Procrastination Among University Students: A Study Investigating Sociodemographic and Psychological Factors

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Procrastination is a widespread problem that is very common among university populations and is associated to negative consequences. The aim of this study is to analyze procrastination in university students and its relationship with sociodemographic and psychological variables. A multicenter study involving 845 university students was conducted, with participants completing several questionnaires, including the Procrastination Assessment Scale-Student (PASS), Academic Time Management (ATM), Brief Symptom Inventory (BSI-18), and Big Five Inventory-10 (BFI-10). The study subsequently examined procrastination patterns among these students, distinguishing between low and high procrastination profiles, and explored demographic and psychological variations using ANOVA, Chi-square analysis, and logistic regression. Results showed that forty-seven percent of students procrastinate, and males procrastinate more than female students (p=.018). Procrastination was related to psychological variables (more anxiety, depression, somatization), personality variables (less conscientiousness and agreeableness), and time management (organization, follow-up, and assignment completion). More responsible students who better plan their time and track their progress procrastinate less. It would be necessary to provide interventions for university students at risk of suffering negative consequences from procrastination.

INTRODUCTION

Procrastination is a social practice consisting of the constant postponement of tasks and responsibilities. This type of habit often leads to detrimental consequences for

individuals engage in it (Svartdal, F. & Løkke, J.A., 2022), as it hinders the fulfillment of various daily obligations (Laureano & Ampudia, 2019). Although it is common to find research that analyses these types of behaviours in the academic enviroment (Santyasa et al., 2021), procrastination is a pervasive practice that is not limited to this realm and can be found in diverse areas of human activity (Khan et al. 2014), such as health (Sirois, 2015), work (Metin et al., 2016), and family (Soysa & Weiss, 2014).

In the university academic context, procrastination is considered a central factor in understanding students' time management. Some studies also point to a direct inverse relationship between procrastination and academic achievement (Santyasa et al., 2020). Since the 1980s and starting from the stress that the academic experience often caused in students (MacCann et al., 2012), the close relationship between time management and success in studies was highlighted. The greater the students' ability to control their time, the less stressful they became and the more efficient they were at completing their tasks. In the decades that followed, this idea has been reaffirmed and nuanced through numerous studies that show clear relationships between student's time management skills and academic success (Basila, 2014; Hensley et al., 2021; Karatas, 2015; Wang & Englander, 2010). In all of these investigations, procrastination plays a fundamental role in understanding academic planning and time management, and even obtaining a better understanding of the students' cognitive skills involved in their learning (Yurtseven & Dogan, 2019).

The effects resulting from procrastination behaviors are varied and, according to a significant number of studies, could have negative consequences for university students that can affect them in the short, medium, and long term. These consequences range from the purely academic, such as lack of attention in class (Ying & Lv, 2012), low academic achievement (Santyasa et al., 2021; Naturil-Alfonso et al., 2018), and university dropout (Scheunemann et al., 2022; Garzón-Umerenkova & Gil-Flores, 2017a), to psychological repercussions, increased anxiety and stress that can lead to depression and other forms of deterioration of mental health (Essau et al., 2008; Johansson et al., 2023), to negative consequences in the future job market, such as precarious job stability, lower salary performance, and higher probability of unemployment (Nguyen et al., 2013).

Fortunately, there are many researchers who agree that academic procrastination behaviours can be avoided. The role of university teachers may be essential in this regard, since, as Ertem and Ari (2022) state, designing activities that take into account students' goals, expectations and skills could help reduce their levels of procrastination and, therefore, improve their academic performance. The implementation of training programmes focused on time management (O'Connor & Paunonen, 2007; Nadinloyi et al., 2013) could also mitigate procrastination behaviour among university students in good measure. These programs, beyond providing practical tools for time management, must address the problem in all its complexity, considering cognitive, metacognitive, behavioral, and motivational aspects (Ertem & Ari, 2022; Garzón-Umerenkova & Gil-Flores, 2017a). Therefore, in order for these interventions to be real and effective, it is necessary to determine the profile of the procrastinator.

Student motivation and self-control seem to be key aspects that help to avoid procrastinating behaviour. Some studies claim that students who are able to set and pursue long-term goals show lower levels of procrastination (Ertem & Ari, 2022). These goals help students to focus on achieving small accomplishments that will lead to their ultimate objective, and to avoid distractions and impulsive, hedonistic behaviour. The ability to have long-term goals and to maintain constant motivation strengthens students' self-control and enables them to develop effort and perseverance to face the academic demands.

Numerous studies have attempted to characterize the profile of the procrastinating student, relating it to sociodemographic, psychological, academic, or personal variables of different types. There is some consensus in affirming that men tend to procrastinate more than women (Durán-Aponte & Pujol, 2013; Pehlivan, 2013) and that older students who combine studies with part-time jobs generally show greater time management skills and, therefore, procrastinate less on tasks (Vaez & Laflame, 2008; Robotham, 2012). Certain personality traits, such as those described in the widely disseminated Big Five Inventory model (Rammstedt & John, 2007) -neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness, also appear to be related to procrastination tendencies (Ferrari & Pychyl, 2012; Karatas, 2015). Likewise, other psychological traits such as memory, creativity, self-control or self-esteem could be linked to procrastination habits (Ertem & Ari, 2022; Macan et al., 2010).

Despite these consensuses, certain discrepancies remain noteworthy. As authors such as Garzón-Umerenkova et al. (2020) affirm, for example, there is a puzzling dance of figures in the results of some researches regarding the percentage of university students with a tendency to procrastinate tasks. To quote just a few: Haycock et al. (1998) estimated it between 30% and 50%, Ferrari et al. (2005) pointed to 70%, while Rosales and Espín (2023) estimate a percentage of 85.9%. Similarly, regarding neuroticism or emotional instability, some studies consider it an irrelevant aspect to explain procrastination (Steel et al., 2001), while others indicate the opposite (Mantrágolo, 2018). This heterogeneity of results could be explained by the degree to which it manifests in the individual, the timing of the evaluation, the instrument used, or the sample itself. Likewise, the disparity of instruments used in the assessment of procrastination may emphasize one or another aspect of this type of behaviour, and unintentionally, may be trying to characterise different types of procrastination within the same group (Garzón-Umerenkova et al., 2020). In the same line, Claessens et al. (2007) point out, in their exhaustive review on time management, a remarkable lack of qualitative studies on the subject.

Based on all of the aforementioned, it seems clear that there is a need to further delve into the study of the different variables that help us characterize the profile of the academic procrastinator. This study investigated procrastination patterns in university students, distinguishing between low and high procrastination profiles, and assessed the differences in demographic and psychological factors, including psychological distress, personality traits, and time management skills, among these distinct procrastination profiles.

METHOD

Sample

An observational multicenter prospective cross-sectional study was carried on. This study had a sample of 845 students from 6 faculties of Humanities and Social Sciences at the University of Barcelona (UB), Spain. All participants signed informed consent and completed the administered questionnaires. This study was carried out in accordance with the Declaration of Helsinki, and the UB ethics committee (ref. 012) approved the protocol. A total of 939 students agreed to participate in the study, of which 845 were included in the final analysis. However, 94 participants were excluded as they did not complete the required questionnaires.

Instruments

The questionnaires used in the evaluation protocol are described below.

Sociodemographic profile and academic performance

The questionnaire used to determine the sociodemographic profiles of the sample and their academic performance included questions about the students (age, gender, current academic year, degree being studied) and their academic performance (average grades obtained so far, as a university student).

Procrastination was assessed using the *Procrastination Assessment Scale-Student* (PASS), created by Solomon and Rothblum (1984). It consists of an 18-item measure that assesses the level of procrastination in 6 academic domains: taking an exam, studying for an exam, keeping up with weekly readings, completing administrative tasks, attending meetings, and completing academic tasks. Participants were asked to respond on a 5-point Likert scale (1: never, to 5: always). These items measured the tendency of the students to postpone their studies and assigned schoolwork (e.g., "I promise myself I'll do my schoolwork, but then I still postpone it anyway"). The scale of the Spanish version has a Cronbach's alpha between .86 to .99 (Garzón-Umerenkova & Gil-Flores, 2017b). In this study the Cronbach's alpha is .88.

The *Academic Time Management* (ATM) is an instrument for assessing student's strategies and useful use of time for their learning (Won et al., 2018). Participants responded to 5 items that assessed time planning (e.g., "I set deadlines to complete a task"), 4 items for time monitoring (e.g., "I look at a planner, schedule, or calendar every day to see what I have to do"), and 5 items to assess procrastination on tasks (e.g., "I postpone doing my class work until the last minute"). The reliability is between .80 and .93 (Won & Shirley, 2018). In this study the Cronbach's alpha is .71

Psychological distress was assessed using the *Brief Symptom Inventory* (BSI-18), a brief questionnaire for detecting psychological distress in clinical and community populations (Derogatis, 2001). Participants were asked to respond regarding how they had felt during the last 7 days; each item was rated on a 5-point Likert scale from 0 (not at all) to 4 (extremely). The reliability is between .81 and .90 (Andreu et al., 2008). In this study the Cronbach's alpha is .91

Personality was measured with the *Big Five Inventory-10* (BFI-10). The BFI-10, developed by (Rammstedt & John, 2007), is an abbreviated version of the well-established Big Five Inventory (BFI), and consists of 10 of the standard BFI's 44 items. Procrastination may be related to the Big Five model (Karatas, 2015), widely used in the practice of psychological assessment, and therefore we have relied on it for this research. In this study the Cronbach's alpha is ranging from .70 to .79, and in Spanish version alphas is ranging from .61 to .81 (Renau et al., 2013). The BFI-10, introduced due to its greater acceptance and the time needed for people to answer it, assesses the following personality traits: neuroticism, extraversion, openness, conscientiousness, and agreeableness.

Procedure

Data collection took place during the academic years 2018-2020. The researchers of the different degree programs were contacted, the protocol for the questionnaires to be administered was presented to them, and a sheet introducing the project, a copy of the protocol, and a participation consent form were sent to them via email. They were asked to explain and encourage the students in their degree programs to complete the protocol for this study. The estimated time to complete the protocol ranged from 10 to 30 minutes. Participation was entirely voluntary, and subjects could indicate the possibility of interrupting it at any time without any negative consequences. All students were informed about the study, the anonymous collection and treatment of data.

Statistical analysis

Descriptive statistics and frequency distributions were calculated for demographic and clinical characteristics using SPSS version 23 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp). To identify patients with similar procrastination patterns, a cluster analysis was conducted. Clustering variables comprised the PASS items. Since clustering requires valid values for all variables, subjects with any missing PASS values were eliminated. A final sample of n= 845 was used for the cluster analysis. We carried out a k-means method using Euclidean distances between observations to estimate clusters and Ward's hierarchical clustering method, where the distance between two clusters is defined as the squared error criterion. In all instances, the distances were computed from the raw data to incorporate the elevation, scatter, and shape of the subject's profiles. A two-cluster solution was found to distinguish between low and high procrastination. Analyses of variance (ANOVA), as well as Chi-square analyses were carried out to evaluate differences in demographic, and psychological characteristics among the procrastination profiles. Bonferroni correction was used for post-hoc contrast. Eta squared (η^2) was applied to assess effect size in continuous variables. Eta-squared ranges between 0 and 1, with $\eta^2 \sim .01$ for a small, $\eta^2 \sim .06$ for a medium, and $\eta^2 > .14$ for a large effect size (Pierce, Block, & Aguinis, 2004). Those sociodemographic and psychological variables that were significantly related to procrastination profile in the univariate analysis were introduced into the logistic regression analysis as adjustment variables using the forward conditional methods for logistic regression. We applied Nagelkerke's R-squared to determine goodness-of-fit of the logistic regression model. A *p*-value of <.05 was deemed statistically significant.

FINDINGS

Sociodemographic characteristics

The sample consisted of 845 university students (82% females and 17% males), with a mean age (M) of 22.4 years (SD= 6.5). Of these, 58% were not employed, 55% were in their first or second year of study, and 45% were in their third or fourth year. The students mainly came from the Faculty of Education (47%) and Information and Audiovisual Media (25%). The average academic performance was 7.1 (SD= 1.0), out of 10.

Two groups of students were identified to distinguish between low and high procrastination, using a k-means method with Euclidean distances between observations. Students were classified as having low procrastination (53%, n= 446) or high procrastination (47%, n= 399). Analyzing the relationship between procrastination and sociodemographic characteristics, we found that male students procrastinated more than female students ($X2$= 5.642, p= .018), and students from the Faculty of Information and Audiovisual Media procrastinated more than those from Education ($X2$= 10.864, p= .004), see Table 1.

Table 1
Differences in demographic among the procrastination profiles (n= 845)

Variables	Total sample n (%) 845 (100%)	Low procrastination n (%) 446 (53%)	High procrastination n (%) 399 (47%)	X^2	P value
Sex					
Men	150 (18)	66 (44)	84 (56)	5.642	.018
Women	695 (82)	380 (55)	315 (45)		
Age					
<21y	503 (60)	274 (55)	229 (45)	1.428	.232
≥21.1y	342 (40)	172 (50)	170 (50)		
Employment Status					
Works	355 (42)	185 (52)	170 (48)	.110	.740
Does not work	490 (58)	261 (53)	229 (47)		
Academic year					
1st and 2nd	468 (55)	252 (54)	216 (46)	.477	.490
3rd and 4th	377 (45)	194 (52)	183 (48)		
Studies					
Education	397 (47)	226 (57)	171 (43)	10.864	.004
Comunication	213 (25)	92 (43)	121 (57)		
Others	235 (28)	128 (54)	107 (46)		
Academic Performance					
Passed	204 (33)	105 (52)	99 (48)	.652	.419
Good-Excellent	406 (67)	223 (55)	183 (45)		

Abbreviations. M= Mean; SD= Standard Deviation. Bold values indicate the significant at 5% level.

Profiles of procrastination and psychosocial characteristics

When looking for relationships between procrastination profiles and psychosocial characteristics assessed by the scales (BSI, BFI and ATM), we found that students with higher scores in procrastination also showed higher levels of depression (M = 70.5 vs M = 67.3; F= 55.891, p= .001, η 2 = .073), anxiety (M = 68.1 vs. M = 64.7; F= 22.223, p= .001, η 2= .033), somatic symptoms (M = 68.0 vs M = 65.4; F= 5.930, p= .015, η 2 = .008), and psychological distress (M = 70.5 vs M = 67.3; F= 41.845, p= .001, η 2 = .056). They were also less responsible students (M = 5.2.5 vs M = 6.3; F= 82.796, p= .001, η 2 = .104), and less agreeable (M = 6.6 vs M = 6.8; F= 5.118, p= .024, η 2 = .007). Students who plan their time poorly, do not monitor their progress, and therefore don't turn in their work on time. These are also the ones who procrastinate the most (p<.001), see table 2.

Table 2
Differences in baseline psychosocial characteristics and procrastination profiles

	Low procrastination 446 (53%)		High procrastination 399 (47%)				
	Mean	SD	Mean	SD	F	*p*	Eta-squared
Psychological distress (BSI)	67.4	6.9	70.6	6.2	41.845	.001	.056
Anxiety	65.8	6.6	68.2	6.3	24.223	.001	.033
Depression	64.9	6.1	68.3	5.7	55.891	.001	.073
Somatization	61.9	8.1	63.4	7.7	5.930	.015	.008
Big Five Inventory (BFI)							
Neuroticism	6.3	1.9	6.3	2.1	.085	.771	--
Extraversion	6.5	1.8	6.3	1.9	3.098	.079	--
Opennes to experience	6.9	2.1	7.0	2.2	.163	.687	--
Conscientiousness	6.3	1.7	5.2	1.6	88.807	.001	.095
Agreeableness	6.8	1.2	6.6	1.3	5.763	.017	.007
Time Management (ATM)	48,4	8,5	38,3	8,7	285.62	.001	.253
Time planning	18.2	3.9	15.5	4.0	94.644	.001	.102
Time monitoring	15.3	4.1	13.3	4.3	42.891	.001	.048
Procrastination on tasks	14.9	3.1	9.5	4.0	481.36	.001	.363

Abbreviations: BSI, Brief Symptom Inventory; BFI, Big Five Inventory. ATM, Academic Time Management. Bold values indicate the significant at 5% level.

Factors that could explain procrastination

Sex, anxiety, depression, somatization, psychological distress, conscientiousness and agreeableness, time planning, time monitoring, and procrastination on tasks were the variables that showed significant differences between students with high and low scores on procrastination. Therefore, they were introduced as variables in the logistic regression analysis. The results indicate that students who are more responsible, plan their time better and monitor their progress, tend to procrastinate less (Nagelkerke's R2= 89.0), see table 3.

Table 3
Multivariate logistic regression of factors significant with procrastination profiles of students

Variables	β	Wald test (z-ratio)	Sig.	Odds ratio	95% CI lower	95% IC higher
BSI. Anxiety	-.032	.152	.697	.968	.823	1.139
BSI. Depression	-.028	.101	.751	.972	.818	1.156
BSI. Somatization	.024	.207	.649	1.024	.924	1.136
BSI. Psych. distress	.037	.054	.816	1.038	.757	1.423
BFI. Agreeableness	.006	.002	.968	1.006	.763	1.325
BFI. Conscientiousness	.264	4.406	-.032	1.302	1.018	1.665
ATM. Time planning	.330	29.041	-.028	.719	.638	.811
ATM. Time monitoring	1.118	107.141	.024	.327	.265	.404
ATM. Procrastination on tasks	.107	3.964	.046	1.113	1.002	1.237

Abbreviations: BSI, Brief Symptom Inventory; BFI, Big Five Inventory. ATM, Academic Time Management. Adjusted for demographic variables (sex).

DISCUSSION

Based on the data collected in this study, we can assert that men procrastinate more than women. 56% of male participants showed high levels of procrastination compared to 45% of females. This result is consistent with many other studies (Balkis & Duru, 2009; Limone et al., 2020; Steel & Ferrari, 2013). The observed percentage difference is considerable, exceeding 10%, and could explain the conclusions of other research suggesting that academic performance tends to be higher in women than men (Svartdal, F. & Løkke, J.A., 2022).

Regarding the faculties where participants studied, we found a higher presence of Audiovisual and Information students in the high procrastination group, compared to Education students. These results are in line with the observations of Chamorro-Premuzic and Furnhman (2003), who claim that certain personality traits are often

related to certain professions and studies. For example, according to Sánchez et al. (2020), Audiovisual Communication students face continuous and prolonged use of communication technologies in most subjects of the degree, which exposes them to a potential risk of procrastinating on their academic tasks.

According to the collected data, university students who tend to postpone their responsibilities usually show higher levels of general psychological distress, depression, anxiety, and somatization (Claessens et al., 2007). They also tend to exhibit less cordial and friendly behaviors than students who procrastinate less and take fewer responsibility on their learning process. This last point could explain why these same students show poorer time management, do not monitor or track their tasks, and often fail to submit their assignments on time.

The psychological profile that emerges from all of the data only confirms the conclusions of numerous previous studies. The stress caused in students by academic demands (Hensley et al., 2018; Umam & Soeharto, 2022) has been the basis for a large number of investigations on academic time management and procrastination in university students. According to various authors, there is a close relationship between stress in university students and psychological disorders such as depression and anxiety (Vásquez & Ríos, 2017). On the other hand, as demonstrated by other studies, task delay is strongly linked to a lack of motivation and low levels of self-control and academic engagement in students (Ertem & Ari, 2022; Balkis & Duru, 2009; Quant & Sanchez, 2012). The lack of long-term goals leads students to a deficit of self-control, resulting in a lack of effort and perseverance (Ertem & Ari, 2022). Therefore, it is not surprising to observe that these same students show high scores on aspects related to poor time management or lack of task follow-up.

From this perspective, procrastination does not appear as a cause, but as a consequence of the lack of commitment and motivation of the university student, which ends up resulting in a whole series of attitudes, habits, and behaviors that have a negative impact on academic practice (Klingsieck, 2013). As we have seen, the repercussions of procrastination can be of different types, ranging from the academic field itself -lack of concentration, academic dropout, etc.- to the work or family environment, generating psychological discomfort in the individual. In extreme cases, this discomfort can cause depression or anxiety in the student.

Be that as it may, it seems clear that the result of this complex process, in which multiple factors are involved, is poor, or even no, time management of the student's homework, as well as constant procrastination of academic commitments.

In any case, it seems clear that the result of this complex process, in which multiple factors are involved, is poor time management of the student, as well as the constant postponement of their academic commitments. As some researchers have already pointed out, it is the responsibility of the university itself to address this problem by providing tools and resources to its students through time management training programs that help improve their academic performance (Díaz-Morales, 2019). Likewise, it is essential to involve university lecturers who, by designing activities that

take into account the students' objectives, expectations and skills, are able to make teaching more motivating for them (Ertem & Ari, 2022). In the current context of high heterogeneity of university students (MacCann et al., 2012), this need seems more urgent than ever. However, in order to prevent procrastination and be able to make effective use of these types of programs, it is necessary to thoroughly understand the sociodemographic, personal, and academic characteristics of the students (Garzón-Umerenkova et al., 2020). From this study, we have attempted to provide evidence to help define and characterize the profile of university procrastinating students from a sociodemographic and psychological perspective.

Based on the collected data, it can be asserted that there is a significant trend towards more pronounced procrastination among male students compared to their female counterparts. This finding, supported by prior research, sheds light on gender differences in procrastination patterns and may contribute to understanding disparities in academic performance between men and women. Additionally, it is observed that certain academic programs, such as those related to audiovisual and information studies, harbor a higher proportion of students with high levels of procrastination compared to those in education programs. This observation suggests that program-specific characteristics may influence procrastination tendencies and supports the need for tailored support and teaching approaches for each program's particularities.

These findings underscore the importance of addressing procrastination in the educational environment through strategies that include early identification of students prone to procrastination, offering psychological and academic support, and promoting responsibility and intrinsic motivation. Furthermore, the implementation of time management programs can be crucial to equip students with organizational and planning skills that enable them to reduce procrastination and enhance their academic performance. Ultimately, comprehending the profile of procrastinating students from sociodemographic and psychological perspectives provides a solid foundation for decision-making in educational institutions aiming to improve the experience and academic success of their students.

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