Comparing the Japanese Version of the Gambling Functional Assessment – Revised to an American Sample

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Abstract

The Gambling Functional Assessment – Revised (GFA-R) was developed to determine the degree to which gambling behaviour was maintained by positive reinforcement or escape. For this study, the GFA-R was translated into Japanese and completed by 126 Japanese university students, who also completed the Japanese version of the South Oaks Gambling Screen (SOGS). Their results were compared to those from 133 American university students. All respondents endorsed gambling for positive reinforcement to a greater extent than as an escape. For both samples, the factor structure for the original GFA-R adequately fit the data, and internal consistency measures were very good. SOGS scores correlated more strongly with gambling as an escape than for positive reinforcement. The Japanese version of the GFA-R may be a useful research tool in a variety of ways, and may be helpful for practitioners in Japan interested in knowing the contingency maintaining their client's gambling behaviour.

Résumé

Le questionnaire *Gambling Functional Assessment – Revised* (GFA-R) vise à déterminer dans quelle mesure on peut attribuer la persistance des comportements de jeu au renforcement positif ou à la recherche d'évasion. Dans cette étude, le GFA-R a été traduit en japonais et rempli par 126 étudiants japonais qui ont répondu en outre à la version japonaise du *South Oaks Gambling Screen* (SOGS). Les résultats obtenus ont été comparés à ceux de 133 étudiants américains. Ils accordent au renforcement positif un plus grand poids qu'à l'évasion. La structure factorielle du GFA-R pour les deux échantillons correspondait adéquatement aux données et les mesures sur la cohérence interne étaient très bonnes. Les résultats du SOGS indiquent pour leur part que le jeu est plus fortement corrélé avec l'évasion qu'avec le renforcement positif. La version japonaise du GFA-R pourrait s'avérer

un instrument de recherche utile à certains égards, notamment pour les intervenants japonais qui s'intéressent aux raisons contribuant à la persistance des comportements de jeu chez leurs clients.

Introduction

Pathological and problem gambling are major societal problems. Although determining exact prevalence rates is difficult, research suggests that somewhere between 1%–2% of the population suffers from pathological gambling (see Petry, 2005). An additional 5% or more may suffer from problem gambling, which is a subclinical version of pathological gambling (Petry, 2005).

Because gambling problems are such a major concern, a great deal of research has focused on designing diagnostic measures that identify the potential presence of pathology. One such attempt was the creation of the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987). The SOGS is a 20-item self-report measure that asks questions about the respondent's gambling history. A score of 5 or more on the SOGS suggests the probable presence of pathological gambling and researchers (e.g., Weiss & Loubier, 2010) have suggested that scores of 3 or 4 suggest the potential presence of problem gambling. Many other assessment tools have also been developed, such as the Addiction Severity Index (McLellan et al., 1988) and the Canadian Problem Gambling Index (Ferris, Wynne, & Single, 1999), all in an attempt to identify individuals who may be pathological or problem gamblers.

Far less research has focused on developing measures that determine *why* an individual gambles. Dixon and Johnson (2007) made an initial attempt when they introduced the Gambling Functional Assessment (GFA). The GFA is a 20-item self-report measure designed to assess four possible maintaining contingencies for the respondent's gambling behaviour: (1) tangible outcomes (i.e., money), (2) social attention, (3) sensory experience, and (4) escape, or of any combination of (1) to (4). Modified from a similar measure in the self-injurious-behaviour literature (Durand & Crimmins, 1988), the idea behind the GFA was that the category in which the respondent scored the highest was likely the primary contingency maintaining the respondent's gambling.

Subsequent psychometric research, however, indicated that the GFA was not measuring four different potential contingencies as designed. Instead, the GFA appeared to be measuring only two: gambling for positive reinforcement, gambling as an escape, or both (Miller, Meier, Muehlenkamp, & Weatherly, 2009). Likewise, this research also indicated that the GFA was not cleanly parsing these two contingencies. For instance, some items intended to identify gambling maintained by one contingency did not load onto the factor associated with that contingency. Still other items were not associated with either contingency.

Thus, Weatherly, Miller, and Terrell (2011) developed a revised version of the GFA (GFA-R). The GFA-R consists of 16 self-report items, eight of which are designed to measure gambling for positive reinforcement and eight that are designed to measure gambling as an escape. Exploratory and confirmatory factor analyses, conducted on data from two separate samples, showed that each of the 16 items clearly loaded onto their respected factor. Likewise, Weatherly, Miller, Montes, and Rost (2012) showed that the GFA-R has good internal consistency, with Cronbach's alpha ranging from 0.87–0.94 for the overall score and scores on the two subscales. Weatherly et al. (2012) also demonstrated that the temporal reliability of the GFA-R scores ranged from good to excellent across 4-week and 12-week periods. Overall, the psychometric results for the GFA-R were superior to those found with the original GFA (for the English version of the GFA-R, see Appendix A).

The GFA-R may be useful for both practitioners and researchers. For practitioners, the GFA-R potentially identifies whether an individual is gambling to obtain something or to remove oneself from something. Such information could be beneficial for designing successful treatments for different individuals who are gambling for different reasons.

For researchers, the GFA-R represents a measure that potentially supplies several independent pieces of information. For instance, although the GFA-R measures gambling maintained by two different contingencies, research using the GFA-R (e.g., Weatherly, 2011b; Weatherly et al., 2011) has repeatedly found that participants tend to endorse gambling for positive reinforcement to a significantly greater extent than they endorse gambling as an escape. Thus, the GFA-R provides a relative measure of the contingencies maintaining gambling behaviour. However, research has also shown that endorsing gambling as an escape is more highly associated with the potential presence of gambling problems, at least as measured by the SOGS, than is endorsing gambling for positive reinforcement (Weatherly & Derenne, 2012; Weatherly et al., 2012; Weatherly, Dymond, Samuels, Austin, & Terrell, 2014). Thus, the absolute scores on the GFA-R subscales may also provide useful information pertaining to the respondent's gambling.

The GFA-R may also be useful in identifying differences that exist at the group level. For instance, Weatherly (2011a) had 29 American Indian and 29 matched Caucasian university students each complete the GFA-R. Results showed that the American Indian participants scored significantly lower on the positive reinforcement subscale than did the Caucasian students, suggesting that the Caucasian students' gambling was more motivated towards the obtaining of something than was the American Indians' gambling. However, scores did not differ between groups in terms of gambling as an escape. Montes and Weatherly (2012) used the GFA-R to demonstrate differences in both the positive and negative reinforcement contingencies that maintained the gambling behaviour of military-affiliated university students (i.e., Reserve Officer Training Corps) and those university students

without a military affiliation. In general, knowing whether such differences exist between groups may be informative for both preventative and treatment purposes.

The present study involved translating the GFA-R (originally created in English) into Japanese and recruiting Japanese university participants to complete the translated measure. A group of American university participants was also recruited for purposes of comparison. Translating measures into different languages or using them to collect data in different cultures, or both, may provide a number of potential benefits. For one, if the measure is psychometrically valid in its translated form, then its usage could benefit practitioners and clients who use that language. Next, it allows for between-cultural comparisons. It is possible that different relationships could be found between the subscales and other measures than are found in the original version within that culture in which the original culture was created. (An example of such a measure is the SOGS, either in the translated version or in another culture.) Such a finding would suggest that the phenomenon under study—in this case gambling behavior—may in fact be fundamentally different between the respective cultures.

Such attempts have been made in the past. For instance, Kido and Shimazaki (2007) tested the Japanese-translated version of the SOGS on a group of Japanese university students and Japanese gamblers. They reported that both the reliability and validity data from the translated measure were satisfactory relative to the original. The fact that the psychometric properties of the SOGS were retained when translated into Japanese and used in a Japanese sample suggests that where gambling is concerned similarities exist between the American and Japanese cultures. However, there are also overt differences in regards to gambling between these two cultures. For instance, skill-stop and pachinko machines, which are popular in Japan, are virtually, if not completely, absent in American casinos (e.g., Brooks, Ellis, & Lewis, 2008). Likewise, activities that would be considered ''gambling'' in America may not be viewed as such in Japan (e.g., pachinko; see Brooks et al., 2008). Thus, one might expect to see differences between the cultures in terms of why people report that they gamble.

In the present study, a group of Japanese university students completed a translated version of the GFA-R and the SOGS. A similarly-sized group of American university students also completed the GFA-R and the SOGS. GFA-R data from each group were then entered into a confirmatory factor analysis, with the factor structure identified in the original tests of the construct validity of the English version of the GFA-R (i.e., Weatherly et al., 2011) used as the model.

Based on the previous research with the GFA-R and the translated version of the SOGS we made the following predictions. First, the Japanese participants would endorse gambling for positive reinforcement to a significantly greater degree than they would endorse gambling as an escape. Second, similar to the results of Weatherly (2011a), the Japanese and American participants might differ in their

endorsement of gambling for positive reinforcement, but they would not differ in their endorsement of gambling as an escape. Third, the same factor structure identified for the original GFA-R would adequately describe the data for both the Japanese and American participants. Fourth, the translated version of the GFA-R would retain sound psychometric properties (e.g., internal consistency measures). Finally, escape subscale scores on the GFA-R for both groups would be more highly correlated with the SOGS scores than would be GFA-R subscale scores for gambling for positive reinforcement.

Method

Participants

The Japanese participants were 126 students attending Doshisha University in Kyoto, Japan. The American participants were 132 students attending the University of North Dakota in Grand Forks, ND. All participants were recruited from psychology courses at their respective university. The demographic information for both groups is presented in Table 1. All participants were compensated with extra course credit in return for their participation.

Materials and Procedure

For the Japanese participants, all procedures were conducted in accordance with the ethical guidelines mandated by Doshisha University. Data collection for the American participants was approved by the institutional review board at the University of North Dakota.

All participants completed three questionnaires. The Japanese participants completed the questionnaires in paper-pencil format, whereas the American participants completed them using an online experiment management system (Sona Systems, Ltd , Version 2.72; Tallinn, Estonia) available to them through their enrollment in a psychology course. Although data collection methods differed between the two samples, research on the GFA-R with American participants has indicated that the psychometric properties of the measure do not differ as a function of whether the measure is completed in a paper-pencil or an online format

Table 1
Demographic characteristics of both groups of participants (with standard deviations in parentheses)

University	Male	Female	Mean Age	Mean GPA
Japanese (*n*=126)	34	92	20.1 (1.2) years	2.5 (0.7) out of 4.0
American (*n*=132)	33	99	19.7 (3.8) years	3.5 (0.5) out of 4.0

Note. GPA = grade point average

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(Weatherly et al., 2011; 2014). The first questionnaire was a short demographic form that asked about the information presented in Table 1.

The second questionnaire was a translated version of the GFA-R (Weatherly et al. 2011). Prior to administering the translated version, the researchers first translated the original version of the GFA-R into Japanese. The translated version was then back-translated into English by someone unfamiliar with the original English version of the GFA-R to ensure that the original content had been retained in the translation. In an attempt to anticipate any differences that might exist between the two cultures, no changes to the original GFA-R were made; the goal of the present research was to test a direct replication of the GFA-R in another culture. The translated version of the GFA-R, completed by the Japanese participants, appears in Appendix B.

Participants endorsed each item on a scale of 0 (Never) to 6 (Always). Items 1, 4, 6, 7, 8, 13, 14 and 16 are associated with gambling for positive reinforcement and scores on those items are summed to give a score for that subscale. Items 2, 3, 5, 9, 10, 11, 12 and 15 are associated with gambling as an escape and scores on those items are summed to give a score for that subscale.

The third questionnaire participants completed was the SOGS (Lesieur & Blume, 1987). The Japanese participants completed the Japanese version (Kido & Shimazaki, 2007) while the American participants completed the original version. The structure of the Japanese version of the SOGS is nearly identical to that of the original with the exception of the response options. Some of the options have been phrased in terms of yen (instead of dollars). Next, many of the yes-no questions on the original SOGS have been replaced with a five-point scale that ranges from 1 (Often) to 5 (Never). For questions in which a ''yes'' would have been counted on the original SOGS, responses of either 1 (Often) or 2 (Modestly) are counted on the Japanese version. This translated version of the SOGS has been shown to have sound psychometric properties (see Kido & Shimazaki, 2007).

Results

Subscale Differences

Mean scores on the GFA-R, as well as for each subscale, for both groups are presented in the top half of Table 2. Mean SOGS scores for both groups are also reported. Results from a Wilcoxon signed-rank test on the data from the Japanese participants indicated that the difference in scores on the two subscales of the GFA-R was statistically significant ($p < .001$). Results from this analysis, and all that follow, were considered significant at $p \leq .05$. An identical analysis on the data from the American participants also indicated a statistically significant difference ($p < .001$). Thus, the gambling behaviour of both groups of participants was maintained by positive reinforcement to a greater extent than it was by escape.

Table 2

Mean scores on the GFA-R and its two subscales and on the SOGS (with standard deviations in parentheses) for (a) all participants, and (b) only those who scored above 0 on the GFA-R

University	All Participants			
	GFA-R			SOGS
	Total	Positive	Negative	
Japanese (*n*=126)	7.5 (10.6)	6.0 (8.1)	1.5 (3.5)	0.4 (1.4)
American (*n*=132)	20.2 (15.1)	17.8 (12.6)	2.4 (5.3)	1.2 (1.7)
Participants Who Scored > 0 on the GFA-R				
Japanese (*n*=68)	13.9 (10.9)	11.2 (8.0)	2.7 (4.4)	0.7 (1.9)
American (*n*=109)	24.5 (13.1)	21.6 (10.5)	2.9 (5.7)	1.4 (1.8)

Between-group comparisons were made by conducting separate Mann-Whitney U tests on scores from both GFA-R subscales, as well as the SOGS. Results indicated that the American participants scored significantly higher on the GFA-R positive reinforcement subscale than did the Japanese participants ($p < .001$), but the difference in scores on the escape subscale was not statistically significant ($p = .110$). American participants also scored significantly higher on the SOGS than did the Japanese participants ($p < .001$).

Fifty eight (46%) of the Japanese and 23 (17%) of the American participants scored 0 on the GFA-R, suggesting that these participants either did not gamble or gambled for reasons not measured by the GFA-R. Results from a difference in proportions test indicated that this difference was statistically significant ($p < .01$), indicating that a greater proportion of the Japanese than American participants scored 0 on the GFA-R.

Mean scores from the GFA-R and the SOGS for only those participants who scored greater than 0 on the GFA-R are presented in the bottom half of Table 2. Results from Wilcoxon signed-rank tests indicated that the difference between the GFA-R subscales remained statistically significant for both the Japanese and American participants ($p < .001$). Results from Mann-Whitney U tests indicated that the American participants still scored higher on both the GFA-R positive reinforcement subscale ($p < .001$) and the SOGS ($p < .001$) than did the Japanese participants. Again, the difference observed for the GFA-R escape subscale was not statistically significant ($p = .410$).

GFA-R Factor Structure

Mplus 6.0 structural equation modelling software (Muthén & Muthén, 2010) was employed to perform a confirmatory factor analysis on the GFA-R data for each

group of participants. Mplus offers several options for estimation, and MLMV estimation was utilized for the analyses that follow. This type of estimation was chosen because the response distributions for several items were skewed. MLMV estimation uses "maximum likelihood parameter estimates with standard errors and a mean- and variance-adjusted chi-square statistic that are robust to non-normality" (Muthén & Muthén, 2010, p. 533). Furthermore, because the GFA-R was designed to measure the reasons why the respondent gambles, data from participants scoring 0 on the GFA-R were excluded from the analyses because these participants either did not gamble or gambled for reasons not measured by the GFA-R.

Model fit for each analysis was assessed via multiple fit indices, including the chi-square test of model fit (recommended $\chi^2 \leq 0.01$) (Hu & Bentler, 1999; Yu, 2002), Comparative Fit Index (CFI; recommended CFI $\geq$ 0.95 for good fit and CFI $\geq$ 0.90 for adequate fit: Hu & Bentler, 1999; Rigdon, 1996; Yu, 2002), root mean square error of approximation (RSMEA; recommended RSMEA $\leq$ 0.05; Hu & Bentler, 1999; Rigdon, 1996; Yu, 2002), and standardized root mean square residual (SRMR; recommended SRMR $\leq$ .07; Hu & Bentler, 1999). For models based on small samples (approximately 75 to 200 cases), chi-square can be interpreted a reasonable measure of model fit and the null hypothesis is that the model provides an adequate fit. The present analyses were based on a sample of 68 (Japanese) and 109 (American) participants after participants with GFA-R scores of 0 were excluded, so the chi-square test was expected to be consistent with other fit indices.

Items 1, 4, 6, 7, 8, 13, 14 and 16 were specified to load on Factor 1 (gambling for positive reinforcement) and items 2, 3, 5, 9, 10, 11, 12 and 15 were specified to load on Factor 2 (gambling as an escape). Modification indices that would result in a chi-square change equal to or greater than four were examined. Based on these modification indices and the interpretability of the suggested modifications, some pairs of residuals were allowed to correlate.

For the model tested on the data from the Japanese participants, all items loaded significantly onto their respective factors; these loadings are presented in Table 3. The two factors were moderately correlated, $r = .578$ (SE = .152), $p < .001$. The chi-square value for overall model fit was not significant, χ^2 (93) = 114.06, $p = 0.07$, which indicates good model fit. The CFI was 0.91, which indicated a good model fit. The RMSEA was 0.06 and the SMSR was 0.09, which were slightly higher than the recommended cut-offs. Overall, however, the results indicated that the factor structure of the original English version of the GFA-R provided an adequate fit to the translated version. The resulting model for the Japanese participants is presented in Figure 1.

For the model tested on the data from the American participants, all items loaded significantly onto their respective factors; these loadings are illustrated in Table 4. In this model, the two factors were weakly correlated, $r = .238$ (SE = .081), $p < .01$. The chi-square value for overall model fit was not significant, χ^2 (92) = 114.29,

Table 3

Unstandardized and standardized loadings (standard errors) for 2-factor confirmatory model using data from the Japanese participants (n=68)

Item	Unstandardized (SE)		Standardized (SE)	
	Factor 1	Factor 2	Factor 1	Factor 2
1	1.00 (—)		0.42 (0.11)	
4	1.22 (0.29)		0.55 (0.11)	
6	1.76 (0.43)		0.75 (0.07	
7	1.84 (0.45)		0.87 (0.06)	
8	0.83 (0.40)		0.29 (0.12)	
13	0.69 (0.25)		0.39 (0.13)	
14	0.77 (0.27)		0.31 (0.11)	
16	1.66 (0.45)		0.70 (0.09)	
2		1.00 (—)		0.64 (0.12)
3		2.16 (0.50)		0.95 (0.04)
5		1.59 (0.46)		0.84 (0.06)
9		2.65 (0.74)		0.78 (0.08)
10		1.91 (0.48)		0.93 (0.03)
11		2.30 (0.79)		0.47 (0.12)
12		1.88 (0.83)		0.70 (0.11)
15		1.29 (0.46)		0.66 (0.10)

Note: Dashes (—) indicate that the standard error was not estimated.

$p = 0.06$, again indicating a good model fit. Further, examination of the other fit indices, CFI = 0.92, RMSEA = .05, and SMSR = .07, also indicated a good model fit. The resulting model for the American participants is presented in Figure 2.

Internal Consistency

When data from all 126 Japanese respondents were analyzed, the internal consistency (i.e., Cronbach's alpha) for the entire GFA-R (i.e., all 16 items) was 0.89. Cronbach's alphas for the GFA-R positive reinforcement and escape subscales were 0.87 and 0.88, respectively. When the data from participants who scored 0 on the GFA-R were excluded, good internal consistency was retained. Cronbach's alphas for the entire GFA-R, positive reinforcement subscale, and escape subscale were 0.85, 0.78 and 0.88, respectively.

When data from all 132 American respondents were analyzed, the internal consistency (i.e., Cronbach's alpha) for the entire GFA-R (i.e., all 16 items) was also 0.89. Cronbach's alphas for the GFA-R positive reinforcement and escape subscales were 0.90 and 0.91, respectively. When the data from participants who scored 0 on the GFA-R were excluded, good internal consistency was again retained. Cronbach's alphas for the entire GFA-R, positive reinforcement subscale, and escape subscale were 0.84, 0.84 and 0.90, respectively.

Figure 1. Factor loadings for the 16 items on the translated GFA-R tested in the confirmatory factor analysis using the data from the Japanese participants
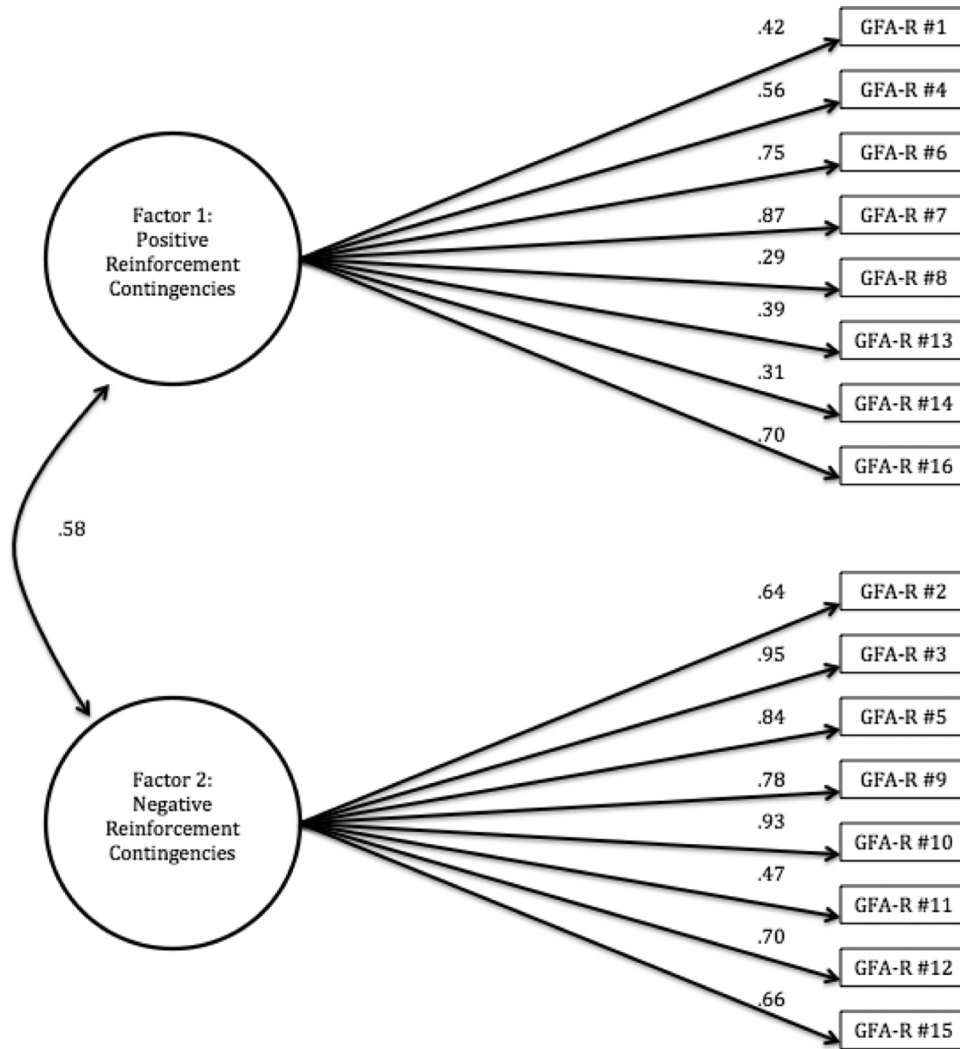
Correlations with the SOGS

For the Japanese sample, one participant (0.8%) scored between 3 and 4 on the SOGS and five participants (4.0%) scored 5 or more. For the entire sample of Japanese participants, the SOGS scores were significantly correlated with both the positive ($r = 0.53$, $p < .001$) and negative reinforcement ($r = 0.56$, $p < .001$) subscales of the GFA-R. When participants who scored 0 on the GFA-R were excluded, the SOGS scores remained more weakly correlated with the positive ($r = 0.50$, $p < .001$), than with the negative ($r = 0.52$, $p < .001$), reinforcement subscale scores on the GFA-R, although the difference between the correlations remained small.

For the American sample, ten participants (7.6%) scored between 3 and 4 on the SOGS and eight participants (6.0%) scored 5 or more. Results from a difference in

Table 4

Unstandardized and standardized loadings (standard errors) for 2-factor confirmatory model using data from the American participants (n=109)

Item	Unstandardized (SE)		Standardized (SE)	
	Factor 1	Factor 2	Factor 1	Factor 2
1	1.00 (—)		0.44 (0.07)	
4	2.24 (0.44)		0.79 (0.05)	
6	2.50 (0.52)		0.81 (0.04)	
7	1.82 (0.43)		0.66 (0.06)	
8	1.30 (0.33)		0.42 (0.08)	
13	1.91 (0.42)		0.55 (0.08)	
14	2.28 (0.48)		0.67 (0.07)	
16	1.86 (0.42)		0.59 (0.07)	
2		1.00 (—)		0.80 (0.10)
3		1.52 (0.19)		0.89 (0.05)
5		1.13 (0.23)		0.74 (0.08)
9		0.96 (0.19)		0.49 (0.10)
10		1.03 (0.14)		0.82 (0.07)
11		1.25 (0.20)		0.69 (0.08)
12		1.23 (0.19)		0.83 (0.06)
15		1.05 (0.22)		0.70 (0.09)

*Note:* Dashes (—) indicate that the standard error was not estimated.

proportions test indicated that the percentage of American participants scoring 5 or more on the SOGS was not significantly higher than the Japanese participants.

For the entire sample of American participants, the SOGS scores were significantly correlated with both the positive ($r = 0.36$, $p < .001$) and negative reinforcement ($r = 0.59$, $p < .001$) subscales of the GFA-R. When participants who scored 0 on the GFA-R were excluded, the SOGS scores remained more weakly correlated with the positive ($r = 0.28$, $p = .003$) than with the negative ($r = 0.57$, $p < .001$) reinforcement subscale scores on the GFA-R.

Discussion

The present study involved translating the GFA-R (Weatherly et al., 2011) into Japanese, administering the translated version to a sample of Japanese university students, and comparing the results to those findings obtained from a sample of American university students. The first hypothesis was that the Japanese participants would endorse gambling for positive reinforcement to a greater extent than gambling for negative reinforcement. That hypothesis was supported. The second hypothesis was that the groups would differ in their endorsement of gambling for positive reinforcement, but not in their endorsement of gambling as an escape. This hypothesis was also supported. The third hypothesis was that the same

Figure 2. Factor loadings for the 16 items on the GFA-R tested in the confirmatory factor analysis using the data from the American participants
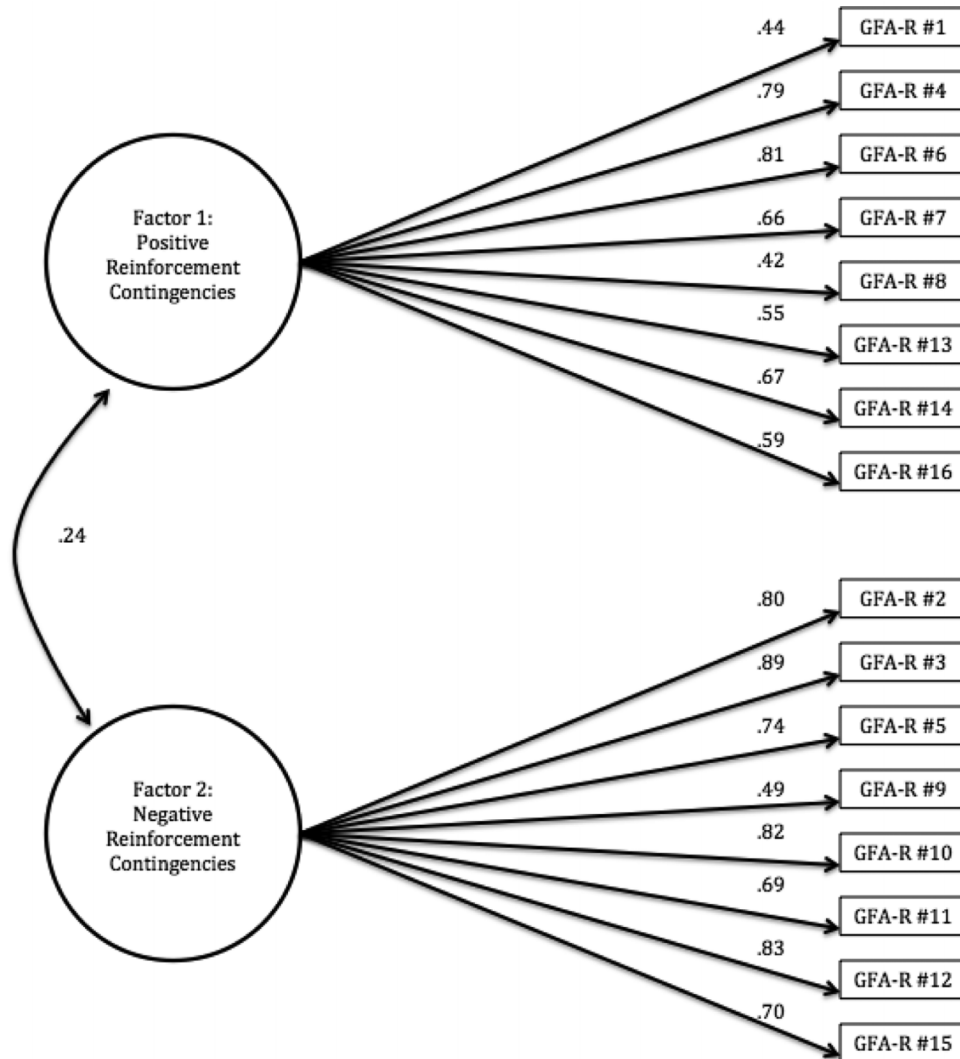
factor structure that described the data for the original English version of the GFA-R would adequately fit the data for the translated version. That hypothesis was also supported. The fourth hypothesis was that the translated version would display good internal inconsistency measures, which was found to be the case. The final hypothesis was that the participants' scores on the SOGS (Kido & Shimazaki, 2007) would correlate more strongly with their scores on the GFA-R escape subscale than with their scores on the positive reinforcement subscale. Correlations with both subscales were statistically significant for both groups, but the SOGS scores more strongly correlated with the scores on the GFA-R negative reinforcement subscale than with the scores on the GFA-R positive reinforcement subscale. The difference was small for the Japanese participants, however.

Thus, the present results suggest that the Japanese version of the GFA-R represents a reasonable functional assessment measure. The same two-factor structure that described the English version provided an adequate fit for the data collected using the Japanese version. Furthermore, the internal consistency measures on the translated version of the GFA-R were very good, even when data from participants who scored 0 on the overall measure were excluded from analysis.

One notable difference between the models for the Japanese and American participants was the correlation between the two factors measured by the GFA-R. As can be seen in Figures 1 and 2, the factors were more strongly correlated for the Japanese sample than for the American sample. This difference would suggest that the contingencies of gambling to obtain something versus to remove oneself from something were more distinct for the American, than for the Japanese, respondents.

A second notable difference pertains to participants' scores on the positive reinforcement subscale of the GFA-R. Specifically, the American participants scored significantly higher on this subscale than did the Japanese participants, even when data from participants who scored 0 on the GFA-R were removed from the analysis. This result would indicate that, at least when it comes to university students, the gambling behaviour of Japanese individuals was less controlled by positive reinforcement contingencies than was the gambling behaviour of American individuals. This difference might also explain why a higher proportion of the Japanese participants scored 0 on the GFA-R than did the American participants.

There were also several notable failures to find differences between the two groups of participants. One such failure was with the escape subscale of the GFA-R, with the groups not scoring significantly differently on this subscale. This lack of difference was predicted based on other cross-cultural comparisons (i.e., Weatherly, 2011a). Given that research has indicated that endorsing gambling as an escape is more strongly related to gambling problems than endorsing gambling for positive reinforcement (Weatherly & Derenne, 2012; Weatherly et al., 2012; Weatherly, 2013), this result would suggest that the groups did not differ in their risk for pathological gambling. This suggestion is actually supported by the other notable lack of difference from the present study: the proportion of participants who scored 5 or more on the SOGS did not differ between groups, suggesting that the frequency of pathological gambling did not vary significantly between the two groups.

With that said, it is important to note that the present results, and those of Weatherly et al. (2011; 2012) for that matter, do not necessarily apply to pathological gamblers. That is, the current and past analyses have been done with university samples and have not specifically targeted problem or pathological gamblers. Thus, it is not possible to conclude that the same relationships between the subscales of the GFA-R, or correlations between the SOGS and GFA-R scores, would be found with problem or pathological gamblers.

Likewise, the present sample consisted of students from one particular Japanese and American university each, students most of whom were both young and female. One cannot assume that similar results will be observed when a more diverse pool of participants is sampled, especially when one recognizes that males are at a greater risk for developing pathological gambling than are females (see Petry, 2005). On the other hand, being young is also a risk factor for pathological gambling and research has also suggested that university students display the disorder at a greater rate than the general population, at least in the United States (e.g., Neighbors, Lostutter, Cronce, & Larimer, 2002).

It should also be noted that the present results are based completely on self-reports. That is, there is no guarantee that the results from either the GFA-R or the SOGS correlate perfectly with overt behaviour. The factor analyses were also conducted only on the data from participants who scored more than 0 on the GFA-R. Exactly why certain individuals scored 0 on the GFA-R is not known. It could be assumed that these individuals do not gamble, but this assumption may be incorrect: It is possible that these individuals do indeed gamble, but that they do so for reasons not addressed by the GFA-R. If this latter possibility is correct, then the GFA-R is not an exhaustive functional assessment tool. Determining which of these possibilities, if not both, are correct might be worth future research.

With these limitations in mind, however, the present results support the conclusion that the Japanese version of the GFA-R may have utility for researchers and, potentially, practitioners. To our knowledge, the present data represent the first reporting of the function of gambling behaviour in a sample of Japanese individuals. The results suggest that, although an absolute difference between Japanese and American respondents in how much they endorse gambling for positive reinforcement may exist, the relative difference between gambling for positive reinforcement or as an escape appears to be similar across cultures. Thus, the Japanese version of the GFA-R may not only be useful for researchers interested in gambling behaviour in Japan, but also to those researchers interested in studying cross-cultural differences.

Practitioners may find the GFA-R useful because knowing whether an individual suffers from problem or pathological gambling does not necessarily inform one about why that person is gambling. The GFA-R represents one possible measure of making that determination. It may be the case that the problem or pathological gambling of two different individuals is being maintaining by different contingencies. If so, their scores on the GFA-R would be informative so that individualized treatment plans could be developed.

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Appendix A

Gambling Functional Assessment – Revised (GFA-R)

Please answer each question with the appropriate number from the following scale:

0	1	2	3	4	5	6
Never	Almost Never	Seldom	Sometimes	Usually	Almost Always	Always

____ 1. After I gamble, I like to go out and celebrate my winnings with others.

____ 2. I gamble after fighting with my friends, spouse, or significant other.

____ 3. I gamble when I feel stressed or anxious.

____ 4. I like the sounds, the lights, and the excitement that often go along with gambling.

____ 5. If I have a hard day at work or school, I am likely to gamble.

____ 6. I gamble when my friends are gambling with me.

____ 7. I find myself feeling a rush, and getting excited, when I gamble.

____ 8. When I gamble, I choose which games to play based upon my best chance of winning.

____ 9. I gamble to get a break from work or other difficult tasks.

____10. I gamble when I am feeling depressed or sad.

____11. I find that gambling is a good way to keep my mind off of problem I have in other parts of my life.

____12. I gamble when I am in debt or need money.

____13. I really enjoy the complementary perks that come along with gambling, like free points, drinks, comp coupons, etc.

____14. I enjoy the social aspects of gambling such as being with my friends or being around other people who are having a good time and cheering me on.

____15. I gamble when I have a work project or class assignment that is due in the near future.

____16. I gamble primarily for the money that I can win.

Items 1, 4, 7, 8, 13, 14, and 16 should be summed to give a score for gambling maintained by positive reinforcement. Items 2, 3, 5, 9, 10, 11, 12, and 15 should be summed to give a score for gambling maintained by negative reinforcement.

Appendix B

Japanese translation of the Gambling Functional Assessment (GFA-R)

1. ?????????????????????????????????

2. ????????????????????????????????

3. ?????????????????????????

4. ????????????????????????????????

5. ??????????????????????????????????

6. ?????????????????????????????

7. ????????????????????????

8. ???????????????????????????????

9. ?????????????????????????????????

10. ?????????????????????????

11. ??

12. ????????????????????????????

13 ???????????????????????????????????????

14.???

15. ????????????????????????????????????

16. ???

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