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Psychometric Properties of Adult Inventory of Procrastination in a Turkish Sample

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Abstract The present study assessed the psychometric properties of the *Adult Inventory of Procrastination* for Turkish adults. The Adult Inventory of Procrastination (AIP), General Procrastination Scale (GP), and Decisional Procrastination Scale were administered to 423 Turkish adults (183 women, 240 men; $M_{age} = 38.7$, SD = 8.24) working in the governmental institutions in Turkey. The results of the confirmatory factor analysis yielded fit index values demonstrating viability of univariate factor solution as in the original. Findings also revealed that, as predicted, the AIP score was strongly correlated with GP score ($r = .66$). Overall, results provided evidence for the factor validity and reliability of the Turkish version of the scale for use in Turkish adult populations.

Keywords Adult Inventory of Procrastination · Reliability · Factorial structure · Turkish adult population

Introduction

It was estimated that within the USA and Canada, 20 % of adults (Harriot and Ferrari 1996) engage in *procrastination* (Lay 1986; Solomon and Rothblum 1984), a tendency to delay an action or decision which one intends to do (Ferrari et al. 1995). Most studies examined procrastination as an individual variable (e.g., Milgram and Tenne 2000; Watson 2001). For instance, studies reported that procrastination is related to traits including low states of self-confidence and self-esteem (Ferrari 2001; Uzun Özer et al. 2012), high states of depression (Steel et al. 2000), anxiety, (Rothblum et al. 1986), learned helplessness (Schubert et al. 2000), and self-consciousness (Beck et al. 2001). Moreover, procrastination in adults has been associated with higher stress, higher acute health problems, and the practice of fewer wellness behaviors (Sirois 2007). Hence, engaging in procrastination has been seen far more than time management difficulty (Ferrari et al. 2005).

Ferrari and colleagues noted that the prevalence of *chronic procrastination* (the frequent use of delays as a maladaptive lifestyle) was remarkably similar in diverse countries such as the United Kingdom, Australia, Spain, Peru, and Venezuela (Diaz-Morales et al. 2006a; Ferrari et al. 2007), with self-reported rates relatively equal for adult men and women (Ferrari et al. 2005; Hammer and Ferrari 2002).

Understanding cross-cultural similarities and differences may be best achieved by the adaptation of valid and reliable measure for use in non-English-speaking populations. When considering reliable and valid translated procrastination measures, there appear to be few scales for use in English-speaking population that meet the needs for assessing task delays in various cultures. For instance, Diaz-Morales et al. (2006b) translated the three leading self-reported procrastination scales, including the *Adult Inventory of Procrastination* (*AIP*), into Spanish. Their studies retained *AIP*'s reliability and validity across adult demographic samples. In contrast, not much published research exploring procrastination measures in adult samples may be found on the valid and reliable use of the *AIP* in Turkish samples. In the previous studies, Turkish versions of the 16-item *Aitken Procrastination Inventory*, student version of 20-item *General Procrastination Scale* (Balkıs 2006), and the 44-item *Procrastination Assessment Scale-Student* (Uzun Özer et al. 2009) used

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student samples do not appropriate because these measures focus on academic domains. The *Adult Inventory of Procrastination* was developed by McCown and Johnson (1989) to assess procrastination level in adults. It examines procrastination motivated by fears of success or failure, avoidance of skill inabilities, or insecurities about performance (Ferrari 1991). AIP consists of 15-items on a 5-point Likert scale (1 = *false for me*, 5 = *true for me*). In the scale, seven items are reverse-scored, and high scores are indicative of high-level procrastination. The items include "I do not get things done on time" and "I am not good at meeting deadlines." Previous studies reported the AIP to be reliable and valid with coefficient alphas ranging from 0.79 to 0.83, and a month test–retest reliability of 0.71 (Ferrari 1994; Ferrari et al. 1995).

The *AIP* has been widely used as a valid tool in studies of procrastination in English-speaking adults (see in Ferrari et al. 1995) and adapted for Anglo adult samples (Diaz-Morales et al. 2006a). It was found to have good psychometric qualities (Ferrari et al. 1995). In this respect, translation and adaptation of the Adult Inventory of Procrastination for use in Turkish culture might provide a useful research tool to assess the adult rates of procrastination. Ferrari et al. (2009) used translated version of AIP to explore the three aspects of chronic procrastination in Turkish adults; however, they did not assess the psychometric properties of AIP for use in Turkish adult populations. In this regard, the aim of the present paper was to expand the earlier study and test the usability of the Adult Inventory of Procrastination for a Turkish sample. It is expected that the present paper will be a pioneer for conducting procrastination studies in different populations of adults in Turkey, which in turn provides a cross-cultural comparison.

Methods

Participants

A total of 423 adults (183 women, 240 men; M_{age} = 38.7-year old, SD = 8.24; age range = 24–61) working in governmental institutions in Turkey participated in the present study. Most participants were married (76 %) with two children (*M* number of children = 2.23; SD = 1.05). The sample consisted of employees at different positions working in their current position an average of 9.35 years (SD = 7.4; range = 1–27). The participants also stated different education levels: high schools or less (30 %); graduate degree (63 %), or postgraduate degree (7 %).

Instruments

Besides Adult Inventory of Procrastination, Decisional Procrastination Scale (DP) and General Procrastination Scale (GP) were used in the present study. The DP and GP scales were utilized to examine the discriminant validity of the AIP.

The *Decisional Procrastination Scale* (*DP*, Mann 1982) consisted of 5 items on a 5-point Likert scale (1 = *not true for me*; 5 = *true for me*). High scores indicate the tendency to postpone the decision of the tasks. Previous studies reported a Cronbach alpha ranging from 0.71 to 0.80, and a one-month test–retest reliability of 0.69 (Effert and Ferrari 1989; Ferrari 1994). Unidimensional, 5-item Turkish version of DP (Balkis 2006) was found internally consistent (r = .73). Balkis also found a one-month test–retest reliability of 0.67 and correlation of DP with rational decisional making style as −0.26.

General Procrastination Scale (*GP*, Lay 1986) consists of 20 items on a 5-point Likert scale (1 = *false for me*, 5 = *true for me*). Ten items are reverse-scored, and high scores indicate the arousal procrastination tendencies that include purposively waiting until the last minute for a thrill-seeking sensation (Ferrari 1992). This scale has good internal consistency (coefficient alpha 0.78; Ferrari 1991) and temporal stability (retest reliability = 0.80, Ferrari 1989). Turkish adaptation study for the student version of GP was conducted by Balkis (2006). He excluded the 5 lower inter-item correlation items of GP and found unidimensional 15 items. Internal consistency of GP was reported 0.84, and one-month test–retest reliability was 0.88.

Translation of AIP

AIP was developed and used extensively with English-speaking adults. Hence, the adaptation of AIP for use with Turkish samples was implemented in a series of steps to ensure the equivalency of meaning and freedom from cultural bias. As a first step, three Turkish counselors, who were fluent in English and had background in Psychology, and two English instructors translated each item of the AIP independently. Items that best represented the original version were chosen among translations, and a back translation then was conducted among the selected items to check that the original constructs were assessed. In order to determine the content-related validity, the Turkish version of the *AIP* then was given to field experts who had at least PhD degree for evaluation. After obtaining feedback regarding the adequacy of the translation, necessary revisions were made and Turkish version was formed. Then, pilot study was conducted with 20 adults to check the understandability of items in Turkish version of AIP. Any additional change was made after pilot testing.

Procedure

Participants were recruited from middle-class SES adults working in the governmental institutions in Turkey. After

obtaining necessary permissions, volunteer adults working in various positions participated in the study. It took participants approximately 20 min to complete the data collection instruments with the demographic sheet.

Results

Sex differences were examined in the initial analysis. A significant sex difference was found on Adult Inventory of Procrastination scores ($F_{1,421} = 3.85$, $p < .05$, $\eta_p^2 = 0.009$), with men ($M = 30.2$, SD = 8.3) reporting higher procrastination score scores than women ($M = 28.6$, SD = 7.7). Similarly, a significant sex difference was found on participants' general procrastination score ($F_{1,419} = 5.39$, $p < .05$, $\eta_p^2 = 0.013$). However, no significant sex differences were obtained on participants' decisional procrastination scores. The overall mean on adult inventory of procrastination was 29.1 (SD = 7.6). The General Procrastination Scale had a mean of 41.8 (SD = 9.9), and the mean of the Decisional Procrastination Scale was 11.3 (SD = 4.8).

Construct Validity of Adult Inventory of Procrastination

A series of preliminary analyses were performed before conducting reliability and validity studies of Turkish version of the AIP. The distribution of responses across the rating scale for each item was examined. Screening of the data was also performed, including analysis of the normality of each variable, skewness and kurtosis, outliers, and missing data. Normality was within the accepted level (±3.29) of skewness and kurtosis. Replacement of missing values with the mean can be done if each variable has at least 5 % missing value (Tabachnick and Fidel 2001). In the present data, less than 5 % of the given responses were missing values. Thus, each value was replaced with the mean. Thereafter, a reliability analysis was performed with the 15 items. Corrected item-total correlations were also computed to highlight those items with poor reliability (<0.30). Corrected item-total correlations higher than 0.30 were accepted as the criterion for excluding an item from the analysis.

Confirmatory Analysis

A confirmatory factor analysis on the original univariate model was evaluated by using the AMOS 19.0 program. Results revealed that chi-square test was significant indicating good fit ($\chi^2 = 6.75$, $df = 2$). Because the χ^2 statistics is easily influenced by the sample size, multiple goodness-of-fit indices were also used to evaluate the fit between the model and the sample data (Bentler and Bonett 1980). The goodness-of-fit index (GFI, value above 0.90), the adjusted goodness-of-fit index (AGFI, value above 0.80), and the root-mean-square error approximation (RMSEA, value smaller than 0.10) are suggested as criteria for acceptable fit (Browne and Cudeck 1993; Schumacker and Lomax 1996). Moreover, in the recent literature, item parceling is suggested since some scholars (Bandalos 2008; Nasser and Wisenbaker 2003) indicate the parcels' scores are more likely to be distributed normally than those of single items. Second, "the resulting reduction in the complexity of measurement models should lead to more parameter estimates" (Nasser and Wisenbaker 2003; p. 730). Finally, since the parcels reduce the number of indicators in the model, researchers can use more realistic models. Thus, item parceling was adopted. In this respect, confirmatory factor analysis for the original univariate model for the Turkish version of the AIP was tested. The results of the analysis yielded a good fit ($\chi^2 = 6.75$, $df = 2$, $\chi^2/df = 3.37$; GFI = 0.99; AGFI = 0.96; RMSEA = 0.075). These fit indices calculated in the present study suggested that univariate factor solution with 15 items could be considered as a good fit to the sample data.

Discriminant Validity

To examine the discriminant validity of the Turkish AIP, the correlation coefficients between AIP, DP, and GP were analyzed. The correlation score between AIP and GP ($r = .66$, $p < .001$) was found higher than the correlation score between AIP and DP ($r = .41$, $p < .001$).

Reliability

The internal consistency coefficient (Cronbach Alpha) for the Turkish version of AIP was found to be 0.71 in the present sample, suggesting that Turkish Adult Inventory of Procrastination showed moderate internal consistency.

Discussion

In the present study, the psychometric properties of widely used self-report measure of adult procrastination were examined within Turkish population. In the line with this aim, a translation of AIP into Turkish language was accomplished. In terms of construct validity of the scale, confirmatory factor analysis was conducted. Univariate factor structure of Turkish version of AIP then was supported by confirmatory factor analysis. In this regard, the recent factor analytic studies with English-speaking samples based on unidimensional (see Ferrari et al. 1995) factor structure were identified.

Besides the factor structure, the results regarding the correlations among adult procrastination scores, general procrastination (obtained from GP), and decisional procrastination (obtained from DP) scores provided the evidence of discriminant validity. In other words, all three scales were found significantly related to each other among Turkish adult sample as consistent with the previous results (Freeman et al. 2011; Diaz-Morales et al. 2006a, 2008; Ferrari et al. 1995). Scores on the translated version of AIP had an adequate internal consistency coefficient of 0.71, which is similar to the value of previous studies (e.g., Hammer and Ferrari 2002).

Based on the evidences provided in the present study, the Turkish version of the AIP appears to be a valid and reliable instrument for Turkish adults. With the use of AIP, both researchers and the counselors working with adults are expected to obtain data guiding their further studies and applications. The Turkish adaptation of the AIP is also expected to fill in the gap in assessing procrastination in adult population, which in turn contributes to conduct cross-cultural studies related to the assessment of procrastination and with other cultural variables.

The present findings may be logically compared with the original academic procrastination studies conducted by McCown and Johnson (1989) and other scholars (e.g., Ferrari et al. 1995, 2007) with adults from Europe, Australia, the United States, Peru, and Venezuela. In this respect, several implications arise out of the present study for the future researchers. The results obtained from the Turkish sample showed some evidence of the reliability and validity of the AIP in Turkish society. Hence, future cross-cultural procrastination research including well-established methodologies and more culturally perceptions would no doubt strengthen the findings in terms of cultural differences in the meaning of procrastination.

There are possible limitations of the present study that are worth noting as they suggest topics for further studies. The main limitation is the convenience sampling of this study. So, further studies with larger and more demographically diverse populations selected randomly from the different regions of Turkey would no doubt strengthen the findings of the study. Second, since the present study showed only preliminary data for this translated version, by using different and larger samples, different Middle Eastern cultures will be useful.

References

Balkıs, M. (2006). *The relationship between student teachers' procrastination behavior, thinking and decision making styles*. Unpublished doctoral dissertation, Dokuz Eylül University, Izmir.

Bandalos, D. L. (2008). Is parceling really necessary? A comparison of results from Item parceling and categorical variable methodology. *Structural Equation Modeling, 15*, 211–240.

Beck, B. L., Koons, S. R., & Milgrim, D. L. (2001). Correlates and consequences of behavioral procrastination: The effects of academic procrastination, self-consciousness, self-esteem, and self-handicapping. *Journal of Social Behavior & Personality, 16*, 3–11.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*, 588–606.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

Diaz-Morales, J. F., Ferrari, J. R., Argumedo, D., & Diaz, K. (2006a). Procrastination and demographic characteristics in Spanish adults: Further evidence. *The Journal of Social Psychology, 146*, 629–633.

Diaz-Morales, J. F., Ferrari, J. R., & Cohen, J. R. (2008). Indecision and avoidant procrastination: The role of morningness-eveningness and time perspective in chronic style lifestyle. *The Journal of General Psychology, 135*(3), 228–240.

Diaz-Morales, J. F., Ferrari, J. R., Diaz, K., & Argumendo, D. (2006b). Factor structure of three procrastination scales with a Spanish adult population. *European Journal of Personality Assessment, 22*, 132–137.

Effert, B. R., & Ferrari, J. R. (1989). Decisional procrastination: Examining personality correlates. *Journal of Social Behavior & Personality, 4*, 151–156.

Ferrari, J. R. (1989). Reliability of academic and dispositional measures of procrastination. *Psychological Reports, 64*, 1057–1058.

Ferrari, J. R. (1991). Compulsive procrastination. *Psychological Reports, 68*, 455–458.

Ferrari, J. R. (1992). Procrastination in workplace. Attribution for failure among individuals with similar behavioral tendencies. *Personality & Individual Difference, 13*, 315–319.

Ferrari, J. R. (1994). Dysfunctional procrastination and its relation with self-esteem, interpersonal dependency, and self-defeating behaviors. *Personality and Individual Differences, 17*, 673–697.

Ferrari, J. R. (2001). Procrastination and attention: Factor analysis of attention deficit, boredomness, intelligence, self-esteem, and task delay frequencies. *Journal of Social Behavior & Personality, 16*, 185–196.

Ferrari, J. R., Diaz-Morales, J. F., O'Callaghan, J., Diaz, K., & Argumedo, D. (2007). Frequent behavioral delay tendencies by adults: International prevalence rates of chronic procrastination. *Journal of Cross-Cultural Psychology, 38*, 458–464.

Ferrari, J. R., Doroszko, E., & Joseph, N. (2005). Exploring procrastination in corporate setting: Sex, status, and settings for arousal and avoidance types. *Psychology Research Journal, 1*, 25–34.

Ferrari, J. R., Johnson, J. L., & McCown, W. G. (Eds.). (1995). *Procrastination and task avoidance: Theory research, and treatment*. New York: Plenum Press.

Ferrari, J. R., Uzun Özer, B., & Demir, (2009). Chronic procrastination among Turkish adults: Exploring decisional, avoidant and arousal style. *Journal of Social Psychology, 49*(3), 302–307.

Freeman, E. K., Cox-Fuenzalida, E. L., & Stoltenberg, I. (2011). Extraversion and arousal procrastination: Waiting for the kicks. *Current Psychology, 30*, 375–382.

Hammer, C. A., & Ferrari, J. R. (2002). Differential incidence of procrastination between blue- and white-collar workers. *Current Psychology: Developmental, Learning, Personality, Social., 21*, 333–338.

Harriot, J., & Ferrari, J. R. (1996). Prevalence of procrastination among samples of adults. *Psychological Reports, 78*, 611–616.

Lay, C. H. (1986). At least my research on procrastination. *Journal of Research in Personality, 20*, 479–495.

Mann, L. (1982). Decision-making questionnaire. In J. R. Ferrari, J. L. Johnson, & W. G. McCown (Eds.), *Procrastination and task avoidance: Theory, research, and treatment* (pp. 61–63). New York: Plenum Publishing.

McCown, W., & Johnson, J. (1989). Adult inventory of procrastination. In J. R. Ferrari, J. L. Johnson, & W. G. McCown (Eds.), *Procrastination and task avoidance: Theory, research, and treatment* (pp. 63–66). New York: Plenum Publishing.

Milgram, N. A., & Tenne, R. (2000). Personality correlates of decisional and task avoidant procrastination. *European Journal of Personality, 14*, 141–156.

Nasser, F., & Wisenbaker, J. (2003). A Monte Carlo study investigating the impact of item parceling on measures of fit in confirmatory factor analysis. *Educational and Psychological Measurement, 63*, 729–757.

Rothblum, E. D., Solomon, L. J., & Murakabi, J. (1986). Affective, cognitive and behavioral differences between high and low procrastinators. *Journal of Counseling Psychology, 33*(4), 387–394.

Schubert, W., Lilly, J., & Stewart, D. W. (2000). Overcoming the powerlessness of procrastination. *Guidance and Counseling, 16*, 39–43.

Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum.

Sirois, F. M. (2007). I'll look after my health later: A replication and extension of the procrastination-health model with community-dwelling adults. *Personality and Individual Differences, 43*, 15–26.

Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology, 31*, 503–509.

Steel, P., Brothen, T., & Wambach, C. (2000). Procrastination and personality, performance, and mood. *Personality and Individual Differences, 30*, 95–106.

Tabachnick, B. G., & Fidel, L. S. (2001). *Using multivariate statistics* (4th ed.). London: Allyn and Bacon.

Uzun Özer, B., Demir, A., & Ferrari, J. R. (2009). Exploring academic procrastination among Turkish students: Possible gender differences in prevalence and reasons. *Journal of Social Psychology, 149*(2), 241–257.

Uzun Özer, B., Demir, A., & Harrington, N. (2012). Psychometric properties of Frustration Discomfort Scale in a Turkish sample. *Psychological Reports, 111*(1), 117–128.

Watson, D. C. (2001). Procrastination and the five-factor model: A facet level analysis. *Personality and Individual Differences, 30*, 149–158.