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Conflict of interest

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# Psychometric properties for the General Procrastination Scale (GPS) Brazilian version

## *Propriedades psicométricas da General Procrastination Scale (GPS) Versão Brasileira*

Guilherme Chirinéa<sup>1</sup> , André Pereira Gonçalves<sup>1</sup> , Villena Louise Meira Costa Lima<sup>1</sup> , Ana Luísa Menezes Santos<sup>1</sup> , Cecília Pires de Almeida<sup>1</sup> , Pragya Lodha<sup>2</sup> 

<sup>1</sup> Universidade Federal da Bahia, Instituto Multidisciplinar em Saúde. Vitória da Conquista, BA, Brasil. Correspondence to: A. P. GONÇALVES. E-mail: <andregoncalvespsi@gmail.com>.

<sup>2</sup> SNDT University, Post Graduate Psychology. Mumbai, Maharashtra, India.

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### Abstract

#### Objective

Procrastination has been the subject of studies due to its impact on people's lives, work performance, satisfaction, and mental health. Measuring this construct is necessary to understand daily life's direct and indirect effects. The objective of this study was to verify the evidence of validity and reliability of the General Procrastination Scale for the Brazilian context as a method of investigating the phenomenon.

#### Method

Data were collected from 421 adults, aged between 18 and 64 years and with complete primary education, based on the application of a self-report measurement questionnaire.

#### Results

The results indicated a unifactorial structure and expected correlations with the external measures.

#### Conclusion

These results demonstrate the suitability of the scale for measuring procrastination in a Brazilian sample, which places this scale as a possibility of use in research to measure this construct.

**Keywords:** Factor analysis, statistical; Procrastination; Psychometrics.

### Resumo

#### Objetivo

A procrastinação tem sido alvo de estudos devido ao impacto que traz na vida das pessoas, rendimento no trabalho, satisfação e na saúde mental. Mensurar este construto é necessário para compreender os impactos diretos e indiretos no cotidiano. O objetivo deste estudo foi verificar as evidências de validade e fidedignidade da General Procrastination Scale para o contexto brasileiro como método de investigação do fenômeno.

**Método**

Foi realizada uma coleta de dados em 421 adultos, com idades entre 18 e 64 anos e ensino fundamental completo, a partir da aplicação de um questionário de medida de autorrelato.

**Resultados**

Os resultados indicaram estrutura unifatorial e correlações esperadas com as medidas externas.

**Conclusão**

Estes resultados indicam adequação da escala para mensuração da procrastinação em uma amostra brasileira, o que coloca esta escala como uma possibilidade de uso em pesquisas para mensuração deste construto.

**Palavras-chave:** Análise fatorial; Procrastinação; Psicometria.

Procrastination can be described as the voluntary delay or postponement of tasks that have set deadlines, which, if not met, will have negative consequences (e.g., a decrease in academic or work performance and increased stress; Klingsieck, 2013; Krispenz et al., 2019). Procrastination involves engaging in more pleasurable or less important tasks instead of those that should be done with greater urgency, such as delaying the submission of an academic paper or postponing the start of a project at work (Lodha et al., 2019). This phenomenon can be understood as multifaceted, explained by affective components (preference for certain activities), cognitive components (dysfunctional beliefs that result in task delay), and behavioral components (the degree of task aversiveness; Kim et al., 2017).

The literature has linked some psychological factors to an increase in procrastination behavior, such as low self-regulation capacity, high impulsivity, aversion to specific tasks, distracting stimuli in the environment, and dysfunctional beliefs (Correia & Moura Júnior, 2017; Gustavson et al., 2014; Steel, 2007). Another variable that has been related to procrastination is personality. The results of a meta-analysis indicate that individuals with higher levels of neuroticism and emotional instability, for example, tend to present higher levels of procrastination in academic tasks (Kim et al., 2017). Finally, sociodemographic factors are also related to the phenomenon. For example, procrastination is more common in men (Steel & Ferrari, 2013), and students are more likely to exhibit procrastination behavior when compared to other groups, such as full-time workers, part-time workers, business executives, domestic workers, freelancers, and the unemployed (Nomura & Ferrari, 2021).

Procrastination is associated with several adverse outcomes for the individual, such as poor performance in tasks, lower satisfaction in family relationships, lower sleep quality, problematic smartphone use, and more incredible difficulty controlling excessive internet use (Geng et al., 2021; Reinecke et al., 2018; Rozgonjuk et al., 2018). Procrastination behavior is also negatively related to work performance, which means that engaging in personal activities unrelated to the worker's duties hinders the quantity and quality of work produced (Metin et al., 2018; Steel et al., 2022). In addition, higher rates of procrastination are associated with poorer mental health and lower levels of mental health help-seeking (Kim et al., 2017; Stead et al., 2010). Studies on the relationship between procrastination and mental health have examined poorer health and well-being indices associated with procrastination behavior (Gadosey et al., 2021; Sirois & Pychyl, 2013). Constructs such as depression and stress are positively related to procrastination (Beutel et al., 2016).

Given the impacts of procrastination on people's health and well-being, it is necessary to find ways to measure this construct so that professionals can create coping strategies. The General Procrastination Scale (GPS, Lodha, 2019) is one available test that measures procrastination. This scale evaluates procrastination based on a self-report measure of 23 items. These items are

responded to on a 5-point Likert scale, and their sum generates a Procrastination Quotient (PQ). The development of procrastination measures that consider aspects related to specific social and cultural contexts (such as the Brazilian one) expands scientific production in the field and favors the creation of coping strategies for procrastination behavior (Costa et al., 2022).

Thus, this study aims to verify the evidence for the validity and reliability of the GPS in the Brazilian context. Validity evidence will be investigated based on internal structure and relationships with external variables. It is expected that the GPS will present favorable validity evidence for its use in the Brazilian population, that there will be a positive relationship between general procrastination and academic procrastination variables (Kim & Seo, 2015), and a negative relationship between procrastination and good mental health (Beutel et al., 2016; Sirois & Pychyl, 2013; Stead et al., 2010), work engagement, and job satisfaction (Metin et al., 2018; Steel et al., 2022).

## Method

### Participants

Using the cross-sectional study model, we collected the sample population through convenience sampling. The exclusion criteria for the sample was a population under 18 years of age with incomplete primary education. The total number of participants was 421 adults between 18 and 64 ( $M = 29.7$ ;  $SD = 11.1$ ). The sample was mostly white (43.2%), women (64.3%), singles (67.9%), university students (44.1%), and residents of the northeast region of Brazil (77.1%). The age group of the two participants varied between 18 and 64 years, with 37.5% reporting that they had engaged in psychological treatment and 18.6% in psychiatric treatment in the last six months. In addition, 22.8% of the two participants reported taking or having taken some psychiatric medication in the last six months, 23.9% had a mental disorder diagnosis, and 12.5% attempted suicide. Also, 26.1% were exclusively students, 28.9% did not have individual income, and 29.2% looked for ways to grow in the profession.

### Measures

#### ***The General Procrastination Scale (GPS, Lodha et al., 2019)***

The GPS is a procrastination measure in four domains: academic context, work environment, medical, and civic responsibilities. It is made up of 23 items (e.g., I try to avoid tasks in which I have little or no interest; I say goodbye to tasks that are necessary for me) that must be answered on a five-point scale in which 1 corresponds to "Never" and 5 "Always". Lodha et al. (2019) indicate the psychometric quality of the scale.

#### ***Generalized Anxiety Disorder (GAD-7, Spitzer et al., 2006)***

The GAD-7 was designed for primary care patients. The GAD-7 consists of a self-report questionnaire that identifies generalized anxiety disorder symptoms. Subjects are asked if they were bothered by anxiety-related problems over the past two weeks by answering seven items on a 4-point scale. Studies indicate satisfactory psychometric qualities for the scale (Gonçalves et al., 2023; Spitzer et al., 2006; Sousa et al., 2015).

### ***Utrecht Work Engagement Scale (UWES-9, Ferreira et al., 2016)***

The UWES-9 is an instrument that measures non-work engagement based on the three-dimensional model of non-work engagement by Schaufeli et al. (2002). It is a reduced version of UWES-17, made up of 9 items that describe the frequency with which the feelings of vigor, dedication, and absorption in the job were noted by the participants (e.g., “In my job, I feel full (chemo) of energy”). The items must be answered on a seven-point scale in which 1 corresponds to “Never,” and 7 corresponds to “Always”. Ferreira et al. (2016) indicated good psychometric properties of the scale.

### ***Work Satisfaction Scale – Reduced (EST-R, Siqueira, 2008)***

The EST-R is an instrument that measures job satisfaction levels based on five dimensions: satisfaction with work colleagues, satisfaction with salary, satisfaction with the chef, satisfaction with the nature of work, and satisfaction with promotions. It corresponds to the shortened version of the EST and is made up of 15 items (e.g., My current job does not feel like the spirit of collaboration between my work colleagues.) that must be answered on a seven-point scale in which 1 corresponds to “Totally unsatisfied” and 7 corresponds to “Totally satisfied”. Siqueira (2008) indicated adequate psychometric properties of the scale.

### ***Academic Procrastination Scale–Short Form (APS-SF, Chakraborty & Chechi, 2019)***

The APS-SF is an instrument that measures procrastination in the academic environment, adapted from McCloskey’s 25-item scale (2011). It is made up of five items (e.g., “I put off projects until the last minute.”; “I know I should work on school work, but I just do not do it.”) that correspond to the numbers 2, 4, 7, 17 and 23 of the original scale. The items must be answered on a five-point scale in which 1 corresponds to “I agree,” and 5 corresponds to “I disagree”. Studies indicate good psychometric qualities for the scale (Balkis & Duru, 2022; Chakraborty & Chechi, 2019; Yockey, 2016).

## **Procedures**

The research was approved by a Committee of Ethics in Research (CAAE: 63028822.5.0000.5556; Federal University of Bahia). People from the Community sample were recruited via online social networks, and the administration were online using Google Forms. All participants received detailed information concerning the aims of the study and signed an informed consent to use the data.

## **Data Analysis**

Descriptive statistics were investigated, as well as inferential analyses. Subsequently, the instrument’s factor structure was analyzed using exploratory factor analysis to verify the evidence validity based on the internal structure. The following model fit indices were used: Confirmatory Fit Index (CFI > 0.90), Tucker-Lewis Index (TLI > 0.90), e Root Mean Square Error of Approximation (RMSEA < 0.05; Hu & Bentler, 1999). In addition to the fit indices, we used the possibility of model interpretation to define the structure of the scale. As the scale has negative and positive items, we controlled the acquiescence using Random Intercept. We verify the factor’s internal consistency analysis using Cronbach’s alpha and McDonald’s omega. Indices above 0.70 are expected. Finally, Pearson’s correlation analysis was conducted between the GPS and external measure scores to verify

external validity evidence. The correlations were interpreted according to the values proposed by Cohen (1992), in which values around 0.10 to 0.29 are considered low, around 0.30 to 0.49 moderate, and above 0.50 vital.

## Results

Different internal structures were tested for the GPS scale, with the unifactorial structure being the most appropriate considering the fit indices and the interpretability of the retrieved grouping. The factorial structure controlling acquiescence by the random intercept method was superior to the model without control. The fit indices for this model with acquiescence control were: CFI = 0.918; TLI = 0.907; RMSEA = 0.072, whereas for the model without acquiescence control, they were: CFI = 0.856; TLI = 0.837; RMSEA = 0.095. The factor loadings are presented in Table 1.

**Table 1**  
*Factor structure of the General Procrastination Scale (GPS)*

Conteúdo do Item	Cod.Item	Carga fatorial
I try to avoid tasks in which I have little or no interest	GPS01	0.52
I delay tasks that are necessary for me	GPS02	0.73
I start working on a task immediately as soon as it is given to me	GPS05	-0.78
I take a long time to deal with medical issues related to my health	GPS07	0.35
I prefer to submit work before the deadline	GPS08	-0.79
I delay starting work on a project	GPS09	0.81
I delay going out with my friends for a movie, dinner, or similar plans	GPS10	0.42
I postpone tasks until they become urgent	GPS11	0.99
When I make an action plan, I follow it	GPS12	-0.60
I think a lot about the things I would like to do but end up not doing them	GPS13	0.58
I usually do tasks or projects at the last minute	GPS14	0.97
I put off my tasks when something more interesting comes up	GPS15	0.72
I prefer to plan tasks and events in advance	GPS16	-0.59
I unnecessarily delay completing tasks, even when they are important	GPS17	0.86
I only finish my tasks when I am pressured to do so	GPS19	0.70
I arrive late to work or college	GPS20	0.54
I try to avoid any buildup of work	GPS21	-0.70
I delay tasks that bother me	GPS22	0.77
A		0.92

After the first round of analysis, five items with loads lower than 0.30 were excluded. Therefore, Brazil's final version of the GPS remained with 18 items. Reliability was verified by alpha, which indicated a value considered good. Therefore, it can be understood that a general latent variable of procrastination explains the GPS items. Table 2 shows the GPS correlations with external measurements.

**Table 2**  
*Correlations of the General Procrastination Scale (GPS) with External Variables*

Measure	1	2	3	4	5	6	7	8	9
GPS	-0.57*	-0.31*	-0.13*	-0.17*	-0.13*	-0.19*	-0.18*	0.34*	0.36*

Note: \* $p < 0.01$ ; 1: Academic procrastination; 2: Engagement at work; 3: Satisfaction with leadership; 4: Satisfaction with colleagues; 5: Satisfaction with salary; 6: Satisfaction with promotion; 7: Satisfaction with the nature of the work; 8: Anxiety; 9: Psychiatric diagnosis.

Correlations between GPS and external measures were in the expected direction. Procrastination measured by GPS correlated negatively with a strong magnitude with academic procrastination. It is necessary to indicate that on the academic procrastination scale, the lower the score, the higher the level of procrastination. Correlations with job satisfaction were all in the expected direction; however, they were low magnitude. Finally, correlations with anxiety and psychiatric diagnosis were also in the expected direction with moderate magnitude.

## Discussion

This study aimed to verify the validity evidence of the GPS in the Brazilian context. Overall, the results indicate that the unifactorial model is suitable for understanding the scale's internal structure with good internal consistency. Our results support validity evidence of the GPS for this Brazilian sample.

The unidimensional model with acquiescence control was the most harmonious model among acceptable fit indices and the possibility of interpreting the grouping. It was necessary to exclude five items due to their low contribution to the factor, and the final version adopted was composed of eighteen items. The acquiescence control model worked better when compared to the model without control, even on an unbalanced scale, which is consistent with what the literature points out (Martins et al., 2023). Controlling the influence of acquiescence is necessary since this bias can compromise the psychometric characteristics of a scale (Valentini, 2017; Zanon et al., 2018) because it tends to inflate correlations of items written in the same direction and suppress correlations of opposing items (Danner et al., 2015; Lechner & Rammstedt, 2015). The correlations with external measures were in the expected and hypothesized directions. Procrastination was positively correlated with anxiety and psychiatric diagnoses. These results indicate that individuals who procrastinate more have poorer mental health. Our results are consistent with the findings in the literature pointing out that avoiding demands due to fear of failure is a common characteristic of anxiety disorders, and postponing activities and commitments can generate high levels of stress and harm individuals' mental health (Beutel et al., 2016; Johansson et al., 2023; Oguchi et al., 2023). In addition, the behavior of procrastination includes delay and postponement in dealing with medical and health issues, which also affects the search for treatment in cases of psychiatric diagnosis and implies a worse prognosis in cases of disorders (Stead et al., 2010).

Regarding work engagement and satisfaction, we found a negative and low-magnitude correlation with procrastination, similar to the results reported by other studies. Nevertheless, it is possible that behaviors such as task delivery avoidance and delay, characteristic of procrastination, may influence the completion of activities required by the work environment (Metin et al., 2019). In addition, procrastinating behavior produces negative feelings and discomfort, which can affect a positive work experience and compromise the quality of the individual's bond with the workplace (Wang et al., 2021).

Finally, it was found that higher levels of academic procrastination are related to higher levels of general procrastination. Although the raw result found refers to a negative correlation between the GPS scale results and the APS-SF, the latter has an inverted score, so lower scores indicate higher levels of academic procrastination. Therefore, the results align with what is found in the literature (Balkis & Duru, 2022; Soares et al., 2022; Yockey, 2016).

The presented results should be observed considering some limitations. First, the sample selection method adopted was convenience sampling, not random, without specific access to a group

of procrastinators. In addition, there was a gender imbalance in the sample, with a predominance of women compared to men, which may influence the obtained results. Future studies may consider these limitations and seek to overcome them.

Based on the findings of this study, we can consider that we achieved the objective of verifying the validity of evidence based on the internal and external structure of the GPS in the Brazilian context. In the end, the GPS for the Brazilian context has eighteen items, with five initial items excluded for having a factor loading of less than 0.30. In addition, we found external validity through significant correlations with academic procrastination, job satisfaction, anxiety, and psychiatric diagnosis. Future studies may use other tests to expand our results and conduct studies with a sample composed of previously identified procrastinators.

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## Contributors

Conceptualization: A. P. GONÇALVES. Formal analysis: V. L. M. C. LIMA; A. L. M. SANTOS, and C. P. ALMEIDA. Methodology: A. P. GONÇALVES. Project administration: G. CHIRINÉA and A. P. GONÇALVES. Resources: P. LODHA. Writing – original draft: V. L. M. C. L. LIMA, A. L. M. SANTOS, and C. P. ALMEIDA. Writing – review and editing: G. CHIRINÉA and A. P. GONÇALVES.