Relationship Between Academic Procrastination, Well-Being, and Grades: the Mediational Role of Self-Regulation and Bad Habits

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Abstract

Psychological research, nowadays, on the areas of student´s health and well-being has shown interesting results where the central constructs are self-regulation and procrastination. Self-regulation behavior is a meta-skill that includes cognitive, affective, and motivational aspects of the individuals. Procrastination can be defined as a meta-skill (a self-regulatory failure) that implies active de-regulatory conduct. The evidence points out that self-regulation contributes to the prediction of well-being, health, and academic procrastination. This study aims to establish procrastination´s direct and indirect effects on students´ well-being and academic performance, being self-regulation and bad habits the mediators. A total of 710 college students from 16 to 53 years of age took part (Average of 20.8 and SD 4.3), 224 (31.5%) were men and 486 (68.5%) women. Two mediational analyses were carried out. Results indicate the significance of the proposed model as procrastination does not directly affect the student´s psychological well-being or academic performance. The conclusions point out that procrastination indirectly affects students´ well-being, academic performance, and bad habits, being self-regulation a mediating variable. The possible theoretical, methodological, and psychoeducational intervention implications are discussed.

KEYWORDS: COLLEGE STUDENTS, SELF CONTROL, MENTAL HEALTH, ACADEMIC ACHIEVEMENT.

Introduction

Health and psychological well-being concepts have evolved in the last few years. The World Health Organization (WHO) points out the importance of defining them as the absence of illness and as a state of well-being of the individuals at a physical, mental, and social level (Fancourt & Finn, 2019). This perspective on health is more recent and integral. It includes subjective aspects of the individual, the perception of well-being and its physical, cultural, economic, spiritual, psychosocial characteristics, and the capacity to respond accordingly to the different expected daily roles (Alpis et al., 2016). Hence, variables such as health, life quality, and college students´ well-being have been progressively incorporated into the education research, complementing the traditional studies solely focused on academic achievement.

Health and Well-Being of College Students

The data on health, mental health, and well-being of college students vary among countries. Still, it shows high-stress levels, emotional discomfort, and associated mental disorders, tending to be higher than the general population. For example, in first world countries such as Canada, it has been found that 30% of college students are highly distressed (Adlaf et al., 2005), the stress levels of the students are double when compared to non-student peers. According to the American College

Health Association-National College Health Assessment (ACHA-NCHA) report, mental distress is a significant concern for university students; more than 50% indicates that in the previous 12 months, they felt depressed, hopeless, anxious, or exhausted (American College Health Association , 2019).

In Latin America, these figures are also of relevance, indicating high levels of anxiety, depression, suicidal conduct, and personality disorders, among others (Cuenca et al., 2020). Despite those surveys are diverse and challenging to compare between countries, high levels of psychological unrest and mental illness are consistent and higher than the general population. For example, a study with Chilean students found that 27% of them meet the diagnostic criteria for depression, 10.4% for bipolar disorder, 5,3% is at risk of committing suicide, 24.2% presents alcohol abuse, and 15.3% may have an eating disorder (Baader et al., 2014).

Self-Regulation as Functional Meta-Behavioral Variable of College Students

When studying health, mental health, and well-being in academic contexts, self-regulation and procrastination are of interest (Hennessy et al., 2020). The evidence supports that self-regulation contributes to predicting the vital well-being (flourishing), health, academic procrastination, and college students' academic performance (Garzón et al., 2018; Haydon & Salvatore, 2022). Undergraduate students' self-regulation capacity significantly predicted their stress levels, psychological well-being, mental health functioning, and achievement emotions (de la Fuente et al., 2020; Durand-Bush et al., 2015).

The SRL vs. ERL Theory (de la Fuente, 2017) has defined both constructs as two opposite sides of the regulatory meta-skill: meaning, Self-Regulation (SR) as a regulatory meta-skill, and procrastination (PROC) as a de-regulatory meta-skill. A definition of self-regulation (SR) can be the individuals' tendency concerning the specific ability to plan and adequately manage their behavior flexibly (Brown, 1998; Inzlicht et al., 2021; Zimmerman, 2000;). Various authors have identified self-regulation as the capacity to manage and demonstrate appropriate actions,

considering it a cyclical process that consists of three components: forethought, performance control, and self-reflection (Zimmerman, 1995). The study operationalized the self-regulation construct from the Brown model (Brown, 1998) who defines self-regulation as the persons´ ability to plan and flexibly manage their behavior, according to the desired outcomes. What leads people to plan and flexibly address their behavior according to the environment's demands through a series of learned strategies (Brown, 1998), being a similar construction to Zimmerman´s model. Self-regulation (SR) has been considered as a personality construct of a generalist character, a precursor of the specific construct that appears in learning contexts, meaning learning self-regulation (SRL) (Zimmerman, 2008). Thus, it has shown its predictor potential in learning behaviors and health behaviors .

Additionally, it is considered a meta-behavioral variable or construct, which means that it is a meta-ability or an ability that encompasses different subcomponents of cognitive, affective, and motivational skills, as well as habits (de la Fuente, 2017). Complementarily, self-regulation has been used to promote healthy behaviors and to train the capacity of the individuals´ to establish and maintain healthy goals (de Ridder & Kuijer, 2006; Hagger & Orbell, 2021; Mann et al., 2013).

In the relation between self-regulated behavior and habits, the habit's definition can be implicit associations between contexts and responses that develop through repeated reward learning (Wood & Rünger, 2016). The study of habits in psychology dates back to the research by William James (1916/1983) and nowadays are studied due to their influence on life quality, health, consumption, eating behavior, etc. (Clarck, 2000; Wood & Rünger, 2016). Understanding habits is vital from the applied perspective of human health and welfare (Wood & Neal, 2016; Wood & Rünger, 2016). The regulation of one's conduct is critical to adequately developing and maintaining healthy habits and avoiding becoming involved in risk behaviors – such as the consumption of alcohol or other drugs (Pichardo et al., 2018).

Procrastination as Dysfunctional Meta-Behavioral Variable of College Students

The definition of procrastination is a lack of self-regulation or de-regulatory conduct. "Procrastination is typically taken as an irrational or a self-defeating delay, to be worse off for putting off" pg. 73 (Steel & Klingsieck, 2016). Therefore, a component of procrastination is delaying, but delaying does not necessarily lead to procrastination. So, to define procrastination, three elements have to be accounted for: 1. intended; 2. voluntarily delayed, and 3. foreseeably pathological (Steel & Klingsieck, 2016).

There are different explanations for the gap between intentions and behavior from the self-regulation point of view. Beyond lack of skills or impulsive conduct, some authors define procrastination as a sub-regulation form (Rabin et al., 2010). In contrast, others define it as mis-regulation, through which the individuals´ postpone or avoid aversive tasks to gain a short-term positive effect (Tice & Bratslavsky, 2000). Authors such as Kroese and de Ridder (2016) point out that individuals´ take liberties and justify their "bad" behavior, for which procrastination would be the way people knowingly and willfully fail, allowing oneself not to do something.

Being negative emotions a procrastination component, as a prior aspect (lack of emotional self-regulation, task aversion, among others) (Gil et al., 2020) or as a consequence (stress, depression, anxiety, guilt, among others) (Balkıs & Duru, 2021; Eckert et al., 2016), that results in anxiety, stress, discomfort, among others which are described in literature As an example, it has been found in students that self-efficacy and procrastination explain 40% of the psychological vulnerability variance, which included physical anxiety and depression factors (Kiamarsi & Abolghasemi, 2014). In this sense, the inverse relationship between procrastination and healthy behaviors has produced evermore interest as it offers new perspectives on understanding the intentions of the individuals´ in a health context (Kroese & de Ridder, 2016).

Relation Mediational Model

Previous studies have established linear relationships between both variables (procrastination and self-regulation (Limone et al.,

2020; Rabin et al., 2010; Steel & Klingsieck, 2016); Uzun et al., 2020). However, there has not been an integration on procrastination, self-regulation, and well-being variables in college students. This way, it is needed to pinpoint the mechanisms or processes through which these relationships are established.

From a methodology perspective, it is usual that some confusion exists on the differential meaning of moderation and mediation since both effects are of importance to understand a good number of psychological phenomena (Baron & Kenny, 1986). A moderation hypothesis tries to determine under which conditions a relationship is more robust, weaker, disappears, or has a directional change. The moderation effects are also called interaction effects. On the other hand, mediation refers to the indirect influence that an independent variable exerts on a dependent variable. Therefore, mediation effects are also called indirect effects.

This study aimed to establish a mediational model, meaning, the indirect effect of procrastination on students' well-being, being self-regulation the mediator variable. For this, a mediational model based on the regression analysis proposed by Hayes (2021, 2017) is used; this arises as a criticism of the traditional mediational model of Baron and Kenny (1986).

Study Objectives and Hypothesis

Although procrastination is a widespread phenomenon and has been extensively studied in the last two decades, research is still scarce concerning its study in academic contexts using models that integrate other relevant variables. Due to the above, we pretend to establish the relative impact of procrastination on two aspects: academic performance and the well-being of students. Understanding that this impact is not systematic (it is not replicated in all studies) leads to thinking that there are relevant mediational variables (such as self-regulation level or student´s habits) that generate a risk factor.

We try to describe the frequency of bad habits and college students' psychological well-being from various programs and two different universities on the primary objective. It is expected that the obtained values are similar to previous studies in college students. As a second objective, we seek

to establish and corroborate a mediational model of (a) procrastination on academic performance being bad habits and self-regulation, the mediational variables; and (b) of procrastination over the psychological well-being of the students, with self-regulation as the mediator. Consequently, with this assumed mediation hypothesis, it is expected to obtain statistically significant values on the mediation role of self-regulation (in a and b models) and bad habits (in model b).

Method

Participants

A convenience sampling was used, guaranteeing the heterogeneity of the participants. A total of 710 college students took part. The participant's age range was 16 to 53 years old (mean of 20.8 and SD 4.3), 224 were men (31.5%), and 486 women (68.5%). They were from two different non-religious private universities at Bogotá city (Colombia): 329 (46,3%) students belonged to Fundación Universitaria Konrad Lorenz and 381 (53,7%) to Universidad El Bosque. They also belonged to undergraduate programs from the first year (31.3%), second year (23.5%), third-year (20.6%), fourth-year (13.2%), fifth-year (3.2%), and 7.7% from postgraduate programs. Additionally, they were from health, human and social sciences, engineering, and arts programs. The average reported academic grades ranged from 15 to 50 (mean 38.66 and SD 3.8). The grades range from 0 to 5 points in Colombia, being three the minimum score to approve. 560 (78,9%) students pertained to day programs and 149 (21%) to evening programs. 497 (70%) were full-time students and 211 (29.8%) were part-time students. See Table 1.

Table 1.

Sample characterization for the study.

Sample	Categories		Descriptives/frequencies
Sex	1=Man		31.5%
	2=Woman		68.5%
Age			M=20.8 SD=4.3
Year	1=First	year	31%
	2=Second	year	23.5%
	3=Third	year	20.6%
	4=Fourth	year	13.2%
	5=Fifth	year	3.2%
	6=Postgraduates		7.7%
Program	1=Psychology		37%
	2=	Education	0.6%
	3= Engineering and math		23.8%
	4= Music-Arts-	Design	1.1%
	5=	Health	18.3
	6=Administration – Business		11.3
	7=Other	(postgraduates)	7.9%

Dedication	1=Full	time	70%
	2=Part	time	30%
Period	1=Day		78.9%
	2=Evening		21%

Instruments

Sociodemographic and academic performance questionnaire. The authors created and applied an ad-hoc sociodemographic questionnaire. Nine questions of sociodemographic variables were included as follows: gender, age, university, program, semester, daytime or nighttime studies, dedication to the studies (works and studies, studies full time), approximate cumulative average (from 1 to 5), and if the student plans his/her time (yes/no).

Validated Spanish version of the Procrastination Assessment Scale-Students, PASS (Garzón & Gil, 2017). Solomon and Rothblum's (1984) original PASS test consist of 44 items and is divided into two sections. The study did not consider the second part of the PASS because it refers to students' different motives to procrastinate. This aspect is not included in the objectives of the present study.

The first part, which the present study considered, comprises 18 items that assess the procrastination frequency. The answering options are presented on a Likert scale with values from 1 to 5 where 1 (never), 2 (rarely), 3 (sometimes), 4 (frequently), and 5 (always). In its validation for Colombia, the authors made a linguistic adjustment, and discriminant validity evidence was obtained for the procrastination frequency in time management and academic performance measures. Significative negative and moderate correlations were found between procrastination frequencies, academic performance, and the score in a time management test (Garzón & Gil, 2017). In the Colombian adaptation of the PASS, a Rasch analysis was performed and indicated an item adjustment to the model. The reliability values found for the first attribute (procrastination frequency) were .99 (items) and .86 (subjects). Through a Rasch analysis, the reliability index is calculated for the test and persons´ items and are

interpreted as a Cronbach´s Alpha, expecting values above an Alpha=0.80 [42].

Short Self-Regulation Spanish Validated Questionnaire, Short-SR (Pichardo et al., 2018). As a self-regulation measure, the abbreviated Spanish adaptation of the Self-Regulation Questionnaire (SRQ) was used, which in turn was created based on the original Brown (1998) questionnaire. It seeks to measure general self-regulation behavior that leads people to plan and direct their actions flexibly according to the environment's demands. The SRQ-Abbr consists of 17 items and four dimensions (Goal setting, Perseverance, Decision-Making, and Learning from mistakes), obtained through Exploratory and Confirmatory Factorial Analysis, with good reliability values (Cronbach´s Alpha between .71 and .87). In a subsequent validation study (Garzón et al., 2017) using CFA and Rasch analysis, the four subscales' dimensionality, and the adjustment of the items to the model were adequate. The results confirmed the functioning of the measurement scale. Reliability values of the measure above 0.95 were obtained for the four subscales; however, the inclusion of more items, both of greater and lesser difficulty, could improve the persons' reliability and construct validity.

Additionally, the reliability analyses were performed on the self-regulation test with the sample size in the present study (N=710). The following Cronbach´s Alpha values were obtained for the different subscales: Goal setting (6 items) .77; Perseverance (3 items) .604; Decision making (5 items) .796 and Learning from mistakes (3 items) .695. The full test (17 items) obtained a Cronbach´s Alpha of .866.

Bad habits and psychological well-being. To obtain a self-report on the participants' physical and mental health, the authors created and applied an ad-hoc questionnaire based on seven assertions. The authors used it in a previous study (Garzón et

al., 2018) with a Colombian sample. We verified its psychometric properties and its predictive structural value on the self-regulation, procrastination, and flourishing variables. Additionally, few scales of this type are directly associated with the academic context and validated for a Colombian sample; thus, the test mentioned above was used as its properties of the population used in the study were already verified. This inventory summarizes the definition of health by the WHO (World Health Organization): "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 1984). It was considered to focus the questions on aspects related to the effects of the study. Through these, an overall assessment of the participants' general health was performed. They examined feeding, sleep, and recreation habits, besides anxiety, depression, or stress that the studies may be generating. The study used a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The results showed two factors; one grouped the questions related to health habits, and a second one related to psychological aspects. Therefore, in this study, the definition of "bad

habits" refers to those that negatively impact people's quality of life or health.

In the Colombian sample, the model obtained good fit indexes (CFI = 0.96, GFI = 0.94, NFI = 0.90; RMSEA=.072), with a Cronbach´s alpha of .82. From the sum of items 1 through 4 presented below in table 2, the bad habits variable was constructed, and it is interpreted that the better the score, the better the habits. The mean of the scale was 2.67, with an SD of .76. From the sum of the items 5 to 7, presented in table 2, the psychological well-being variable was constructed, which was employed later in the mediation model. Its interpretation is, the lower the score, the higher the psychological stability. High scores indicate psychological instability due to the report of anxiety, depression, and study-related stress symptoms. The mean was 3.2 and SD 0.6.

Table 2 summarizes the present study's involved variables to clarify the measure type and the employed response range. On the other hand, the third column is the description of the mean and standard deviation results, or the percentages, according to the variable scale type.

Table 2.

Variables and measure range for the study.

Instruments and Variables	Measure range		Descriptives/frequencies
Academic grades (self-reported)	1= 2= 3= 45-50	15-30 35-40	4.3% 85.7% 10%
Plans its time	1= 2= No	Yes	75% 24.4%
Bad habits	Scale from 1 to 5		M= 2.67 SD=.76
Psychological well-being	Scale from 1 to 5		M= 3.21 SD=.85
Self-regulation	Scale from 1 to 5		M=3.5 SD= .53
Procrastination intensity	Scale from 1 to 5		M=3.07 SD= .64

Procedure

The test application was collectively in IT (Information Technology) classrooms using an online survey tool called LimeSurvey, in which the authors created the questionnaire used in this study. A non-probabilistic sample was performed to guarantee the heterogeneity of the sample regarding programs and study years. The students participated voluntarily. Considering the deontological and ethical psychology code in Colombia (Title 9, Research and Teaching, Article 50), the authors obtained the participants' informed consent. The Research Commission of Fundación Universitaria Konrad Lorenz approved it beforehand.

2.4. Data Analysis

We used a mediational model based on the regression analysis by Hayes (2012, 2017); it works through the macro Process-SPSS. The main criticism towards the traditional mediational model of Baron and Kenny (1986) consists in that (1) the indirect coefficient is not estimated but inferred; (2) it is conditioned to normality in the data distribution, which is not always the case and (3) it requires samples of considerable size.

To reduce the defects of the traditional mediational analysis, Hayes (2012, 2017) proposes an analysis based on bootstrapping and the corresponding software, which in turn is based on (1) the data do not need to have a normal distribution; (2) it does not assume that the indirect effect has a normal distribution and (3) bootstrapping allows working with small samples.

Hayes' model 6 was analyzed to test the prediction, implying that procrastination affects academic performance mediated by bad habits and self-regulation (Hayes, 2012, 2017) (see Figure 1). The mediational model of the Process macro was used at 95% confidence with a bootstrapping of 5.000 samples.

Hierarchical regression analysis was performed to test the prediction that self-regulation mediates the procrastination effect on psychological well-being, on the total effect (c), on the direct effect (c'), and on the indirect effect (ab), as well as the calculation of the confidence intervals at 95% (CI) for the model parameters (see Figure 2). The

mediational model of the Process macro was used at 95% confidence with a bootstrapping of 10.000 samples.

The estimation of the indirect effect (if it is or is not significant) is performed by creating confidence intervals with the data, with samples, and resamples. The decision on the statistical significance of the indirect effect is made based on the obtained distribution. It is considered that an indirect effect (mediation) is statistically significant if, at a confidence interval of 95%, it does not include a 0 value. If there is a 0-value included in such confidence interval, the null hypothesis cannot be rejected, meaning any association between the implicated variables (Hayes, 2012).

Results

Description of bad habits and psychological well-being

Table 3 shows that the results for the seven items related to the students' habits and psychological well-being are summarized. The students answered each item on a 5-point Likert scale: (1) Strongly disagree; (2) mostly disagree; (3) partially agree; (4) mostly agree and (5) strongly agree.

The interpretation of the first four items (which make up the Bad Habits sub-scale) would be that the lower the obtained score, the worse the reported habits will be, and the higher the score, the better the habits will be. Following the above, 62% of students report having bad habits, being below the average (2,6). The above indicates that most students in the sample report lousy sleep patterns, awful feeding habits, spend little time with family and friends, and inadequately mix study with other activities.

The interpretation of the last three items (which make up the Psychological Well-being sub-scale) would be that the higher the score, the worse psychological well-being, and the lower the score, the best psychological well-being. Following the above, 40% of students in the sample report some psychological discomfort, being above the average (3.2). The above indicates a high

proportion of students in the sample report feeling anxious, depressed, or stressed by their academic obligations.

Table 3.

Descriptive data for bad habits and psychological well-being items.

	M	SD	Lower values	Upper values
1. I sleep well	2.87	(.97)	33.7%	
2. I have good eating habits	2.72	(.95)	41.4%	
3. I spend time with my family/friends	2.36	(1)	59.5%	
4. I adequately combine my study duties with leisure activities	2.72	(1)	44.2%	
Total "Bad Habits"	2,6	(.75)	62%	
5. I feel anxious about my studies	3.05	(1.1)		35.2%
6. I feel depressed about my studies	3.5	(1.3)		57.1%
7. I feel stressed about my studies	3.1	(1.1)		38.8%
Total "Psychological Well-being"	3.2	(.85)		40%

Note. Items 1, 2, 3 and 4 make up the bad habits sub-scale; Items 5, 6 and 7 make up the psychological well-being sub-scale. For the obtainment of the scores, the items on each sub-scale were added up and then divided by the corresponding number (4 items in "bad habits" and 3 items in "psychological well-being"). Lower values, the percentage of students who expressed (1) strongly disagree or (2) mostly disagree with the statement. Upper values, the percentage of students who expressed (4) mostly agree or (5) strongly agree with the statement. For the "Bad Habits" sub-scale the low values reflect the percentage of students below the average. For the "Psychological Well-being" sub-scale the high values reflect the percentage of students above the average.

Associations between study variables

Pearson´s coefficient of the correlation product-moment was calculated. The study found low and moderate association values for the relevant variables and expected direction (see table 3). It should be noted the inverse relationship between self-regulation and procrastination frequency (-,342**); the bad habits (-,308**) and positive with the average grades (,263**) and psychological well-being (,205**). See Table 4.

Table 4.

Correlations between self-regulation, procrastination, well-being, habits and average.

	SR	Procrastination frequency	Psychological well-being	Bad habits	Average grades
SR	1,000				

	-,342**	1,000			
Procrastination frequency					
Psychological well-being	,205**	-,090*	1,000		
Bad habits	-,308**	,170**	-,144**	1,000	
Average grades	,263**	-,168**	,071	-,092*	1,000

Note: ** $p <.01$; $p <.05$.

Mediational models

A mediational sequential analysis (Model 6 in Process) was carried out, being academic performance as the dependent variable (DV), procrastination as the independent variable (IV), and bad habits and self-regulation as the mediational variables (M). The results indicate that the direct effect of procrastination and bad habits on academic performance is not significant. On the other hand, the direct effect of self-regulation on performance is significant, as well as bad habits on self-regulation, and

procrastination on bad habits and self-regulation (see Figure 1).

The mediational analysis indicates that the indirect effect of procrastination on performance through bad habits is not significant. Meanwhile, the indirect effect of procrastination on performance through self-regulation (indirect effect 2) and of procrastination on performance through bad habits and self-regulation (indirect effect 3) are significant (see Figure 1 and Table 5). This way, according to the results of the analysis, the total indirect effect is significant.
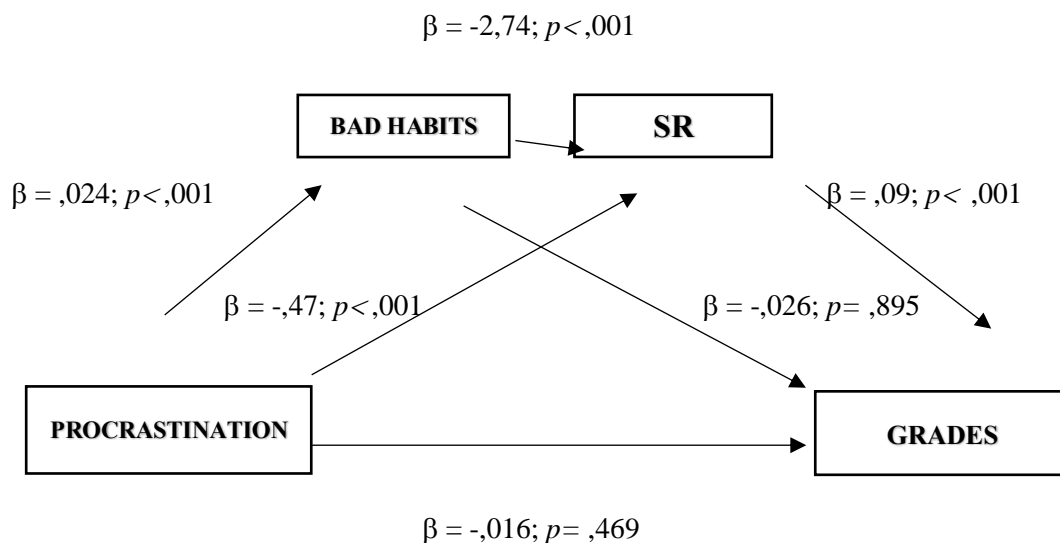
$\beta = -2,74; p < ,001$

$\beta = ,024; p < ,001$

$\beta = -,47; p < ,001$

$\beta = ,09; p < ,001$

$\beta = -,026; p = ,895$

$\beta = -,016; p = ,469$

Figure 1. Results of the direct effects from the serial mediational analysis.

Angélica Garzón Umerenkova[1], Jesús de la Fuente Arias[2,3], Javier Gil Flores[4]

Table 5.

Data summary for the indirect effects from the serial mediational analysis.

			Effect	BootSE	BootLLCI	BootULCI
Indirect	Total		-,0498	,0108	-,0713	-,0285
Effects	1	Proc-BH-Grades	-,0006	,0049	-,0106	,0087
	2	Proc-SR-Grades	-,0431	,0094	-,0617	-,0251
	3	Proc-BH-SR-Grades	-,0061	,0019	-,0102	-,0029

Note: Proc (Procrastination); Bad Habits (BH); Self-Regulation (SR)

On the other hand, the dual mediational model was created using three variables. The independent variable (IV) was procrastination (PROC), as the dependent variable (DV), psychological well-being (PW), and as the mediational variable (M) self-regulation (SR) (see Figure 2).

β = -,29; p< ,001   β = ,256; p< ,001

a   b

c´

β = -,016; p= ,697
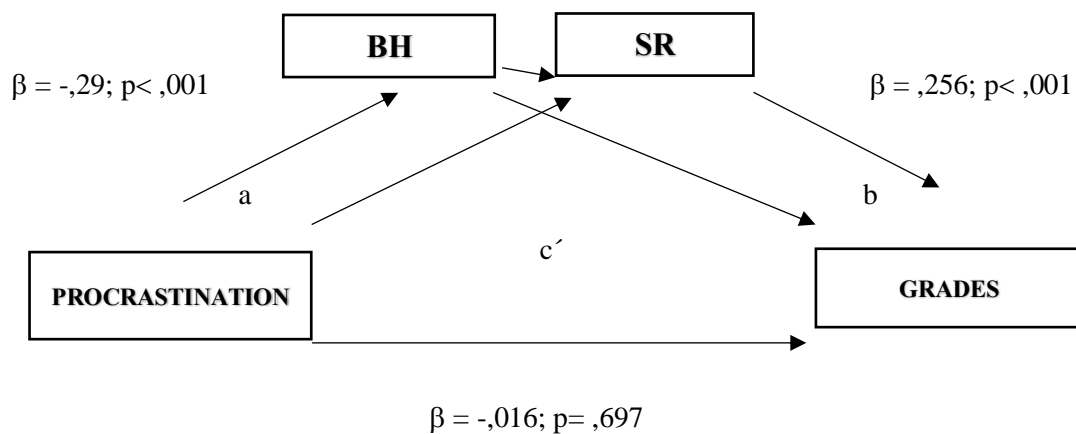
Total effect (c) = -,09*; p< 0,01

Estimated indirect effect (ab) = 0,016 (95% CI = -0,108 -0,045)

Figure 2. Mediational analysis results.

The hierarchical regression analyses show the total effect (c), the direct effect (c') and, the indirect effect (ab), as well as the calculation of the confidence intervals at 95% (CI). For the psychological well-being variable, the obtained results (see figure 2) have no significant direct effect of procrastination. There is only an indirect effect of procrastination on psychological well-being if it is mediated by self-regulation. Such a mediator effect does not appear when analyzing the mediational model using bad habits and average grades as mediators.

Discussion

Regarding the first objective, which was to describe the bad habits and psychological well-being frequency on the students involved in the study, there were found high values on feeling depressed because of the academic duties on 57% of students; a 38% reported feeling stressed due to the academic responsibilities; a 59% reported not to spend enough time with family/friends, and a 33% did not sleep well. These results are consistent with some of the previous studies on college students' psychological discomfort, to its inverse relation with procrastination and positive with self-regulation (de la Fuente, 2021; de Ridder, D., & Kuijer, 2006; Stöber & Joormann, 2001; Ziegler & Opdenakker , 2018), being the obtained values in the present study and for both variables, small but significant.

Also, the results are consistent with studies that indicate the presence of unhealthy conducts (in this study conceptualized as "bad habits") among college students of different levels, having a significant inverse relationship with self-regulation, and positive and significant with procrastination (de Ridder & Kuijer; 2006; Garzón et al., 2018; Kroese & de Ridder, 2016; Rhodes et al., 2013; Zhao et al., 2021).

Finally, the correlation results indicate inverse values between high levels of academic procrastination and low self-regulation; and between bad habits and psychological well-being, which would be in coherence with the expected direction from a theoretical perspective.

Regarding the second objective, we seek to establish and corroborate a mediational model of (a) procrastination on academic performance being bad habits and self-regulation the mediator variables; and (b) of procrastination on the psychological well-being of the students, with self-regulation as the mediator.

About the model (a), the authors found that neither procrastination nor bad habits by themselves are predictive of low academic performance. However, they are predictive when there are low self-regulation levels. While bad habits are predictors of deficient self-regulation and high procrastination, they do not impact academic performance unless there is low self-regulation.

This sequential model points out the importance of adequate habit management (sleep, feeding, and recreational habits) and the self-regulation of students´ due to its potential impact on academic performance.

Regarding model (b), the effect of procrastination on the student´s psychological well-being, having self-regulation as a mediator. It was found that, effectively, self-regulation mediates the impact of procrastination on psychological well-being. The above means that high levels of procrastination are not in themselves predictors of low psychological well-being; this, in turn, would partially explain why the results are not always consistent between high procrastination and health problems and low well-being. According to the results shown, there must be low levels of self-regulation in the individuals for that to occur.

The harmful emotional component of procrastination on the individuals would generate psychological discomfort (Pychyl & Sirois, 2016; Wypych et al., 2018) or the bad habits carry low academic performance, but with the condition that there are low levels of self-regulation. To put it differently, high levels of self-regulation would be a protecting factor to avoid psychological discomfort and low academic performance, even in students with high levels of procrastination.

From a methodological perspective, it is an advance, as these results are robust, in the way that they are supported on a statistical resampling model (5000-10000 cases), they go beyond the original sample. They could be generalized to other populations with similar characteristics. The bootstrapping method developed by Hayes (2021, 2017) has less chance of Type I Error compared to the traditional multiple regression of Baron and Kenny (1986) or the Sobel test (Sobel, 1982) for the mediation estimation.

Among the possible limitations of this study are self-report measures, generating a low chance to compare the presented data with other types of criteria or evidence.

On the other hand, being it a transversal type study that collected data on a specific time frame does not establish a timeline that records the evolution of the presented variables. Therefore, it is suggested that further research be carried out

Angélica Garzón Umerenkova[1], Jesús de la Fuente Arias[2,3], Javier Gil Flores[4]   1258

longitudinally to determine the development of the proposed variables over time and in ever-changing academic situations. At last, other academic levels and countries could also broaden the sample.

From the conceptual perspective, it would be of interest to further investigate the moderator/mediator role of other variables such as emotional regulation or stress, to better contrast these variables' influence on psychological well-being or academic performance.

With a broader view, given the value and direction of the associations between self-regulation and procrastination, the psychological well-being, bad habits, and academic performance, it is given that it is a central predictive construct; that, also, mediates the procrastination effect on the student's well-being and academic performance. Therefore, it is interesting to consider training and improving self-regulation from a prevention perspective to improve health and quality of life of the students in the academic contexts (Balkis & Duru, 2021; Eckert et al., 2016; Goroshit, 2018; Van Eerde & Klingsieck, 2018), also considering its benefic potential on the negative emotions' management, stress, academic performance among other issues (de la Fuente & Amate, 2019).

According to the present study results, the existence of a self-regulatory failure (nonregulation or dysregulation) is foundational to trigger psychological discomfort and low academic performance in students that present moderate to high levels of academic procrastination. However, from the prevention point of view, there are not, at this time for the educational context, standardized recommendations to establish interventions to prevent or reduce procrastination or improve self-regulation capacity (Zacks & Hen, 2018). But the results in the present study show that to approach procrastination as a self-regulatory failure is a complete perspective; this is because low procrastination itself is not leading to an impact on the students' well-being or performance; it just happens when self-regulation is compromised.

In a preventive orientation to reduce academic procrastination, improve academic performance, and reduce the students' psychological discomfort, it is important to include strategies of behavioral

management of the daily habits that involve behavioral and emotional regulation (Svartdal et al., 2020). This matter has been mostly overlooked in the intervention proposals on academic procrastination from a non-clinical perspective, mainly focused on cognitive aspects (Zacks & Hen, 2018). Contents and techniques from the therapeutical intervention context could be incorporated in the educational context, such as the Cognitive-Behavioral Therapy, the principles of the Acceptance and Commitment Therapy, or the principles of Rational Emotive Therapy by Albert Ellis (Balkis & Duru; 2007, 2021; Ozer et al., 2013; Van Eerde & Klingsieck, 2018).

The literature review on procrastination prevention or self-regulation improvement takes three possible scenarios: therapeutical treatment, therapeutical prevention, and teacher/counselor intervention (Zacks & Hen, 2018). The latter approach is the most interesting in academic and public health contexts. It supposes that the teacher/instructor applies non-therapeutical methods to reduce or prevent students´ procrastination and reach a high number of students. With the arrival of virtual learning as an additional tool that supports face to face classes, these types of systems, mechanisms, notices, or systematizations can be employed by the instructor in the design of its course as a preventive measure hetero-regulation of students´ procrastination.

As mentioned in the introduction, college students tend to present higher rates than the general population concerning high-stress levels, emotional discomfort, and associated mental disorders. It is recommended for new students that the universities develop assessment strategies and training skills of self-regulation, good habits, and well-being. An approach to care in life quality and well-being of college students is a matter of public health and prevention that involves improving self-regulation skills (Hennessy et al., 2020). Therefore, the educational perspective of primary prevention offered by the academic context is determinant in encouraging regulation, overcoming the situations, and personal characteristics of nonregulation or dysregulation.

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