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Academic engagement and academic self-efficacy as predictors of academic procrastination in Peruvian adolescents

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Introduction: Academic procrastination is a maladaptive learning behavior that can impair student performance. The research aims to determine whether academic engagement and self-efficacy predict academic procrastination in Peruvian adolescents.

Method: This is a cross-sectional predictive design, with a sample of 450 high school students of all grades, selected by convenience. The students were mostly female (60.9%), were in the first year of high school (28.9%) and were from private institutions (85.1%). The averages, variability and distribution of the data obtained were calculated. A correlation analysis was performed between the variables, as well as a multiple correlation analysis and, finally, a multiple linear regression analysis.

Results: The results showed that self-efficacy was inversely related to academic procrastination ($r = -0.250$; $p < 0.001$) and this, in turn, to commitment ($r = -0.263$; $p < 0.005$). Self-efficacy was directly related to engagement ($r = 0.112$; $p < 0.005$). Self-efficacy ($\beta = -0.223$; $p < 0.001$) and engagement ($\beta = -0.238$; $p < 0.001$) inversely influenced procrastination, explaining 11.8% of its variability ($R = 0.344$, $R^2 = 0.118$, $F = 30.0$, $p < 0.001$).

Discussion: The results showed the importance of academic engagement and self-efficacy in mitigating the propensity for academic procrastination among Peruvian adolescents. Consequently, educational institutions and schools should prioritize the implementation of teaching methodologies and interventions that improve students' motivation and engagement, as well as foster confidence in their abilities to achieve academic success, in order to counteract the detrimental effects of procrastination on their academic development.

KEYWORDS

academic procrastination, academic engagement, academic self-efficacy, Peruvian adolescents, academic performance

1 Introduction

Academic procrastination is the tendency to voluntarily and irrationally postpone academic tasks or activities despite being aware of the negative consequences that this delay can entail (Ayala Ramírez et al., 2020; Barraza Macías and Barraza Nevárez, 2019). This delay in the completion of academic tasks is a persistent behavior in the academic development of adolescents (Ghasempour et al., 2024; Grunschel et al., 2013). Various recent research shows its prevalence among this student group. In Indonesia, it was found that adolescents, for the most part, often tend to postpone the completion of academic assignments (Setiyowati et al., 2020). Another study explored procrastination behavior of Chinese schoolchildren over time, showing that it gradually increases in proportion to the individual's low levels of self-esteem (Yang et al., 2023). On the other hand, in Iran, the prevalence of procrastination among adolescent schoolchildren was evidenced, identifying three aspects of procrastination (deliberate procrastination, procrastination resulting from fatigue, and procrastination due to lack of planning), highlighting the effectiveness of strengthening student motivation to reduce this tendency (Hosseini et al., 2020).

Due to the biological, psychological, and social changes experienced at this stage of human development (Asio, 2020), the individual may experience alterations in decision-making and behavior (Blakemore, 2018). This opens the possibility of negative behavioral changes in adolescents' school education that the COVID-19 pandemic may have exacerbated, as procrastination (González-Brignardello et al., 2023; Salmela-Aro et al., 2021). In that sense, the present research is relevant because it analyzes academic self-efficacy and engagement as predictors of academic procrastination in Peruvian adolescents in post-pandemic times, being procrastination a variable associated with high levels of stress and anxiety (Wildberger Ramírez and Aranda Ledesma, 2022) and is influenced by self-esteem, subjective well-being, and a sense of belonging (Song et al., 2024), which are relevant aspects for adolescents. Procrastination has been the subject of study in recent publications (Çıkrıkçı and Erzen, 2020; Yang et al., 2023). However, few have evaluated academic self-efficacy and engagement as factors influencing academic procrastination in the adolescent population, mostly focusing on university students (Callañaupa Amable et al., 2024). In addition, Brush et al. (2022) point out that the psychological, social, and emotional aspects must be cohesive so that the student gives due importance to the cognitive processes of learning. In this sense, the present research is relevant because it will lead to the knowledge of the interaction of these variables in adolescents within the framework of social cognitive theory.

In this sense, academic self-efficacy emerges, understood as the set of beliefs that an individual has regarding their abilities to achieve success in academic tasks (Bandura, 1997; Palenzuela, 1983), as a key factor in the student's attitude toward the academic context. These beliefs are linked to the perception of support for autonomy, academic satisfaction, and the intention to continue studying, influencing procrastination (Yiğit Güngör, 2020) and academic engagement (Ghasempour et al., 2024). In this way, a determining factor is that students face challenges, set goals, and persevere in achieving their academic objectives (Meng and Zhang, 2023).

Students confident in their abilities to achieve academic success are more engaged and procrastinate less. Chinese university students

with higher academic self-efficacy showed less tendency to procrastinate due to greater motivation and academic self-regulation (Liu et al., 2020). In Spain, university students with greater confidence in their abilities to achieve academic success demonstrated greater commitment and less procrastination (Valenzuela et al., 2020). Another study conducted on university students from Portugal, Brazil, Mozambique, the United Kingdom, the United States of America, Finland, Serbia and Taiwan has demonstrated that academic self-efficacy is inversely related to procrastination, which subsequently contributes to increased student dropout rates (Marôco et al., 2020).

On the other hand, academic engagement refers to a student's proactive involvement, enthusiasm, and commitment to their educational endeavors (Fredricks et al., 2004), is a significant emotional factor in the learning process and plays a crucial role in student achievement (Suleiman et al., 2024), and should therefore be paid attention to. Various factors can influence academic engagement. In China, college students with higher psychological capital were found to have greater emotional commitment to their academic pursuits (Liu et al., 2024). Another study conducted in Greece showed that applying gamification strategies contributes to the academic commitment of university students (Lampropoulos and Sidiropoulos, 2024). In Ethiopia, socialization by parents and peers was found to increase academic engagement among schoolchildren (Woreta, 2024).

Studies have shown that more engaged students complete teacher assignments on time and tend to procrastinate less. Research conducted in Iran found that college students who were more academically engaged were less likely to procrastinate on assigned academic activities (Yousefi Afrashteh and Janjani, 2024). In China, academic engagement was negatively and significantly related to undergraduate students' procrastination behavior (Chen and Zeng, 2022). Likewise, Spanish university students showed lower levels of academic procrastination based on an attitude of commitment, such as academic self-regulation (Ragusa et al., 2023).

Social cognitive theory postulates that human behavior results from the interaction of personal, emotional, and social factors (Bandura, 1986). According to this theory, human behavior originates from a triad of factors: personal (cognition, physiological, psychological), the environment in which it develops and the emotions experienced. Thus, academic self-efficacy acts as the cognitive factor of an individual's belief in his or her abilities to achieve success and engagement as the intrinsic motivation experienced to optimally develop his or her activities. In this understanding, harmful behavior in adolescents, such as academic procrastination, could be influenced by academic self-efficacy. Furthermore, regarding academic engagement, self-determination theory suggests that students engaged in their studies, driven by intrinsic motivation, are less likely to engage in negative behavior, such as procrastination (Ryan and Deci, 2000).

It is important to analyze the relationship between these variables and procrastination to understand the factors underlying this harmful attitude in teaching-learning. However, little research investigates the influence of these factors on academic procrastination among adolescents (Katz et al., 2014), mainly focused on the university and pre-university population (Malkoç and Kesen Mutlu, 2018; Tisocco and Liporace, 2023). Given that, although clear relationships between these variables have been demonstrated in other contexts, particular attention is needed in the

Latin American educational context and even more so in the Peruvian one (Nemtcan et al., 2022). Therefore, the objective of the present investigation is to determine the predictive capacity of self-efficacy and academic engagement on academic procrastination in Peruvian adolescents, as be seen in Figure 1.

In this context, the present study contributes to the existing literature by providing empirical evidence of the negative prediction of academic self-efficacy and engagement on procrastination among Peruvian adolescents, thus addressing the limited information regarding the relationship of these variables in the educational context of adolescents. This research is particularly valuable for educators and educational policymakers focused on this age group, enabling them to adopt and adapt their interventions in the teaching-learning process, by strengthening self-efficacy and engagement as key factors, educators may improve students' performance and well-being, facilitating the development of effective study habits. Consequently, the research question proposed in this study were: are self-efficacy and academic engagement predictors of academic procrastination in Peruvian adolescents? Four hypotheses to address this inquiry were formulated as follows.

H1: Academic self-efficacy is negatively and significantly related to procrastination in Peruvian adolescents.

Higher levels of academic self-efficacy are associated with a lower tendency to postpone academic tasks. This is supported by previous research (Syapira et al., 2022) reported this association in Muslim adolescents during the online learning period. Likewise, Parmaksız (2023) noted this relationship among Turkish students. Indonesian students with higher self-efficacy tended to exhibit less procrastinating behavior (Tri Handayani et al., 2021). Therefore, self-efficacy could be a factor reducing academic procrastination in Peruvian adolescents.

H2: Academic engagement is negatively and significantly related to academic procrastination in Peruvian adolescents.

Previous research has reported that there is a negative relationship between academic engagement and academic procrastination. This relationship was found in high school students in China (Li et al., 2023). Similarly, in China, other

research showed that higher levels of academic engagement among students were significantly associated with a reduction in the tendency to postpone academic activities (Shufang et al., 2023). This association is supported by self-determination theory, according to which academic procrastination is an indication of decreased engagement, since lacking orientation and motivation for learning they are more likely to postpone the fulfillment of their academic duties (Klassen et al., 2008; Steel, 2007). In this sense, academic engagement may be negatively related to procrastination in Peruvian adolescents.

H3: Academic self-efficacy and academic engagement are positively and significantly related in Peruvian adolescents.

Academic self-efficacy has been shown to have a positive relationship with academic engagement. This means that when students believe in their ability to achieve their academic goals, they tend to be more engaged and involved in their studies, as reported in previous research. Both variables were found to be positively associated among Chinese high school students (Chen et al., 2021; Zhao et al., 2021). Dicha relación también ha sido explorada en el contexto del aprendizaje del inglés como lengua extranjera, con el mismo resultado (Wang et al., 2023). Likewise, in Taiwan, high school students with greater confidence in their abilities to achieve academic success had greater behavioral and emotional engagement (Lin, 2021). Therefore, it is possible to assume that academic self-efficacy is positively related to academic engagement in Peruvian adolescents.

H4: Academic self-efficacy and academic engagement predict academic procrastination in Peruvian adolescents.

Previous studies have identified academic self-efficacy as a key factor in reducing academic procrastination (Bozgün and Baytemir, 2022; Kurtovic et al., 2019; Ren et al., 2021). The belief that an individual has in his or her abilities to succeed in a specific task, understood as self-efficacy, is the driving force behind his or her thinking, feeling and acting, allowing him or her to persevere even in the midst of difficult situations (Schunk, 2012). On the other hand, engagement and the emotional component of learning have been highlighted as predictors of postponement of academic activities (Martinie et al., 2023; Rahimi and Vallerand, 2021; Shih, 2019).

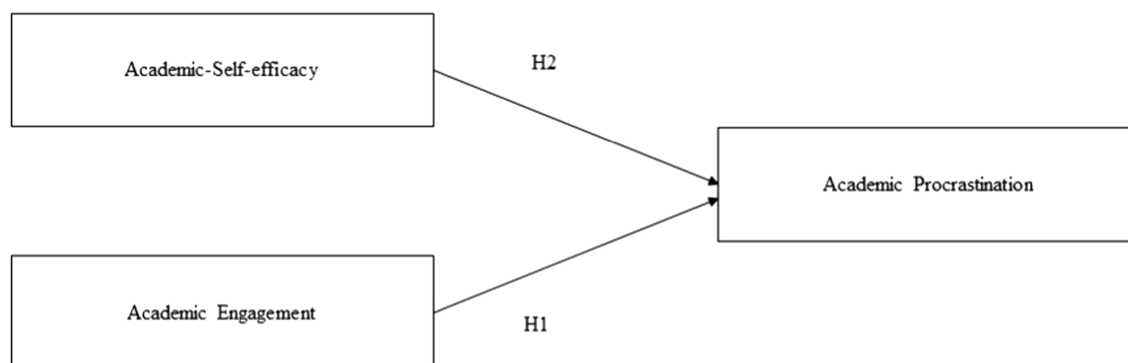


FIGURE 1
Theoretical model.

Therefore, both factors could be predictors of academic procrastination in Peruvian adolescents.

2 Method

2.1 Design and participants

A quantitative predictive cross-sectional design was followed to determine the influence of academic engagement and academic self-efficacy on academic procrastination in Peruvian adolescents (Ato et al., 2013). A non-probabilistic sampling was followed for convenience by the intention of the researcher and was estimated by considering the expected effect size ($f = 0.15$), the desired statistical significance ($\alpha = 0.05$), the level of statistical power ($1 - \beta = 0.95$) and the number of predictors. Based on these calculations, it was estimated that a minimum sample of 106 would be appropriate (Soper, 2025). However, for this study, we had the participation of 450 secondary students from three schools in Peru, of whom 60.9% are women and 39.1% are men. As for their age, 24.4% are 15 years, the majority. Most (29.9%) are in the first year of secondary education and study at a private institution (85.1%). As be seen in Table 1.

2.2 Ethical aspects

The study was approved by the Ethics Committee of the Universidad Peruana Unión, Peru (Approval certificate number 2023-CE-EPG-00163), following the guidelines of the Declaration of Helsinki. Data collection was conducted in person at each educational institution. Given that the participants were minors, parental consent was obtained. Authorization was also secured from the school directors and facilitated by the class teachers. Participants were informed about the study's purpose, the voluntary nature of participation, potential benefits and risks, as well as confidentiality and data privacy measures. Consequently, each participant provided consent to partake in the study.

2.3 Instruments

Escala Utrecht Work Engagement Scale (UWES): This instrument was designed by Schaufeli et al. (2006) and adapted to the Peruvian context by Dominguez-Lara et al. (2022). It consists of 9 items, with 6 response options presented on a Likert-type scale (0 = "Never" to 6 = "Every day"), where higher scores indicate greater academic engagement. It has good reliability (α and $\omega > 0.9$) and psychometric properties that support its unidimensionality (CFI = 0.998, RMSEA = 0.065, WRMR = 0.441).

The Scale of Specific Perceived Self-Efficacy of Academic Situations (EAPESA): Designed by Palenzuela (1983) and validated in Peruvian adolescents by Chávez Flores (2022). The instrument is unidimensional and composed of 9 items. The response options are presented on a four-point Likert-type scale (From 1 = "Never" to 4 = "Always"), where higher scores indicate a better perception. It has good reliability (α and $\omega > 0.9$) and a good fit of the one-dimensional model (CFI = 0.97, RMSEA = 0.05 and SRMR = 0.04).

Academic Procrastination Scale: This scale was designed by Busko (1998) and was validated in Peruvian high school students by Trujillo-Chumán and Noé-Grijalva (2020). The instrument is unidimensional and composed of 8 items. The response options are presented on a four-point Likert-type scale (from 1 = "Never" to 5 = "Always"), where higher scores indicate a better perception. It reported good internal consistency ($\omega = 0.80$) and adequate psychometric properties (CFI = 0.980, TLI = 0.970, SRMR = 0.034 and RMSEA = 0.048).

Once the data was collected, it was tabulated and imported into Jamovi 2.3.28.0 software. First, the Mean (M), standard deviation (SD), skewness (g1), and kurtosis (g2) were extracted. The relationships between variables were then analyzed. Multiple correlation coefficients (R, R², corrected R², SE, and F) were also extracted. Finally, multiple regression coefficients (unstandardized B, standardized β , and t-test) were considered.

3 Results

Table 2 shows descriptive statistics, including mean, standard deviation (SD), skewness, and kurtosis. The highest average is found in the academic engagement variable, and the lowest is in the academic procrastination variable. The greatest dispersion is also found in the academic engagement variable, while the lowest is in academic self-efficacy. The coefficient of skewness and kurtosis does not exceed the range of being more significant than 1.5 or less than -1.5. It is considered symmetrical, so the data is estimated to be close to the mean.

Table 3 and Figure 2 shows the relationship between the variables in the model. The results obtained according to the hypotheses raised are described below.

3.1 Relationship between academic self-efficacy and academic procrastination in Peruvian adolescents

As the results, academic self-efficacy and postponement of academic tasks by Peruvian adolescents were negative and significant related ($r = -0.250$; $p < 0.01$). This means that it suggests that Peruvian adolescents with higher academic self-efficacy tend to procrastinate less, while those with lower self-efficacy tend to procrastinate more frequently. In this way, the belief or confidence that students have in their ability to successfully carry out academic activities is an important factor in reducing the postponement of activities in this student population.

3.2 Relationship between academic engagement and academic procrastination in Peruvian adolescents

Academic engagement was negatively and significantly related to procrastination among Peruvian adolescents. This means that the more motivation, effort and dedication to academic tasks Peruvian adolescents tend to procrastinate less, and vice versa. The strength of this relationship was low to moderate ($r = -0.263$), but significant ($p < 0.05$). Thus, academic engagement is identified as a key factor in decreasing non-compliance with academic activities and improving success among Peruvian schoolchildren.

TABLE 1 Sociodemographic information.

<i>n</i> = 450		Frequency	%
Sex	Male	176	39.1%
	Female	274	60.9%
Age	12	24	5.3%
	13	96	21.3%
	14	101	22.5%
	15	110	24.5%
	16	64	14.2%
	17	55	12.2%
Year of study	First	130	28.9%
	Second	37	8.2%
	Third	92	20.4%
	Fourth	79	17.6%
	Fifth	112	24.9%
Type of institution	Public	67	14.9%
	Private	383	85.1%

TABLE 2 Descriptive analysis of the variables academic self-efficacy, academic engagement and academic procrastination.

Variables	M	SD	<i>g</i> ₁	<i>g</i> ₂
1. Academic Self-efficacy (ASE)	25.6	3.56	−0.556	1.27
2. Academic Engagement (AE)	27.2	7.58	−0.025	0.900
3. Academic Procrastination (AP)	19.6	4.42	0.415	0.185

TABLE 3 Correlation analysis between variables academic self-efficacy, academic procrastination, and academic engagement.

Variables	Academic self-efficacy	Academic procrastination	Academic engagement
Academic self-efficacy	1		
Academic procrastination	−0.250**	1	
Academic engagement	0.112*	−0.263**	1

p* < 0.05, *p* < 0.001.

3.3 Relationship between academic engagement and academic self-efficacy in Peruvian adolescents

According to the obtained results, academic self-efficacy exhibited a positive correlation with academic engagement ($r = 0.112$), demonstrating a weak, but statistically significant relationship at the 0.05 level. Adolescents who perceived greater confidence in their abilities to address and fulfill academic demands demonstrated increased emotional, cognitive, and behavioral involvement in their academic activities, fostering active and enthusiastic engagement with the educational environment.

3.4 Academic self-efficacy and academic engagement predict academic procrastination in Peruvian adolescents

Table 4 shows the model summary, where the corrected coefficient of determination (corrected R^2) is 0.114, indicating

that self-efficacy and academic engagement explain 11.4% of the variability of academic procrastination from academic self-efficacy and academic engagement. The multiple correlation coefficient (R) of the proposed model is moderate (0.344); however, its level of sample significance is high ($p = 0.000$). On the other hand, the corrected or adjusted R^2 value was low (0.114). However, the correlation is significant ($p = 0.000$), according to Arias and Molina (2017). Furthermore, the F value of the ANOVA is 30.0; this means that there is a high variance rate between the means, indicating a linear explanatory relationship between academic self-efficacy and engagement, with academic procrastination as the criterion variable (Vilà Baños et al., 2019; Wooditch et al., 2021).

Additionally, the values of Tolerance ($1-R_j^2$) and Variance Inflation Factor (VIF) were estimated, según lo recomendado por (Field, 2012). The result showed that the values were optimal (VIF = 1.01, for both predictors), indicating no multicollinearity between the independent variables (Montgomery et al., 2012). Therefore, the results of the model can be said to be reliable and accurate (see Table 5).

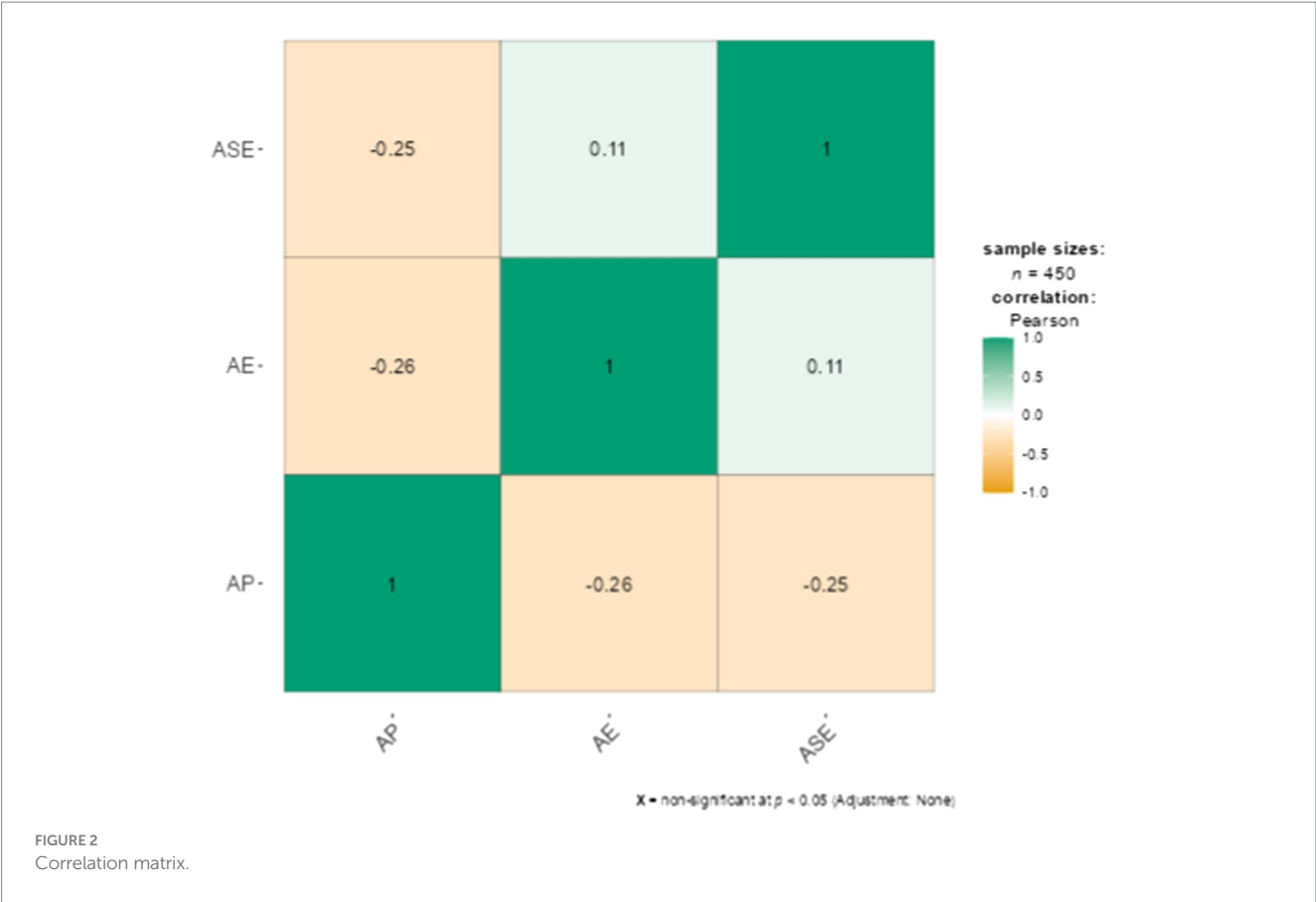


TABLE 4 Multiple correlation coefficients R, R², Adjusted R², EE and F.

Model	R	R ²	Adjusted R ²	F	gl1	gl2	p
1	0.344	0.118	0.114	30.0	2	447	<0.001

Models estimated using sample size of N = 450.

TABLE 5 Collinearity statistics.

Variables	VIF	Tolerance
ASE	1.01	0.987
EA	1.01	0.987

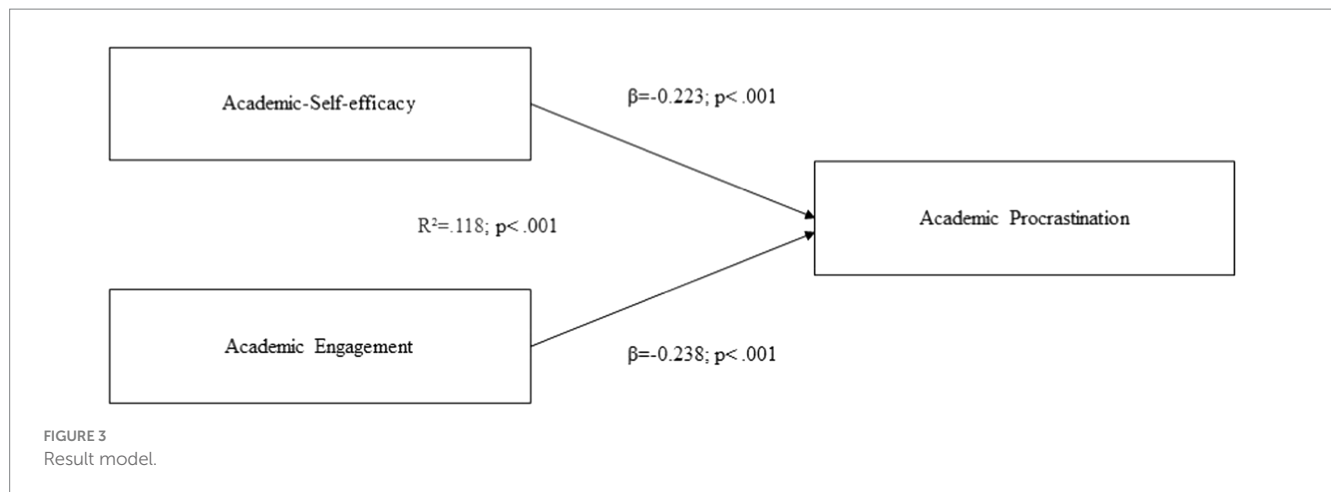
TABLE 6 Multiple regression coefficients B (unstandardized), β (standardized) and t-test.

Variables	B	EE	β	Lower	Upper	t	p
Constant	30.469	30.469	1.528	27.467	33.472	19.94	<0.001
ASE	-0.277	0.0555	-0.223	-0.190	-0.088	-4.99	<0.001
AE	-0.139	0.0261	-0.238	-0.386	-0.168	-5.32	<0.001

Table 6 shows the unstandardized regression coefficients (B) and standardized regression coefficients (β). In these results, the β coefficients (−0.277 and −0.139) indicate that academic self-efficacy and engagement negatively affect academic procrastination in Peruvian schoolchildren. The results of the analysis indicate that the variables academic self-efficacy and academic engagement are highly significant predictors of academic procrastination ($p < 0.001$). This is illustrated in Figure 3.

4 Discussion

Academic procrastination is a harmful behavior that has increased due to the pandemic (Wu et al., 2023). The theory of academic procrastination, proposed by Schraw et al. (2007) suggests that conscious procrastination of academic activities is influenced by two dimensions, adaptive (counteracting the tendency to procrastinate) and maladaptive (exacerbating this behavior). This research aimed to



determine the predictive capacity of academic engagement and self-efficacy on procrastination in Peruvian. The results showed that higher levels of engagement and self-efficacy decrease procrastinating behavior. The theory of academic procrastination and academic self-efficacy is substantiated by evidence indicating that self-efficacy and engagement, as adaptive dimensions, facilitate the timely completion of academic tasks among Peruvian adolescents, thereby mitigating procrastinatory behavior.

The results indicated that academic self-efficacy has an inverse and highly significant relationship with procrastination. This result corroborates what was reported by previous research on university students (Buenaño Guevara and Flores Hernández, 2023; Nemtcán et al., 2022; Pichen-Fernandez and Turpo Chaparro, 2022). In a study on Turkish university students, both variables were negatively related, although very weak (Odaci, 2011). In Malaysia, another study found a negative relationship between these variables in a university population (Abu Bakar and Umar Khan, 2016). This indicates that academic self-efficacy is a factor that may reduce the tendency among Peruvian adolescents to postpone academic activities. In this way, this study adds to the knowledge of the variables that contribute to adolescent procrastinating behavior, which is rarely addressed in countries outside of North America and Europe (González-Brignardello et al., 2023).

Regarding academic self-efficacy and academic engagement, a positive and significant relationship was determined between both. This finding corroborates what is stated by the socio cognitive theory, which argues that greater confidence in performing academic tasks leads to better motivation and commitment (Bandura, 1997). In this way, a student who believes in his or her abilities to achieve success in studies will have a better intrinsic motivation and, consequently, will expend more effort and commitment in fulfilling each assignment received. This finding about relationship between academic self-efficacy and engagement corroborates what Wu et al. (2020) and Paredes-Proañó and Herrera-Granda (2023) reported in university students. In Spain, university students with higher self-efficacy were more committed to their studies (Gutiérrez and Tomás, 2019). Schoolchildren in Turkey with high self-confidence were more emotionally, cognitively, and behaviorally engaged in their studies (Sökmen, 2021). The same result was seen in Pakistan among university students (Ahmed et al., 2018). In this way, it is

evident that academic engagement and self-efficacy are directly related among Peruvian students. This is important in contributing to understanding the interaction of both in a Latin American country, given that this varies according to the geographic region (Fatimah et al., 2024).

Regarding academic procrastination, this variable showed a negative and highly significant correlation with academic engagement. Previous research also highlighted the reduction of procrastination due to the student's positive attitude toward academic tasks (Rahimi et al., 2023; Serdar, 2021). In Canada, undergraduate students showed higher levels of procrastination due to a lower commitment to academic tasks (Closson and Boutillier, 2017). Another study conducted on American first-year college students found an negative and significant relationship between both variables (Yamada et al., 2016). In this way, major levels of academic engagement are related to lower adolescent procrastination levels.

Regarding the regression analysis, it was found that both self-efficacy and academic engagement predict academic procrastination. These findings are consistent with the negative influence of engagement on procrastination reported by Piri et al. (2023) among Chinese students' engagement and by Liu et al. (2020) for self-efficacy as negative predictor of procrastination among university students. In Norway, students with greater confidence in completing academic tasks showed a lower tendency to procrastinate (Svartdal et al., 2022).

Although the results present a low coefficient of determination, they are aligned with the theory and contribute to predicting academic procrastination among secondary-level students based on self-efficacy and academic engagement.

This study holds both theoretical and practical significance. It contributes to the understanding of self-determination theory by demonstrating that academic engagement serves as a negative predictor of the postponement of academic activities. Furthermore, it confirms what is pointed out by social cognitive theory in the Peruvian school context by demonstrating that the confidence that a student has in their abilities to achieve academic success negatively predict procrastination by reducing the disinterest and disconnection with studies manifested through procrastination (Salmela-Aro et al., 2021).

In practice, teachers should implement strategies to assist students in establishing clear and attainable academic objectives

(e.g., studying a daily subject) that reinforce the perception of control and incremental success, thereby enhancing their self-efficacy (Covarrubias-Apablaza et al., 2019; Nájera Saucedo et al., 2020). In addition, the application of teaching strategies that promote collaborative learning, such as project-based learning, should be encouraged in order to encourage active participation, motivation and a sense of belonging in students (León Quispe et al., 2023). Feedback is also an effective didactic strategy to strengthen self-efficacy in students to which educational actors should pay attention (Simonsmeier et al., 2020). Furthermore, incorporating play into the teaching-learning process is advantageous for increasing student motivation, enhancing their academic skills and competencies, thereby leading to academic success (Jaramillo-Mediavilla et al., 2024; Prieto-Andreu et al., 2022).

The present research contributes to the existing literature by providing empirical evidence regarding the relationship between academic self-efficacy, academic engagement, and procrastination in adolescents, a population that is little studied, especially in the Latin American context and, in particular, in Peru. On a practical level, these findings constitute a point of reflection for managers and educators involved in academic training at the secondary level to plan and implement interventions to promote academic engagement among students.

This research had limitations. Since a cross-sectional design was followed, it is impossible to establish causal relationships between the variables (Corkin et al., 2014). Also, since self-report questionnaires were used, the results may be exposed to bias (Fentaw et al., 2022). This study focused on students aged 12–17 years, thus the findings may differ in other populations. The sample predominantly comprised private educational institutions, which limits its generalizability to other educational contexts. These institutions generally possess more resources and trained teaching staff compared to public schools, facilitating an environment conducive to fostering self-efficacy (Delprato and Antequera, 2021). As a result, the scope for generalizing these findings is restricted, and it is not possible to determine causal relationships.

Despite these limitations, the findings are important because they corroborate the existing theory and add to the knowledge of the factors affecting high school students' procrastinating behavior. This allows us to understand the interaction of these variables in the specific context of an adolescent population. Furthermore, it contributes to advancing the understanding of motivational theories such as self-determination and social cognitive theory.

It is recommended that future research consider other methods of data collection, such as observation or interview, for a broader understanding of the phenomenon of academic procrastination (Turner and Meyer, 2000), as well as using longitudinal designs that establish causality between variables over time. We should continue investigating the relationship between these variables in the context of secondary education and carry out structural analyses to identify variables involved in the proposed model. Future research could investigate the relationship between specific dimensions of academic engagement, such as motivation, mental effort, and dedication, and academic procrastination, including challenges in time management

and lack of planning, among other factors. Additionally, the role of academic self-efficacy, encompassing emotional self-regulation and learning management, should be examined within the Latin American educational context. Such studies would contribute to a deeper understanding of the mechanisms that facilitate or impede learning among this student population. In conclusion, academic engagement and academic self-efficacy predict negative and significantly academic procrastination. This finding highlights the importance of strengthening students' confidence and emotional and behavioral commitment to reduce the incidence of procrastinating behaviors and thus improve their academic performance and well-being.

Data availability statement

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

Ethics statement

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

Author contributions

TC-F: Conceptualization, Investigation, Methodology, Resources, Writing – original draft. LF-O: Conceptualization, Investigation, Methodology, Resources, Writing – original draft. MN-C: Investigation, Writing – original draft. CA-R: Project administration, Software, Supervision, Validation, Visualization, Writing – review & editing.

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