PSYCHOMETRIC PROPERTIES OF THE TUCKMAN PROCRASTINATION SCALE IN A TURKISH SAMPLE[1]

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Summary.—A stepwise validation procedure was carried out to translate and develop a Turkish version of the Tuckman Procrastination Scale. A total of 858 college students completed the Tuckman Procrastination Scale, the Academic Self-efficacy Scale, and the Rosenberg Self-esteem Scale. Two items in the original scale loaded on a different factor and were removed from the measure. The 14-item scale had a one-factor solution as supported by subsequent confirmatory factor analysis. The Turkish version of the Tuckman Procrastination Scale scores correlated negatively with academic self-efficacy and self-esteem scores. Overall results provided evidence for the validity and the reliability of the scale scores.

In an academic setting, every student has tasks to perform, but for various reasons, performing these tasks may often be postponed. Inclination to engage in such a dilatory behavior is called procrastination (Ferrari, Johnson, & McCown, 1995; Schowuenburg, Lay, Pychyl, & Ferrari, 2004; Uzun Özer, Demir, & Ferrari, 2009). Procrastination includes intentional delay of an intended course of action, despite the awareness of negative outcomes (Steel, 2007). It was estimated that 70 to 95% of English-speaking college students (Ellis & Knaus, 1977; Steel, 2007) engage in procrastination, which is seen as an endemic behavior in the academic domain (Lee, 2005). Similarly, 52% of Turkish students reported being frequent procrastinators on schoolwork (Uzun Özer, *et al.*, 2009). Procrastinators often have difficulty motivating themselves (Tuckman, 1998), and for that reason they tend to use a variety of rationalizations for delaying academic tasks rather than self-regulating their learning (Tuckman, 2005). Engaging frequently in procrastination may cause problems encountered by

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many college students. Evidence has shown that procrastination may result in poor academic performance, lower grades, and course withdrawal (Wesley, 1994; Beck, Koons, & Milgrim, 2000). Hence, researchers have devoted a large amount of attention to procrastination in the university setting. Empirical studies showed that procrastination is a correlate of other self-related constructs such as lower self-efficacy and self-esteem (Haycock, McCarthy, & Skay, 1998). In this respect, previous findings showed a negative relationship between procrastination and self-efficacy beliefs (Steel, 2007), i.e., "disbelieving in one's own capability to perform a task" (Tuckman, 1991, p. 474). Other researchers (e.g., Klassen, Krawchuk, & Rajani, 2008) believe that self-esteem, i.e., judgments of global self-worth (Rosenberg, 1965), might be another key to understanding procrastination in academic settings. In this sense, procrastination has been described as a self-handicapping strategy for protecting self-esteem (Burka & Yuen, 1983), and many studies have demonstrated a negative association between academic procrastination and self-esteem (e.g., Ferrari, 1994, 2001).

Although procrastination has been investigated in samples from different cultures as diverse as the Netherlands (Schouwenburg, 1992), South Australia (Beswick, Rothblum, & Mann, 1988), and Canada (Senecal, Koestner, & Vallerand, 1995), many aspects of the construct have yet to be examined. Procrastination is encountered in almost every society and appears not to be specific to any culture (Prohaska, Morill, Atiles, & Perez, 2001; Ferrari, Diaz-Morales, O'Callaghan, Diaz, & Argumeda, 2007). Nevertheless, a limited number of cross-cultural studies have demonstrated that the reasons for and characteristics of procrastination may vary from culture to culture. Israeli students, for example, have been reported to engage in procrastination for different reasons than students in Western countries (Milgram, Marshevsky, & Sadeh, 1994). Ferrari and colleagues (1995) found that the fear of failure and aversiveness of the tasks were found to be the most important reasons for procrastination for the American students. However, information regarding the prevalence of academic procrastination in Turkey or the extent to which academic procrastination is related to similar and distinct constructs is quite limited. Obviously, the limited research on procrastination in Turkey might be partly due to the limited number of psychometric measures available to researchers in Turkey. The Procrastination Assessment Scale–Student (PASS) used by Uzun Özer, *et al.* (2009) is limited to procrastination in six areas of academic functioning. The Turkish version of the Adult Inventory of Procrastination (Ferrari, Uzun Özer, & Demir, 2009) is used to assess general procrastination style in adults. While the former focuses on academic procrastination and includes a large number of items, the latter only focuses on adults' procrastination behaviors in nonacademic contexts. The Tuckman Procrastination Scale, on the other hand, is geared toward assessing academic procrastination in college settings, in-

cludes fewer items, has solid psychometric properties, and is easier to ad-
minister and score.

The Tuckman Procrastination Scale was developed to measure pro-
crastination tendency on academically related tasks (Tuckman, 1991) and
is widely used (Ferrari, *et. al.*, 1995). The scale was first developed as a
72-item scale, and after performing factor analysis the scale was accepted
with 35 items. In a subsequent study of college students, a factor analysis
yielded 16 unidimensional items. Tuckman (1991) recommended use of
this shortened version to detect students having procrastination tenden-
cies in the completion of academic requirements. Although Klassen and
Kuzucu (2009) adapted the Tuckman Procrastination Scale into Turkish
and used the scale with Turkish high school students, they did not exam-
ine and report factorial validity of the scale for high school nor for college
students. The present study sought to close this gap using a sample of
Turkish college students.

METHOD

Sample

Data for the present study was obtained from two samples of Turkish
college students using a convenience sampling method. The first sample
consisted of 236 (92 men, 137 women, 7 not indicated) Turkish college stu-
dents (*M* age = 20.5 yr., *SD* = 1.7, range 18 to 29). These participants were
undergraduate students from different grade levels, at a major state-fund-
ed university in Turkey. The sample included 92 (48 women, 44 men) first-
year students, 98 (66 women, 32 men) sophomores, 10 (6 women, 4 men)
juniors, and 29 (17 women, 12 men) seniors. The same seven students also
did not indicate their grade levels. Because sex and grade level were not
used as control variables in any subsequent analysis, students who failed
to report their gender and grade level were included in the factor analysis.

The sample employed for the latter part of the study was derived
from a separate group. These participants included 622 (313 women, 309
men) Turkish college students (*M* age = 21.3 yr., *SD* = 1.7, range 17 to 31).
The participants consisted of 174 first-year students (92 women, 82 men),
134 sophomores (61 women, 73 men), 181 juniors (102 women, 79 men),
and 133 seniors (58 women, 75 men).

Measures

Procrastination.—The Tuckman Procrastination Scale was developed
to assess college students' procrastination tendencies (Tuckman, 1991).
The English version of the instrument included 16 items rated on a four-
point scale (1 : Strongly disagree, 4 : Strongly agree) and had a single factor
structure with a loading of .40 or higher (see Table 1 for the factor loadings
of the English version). In the original study Cronbach's α was .86 (Tuck-

TABLE 1

FACTOR LOADINGS OF TURKISH VERSION OF THE TUCKMAN PROCRASTINATION SCALE AND THE
ORIGINAL TUCKMAN PROCRASTINATION SCALE

Turkish Item [English]	Factor Loadings (Present Study)	Factor Loadings (Tuckman, 1991)
1. Önemli olsalar bile, işleri bitirmeyi gereksiz yere ertelerim [I needlessly delay finishing jobs, even when they're important].	.75	.63
2. Yapmaktan hoşlanmadığım şeylere başlamayı ertelerim [I postpone starting in on things I don't like to do].	.51	.47
3. İşlerin teslim edilmesi gereken bir tarih olduğunda, son dakikaya kadar beklerim [When I have a deadline, I wait until the last minute].	.64	.65
4. *Zor kararlar almayı ertelerim* [*I delay making tough decisions*].	*Removed*	.40
5. Çalışma alışkanlıklarımı geliştirmeyi ertelerim [I keep putting off improving my work habits].	.62	.59
6. Bir şeyi yapmamak için bahane bulmayı başarırım [I manage to find an excuse for not doing something].	.57	.56
7. Ders çalışmak gibi sıkıcı işlere dahi gerekli zamanı ayırırım [I put the necessary time into even boring tasks, like studying]. (R)	.39	.53
8. Ben iflah olmaz bir zaman savurganıyım [I am an incurable time waster].	.78	.70
9. Ben bir zaman savurganıyım ama bunu düzeltmek için hiç bir çaba gösteremiyorum [I'm a time waster now but I can't seem to do anything about it].	.71	.75
10. *Bir şey üstesinden gelinemeyecek kadar zor olduğunda, onu ertelemek gerektiğine inanırım* [*When something's too tough to tackle, I believe in postponing it*].	*Removed*	.51
11. Bir şeyi yapacağıma dair önce kendime söz verir, sonra kararımı uygulamayı ağırdan alırım [I promise myself I'll do something and then drag my feet].	.49	.71
12. Bir eylem planı yaptığımda, onu takip ederim [Whenever I make a plan of action, I follow it]. (R)	.58	.53
13. Bir işe başlayamadığımda kendimden nefret ederim, ama yine de bu beni harekete geçirmez [Even though I hate myself if I don't get started, it doesn't get me going].	.60	.59
14. Önemli işleri her zaman vaktinden önce tamamlarım [I always finish important jobs with time to spare]. (R)	.62	.57
15. Bir ise başlamanın ne kadar önemli olduğunu bilmeme rağmen tıkanır kalırım [I get stuck in neutral even though I know how important it is to get started].	.72	.67
16. Bugünün işini yarına bırakmak benim tarzım değildir [Putting something off until tomorrow is not the way I do it]. (R)	.78	.60

man, 1991), and in a more recent study Tuckman (2007) reported Cronbach's α to be .89.

Self-efficacy.—The Academic Self-efficacy Scale was developed by Jerusalem and Schwarzer (1981) to assess students' sense of perceived self-efficacy in an academic setting (see Yılmaz, Gürçay, & Ekici, 2007). The Academic Self-efficacy Scale is unidimensional and has 7 items. Items are rated on a five-point Likert scale (1: True for me, 5: False for me). Jerusalem and Schwarzer (1981) reported the Cronbach's α as .87. A unidimensional, seven-item Turkish version of the Academic Self-efficacy Scale (Yılmaz, *et al.*, 2007) was also found to be internally consistent (α = .79). Yılmaz, *et al.* (2007) reported a correlation coefficient of .44 between the Academic Self-efficacy Scale and the Rosenberg Self-esteem Scale. In the present study, the reliability of the observed scores was α = .76. The Academic Self-efficacy Scale was used to provide convergent validity evidence for the Tuckman Procrastination Scale.

Self-esteem.—The Rosenberg Self-esteem Scale consists of 10 items rated on a four-point scale (1: Strongly agree, 4: Strongly disagree). The scale had good internal consistency ($\alpha = .80$) and test-retest reliability ($r = .85$). The Rosenberg Self-esteem Scale was adapted into Turkish by Çuhadaroğlu (1985), who reported a test-retest reliability of .75 and a significant association with psychiatric ratings from interviews ($r = .71$). In the present study, the reliability of the observed scores was α = .70. The Rosenberg Self-esteem Scale was used to provide construct validity evidence for the Tuckman Procrastination Scale.

Procedure

A stepwise validation procedure was followed in translating and adapting the Tuckman Procrastination Scale into Turkish (Hambleton, 2005). The semantic equivalence of the items was established through a translation and back-translation procedure (Canino & Bravo, 1999). A sample of Turkish college students provided feedback on the clarity of the items. To establish content equivalence of the Turkish version of the scale, the original author and experts in procrastination who are native speakers of Turkish and fluent in English were consulted. After establishing the construct validity, criterion equivalence was examined. The details of the validation procedure are provided below.

Step 1: Five graduate students in the Counseling Psychology department independently translated the Tuckman Procrastination Scale items into Turkish. The scale items that were translated into Turkish then were given to five other graduate students who were fluent in both languages for back translation. These five graduate students independently translated the scale items that were translated into Turkish back into English.

Step 2: Back-translated items were reviewed and compared to original Tuckman Procrastination Scale items by the original developer of the scale (B. W. Tuckman). In reviewing the back-translated items, the original author checked the semantic equivalence of the back-translated items to the original items and ensured that the intended meaning in the original items was preserved during the translation process. The original author then suggested the best candidate items among the back-translated item pool for each Tuckman Procrastination Scale item. The first draft of a Turkish Version of the Tuckman Procrastination Scale–Short Version was constructed based on the items recommended.

Step 3: Three field experts with Ph.D. degrees in Counseling Psychology reviewed the first draft of the Turkish Version of Tuckman Procrastination Scale in terms of its content equivalency and the appropriateness for Turkish culture. Based on the three experts' suggestions, wordings in the several items in the first draft of the Turkish version were revised to better communicate the ideas that were intended in the original scale. The second draft of the Turkish Version of the Tuckman Procrastination Scale was constructed based on the revisions recommended by the three field experts.

Step 4: The second draft of the Turkish Version of the Tuckman Procrastination Scale was given to 10 undergraduate students to test the clarity of the items for the population of interest. Students who participated in this pilot study were asked to state whether the meaning of the items was clear. Students were also invited to provide alternative items/words for the items/words that they thought were not clear. Based on the students' feedback, minor revisions were made to seven items. The final form of the Turkish version was formed based on the students' feedback.

Step 5: The final form of the Turkish Version of the Tuckman Procrastination Scale was administered to a total of 858 college students to establish validity (construct and concurrent) and reliability of the scale scores in the Turkish sample. The construct validity of the scale was established using exploratory (the first sample, $n = 236$) and confirmatory factor analysis (the second sample, $n = 622$), and the concurrent validity was established by calculating the Pearson correlation coefficients between the Academic Self-efficacy Scale, the Rosenberg Self-esteem Scale, and the Turkish version of the Tuckman Procrastination Scale scores. The reliability of the measurement was calculated using internal-consistency and coefficient of stability approaches.

RESULTS

The descriptive statistics indicated that the mean of the Turkish version of the Tuckman Procrastination Scale scores of the Turkish sample was 41.83 ($SD=1.18$). The Academic Self-efficacy Scale had a mean of 23.72 ($SD=5.28$), and the mean of the Rosenberg Self-esteem Scale was 31.83 ($SD=5.52$).

Exploratory Factor Analysis

Initially, an exploratory factor analysis was conducted using the unweighted least squares (ULS) method of estimation on a polychoric correlation matrix to reveal the factor structure of the 16-item Turkish version of the Tuckman Procrastination Scale. The analysis was run using the FACTOR software version 7.02 (Lorenzo-Seva & Ferrando, 2006). The analysis was performed on the first sample. Graphical and numerical inspection of sample data suggested that sample distribution exhibited moderate kurtosis and did not severely deviate from normality. Sample data did not include outliers. The results of the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.86) and the Bartlett's test of sphericity (BTS = 1517, $p < .001$) indicated that the data were suitable for factor analysis. An oblique rotation with the Kaiser normalization procedure was performed to facilitate the interpretability of results. Two factors emerged with eigenvalues greater than 1 (Factor 1: eigenvalue = 6.20, percent variance = 38.78; Factor 2: eigenvalue = 1.34, percent variance = 8.37). Communality estimates ranged from .45 to .83. The correlation coefficient between the two factors was $r = .32$. Results indicated that while Items 4 and 10 loaded on Factor 2, the remaining 14 items loaded on Factor 1. The following criteria were utilized in deciding number of factors to retain: (a) Kaiser's criterion, (b) the scree test, (c) parallel analysis, and (d) the interpretability of the resulting factor structures criterion. Kaiser's criterion suggested the existence of two factors. The scree test indicated a one-factor solution for the data. Parallel analysis suggested that only the first factor should be retained as the actual eigenvalue of the second factor (eigenvalue = 1.34) was lower than the eigenvalue of the second factor (eigenvalue = 1.44) generated by the parallel analysis (Hayton, Allen, & Scarpello, 2004). Also, a review of the two items that loaded on Factor 2 revealed that these items represented a tendency to avoid something "tough," whereas the remaining items represented a tendency to "delaying" or "not finishing" a task. This subtle meaning difference between these two items in the original scale became evident in the Turkish sample. Therefore Items 4 and 10 were removed from the analysis and the 14 items that loaded on the first factor were retained, reflecting the single factor structure of the original measure. A second factor analysis was conducted on the retained 14 items. This analysis produced a one-factor solution with an eigenvalue of 5.95, which explained 42.52% of the total variance, acceptable for a single-factor solution. Inter-item correlations and item-total correlations ranged from .25 to .62 and .36 to .74, respectively. Table 1 shows the factor loadings of the 14-item scale.

Confirmatory Factor Analysis

A confirmatory factor analysis was conducted using Lisrel Version 8.80 on the one-factor, 14-item model derived from the preceding explana-

tory factor analysis. The analysis was performed on the second sample. A polychoric correlation matrix and an asymptotic covariance matrix were generated and used in the analysis. These matrices were analyzed using the robust diagonally weighted least squares (DWLS) method of estimation (Jöreskog & Sörbom, 1993).

The chi-square test was significant, indicating poor fit ($\chi^2 = 237.43$, $df = 77$, $p < .001$). Because the χ^2 statistic is easily influenced by large sample sizes, multiple goodness of fit indices were used to evaluate the fit between the model and the sample data (Bentler & Bonett, 1980). The indices used in the present study were the Non-normed Fit Index (NNFI = 0.98), the comparative fit index (CFI = 0.98), and the root mean square error approximation (RMSEA = 0.058; 90%CI = 0.050–0.066). The fit indices suggested that the one-factor solution with 14 items was a good fit to the sample data.

Concurrent Validity

To provide further evidence for the validity of the scores, concurrent validity was established using the second sample of 622 participants. Initially, all three scales were subjected to Confirmatory Factor Analysis. A polychoric correlation matrix and an asymptotic covariance matrix were generated and analyzed using the robust diagonally weighted least squares (DWLS) method of estimation. The fit indices suggested that the model where the scale items were restricted to load only on their corresponding scale factor was acceptable ($\chi^2 = 1664.56$, $df = 431$, $p < .001$; NNFI = 0.94; CFI = 0.94; RMSEA = 0.068; 90% CI = 0.065–0.071), suggesting that procrastination, academic self-efficacy, and self-esteem form three distinct constructs. The Pearson correlations among the participants' Academic Self-efficacy Scale, Rosenberg Self-esteem Scale and the Turkish version of the Tuckman Procrastination Scale scores were in the expected direction. There was a negative correlation between the Academic Self-efficacy Scale and the Turkish Version of the Tuckman Procrastination Scale scores ($r = -22$, $p < .01$), suggesting that participants with a high procrastination score tended to have low self-efficacy. Likewise, there was a negative correlation between the Rosenberg Self-esteem and the Turkish version of the Tuckman Procrastination Scale scores ($r = -23$, $p < .01$), indicating that participants with higher procrastination tended to report lower self-esteem. These results provided additional evidence for the validity of the Turkish version of the Tuckman Procrastination Scale scores.

Reliability

Two reliability coefficients were calculated for the Turkish version of the Tuckman Procrastination Scale: the internal consistency coefficient and coefficient of stability (test-retest). Cronbach's α for the 14-item scale was α = .90 for the first sample and .85 for the second sample, indicating high

internal consistency. These alpha coefficients are slightly higher than the alpha value ($\alpha = .82$) reported by Klassen and Kuzucu (2009). McDonald's ω_h for the first sample was $\omega_h = .88$, and .84 for the second sample. Inter-item correlations and item-total correlations ranged from .25 to .62 and .36 to .74, respectively. The coefficient of stability was calculated using the data obtained from 22 participants who completed the Turkish Version of the Tuckman Procrastination Scale twice within a four-week interval. The Pearson correlation was $r = .80$, again indicating high reliability.

Discussion

The present study examined the psychometric properties of the Tuckman Procrastination Scale using a sample of Turkish college students. Exploratory and confirmatory factor analyses results supported the unidimensional structure of the 14-item Tuckman Procrastination Scale for Turkish college students. Reliability estimates for the Turkish version of the Tuckman Procrastination Scale were within the acceptable range and they were similar to the reliability coefficients reported in previous studies (e.g., Tuckman, 2007). Besides the factor structure, the results regarding the correlations between the Academic Self-efficacy Scale, the Rosenberg Self-esteem Scale, and the Turkish version of the Tuckman Procrastination Scale scores provided evidence for the construct validity, consistent with previous studies (Dweck & Leggett, 1988; Haycock, *et al.,* 1998; Schubert, Lilly, & Stewart, 2000; Klassen & Kuzucu, 2009).

Based on the evidence provided in the present study, the Turkish version of the Tuckman Procrastination Scale appears to produce valid and reliable scores for Turkish college students. With the use of this scale, both researchers and counselors working with college students will be able to obtain data to guide their efforts. The Turkish adaptation of the Tuckman Procrastination Scale is also expected to fill the gap in assessing procrastination in the Turkish college population, which in turn might stimulate cross-cultural studies relating the assessment of procrastination to other variables.

There are several limitations of the present study, e.g., the sample was not a random sample and the participants were recruited from only two sites. Therefore, further validation studies should be conducted with diverse samples to provide additional evidence for the validity and reliability of observed scores. Further research with larger and more demographically diverse populations, such as samples from different universities and different regions of Turkey, would no doubt strengthen the findings. The current study is the first attempt to examine the factor structure of the Tuckman Procrastination Scale for the Turkish university student population, and the results could be considered preliminary for establishing cross-cultural equivalency of the scale. Findings of this study suggested possible cultural differences; thus, further studies may examine cross-cultural issues regarding academic procrastination.

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