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ORIGINAL RESEARCH

Turkish Version of the Problem Gambling Severity Index (PGSI-T): Psychometric Properties Among the University Students

Kuntay Arcan

Department of Psychology, Maltepe University School of Humanities and Social Sciences, İstanbul, Turkey

ORCID iD of the author: K.A. 0000-0002-8118-4547.

Main Points

- Problem Gambling Severity Index showed promising psychometric results among Turkish university students.
- Problem Gambling Severity Index scores of the participants were positively and significantly correlated with gambling-related faulty cognitions, gambling frequency and harm.
- Young and educated sample recruited using convenience sampling method, the lack of re-test reliability and the cross-sectional nature of the data were major limitations of the present study.

Abstract

The aim of this study was to examine the psychometric properties of the Turkish version of the Problem Gambling Severity Index (PGSI-T). The study sample included 182 voluntary university students (mean age=24.06 years) who reported that they had participated in gambling at least once in the previous year. The results of the confirmatory factor analyses supported the unifactorial structure of the PGSI-T among the Turkish university students participated in gambling. Cronbach's alpha for the PGSI-T was good (α=0.82). Positive and significant correlations of the PGSI-T with gambling-related variables such as gambling frequency, gambling harm, South Oaks Gambling Screen supported the concurrent validity of the scale; whereas higher scores of the probable problem gamblers on PGSI-T compared to the nonproblem gamblers supported the criterion validity of the scale. These findings suggest that PGSI-T is a valid and reliable instrument to assess gambling problems among Turkish university students. Future research with more representative samples will be useful in testing the generalizability of these findings.

Keywords: Problem gambling severity index, Turkish, validity, reliability

Corresponding author:
Kuntay Arcan
E-mail:
kuntayarcan@maltepe.edu.tr
kuntayarcan@yahoo.com

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Introduction

Gambling is defined as taking a risk or relying on chance when the outcome is not certain (Freimuth, 2008). A value is placed upon a game, event, or a bet and the outcome to some magnitude is determined by chance (Bolen & Boyd, 1968). The expectation is gain in value that is more than the invested value. Gambling is considered as a form of risk-taking behavior (Slutske, Caspi, Moffitt, & Poulton, 2005). Enhancement, coping, and social concerns (Stewart & Zack, 2008) in addition to the monetary concerns (Wulfert, Franco, Williams, Roland, & Maxson, 2008) are primary motivational associates of gambling behavior. Gambling is related to difficulties of varying severity and duration for some people, whereas it continues to be a positive experience of entertainment for the majority of people (Voldberg, Nysse-Corris, & Gerstein, 2006). Problem gambling is stated to occur when the gambling of the individual is out of control and it begins to cause personal, interpersonal, and social problems (Raylu & Oei, 2004a). Research showing evidence of association of suicidal thoughts and attempts with gambling problems (Newman & Thompson, 2007; Petry & Kiluk, 2002; Stuhldreher, Stuhldreher, & Forrest, 2007) is noteworthy to indicate the seriousness of

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gambling-related negative consequences. The harm caused by gambling is not limited to the gamblers but it also affects others around them due to financial problems or domestic violence related with gambling (Svensson, Romild, & Shepherdson, 2013; Wiebe, Single, & Falkowski-Ham, 2003). Thus, as a matter of public health concern, examination of gambling behavior and its negative consequences is required (Chou & Afifi, 2011; Faregh & Leth-Steensen, 2011; Nower, Derevensky, & Gupta, 2004).

The increase in gambling research (Johansson, Grant, Kim, Odlaug, & Götestam, 2009) is gratifying when the harm caused by this addictive behavior among different populations is considered. However, it is stated that gambling research is in an early stage (Chiu & Storm, 2010). In addition to the lack of understanding and precision in the definition required to clarify the nature and extent of problem gambling (McMillen & Wenzel, 2006), gambling research being conducted mostly in Western populations is remarkable as an essential constraint of the field. The social context of gambling cannot be ignored (Pöysti & Majamäki, 2013). Understanding the contribution of cultural factors is emphasized to devise better prevention and treatment options for problem gambling (Raylu & Oei, 2004b). Lack of gambling research support from non-Western countries limits the understanding of similarities and differences across cultures in relation to the problem gambling. Expanding research by including the non-Western populations may contribute to the maturation of gambling research. Given priority for validating and using as many as the same gambling-related measurement instruments as possible across different populations as far as cultural variations permit may improve the understanding of the nature of gambling problems and accordingly help to tailor the treatment and to develop preventative programs more effectively.

Following the strategic priority suggested above, this study aimed to evaluate the psychometric properties of the Turkish version of Problem Gambling Severity Index (PGSI-T). PGSI is derived as a subset of the Canadian Problem Gambling Index (CPGI; Ferris & Wynne, 2001). Items of the scale assess gambling behavior and adverse consequences of gambling. PGSI is one of the most commonly used instruments to assess problem gambling severity together with South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) and versions of DSM IV – based scales that utilize criteria of pathological gambling (e.g. Orford, Wardle, Griffiths, Sproston, & Erens, 2010; Stinchfield, Govoni, & Frisch, 2005). Items of betting more than one could afford and health problems caused by gambling such as stress and anxiety are peculiar to PGSI compared to the other two measures. PGSI was developed to measure problem gambling especially on general population surveys with a new and more meaningful instrument (Ferris & Wynne, 2001), whereas SOGS was developed in a medical context for clinical purposes (McMillen & Wenzel, 2006). PGSI was stated to be psychometrically stronger than comparable gambling scales (Currie, Casey, & Hodgins, 2010). PGSI was recommended to be administered in large population surveys because it is short, practical, and possesses measurement superiorities (McMillen & Wenzel, 2006). Satisfactory reliability and validity findings were reported for the scale by the studies conducted with Chinese (Loo, Oei, & Raylu, 2011), Spanish (Lopez-Gonzales, Estevez, & Griffiths, 2018), or Australian (Bertossa, Harvey, Smith, & Chong, 2014) participants. Respondents of PGSI can be classified in non-problem, low-risk, moderate-risk, or problem gambling groups that vary in severity of gambling behavior (Ferris & Wynne, 2001). In spite of the contradictory findings for the validity of PGSI interpretive categories (Currie, Hodgins, & Casey, 2013; Miller, Currie, Hodgins, & Casey, 2013; Williams & Voldberg, 2014), categorization of gambling behavior and gamblers along a continuum is important not to limit the investigation to pathological gambling and pathological gamblers. Evidence suggests that gambling-related harm is not peculiar to pathological gambling (Currie, Hodgins, Wang, el-Guebaly, Wynne, & Chen, 2006; Wiebe et al., 2003). In other words, harm at any level of gambling is possible (Blaszczynski, 2009).

Contributing to the promotion of gambling research in Turkey by adapting PGSI into Turkish is one of the prominent reasons to conduct the present study. The absence (or belief in the absence) of gambling-related problems in Turkey may be one possible explanation of the lack of interest in research on gamblers in the Turkish society. However, the findings of a few relevant studies do not support this explanation. For instance, the Government Inspection Board (GIB; 2009), which is a foundation of the Turkish Presidency of Republic, reported that approximately 3% and 10% of the nationally representative sample of 1,536 gambling participants, respectively, reported that they "gamble till they lose all their money in a given day" and "chase their monetary losses." Findings of a more recent research suggested that gambling was problematic at least among the regular gamblers in Turkey (Arcan & Karanci, 2015). Thus, important indications that are related to the existence of problem gambling are already present in the limited Turkish literature. Lack of available and appropriate gambling-related measurement instruments in Turkey seems to be a more plausible reason that may explain the disinterest in the field. As per the author's knowledge, Turkish versions of SOGS (Duvarci & Varan, 2001) developed by Lesieur and Blume (1987), Gambling-Related Cognitions Scale (Arcan & Karanci, 2015) developed by Raylu and Oei (2004b), and Five-Factor Gambling Motives Scale (Arcan & Karanci, 2015) developed by Lee, Chae, Lee, and Kim (2007) are the only gambling-related measurement instruments used in Turkey. Thus, it is expected to attract attention of new researchers to study gambling and related problems in Turkey by the adaptation of the PGSI which is stated to be a brief, clear, and straightforward instrument with adequate psychometric properties (Holtgraves, 2009).

The second and globally expected prominence of this study is the contribution to the investigation of psychometric properties of PGSI related to the differentiating features of the Turkish population compared to the Western populations. Social availability of gambling which refers to the approval of gambling by family, friends, or society (Welte, Barnes, Wieczorek, Tidwell, & Hoffman, 2007) is probably low in Turkey. Turkey is predominantly a Muslim country, thus gambling is prohibited according to the Islamic faith. The importance of religious commitment is stated to be high in Turkey (Esmer, 2012). GIB (2009) report revealed that "sin" was the first reason not to gamble for almost half of those participants who indicated that they did not gamble in the previous year (32.7% of the whole sample) in Turkey. In addition to the possible low acceptability of gambling in the Turkish society, it is also important to note that some types and environments of gambling available to the Western populations such as elec-

tronic gambling machines or casinos are not legally authorized in Turkey. Changing association of gambling severity in relation to the various gambling forms has been already found in different studies (Faregh & Leth-Steenson, 2011; Kessler et al., 2008; Petry, 2003; Welte et al., 2007). To sum up, this study will test the psychometric properties of PGSI not only in a different language but in a distinctive population with respect to the acceptability of gambling and available gambling forms. The present study included university students as the sample, thus it will not be possible to generalize the findings to all gambling individuals in Turkey. However, possible promising results of the present study will probably lead to testing the psychometric properties of PGSI in different samples of gambling individuals in Turkey.

Methods

Participants

The sample size of the present study was 182 university students who reported to have gambled at least once in the previous year. The participants were selected through convenience sampling in three universities of İstanbul on the basis of a voluntary participation. The students who did not gamble in the previous year were not included in the study. The majority of the participants were from departments of Psychology (54.9%), Psychological Counseling (17.0%), and Philosophy (9.3%). Remaining participants were from other eight departments with minor proportions. Majority of the sample comprised undergraduate students (90.7%) compared to the graduate students (9.3%). Ninety-eight (53.8%) participants were males and 84 (46.2%) were females. The mean age of the participants was 24.06 years (SD=3.34; range: 19-47 years). Majority of the sample was not employed (97.3%) and was not married (96.2%). Of the 182 participants, 107 (58.8%) reported alcohol use and 88 (48.4%) of them also reported cigarette smoking.

Materials

The following measures were used in the present study:

Demographics: A demographics form consisted of information about demographical variables of the participants such as age, gender, marital and employment status. Moreover, cigarette smoking and alcohol use of the participants were also asked in the demographics form.

Gambling Information Form: This form consisted of information about the participants' gambling involvement, gambling-related faulty cognitions, and gambling-related harm reports. Gambling frequency and participated gambling types in the previous year were asked as part of the gambling involvement information. Frequency of gambling was measured on a 5-point scale (1: never, 2: less than once in a month, 3: at least once in a month, 4: at least once in a week, 5: most days of a week) in horse races, sports betting, internet gambling, lottery, and four more local gambling types.

Gambling-related faulty cognitions of the participants were measured by two items of the CPGI (Ferris & Wynne, 2001). CPGI includes different problem gambling correlates such as family problems, comorbidity with alcohol and drug, or depression in addition to the faulty cognitions. These problem gambling correlates and gambling involvement items (e.g., gambling expenditure or time) of the CPGI are not scored. The participants of the present study rated the faulty cognitions items of "After losing many times in a row, you are more likely to win." and "You could win more if you use a certain system or strategy." on a 3-point scale (1=do not accept, 3=accept).

Additionally gambling-related harm was also evaluated by means of family and friendship relations, job or school life, economical concerns, and emotional well-being on a 4-point scale (1=no harm, 4=very much harm). Each domain was assessed by a single question (e.g., "Rate the effect of gambling on your family relationships."). In addition to the separate harm scores of family relationships, friendship, job or school life, economic well-being, and emotional well-being, the mean scores for five questions were utilized to measure total gambling-related harm scores of the participants. The internal consistency value for the total gambling harm questions was 0.87.

Problem Gambling Severity Index (PGSI): PGSI is derived as a subset of CPGI (Ferris & Wynne, 2001). Nine items of the scale assess gambling behavior (bet more than could afford, increase wagers to get the same feeling of excitement, chase gambling losses, borrow money, or sell anything) and adverse consequences of gambling (recognition of gambling problem, negative health effects, criticism of others about betting, financial problems, feelings of guilt). Respondents can be classified in nonproblem (PGSI score=0), low-risk ($1 \leqslant$ PGSI score<3), moderate-risk ($3 \leqslant$ PGSI score<8), or problem gambling (PGSI score $\geqslant 8$) groups according to their total scores on a 4-point rating scale (0=never, 1=sometimes, 2=most of the time, 3=almost always) of the PGSI items. The possible scores are between 0 and 27. The internal consistency and test – retest reliability values for the PGSI were 0.84 and 0.78, respectively, and concurrent validity was satisfactory correlating at 0.83 with SOGS (Ferris & Wynne, 2001).

South Oaks Gambling Screen (SOGS): SOGS is a self-reported questionnaire that is developed to assess gambling-related behaviors and problems (Lesieur & Blume, 1987). The possible scores are between 0 and 20. Scores of 5 or greater are used to identify probable pathological gamblers. The internal consistency and test – retest reliability values for the SOGS were reported as 0.97 and 0.71, respectively (Lesieur & Blume, 1987). The possible scores for the Turkish version of SOGS are between 0 and 19 since three items in the original form that did not discriminate between pathological and nonpathological Turkish gamblers were replaced with two culturally relevant items (Duvarcı & Varan, 2001). Duvarcı and Varan (2001) indicated cut-off score of 8 to identify the probable pathological Turkish gamblers. The internal consistency and test – retest reliability values were reported as 0.88 and 0.95 for the Turkish version of SOGS (Duvarcı & Varan, 2001). The internal consistency value for the SOGS was good for the present study (α=0.79).

Procedure

Translation and back translation were performed for the adaptation study of the PGSI into Turkish. Original form was translated into Turkish by two researchers and comprehensibility of the translated items was rated by two other independent judges. Before the final version of the form (Appendix) was decided, PGSI-T was evaluated for grammatical and semantic suitability by a Turkish language teacher and back translation of the Turkish items into English by two other independent judges was completed.

The instrument set was administered between January 1 and June 20 in 2016, after getting ethical approval from the Ethics Committee of Maltepe University, İstanbul (63316977/12-9). Participants signed a written informed consent form including the information that participation was voluntary, no personal identification information was asked, and withdrawal at any time of the study was possible. The participants individually completed the paper-and-pencil questionnaires, on an average, in 20 minutes.

Statistical Analysis

All statistical analyses were conducted with the Statistical Package of Social Sciences version 16 (SPSS Inc.; Chicago, IL, USA) Program except confirmatory factor analyses (CFA) of the PGSI-T that was performed by LISREL 8.71 Program.

Results

Gambling Involvement of the Participants

Betting on sports was found to be the most popular gambling type among the participants of the present study. Sixty-one percent of the participants reported that they had placed bets on sports at least once in the previous year. National lottery (56.6%) was found to be the second most preferred gambling type following sports betting. In contrast, gambling on horse races was the least participated gambling type among the participants of the present study, 91.8% of the participants reported that they never gambled on horse races in the previous year.

Gambling was not infrequent among the participants of the study. More than half of the participants (50.5%) reported that they gambled at least once in a month and more than quarter of the participants (26.3%) reported that they gambled at least once in a week. Gambling frequency reports of the participants have been detailed in Table 1.

Total number of different gambling types participated in the previous year was also considered as part of the gambling involvement information. As shown in Table 2 most of the participants

Table 1.
Gambling Frequency in the Last 12 Months

	Frequency (%)	Cumulative percentage
No response	2 (1.1)	1.1
Less than once in a month	88 (48.4)	49.5
At least once in a month	44 (24.2)	73.7
At least once in a week	32 (17.6)	91.3
Most days of the week	16 (8.8)	100.0

Table 2.
Number of Participated Different Gambling Types in the Last 12 Months

Participated gambling types	Frequency (%)	Cumulative percentage
No response	1 (0.5)	0.5
1	57 (31.3)	31.9
2	54 (29.7)	61.5
3	42 (23.1)	84.6
4	11 (6.0)	90.7
5	11 (6.0)	96.7
7	6 (3.3)	100.0

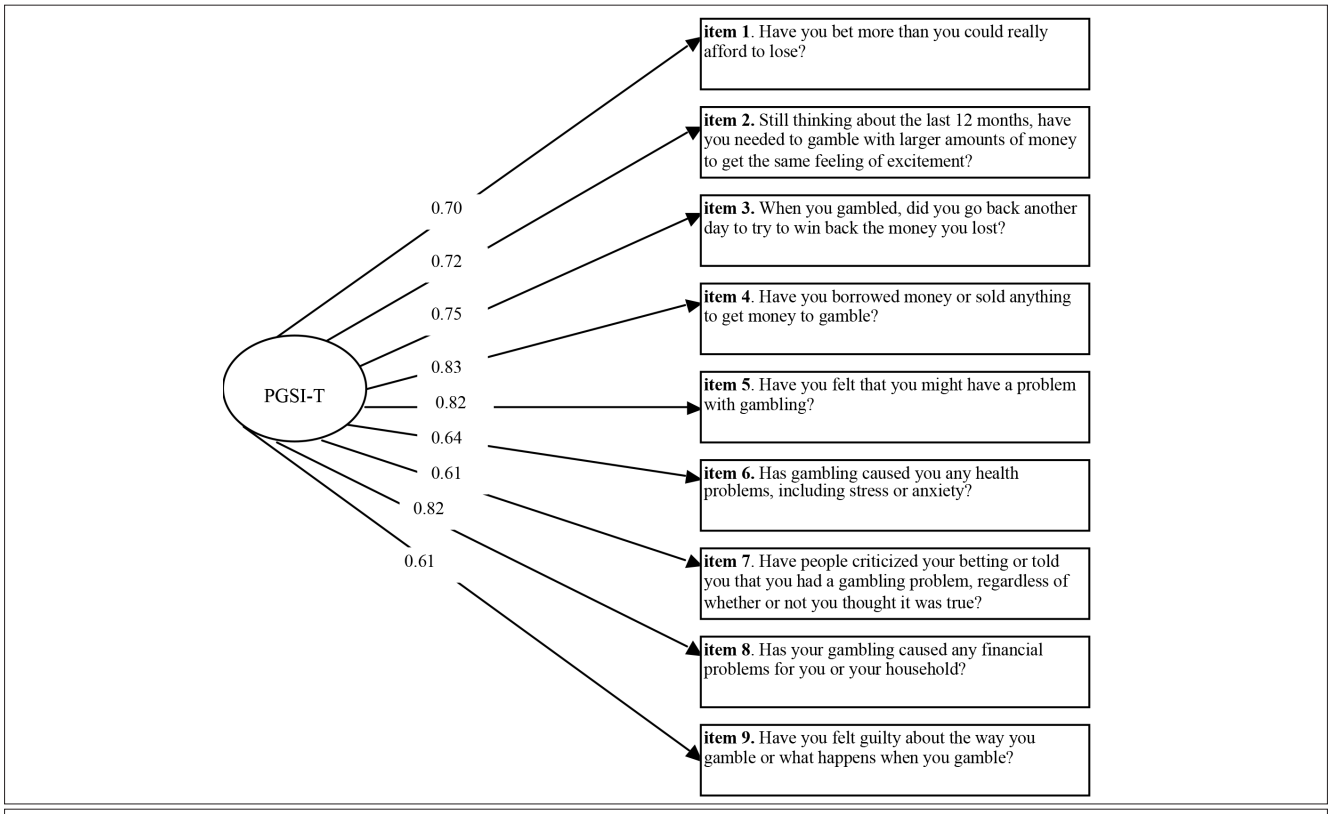

Figure 1. The hypothesized model (Hayes, 2013)

(31.3%) participated in single type of gambling. However, participating in 2 (29.7%) and 3 (23.1%) different kinds of gambling was also common among the participants of the study.

Confirmatory Factor Analyses

CFA was conducted via LISREL 8.71 Program to test if the unifactorial structure of PGSI obtained in the previous studies (Brooker, Clara, & Cox, 2009; Ferris & Wynne, 2001; Loo et al., 2011) could be retained in the Turkish sample. Diagonally weighted least squares were used to estimate the model as it makes no distributional assumptions about the observed variables (Li, 2016). Data fit indices of Chi-squared (χ^2), ratio of χ^2 to degrees of freedom (df), root mean square error of approximation (RMSEA), comparative fit index (CFI), goodness-of-fit index (GFI), and non-normed fit index (NNFI) were assessed in the analyses.

According to the results of the CFA, fit indices were acceptable. The GFI (0.98), CFI (0.99), and NNFI (0.99) values were higher than 0.95 and the RMSEA value (0.075) was smaller than 0.08, showing acceptable fit for the data. Values less than 0.08 for RMSEA and values higher than 0.90 for CFI, GFI and NNFI indicate an acceptable fit (Hooper, Coughlan, & Mullen, 2008; Kline, 2005; Tabachnick & Fidell, 2007; Sümer, 2000). In contrast, Chi-squared value was significant, $\chi^2_{(27)} = 54.85$, $p < .05$, although a non-significant Chi-squared value is required for a good fit. However, numerous alternative measures of model fit other than Chi-squared value have been proposed as that value is sensitive to violations of normality and sample size (Blunch, 2008), and several problems are possible in both large and small samples (Tabachnick & Fidell, 2007). Relative Chi-squared (ratio of χ^2 to df) that takes sample size into consideration is one of those alternative measures. χ^2/df ratios less than 5 (Wheaton, Muthen, Alwin, & Summers, 1977), less than 4 (Field, 2000), or in the range of 2 to 1 or 3 to 1 (Carmines & McIver, 1983; Munro, 2005) are indicative of an acceptable fit. Taking relative Chi-squared measure (χ^2/df ratio) into consideration (54.85/27=2.03) the result indicated a good fit for the present study. Additionally, the loadings of the items had acceptable values, they were 0.61 and above. The factor structure of PGSI-T has been shown in Figure 1.

Reliability

The Cronbach's alpha value was computed to assess the internal reliability of the PGSI-T. The computed value was high (α=0.82). Item total correlations were also computed for the PGSI-T as shown in Table 3. Corrected item total correlation coefficients were between 0.40 and 0.63.

Table 3.
Reliability of PGSI-T

	α if item deleted	item – total r
Item 1	0.81	0.54
Item 2	0.80	0.55
Item 3	0.80	0.59
Item 4	0.81	0.56
Item 5	0.80	0.63
Item 6	0.81	0.50
Item 7	0.82	0.40
Item 8	0.80	0.60
Item 9	0.81	0.48

Validity

Concurrent and criterion-related validities were examined for the PGSI-T.

Concurrent Validity: Relations of the PGSI-T with a range of well-established problem gambling correlates were explored in order to support the concurrent validity of the scale. Those correlates were SOGS scores, total number of different participated gambling types, gambling frequency, gambling-related faulty cognitions, and gambling-related harm. All correlation coefficients were found to be significant and positive ($p < .001$) supporting the concurrent validity of the PGSI-T. PGSI-T showed highest correlations with SOGS and gambling frequency. The result of the correlation analysis has been shown in Table 4.

In addition, two separate independent *t*-tests were conducted to support the concurrent validity of the PGSI-T. According to the results of the analyses, PGSI-T scores of the participants who reported that they were smoking were higher compared to the participants who reported that they were not smoking, as expected. In contrast, PGSI-T scores of the participants did not differ according to their alcohol use. The results have been shown in Table 5.

Criterion-related Validity: Participants of the present study were divided into two groups of nonproblem and probable problem gamblers according to their SOGS scores. Nonproblem gambling group was composed of participants who had SOGS scores 0 (n=73) and probable problem gambling group was composed of participants who had SOGS scores above 3 (n=39). Two groups were compared on their PGSI-T scores in order to support the criterion-related validity of the scale. According to the result of the independent samples *t*-test, as expected, probable problem gamblers (SOGS>3) had higher scores on PGSI-T than nonproblem

Table 4.
Correlations of PGSI-T with Research Variables

Variables	Correlation coefficient with PGSI-T
SOGS	.76*
Number of gambling types	.38*
Gambling frequency	.54*
Gambling-related faulty cognitions	.40*
Gambling-related harm – family relationships	.35*
Gambling-related harm – friendship relationships	.28*
Gambling-related harm – school / work life	.45*
Gambling-related harm – economical concerns	.47*
Gambling-related harm – emotional well-being	.47*
Gambling-related harm – total	.51*

*p<0.001

Table 5.
PGSI-T Score Comparisons According to Smoking Cigarette and Drinking Alcohol

	Smoking cigarette		
	yes (n=88) M (SD)	**no (n=93) M (SD)**	***t***
PGSI-T score	5.00 (4.19)	3.34 (3.54)	(179) 2.88*
	Drinking alcohol		
	yes (n=107) M (SD)	**no (n=72) M (SD)**	
PGSI-T score	4.39 (3.66)	3.89 (4.43)	(177) 0.83

*p<0.01.
M: mean; SD: standard deviation

Table 6.
SOGS Group Comparisons on PGSI-T Scores

	Nonproblem gamblers M (SD)	**Probable problem gamblers M (SD)**	***t***
PGSI-T score	1.48 (1.72)	9.36 (3.63)	(110) -15.60*

*p<0.001
M: mean; SD: standard deviation

Table 7.
Distribution of PGSI-T Scores

Interpretative categories	**PGSI score**	**n (%)**	**Cumulative percentage**
Nonproblem gambling	0	34 (18.7)	18.7
Low-risk gambling	1	26 (14.3)	33.0
	2	22 (12.1)	45.1
Moderate-risk gambling	3	15 (8.2)	53.3
	4	12 (6.6)	59.9
	5	15 (8.2)	68.1
	6	9 (4.9)	73.1
	7	11 (6.0)	79.1
Problem gambling	>7	38 (20.9)	100.0

Minimum PGSI score: 0 Maximum PGSI score: 21 M (SD) = 4.18 (3.96)
M: mean; SD: standard deviation

gamblers (SOGS=0). In addition to the result of the *t*-test analysis, means and standard deviations of the PGSI-T scores for the nonproblem and probable problem gambling groups have been shown in Table 6.

Distribution of the PGSI-T Scores

The PGSI-T scores of the sample ranged between 0 and 21 (M=4.18, SD=3.86) according to the results of the study. The most frequent PGSI-T score was 0 (18.7%) among the participants of the study. Almost half of the participants (45.1%) scored 2 or less on PGSI-T. According to the interpretative categories of the scale 18.7% of the participants were nonproblem, 26.4% of the participants were low-risk, 34.0% of the participants were moderate risk, and 20.9% of the participants were problem gamblers. Percent and frequencies of PGSI-T scores and interpretative categories of gambling severity have been shown in Table 7.

Discussion

The present study aimed to examine the psychometric properties of the PGSI in the Turkish language among the Turkish gamblers. There were two main reasons to conduct the study. The first reason was related to the limited number of gambling-related instruments in Turkish. The intention was to attract the attention of researchers on gambling problems and to promote the interest in studying those problems of the Turkish gamblers. The second reason was to contribute to the universal gambling literature from a non-Western country. Social approval of gambling in Turkish society is low in relation with the Islamic faith. Thus, the study aimed to test the psychometric properties of PGSI not only in another language but also in a distinctive population with respect to the acceptability of gambling.

PGSI-T showed promising results to be used in future research to assess gambling problems at least among the university students. To begin with the results of the CFA, the unifactorial structure of PGSI was supported in the present study. This finding is consistent with the relevant results of the previous studies (Brooker et al., 2009; Ferris&Wynne, 2001; Loo et al., 2011; Miller et al., 2013). The loadings of the items were satisfactory. The reliability and validity of the PGSI were also supported for the Turkish gambling university students according to the results of the relevant analyses. Internal consistency value computed for the PGSI-T was compatible with the internal consistency values re-

ported for the original version (Ferris & Wynne, 2001), the Australian version (Bertossa et al., 2014), the Spanish version (Lopez Gonzalez et al., 2018), and the Chinese version (Loo et al., 2011) of the PGSI. Corrected item total correlation coefficients were within acceptable range supporting the reliability of the PGSI-T. Relations with gambling-related measures taking past research findings into consideration were explored in order to investigate the concurrent validity of the PGSI-T. Positive and significant correlations found according to the results of the analyses were consistent with previous associations established between gambling problems and gambling frequency (e.g., Chiu & Storm, 2010; Matthews, Farnsworth, & Griffiths, 2009), total number of participated different gambling types (e.g., Kessler et al., 2008; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2004), and gambling-related faulty cognitions (e.g. Loo et al., 2011; Moodie, 2008). PGSI-T scores of the participants were also found to be correlated with their gambling-related harm reports. Cigarette-smoking participants had higher PGSI-T scores as the relevant literature suggest (e.g. McGarth & Barrett, 2009; Migues & Becona, 2015). However, the participants who reported that they consumed alcohol did not have higher PGSI-T scores. Related research support association of alcohol consumption and problem gambling (e.g. el-Guabely et al., 2006; Johansson et al., 2009). The present study lacked the information about the participants' frequency, amount, and severity of alcohol consumption. Future research considering the heterogeneity of the participants in their alcohol drinking behaviors is required to examine this association in detail and reach at more reliable conclusions. In addition, two groups of nonproblem and probable problem gamblers were composed according to the participants' SOGS scores and those groups were compared on their PGSI-T scores in order to test the criterion-related validity of the PGSI-T. Probable problem gamblers had higher PGSI-T scores than nonproblem gamblers, as expected.

In spite of the promising results for the validity and reliability of the PGSI-T, the study has several limitations to be considered. First of all, the sample of the study was composed of a small number of university students. Thus, a relatively young and educated sample of the present study recruited using convenience sampling method may not represent the population of Turkish gambling individuals properly, applying findings from one population across the board is problematic (Henrich, Heine, & Norenzayan, 2010). Results of a recent study indicated that recruiting student gamblers directly from university courses created a biased sample, because those participants differed significantly from gamblers recruited from the general population and also from student gamblers recruited from the general population in terms of general demographics and gambling participation manners (Gainsbury, Russell, & Blaszczynski, 2014). It was specifically concluded that first-year psychology students were not representative of adult general population as well as students from the general population (Gainsbury et al., 2014). Thus future studies with more representative samples in socio-demographics and gambling patterns of the participants are required to generalize the findings of the present study. Moreover, investigating the psychometric properties of the PGSI-T in clinical samples may be useful to compare those properties between clinical and nonclinical populations.

The lack of re-test reliability and the cross-sectional nature of the PGSI-T data were other limitations of the present study. Examining the test – retest reliability of the PGSI-T in future research is required to confidently use the scale in longitudinal studies that can be designed to examine the changes in gambling problems in time and the correlates of those changes. Reliance on the self-report of the participants was the other limitation of the present study. Some participants might have under-reported their gambling behavior and problems as gambling is a socially undesirable behavior in the Turkish society. Moreover, examining the validity of the interpretative categories of the PGSI-T is required in future research in order to properly categorize the gambling individuals in the Turkish population. For instance, proportion of the problem gamblers was relatively high in the sample of the present study. Maybe a higher score to identify the problem gamblers is required for PGSI-T as it was computed for the Turkish version of the SOGS. Duvarcı and Varan (2001) indicated the cut-off score of 8 to identify the probable pathological Turkish gamblers instead of 5 for the SOGS. Considering the contradictory findings for the validity of PGSI interpretive categories already present in the related literature (Currie et al., 2013; Miller et al., 2013; Williams & Voldberg, 2014), intensification of the relevant research is required.

In conclusion, the results of the present study suggest that PGSI can be used in the Turkish population to assess problem gambling participation of the university students in spite of the limitations that have been detailed above. Adaptation study of the scale in Chinese (Loo et al., 2011) previously showed that identification of gambling problems by PGSI was possible in a non-Western culture. The findings of the present study that support the reliability and validity of the PGSI in a distinctive society also indicate important hints of common criteria underlying problem gambling construct above and beyond cultural differences. This indication is essential to encourage comparative research across cultures at one hand. On the other hand, as it is suggested for the Chinese population (Loo et al., 2011) it seems reasonable to follow the Western theory and measurement approach as a foundation to improve gambling research also in Turkey. However, it is important to note that future research of the PGSI-T with different samples other than the university students is required. Future studies including different samples that vary in the participants' sociodemographic features and gambling involvement levels will further confirm the findings of the present study. In addition, taking possible gender differences into consideration and examining the validity of the interpretative categories of the scale in future studies will also be crucial. The findings of the present study are promising enough to inspire those studies. As Currie and his colleagues (2013) suggest scale validation is an ongoing and iterative process.

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Appendix

Problemli Kumar Oynama Ölçeği

Bahis ve kumar oynama davranışlarınız için son 12 ayı düşünerek uygun bulduğunuz seçeneği işaretleyin.

Son 12 ayı düşündüğünüzde;	**Hiçbir zaman**	**Bazen**	**Çoğu zaman**	**Neredeyse her zaman**
1. Ne sıklıkla karşılayabileceğinizden fazlası için bahis oynadınız?				
2. Ne sıklıkla aynı heyecanı duymak için daha fazla parayla kumar oynamaya ihtiyaç duydunuz?				
3. Ne sıklıkla kumar oynadıktan sonra kaybettiğiniz parayı geri kazanmak için başka bir gün geri döndünüz?				
4. Ne sıklıkla kumar oynamak için borç aldınız ya da herhangi bir şey sattınız?				
5. Ne sıklıkla kumar oynama ile ilgili bir sorununuz olabileceğini hissettiniz?				
6. Ne sıklıkla kumarın sizde herhangi bir sağlık sorununa yol açtığı oldu; stres ya da kaygı dahil?				
7. Ne sıklıkla siz öyle düşünmeseniz de diğerlerinin bahis oynamanızı eleştirdikleri ya da kumar sorununuz olduğunu söyledikleri oldu?				
8. Ne sıklıkla kumar oynamanızın sizin ya da evinizdekiler için maddi sorunlara yol açtığı oldu?				
9. Ne sıklıkla kumar oynama biçiminiz ya da kumar oynadığınızda olanlar için suçluluk hissettiniz?				