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Validation of a French version of the Pure Procrastination Scale (PPS)

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Abstract

Procrastination is a widespread phenomenon that affects everyone's day-to-day life and interferes with the clinical treatment of several psychopathological states. To assess this construct, Steel (2010) developed the Pure Procrastination Scale (PPS), a short scale intended to capture the general notion of dysfunctional delay. The aim of the current study was to present a French version of this questionnaire. To this end, the 12 items of the PPS were translated into French and data were collected from an online survey in a sample of 245 French-speaking individuals from the general population. The results revealed that one item had problematic face validity; it was therefore removed. Exploratory and confirmatory analyses performed on the resulting 11-item version of the French PPS indicated that the scale was composed of two factors ("voluntary delay" and "observed delay") depending on a common, higher-order construct ("general procrastination"). Good internal consistency and test–retest reliability were found. External validity was supported by specific relationships with measures of personality traits, impulsivity, and subjective well-being. The French PPS therefore presents satisfactory psychometric properties and may be considered a reliable and valid instrument for research, teaching and clinical practice.

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1. Introduction

Procrastination, or to "voluntarily delay an intended course of action despite expecting to be worse off for the delay" [1], is conceptualized as a self-regulatory failure [1–6], representative of low consciousness and high impulsiveness (more specifically, high lack of perseverance, that is, difficulties remaining focused on a task that may be boring or difficult) [7]. A widespread phenomenon that affects everyone's day-to-day life, procrastination has been associated with negative consequences for performance, financial and career success [8], physical health [9], mood and self-esteem [10], subjective well-being [11], and the therapeutic process in several psychopathological states [4].

However, there is still no clear consensus on how procrastination should be measured, as reflected in the wide variety of self-report measures of procrastination that exist. In

this context, Steel [12] conducted an online survey including three key procrastination scales (Adult Inventory of Procrastination, AIP; Decisional Procrastination Questionnaire, DPQ; General Procrastination Scale, GPS) [13–15] to highlight the core items of procrastination. Factor analyses (exploratory and confirmatory) revealed one factor that consistently explained most of the variance in the three scales and that contained items from all of them. On the basis of the top-loading items of this factor, a 12-item scale called the Pure Procrastination Scale (PPS) was developed. This short scale was intended to capture dysfunctional delay and showed high internal consistency ($\alpha = .92$). In addition, it showed better convergent validity with another measure of procrastination (Irrational Procrastination Scale, IPS) [16], a measure of impulsivity (Susceptibility to Temptation Scale, STS) [16], and a measure of subjective well-being (Satisfaction with Life Scale, SWLS) [17] than the scales upon which it was based (i.e., AIP, DPQ, and GPS). However, the PPS's factor structure was not evaluated further.

There currently are no validated self-report measures of procrastination in French, although accurate measures are strongly needed to further improve the understanding, prevention and treatment of procrastination. The aim of the present study was thus to present a French version of the PPS to

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researchers, teachers and clinicians. More specifically, we translated the 12 items of the PPS into French and evaluated its factor structure, internal consistency and test–retest reliability. We also evaluated the external validity of the French version of the PPS by examining its relationships with measures of personality traits, facets of impulsivity and subjective well-being. A high level of procrastination was expected to be specifically related to low conscientiousness (one of the dimensions of personality), lack of perseverance (one of the facets of impulsivity), and low subjective well-being, as previously demonstrated in the literature [2,7,11,12].

2. Method

2.1. Participants and procedure

A total of 245 French-speaking individuals from the general population (154 females and 91 males) participated in an online survey. The mean age of the sample was 34.39 years ($SD = 9.54$, range = 18–69) and the mean number of years of education was 17.79 years ($SD = 3.00$, range = 9–26); 78% were employed, 16% students, 3% unemployed, and 3% retired. Participants were recruited by email through personal contacts. The email contained information on the purpose of the study and the consent terms, as well as a link to the survey. The survey included personal information (socio-demographic data), a French version of the Pure Procrastination Scale (PPS) [12], and three supplementary questionnaires assessing personality traits (short French version of the NEO-PI-R, NEO-60) [18], impulsivity (short French version of the UPPS-P Impulsive Behavior Scale, short UPPS-P) [19], and subjective well-being (Satisfaction with Life Scale, SWLS) [17,20]. All participants ($n = 245$) provided informed, voluntary consent and filled out the French version of the PPS. A subgroup of 225 participants also filled out the three supplementary questionnaires to determine the external validity of the scale; of those 225 participants, 177 completed the French PPS twice (with an interval of one week) to establish test–retest stability. The study was approved by the Ethics Committee of the Faculty of Psychology of the University of Geneva.

2.2. Instruments

The French version of the PPS [12] was developed as follows: (a) The authors of this study translated the 12 items of the original English version of the PPS into French; (b) an English-French bilingual translated the French version back into English; and (c) discrepancies between the original PPS and the back-translation were discussed between the authors and the back-translator until a satisfactory solution was found. The 12 items of the PPS evaluate procrastination conceptualized as a dysfunctional delay (e.g., “I am continually saying I’ll do it tomorrow”; “I delay making decisions until it’s too late”) and are to be answered on a 5-point Likert scale (1 = “very seldom or not true of me”; 2 = “seldom true of me”; 3 = “sometimes true of me”; 4 = “often true of me”; 5 = “very often true of true of me”).

The NEO-60 [18] is a 60-item questionnaire that assesses the five main dimensions of personality (12 items per dimension): neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Answers are given on a Likert scale ranging from 0 (“strongly disagree”) to 4 (“strongly agree”). The UPPS-P [19] is a 20-item questionnaire that assesses five different facets of impulsivity (four items per dimension): negative urgency, positive urgency, (lack of) premeditation, (lack of) perseverance, and sensation seeking. Answers are given on a Likert scale ranging from 1 (“I agree strongly”) to 4 (“I disagree strongly”). The SWLS [20] assesses subjective well-being and is composed of five items rated on a Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”).

3. Results

3.1. Factor structure

The data set ($n = 245$) was first divided through random selection to allow two independent factor analysis techniques: exploratory and confirmatory.

Out of the first data set of 123 participants retained for the exploratory factor analysis (EFA), 3 had one missing value. Pairwise deletion for missing data was used throughout the analyses (as there were few and only randomly missing data). The item-total correlations for the 12 items of the French PPS ranged from .39 to .78, with a mean of .44. One item, the 12th (“Putting things off till the last minute has cost me money in the past”) was below the mean, suggesting that this item did not measure the same construct as the other items. Moreover, an examination of the score distribution of this item revealed a floor effect (80% of participants responding 1, “very seldom or not true of me” or 2, “seldom true of me” to the 5-point scale for this item). Consequently, we decided to remove item 12, assuming that this would yield a scale with better face validity. Univariate normality was then explored for the remaining 11 items of the French PPS by calculating the skewness and kurtosis of each item. The results showed that skewness ranged from $-.24$ to $.94$ and kurtosis from -1.05 to $.20$, indicating no strong deviation from normality (absolute values are considered to be extreme for skewness greater than 3 and kurtosis greater than 20) [21]. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy [22] and Bartlett’s test of sphericity [23] indicated that the 11 items were adequate for factor analysis (KMO = .86, Bartlett’s $\chi^2 = 801.08$, $p < .0001$; a KMO between .50 and 1 and a significant Bartlett’s test of sphericity are considered appropriate for factor analysis) [24].

In order to determine how many factors to retain in factor analysis, we used Velicer’s minimum average partial (MAP) test [25], which clearly suggested a two-factor structure, as well as a parallel analysis [26], which also suggested a two-factor structure (the first two eigenvalues of a principal component analysis, 5.65 and 1.52, respectively, were situated above the eigenvalues extracted from random samples). Consequently, the correlation matrix was analyzed with an

EFA computed with two factors, using the maximum likelihood method (as the data were normally distributed), and an oblique rotation (assuming that the factors were correlated). This EFA explained 65% of the total variance (factor 1 = 51% and factor 2 = 14%) and all loadings were close to or greater than .40. Based on a factor loading cutoff of .30 [27], factor 1 included items 1–8, and factor 2 items 9–11 (Table 1). Factor 1 was labeled “voluntary delay”; items loading on this factor relate to the notion of voluntarily putting off things or decisions. Factor 2 was labeled “observed delay”; items loading on this factor relate to the observation of running out of time, not getting things done on time, or not being very good at meeting deadlines, which does not necessarily imply the notion of voluntarily delaying. “Voluntary delay” and “observed delay” were moderately related ($r = .47, p < .001$).

In the second data set of 122 participants retained for the confirmatory factor analysis (CFA), there were no missing values. Skewness ranged from -0.22 to 1.28 and kurtosis from -1.08 to 1.18 , indicating no strong deviation from normality. We tested a higher-order factor model (Fig. 1) in which two factors (i.e., “voluntary delay” and “observed delay”) depended on a common, higher-order construct labeled “general procrastination,” with a CFA using the maximum likelihood method. This model was chosen because its structure was able to account for the moderate relationship between “voluntary delay” and “observed delay.” We also tested two alternative factor models: a two-independent-factors model and a one-factor model. Model fits were evaluated with the root mean square error of approximation (RMSEA) [28] and the standardized root mean square residual (SRMR) [29], two indices claimed to be less sensitive to small misspecifications of the factor structure [30]. We also report the comparative fit index (CFI) [31], a commonly used fit index. The combination of these indices indicated an acceptable fit for the

higher-order factor model, with an RMSEA equal to .08 and an SRMR equal to .06 (an RMSEA between .05 and .08 and an SRMR between .05 and .10 indicate an acceptable fit) [32], as well as a CFI equal to .94 (a value above .90 corresponds to an acceptable fit) [27]. By contrast, the results showed that the two-independent-factors model fits the data poorly (RMSEA = .10, SRMR = .17, CFI = .90), as does the one-factor model (RMSEA = .14, SRMR = .09, CFI = .81).

3.2. Test–retest reliability and construct validity

Among the 177 participants who completed the French PPS twice, 3 had one missing value at time t , and 2 one missing value at time $t+7$ days. Pearson correlations between the two sessions were $r = .87$ ($p < .001$) for PPS-Tot, $r = .86$ ($p < .001$) for PPS-F1, and $r = .81$ ($p < .001$) for PPS-F2, which emphasized strong test–retest reliability. Among the 225 participants who filled out the three supplementary questionnaires in addition to the French version of the PPS, 3 had one missing value for the French PPS. For the NEO-60, 1 participant had two missing values and 7 participants one missing value. For the UPPS-P, 7 participants had one missing value. There was no missing value for the SWLS. Means, standard deviations, and internal consistency coefficients (Cronbach’s α) of the various questionnaires (total and/or subscale scores) are presented in Table 2. The Cronbach’s α ranged from .77 to .90, indicating acceptable to good internal consistency for these questionnaires (a value above .70 is acceptable, above .80, good, and above .90, excellent) [33].

To evaluate the external validity of the French version of the PPS, Pearson correlations were computed between the scores of the French PPS (the total score and the subscale scores for factors 1 and 2 were retained on the basis of the higher-order factor model), the subscale scores of the NEO-60, the subscale scores of the UPPS-P, and the total score of the SWLS (Table 3). We also computed the true score correlation (r_{true}) by taking the reliability of the scales into account (Table 3). Concerning the correlations between the total score on the French PPS (PPS-Tot) and the external validity measures, conscientiousness was the strongest dimension of personality related to PPS-Tot and lack of perseverance the strongest facet of impulsivity. A significant correlation was also found between subjective well-being and PPS-Tot. Concerning the correlations computed between the subscale scores of factors 1 (PPS-F1) and 2 of the French PPS (PPS-F2) and the external validity measures, a significant correlation was found between UPPS-P lack of premeditation and PPS-F1 but not with PPS-F2. On the other hand, a significant correlation was found between UPPS-P sensation seeking and PPS-F2 but not with PPS-F1.

4. Discussion

The aim of this study was to validate a French version of the PPS and thus provide French-speaking researchers, teachers and clinicians with a self-report measure of procrastination.

Table 1
Loadings of the exploratory factor analysis.

#	Item	Factor 1	Factor 2
1	I delay making decisions until it’s too late	.36	.15
2	Even after I make a decision I delay acting upon it	.65	.08
3	I waste a lot of time on trivial matters before getting to the final decisions	.70	.08
4	In preparation for some deadlines, I often waste time by doing other things	.67	.15
5	Even jobs that require little else except sitting down and doing them, I find that they seldom get done for days	.89	−.07
6	I often find myself performing tasks that I had intended to do days before	.80	.10
7	I am continually saying “I’ll do it tomorrow”	.87	−.11
8	I generally delay before starting on work I have to do	.85	−.07
9	I find myself running out of time	.17	.52
10	I don’t get things done on time	−.09	1.04
11	I am not very good at meeting deadlines	.06	.70

Values greater than .30 are in bold.

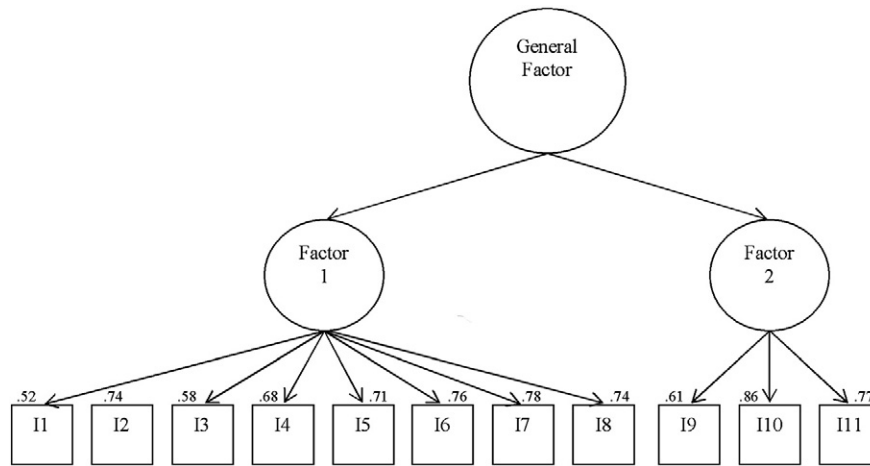


Fig. 1. Higher-order factor model in which factors 1 and 2 depend on a common, higher-order construct. Circles reflect latent variables; squares, manifest variables; arrows, factor loadings. All factor loadings are statistically significant at $p < .001$.

Item level, factor structure, internal consistency, test–retest reliability and external validity were examined.

Item-level analysis of the 12 translated items of the PPS indicated that item 12 (“Putting things off till the last minute has cost me money in the past”) did not measure the same construct as the other items. Indeed, while items 1–11 evaluate the general notion of dysfunctional delay, item 12 seems to capture something more specific (i.e., the financial consequences of the delay) and was under-represented in our sample. This item was therefore removed.

EFA indicated that the resulting 11-item version of the French PPS was two-dimensional. CFA showed that a higher-order factor model fit the data, whereas a two-independent-factors model and a one-factor model did not. This implies that the 11-item version of the French PPS is composed of two

procrastination-related factors (“voluntary delay” and “observed delay”), which depend on a common, higher-order construct of procrastination (“general procrastination”). “Voluntary delay” (i.e., factor 1) relates to the notion of voluntarily putting off actions or decisions and “observed delay” (i.e., factor 2) to the observation of running out of time, not getting things done on time, or not being very good at meeting deadlines, which does not necessarily imply the notion of voluntarily delaying.

These results suggest that the measurement of procrastination should focus on the distinction between two procrastination dimensions rather than one dimension. This is in accordance with some earlier authors who conceptualized procrastination as a multidimensional rather than a one-dimensional construct [34]. However, these results also suggest that the two procrastination dimensions are moderately related to each other and depend on a more general construct of procrastination. This is in line with Steel’s statement that the PPS (although he did not strictly evaluate its factor structure) reflects a general procrastination factor consistent with the notion of dysfunctional delay [12].

The internal consistency of the various scales and test–retest reliability indices were good. Specific relationships were highlighted between the total score on the French PPS and measures of personality traits, impulsivity, and subjective well-being. Low conscientiousness, lack of perseverance and low subjective well-being were closely related to a high level of “general procrastination” (i.e., total score), as previously demonstrated in the literature [2,7,11,12]. These relationships indicate that the French PPS possesses good external validity. In addition, relevant links emerged between the subscale scores of the French PPS and the external validity measures. More specifically, “voluntary delay” (i.e., subscale score of factor 1) was specifically related to greater lack of premeditation (i.e., tendency not to take into account the consequences of an act before engaging in that act) and “observed delay” (i.e., subscale score of factor 2) to higher sensation seeking (i.e., tendency to enjoy and pursue activities

Table 2
Means, standard deviations, and Cronbach’s α of questionnaires.

	Mean	SD	α
PPS			
Total	2.66	.75	.89
Factor 1	2.77	.82	.89
Factor 2	2.36	.88	.79
NEO-60			
Neuroticism	1.96	.75	.90
Extraversion	2.58	.56	.81
Openness to experience	2.64	.60	.82
Agreeableness	2.50	.55	.78
Conscientiousness	2.77	.54	.84
UPPS-P			
Negative urgency	2.16	.67	.85
Positive urgency	2.49	.58	.77
Lack of premeditation	1.94	.05	.81
Lack of perseverance	1.69	.51	.84
Sensation seeking	2.48	.48	.85
SWLS	5.04	1.29	.86

PPS = Pure Procrastination Scale; NEO-60 = short French version of the NEO-PI-R; UPPS-P = short French version of the UPPS-P Impulsive Behavior Scale; SWLS = Satisfaction With Life Scale.

Table 3

Observed and true score correlations between external validity measures and PPS scores.

	PPS-Tot			PPS-F1			PPS-F2		
	<i>r</i>	(95% CI)	<i>r</i> _{true}	<i>r</i>	(95% CI)	<i>r</i> _{true}	<i>r</i>	(95% CI)	<i>r</i> _{true}
NEO-60									
Neuroticism	.38*	(.26 .48)	.42*	.38*	(.26 .48)	.42*	.24*	(.11 .36)	.28*
Extraversion	-.08	(-.21 .05)	-.09	-.06	(-.19 .07)	-.07	-.10	(-.22 .04)	-.11
Openness to experience	.23*	(.11 .35)	.26*	.21*	(.08 .33)	.24*	.20*	(.07 .32)	.24*
Agreeableness	-.22*	(-.34 -.09)	-.24*	-.20*	(-.32 -.07)	-.22*	-.17*	(-.29 -.04)	-.20*
Conscientiousness	-.61*	(-.68 -.52)	-.68*	-.59*	(-.67 -.49)	-.65*	-.43*	(-.53 -.32)	-.51*
UPPS-P									
Negative urgency	.25*	(.12 .37)	.30*	.22*	(.10 .34)	.27*	.21*	(.08 .33)	.27*
Positive urgency	.21*	(.09 .34)	.26*	.21*	(.08 .33)	.25*	.15*	(.02 .28)	.19*
Lack of premeditation	.21*	(.08 .33)	.25*	.21*	(.08 .33)	.26*	.12	(-.01 .25)	.16
Lack of perseverance	.37*	(.25 .48)	.45*	.34*	(.22 .45)	.41*	.31*	(.19 .43)	.40*
Sensation seeking	.11	(-.02 .24)	.14	.07	(-.06 .20)	.08	.18*	(.05 .30)	.23*
SWLS	-.23*	(-.35 -.11)	-.27*	-.23*	(-.35 -.11)	-.27*	-.15*	(-.28 -.02)	-.18*

PPS = Pure Procrastination Scale; NEO-60 = short French version of the NEO-PI-R; UPPS-P = short French version of the UPPS-P Impulsive Behavior Scale; SWLS = Satisfaction With Life Scale; *r*_{true} = correlation corrected for measurement error.

* 0 not included in the 95% confidence interval (CI).

that are exciting and openness to trying new experiences). In other words, voluntarily putting off actions or decisions may reflect a preference to act on the spur of the moment, disregarding the longer-term consequences of delaying. On the other hand, running out of time, not getting things done on time, or not being very good at meeting deadlines may rather arise out of a preference to pursue stimulating experiences instead of accomplishing the task at hand. This suggests that each PPS subscale refers to a specific, distinct content. It should be noted here that the relationship between sensation seeking and “observed delay” indicates that at least some aspects of procrastination are related to arousal-based personality traits, as suggested by Ferrari [35], for example. However, the absence of any relationship with the other scores on the French PPS also supports some studies indicating that sensation seeking is not central to the construct of procrastination [12,36]. Nonetheless, the French PPS allows a choice between the use of the total score or the more specific factor scores, depending on the goal of the research or clinical application (e.g., focus on the core construct of procrastination or on more specific procrastination-related aspects such as mechanisms associated with the sensation seeking dimension of impulsivity).

A limitation on the study might be our sample, in which the gender ratio was imbalanced (37% men), the mean age rather young ($m = 34.39$, $SD = 9.54$), and the mean number of years of education rather high ($m = 17.79$, $SD = 3.00$). The French PPS should therefore be used cautiously in populations with different demographic characteristics, and further research should examine the validity of this questionnaire in different samples, including clinical populations.

In conclusion, the adapted French PPS has been shown to possess satisfactory psychometric properties and may therefore be a valuable screening instrument for researchers, teachers and clinicians in a French-speaking context.

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