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Procrastination in pre-service teachers: the role of learning strategies and academic achievement

La procrastinación en la formación inicial del profesorado: el rol de las estrategias de aprendizaje y el rendimiento académico

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ABSTRACT

A high percentage of university students postpone their academic activities, which leads to academic and personal difficulties. The aim of this work is to identify and describe academic procrastination and its link to the use of metacognitive learning strategies, socio-affective strategies, and academic performance in pre-service teachers. The sample was made up of 794 bachelor's and master's degree students in teacher education who completed the *Academic Procrastination Scale,* the *Procrastination Assessment Scale-Student (PASS)*, and the *Metacognitive Strategies* and *Socio-affective Strategies* scales of the ACRA scales. Descriptive, correlational, sample contrast, and hierarchical linear regression analysis shows there is a high percentage of students who habitually procrastinate, and who believe their behavior to be detrimental to them. Academic procrastination is negatively related to academic performance and the use of metacognitive and socio-affective strategies. Women evidence a lower level of academic procrastination than their male counterparts, although they believe it to be more detrimental to their academic activities. There are also differences in that women attribute the problem more to a lack of empathy and lack of self-confidence, whereas in men the problem is linked to the search for excitement. The variables which most predict procrastination are the low use of metacognitive strategies and the lack of energy and self-control. No differences were found between the years of the degree, age or regarding whether students are working or not, or the dedication this entails. We discuss the implications of the results in specific actions aimed at reducing procrastination behavior in university students.

Key words: academic procrastination, metacognitive learning strategies, socio-affective learning strategies, academic achievement, gender, pre-service teacher education

RESUMEN

Un alto porcentaje de alumnado universitario posterga sus actividades académicas, siendo causa de dificultades académicas y personales. El objetivo de este trabajo fue identificar y caracterizar la procrastinación académica, y su relación con el uso de estrategias de aprendizaje metacognitivas, estrategias socioafectivas, y con el rendimiento académico en estudiantes universitarios de formación del profesorado. La muestra estuvo formada por 794 estudiantes universitarios de los grados de Educación Infantil, Educación Primaria, Educación Social, y Máster en Formación del Profesorado en Educación Secundaria Obligatoria, Bachillerato y Formación Profesional, que completaron la *Escala de Procrastinación Académica (EPA),* la *Escala de Evaluación de Procrastinación para Estudiantes (PASS)*, y las escalas *Estrategias Metacognitivas* y *Estrategias Socioafectivas* de las escalas ACRA. Mediante análisis descriptivos, correlacionales, contraste de medias, y de regresión lineal jerárquica, se constata que hay un alto porcentaje de estudiantes que procrastinan habitualmente, y que consideran que esta conducta les es perjudicial. Se produce una relación negativa entre la procrastinación académica con el rendimiento académico, y el uso de estrategias metacognitivas y socioafectivas. Las mujeres presentan menor grado de procrastinación

académica que los varones, aunque consideran que es una conducta más perjudicial para sus actividades académicas, que atribuyen la falta de empatía y baja autoconfianza, mientras que los varones lo hacen a la búsqueda de excitación. Las variables más explicativas de la conducta procrastinadora son el bajo uso de estrategias metacognitivas y la falta de energía y autocontrol. No se encuentran diferencias entre cursos, edad o si realizan o no alguna actividad laboral. Se discuten las implicaciones de los resultados en actuaciones específicas para reducir la procrastinación en estudiantes universitarios.

Palabras clave: procrastinación académica, estrategias metacognitivas, estrategias socioafectivas, rendimiento académico, género, formación inicial del profesorado

INTRODUCTION

Academic procrastination is the voluntary but irrational delaying of tasks or actions regarding the designated timeframe, entailing negative consequences for the person (Steel, 2007), and reflecting insufficient control over self-regulation processes (Zhao et al., 2019). It involves a cognitive and behavioural pattern that can lead to anxiety, unease, exhaustion, and even depression and negative feelings (Steel & Klingsieck, 2016) throughout the process, although not in all cases, as it depends on how it can impact poor academic performance (Hen & Goroshit, 2020). It is estimated that between 70% and 90% of university students put off their academic tasks (Goroshit & Hen, 2021), and that around 30% of these do so regularly (Hayat et al., 2020).

Some authors believe that academic procrastination may be due to fear of failure (Abdi Zarrin et al., 2020), difficulties with time management (Garzón-Umerenkova & Gil, 2017), or to task aversion (Visser et al., 2018). Gil et al. (2020) distinguish between those who procrastinate because of being unable to respond adequately to the demands of the task or through fear and insecurity, and those who do so because they seek thrills and excitement (Fernie et al., 2018), and which might suggest an active form of procrastination, characterised by intentionally delaying tasks in order to improve efficiency, and which would have less of an impact on performance compared to those who procrastinate because of a problem of self-regulation (Suárez-Perdomo & Feliciano-García, 2020).

Procrastination and learning strategies

This deficit in learning self-regulation might be what underlies procrastinating behaviour. Various studies have reported a negative link between procrastination and learning strategies, particularly those which are metacognitive (Howell & Watson, 2007), and which prove especially important in self-regulated learning (de

la Fuente et al., 2021), since they imply self-knowledge and self-management of learning processes, geared towards planning, regulation, and evaluation. Rather than the moment at which the task is begun, what is important is actually getting it done, supervision thereof (Franz, 2020) and, where necessary, adopting corrective measures. Procrastinating students are not fully aware of having prepared the task well enough to be able to complete it (Sæle et al., 2017).

Metacognitive strategies are, however, shaped by the student's ability to control and deal with socioemotional variables. Yet, how this is linked to procrastination has received less attention from academic research, which has tended to focus on: (a) socio-affective strategies, such as social interaction, social support, and academic engagement (Goroshit & Hen, 2021), and which imply actions aimed at gaining support from others or cooperating; (b) affective strategies involved in emotional regulation (Wang et al., 2021), self-control and reducing anxiety, negative expectations, and applying mechanisms to avoid distractors (de la Fuente et al., 2021); and (c) motivational strategies, such as establishing personal goals that help to activate, regulate and maintain study habits (Román & Gallego, 1994), and which can have positive effects on performance and affective well-being. Several studies have reported a direct link between low procrastination and high motivation, whereas others see procrastination as a mediating variable between motivation and academic performance (Bäulke et al., 2021). It seems clear that one of the variables that marks the difference between the various degrees of procrastination is the lack of intrinsic motivation and a locus of external control (Visser et al., 2018).

Procrastination and academic performance

The link between procrastination and academic performance has been one focus of research, with a negative linkage having been found between the two variables. This has been seen to occur to a greater extent with tasks that are graded immediately, such as an exam or an assignment (Hen & Goroshit, 2020), and to a lesser extent with average grades awarded for a course or degree, as occurs for example with the *Grade Point Average* or *GPA* (Goroshit & Hen, 2021), or self-reported performance measures (Fernie et al., 2018). This negative relation between procrastination and academic performance remains throughout all the years of the student's degree course (Kljajic & Gaudreau, 2018) and is linked to low self-efficacy. Other studies find that this in itself is not influential, but that it is mediated by a mechanism of maladaptive perfectionism (Kurtovic et al., 2019), wherein the person is constantly concerned about their mistakes and experiences a feeling of inability and a sense of guilt (Limone et al., 2020), with this being linked to high procrastination and poor academic performance. Quite the opposite occurs with adaptive perfectionism, the effort to accomplish which is determined by high expectations of achievement,

making greater use of cognitive and metacognitive learning strategies (Howell & Watson, 2007), and which can even allow students to have more time to think about the task and to focus on details, and which does not affect performance.

Academic procrastination, gender, year, and employment

With regard to gender, several studies point out that a greater percentage of males display dilatory behaviour (Hayat et al., 2020), although the percentage of variance in procrastination that is explained by gender is low (Balkis & Duru, 2017; Garzón-Umerenkova & Gil, 2017). As regards age, it seems that younger students procrastinate more than those who are older (Kim & Seo, 2015). Nevertheless, other studies have failed to find any relation between the level of procrastination with age and with the year of the degree (Pala et al., 2011). Finally, due to the reduced amount of time available and the need to double up their responsibilities, students who combine their studies with some kind of employment might be expected to procrastinate to a greater extent than those who dedicate their time solely to academic courses. In fact, this is one of the main reasons linked to dropping out of university early. However, this does not appear to be a differential variable in the level of procrastination (Gil et al., 2020).

Academic procrastination and initial teacher training

A large percentage of teachers tend to procrastinate in their teaching duties, and to experience negative emotions because of said behaviour (Laybourn et al., 2019). As a result, gaining an insight into the procrastinating behaviour of students taking degrees that lead to a career in teaching is particularly important when compared to students involved in other areas of knowledge. In this regard, the frequency of this behaviour amongst this group is similar to that of other university students. Specifically, Balkis & Duru (2009) found that 23% of these students displayed high levels of procrastination, while a further 27% exhibited a medium level of procrastination, with the percentage being higher amongst males (Suárez-Perdomo & Feliciano-García, 2020). In contrast, the year of the degree seems to exert no significant effect (Özer & Yetkin, 2018). Moreover, procrastination amongst these students is negatively related to academic performance, positive attitudes towards school and teacher, academic self-concept, motivation, and self-regulation (Kármen et al., 2015). Specifically, the procrastination displayed by these students increases as the use of learning strategies diminishes (Dunn & Hayakawa, 2021). As a result, training in self-regulation and motivational strategies

in these students might help to reduce procrastinating behaviour, as experience in this regard has shown (Visser, 2020).

Purpose of the study

As claimed by Barnová and Krásna (2021), procrastination amongst students studying their first years of teacher training may be considered a specific and persistent problem that has a direct impact on their future teaching practice, and in which there is also a strong link between academic procrastination and general procrastination, in addition to procrastination in their private life. As a result, procrastination is a behaviour to be taken into account when training future educators, since it is they who will one day be teaching their own pupils in infant, primary, and secondary education, and who will need to prevent such procrastinating behaviour setting in at an early age. Nevertheless, few studies have been carried out with this specific group. Those studies which have been conducted have relied on small samples and have failed to explore in depth the role played by metacognitive and socio-affective learning strategies.

This study seeks to identify and describe the procrastinating behaviour of university students who are taking initial teacher training degrees (bachelor's degrees in infant education, primary education, social education, as well as master's degrees in compulsory secondary education, upper secondary education and vocational training). It also aims to examine in greater depth the explanatory power of using metacognitive and socio-affective learning strategies, and academic performance in procrastinating behaviour. All of these topics are explored through variables that might determine the frequency and causes of this behaviour, such as gender, year of the degree, and time dedicated to employment in cases where students are combining paid work with their academic studies.

METHOD

Participants

The study involved 724 university students (622 women) who were taking degrees in infant education, primary education, social education, as well as master's degrees in teacher training in compulsory secondary education, upper secondary education, and vocational training at eight university campuses in the region of Castilla y León. Given that these degrees are mainly taken by women (77.5% according to the Ministry of Education Indicator of University Statistics), most of the student participants were female, with degrees in infant and primary education

proving prominent. Participants were aged between 18 and 56 years of age (*M* = 22, *SD* = 5.18), and their average marks ranged between 4 and 9.4 points (*M* = 7.3, *SD* = 0.94). 26.8% do some kind of paid work, involving between two and 60 hours per week (*M* = 20.2, *SD* = 13.16). The distribution of the characteristics is shown in Table 1.

Table 1
Distribution of Frequencies of the Sample Characteristics

Characteristics	*n*	%
Age		
Up to 20	441	55.6%
Over 20	353	44.4%
Gender		
Feminine	622	78.3%
Masculine	172	21.7%
Years		
Initial	513	64.6%
Final	281	35.4%
Average mark		
4 to 5.9 points	41	5.2%
6 to 7.9 points	538	67.7%
8 to 10 points	215	27.1%
Hours of paid work per week		
None	582	73.3%
Up to 20 hours	127	16.0%
Over 20 hours	85	10.7%

Variables and Instruments

The *Academic Procrastination Scale* (EPA, Busko, 1998). This is widely used in Latin-America, given that it provides a general measure of academic procrastination (Domínguez-Lara, 2018; Trujillo-Chumán, K. & Noé-Grijalva, 2020). It is brief, and contains short and understandable items, and is mainly applied to higher education students. It is made up of 16 items on a five-point Likert type scale, ranging from 1 (*always, it always happens to me*) to 5 (*never, it never happens to me*). It has a single-factor structure and an internal consistency coefficient in the original version of α = .86. Álvarez (2010) adapted the instrument to Spanish, obtaining a single-factor structure, in accordance with the original design of the scale, and the internal consistency coefficient is α = .87.

The *Procrastination Assessment Scale for Students* (PASS, Solomon & Rothblum, 1984, adapted by Garzón-Umerenkova & Gil, 2017). It is a widely used scale in secondary education and higher education since it not only measures the intensity of procrastinating behaviour but also what impact it has on the student and the reasons attributed to such behaviour. It consists of 44 items on a five-point Likert type scale, from 1 (*never*) to 5 (*always*), divided into two parts. The first 18 items identify how often subjects procrastinate, whether this poses a problem, and whether they wish to curb this behaviour. The remaining 26 items group together five reasons for procrastinating: (a) thrill seeking, with an internal consistency coefficient of α =.81; (b) lack of energy and self-control, with α =.82; (c) perfectionism, α =.71; (d) anxiety over assessment, α =.72; and (e) lack of assertiveness and low self-esteem, α =.76. The psychometric properties of the instrument are appropriate, and it offers a good fit for the Rasch model, added to which all the items offer differential functioning. It also displays suitable discriminant and predictive validity indices, with negative and significant correlations between procrastination and time management as well as grades.

The *Metacognitive and Socio-affective Scales* of the instrument called the ACRA Scales of Leaning Strategies (Acquisition, Codification, Recuperation, and Support, Román & Gallego, 1994). It is an instrument designed in the Spanish context whose aim is to measure the use of learning strategies. It is based on the Atkinson–Shiffrin multi-store model and identifies different learning strategies, techniques and tactics depending on its specificity. It is widely used in Spanish-speaking countries, both for measuring strategies in themselves and for analysing the links between learning strategies and other psychoeducational variables. It comprises several independent scales with Likert-type items offering four response options ranging from 1 *(never, or almost never)* to 4 *(always, or almost always).* This instrument was revised in 2013, with the two subscales that make up the assistance scale subsequently being considered independently: the *Metacognitive Strategies Scale,* composed of 17 items, with a construct validity *r* = .91, and an internal consistency of α =.89, and the *Socio-affective Learning Strategies Scale,* which has 18 items and an *r* = .96, and α = .89.

Procedure

The work was approved by the Ethics Committee for Research with Medicine (CEIm, University of Valladolid Hospital Clinic), reference number PI 21-2258. Subsequent to approval from the corresponding academic officers, a message was sent to the students informing them of the aim of the research and requesting their cooperation in filling out surveys by accessing a link. The landing page informed them of the ethical safeguards, the ethical research committee's code of approval

and the informed consent which, unless accepted, prevented them from completing the survey. Together with the surveys, they were asked about their age, university and campus, degree studies, year of the degree, average mark from the previous year (if they were taking a degree), or previous degree (if they were taking a master's degree) and which was contained in the academic management computer application available to the students. Finally, they were asked about employment and —when this was the case— how many hours this took up. In order to analyse the data, students were split into two groups; those who were commencing their studies (first two years), and students who were in the latter stages of their degree (after the third year). In an effort to ascertain whether there were significant differences in procrastinating behaviour with regard to academic performance, students were categorised into those who performed better and those who performed more poorly, taking a mark of eight out of ten as the cut-off point, given that the academic performance of the students participating was average-high (M = 7.3, SD = 0.94). No statistically significant differences were found between bachelor's degree students and master's degree students: $t(792) = 1.18$, $p = .238$.

Data Analysis

Descriptive analysis, correlational analysis, and inferential analysis of differences of means between groups was performed. To do this, we calculated the Pearson correlation coefficient r, the t parametric test of two independent groups, including a calculation of the effect size of Hedges' g, with the cut-off points: (a) g = 0.20 small effect size; (b) g = 0.50 moderate effect size; and (c) g = 0.80 large effect size.

In order to estimate the predictive value of certain variables in the level of procrastination, a hierarchical linear regression analysis was applied using the successive introduction of variables, which included the following independent variables in successive steps: (1) metacognitive strategies, socio-affective strategies, and non-categorised academic performance; (2) to what extent procrastinating posed a problem, to what extent they wished to curb their procrastinating behaviour; (3) the reasons for procrastination: thrill seeking, lack of energy and self-control, perfectionism, anxiety over assessment, lack of assertiveness and low self-esteem; and (4) gender and academic level (included as fictitious variables), and the hours dedicated to employment. We calculated the regression coefficients (R), and determination coefficients (R^2 and R^2 adjusted), non-standardised coefficients (B), standardised coefficients (β), increase in R^2 (ΔR^2) and F (ΔF) to test whether or not the models were nested. Regarding the model fit, we reviewed cases of non-autocorrelation (Durbin-Watson statistic), non-collinearity (VIF and tolerance indices), non-existence of high-influence outliers (Cook's distance), and variance

analysis so as to test whether the variance explained by regression is significantly higher than the non-explained variance.

Statistical data analysis was carried out using the SPSS statistical package, version 26.

RESULTS

Descriptive and correlational analysis

84.6% of students professed to procrastinating on various occasions. Of these, 34.5% identified it as behaviour they engaged in regularly and in a general manner. It proved to be very problematic for 49.6% in terms of their academic development, with a further 38.4% claiming that it occasionally proved problematic. Finally, it is worth highlighting that 90% expressed a desire to curb their procrastinating behaviour. Of these, 70.6% would like to reduce such behaviour always. The most commonly cited reason for procrastination was anxiety over assessment.

Table 2 shows the correlation coefficients between the study variables. Of particular interest are those corresponding to the relation between academic performance, metacognitive and socio-affective strategies, and procrastination. In this sense, prominent is the high negative correlation between academic procrastination and the use of metacognitive strategies, $r(792) = –.49$, $p < .001$. There is also a significant correlation between procrastination and socio-affective strategies, $r(792) = –.35$, $p < .001$, and academic performance, $r(792) = –.30$, $p < .001$. No significant correlations emerge between the reasons for procrastination and learning strategies and academic performance, nor between the level of procrastination and the hours devoted to employment, $r(792) = –.06$, $p = .152$.

The highest correlation is found between the level of procrastination (EPA scale) and the frequency of procrastination (first part of the PASS scale), $r(792) = .64$, $p < .001$, given that both measure procrastinating behaviour, albeit from complementary approaches. Nevertheless, there is no correlation between the level of procrastination and such behaviour posing a problem for the individual, $r(792) = –.07$, $p = .093$, although there is with regard to wishing to reduce such behaviour, $r(792) = .14$, $p = .001$. Those who do profess to having a problem state that they wish to change their procrastinating behaviour, $r(792) = .48$, $p < .001$. The reasons for procrastination that are most closely linked to one another are the lack of energy and self-control related to thrill seeking, $r(792) = .47$, $p < .001$, and the lack of assertiveness and low self-esteem, $r(792) = .62$, $p < .001$, together with anxiety over assessment, and perfectionism, $r(792) = .53$, $p < .001$.

Table 2

Correlation matrix between the study variables (n = *794)*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. EPA	—												
2. PASS	.64	—											
3. Problem	-.07	.14	—										
4. Change	.14	.29	.48	—									
5. Reason 1	.33	.28	-.02	.01	—								
6. Reason 2	.37	.40	.13	.18	.47	—							
7. Reason 3	.15	.06	.16	.07	.33	.35	—						
8. Reason 4	.12	.07	.15	.10	.23	.31	.53	—					
9. Reason 5	.14	.17	.19	.20	.38	.62	.42	.47	—				
10. LS_MCog.	-.49	-.35	.04	-.03	-.16	-.14	-.17	-.15	-.06	—			
11. LS_S.Affec.	-.35	-.25	.01	-.02	-.06	-.10	-.17	-.10	-.04	.56	—		
12. Acad Perf.	-.30	-.22	-.02	-.05	-.12	-.14	-.06	.05	-.16	.14	.13	—	
13. Hours	-.06	-.03	-.10	-.02	.10	-.07	-.05	.06	-.08	-.01	-.03	.06	—
M	50.41	16.14	17.66	20.36	8.91	26.61	7.91	6.35	15.49	49.99	50.28	7.20	20.44
SD	7.87	3.80	4.54	5.66	3.32	6.50	3.02	2.31	4.16	8.60	7.90	0.92	12.74

Note. EPA = Degreew of academic procrastination, range [16.80], PASS= Frequency of academic procrastination [6.30], Problem = Procrastination poses a problem for them [6.30], Change = They would like to reduce their procrastinating behaviour [6.30], Reason 1= Thrill seeking [5.25], Reason 2 = Lack of energy and self-control [10.50], Reason 3 = Perfectionism [3.15], Reason 4 = Anxiety over upcoming assessment [2.10], Reason 5 = Lack of assertiveness and low self-esteem [6.30]. LS_MCog. = Metacognitive strategies [17.68], LS_S.Affec. = Socio-affective strategies [18.72], Acad Perf. = Academic performance [0.10], Hours = Hours devoted to employment.

Gender

Table 3 shows that men obtain higher scores in the level of academic procrastination (*M* = 53.68, *SD* = 8.01) than women (*M* = 49.62, *SD* = 7.39), *t*(792) = 4.85, *p* < .001, with a moderate effect size, *g* = 0.54. The same occurs with frequency of procrastination, with higher scores amongst males (*M* = 16.99, *SD* = 3.92) when compared to women (*M* = 15.93, *SD* = 3.76), *t*(792) = 2.50, *p* = .013, with a small effect size, *g* = 0.28. However, procrastination seems to pose a greater problem for female students (*M* = 18.18, *SD* = 4.42) than for their male counterparts (*M* = 16.42, *SD* = 4.56), *t*(792) = –3.55, *p* < .001, with a small effect size *g* = 0.40.

With regard to why they procrastinate, males evidence significantly higher levels in terms of thrill seeking (*M* = 9.66, *SD* = 3.18) than females (*M* = 8.11, *SD* = 2.82), *t*(792) = 4.80, *p* < .000, with a moderate effect size, *g* = 0.53. In contrast, when identifying lack of assertiveness and low self-esteem as the cause of procrastination, this is seen to be more intense amongst women (*M* = 15.72, *SD* = 4.46) than men (*M* = 14.43, *SD* = 4.21), *t*(792) = –2.59, *p* = .010, with a small effect size *g* = 0.29.

Table 3

Means and Standard Deviations, t Value, Significance and Effect Size of Academic Procrastination by Gender

	Gender						
	Males (*n* = 172)		Females (*n* = 622)				*Hedges´ g*
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	
Level of academic procrastination	53.68	8.01	49.62	7.39	4.85	< .001	0.54
Frequency of academic procrastination	16.99	3.92	15.93	3.76	2.50	.013	0.28
Procrastination poses a problem	16.42	4.56	18.18	4.42	–3.55	< .001	0.40
Wish to reduce their procrastination	19.47	5.32	20.45	5.64	–1.58	.115	
Thrill seeking	9.66	3.18	8.11	2.82	4.80	< .001	0.53
Lack of energy and self-control	26.88	6.09	26.90	6.50	–0.04	.971	
Perfectionism	7.39	2.67	7.81	2.99	–1.27	.206	
Anxiety over assessment	6.24	2.30	6.42	2.35	–0.70	.485	
Lack of assertiveness and low self-esteem	14.43	4.21	15.72	4.46	–2.59	.010	0.29

Academic performance

One of the variables in which most differences occur in the intensity and reasons for procrastination is academic performance (Table 4). Those whose academic performance is higher procrastinate significantly less (M = 47.51, SD = 7.58) than those whose academic performance is poorer (M = 51.51, SD = 7.86), $t(792) = 4.93$, $p < .001$, with a moderate effect size, $g = 0.51$. The same occurs with frequency of procrastination, between those with a superior academic performance (M = 14.88, SD = 3.74) and a lower performance (M = 16.52, SD = 3.83), $t(792) = 4.33$, $p < .000$, with a small effect size, $g = 0.43$. There are also significant differences in three of the reasons why they procrastinate: thrill seeking, lack of energy and self-control, and lack of assertiveness and low self-esteem. In all of these, there is a lower score amongst those evidencing superior academic performance, and with small effect sizes.

Table 4

Means and Standard Deviations, t Value, Significance and Effect Size in Academic Procrastination by Academic Performance

	Academic Performance						
	Up to 7.9 (n = 579)		From 8 to 10 (n = 215)				*Hedges´ g*
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	
Level of academic procrastination	51.51	7.86	47.51	7.58	4.93	< .001	0.51
Frequency of academic procrastination	16.52	3.83	14.88	3.74	4.33	< .001	0.43
Procrastination poses a problem	17.79	4.46	17.78	5.01	0.01	.989	
Wish to reduce their procrastination	20.66	5.55	19.53	5.78	2.04	.042	0.20
Thrill seeking	8.98	3.18	8.25	3.45	2.25	.025	0.23
Lack of energy and self-control	27.14	6.14	25.16	7.10	3.06	.002	0.31
Perfectionism	7.77	2.89	7.99	3.28	-0.75	.457	
Anxiety over assessment	6.39	2.27	6.12	2.46	1.16	.245	
Lack of assertiveness and low self-esteem	15.80	4.15	14.22	4.09	3.81	< .001	0.38

Year, age, and employment

Significant differences were only found when attributing task delaying to a lack of energy and self-control. Those who are in the early years of their university studies exhibit higher scores (M = 9.15, SD = 3.45) than those who are nearing the end (M = 8.50, SD = 3.02), $t(792) = 2.30$, $p = .022$, with a small effect size, g = 0.20. No significant differences were found in any of the variables amongst the categories in which student age was codified. As regards whether or not students were in employment, significant differences were only found in terms of lack of energy and self-control, with higher scores for those who are active in some kind of employment (M = 9.39, SD = 3.49) compared to those who are not (M = 8.74, SD = 3.24), $t(792) = 2.14$, $p = .032$, with a small effect size, g = 0.20. Delving deeper into the cause of procrastination, no significant differences were found between those who work full time (M = 9.39, SD = 3.30) and those who work part time (M = 9.38, SD = 3.63), $t(166) = –0.01$, $p = .994$.

Hierarchical linear regression analysis

After successively introducing the variables into the different stages (Table 5), all of them are significant ($F_1 = 78.47$, $p < .001$; $F_2 = 54.87$, $p < .001$; $F_3 = 50.69$, $p < .001$; and $F_4 = 39.23$, $p < .001$), and lead to significant increases in R^2 and F ($\Delta R^2_1 = .40$, $\Delta F_1 = 78.47$, $p < .001$; $\Delta R^2_2 = .04$, $\Delta F_2 = 12.16$, $p < .001$; $\Delta R^2_3 = .16$, $\Delta F_3 = 26.74$, $p < .001$) except at stage 4 ($\Delta R^2_4 = .00$, $\Delta F_4 = 1.02$, $p = .385$). Consequently, the resulting model with the chosen variables explains 58% of variance, with the explained variance being significantly higher than the non-explained. The Durbin-Watson value is close to 2 (d = 1.91), such that no self-correlation is assumed to have occurred. The VIF values lie in the range [1.07, 2.07], below 10. The tolerance indices are in the range [.49, .93], and not below .10, such that collinearity amongst the variables can be ruled out. The Cook distance does not exceed 1 in any of the cases, [.000, .036], with M = .003.

Learning strategies and academic performance explain 39% of variance. As a result, little use of metacognitive and socio-affective strategies, together with low academic performance, are significantly predictive variables of greater procrastination. In this regard, prominent are metacognitive strategies, with a greater coefficient ($\beta = –.35$, $p < .001$), although academic performance also stands out ($\beta = –.17$, $p < .001$), together with socio-affective strategies ($\beta = –.08$, $p < .05$), albeit to a lesser extent. Also significant is considering procrastination to be a problem ($\beta = –.09$, $p < .05$) and the extent to which there is a desire to curb the tendency to delay tasks ($\beta = .14$, $p < .01$).

Prominent amongst the causes to which students attribute their procrastinating behaviour is the lack of energy and self-control (β = .33, p < .001), followed by perfectionism (β = .21, p < .001), thrill seeking (β = .20, p < .001), and anxiety over assessment (β = .12, p < .01). In contrast, attributing this to the lack of assertiveness and low self-esteem is not significant.

Table 5

Overall results of the hierarchical regression linear analysis of the level of procrastination (EPA)

Variable	*B*	*SE B*	95% CI	β	$R^2adj.$	ΔR^2	ΔF	*p*
Stage 1					.39	.40	78.47	< .001
Academic performance	-2.03	.381	[-2.78 -1.28]	-.22***				
Metacognitive strategies	-0.44	.046	[-0.53 -0.35]	-.48***				
Socio-affective strategies	-0.15	.055	[-0.26 -0.04]	-.13**				
Stage 2					.41	.04	12.16	< .001
Academic performance	-1.93	.370	[-2.66 -1.20]	-.21***				
Metacognitive strategies	-0.42	.045	[-0.51 -0.33]	-.45***				
Socio-affective strategies	-0.14	.054	[-0.24 -.031]	-.12*				
Procrastination poses a problem	-0.30	.082	[-0.46 -.141]	-.17***				
Wish to reduce their procrastination	0.31	.068	[0.18 0.44]	-.21***				
Stage 3					.58	.16	26.74	< .001
Academic performance	-1.53	.324	[-2.17 -0.90]	-.17***				
Metacognitive strategies	-0.32	.039	[-0.40 -0.25]	-.35***				
Socio-affective strategies	-0.09	.046	[-0.18 0.01]	-.08*				
Procrastination poses a problem	-0.16	.072	[-0.31 -0.02]	-.09*				
Wish to reduce their procrastination	0.20	.060	[0.09 0.32	-.14**				
Thrill seeking	0.51	.106	[0.30 0.72]	-.20***				
Lack of energy and self-control	0.42	.062	[0.30 0.54]	-.33***				

Variable	*B*	*SE B*	95% CI	β	$R^2adj.$	ΔR^2	ΔF	*p*
Perfectionism	0.58	.121	[-0.81 -0.34]	-.21***				
Anxiety over assessment	0.41	.154	[-0.71 -0.10]	-.12**				
Lack of assertiveness and low self-esteem	-0.12	.094	[-0.30 0.07]	-.06				
Stage 4					.58	.00	1.02	.385
Academic performance	-1.44	.335	[-2.10 -0.78]	-.16***				
Metacognitive strategies	-0.31	.040	[-0.39 -0.23]	-.33***				
Socio-affective strategies	-0.09	.047	[-0.18 0.00]	-.08*				
Procrastination poses a problem	-0.16	.073	[-0.30 -0.01]	-.09*				
Wish to reduce their procrastination	0.21	.060	[0.09 0.32]	-.14***				
Thrill seeking	0.48	.109	[0.27 0.70]	-.19***				
Lack of energy and self-control	0.42	.062	[0.30 0.54]	-.33***				
Perfectionism	0.56	.122	[-0.80 -0.32]	-.21***				
Anxiety over assessment	0.43	.155	[-0.74 -0.13]	-.13**				
Lack of assertiveness and low self-esteem	-0.10	.097	[-0.29 0.09]	-.05				
Gender	-1.02	.728	[-2.45 0.42]	-.05				
Year	-0.39	.612	[-1.60 0.81]	-.02				
Hours dedicated to employment	-0.02	.030	[-0.08 0.04]	-.02				

Note. $R^2adj = R^2$ adjusted, CI = confidence interval for *B*.
*$p < .05$, **$p < .01$, ***$p < .001$

DISCUSSION AND CONCLUSIONS

This work seeks to explore in greater depth the link between academic procrastination and the use of metacognitive and socio-affective learning strategies, and academic performance amongst university students who are taking degrees in

education (degrees in infant education, primary education, social education, and master's degrees in teacher training for compulsory secondary education, upper secondary education, and vocational training). Worth highlighting is the high percentage of students who profess to delaying their academic tasks (85%), amongst whom a significant proportion acknowledge doing so regularly (35%). These results confirm the high level of procrastination amongst university students, and concur with the findings obtained by Bäulke et al. (2021), where between 33% and 50% of students regularly procrastinate, or those of Hayat et al. (2020) who found that 29.3% of students procrastinated to a high degree. Nevertheless, the higher percentage found amongst students taking degrees in teacher training would seem to indicate that such behaviour is more commonplace than in other degrees, in contrast to the findings reported by Balkis and Duru (2009) for this group. This confirms the widespread nature of this behaviour, even bearing in mind that subjects tend to overestimate how often they procrastinate when this is measured using self-reports (Kim & Seo, 2015). Regardless of its negative impact on performance, or whether it is unconscious or intentional, we found that it causes intense unease amongst 50% of students and is, moreover, something that the vast majority wish to curb (71%), which is in line with the findings of Balkis and Duru (2017) regarding the impact that academic procrastination has on students' satisfaction with academic life.

Metacognitive and socio-affective strategies, and performance, without considering other variables, account for 39% of the explained variance of procrastinating behaviour, with this behaviour being negatively linked to learning strategies, particularly those which are metacognitive (−.49), thereby pointing to less planning, regulation and evaluation of learning processes. It is specifically metacognitive strategies that have the greatest explanatory power vis-à-vis procrastinating behaviour. Kármen et al. (2015) identify lack of self-control as being one of the principal causes of procrastination of future teachers. Likewise, Limone et al. (2020) find that the metacognitive aspect of learning, together with time management, exhibit significant explanatory power in task delaying, and that this is more intense amongst males, who use this kind of strategy less often. De la Fuente et al. (2021) stress the importance of the learning regulation process, such that enhancing this regulatory process entails a greater level of academic confidence, which is linked to a reduction in procrastination. In contrast, lower regulation is seen to trigger a rise in procrastination. In sum, and as pointed out by Franz (2020), the moment at which the task is commenced is not as important as actually seeing it through and checking to ensure that the plan set out is adhered to.

The same tendency is found between procrastination and socio-affective strategies, albeit less intensely (−.35), and is also seen to explain academic procrastination to a significant extent. This underlines the importance of processes that help students to prepare themselves psychologically to face the task of learning in the best possible manner, and in which the inappropriate use of motivational

regulation strategies may only serve to further procrastination (Steel, 2007). Wang et al. (2021) find that the use of self-rewards, establishing personal goals, internal dialogue, and rewards based on including pleasant features in the activity can significantly predict low student academic procrastination. Socio-affective strategies, however, go further than this, and include implementing mechanisms to seek social support, cooperation, or conflict avoidance. For their part, affective strategies help to address the question of self-control, to manage anxiety and to lessen the impact of distracting stimuli.

Academic performance is also an explanatory variable, and displays a significant negative correlation with the two measures of procrastination (−.30 and −.22), in line with the results reported by Balkis and Duru (2009) with future teachers, and who found a correlation between the two variables of −.28. This has also been found to occur with university students from other disciplines, as for example reflected in the studies by Sæle et al. (2017), who reported a correlation of −.16 between procrastination and *Grade Point Average* (GPA), or the results obtained in the meta-analysis carried out by Kim and Seo (2015), and Steel (2007), whose correlations fell within the range −.16 to −.25.

Moreover, we should also remember the reasons why activities are put off. In this regard, this study highlights lack of energy and self-control as being the number one cause in students who procrastinate most, in addition to which it also has the greatest explanatory power, which would point to less use of self-regulatory processes amongst these students (Balkis & Duru, 2017). These results are similar to those of Zhao et al. (2019), where procrastination correlated negatively with time management and self-control, albeit with less predictive power than was found in our study. This points to poorer time management on the part of future teachers —a key skill in their professional future. It is also worth highlighting anxiety when faced with assessment as being one of the most frequent causes of procrastination amongst the subjects in the sample. In this regard, Dunn and Hayakawa (2021) find that future teachers with attributional thoughts of low effort evidence higher levels of procrastination, which impacts assessment processes. In a similar vein, Abdi Zarrin et al. (2020) state that fear of failure, together with a low level of responsibility, are predictors of high procrastination. Graded assignments at university are not usually required to be handed in immediately but can be planned at the start of the courses. Students are usually allowed generous due-by dates for assignments, although the work does require prior constant dedication and cannot simply be tackled in the days immediately before work is due in for assessment. As affirmed by Bäulke et al. (2021), because greater independence is demanded in university learning, students must organise time and resources that are not shaped by the immediate results which could serve as a stimulus. Should students fail to do this,

there is a greater likelihood that they will not have taken the action required to complete a task successfully, which will then trigger anxiety when they are assessed.

As far as gender is concerned, we find that men are prone to engage in procrastinating behaviour more intensely than women, which concurs with other findings from studies carried out amongst the general university population (Limone et al., 2020), as well as with results from studies conducted specifically with future teachers (Akdemir, 2019). This might account for the lower academic performance found amongst males in these degrees (Barnová & Krásna, 2021), bearing in mind that most of the students on these degrees are women. In our study, males more often attribute procrastinating behaviour to thrill seeking than their female counterparts, which might be linked to impulsiveness. In women, such behaviour is usually put down to lack of empathy and self-esteem, thereby indicating that affective factors carry greater weight in women than in men (Abdi Zarrin et al., 2020). As did Özer and Yetkin (2018), we failed to find any relevant differences between students in the early or latter years of their degree. Nor did we find any differences between those who are only students and those who are also engaged in some kind of employment, nor with regard to whether this work is full time or part time. As a result, availability of time does not emerge as a determining factor in procrastinating behaviour. Rather, it is a question of planning and self-regulating the use of time, findings which concur with those from the studies by Garzón-Umerenkova et al. (2020) carried out with university students from a varied range of degrees.

Given that they are intentional, conscious and learnt procedures, such learning strategies might be included in teaching at the start of university studies as a way to reduce or prevent procrastination, whilst also providing students with instruction in learning strategies aimed at their future pupils. Particular emphasis should be placed on strategies related to self-regulation and time management, and that stress the need to reduce anxiety when faced with exams or assessment. All of this must be carried out at the start of the degree, since this is when students need to adapt the strategies they should already have acquired at secondary level to the demands and timeframes involved in university studies. This type of training can specifically be helped through tutoring or mentoring with students, by teachers' modelling on each course, underpinning the importance of self-regulating their learning and by seeking the socio-affective support required to help this. Training should seek to reduce stress and to prevent distracting influences from having an impact and it should also foster academic well-being —always in a contextualised manner. As pointed out by Steel and Klingsieck (2016), the instructional flexibility of university teachers can also help to reduce procrastinating behaviour by promoting a feeling of independence and the expectation of achievement. All of this is particularly important in future teachers, since they will serve as models for strategic teaching and learning processes for their pupils, regardless of what stage of education they are teaching at.

This study is not without its limitations, such as those stemming from transversal research, particularly vis-à-vis students' year of the degree and age. In addition, the findings should be confined to degrees in education, or by extension, to the field of social and legal sciences. In this regard, there is a predominance of female students, added to which the classroom dynamics and methodological strategies differ from those used in other areas of knowledge. Finally, mention should be made of the limitation concerning the use of self-reports rather than direct observations as well as the differences involved in measuring success through performance indicators rather than through academic grades. As a result, further inquiry should be carried out to explore in greater depth the differences in procrastination from a longitudinal inter and intra-year study and through multi-level studies, distinguishing between procrastination in tasks undertaken throughout the academic year, and the demands this makes on each individual student, taking into account the learning difficulties evidenced by certain students.

NOTES

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