Validity evidence of the Academic Procrastination Scale for undergraduates

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Abstract
The objective of this study is to analyze the validity evidence of the Academic Procrastination Scale (APS) in a sample consisting of 1979 students from public and private universities, from different courses, 67% of the students being women, aged 18 to 68 years old (M = 22.84). The principal component analysis revealed two components, also validated by confirmatory analysis, which showed a good overall fit of a two-dimensional model: Daily Study Procrastination (α = 0.75) and Exam Study Procrastination (α = 0.75). Internal consistency was estimated through Cronbach's alpha, obtaining 0.83 for the total scale. The study concludes that APS has satisfactory psychometric properties and suggests further validation studies and also analysis of academic procrastination in higher education students.
Keywords: self-regulated learning; psychometric properties; reliability; universities; higher education.

Evidências de validade da Escala de Procrastinação Acadêmica para Universitários

Resumo
O objetivo deste estudo é analisar as evidências de validade da Escala de Procrastinação Acadêmica (EPA) em uma amostra de 1979 estudantes de universidades públicas e privadas, matriculados em cursos de graduação distintos, sendo 67% mulheres, com idades variando entre 18 e 68 anos (*M* = 22,84). A análise de componentes principais indicou dois componentes, validados também pela análise confirmatória, a qual confirmou o ajuste dos dados ao modelo de dois fatores: Procrastinação para o Estudo Diário (α = 0,75) e Procrastinação para o Estudo para Provas (α = 0,73). A consistência interna, estimada pelo alfa de Cronbach, foi de 0,83 para a escala total. Conclui-se que a EPA apresenta propriedades psicométricas satisfatórias, com a sugestão da continuidade de estudos de validade e, também, de avaliação da procrastinação acadêmica em estudantes do ensino superior.
Palavras-chave: autorregulação da aprendizagem, propriedades psicométricas, confiabilidade, universidades, ensino superior

Evidencias de validez de la Escala de Procrastinación Académica para universitarios

Resumen
El objetivo de esta investigación es analizar las evidencias de validez de la Escala de Procrastinación Académica (EPA) en una muestra constituida por 1979 estudiantes de universidades públicas y privadas, de diferentes cursos de grado, de los cuales el 67% eran mujeres, con edades comprendidas entre 18 y 68 años (M = 22,84). El análisis de los componentes principales reveló dos componentes, también validados por el análisis confirmatorio, que mostró un buen ajuste general de un modelo bidimensional: Procrastinación del Estudio Diario (α = 0,75) y Procrastinación del Estudio en Exámenes (α = 0,75). La consistencia interna se estimó mediante el alfa de Cronbach, obteniendo 0,83 para la escala total. Se concluye que la EPA cuenta con propiedades psicométricas satisfactorias y sugiere otros estudios de validación y de análisis de la procrastinación académica en los estudiantes de educación superior.
Palabras clave: autorregulación del aprendizaje; propiedades psicométricas; confiabilidad; universidades; educación superior.

With the expanded access to higher education and greater diversity in students' traits, it is essential to have instruments to evaluate psychological variables to support diagnosis and intervention aimed at promoting academic success, well-being and satisfaction with the university experience (Araújo, 2017; Dominguez-Lara, 2018; Heringer, 2018). To this end, the design and/or adaptation of scales and tests for the Brazilian students and the detailed description of their psychometric properties, especially structural analysis, through exploratory factor, principal component or confirmatory analysis, is unique in evaluating the quality of instruments used to measure constructs. In the sense, a special role is played by validity studies to confirm the representativeness of the items of the evaluated dimension (Dominguez-Lara, 2018). Therefore, the objective of this study is to analyze the validity evidence of the Academic Procrastination Scale, translated and culturally adapted for Brazilian higher education students. The widespread use of psychometric instruments in investigations with undergraduates, the search for scales that provide valid and reliable measures of the analyzed dimensions and

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the scarcity of Brazilian instruments focused on this theme justify the study (Polydoro et al., 2016).

Procrastination is observed in several contexts of personal activity (work, family, study), resulting in an overload of tasks with implications for the well-being and physical and mental health of individuals who postpone the execution of activities (Dominguez-Lara, 2016; van Eerde, 2003). In higher education there is a specific type of procrastination – academic – which the different definitions in the literature agree in describing as voluntarily delaying or postponing the beginning, execution and completion of tasks that are deemed necessary, despite awareness of the implications linked to their non-execution (Dominguez-Lara, 2016; Dominguez-Lara & Campos-Uscanga, 2017; Steel, 2007). Academic procrastination differs from a planned learning strategy focused on delaying the completion of a task, for example, to better prepare for it and, consequently, obtain a better result (van Eerde, 2003). In academic procrastination, the delay or postponement of tasks is not intentionally planned, aims to put off the completion of an anticipated action and generates discomfort in individuals (Rosário et al., 2009; van Eerde, 2003).

Higher education students report academic procrastination. In the US, 70% of university students admitted to engaging in it regularly, while 50% acknowledge the negative implications of postponing the execution of tasks (Schraw, Wadkins, & Olafson, 2007; Solomon & RothBlum, 1984). In Latin America, Dominguez-Lara and Campos-Uscanga (2017) found, in a sample of Peruvian university students, that 47% could be considered procrastinators.

The reasons given by students for putting off work are distinct and relate to lack of adherence to the task at hand, anticipation of difficulties in carrying it out, poor time management and lack of commitment (Dominguez-Lara, 2016; Fernie et al., 2017; Gil-Flores et al., 2020; Steel, 2007). Studies describe that students who postpone doing assignments have poor academic performance (Duru & Balkis, 2017; Jackson et al., 2003; Kim & Seo, 2015; Steel, 2007). That happens because they put off the execution of tasks, study for only few hours and do not start early on their activities, thus restricting the time in which to do them, which compromises the quality of work or study and affects assessment results. Such consequences are not restricted to specific subjects, but rather compromise students' overall academic performance (Jackson et al., 2003). The postponement of schoolwork is associated, at the beginning of the term and for a short period, with a decrease in stress, due to the absence of concerns about academic activities. However, at the end of the term students who procrastinate report high levels of stress and illness, probably due to the impact of postponement (Tide & Baumeister, 1997). Procrastinating students feel distressed, depressed, more strained and less satisfied with life (Duru & Balkis, 2017; Fernie et al., 2016; Gagnon et al., 2016; Steel, 2007; Tice & Baumeister, 1997). That is because increased postponement negatively impacts grades and academic performance, which affects students' self-esteem and sense of satisfaction, suggesting that the negative effects of putting of the execution of schoolwork extends beyond educational implications (Duru & Balkis, 2017; Kim & Seo, 2015).

Due to the influence of procrastination on variables associated with success in higher education, such as academic achievement, there are reports of specific interventions aimed at reducing it, especially programs whose main focus is to promote self-regulated learning, also including emotional regulation (Polydoro & Pelissoni, 2017; Eckert et al., 2016). Such interventions are justified since procrastination is associated with failures in self-regulated learning processes, specifically concerning beginning, persisting in or completing activities, in terms of activation, self-control, time management, task organization and emotional regulation, bearing in mind that the relationships between postponing work and self-regulation still require further investigation (Dominguez-Lara, 2018; Grund & Fries, 2018; Rosário et al., 2009; Steel, 2007; Wolters, Won, & Hussain, 2017; Zhao et al., 2019). In turn, delaying the execution of tasks is associated with the execution of low-quality work, limited construction of knowledge about specific contents addressed in higher education, negative impacts on academic performance, longer time to graduate and increased dropout rates (Garzón & Gil, 2017; Gómez, Ortiz & Perdomo, 2016; Kim & Seo, 2015). However, psychological variables such as self-efficacy and individual traits like gender and age may have a moderating effect on the relationship between procrastination and academic failure (Rosário et al., 2009; Quispe-Bendezú et al., 2020).

Regarding the construct of procrastination, as well as other psychological variables such as self-efficacy, there is strong evidence of the greater predictive power of specific measures compared to constructs in general (Dominguez-Lara, 2018; Multon et al., 1991). And given the almost complete lack of correlations between general and academic procrastination,

identified in a study with Peruvian university students, the use of more particular measures is suggested, taking care to base the evaluation of such psychological constructs on specific contexts or situations (Álvarez, 2010; Dominguez-Lara, 2018).

Academic procrastination concerns postponing the execution of assignments or reports, missing submission deadlines, putting off chores related to academic life, such as enrollment and returning library books, and several other tasks linked to studying (Rosário et al., 2009). In higher education, studying involves daily activities of contact and research about content to be learned, performance of assignments related to the subjects and credits taken, as well as specific preparation for assessments. Therefore, this study is justified in investigating academic procrastination related to postponement of daily study and preparation for exams as a way of identifying the different specificities of the construct (Costa, 2007; Rosário et al., 2009).

The literature describes a number of instruments that specifically evaluate academic procrastination. The Procrastination Assessment Scale for Students (PASS) was developed by Solomon and Rothblum (1984) and is one of the first scales aimed at assessing the construct. The instrument consists of two parts: the first part evaluates the prevalence of academic procrastination in six areas: writing term papers, studying, keeping up with weekly readings, doing administrative tasks, attending meetings and performing academic tasks in general. The answers are given according to a 5-point Likert scale, as follows: a) frequency of procrastination in that area: 1 (never) to 5 (always); b) degree to which procrastination in that area is identified as a problem: 1 (not a problem) to 5 (always a problem), with these two dimensions jointly evaluated by adding the answers; c) desire to decrease procrastination in that area: 1 (do not want to decrease) to 5 (definitely want to decrease). This first group of items was not submitted to psychometric studies, being based on the sum of response frequency. The second part of PASS presents procrastination scenarios and lists a number of reasons why students postpone the execution of tasks, also answered by means of a 5-point Likert scale, indicating to what extent the reason justifies procrastination. This second stage was submitted to exploratory factor analysis, with the items grouped into two factors: the first related the reasons to anxiety, perfectionism and lack of confidence; the second related them to aversion to the task and laziness. Despite its widespread use, there is criticism in the literature of this proposal to measure the construct, since not all procrastination behavior is associated with problems (Mccloskey & Scielzo, 2015). In addition, it is understood that term papers, assignments and weekly readings are study activities rather than academic tasks exclusively related to preparation for formal assessments, not to mention the lack of psychometric studies on all evaluated dimensions.

Another instrument described in the literature to assess academic procrastination is the *Tuckman Procrastination Scale*, a self-reporting instrument answered according to a 4-point Likert scale, originally developed with 72 items, reduced to 35 in the initial study and, later, in a new investigation, limited to 16 items concerning academic procrastination in higher education (Özer et al., 2013; Tuckman, 1991). However, there are criticisms of the psychometric study of this instrument, carried out with a small and poorly diverse sample (Mccloskey & Scielzo, 2015). In a new investigation the instrument was culturally adapted for Turkish university students and showed good psychometric properties, requiring the elimination of two items, thus consisting of a one-dimensional scale of 14 items, with an internal consistency coefficient of 0.90 (Özer et al., 2013).

In Latin American there is *Escala de Procrastinação Acadêmica* (Academic Procrastination Scale), an adaptation of the instrument of that name initially developed by Busko and adapted by Alvaréz (2010). It comprises 16 items that must be answered using a 5-point Likert scale ranging from 1 (never) to 5 (always). The items are grouped into two domains: academic self-regulation (α= 0.82) and postponement of activities (α= 0.75), the latter consisting of only three items, with good internal consistency (Dominguez-Lara et al., 2014).

For Brazilian students there is *Escala de Procrastinação Ativa* (Active Procrastination Scale) (Gouveia et al., 2014), which is based on the concept that procrastination does not merely reflect a passive action by students, but incorporates their role as subjects of their choices. It is a cultural adaptation of the scale of the same name which, according to the authors of the Brazilian version, was developed by Choi and Moran (2009) and presents a two-dimensional structure. The scale consists of 16 items related to the affective, cognitive and behavioral aspects of procrastination, answered on a seven-point Likert scale ranging from 1 (totally not true) to 7 (totally true). In the Brazilian version, the items are grouped into four factors, namely: preference for pressure, ability to meet deadlines, satisfaction with results and intentional decision. These last two factors have an internal consistency of 0.66 and 0.61, respectively, not meeting the

above 0.70 recommendations in the literature (Pasquali, 2003). Although the authors suggest the possibility of using it for research purposes, they stress that the small number of items in each factor contributed to lower internal consistency (Gouveia et al., 2014).

Also in Brazil there is *Questionário de Procrastinação Acadêmica: consequências negativas* (Academic Procrastination Questionnaire: negative consequences) (Geara & Teixeira, 2017), consisting of a set of six scales. The first measures the tasks students put off and must be answered using a 5-point Likert scale ranging from 1 (never) to 5 (always); the others relate to general impact of academic procrastination, educational consequences, physical consequences, psychological consequences and motivations for behavior change, which must be analyzed on a similar scale, but with different descriptors: 1 (the sentence is totally false about me) to 5 (the sentence is totally true about me). Regarding specifically the tasks that students postpone, the scale consists of five items which, according to the authors' instructions, should be studied independently, without the constitution of a single factor. Therefore, no psychometric studies of this set of items have been performed, which makes it difficult to use the scale in later analyses.

Also noteworthy is the adaptation for higher education and preliminary psychometric study in the Brazilian context of *Questionário de Procrastinação Acadêmica* (Costa, 2007), carried out as part of Sampaio's master's dissertation (2011). The original questionnaire evaluates how often Portuguese students postpone study activities for exams and daily activities. It is an instrument aimed at students in primary and secondary education, comprising 10 items that must be answered using a five-point Likert scale ranging from 1 (never) to 5 (always). Both the scale as a whole and its domains present good internal consistency, with values above 0.70 (Costa, 2007; Rosário et al., 2009).

Due to the lack of validated instruments for Brazilian university students focused exclusively on academic postponement of study tasks, *Questionário de Procrastinação Acadêmica* (Costa, 2007) was linguistically and culturally adapted for higher education and named *Escala de Procrastinação Acadêmica* – EPA (Academic Procrastination Scale – APS). The preliminary study, presented by Sampaio (2011), on validity evidence of the adapted version with data from 663 university students, through factor analysis with Varimax orthogonal rotation, confirmed two dimensions of the scale, with five items each. The Exam Study Procrastination dimension showed an internal consistency of 0.73, while for the Daily Study Procrastination dimension the coefficient was 0.68. In view of the promising initial results of the psychometric study of the Academic Procrastination Scale, associated with the increase of students in post-secondary education and their different traits, the present study aimed to analyze the validity evidence of the Academic Procrastination Scale, considering a distinct and diverse sample of higher education students.

Method

Participants

The convenience sample of the study comprised 2024 university students, enrolled in institutions located in states in the five Brazilian regions, who were randomly divided into two groups using the SPSS statistical package, the first consisting of 1010 students (49.9%) and the second of 1014 (50.1%). The first sample comprised students of both genders (68.1% women) with ages ranging from 18 to 60 (M = 23; SD = 6.55), 80% enrolled in public institutions in courses from several areas of knowledge, especially humanities (45.7%), with 25% studying psychology. An exploratory study of the instrument was carried out with the data of these students, using principal component analysis. Regarding the second sample, whose data were submitted to confirmatory factor analysis, there was also a predominance of women (67%), aged 18 to 60 years old (M = 22.9; SD = 6.04), enrolled in humanities courses (44%), with 81.6% attending public universities.

Instruments

Characterization questionnaire. This instrument was used to consult information related to gender, age, course and institution.

Academic Procrastination Scale (APS) - This is a self-reporting scale aimed at measuring specific procrastination behavior in study. The scale is derived from *Questionário de Procrastinação no Estudo* (Procrastination in Study Questionnaire) (Rosário et al., 2009; Costa, 2007), developed for Portuguese students enrolled in primary and secondary education. The instrument was culturally adapted for the Brazilian population enrolled in higher education (Sampaio, 2011). Like the Portuguese version, the scale consists of ten statements grouped in two dimensions: daily study procrastination (*When an academic assignment is very difficult, I give up and move on to another task*) and exam study procrastination (*I interrupt study time for exams to do other activities, e.g. watch TV, listen to music, talk on the cell phone*), composed of five items each,

answered according to the frequency of the behavior on a five-point Likert scale ranging from never (1) to always (5). The scale score is obtained by dividing the sum of the answers to the items by ten.

Data collection procedures and ethical aspects

This investigation was conducted in an ethical manner, following the guidelines and standards regulating research with human beings, and was initiated following approval by the Research Ethics Committee (CAAE: 0061.0.146.000-10). The data were collected in person, using pencil and paper, lasting 10 minutes on average, with the attendance of one of the authors of this study. A convenience sample was used and the students were invited in the classroom to take part in the study.

Data Analysis Procedures

The psychometric study of the instrument involved analysis of the validity evidence based on the internal structure, carried out by means of principal component analysis and confirmatory factor analysis and the study of internal consistency, performed by calculating Cronbach's alpha, using the SPSS and AMOS statistical packages. The sample was randomly divided into two groups, the first consisting of 1010 students and the second of 1014, and the confidence index of the factor analysis and Bartlett's test of sphericity were verified for both. Principal component analysis was performed with the first group using such an extraction method, with Varimax rotation. The proposal for the second group was to confirm the theoretical model in order to verify the fit of the items to the two dimensions initially proposed. The maximum likelihood method was used, based on the following indicators to interpret the results: Chi-square ratio by degrees of freedom (χ^2/gl <3), comparative goodness fit index (CFI <0.90), normed fit index (NFI <0.90), Tucker-Lewis index (TLI <0.90) and root mean square error of approximation (RMSEA <0.08) (Hu & Bentler, 1999). Factor loading above 0.40 was used as a criterion to retain items. The standard reference threshold of $p <$ 0.05 was used in analyzing the statistical significance of the coefficients obtained.

Results

The descriptive analyses of the items that make up the two samples showed a good dispersion of the answer options, without the need to exclude any item. For both samples the confidence index of the factor analysis (KMO = 0.87; KMO = 0.89) and of Bartlett's test of sphericity (χ2 = 2117.67 p <0.001; χ2 = 2395.43 p <0.001) were satisfactory, with indications for the continuity of the analyses.

The principal component analysis performed with the Varimax rotation and the data from the first sample of 1010 students highlighted the presence of two components, as initially predicted, with eigenvalues above 1 and which explained 49.18% of the accumulated variance. Table 1 features the factor loadings of the items in the components, which ranged from 0.422 to 0.739, with no need to eliminate any item, as they were all above 0.40, with evidence that they are accurate in the domains. In the first component, five items were loaded related to daily study procrastination, which concerns postponement of continuous study and schoolwork tasks. The second component relates to exam study procrastination, which concerns actions that influence the preparation for exams. Item 9 was the only one with a factor loading above 0.40 in both domains, but we chose to keep it in exam study procrastination due to the higher factor loading in this component and because it coincided with the allocation provided in the original version of the instrument. Regarding the internal consistency coefficients, total scale (0.81), daily study procrastination (0.74) and exam study procrastination (0.71) all proved to be adequate.

The correlations coefficients between the items ranged from 0.086 to 0.477 and were statistically significant. Despite the fact that some correlation coefficients were less than 0.30, the results were observed in a few relations, and none of the single items showed a weak correlation coefficient with all the items on the scale. Therefore, we chose to retain the ten statements proposed by the scale (Hair et al., 2005). The correlation between the two subscales was moderate (0.536) and statistically significant.

Confirmatory factor analysis (CFA) was carried out with the second sample of 1014 participants in order to verify the fit of the data to the two-dimensional model, composed of daily study procrastination and exam study procrastination. The results were analyzed using the following fit indices: absolute, the ratio of chi-square to degrees of freedom (χ^2/df); comparative, using the comparative fit index (CFI), the Tucker-Lewis index (TLI) and the normed fit index (NFI); in addition to the parsimonious fit indicator, using the root mean square error of approximation (RMSEA).

It was identified that the results of fitting the data to the model in which the items are grouped in the two domains (exam study procrastination and daily study procrastination), performed by confirmatory factor analysis, are adequate according to the parameters reported by prior investigation (Hu & Bentler, 1999). There are reservations regarding the chi-square result ($\chi^2/gl = 3.62$ $p<0.001$). Despite being above three and indications in the literature that values up to five are reasonable, the presence of statistically significant differences indicates lack of similarity between the data and the theoretical model, despite the divergence in the literature on adequate values (Ramos & Cerqueira-Santos, 2019). However, the chi-square test is known to be very sensitive to sample size (Pérez-Gil et al., 2000) and, therefore, the suggestion is to use other parameters for confirmatory analysis, since this analysis was carried out with data from more than 1000 students.

Regarding the comparative coefficients, CFI = 0.964; NFI = 0.951; TLI = 0.941 are quite adequate. This is because the literature has described that values above 0.95 are indicative of excellent fit, but the scores between 0.90-0.95 are also safe to indicate a good fit. In this study CFI and NFI are above 0.95 and TLI is within the range described as adequate (Brown, 2006; Hu & Bentler, 1999).

The parsimonious fit indicator, RMSEA, was 0.051, located in an interval that ranged from 0.041 to 0.061, with a low presence of residue. Values below 0.08 are deemed acceptable, based not only on the residue average but on its minimum and maximum values (Hair et al., 2005; Hu & Bentler, 1999). These results confirm that the specification of the scale in two

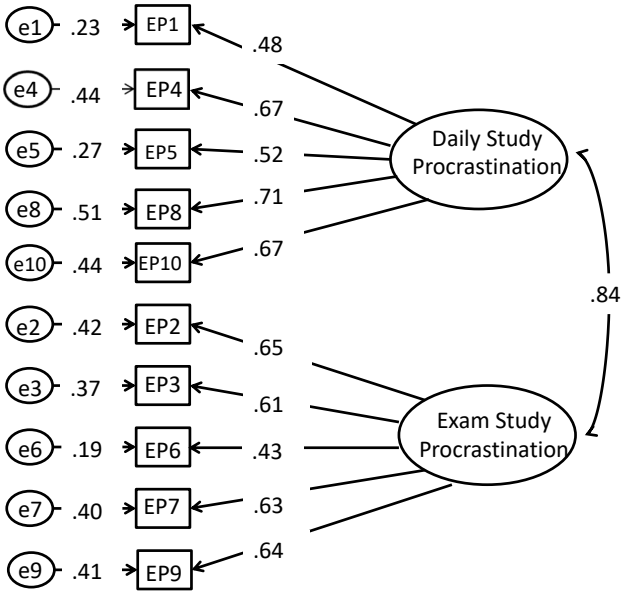

Figure 1. Academic Procrastination Scale Model with two correlated dimensions

Table 1.
Loadings of items in the components, percentage of explained variance and Cronbach's alpha

Items	Daily study procrastination	Exam study procrastination
1	.716	
4	.739	
5	.601	
8	.573	
10	.676	
2		.706
3		.592
6		.667
7		.650
9	.422	.601
% of explained variance	37.29	11.89
Number of items	5	5
Cronbach's alpha	0.74	0.71

dimensions corroborates reality and the factor loadings are described in Figure 1.

Still regarding the proposed model, all items have factor loadings above 0.40, the minimum coefficient of representation of the item with the factor, and ranged from 0.43 to 0.71, although these are not high values. Concerning internal consistency, Cronbach's alpha of the total scale was 0.83, being adequate in both domains, Daily Study Procrastination (0.75) and Exam Study Procrastination (0.73), since the literature considers values above 0.70 to be convenient (Pasquali, 2003). Also studied were the relationships of the factors with each other and with the total scale, the results of which are shown in Table 2.

Pearson's correlation coefficients showed positive and statistically significant correlations ranging from moderate to strong between the dimensions of the Academic Procrastination Scale (daily study and exam) and the total score of the scale.

Discussion

This study analyzed the psychometric properties of the Academic Procrastination Scale, previously adapted both linguistically and culturally for Brazilian higher education students (Sampaio, 2011). The principal component and confirmatory factor analyses supported the initial proposal of grouping the 10 items into two components, confirming a two-dimensional structure, with five items in each domain. The internal consistency coefficients of the scale and in its domains are in accordance with the indicators reported by the literature and provide evidence that the scale has adequate parameters of both construct validity and internal consistency. This indicates that the factor structure in question, besides converging with the findings in the preliminary study (Sampaio, 2011), replicates the structure identified in Portuguese primary and secondary students. It also provides evidence that the specificities in the study of academic procrastination are more centered on the nature of the task to be postponed than on broader educational contexts, such as level of teaching. Such results confirm that the psychometric properties are adequate, besides also meeting the principle of parsimony, given the confirmation of a smaller number of factors compared to the number of original variables. (Sartes & Souza-Formigoni, 2013). In addition, the instrument has a small number of items and is quick to administer, without tiring out the respondents.

The principal component analysis indicated the solution of two fairly acceptable domains, with saturation of all items in the two major domains above 0.40, indicative of a solid structure (Dominguez-Lara et al., 2014), and the amount of explained variance close to 50%, a highly acceptable value. Despite the limitations of the principal component analysis, we chose to perform it because the sample size is larger and distinct from that of the original study, carried out by Sampaio (2011). And even with the adequate results from this analysis, confirmatory research is recommended and feasible to obtain a more robust indication of the construct's validity (Pérez-Gil et al., 2000; Dominguez-Lara et al., 2014). From the indexes obtained from the confirmatory study of the Academic Procrastination Scale, it was found that chi-square alone did not enable a good fit of the data to the theoretical model. However, as already noted, this test is very sensitive to samples with more than 200 participants, and therefore it is prudent to use other indicators, less dependent on sample size, which confirmed the two-dimensional structure of the instrument (Pérez- Gil et al., 2000). It should be noted that the distribution of items in two dimensions is identical to the original

Table 2.
Correlation of the dimensions with each other and with the total scale

	Daily Study Procrastination	Exam Study Procrastination	Academic Procrastination
Daily Study	1	.610	0.903
Procrastination		p<0.001	p<0.001
Exam Study		1	0.892
Procrastination			p<0.001

proposal of the instrument (Costa, 2007), with an emphasis in that scale on procrastination of study tasks and of those involving preparation for exams and daily study.

Academic procrastination is a highly prevalent phenomenon among higher education students, but which must also be understood in light of the broader cultural aspects related to study practices. Distinguishing between postponing daily study tasks and postponing study for exams seems to be valid in Portugal and Brazil. Students' actions are deemed to be different according to curriculum frameworks, level of external regulation of tasks and students' personal goals. In other words, the factor structure confirms the difference in students' academic behavior, especially concerning daily study activities, which probably do not result in direct short-term consequences, and tasks related to formal assessments, which result in a grade that enables students to continue their studies.

The differentiation of academic procrastination proposed in this study, therefore, dialogues with the principles of self-regulated learning, which concerns control by students of their behavior, affect and cognition as well as of environmental adjustments that enable them to achieve their previously defined goals (Zimmerman, 2001). Failures in the cyclic process of self-regulated learning may culminate in academic procrastination, with indications that more self-regulated students are less likely to postpone study tasks (Rosário et al., 2009; Costa, 2007; Eckert et al., 2016; Zhao et al., 2019). Since the evidence suggests medium- or long-term impacts of academic procrastination on student success, questions remain as to whether the frequency of procrastination in different study tasks is also associated with different academic consequences.

Also regarding APS, its use will help researchers, professionals of student support services and educational administrators to identify and measure study procrastination among higher education students and enable them to distinguish between the types of study being postponed: daily or for exams, more prevalent in the sample. This will allow the planning of interventions based on students' traits and the specific challenges faced in academic life in order to promote success in higher education. This is because no less important than describing the reasons and consequences of procrastination is the need for it to be identified and better understood, taking into account several other characteristics of students, such as self-esteem and self-efficacy, among other variables with impacts on academic procrastination (Dominguez-Lara & Campos-Uscanga, 2017; Dominguez-Lara et al., 2019).

Regarding the support network for higher education students, it is known that the support and services sectors of schools offer interventions that not only include financial support, but also incorporate programs that aim to promote professional, interpersonal, career and health skills, as well as improve the learning process (Dias et al., 2020; Pinheiro et al., 2018). However, care must be taken to ensure that the evaluation of such interventions is supported by evidence that makes it possible to understand their efficacy. Thus, APS will be of great value to professionals working in student support services, and it can be used for both diagnosis and evaluation of the impact of interventions on academic procrastination among higher education students (Dias et al., 2020 Pinheiro et al., 2018). Since the literature describes that the postponement of academic tasks is a predictor of academic success, the instrument may also be useful in the early identification of students who procrastinate, in order to prevent academic failure.

This study has its limitations, specifically related to the traits of the sample which, despite being composed of students enrolled in institutions from different Brazilian regions, was not able to faithfully represent the Brazilian university population. This is because the expansion in access to higher education is accompanied by a greater variety in students' characteristics regarding personal aspects and schooling background, among other aspects (Heringer, 2018). New validation studies should focus on a greater diversification of the sample's traits in order to address the diversity of students present in higher education today, such as students of different ethnic origins and those with special needs. Other investigations could add new evidence of validity and reliability through studies that assess the temporal stability of the measure, for example, through test-retest. Empirical studies on the predictive role of academic procrastination measures in variables associated with student success in higher education are highly valid, as are cross-cultural comparisons between university students from Brazil and other countries, in order to improve the instrument's psychometric parameters and the conceptual domain of this relevant variable in the educational context.

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