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ADULT INVENTORY OF PROCRASTINATION SCALE (AIP): A COMPARISON OF MODELS WITH AN ITALIAN SAMPLE

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The present study analyzed the psychometric proprieties of the Adult Inventory of Procrastination (AIP) by McCown and Johnson (1989) with an adult Italian sample (n = 305) by comparing three construct models. Models included: 1) the original uni-dimensional structure; 2) a Spanish model with two components — lack of punctuality and lack of planning (Díaz Morales, Ferrari, Diaz, & Argumendo, 2006); 3) a Turkish model with two components reflecting positive aspects of avoidance and negative aspects of avoidance (Ferrari, Özer, & Demir, 2009). Moreover, two models using the Adult Inventory of Procrastination and the Decisional Procrastination Scale were analyzed using scores on the AIP: the four-component model of Díaz Morales et al. (2006) and Steel's (2010) three-factor model of procrastination. Results showed that the original uni-dimensional model provided the best fit. Both internal consistency for reliability, and convergent and discriminant validity with other measures supported the uni-dimensional psychometric properties of the Italian AIP.

Key words: Procrastination; Construct model; Psychometrics proprieties; Self-efficacy; Italian sample.

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INTRODUCTION

Procrastination is an intentional delay of a course of action despite expecting to be worse off for the delay (Ferrari, 2010). Research over the past 25 years has shown that procrastination is a common problem in the general population and reflective of a maladaptive style to life (i.e., Ferrari, 2010; Ferrari, Díaz Morales, O'Callaghan, Diaz, & Argumendo, 2007). Not surprisingly, many different measures have been proposed to operationalize this needless and irrational delay, and debate continues over the psychometric properties of these measures and which scale might be considered "best" for use in research to ascertain a "pure" construct of procrastination (Steel, 2007).

The main purpose of the present research was to analyze the psychometric proprieties of an Italian version of the Adult Inventory of Procrastination (AIP), by McCown and Johnson (1989), a leading measure of procrastination tendencies (see Ferrari, Johnson, & McCown, 1995). We used an adult Italian sample to compare three construct models to reflect the psychometric structure of the AIP, and to test two general multi-dimensional models on the construct of procrastination. Until the present study, three AIP scale models have never been compared in the literature. Moreover,

confirmatory factor analysis has never been performed only on the AIP items to ascertain which dimensional structure best reflects this scale. In addition to exploring the underlying factor structure of the scale using an adult Italian sample, we assessed procrastination tendencies with an adult population whose popular culture indicates that procrastination is a widespread national problem. Finally, results discussed how cultural perspectives may evaluate different attitudes, beliefs, customs, morals, and ethical standards that guide people from global worldviews.

The AIP scale measures the chronic tendency to postpone tasks in various situations (see Ferrari et al., 1995, for the complete list of items). It examines procrastination motivated by fears (e.g., success or failure), avoidance of disclosure of skill inabilities, and performance insecurity (Ferrari, 1991). The AIP assesses avoidance procrastination; that is, putting off tasks to protect one's self-esteem from possible failure. The AIP is composed of 15 Likert-scale items such that respondents express an opinion on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*) to statements such as "I am not very good at meeting deadlines" and "I don't get things done on time." For seven items, scores are reversed so that high ratings indicate procrastination.

In terms of reliability, McCown and Johnson (1989) found an alpha coefficient for internal consistency of .86 for a group of 110 adults, and test-retest reliability after six months of .76. Ferrari and Patel (2004) reported an internal consistency alpha coefficient of .86 with a group of 160 university students. Moreover, Ferrari et al. (2007) found that scores on the AIP were reflective of behavioral procrastination tendencies among adults from North and South American as well as European countries.

Regarding predictive validity, AIP scores predicted less time devoted to study in 48 university undergraduate students of psychology ($r = -.24$) and 40 third-year medical students ($r = -.27$; see Ferrari et al., 1995). Ferrari (1993) also reported the validity of AIP scores in predicting diligence in real tasks like Christmas shopping. AIP scores were higher for shoppers on Christmas Eve than for those who had bought their Christmas gifts in the five previous weeks.

Ferrari and Patel (2004) did not find any significant gender difference on AIP scores, a result confirmed by Díaz Morales, Cohen, and Ferrari (2008). Furthermore, they indicated that AIP scores decreased with age ($r = -.27$, $p < .001$). Moreover, McCown and Johnson (1989) originally reported that AIP scores correlated with inefficient time management ($r = .49$), time wasting ($r = .59$), impulsivity ($r = .52$), neuroticism ($r = .63$), and depression ($r = .52$).

As for construct validity, the literature reports three diverse models underlying the AIP differing in the number and content of the factors. One model supports the AIP original unidimensional model. In this line of research, Ferrari et al. (1995) reported that studies with students showed fair to good construct validity of the uni-dimensional AIP. This model has never been psychometrically tested using confirmatory factorial analysis.

However, Díaz Morales, Ferrari, Diaz, and Argumedo (2006) conducted the first study about the factorial structure of the AIP among adults. The research, with a Spanish sample, revealed a two-factor dimensional structure of the AIP. One factor referred to a *lack of punctuality* (nine items; explained variance = 30.7%; α coefficient = .81) and a second factor to a *lack of planning* (six items; explained variance = 10.7%; α coefficient = .62). The correlation between factors was moderate. With this model, the two components reflected concerns on accuracy in meeting appointments and the process of planning (Díaz Morales et al., 2006).

A recent third model developed through principal component analysis using a Turkish adult sample ($n = 354$) found a two-dimensional structure for the AIP, with the first component

comprised of seven items (explained variance = 19.4%) focusing on *positive aspects of avoidance*, and the second component of eight items (explained variance = 15.7%) exploring *negative aspects of avoidance* (Ferrari, Özer, & Demir, 2009). In this model, negative and positive aspects of avoidance are distinct.

Moreover, there are general multi-dimensional models on procrastination on the basis of the scores of three scales: the AIP scale, the General Behavioral Procrastination (GP) scale (Lay, 1986), and the Decisional Procrastination (DP) scale (Mann, 1982). See Ferrari et al. (1995) for psychometric information including the actual English items on each of these widely used scales. The GP scale assesses global tendencies toward procrastination across a variety of delay tasks, while the DP scale evaluates the purposive delay in making decisions within some specific time frame. Currently, there are two general multi-dimensional models on procrastination: the first proposed by Díaz Morales and colleagues (2006) and the second by Steel (2010).

The general multi-dimensional model of Díaz Morales and colleagues (2006) has four components: Dilatory behaviors, Indecision, Lack of punctuality, and Lack of planning. Items 5 and 15 loaded on the first factor, Dilatory behaviors. The Lack of punctuality dimension reflected substantially the first component obtained by Díaz Morales and colleagues with principal component analysis on the AIP item scores; the Lack of planning dimension followed the second factor obtained on the AIP scale (Lack of planning).

Recently, Steel (2010) proposed a second model on the basis of the same three scales. He carried out an online survey with 4,169 English-speaking participants, divided the sample into two subgroups to perform exploratory (EFA) and confirmatory (CFA) factor analyses across all three procrastination measures. He found a three-factor structure which explained 49% of the variance. The first factor (36% of the variance) was defined as a general procrastination dimension including items from all three procrastination scales (seven items from the AIP loaded on this initial factor). The second factor, accounting for 7% of the variance, contained items relating to rushing and appointment keeping (with four AIP items on this factor). The third factor, accounting for 6% of the variance, primarily loaded with items associated with promptness and doing tasks immediately (four items of the AIP loaded on this factor). In Steel's model, six out of seven items in the first factor reflected the negative aspects of the avoidance factor, consistent with the results of Ferrari et al. (2009) using a Turkish sample. Every item of the second factor on the lack of punctuality replicated the results of Díaz Morales et al. (2006) with a Spanish sample. Finally, every item in Steel's third factor loaded on the same positive aspects of avoidance factor with a Turkish sample (Ferrari et al., 2009) and lack of planning dimension with a Spanish sample (Díaz Morales et al., 2006).

The Present Study

Our main aim in the present study was to explore the psychometric proprieties of an Italian version of the AIP by McCown and Johnson (1989) and ascertain which of these construct dimensional models would emerge using confirmatory factor analysis.

The need for an Italian procrastination scale such as the AIP arises from the fact that few Italian methods assess the procrastination construct within this culture and a possible diffusion of procrastination in Italy. Evidence for widespread procrastination tendencies among Italians was supported, for example, by the high number of university students not complying with the yearly

examination schedule, 62% of the 249,593 Italian graduates of 2007 who did not complete their studies in due time (ISTAT, 2009).

Therefore, we verified the factor structure, reliability, and convergent validity of an Italian version of AIP. More specifically, we compared three factor structures: 1) the original model including only one factor (McCown & Johnson, 1989), 2) the Spanish two-dimensional AIP model comprising two components: lack of punctuality and lack of planning (Díaz Morales et al., 2006), 3) the Turkish two-dimensional AIP model with two components reflected positive aspects of avoidance and negative aspects of avoidance (Ferrari et al., 2009).

Comparing models with an Italian sample seems warranted by a cultural perspective; indeed, it is important to consider that all three countries (Spain, Turkey, and Italy) are characterized by a culture with low uncertainty avoidance (i.e., a tendency toward orderliness and structured lifestyles, clear specification of social expectations and rules) and low future orientation (the degree to which a collective culture encourages future oriented behaviours) such as planning (Jesuino, 2002; Kabasakal & Bodur, 2002). It was expected that both uncertainty avoidance and future orientation definitions would be essential aspects for the Italian procrastination behavior.

Moreover, because Díaz Morales et al. (2006) and Steel (2010) proposed two general multi-dimensional models developed by factor analysis on AIP, GP, and DP items, we tested the congruency between these structures and our Italian AIP data. Obviously, we do not consider the present study a verification of these two general multi-dimensional models, we want to partially compare these two models on the basis of AIP scores.

We examined the convergent validity between AIP scores and scores on two other leading procrastination scales: Lay's (1986) 20-item General Procrastination scale and Mann's (1982) 5-item Decisional Procrastination scale (see Ferrari et al., 1995, for the psychometric properties of these most often used measures). We expected AIP scores would correlate more with GP scores than with DP scores, because both AIP and GP measures reflect behavioral procrastination tendencies while the DP scale pertains to cognitive/indecision procrastination. The correlation between scores on the AIP and a related construct, self-efficacy, associated with procrastination scales (i.e., Klassen et al., 2009), was also interpreted as a simple assessment of discriminant validity for our present Italian data. The association between procrastination and self-efficacy has been studied by many scholars: high self-efficacy leads the person to initiate tasks and persist on tasks in the face of challenges, whereas low self-efficacy may lead to procrastinating behaviors (Klassen et al., 2009).

In order to analyze discriminant validity, we expected that correlations between the AIP scale and a different construct, namely self-efficacy, should be significantly lower than correlations between the AIP scale and other procrastination scales. Finally, we analyzed the influences of socio-demographic aspects (e.g., gender and education level) on AIP scores.

METHOD

Participants

This study used a sample of both gender adult participants. A total of 305 adults from northern Italy (68% women, 32% men; *M* age = 33.8 years, *SD* = 1.01, age range = 18 to 62) participated in the present study. In terms of education level, 17% possessed a diploma below high school, 53% a

high school diploma, and 30% an upper-secondary school diploma. About 67% of the participants worked in a municipality and 32% in private companies. The sample had a similar percentage of female participants than both studies by Ferrari and colleagues (2009) and Steel (2010); conversely, it showed a higher percentage of female respondents than Díaz Morales et al.'s (2006) sample. Moreover, the sample had a lower age mean than those of comparison research.

Instruments

All participants completed a questionnaire that included the AIP, GP, and DP scales, a scale on self-efficacy, and a personal data panel. The GP and DP scale items were published by Ferrari et al. (1995), and the AIP scale was described above in the introduction. The DP scale consists of five items with a 5-point Likert scale and is considered uni-dimensional. It examines decisional procrastination (i.e., indecision), the purposive delay in making decisions within some specific time frame. It comprises items such as "I delay making decisions until it is too late" or "I put off making decisions." High scores indicate a tendency to put off decisions by doing other tasks (Ferrari et al., 1995), and the scale has a coefficient alpha of .70 to .83, reflecting good internal consistency with varied adult population from different countries (e.g., Díaz Morales et al., 2006; Effert & Ferrari, 1989). With the present study, CFA verified a one-factor structure (GFI = .98; AGFI = .94; CFI = .98; RMSEA = .08) and Cronbach's alpha showed a fair internal consistency (.79).

Lay's GP scale has 20 items rated on a 5-point Likert scale. It is considered a uni-dimensional measure including statements such as "I am continually saying I'll do it tomorrow" and "When preparing to go out, I am seldom caught doing something at the last minute" (see Ferrari et al., 1995). The GP scale measures dilatory behavior across different situations related to personality variables such as low self-control, rebelliousness, and extraversion (see Ferrari et al., 1995). The GP internal consistency of this measure with adults was reported to be between .80 and .84 with international samples (e.g., Díaz Morales et al., 2006; Ferrari et al., 2007). With the present study, a one-factor structure was not verified by CFA (GFI = .81; AGFI = .77; CFI = .68; RMSEA = .08), while Cronbach's alpha showed a good internal consistency (.84). We adopted a structure with two factors suggested by Mariani (2009) with an Italian sample: Tendency to postpone tasks (items 1, 5, 7, 9, 12, and 19) and Getting tasks done on time (items 3, 4, 8, 14, 15, 18, and 20). CFA verified this factor structure (GFI = .95; AGFI = .93; CFI = .95; RMSEA = .04) and Cronbach's alpha showed a fair internal consistency (I factor = .73; II factor = .72). However, the present research used all three scores: General Procrastination, General Procrastination-postponing task factor, and General Procrastination-doing in time factor (see Table 3).

For the discriminant criteria, we chose the Italian adaptation of the General Self-Efficacy scale (GSE; Luszczynska, Scholz, & Schwarzer, 2005). The GSE scale consists of 10 items with a 5-point Likert scale. It has been adapted to 28 languages. A typical item is "Thanks to my resourcefulness I can handle unforeseen situations." In a study by Luszczynska and colleagues (2005), Cronbach's alphas between .87 and .94 were obtained in six diverse samples. With the present sample the Italian version was used (Sibilia, Schwarzer, & Jerusalem, 1995); CFA verified the one-factor structure (GFI = .95; AGFI = .92; CFI = .95; RMSEA = .06) and Cronbach's alpha showed a fair internal consistency (.73).

Procedure

Initially, we translated the three scales from the original English version into Italian as follows: a) translation of the three scales into Italian by two experts familiar with both the procrastination construct and the English language; b) comparison between the experts' two versions to produce a single version for every scale; c) back-translation of this version by a mother-tongue English speaker: this translation was "blind", that is, the original versions of the scales were not known; and d) definition of the final version in light of the indications yielded by the entire translation process (Hambleton, Merenda, & Spielberger, 2005).

The paper questionnaires were distributed individually to participants in sealed envelopes, and were collected using a procedure which ensured both anonymity and the acceptance of protocols returned after some days' delay. Respondents provided informed consent which included information on the scientific aims of the research, the data handling process, and the confidentiality of the information collected, ensuring data anonymity. This careful procedure was especially important because our participants were employees in public agencies. In workplace settings, replies to questions on the tendency to procrastinate may be distorted by the expectations of superiors/colleagues (procrastination, in fact, might be seen as deleterious to productivity). Finally, the questionnaire specified that there were no right or wrong answers, and that its purpose was only to find out the respondents' opinions. Participants returned the questionnaires in anonymous sealed envelopes.

RESULTS

Confirmatory factor analysis was performed using the AMOS 18 statistical package to test the goodness of fit of the four hypothesized models. The asymptotically distribution-free method was used because some items (1, 8, 9, 15) showed values of kurtosis outside the –1 to +1 range.

As regards criteria for evaluating the model-data fit, as indicated by the literature (i.e., Schweizer, 2010), we adopted the following indexes: the normed χ^2, which is the ratio of the model χ^2 and the degrees of freedom, the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the Bentler comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Schweizer summarized the acceptable levels of some fit indexes: normed χ^2 is expected to stay below 3, RMSEA below .08, and SRMR below .10. CFI values should be in the .90 to 1.00 range. Finally, GFI greater than .95 and AGFI greater than .90 suggest acceptable model-data fit (Byrne, 2001).

To compare the non-nested models, the Akaike Information Criterion (AIC; Akaike, 1987) and the Bayesian Information Criterion (BIC; Schwartz, 1978) fit indexes were used. The AIC permits to select a model on a measure of similarity between a correct model and the competing ones. The BIC enables to choose the model with the highest probability of being the correct model. AIC and BIC penalize models with more parameters and therefore help to protect against unnecessary model complexity. The AIC and BIC measures indicate a better fit when they are smaller.

Reliability was measured using Cronbach's alpha and the convergent validity was estimated by using Pearson product-moment correlation between the AIP scale and criteria. A

MANOVA was performed to analyze the effects of socio-demographic aspects on AIP, GP, and DP scores.

Testing between Models

The three different factor structures of the AIP were considered as competing models for their adequacy in representing the latent variable of procrastination. The models did not include correlated errors. The original model of the AIP structure had one latent variable and is referred to as model 1 (see Table 1). The results showed global adequate fit; a good fit for GFI and AGFI indexes; ratio of the model χ^2 and the degrees of freedom, RMSEA, and SRMR were adequate. CFI index results were poor.

TABLE 1
AIP models: fit indexes

Model	*df*	χ^2	χ^2/df	GFI	AGFI	RMSEA	CFI	SRMR	AIC	BIC
1	90	218.26***	2.43	.98	.98	.06	.70	.09	278.26	389.17
2	89	252.00***	2.83	.89	.85	.08	.76	.07	313.09	427.70
3	89	281.30***	3.16	.88	.83	.09	.72	.08	343.30	457.91
1b	87	159.20***	1.83	1.00	.99	.04	.90	.06	213.20	332.25
4	87	213.02***	2.45	.98	.98	.07	.61	.11	279.20	401.02
5	88	241.12***	2.77	.90	.86	.10	.77	.08	307.12	429.12

Note. 1 = Original model (one factor); 2 = Turkish model with two factors; 3 = Spanish model with two factors; 1b = Adjusted original model (one factor) with three error correlations; 4 = Spanish general multi-dimensional model; 5 = Steel's general multi-dimensional model with three factors.
*** $p < .001$.

The Spanish model of the AIP (model 2 in Table 1) showed an overall poor fit as the ratio of the model χ^2 and the degrees of freedom, GFI, AGFI, CFI, and RMSEA indicate. The Turkish model of the AIP (model 3 in Table 1) had an overall insufficient fit; the ratio of the model χ^2 and the degrees of freedom, RMSEA and SRMR were adequate; however the GFI, AGFI, and CFI indexes were insufficient to support this model.

Overall, this comparison of models across the AIC and BIC indexes showed that the original one-factor model had the best fit: the smaller AIC and BIC indicate that the one-factor model was preferable to the two less parsimonious AIP models tested.

The analysis of one-factor model modification indexes found that error of item 13 could be correlated with errors of item 4, item 7, and item 8. All four items concern, substantially, things to do before a deadline. Results (model 1b in Table 1) showed that near all fit indexes were excellent (normed χ^2, GFI, AGFI, RMSEA, and SRMR); CFI index was merely acceptable.

As for the one-factor model, the regression weights were all significant ($p < .001$, see Table 2). In addition, the Squared Multiple Correlations corresponding to nine of the fifteen observed variables indicated that the factor explains a respectable portion of the variance (between 26% and 48%). Items 5, 14, 9, and 12 appeared to be the best indicators of the procrastination

factor. In contrast, items 13, 4, 6, and 3 showed the lowest standardized regression weights.

TABLE 2
One-factor CFA: regression weights

Item	Estimate	SE	CR	Standardized
1	1.00	–	–	.390
2	2.12	.274	7.75***	.578
3	1.89	.298	6.35***	.373
4	–1.14	.309	–3.69***	–.256
5	–3.07	.402	–7.64***	–.692
6	–1.66	.364	–4.56***	–.301
7	–3.27	.448	–7.30***	–.585
8	1.26	.175	7.20***	.540
9	–1.41	.169	–8.37***	–.624
10	–2.20	.302	–7.28***	–.509
11	1.91	.340	5.63***	.379
12	2.85	.397	7.19***	.624
13	1.06	.300	3.54***	.228
14	–3.31	.449	–7.37***	–.687
15	–1.28	.170	–7.55***	–.514

Note. SE = Standard Error; CR = Critical Ratio.
***$p < .001$.

Finally, two general multi-dimensional models were tested. The multi-dimensional model of Díaz Morales and colleagues showed an essentially insufficient fit: even if normed χ^2, GFI, AGFI, and RMSEA indexes were adequate, SRMR and CFI were insufficient. The fit of Steel's model was insufficient too; the ratio of the model χ^2 and the degrees of freedom and SRMR showed adequate value, whereas GFI, AGFI, CFI, and RMSEA indexes were insufficient. The comparison of these two general models showed that the structure of Díaz Morales and colleagues got better indexes of AIC and BIC than the structure proposed by Steel.

Reliability, Convergent and Discriminant Validity

The reliability of the AIP scale with the one-factor structure was acceptable: Cronbach's alpha was .75 (see Table 3). We found that the level of internal consistency did not increase when any items were deleted. Therefore, we retained all of the original 15 items of the AIP. Item-scale corrected correlations were not high, ranging between .21 and .50 (M = .35; SD = 0.10).

Pearson's correlations were computed to determine the relations between the AIP scale (original factor model) and the other scales (GPS, DP, and GSE). With regards to convergent validity, AIP scores showed a correlation of .62 with GP (see Table 3), .43 with GP-postponing task factor and –.57 with GP-doing in time factor. The correlation with DP scores was .48. AIP scores

TABLE 3
Scales: descriptive results, reliability, and correlations

Scale	*M*	*SD*	α	2	3	4	5	6
1 AIP	35.33	7.29	.75	.616***	.432***	–.574***	.477***	–.233***
2 GP	44.47	10.66	.84		.748***	–.785***	.527***	–.175***
3 GP-pt	12.71	4.25	.73			–.333***	.485***	–.183**
4 GP-ot	26.80	4.56	.72				–.392***	.244**
5 DP	10.42	4.03	.79					–.247***
6 GSE	36.54	5.90	.73					

Note. AIP = Adult Inventory of Procrastination; GP = General Procrastination; GP-pt = General Procrastination-postponing task; GP-ot = General Procrastination-doing in time; DP = Decisional Procrastination; GSE = General Self-efficacy scale. α = Cronbach's alpha index of internal consistency.
** $p < .01$. ***$p < .001$.

had significantly higher correlations with GP global score than with DP ($p < .05$) score. It was in favor of convergent validity.

On the other hand, the correlation between the AIP scale and the GSE scale was –.233. Moreover, it was analyzed whether the correlation of AIP with GP, and of AIP with DP were really different from the correlation of AIP with GSE, using the Fisher *r* to *z* transformation. Both comparisons showed a significant difference ($p < .001$). This finding was in favor of discriminant validity.

Exploring the Italian Sample Demographic Differences

To determine the influence of demographic profiles, we performed a multivariate analysis of variance (MANOVA) to examine the effect of gender by education level (lower education qualification, high school diploma, and upper-secondary school diploma) on the three procrastination scores (AIP, GP, and DP). Results revealed no significant effects for gender on AIP scores, $F < 1$, GP scores, $F < 1$, or DP scores, $F < 1$. Academic level had a significant effect on the three procrastination scores $F(2, 300) = 5.43$, $p < .001$, partial $\eta^2 = .06$. In particular, MANOVA showed a significant effect of academic level on AIP scores, $F(2, 300) = 5.84$, $p < .01$, partial $\eta^2 = .04$, and GP scores, $F(2, 300) = 3.55$, $p < .05$, partial $\eta^2 = .03$, but not on DP scores, $F < 1$. In short, upper-division students showed a higher level of procrastination tendencies as measured by AIP and GP scales. Moreover, there was no significant Gender by Academic multivariate interaction. Discrepancies of academic level may have been related to participants' age. However, this MANOVA did not include age, as an independent variable, because it had 9% missing values. So we performed a MANOVA to examine the interaction effect of age by academic level on AIP and GP scores. Results showed that the multivariate interaction was nonsignificant.

DISCUSSION

The main purpose of the present study was to analyze the psychometric proprieties of the Italian version of McCown and Johnson's (1989) 15-item AIP scale, a leading, often used self-

report measure of procrastination tendencies in adults. We used an Italian sample to test five construct models reported recently in the literature, each claiming to reflect the underlying psychometric structure. For the first time in the literature, we performed confirmatory factor analysis on AIP scores in the Italian sample.

The Spanish and the Turkish models were not supported in the present study of adults. The general multi-dimensional model by Díaz Morales and colleagues (2006) showed a better fit than Steel's (2010) general multi-dimensional model. Results suggest that the Italian version of the AIP presents similar psychometric properties to its corresponding original English-language form. The original model by McCown and Johnson (1989) was uni-dimensional and showed the best fit with our current data. All fit indexes, except one, were adequate in the model which did not include correlated errors. More specifically, the insufficient index was the CFI which compared the null model to a proposed model. CFI depends on the average size of the correlations in the data, and in our correlation matrix the average correlation between variables was not very high. However, the model with correlated errors showed an acceptable level of fit.

Confirmatory factor analysis yielded item loadings on a single factor that referred to not doing tasks on time, being non-punctual for appointments, and not meeting deadlines. The four items with higher saturations were reported by Díaz Morales et al. (2006) in the first Spanish factor, referred to as a lack of punctuality. However, only two of these items were in the general procrastination dimension proposed by Steel (2010), and one item was reverse-scored. In contrast, the set of four items with the lowest standardized regression weights is not in any factors of the Spanish, Turkish, or Steel models.

The reliability of AIP scores was acceptable using the present sample. Also, the correlation coefficients among AIP scores and the other self-report scale scores designed to "tap-into" facets of the procrastination constructs were consistent with other studies (see Ferrari, 2010). As expected, in the present study AIP scores correlated more with GP scores than with DP scores. In addition, these indexes were consistent with a meta-analysis by Steel (2010) that included 17 studies and 3,638 respondents. In that study, AIP and GP scores were significantly related at .71 (or .86, corrected for unreliability) while AIP and DP scores related at .46 (or .57, corrected for unreliability). Results show an adequate convergent validity. As expected, AIP scores correlated more with GP and DP scores than with GSE scores. The correlation index between AIP and GSE was consistent with studies by Klassen, Krawchuk, and Rajani (2008) who found an index of –.18, or by Seo (2008) who obtained indexes between –.19 and –.25. All supported both convergent and discriminant validity.

In sum, the results of the present confirmatory factor analysis found the best fit is a one-factor model. Results show higher associations between AIP and GP scores than with AIP and DP scores, in line with the theory of procrastination by Ferrari (2010; Ferrari et al., 2007, 1995). The present model shows that the procrastination tendencies may include cognitive and/or behavioral tendencies. Ferrari claimed that the AIP and GP measures reflect behavioral forms of procrastination. The DP scale reflected cognitive forms of procrastination, such as putting off decisions. The results of the present study also indicate gender is not influential on AIP scores. This outcome confirms the international results by Díaz Morales et al. (2008) and Ferrari et al. (2007), who found no significant gender difference in AIP scores with varied adult samples. However, this evidence conflicts with the meta-analysis conducted by Van Eerde (2003), which stated that the tendency to procrastinate was more common among the male than female participants. We

think further analysis needs to be conducted to clarify this difference. Finally, the association between education level and procrastination as measured by AIP and GP supported the results by Ferrari (1992), and Harriot and Ferrari (1996). That is, we did not find any effect of education level on DP scores.

Results from the present study using confirmatory factor analyses support the continued use of the AIP as a uni-dimensional scale. This outcome is important, because it was demonstrated in a country, such as Italy, where cultural aspects associated with procrastination, such as uncertainty avoidance and low future orientation, are different from those in the USA where the AIP scale was developed (Ashkanasy, Trevor-Roberts, & Earnshaw, 2002). Instead, the present study with an Italian AIP scale obtained results similar to those achieved in Turkey and Spain, where the opposite models of the USA were built.

The AIP, originally developed using US adult samples, has maintained its original structure across varied other cultures including now the Italian one. We suggest that future research continues the application of the AIP to varied samples and populations, and that other newer measures be evaluated against this reliable and valid standard index of procrastination tendencies in adult men and women.

Of course, the present study has limitations. Two of them are associated with the participants and the instrument. As regards the former, our sample size of only a few hundreds is relatively small, and the geographic region not particularly diversified (in terms of country, gender, age, educational qualification, and work experience). Nevertheless, our sample size yields enough statistical power to conduct our analysis.

Moreover, the comparisons of the models present some limits as well. Even if the sample shows a similar male/female ratio to both the research by Ferrari and colleagues (2009) and Steel (2010), it has a higher percentage of females than Díaz Morales et al.'s (2006) sample. Its average age is lower than the samples of comparison research. There are also differences in method: this study, like Díaz Morales et al.'s (2006) and Ferrari and colleagues' (2009), used a traditional paper-and-pencil questionnaire while Steel's (2010) used an online evaluation.

Still, we believe future research should include additional Italian samples of adults. Future research on procrastination performed with the AIP will need to verify the low CFI index reported in the present study. A follow-up study might examine convergent and discriminant validation of the Italian AIP with a broader range of participants and additional self-reported measures. Moreover, we propose validation of the AIP scale with behavioral indexes of postponement and delays with Italians and adults from other nationalities. Finally, it might be interesting to test the discriminant validity of the Italian AIP version with people that usually avoid the task in different contexts, such as family and work. Nevertheless, we think the present study demonstrates that the AIP is a uni-dimensional scale based on the original model, and it is useful to ascertain levels of procrastination among samples of adult men and women.

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