



# Linguistic Adaptation and Validation of the Academic Procrastination Scale – Short Version (APS-S)

Adaptación lingüística y validación de la Escala de Procrastinación Académica – versión reducida (APS-S)


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## Summary

This study was aimed at linguistically adapting the short version of McClosky's Academic Procrastination Scale (APS-S) and obtaining evidence of validity, reliability, and equity in university students from Lima. A total of 4,534 students participated, 2,052 women (45.3%) and 2,482 men (54.7%). The confirmatory factorial analysis of the scale reached an adequate fit to the hypothesized measurement model (CFI = .994, TLI = .988, RMSEA = .038, SRMR = .014). In addition, validity is evidenced with other variables, through correlations with academic self-efficacy ( $r = -.319$ ;  $p < 0.001$ ) and academic performance ( $r = -.146$ ;  $p < .001$ ). Reliability was estimated with the ordinal alpha ( $\alpha_{ord} = .867$ ), and ordinal omega ( $\omega_{ord} = .849$ ) coefficients. Factor invariance analysis showed that the measure is equivalent between men and women ( $\Delta CFI < .010$ ,  $\Delta RMSEA < .015$ ). It is concluded that the APS-S linguistically adapted to Spanish has psychometric properties, constituting a correct measure to evaluate procrastination in university students from Lima.

**Keywords:** Academic procrastination; Linguistic adaptation; Validity; Reliability; Equity.

## Resumen

Este estudio se orientó a adaptar lingüísticamente la versión corta de la Escala de Procrastinación Académica (APS-S) de McClosky y obtener evidencias de validez, confiabilidad y equidad en universitarios limeños. Participaron 4534 estudiantes, siendo 2052 mujeres (45.3%) y varones 2482 (54.7%). El análisis factorial confirmatorio de la escala alcanzó un ajuste adecuado al modelo de medida hipotetizado (CFI = .994, TLI = .988, RMSEA = .038, SRMR = .014). Además, se evidencia validez con otras variables, a través de correlaciones con la autoeficacia académica ( $r = -.319$ ;  $p < .001$ ) y el rendimiento académico ( $r = -.146$ ;  $p < .001$ ). La confiabilidad se estimó con los coeficientes alfa ordinal ( $\alpha_{ord} = .867$ ), y omega ordinal ( $\omega_{ord} = .849$ ). El análisis de invarianza factorial mostró que la medida es equivalente entre hombres y mujeres ( $\Delta CFI < .010$ ,  $\Delta RMSEA < .015$ ). Se concluye que la APS-S adaptada lingüísticamente al español cuenta con las propiedades psicométricas, constituyendo una medida correcta para evaluar la procrastinación en universitarios de Lima.

**Palabras claves:** Procrastinación académica; Adaptación lingüística; Validez; Confiabilidad; Equidad.

## INTRODUCTION

Procrastination is commonly viewed as a behavioral tendency to defer a planned course of action irrationally and voluntarily despite anticipating the adverse consequences of this delay (Steel & Konig, 2006; Steel, 2007; Steel & Klingsieck, 2016). It has also been described as putting off task completion to the point of experiencing subjective discomfort (Ferrari et al., 1995) and intentionally delaying an intended course of action (Klassen et al., 2008) or as a steady personality trait with negative consequences (Choi & Moran, 2009). However, there seems to be a consensus that procrastination consistently delays action, regardless of the outcome (Van Eerde, 2003).

Its occurrence in the educational sphere is academic procrastination, which is the tendency to postpone or delay activities and behaviors related to school, education, and studies (McClosky, 2011). It occurs in students of all ages, whether attending elementary school or pursuing some form of education or degree, being mainly common among university students (Schraw et al., 2007). The literature illustrates six unique aspects of academic procrastination that make up the profile of a procrastinator in the educational sphere. These characteristics are the psychological beliefs about individual competence, distractibility, social factors, time management, personal initiative, and laziness (McClusky, 2011).

Procrastination is increasingly intense in industrialized countries (Rozenal & Carlbring, 2014), contrary to the overvaluation of achievement and results in most Western cultures (Van Eerde, 2003). Epidemiological studies have been reporting the progressive increase of this phenomenon. Thus, 15-20% of adults showed a general history of procrastination, but even worse, more than 70% of students reported procrastination on specific academic tasks (Ferrari et al., 1995). In addition, between 95% and 99% of students identified themselves as procrastinators. And between 32% and 46% (Day et al., 2000) suffered from problematic or chronic procrastination (Clark & Hill, 1994). Despite the adverse consequences on learning in higher education, these rates have been maintained or increased. Thus, according to Burka and Yuen (2008), procrastination occurs intensely in 70-95% of university students, and for Steel (2007), 95% would be classified as procrastinators. In Peru, a prevalence of 14.1% of university students have been reported as academic procrastinators, whose occurrence would be significantly associated with demographic and psychological variables (Domínguez-Lara, 2017).

Procrastination not only adversely affects academic performance and subjective health but also may increase mental illness risk (Stober & Joormann, 2001; Walsh & Ugumba-

Agwunobi, 2002). Thus, the procrastinator would have a risk of increased anxiety, insomnia, and depression (Sirois & Pychy, 2002). The literature converges on the harmful aspect of procrastination and the fact that university students with a procrastinator profile use deficient study strategies, such as difficulties in goal setting and planning, poor perception of their ability to perform academic activities, less interest in activities, and experiencing negative and intense emotions (Domínguez-Lara & Campos-Uscanga, 2017; Muñhoz-Olano & Hurtado-Parrado, 2017; Rahimi et al., 2016). In addition, the direct relationship of this construct with emotional aspects, mainly anxiety and dissatisfaction, with cognitive aspects, such as dysfunctional beliefs and low self-efficacy, and behavioral domains, such as difficulty managing time, poor commitment, and low academic performance has been reported in university students (Alegre, 2013; Brito & Bakos, 2013; Furlan, 2013; González-Brignardello & Sánchez-Elvira-Paniagua, 2013; Ramos-Galarza et al., 2017; Pichen-Fernandez, & Turpo, 2022).

Based on the prevalence rates of procrastination among university students and its potential adverse effects, it is essential to have psychometrically sound measures of academic procrastination. While there are scales to measure it, including one-dimensional (Lay, 1986; Tuckman, 1991) and multidimensional (Chu & Choi, 2005) scales, they have generally been designed referring to specific tasks or activities and not assessing procrastination in academic activities in general (McCloskey, 2011).

In this sense, McClosky (2011) developed the Academic Procrastination Scale (APS) consisting of 25 items, with five-point response options to assess the construct, considering the six domains of academic procrastination (psychological beliefs about individual competence, distractibility, social factors, time management, personal initiative, and laziness). To demonstrate the psychometric properties, he applied the instrument to 681 students from the University of Texas and reported convergent validity due to moderate to high correlations with other procrastination measures by other authors such as Solomon and Rothblum's PASS (1984) ( $r = .53$ ), Lay's PASS (1986) ( $r = .64$ ), and Tuckman's ATPS (1991) ( $r = .70$ ). He found a moderate correlation with conscientiousness personality trait ( $r = -.57$ ) and for academic performance, he reported predictive validity ( $B = -.23$ ,  $t(514) = -5.43$ ,  $p < .001$ ,  $r^2 = .05$ ). The APS showed a very good estimate of internal consistency reliability (Alpha = .94), with the range of item-total correlations being between .41 to .73. Exploratory factor analysis revealed that there was one underlying factor that accounted for approximately 42.50% of the total. However, the author considered that the full scale (25 items) was extensive and that the content was similar. Therefore, he suggested a five-item version (APS-S) and selected items 2, 4, 7, 17, and 23 because they had

item-total correlations higher than .70 and, as a whole, obtained a Cronbach's alpha coefficient of .87 (McClosky, 2011).

Considering the five-item version (APS-S) proposed by McClosky (2011), Yockey (2016) administered it to 284 students from the University of Western States in the United States. Principal component analysis (PCA) determined a single component-based solution that accounted for 65% of the total variance and matched what was obtained with criteria such as eigenvalues greater than 1, Cattell's sedimentation graph, and Horn's parallel analysis. The loadings of the reactants in the components were higher than .70 and in the range of .73 (item 3) and .86 (item 5). The internal consistency reliability was .87, and the item-total correlations were between .49, .49, .74, .60, and .75, respectively. He also reported convergent validity given that the correlation between the APS-S with the PASS ( $r = .54$ ) and the Tuckman (1991) scale ( $r = .79$ ) was statistically significant ( $p < .001$ ) and moderate.

Although the full original version of the APS showed promising psychometric properties in the study conducted by McClosky (2011) and the 5-item short version (APS-S) evidenced convergent-type validity and its one-dimensional internal structure along with adequate reliability (Yockey, 2016). Both versions only have reports of findings in their original language (English) and in a U.S. university population. Furthermore, considering that the referring measures to assess academic procrastination are complete versions with validation research (Ferrari et al., 1995; Harrington, 2005) such as, on the international side, the 12-item PASS by Solomon and Rothblum (1984), the 18-item scale by Tuckman (1991), and the 20-item measure by Lay (1986), and, on the Peruvian side, the EPA by Busko (1998) with 16 items (Domínguez-Lara, 2016; Domínguez et al. 2014) and Tuckman's APTS with 15 items (Alegre-Bravo & Benavente-Dongo, 2019), a short scale of only five items such as the APS-S may be a parsimonious measure of the construct and also provide other researchers with an efficient option for their studies involving this variable in Spanish-speaking university students. In addition, Busko's EPA and Tuckman's APTS scales, which are the most used in research on academic procrastination in Peru, in psychometric analyses presented different factor structures, and the inadequacy of some items was reported (Alegre & Benavente, 2020; Alegre, 2013; Contreras, 2019; Dominguez et al., 2014) that would differ from the authors' original proposal. This could be due to the presence of inverse reactants in the composition of each measure that was not suggested due to their multiple adverse effects (Navarro-González et al., 2016). For this reason, this proposed adapted short version of the Academic Procrastination Measure (APS-S) will allow the measurement of the construct in the Peruvian university population with functional advantages and a theoretical approach to the

domains that make up the construct (Ferrari et al., 1995; McClosky, 2011; Steel, 2007), whose English antecedents concerning its evidence of validity (related to its internal structure) and reliability (internal consistency) reported adequate indicators (Jockey; 2016; McClosky, 2011).

Based on the above and because the short version of the Academic Procrastination Scale (APS-S) of McClosky (2011) lacks a version adapted to Spanish and validated for the Peruvian population, the purpose of this research was to make a linguistic adaptation and obtain evidence of validity, reliability, and equity of the instrument so that it can become a helpful tool to assess academic procrastination in university students. Likewise, this study is considered a contribution to research on the psychometric properties of the APS-S scale in sociocultural settings other than that in which the original version was created.

## **METHOD**

### **Type and Design**

This research falls into the instrumental study and descriptive design category as it involved translation, application, and analysis to obtain evidence on validity, reliability, and equity for the scale version adapted to a Lima population (Ato et al., 2013).

### **Participants**

The study included 4534 full-time undergraduate students from nine schools of a private university in Lima, aged between 16 and 32 ( $M = 19.04$ ;  $SD = 2.45$ ), enrolled in academic terms 2020 and 2021, and were attending semesters one to ten of their degree programs at the time of application. The study modality employed by the participants was online due to the COVID-19 pandemic. Regarding sex, 2052 women (45.3%) and 2482 men (54.7%) responded. This sample was obtained through a non-probabilistic procedure by convenience (Hernández-Sampieri & Mendoza, 2018) since the participants were users of the university's psycho-pedagogical accompaniment service, to which students access voluntarily.

## Data Collection Instruments

### *Academic Procrastination Scale – Short Version (APS-S)*

It is a one-dimensional measure of general academic procrastination consisting of five items in English, whose scaling comprises five response options (1: "Strongly disagree" to 5: "Strongly agree") in each case, for which a higher total score implies higher academic procrastination. These reactants were part of McCloskey's (2011) Academic Procrastination Scale, consisting of 25 items ( $\alpha = .93$ ), which were extracted and validated by Yockey (2016) to form a short version based on the author's proposal. Yockey (2016) reported a Cronbach's Alpha reliability coefficient of .87 and evidence of validity on the internal structure by principal component analysis (PCA), with the factor loadings being located between .73 (item 3) and .86 (item 5) in the extracted component (65% of the variance accounted for).

For this study, the linguistic adaptation process was carried out considering the recommendations of The International Test Commission Guidelines (Muñiz et al., 2013). Thus, the APS-S scale was translated into Spanish following the back-translation method. In the first stage, the original English scale was translated by two Spanish translators (bilingual Spanish/English) who translated the original version into Spanish independently, and, after reviewing the differences and similarities, a synthesis version was agreed upon. In the second stage of this process, the synthesis version was back-translated by two native English translators who did not have access to the original English version of the scale and did the back-translations independently. In the third stage of this process, the back-translations were compared with the original English version of the instrument by two English-proficient educational psychologists to analyze the semantic and not only literal equivalence between the items of the original scale and the two translated versions. It was found that the back-translated versions and the original version were conceptually and semantically equivalent. Subsequently, a pilot test of the instrument was performed in a group of 25 full-time undergraduate students from a university in Lima without obtaining comments on the content or format of the proposal that might involve considering changes. It is worth pointing out that an e-communication had been sent previously to request authorization from the author of the APS-S MSc. Justin McCloskey to use the instrument and the adaptation procedure, to which he gave his consent.

### *Academic Self-Efficacy*

The one-dimensional scale of Academic Situations Specific Perceived Self-efficacy Scale (ASSPSS) of Palenzuela (2012) was used to measure academic self-efficacy, consisting of

10 items, whose scaling corresponds to 4 response options ranging from "never" = 1 to "always" = 4, which allows obtaining total scores between 10 and 40. For this study, the fit indices were calculated through confirmatory factor analysis, resulting in RMSEA = .061, CFI = .995, TLI = .993, and SRMR = .061 as evidence of validity, and the reliability estimate indicated an omega of .881. It should be noted that the scores on this measure were used to evidence discriminant validity (Martínez-García, 2009).

### ***Academic Performance***

The weighted average obtained at the end of the academic term by the students who participated in the study was considered to measure this variable. The weighted average for the academic term is calculated by adding the products of the grade obtained for the subject by the number of credits of the subject and then dividing this sum by the total number of credits enrolled for the academic term. The data were obtained directly from the university's IT systems with the approval of the university's psycho-pedagogical services unit and the students' consent.

### **Procedure**

As part of the activities of the psycho-pedagogical service of a private university in Lima students enrolled in full-time undergraduate degree programs for the 2020-1, 2020-2, 2021-1, and 2021-2 semesters were invited to participate by voluntarily completing an online form created using Microsoft Forms and shared to students via their e-mails and WhatsApp groups, which was kept active for participation during each semester. The psycho-pedagogical accompaniment service of this university covers all undergraduate students and is provided voluntarily. The form was filled out by the participants at the end of each semester. The form began with an explanation of the study purpose, and the informed consent that emphasized the voluntary nature of the participation to request their agreement to continue. Questions were asked to obtain sociodemographic information, such as sex, the university school from which they came, age, and the semester they attended in their degree programs, and the values of academic performance were recorded. Once the initial questions were filled out, the translated Academic Procrastination Scale short version (APS-S) and the Academic Situations Specific Perceived Self-efficacy Scale (ASSPSS) were included.

Thus, this research was conducted following the ethical principles defined for studies with human subjects (Acevedo, 2022).



## Information Analysis

The analytical strategy consisted of five stages. The first stage was aimed at determining the evidence of validity about the content of the translated version of the APS-S by the judges' criterion method by the adequacy of the translation and the representativeness of each reactant. From the ratings given, Aiken's *V* coefficients and their respective 95% confidence intervals were calculated, taking the value of .70 as a cutoff point in both cases (Charter, 2003; Napitupulu et al., 2018, Penfield & Giacobbi, 2004). In the second stage, we analyzed the items based on the answers of all participants by estimating the mean (*M*), standard deviation (*SD*), skewness (*g*1), and kurtosis (*g*2) indices. The latter two were obtained to determine the adequacy of the items and univariate normality based on their location in the range between  $\pm 2$  (Muthén & Kaplan, 1985). Finally, the homogeneity indices were obtained through the item-total correlation considering values above .30 (Nunnally & Bernstein, 1995).

In the third stage, a confirmatory factor analysis (CFA) was carried out to obtain evidence of validity related to the internal structure of the APS-S. Considering the ordinal nature of the reactants, the robust weighted least squares estimator (WLSMV) was employed based on the matrix of polychoric correlations (Brown, 2015; Byrne, 2012). The findings on the hypothesized measurement model were evaluated using the fit indices and their respective cutoff points were considered optimal (Hu & Bentler, 2009), i.e., values higher than .95 for the Tucker-Lewis (TLI) and comparative fit indices (CFI) and indices less than .06 for the root mean squared error of approximation (RMSEA) and .08 for the squared root mean residuals (SRMR) (Abad et al., 2011; Ruiz et al., 2010).

Subsequently, Pearson correlations (*r*) were calculated between total scores on the APS-S, the Academic Situation Perceived Self-Efficacy scale, and the weighted average for the semester to obtain evidence of divergent validity based on the assessment of the significance, the intensity of the relationship, and the statistical significance ( $p < .05$ ) of the coefficients obtained. Effect size criteria of .10, .20, and .30 considered by Gignac and Szodorai (2016) as small, medium, and large, respectively, were taken into account.

The reliability of the scores was estimated using the internal consistency method. The ordinal alpha and ordinal omega coefficients were calculated in line with the level of measurement of the items (Zinbarg et al., 2005; Zumbo et al., 2007) and considering values higher than .80 (Ponterotto & Ruckdeschel, 2007).

Finally, the factorial invariance analysis was carried out by sex as evidence of equity at the configural level: weak, strong, and strict. Cutoff values of  $CFI > .95$ ,  $RMSEA < .05$ ,  $\Delta CFI \leq .01$  and  $\Delta RMSEA \leq .015$  were considered (Chen, 2007; Hu & Bentler, 2009).

To process the information, we worked from a matrix in Microsoft EXCEL in which the data was coded and formatted and then imported into the RStudio program version 4.1.1 in which the analyses were carried out using the packages psych, lavaan, and semTools in their versions 2.0.8, 0.6-7 and 0.5-3, respectively.

## RESULTS

### Content-Related Validity

Eight experts with a Ph.D. degree in Psychology and experience in research on the academic procrastination construct were asked to assess the adequacy of the translation and the representativeness of each reactant to obtain evidence of content validity. For the first case, the concordance was 100% and, for the second aspect, they scored the proposed items between 0 and 3, calculating Aiken's V indexes on their answers. Thus, values between .917 (APS-S 1; APS-S 2) and 1 (APS-S 5) were obtained, exceeding the cutoff point of 0.70 (Napitupulu et al., 2018). Additionally, considering the 95% confidence intervals (Penfield & Giacobbi, 2004), the limits inferior in all cases were higher 0.70, a value recommended by Charter (2003) (Table 1).

**Table 1.**  
*Aiken's V Coefficients*

	<i>M</i>	<i>SD</i>	<i>V</i>	95% CI	
				<i>LI</i>	<i>LS</i>
APS-S 1	2.87	.35	.957	.795	.992
APS-S 2	2.75	.46	.917	.742	.977
APS-S 3	2.75	.46	.917	.742	.977
APS-S 4	2.87	.35	.957	.795	.992
APS-S 5	3.00	.74	1.000	.862	1.000

*Note.* *V*: Aiken's V Coefficient, *IC*: Confidence Interval, *LI*: Limit Inferior, *LS*: Limit Superior.

*Source.* Elaborated by the author.

## Statistical Analysis of Items

The items obtained mean values between 1.84 (APS-S 2) and 2.79 (APS-S 3) and skewness and kurtosis indices that were in the range of +/- 2, evidencing univariate normality and resulting acceptable (Ferrando & Anguino-Carrasco, 2010; Muthén & Kaplan, 1985). Additionally, item-total correlations, as an indicator of homogeneity, fluctuated between .58 (APS-S 5) and .67 (APS-S 4), exceeding the suggested minimum criterion of .30 (Nunnally & Bernstein, 1995) (Table 2).

**Table 2.**  
*Descriptive Analysis of the Items of the APS-S*

	<i>M</i>	<i>SD</i>	<i>g1</i>	<i>g2</i>	<i>r<sub>it</sub></i>
APS-S 1	2.34	.96	.38	-.30	.64
APS-S 2	1.84	.94	1.13	.83	.63
APS-S 3	2.76	1.08	.11	-.78	.62
APS-S 4	2.09	.98	.78	.09	.67
APS-S 5	2.21	1.05	.68	-.28	.58

*Note.* *M*: Mean, *SD*: Standard Deviation, *g1*: Skewness, *g2*: Kurtosis, *r<sub>it</sub>*: Homogeneity Index.

*Source.* Elaborated by the author.

## Validity of Internal Structure

The confirmatory factor analysis followed a nonlinear model with the WLSMV estimator from the matrix of polychoric correlations (Byrne, 2012; Brown, 2015), resulting in standardized factor loadings of the scale items between .65 (APS-S 5) and .76 (APS-S 4), all being statistically significant ( $p < .001$ ) (Table 3)

The CFA evidenced an optimal fit between the hypothesized measurement model and the data, so the comparative fit indices CFI and TLI were higher than .95, and the absolute fit indices RMSEA and SRMR were lower than .06 and .05, respectively (Abad et al., 2011; Hu & Bentler, 2009; Ruiz et al., 2010) (Table 4).

**Table 3.**  
*Validity of Internal Structure by Confirmatory Factor Analysis*

	$\lambda_1$	$\lambda_2$	SEm	z
APS-S 1	1.00	.72	---	---
APS-S 2	.97	.71	.02	41.98
APS-S 3	1.09	.70	.03	42.18
APS-S 4	1.08	.76	.03	39.98
APS-S 5	.99	.65	.03	34.93

*Note.*  $\lambda_1$ : Non-standardized Factor Loading,  $\lambda_2$ : Standardized Factor Loading, *SEm*: Standard Error of Measurement.

*Source.* Elaborated by the author.

**Table 4.**  
*Fit Indices*

Index	Value	Criterion
RMSEA	.038	$\leq .06$
CFI	.994	$\geq .95$
TLI	.988	$\geq .95$
SRMR	.014	$\leq .08$

*Note.* RMSEA: Root Mean Square Error of Approximation, CFI: Comparative Fit Index, TLI: Tucker-Lewis Index, SRMR: Root Mean Squared Residual.

*Source.* Elaborated by the author.

### Validity of Other Variables

Scores on the APS-S were correlated with those obtained on the academic situations perceived Self-Efficacy scale and the semester weighted average to evidence divergent validity. Negative and statistically significant Pearson coefficients, with relatively large and small effect sizes, respectively (Gignac & Szodorai, 2016) (Table 5), were obtained.

**Table 5.**  
*Coefficient of Correlation between the APS-S, Self-Efficacy and Academic Performance*

	ASSPSS	AP
APS-S	-.319***	-.146***

*Note.* ASSPSS: Academic Situations Self-Efficacy, AP: Academic Performance

\*\*\* $p < .001$

*Source.* Elaborated by the author.

## Reliability Estimation

Given the ordinal nature of the APS-S items, the reliability of the scores was quantified using the ordinal alpha and ordinal omega coefficients (Zinbarg et al., 2005; Zumbo et al., 2007) and the obtained indices were .867 and .849, respectively, which could be valued as excellent (Ponterotto & Ruckdeschel, 2007).

## Equity Evidence

The factorial invariance analysis by sex was carried out to determine that both men and women tend to similarly interpret the test content, thus obtaining minimal changes in the CFI and RMSEA ( $\Delta CFI \leq .01$ ;  $\Delta RMSEA \leq .015$ ) at the configural, weak, strong and strict levels (Hu & Bentler, 2009; Chen, 2007). Consequently, if present, the difference in means between both sexes would correspond to those groups and not to the construct, i.e., the scores obtained on the APTS-S would be attributed to academic procrastination and not to sex (Hirschfeld & von Brachel, 2014) (Table 6).

**Table 6.**  
*Invariance Fit Indices of the APS-S Scale by Sex*

	$X^2$	$\Delta X^2$	$gl$	$\Delta gl$	$p$	$CFI$	$\Delta CFI$	$RMSEA$	$\Delta RMSEA$
Configural	37.75	---	10	---	***	.995	---	.040	---
Weak	52.48	14.66	14	4	***	.994	-.002	.039	-.001
Strong	87.61	39.09	18	4	***	.989	-.005	.045	.006
Strict	102.57	15.81	23	5	***	.987	-.002	.043	-.002

*Source.* Elaborated by the author.

## DISCUSSION

This instrumental study aimed to carry out the linguistic adaptation and obtain evidence of validity, reliability, and equity of the APS-S in university students in Lima.

To achieve this objective, it was linguistically adapted following The International Test Commission Guidelines recommendations (Muñiz et al., 2013), thus being the source language English and the target language Spanish. For this purpose, the APS-S was translated following

the back-translation method, resulting in the back-translated versions and the original version being conceptually and semantically equivalent. With the final translated version, a pilot test of the instrument was conducted in a group of 25 full-time undergraduate students from a university in Lima without finding any observations or comments from the participants that would result in changes in the items, the response options, or the instructions.

The evidence of validity of the content was obtained through expert criteria, finding 100% agreement on the adequacy of the translation of the reactants and Aiken's V values being higher than .70, as well as the limits inferior of the 95% confidence intervals (Charter, 2003; Napitupulu et al., 2018; Penfield & Giacobbi, 2004).

The descriptive analysis of the items evidenced univariate normality in all cases as they were in the range of +/- 2 in the skewness and kurtosis indices. Additionally, the item-test correlations were higher than .30, which agrees with that reported by McClusky (2001) (rit (.41; .73)) and Yockey (2016) (rit (.49 - .75)), demonstrating the homogeneity and adequacy of each reactant in its original language and the translated version (Nunnally & Bernstein, 1995).

As evidence of validity of the internal structure, the confirmatory factor analysis of the scale achieved adequate fit indices using the hypothesized measurement model (CFI = .994, TLI = .988, RMSEA = .038, SRMR = .014), with all five items obtaining standardized factor loadings higher than .50. The structure obtained coincides with the finding of one-dimensionality by Yockey (2016) using the principal component analysis.

Evidence of discriminant validity was obtained from the correlation of scores on the APS-S with the ASSPSS as a measure of self-efficacy, resulting in negative, statistically significant, and relatively large ( $r = -.319$ ;  $p < .001$ ), a coincident finding on both variables in university students in Lima (Alegre, 2013; Burgos-Torre & Salas-Blas, 2020; Pichen-Fernandez & Turpo, 2022). According to Farran (2004), this would imply that students' belief in their skills and talents contributes to preventing academic procrastination behavior. Additionally, the relationship between the APS-S and academic performance was inverse and statistically significant but small ( $r = -.146$ ;  $p < .001$ ) (Gignac & Szodorai, 2016), being the same significance and degree of effect size as reported by McClusky (2011) when correlating both variables ( $r = -.23$ ;  $p < .001$ ). In this regard, meta-analytic studies agree that the relationships between self-reported academic procrastination and academic performance are negative but weak (Balkis, 2011; Hen & Goroshit, 2014; Kim & Seo, 2015), and that the inconsistencies found among studies regarding the strength

of the relationship are due to the particularity of the indicator chosen to measure academic performance, and the effect of the participants' sociodemographic characteristics (Kim & Seo, 2015).

The reliability of the measurement was quantified using the ordinal alpha ( $\alpha_{ord} = .867$ ) and ordinal omega ( $\omega_{ord} = .849$ ) coefficients due to the ordinal nature of the items of the scale (Zinbarg et al., 2005; Zumbo et al., 2007), obtaining estimation values close to the internal consistency obtained by McClusky (2011) and Yockey (2016), and reporting a Cronbach's alpha of .87 in both cases, thus indicating that the APS-S delivers reliable scores, in spite of measurement errors (Nunnally & Bernstein, 1995).

In the factorial invariance analysis by sex, minimal changes were observed in the CFI and RMSEA ( $\Delta CFI \leq .01$ ;  $\Delta RMSEA \leq .015$ ) at the configural, weak, strong, and strict levels (Hu & Bentler, 2009; Chen, 2007), thus the scores obtained in the ATPS-S would be attributed to quantity in the academic procrastination construct and not to sex (Hirschfeld & von Brachel, 2014).

Even though it is necessary to conduct more research on the APS-S, the results of the current study demonstrate that this version of the McClusky scale has good reliability estimates, and validity and equity evidence based on a sample of 4,534 university students. According to the results of this research, the APS-S may be a good choice for researchers looking for a frugal and brief measure of academic procrastination to include in their studies.

## CONCLUSIONS

This instrumental study, which involved translation, application, and psychometric analysis of the APS-S, reports sources of validity of the content, internal structure, divergent type, and equity through judges' criterion, confirmatory factor analysis, correlation with other variables and measurement invariance, obtaining in all cases appropriate indices for the proposed version from the scores obtained from the participants. For the estimation of measurement errors, the ordinal alpha and ordinal omega coefficients calculated would indicate that this version of the APS-S delivers reliable scores.

This study, like any other, has limitations considering that it is based on self-reports, mediated by an online form, and the participation of volunteers from a university, which would

restrict strict control in the application process, employing a non-probabilistic sample and not considering students from other institutions or under different management. These characteristics, as a whole, could limit the sample representativeness compared to the population of university students in Lima and the generalizability of the findings. In addition, this research did not provide sources of convergent validity based on the correlation of the APS-S with other measures of Academic Procrastination, as evidenced by Yockey (2016) with the Tuckman ( $r = .79$ ,  $p < .001$ ) and PASS ( $r = .54$ ,  $p < .001$ ) scales. Therefore, future research should consider such measures to provide other sources of validity evidence. In addition, it is worth mentioning that the participants came from a private university in Lima, so it is suggested that other validation studies involve as participants students from universities under different types of management and from other regions of the country, which would favor factorial invariance analysis, and thus provide other equity evidence.

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## APPENDICE

### ACADEMIC PROCRASTINATION SCALE – SHORT VERSION (APS-S)

Sex: *(Male)* *(Female)*

Age: ..... years old

**Instructions:**

For each of the statements below, select the option that best matches your experience as a student.

		<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither agree nor disagrees</i>	<i>Agree</i>	<i>Strongly agree</i>
<b>APS-S 1</b>	I needlessly delay finishing jobs, even when they are important.					
<b>APS-S2</b>	I postpone starting in on things I don't like to do					
<b>APS-S3</b>	When I have a deadline, I wait until the last minute					
<b>APS-S4</b>	I keep putting off improving my work habits.					
<b>APS-S5</b>	I get right to work, even on chores that I find unpleasant.					