pass-grades between 5 and 6.99; Good-grades between 7 and 8.99 and, Excellent-grades between 9 and 10.

## Instruments

Basic family and contextual information questionnaire. A short questionnaire was developed that included aspects such as age, gender self-determined by the student, age of the parents, number of siblings, and other characteristics related to the family context and socioeconomic situation of the parents.

Adverse Childhood Experiences Questionnaire (ACE) (Felitti et al., 1998). This measures the level of adverse childhood experiences by assessing the types of abuse and traumatic experiences that occurred before the age of 18. The ACE questionnaire quantifies childhood trauma on a scale of 1 to 10, through 10 Yes/No questions. Each question corresponds to a type of childhood trauma experience that falls into three broad categories. The first is child abuse, which includes emotional, physical and sexual abuse; the second is physical and emotional neglect. The third category includes family difficulties such as substance abuse, mental illness, violence, divorce or having a family member in prison.

Prior research has indicated a high level of internal consistency for the ACE questionnaire, with a Cronbach's alpha coefficient of 0.88 observed for the ten binary categories derived from the questionnaire (Ziv et al., 2018).

STAI. The State-Trait Anxiety Inventory (Spielberger et al., 1970) in its version validated for the Spanish population (Buena-Casal et al., 2011). This questionnaire offers a self-assessment of anxiety as a transient state (anxiety/state) and/or as general and permanent traits (anxiety/trait). Regarding its internal consistency, the mean Cronbach's alpha for 52 studies included in a meta-analysis was 0.91 for state anxiety and for a meta-analysis with 51 studies it was 0.89 for trait anxiety (Guillén-Riquelme et al., 2014).

CaMir-R (Balluerka et al., 2011) reduced version of the CaMir questionnaire for assessing attachment (Pierrehumbert, 1996). This assesses psychometric properties and internal consistency indices in the 7 dimensions between 0.60 and 0.85, except for the parental permissiveness dimension, which showed good reliability, and can be applied both in the clinical field and in research with adolescents and adults. The CaMIR-R

### dimensions are:

- **Dimension 1 – Security, availability and support of attachment figures.** This deals with the perception of having been wanted by attachment figures and having confidence in their capacity for protection and availability.
- **Dimension 2 – Family concern.** Covers items that deal with the concern and fear of separation from loved ones and current concern about issues or events related to them.
- **Dimension 3 – Parental interference.** This focuses mainly on the feeling of having been a child with fear, anxious about the possible abandonment of parents and, in a certain way, limited by parents in their self-sufficiency, overprotected in this sense.
- **Dimension 4 – The value of parental authority.** This relates to the positive evaluation or otherwise regarding family values and the weight of parental authority.
- **Dimension 5 – Parental permissiveness.** Memories of a childhood with no boundaries and no parental guidance.
- **Dimension 6 – Self-sufficiency and resentment of parents.** This factor implies, on the one hand, resentment of parents and, on the other hand, the rejection of dependence and affective reciprocity and the exaltation of being autonomous, strong and self-sufficient.
- **Dimension 7 – Childhood trauma.** This is composed of items that relate to the memory of neglect, violence, or threats of attachment figures during childhood.

The Spanish version has a good internal structure and presents convergent and decision validity (Lacasa, 2008), as well as internal consistency and temporal stability. The internal consistency indices for the seven dimensions vary between 0.60 and 0.85, except the parental permissiveness dimension, which is unreliable. The second dimension (family concern) which measures concern from parents and separation anxiety does not present a positive correlation with the ambivalent/concerned profile or a negative correlation with the secure profile.

## Statistical Analysis

SPSS (Version 21.0; IBM Corp., 2012) statistical programs were used for all analyses. The Student's t-test or ANOVA were used to compare means of CaMIR-R dimensions, ACE results, Anxiety-Trait and Anxiety-State and Grade variables. The Chi Square test was used to assess group differences in the following two categorical variables: ACE Categories and Attachment Pattern. The Kolmogorov-Smirnov test for a sample was used to confirm that the data distribution had been adjusted to follow a normal distribution. The non-parametric Spearman's rho (rs) test was used to analyse the relationships between the study measurements because some of the variables did not fit the normal distribution. Hierarchical linear models were used to predict academic achievement as a dependent variable and a set of predictors, the attachment dimensions on the one hand and the number of ACEs on the other. In this manner, the degree to which different attachment dimensions predicted academic achievement firstly, and Adverse Childhood Experiences secondly were analysed multivariately. Finally, as part of a mediational analysis, the PROCESS Macro for SPSS version 4.1 (Hayes, 2018) was used to test the simple mediation model; Model 4 was selected, as well as a bootstrap of 10,000 and a 95% confidence interval.

The four ACE categories were organised based on the usual scores: 1) no ACE; 2) one ACE; 3) two or three ACEs; and 4) four or more ACEs.

In order to group students into the three classic attachment typologies (secure, insecure-anxious, insecure-avoidant), the seven dimensions of CaMIR-R are grouped into a variable category called Attachment Pattern. According to Lacasa & Muela (2014): Dimension 1 or Security could be associated with secure attachment, Parental Interference (Dim. 3) with preoccupied attachment, Dimension 6 or Self-sufficiency with avoidant attachment. On the other hand, Dimension 7 (Trauma) could point to disorganised attachment and Dimensions 4 (Authority) and 5 (Permissiveness) refer to representations of the family structure not associated with a given internal attachment model. Dimension 2 has been included in our study in the Anxious style. On that account, those with a higher score in Dimension 1 were categorised as "secure". Secondly, those who scored higher in dimensions 2 and 3 were categorised as "anxious" and those with a higher score in dimension 6 as "avoidant".

## Ethical considerations

The protocol was approved by the Ethics and Biosafety Research Committee of the University of Girona (CEBRUdG), with the protocol code CEBRUdG 0009-2020. Additionally, consent was obtained from the school's management team, as well as from the parents and students who voluntarily chose to participate in the study. The informed consent included a brief overview of the project and psychometric tests, as well as the right to withdraw from the study at any time and assurance of anonymity.

# Results

## Descriptive and correlational analysis

Regarding the occurrence of Adverse Childhood Experiences, we found that the majority of students in the sample (n=65; 58.10%) had experienced zero or one significant adverse experience in their life and 16 (16.96%) had a score higher than 4 or more ACEs (Figure 1).

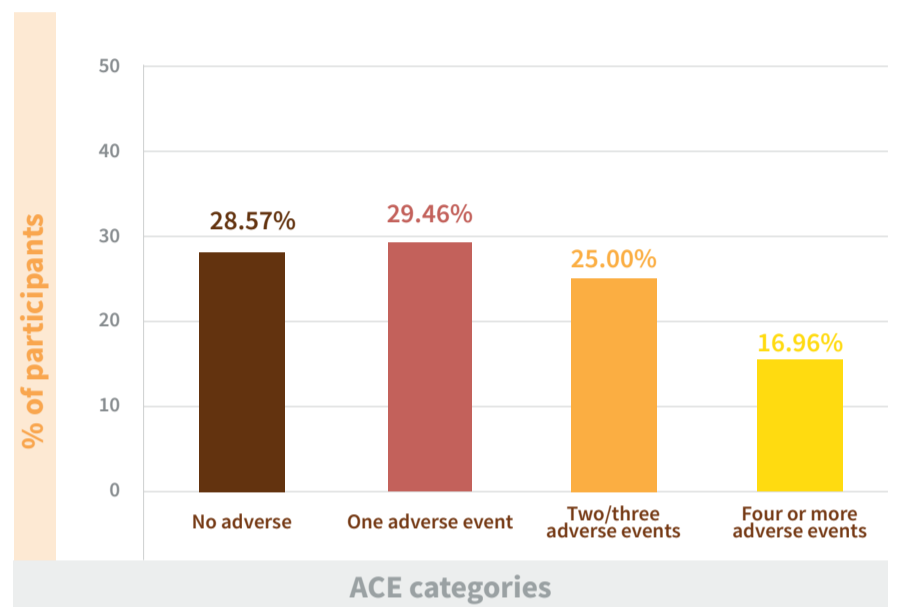


Figure 1  
Percentage of students by the four ACE categories

The descriptive data for the anxiety-trait scale (STAI) is shown in Table 2. In this case, the scores are presented as decile scores, standard scores ranging from 1 to 10 with median in the 5th position, and in both cases, anxiety state and anxiety trait, the mean scores of the students are higher from this expected median.

The results of the 7 dimensions of the CAMIR-R (Table 2) are presented as means of the T-scores (M =50 and SD =10). The lowest score obtained corresponds to dimension 4, "Value of parental authority" (M =46.93), and the highest scores correspond to dimension 5 "Parental permissiveness" (M = 57.14), and dimensions 6 "Self-sufficiency and resentment of parents" (M =54.92) and 7 "Childhood trauma" (M =54.58).

The students' average grade of the evaluations (variable grade) was an average of 6.09 in our sample (which corresponds to a Pass). The standard deviation was 1.5. These results are close to the results expected for the population in this age group and educational level.

The correlations between the variables are shown in Table 2. We highlight the positive, weak, but significant correlation [ $r_s = .29, p < 0.01$ ] between the variable Grade and Dimension 1 of the CaMIR-R related to security in attachment. Likewise, academic achievement negatively correlated with Self-sufficiency and resentment of parents [ $r_s = - 0.34, p < 0.01$ ], Interference from parents [ $r_s = - 0.25, p < 0.05$ ] and Childhood trauma [ $r_s = - 0.25, p < 0.05$ ].

We also want to highlight the negative and significant correlation between the number of Adverse Childhood Experiences and the average grade achieved [ $r_s = - 0.37, p < 0.01$ ].

However, anxiety measures negatively correlate with the security dimension, both in their State version [ $r_s = - 0.34, p < 0.01$ ], and as a Trait [ $r_s = - 0.25, p < 0.01$ ], as well as positively with Dimensions 3 and 6 of the

CaMIR-R (Parental Interference and Self-Sufficiency). Furthermore, the number of ACEs correlates in both Anxiety-State [ $r_s = -0.60, p < 0.01$ ], as well as Anxiety-Trait [ $r_s = -0.28, p < 0.01$ ].

**Table 2**  
Descriptive statistics and correlations for study variables. Significant correlations in bold

Variable	n	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Security a	108	50.41	13.81	--										
2. Concern a	108	51.84	12.08	0.076	--									
3. Parental Interference a	108	51.27	12.80	0.377**	0.131	--								
4. Authority a	108	46.93	10.41	0.378**	0.131	0.031	--							
5. Permissiveness a	108	57.14	11.05	0.084	0.048	0.220*	0.272**	--						
6. Self-sufficiency a	108	54.92	10.27	0.423**	0.172	0.372**	0.041	0.106	--					
7. Trauma a	108	54.58	16.10	0.514**	0.003	0.472**	0.141	0.126	0.360**	--				
8. Anxiety-State b	109	6.40	2.06	0.295**	0.187	0.211*	0.005	0.098	0.307**	0.155	--			
9. Anxiety-Trait b	109	6.37	2.31	0.362**	0.288**	0.189	0.030	0.073	0.445**	0.263**	0.602**	--		
10. ACE c	109	1.74	1.89	0.513**	0.027	0.381**	0.274**	0.177	0.388**	0.596**	0.295**	0.277**	--	
11. Grade d	109	6.09	1.45	0.294**	0.140	0.236*	0.036	0.184	0.336**	0.245*	0.184	0.187	0.372**	--

a Standardised T score with mean 50.0 and standard deviation 10

b Standard scores ranging from 1 to 10 (decatypes) with mean 5.5 and standard deviation 2

c ACE count (Min=0; Max.= 10)

d Mean of subject grades (0-4.99 Fail; 5-6 Pass; 7-8 Good; 9-10 Excellent)

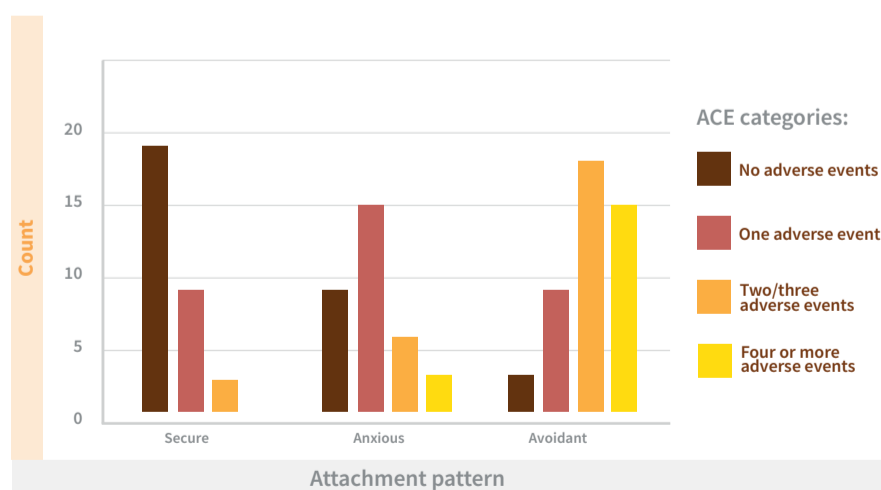
\*  $p < 0.05$

\*\*  $p < 0.01$

## Comparison between the three attachment styles

The one-way ANOVA demonstrated a significant difference between the three groups created (secure, anxious and avoidant) and the measures of anxiety-state [ $F(2, 104) = 9.69, p > .001$ ], anxiety-trait [ $F(2, 104) = 7.35, p = .001$ ], ACE [ $F(2, 103) = 21.99, p > .001$ ], and grade [ $F(2, 104) = 11.54, p > .001$ ].

### ACE relationship with attachment



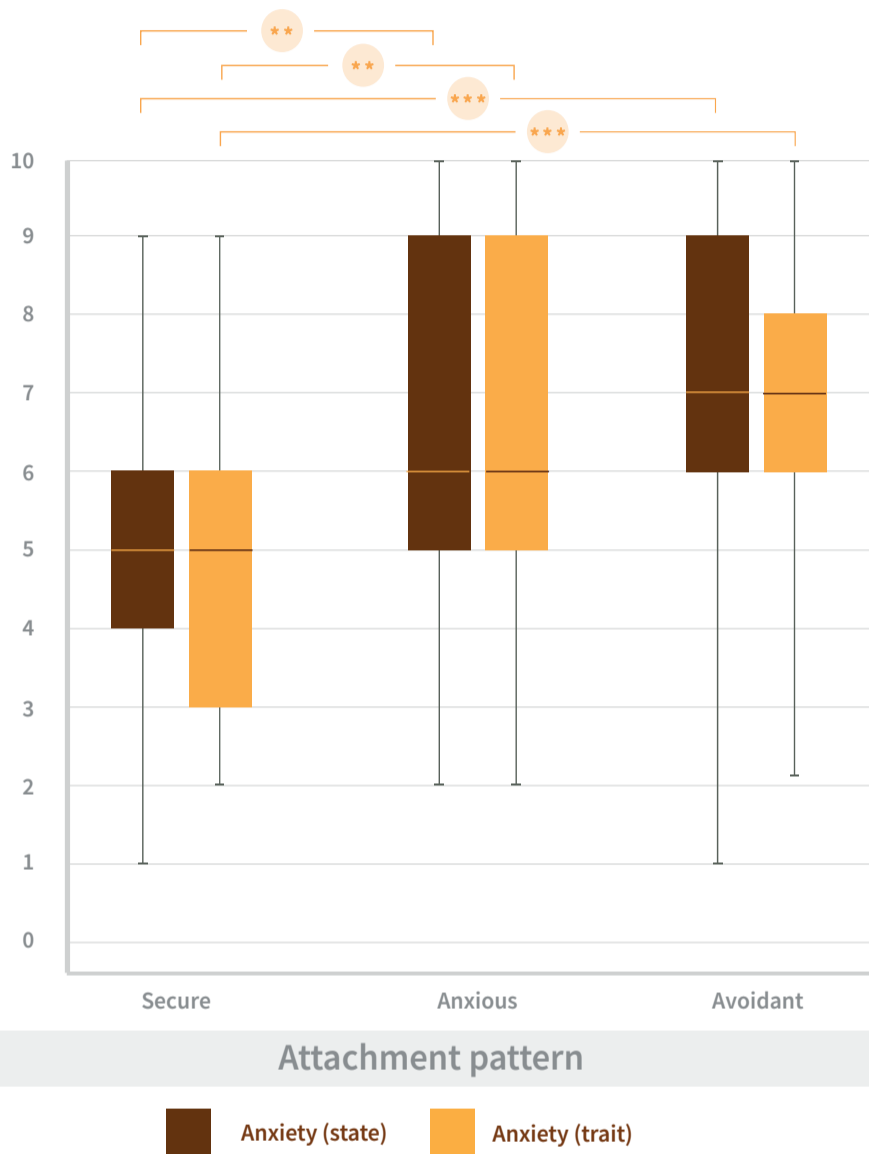
**Figure 2**  
Attachment Typologies and ACE Categories

A Chi-square test of independence showed that there was a significant association between Attachment patterns and ACE categories  $\chi^2(6, N=108) = 46.8, p < 0.001$ . Figure 2 shows how students who have not experienced any ACEs are concentrated in the group of students who fall into the category of secure attachment in the CaMIR-R (Msec = 0.45, SDsec = 0.63). In contrast, the accumulation of adverse events is found in students with insecure attachment, modestly in the anxious style (M<sub>anx</sub> = 1.37, SD<sub>anx</sub> = 1.76) and more significantly in the avoidant style (M<sub>sec</sub> = 2.89, SD<sub>sec</sub> = 1.91)

### Anxiety and types of attachment

A variance analysis showed a significant effect of attachment pattern on both anxiety-state [ $F_{a-state}(2,104) = 9.69, p > .001$ ] and anxiety-trait [ $F_{a-trait}(2,104) = 7.35, p = 0.001$ ]. With respect to Anxiety-State, a Scheffé post-hoc test revealed significant pairwise differences between Secure and Avoidant, with an average difference of  $-1.99$  decatype score ( $p < 0.001$ ), and between Secure and Anxious, with an average difference of  $-1.53$  ( $p < 0.01$ ).

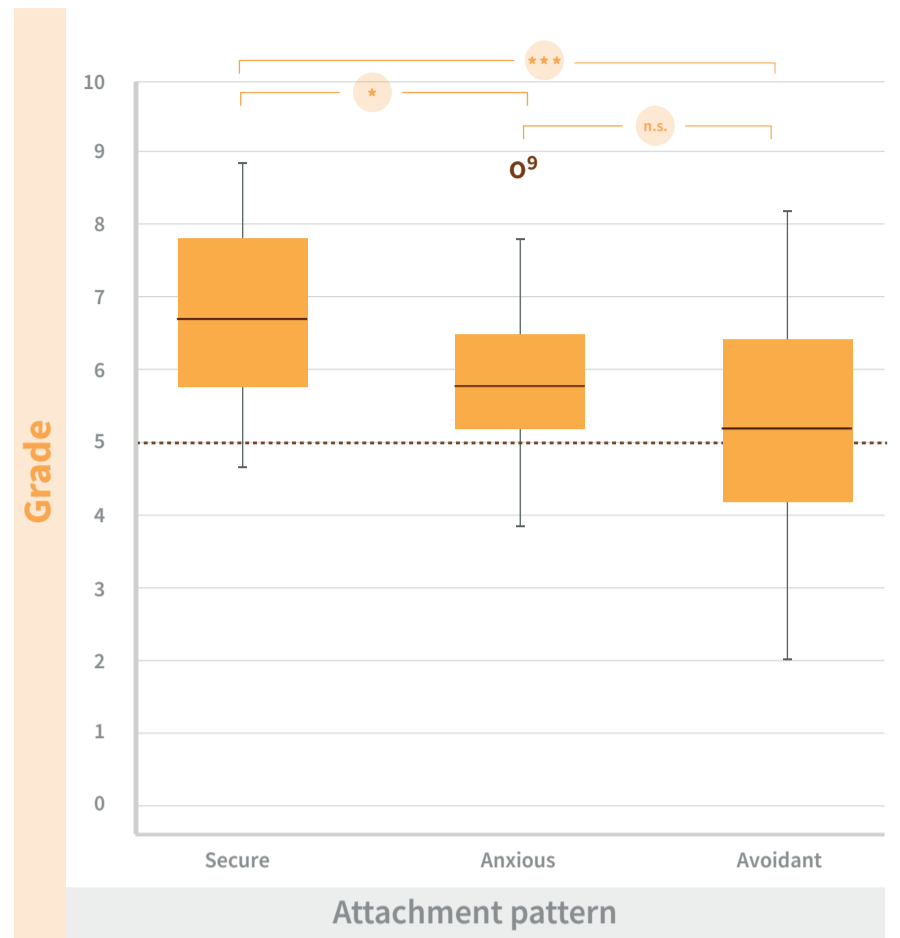
Similar results were found in the case of Anxiety-Trait. A Scheffé post-hoc test revealed significant pairwise differences between Secure and Avoidant, with an average difference of - 1.94 ( $p = .001$ ) and between Secure and Anxious, with an average difference of - 1.60 ( $p < .01$ ). In either case, anxiety-state or anxiety-trait, no significant differences were detected between avoidant and anxious attachment patterns (Figure 3).



**Figure 3. Boxplot of Anxiety-State and Anxiety-Trait** by the three attachment styles \*\*. Scheffé post-hoc test significant pairwise differences ( $p < 0.01$ ). \*\*\* Scheffé post-hoc test significant pairwise differences ( $p < 0.001$ )

## Academic performance and attachment typologies

A variance analysis (ANOVA) of academic performance and attachment style revealed that there were significant differences among conditions,  $F(2, 104) = 11.548, p < .001$ . A post-hoc Tukey test showed that Secure students ( $M_{sec} = 6.96, SD_{sec} = 1.27$ ) differed significantly from Avoidants ( $M_{avo} = 5.45, SD_{avo} = 1.48$ ) and Anxious groups ( $M_{anx} = 6.12, SD_{anx} = 1.11$ ). In line with the previous results, there were no significant differences between the Anxious and Avoidant groups (Figure 4)



**Figure 4** Also reveals that almost half of the Avoidant pupils do not sufficiently acquire the knowledge expected at the educational stage (grade-point average below 5). In other words, these are students who will have to repeat the subject.

Figure 4. Boxplot of the grade-point average by the three attachment styles \*. Tukey HSD post-hoc test shows significant pairwise differences ( $p < 0.05$ ). \*\*\* Tukey HSD post-hoc test shows significant pairwise differences ( $p < 0.001$ )

## Regression and mediational analysis

A hierarchical regression analysis was carried out to multivariately analyse the degree to which academic performance was predicted by the security (related to Secure Style) and self-sufficiency dimensions of the attachment (related to Avoidance Style) firstly, and Adverse Childhood Experiences secondly. The results are shown in Table 3. In the first step, only self-sufficiency has a statistically significant effect on academic grades ( $R^2 = 0.11, p < 0.01$ ). When the ACE variable is included, the greatest percentage of variance in academic performance is explained by the number of ACEs, whereas the aforementioned attachment dimensions lose explanatory power ( $R^2 = 0.15, p < 0.05$ ).

**Table 3** Hierarchical regression, predicting academic outcomes (Grade)

Measure	B	SERC	$\beta$
Step 1. Attachment dimensions			
(constant)	6,805	1.06	
Security	0.020	0.01	0.19
Self-sufficiency	0.032	0.01	0.22*



Measure	B	SERC	$\beta$
Step 2. Adverse Childhood Experiences			
(constant)	7,339	1,07	
Security	0.009	0.01	0.083
Self-sufficiency	0.025	0.01	0.175
ACE	0.187	0.08	0.245*

Grade:  $R = 0.34$  and  $R^2 = 0.11$  ( $p < 0.01$ ) in step 1;  $R = 0.39$  and  $\Delta R^2 = 0.043$  ( $p < 0.05$ ) in step 2  
 B: Non-standardised coefficient; SERC: Standard Error of Regression Coefficient  $\beta$ : Beta standardised coefficient

Considering these results, we are able to assess whether Self-sufficiency or Avoidance could act as a mediator between ACE and academic achievement. The results show a significant indirect effect of ACE on academic achievement through AVOIDANCE inferred from Dimension 6 of the CaMir- ( $\beta = -0.092$ ,  $SE = 0.03$ ,  $95\% CI[-0.17,-0.03]$ ).

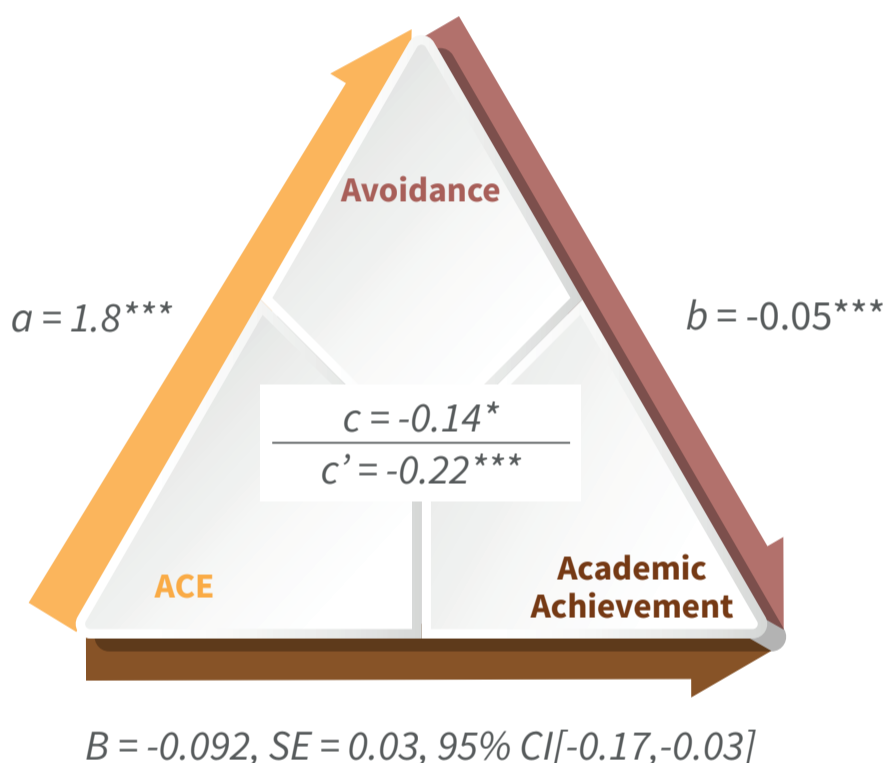


Figure 5. Partial mediation (partial, since both total and direct effects are significant) and complementary.

## Discussion

To better meet the needs of students with poor school performance, we must consider that academic performance is one of the most significant dimensions in the learning process of primary and secondary education students. When they enter an educational institution, they carry with them not only their previous knowledge and the need to learn but also values, beliefs, perceptions, feelings, motivations, and social and emotional bonds that will influence their learning trajectories. For this reason, the results are linked to the importance of adopting an ecological and multisystemic framework to address academic achievement problems (Balart et al., 2023; O'Connor & McCartney, 2007; Sroufe et al., 2005a). In line with the foregoing, the overall goal of this research has been to study the relationship between attachment, anxiety, and adverse experiences with academic performance in adolescents.

The results obtained reveal primarily that the internal attachment model correlates with academic performance. These results point to the line already outlined by Jacobsen, Edelstein, and Hofmann (Jacobsen et al., 1994) when they stated that attachment experiences in childhood produce certain effects on cognitive performance during adolescence. It appears that the development of an internal attachment model as a representation of parents as a secure base appears to be essential for academic success. However, Sayedi, et al. (2017) did not find a significant relationship between academic performance and internal attachment models. Despite this, a significant relationship was found in this study between academic outcomes and emotional self-regulation, which the authors admit is related to secure internal attachment patterns.

Our results also highlight the relationship between Adverse Childhood Experiences and academic performance. This relationship can be interpreted as being due to poor academic engagement and lack of motivation to study. Our data shows that almost 72% of the students in our sample have experienced at least one significant adversity in their life. These results are similar to epidemiological studies that, using parallel parent-child reports, indicate that regardless of where they live on a global map, nearly two-thirds of children and adolescents have faced significant adversity in their lives (Kostić et al., 2019). In contrast, it is important to note the significant impact that ACEs have on academic achievement. Various studies have demonstrated that ACEs are strongly associated with poorer academic outcomes (Perfect et al., 2016; Jimenez et al., 2016). Our findings also indicate that this relationship is mediated by the avoidant internal working model, suggesting that students with ACEs may develop avoidant coping mechanisms that further hinder their academic performance. These results are in line with the proposals of authors who highlight the need to take into account and understand the importance that potentially traumatic events in childhood and adolescence have on school performance, and the need to initiate educational practices and policies in this regard (Balart et al., 2021; Chafouleas et al., 2016).

These results remind us of the importance of managing the class and the figure of the teacher as a secure base. It seems significant to identify students' attachment styles so that teachers can be more sensitive and effective and function as a protective factor. We know that high-quality teacher-student relationships foster a student's achievement. (O'Connor & McCartney, 2007). The findings of our study highlight the role of teachers and other members of the educational community in identifying students with ACEs, high levels of anxiety, and/or an insecure IWM of attachment to provide them with affective and educational support (Balart et al., 2023; Kostić et al., 2019).

This research also suggests that the study of student anxiety may be key to this proposal. Students with an avoidant IWM of attachment are the ones who present the most anxiety, even if it does not manifest itself in an obvious way. This can be related to studies showing how avoidant attachment styles repeatedly show at different ages a large discrepancy between almost no behavioural signs and elevated stress-related physiological responses (e.g. heart rate, ACTH and/or cortisol). (Nachmias et al., 1996; Pierrehumbert et al., 2012; Zelenko et al., 2005) When children do not have secure attachment that helps them self-regulate, they develop strategies to explore their environment and ensure they receive care, even if their caregivers are unstable, by externalising behaviours compatible with TDAH (Zamorano et al., 2023). On the other hand, children with avoidant attachment tend to explore their environment less, which increases their anxiety and leads to behaviours associated with poor cognitive attention. In these situations, the nervous system activates the emotional response system and deactivates the system that regulates higher cortical functioning, which is

crucial for executive functioning, and which forms the basis of academic performance.

Our research reveals that early attachment experiences, particularly those that result in parental rejection, trigger defence strategies such as claiming to be self-sufficient and independent of affective relationships. These unrecognised mechanisms generate anxiety and make it difficult to focus, feel motivated to learn, and self-regulate in order to improve academic performance and grade-influencing techniques for learning at school. Conversely, according to other authors, our study confirms that teenagers who have friends and parents who appreciate and encourage their academic success do better academically and have greater emotional and behavioural self-control. In addition, youngsters who did not fall behind in their education are likely to have stronger connections with their parents at the end of adolescence than those who did fall behind and even drop out. (Facio et al. 2006)<sup>1</sup>.

In conclusion, students who achieved lower marks and, as a result, did not meet the necessary learning standards are those who exhibit higher levels of anxiety, a greater number of adverse early experiences, and insecure attachment patterns (largely avoidant insecure attachment). This leads us to assume that academic failure is a very complicated phenomenon that has its roots in a student's internal emotional issues and cannot be explained by their lack of motivation or desire to do well at school.

## Study Limitations

Despite the significant findings presented in this study, several limitations must be acknowledged. Firstly, it is important to refer to the CAMIR-R, which aims to assess a much more complex construct related to "Internal Working Models". While valuable, this instrument might not be robust enough to capture all facets of internal working models in adults.

To obtain a more accurate and in-depth assessment of this construct, it would be advisable to use more powerful tools such as the Adult Attachment Interview (AAI). The AAI has proven to be an effective methodology for gaining a more precise understanding of the aspects we seek to investigate.

In this context, it is pertinent to cite Lacasa's work on attachment assessment, which emphasizes the need to employ rigorous and validated methods for exploring attachment models in adults (Lacasa, 2020). The adoption of such tools would allow for a better understanding and a more accurate evaluation of constructs related to attachment and internal working models.

These considerations suggest that future research should integrate these advanced methodologies to strengthen the validity and reliability of the findings.

<sup>1</sup> In the same way, the establishment of a secure attachment pattern positively influences childhood cognitive processes in frontal and executive functions, specifically in tasks that involve working memory, inhibitory control, and planning of behaviour towards goals, among others (Halpern and Muriel, 2012; O'Connor and McCartney, 2007), a line of work that we consider relevant and indicative of our future studies.

## References

- Allen, J. P., McElhaney, K. B., Kuperminc, G. P., & Jodl, K. M. (2004). Stability and change in attachment security across adolescence. *Child Development*, 75(6), 1792–1805. <https://doi.org/10.1111/j.1467-8624.2004.00817.x>
- Balart, I., Pérez-Burriel, M., & Sadurní Brugué, M. (2023). Giving voice to education professionals of primary and secondary school students with emotional and behavioural disorders: a qualitative study. *European Journal of Special Needs Education*, 1–15. <https://doi.org/10.1080/08856257.2022.2159275>
- Balart, I., Sadurní Brugué, M., & Pérez-Burriel, M. (2021). Behavioural regulation difficulties at primary and secondary school: risk and protection factors. *Emotional and Behavioural Difficulties*, 26(3), 1–16. <https://doi.org/10.1080/13632752.2021.1943176>
- Balluerka, N., Lacasa, F., Gorostiaga, A., Muela, A., & Pierrehumbert, B. (2011). Versión reducida del cuestionario CaMir (CaMir-R) para la evaluación del apego. *Psicothema*, 23(3), 486–494.
- Baskak, B., Kir, Y., Sedes, N., Kuşman, A., Türk, E. G., Baran, Z., Gönüllü, I., Artar, M., & Munir, K. (2020). Attachment Style Predicts Cortical Activity in Temporoparietal Junction (TPJ). *Journal of Psychophysiology*, 34(2), 99–109. <https://doi.org/10.1027/0269-8803/a000240>
- Blakemore, S. (2018). *Inventing Ourselves: The Secret Life of the Teenage Brain* (Spanish ed). Planeta.
- Blakemore, S., & Mills, K. L. (2014). Is Adolescence a Sensitive Period for Sociocultural Processing? *Annual Review of Psychology*, 65(1), 187–207. <https://doi.org/10.1146/annurev-psych-010213-115202>
- Bowlby, J. (1969). *Attachment and loss*. Vol. 1: Attachment (Spanish ed). Paidós.
- Buela-Casal, G., Guillén-Riquelme, A., & Seisdedos, N. (2011). STAI: Cuestionario de Ansiedad Estado-Rasgo. Adaptación española (8a ed). TEA Editores.
- Burunat, E. (2004). El desarrollo del sustrato neurobiológico de la motivación y emoción en la adolescencia: ¿un nuevo período crítico? *Infancia y Aprendizaje*, 27(1), 87–104. <https://doi.org/10.1174/021037004772902123>
- Chafouleas, S. M., Johnson, A. H., Overstreet, S., & Santos, N. M. (2016). Toward a Blueprint for Trauma-Informed Service Delivery in Schools. *School Mental Health*, 8(1), 144–162. <https://doi.org/10.1007/s12310-015-9166-8>
- Chen, B. Bin. (2017). Parent-Adolescent Attachment and Academic Adjustment: The Mediating Role of Self-Worth. *Journal of Child and Family Studies*, 26(8), 2070–2076. <https://doi.org/10.1007/s10826-017-0728-2>
- Carretero-Dios, H., & Pérez, C. (2007). Standards for the development and review of instrumental studies: Considerations about test selection in psychological research. *International journal of clinical and health psychology*, 7(3), 863–882.
- Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, 302(5643), 290–292. <https://doi.org/10.1126/science.1089134>
- Feldman, R. (2020). What is resilience: an affiliative neuroscience approach. *World Psychiatry*, 19(2), 132–150. <https://doi.org/10.1002/wps.20729>
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258. <https://doi.org/10.1016/j.amepre.2019.04.001>
- Fonagy, P., Gergely, G., Jurist, E., & Target, M. (2004). *Affect regulation, mentalization, and the development of the self*. Other Press.
- Fonagy, P., & Target, M. (2002). Early intervention and the development of self-regulation. *Psychoanalytic Inquiry*, 22(3), 307–335. <https://doi.org/10.1080/07351692209348990>

- IBM Corp. (2012). IBM SPSS Statistics for Windows, Version 21.0. IBM Corp.
- Jacobsen, T., Edelstein, W., & Hofmann, V. (1994). A Longitudinal Study of the Relation Between Representations of Attachment in Childhood and Cognitive Functioning in Childhood and Adolescence. *Developmental Psychology*, 30(1), 112–124. <https://doi.org/10.1037/0012-1649.30.1.112>
- Kostić, M., Lazarević, L., Maravić Mandić, V., Mitković Vončina, M., Radosavljev Kirčanski, J., Tojković, A., & Videnović, M. (2019). Adverse Childhood Experiences (ACE) Study Research on Adverse Childhood Experiences in Serbia. UNICEF in Serbia.
- Kurland, R. M., & Siegel, H. I. (2016). Attachment and Academic Classroom Behavior: Self-Efficacy and Procrastination as Moderators on the Influence of Attachment on Academic Success. *Psychology*, 7(July), 1061–1074.
- Lacasa, F., & Muela, A. (2014). Guía para la aplicación e interpretación del cuestionario de apego CaMir-R. *Revista de Psicopatología y Salud Mental*, 24, 83–93. <https://doi.org/10.13140/10.13140/RG.2.2.17744.30>
- Nachmias, M., Gunnar, M., Mangelsdorf, S., Parritz, R. H., & Buss, K. (1996). Behavioral inhibition and stress reactivity: the moderating role of attachment security. *Child Development*, 67(2), 508–522. <http://www.ncbi.nlm.nih.gov/pubmed/8625725>
- O'Connor, E., & McCartney, K. (2007). Examining teacher-child relationships and achievement as part of an ecological model of development. *American Educational Research Journal*, 44(2), 340–369. <https://doi.org/10.3102/0002831207302172>
- Oliva, A. (2004). La adolescencia como riesgo y oportunidad Resumen Adolescence: Risks and opportunities Abstract. *Infancia y Aprendizaje*, 27(1), 115–122.
- Pérez Burriel, M., & Sadurní Brugué, M. (2014). Developmental trajectory of intersubjectivity in the second and third year of life: Study of fixed-population and random-individual effects. *European Journal of Developmental Psychology*, 11(5), 1–18. <https://doi.org/10.1080/17405629.2014.888996>
- Pierrehumbert, B. (1996). Les modèles de relations: Développement d'un autoquestionnaire d'attachement pour adultes. *Psychiatrie L'Enfant*, 1, 161–206.
- Pierrehumbert, B., Torrisi, R., Ansermet, F., Borghini, A., & Halfon, O. (2012). Adult attachment representations predict cortisol and oxytocin responses to stress. *Attachment and Human Development*, 14(5), 453–476. <https://doi.org/10.1080/14616734.2012.706394>
- Ruzek, E. A., Hafen, C. A., Allen, J. P., Gregory, A., Mikami, A. Y., & Pianta, R. C. (2016). How teacher emotional support motivates students: The mediating roles of perceived peer relatedness, autonomy support, and competence. *Learning and Instruction*, 42, 95–103. <https://doi.org/10.1016/j.learninstruc.2016.01.004>
- Sadurní, M., & Pérez-Burriel, M. (2016). Outlining the windows of achievement of intersubjective milestones in typically developing toddlers. *Infant Mental Health Journal*, 37(4), 356–371. <https://doi.org/10.1002/imhj.21576>
- Sadurní, M., & Rostan, C. (2004). La importancia de las emociones en los períodos sensibles del desarrollo. *Infancia y Aprendizaje*, 27(1), 105–114.
- Sayed, F., Yazdanbakhsh, K., & Karami, J. (2017). The relationship between attachment styles, self-regulation, and academic achievement in students. *International Journal of Educational and Psychological Researches*, 3(4), 250. [https://doi.org/10.4103/jepr.jepr.63\\_16](https://doi.org/10.4103/jepr.jepr.63_16)
- Schelble, J. L., Franks, B. A., & Miller, M. D. (2010). Emotion Dysregulation and Academic Resilience in Maltreated Children. *Child and Youth Care Forum*, 39(4), 289–303. <https://doi.org/10.1007/s10566-010-9105-7>
- Schickedanz, A., Halfon, N., Sastry, N., & Chung, P. J. (2018). Parents' adverse childhood experiences and their children's behavioral health problems. *Pediatrics*, 142(2). <https://doi.org/10.1542/peds.2018-0023>
- Sheinkopf, S. J., Tenenbaum, E. J., Messinger, D. S., Miller-Loncar, C. L., Tronick, E., Lagasse, L. L., Shankaran, S., Bada, H., Bauer, C., Whitaker, T., Hammond, J., & Lester, B. M. (2017). Maternal and infant affect at 4 months predicts performance and verbal IQ at 4 and 7 years in a diverse population. *Developmental Science*, 20(5). <https://doi.org/10.1111/desc.12479>
- Spear, L. P. (2000). The adolescent brain and age-related behavioral manifestations. In *Neuroscience and Biobehavioral Reviews* (Vol. 24, Issue 4). [https://doi.org/10.1016/S0149-7634\(00\)00014-2](https://doi.org/10.1016/S0149-7634(00)00014-2)
- Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the state-trait anxiety inventory*. Consulting Psychologists Press.
- Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005a). Placing early experiences in developmental context. In K. Grosman, K. Grosman, & E. Waters (Eds.), *Attachment from infancy to Adulthood*. Guilford Press.
- Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005b). The development of the person. The Minnesota study of risk and adaptation from birth to adulthood. Guilford Press.
- Stern, D. N. (1977). *The First relationship: infant and mother*. Harvard University Press.
- Trevarthen, C. (2011). What young children give to their learning, making education work to sustain a community and its culture. *European Early Childhood Education Research Journal*, 19(2), 173–193. <https://doi.org/10.1080/1350293X.2011.574405>
- Zelenko, M., Kraemer, H., Huffman, L., Gschwendt, M., Pageler, N., & Steiner, H. (2005). Heart rate correlates of attachment status in young mothers and their infants. *Journal of the American Academy of Child and Adolescent Psychiatry*, 44(5), 470–476. <https://doi.org/10.1097/01.chi.0000157325.10232.b1>
- Ziv, Y., Umphlet, K. L. C., Olarte, S., & Venza, J. (2018). Early childhood trauma in high-risk families: associations with caregiver emotional availability and insightfulness, and children's social information processing and social behavior. *Attachment and Human Development*, 20(3), 309–332. <https://doi.org/10.1080/14616734.2018.1446738>