Analysis of Gambling Behavior

Volume 7 | Issue 1 Article 4

2013

The Relationship of the GFA-R Subscales to Negative Consequences of Gambling in a Sample of Potential Problem and Pathological Gamblers

Jeffrey N. Weatherly Ph. D.
University of North Dakota, jeffrey_weatherly@und.nodak.edu

Analysis of Gambling Behavior 2013, **7**, 25-30 Number 1 (Summer, 2013)

The Relationship of the GFA-R Subscales to Negative Consequences of Gambling in a Sample of Potential Problem and Pathological Gamblers

Jeffrey N. Weatherly
University of North Dakota

Previous research with the Gambling Functional Assessment – Revised (GFA-R) has found that respondents endorse gambling for positive reinforcement significantly more than as an escape, but that endorsing gambling as an escape is more closely associated with potential gambling problems than is endorsing gambling for positive reinforcement. The present study attempted to replicate these results in a sample of potential problem/pathological gamblers. Data from 25 respondents who scored three or more on the South Oaks Gambling Screen (SOGS) were analyzed. These participants scored significantly higher on the GFA-R positive reinforcement, than the escape, subscale. However, only GFA-R escape subscale scores were significantly correlated with SOGS scores. Both GFA-R subscales were significant predictors of reporting negative consequences related to one's gambling, as measured by the Problem Gambling Severity Index, but again endorsing gambling as an escape was the strongest predictor. The present results therefore indicate that prior results from studies that have relied on samples that consisted of largely non-problem gamblers are replicable in a sample of potential problem or pathological gamblers

Keywords: Gambling Functional Assessment – Revised, Escape, Problem gamblers

---

Dixon and Johnson (2007) introduced the Gambling Functional Assessment (GFA), which was a self-report measure containing 20 items. Based on a similar measure designed for self-injurious behavior (Durand & Crimmins, 1988), the GFA was designed to measure four distinct contingencies that might be maintaining the respondent's gambling behavior. The four contingencies were tangible outcomes (e.g., money), social attention, sensory experience, and escape and five items were associated with each contingency. Participants answered each item on a scale of 0 (Never) to 6 (Always), and the contingency that generated the highest sum score across the five items was theorized to be the primary contingency maintaining the respondent's gambling behavior.

Subsequent psychometric research on the GFA suggested that the instrument was not working as designed. Although the GFA had adequate internal consistency and temporal reliability (Miller, Meier, & Weatherly, 2009a), its construct validity was suspect. Miller, Meier, Muehlenkamp, and Weatherly (2009b) conducted exploratory and confirmatory factor analyses on the GFA and found that the instrument was measuring two, rather than four, constructs. Miller et al. (2009b) posited that these constructs were positive reinforcement and escape. However, their data also indicated that the GFA was not cleanly parsing these two contingencies. Specifically, not all items loaded strongly onto one of the two factors, with one item not loading with either. It was also the case that items

Address all correspondence to:
Jeffrey N. Weatherly
Department of Psychology
University of North Dakota
Grand Forks, ND 58202-8380
E-mail: jeffrey.weatherly@und.edu

designed to measure one contingency (i.e., escape) loaded onto the factor that contained items designed to measure another contingency (i.e., positive reinforcement).

Because of these psychometric deficits, Weatherly, Miller, and Terrell (2011) revised the GFA (GFA-R) with the goals of cleanly measuring the two contingencies (i.e., positive reinforcement & escape) and to have an equal number of items associated with each contingency. The resulting GFA-R contains 16 items, eight each designed to measure gambling for positive reinforcement and escape. Exploratory and confirmatory factor analyses indicated that the GFA-R met the original goals (Weatherly et al., 2011). Subsequent research has also indicated that the factor structure of the GFA-R described by Weatherly et al. (2011) describes well data collected from both Japanese (Weatherly, Aoyama, Terrell, & Berry, in press) and United Kingdom (Weatherly, Dymond, Samuels, Austin, & Terrell, in press) participants. Likewise, the internal consistency and temporal reliability of the GFA-R have also been shown to be superior to the original GFA (Weatherly, Miller, Montes, & Rost, 2012).

To date, research using the GFA-R has supported two general conclusions. First, although the instrument has an equal number of items dedicated to measuring gambling maintained by positive reinforcement and escape, respondents tend to score significantly higher on gambling for positive reinforcement than on gambling as an escape (e.g., Weatherly, 2013; Weatherly et al., 2011; Weatherly & Derenne, 2012). Second, despite being endorsed to a lesser degree, endorsing gambling as an escape is more closely associated with gambling problems as measured by the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) and the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001) than is endorsing gambling for positive reinforcement (e.g., Weatherly, 2013; Weatherly & Derenne, 2012).

One of the major criticisms of research on the GFA-R to date is that it has largely been conducted using participants who do not qualify as potential problem or pathological gamblers. This fact is problematic given that the GFA-R was designed ultimately to be used with this population. Furthermore, in samples in which few respondents score high in gambling as an escape or display gambling problems, it would not be unusual to find a strong correlation between these measures if the same few respondents scored high in both. Finding a significant correlation in such instances would not guarantee that a similar relationship would be observed in a population that qualifies as potential problem or pathological gamblers.

The present study was an attempt to determine whether the findings that have been reported with the GFA-R would be replicated in participants who were potential problem or pathological gamblers. To accomplish this goal, a large number of participants were recruited to complete the GFA-R, SOGS, and PGSI. From this sample, data from participants who scored three or more on the SOGS were used for further analysis. Consistent with previous research, it was hypothesized that these participants would endorse gambling for positive reinforcement on the GFA-R significantly more than they would endorse gambling as an escape. It was also hypothesized that their endorsement of gambling as an escape would be more predictive of experiencing negative consequences from their gambling than would be endorsement of gambling for positive reinforcement.

METHOD

Participants

The original sample of participants consisted of 334 psychology students enrolled at the University of North Dakota. Only data from participants who scored three or more on the SOGS were retained for further analysis (see below). The final sample consisted of 25

participants (15 male; 10 female). The mean age of the participants was 19.2 years (*SD* = 1.3 years) and the mean self-reported grade point average was 3.0 out of 4.0 (*SD* = 0.5). Twenty three of the 25 participants reported as Caucasian (92%) and all reported being unmarried. Participants received (extra) course credit in their psychology course in return for their participation.

Materials and Procedure

The first item presented to participants was an informed consent document that outlined the benefits and risks of the study as approved by the Institutional Review Board at the University of North Dakota. Continuation in the study beyond this information constituted the participant granting informed consent.

Participants completed four measures. The first was a demographic form that asked participants about the information presented in the participants section.

The second measure was the GFA-R (Weatherly et al., 2011). As described above, this instrument consists of 16 items, with eight each designed to measure gambling maintained by positive reinforcement or escape. Respondents answer each question on a scale from 0 (Never) to 6 (Always) and answers to the eight items are summed to provide a total score for each subscale. Research has shown that the GFA-R has good internal consistency (Weatherly et al., 2012) and is temporally reliable across four (r = 0.80) and 12 weeks (r = 0.81; Weatherly et al., 2012).

The third measure was the SOGS (Lesieur & Blume, 1987). The SOGS is made up of 20 questions pertaining to the individual's gambling history. The SOGS is scored as outlined in Lesieur and Blume (1987). Researchers have used SOGS scores of 3 or 4 suggest possible problem gambling (e.g., Weiss & Loubier, 2010). Scores of 5 or more suggest the potential presence of pathological gambling (Lesieur & Blume, 1987). Original research on the SOGS (i.e., Lesieur & Blume, 1987) found that the instrument had good internal consistency (α = 0.97). Research has also demonstrated that the SOGS is temporally reliable at four (r = 0.89) and 12 weeks (r = 0.67; Weatherly et al., 2012).

The final measure was the PGSI (Ferris & Wynne, 2001). This instrument consists of 12 items, with only the first nine being counted when calculating the respondent's overall score. Respondents answer each question on a four-point Likert-like scale that ranges from 0 (Never) to 3 (Almost always). Scores from the first nine questions are summed to provide the overall score. Ferris and Wynne (2001) posited that scores of 0 suggest no gambling problems, 1 – 2 suggest low levels of gambling problems and few negative consequences as a result, 3 – 7 suggest moderate levels of gambling problems and some negative consequences, and 8 or more suggest problem gambling and negative consequences. Original research indicated that the internal consistency (α = 0.84) and the temporal reliability (r = 0.78) of the PGSI were good (Ferris & Wynne, 2001).

The order in which participants completed these three measures varied across participants. Once participants completed the measures, they were provided with their participation credit and dismissed.

Data Analysis

Participants' scores on the SOGS were calculated as outlined by Lesieur and Blume (1987). Again, only data from participants who scored three or more on the SOGS were retained for further analysis.

The remaining participants' scores on the GFA-R and PGSI were then calculated as outlined by Weatherly et al. (2011) and Ferris and Wynne (2001), respectively. These scores were then subjected to tests of skewness to ensure that subsequent parametric statistical analyses would be appropriate. Participants' scores on the PGSI were the only

scores that were significantly skewed. These scores were then transformed into categories of 0, 1, 2, and 3 based on the ranges of scores suggested by Ferris and Wynne (2001; see above description). The raw scores for the SOGS and GFA-R were retained and not subjected to data transformation.

RESULTS AND DISCUSSION

Participants mean score on the SOGS was 4.8 (*SD* = 1.8; Range: 3 – 10). Fourteen participants scored 3 – 4 on the SOGS and the remaining 11 participants scored 5 or more. SOGS scores did not significantly correlate with the GFA-R positive reinforcement subscale scores, $r = 0.16$, $p = .452$. They did significantly correlate with the GFA-R escape scores, $r = 0.54$, $p = .005$. Thus, in terms of SOGS scores, endorsing gambling as an escape was more strongly related to potential problems/pathology than was endorsing gambling for positive reinforcement. Results from these, and all following, analyses were considered significant at $p \leq .05$.

To test whether scores differed between the GFA-R subscales, participants' scores were subjected to a one-way repeated measures analysis of variance. Results indicated that participants scored significantly higher, $F(1, 24) = 57.34$, $p < .001$, $\eta^2 = .705$, on the GFA-R positive reinforcement subscale (Mean = 27.5; *SD* = 11.5) than on the GFA-R escape subscale (Mean = 9.1, *SD* = 7.5). Thus, although endorsing gambling as an escape was more strongly associated with SOGS scores than endorsing gambling for positive reinforcement, participants endorsed gambling for positive reinforcement to a significantly greater extent than they did gambling as an escape.

To test whether the GFA-R escape subscale scores predicted experiencing negative consequences as a result of one's gambling, as measured by the transformed PGSI scores, a linear regression was conducted with participants' PGSI scores serving as the dependent measure and GFA-R escape subscales scores as the predictor variable. A hierarchical regression was conducted in which GFA-R positive reinforcement subscale scores were then added as a predictor variable in the second step of the analysis to determine whether these scores added significantly to the explanatory power of the regression model.

Results from the initial step of the regression demonstrated that GFA-R escape scores were a significant predictor of the transformed PGSI scores, $F(1, 23) = 12.95$, $p = .002$, $R^2 = 0.360$, $\beta = .600$, $p = .002$. When GFA-R positive reinforcement subscale scores were added to the regression, the model remained significant, $F(2, 22) = 12.51$, $p < .001$, $R^2 = 0.532$. The GFA-R escape, $\beta = .499$, $p = .003$, and positive reinforcement, $\beta = .427$, $p = .009$, subscales were significant predictors of the transformed PGSI scores, although the escape subscale was the strongest predictor. Further, the addition of the positive reinforcement subscales scores added significantly to the explanatory power of the regression model, R^2 change = 0.172, $p = .009$. Thus, GFA-R escape scores were a strong predictor of experiencing negative consequences from one's gambling, accounting for over one third of the variance in the transformed PGSI scores. However, gambling for positive reinforcement was also predictive of reporting these negative consequences. Overall, the GFA-R subscale scores accounted for over half of the variance in the transformed PGSI scores.

The present results largely replicate previous ones that have been reported using samples with a large proportion of non-problem gamblers. Participants in the present study, who all had SOGS scores of three or more, scored significantly higher on the GFA-R positive reinforcement subscale than on the escape subscale. Thus, even people who display potential problem or pathological gambling tend to endorse gambling to get something to a greater extent than they endorse

gambling as a means of getting away from something. Of the 25 participants in the present sample, only one displayed a higher score on the GFA-R escape subscale than on the positive reinforcement subscale. Interestingly, this participant also displayed the highest SOGS score in the sample.

The results also support the idea that the display of potential gambling problems and the negative consequences that come from them is more strongly associated with endorsing gambling as an escape than gambling for positive reinforcement. Endorsing gambling as an escape, but not endorsing gambling for positive reinforcement, was significantly (and positively) related to participants SOGS scores. Endorsing both contingencies was significantly related to experiencing negative consequences as a result of one's gambling, but again endorsing gambling as an escape was the stronger predictor. Thus, the relationship between endorsing gambling as an escape and experiencing gambling problems appears to exist even when one studies only participants who have potential gambling problems.

There are several aspects of the present procedure that should be considered before broadly generalizing the results. Although the study only utilized data from participants who scored three or more on the SOGS, all of the participants were university students. Likewise, all of the participants were relatively young and/or Caucasian. Thus, one cannot be assured that similar results would be observed if a more diverse sample of participants than the present one was to be tested.

Next, entrance into the present sample was determined by participants' score on the SOGS. Although the SOGS is the most widely used diagnostic screen for pathology gambling, it is not without its critics (e.g., see Gambino, 1997; Stinchfield, 2002). One of the criticisms is that the SOGS may overestimate the potential presence of pathological gambling. With this criticism in mind, it should be overtly stated that the present sample was not the equivalent of a clinical sample. It is possible that not all of the participants in the present study were indeed problem or pathological gamblers.

It is also the case that the measures used in the present study potentially access different timeframes. The SOGS, at least as used in this study, measures one's gambling history over one's entire lifetime. The PGSI, on the other hand, specifically asks respondents to confine their answers to the last 12 months. The GFA-R does not specify a timeframe for responses. This issue is potentially relevant for one particular participant in the present study. This participant scored 5 on the SOGS, suggesting the potential presence of pathology. This individual, however, scored 0 on both the GFA-R and the PGSI. There are numerous potential reasons for why this result was observed. This person may have displayed pathological gambling at one point in time, but had since ceased to display pathology and had in fact not gambled over the past year. This outcome could be an instance of the SOGS overestimating the potential presence of gambling problems. Then again, the outcome may represent the weakness of relying on self-report measures. Whatever the reason, such occurrence should promote caution when interpreting results across these different instruments.

Despite these reasons to interpret the results conservatively, the present results do support the idea that positive reinforcement, rather than escape, is the primary contingency maintaining the gambling behavior of most individuals who gamble. They also join a growing body of literature that suggests that endorsing gambling as an escape is predictive of potential gambling problems. Researchers and practitioners who are interested in screening for potential gambling problems and/or are interested in why individuals gamble, the GFA-R would appear to be a potentially useful instrument in those endeavors.

REFERENCES

Dixon, M.R., & Johnson, T.E. (2007). The gambling functional assessment (GFA): An assessment device for identification of the maintaining variables of pathological gambling. *Analysis of Gambling Behavior, 1*, 44-49.

Durand, V.M., & Crimmins, D.B. (1988). Identifying the variables maintaining self-injurious behavior. *Journal of Autism and Developmental Disorders, 18*, 99-117.

Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index: Final report*. Ottawa, ON: Canadian Center on Substance Abuse.

Gambino, B. (1997). The correction for bias in prevalence estimation with screening tests. *Journal of Gambling Studies, 13*, 343-351.

Lesieur, H.R., & Blume, S.B. (1987). The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. *American Journal of Psychiatry, 144*, 1184-1188.

Miller, J.C., Meier, E., & Weatherly, J.N. (2009a). Assessing the reliability of the Gambling Functional Assessment. *Journal of Gambling Studies, 25*, 121-129.

Miller, J.C., Meier, E., Muehlenkamp, J., & Weatherly, J.N. (2009b). Testing the validity of Dixon & Johnson's (2007) gambling functional assessment. *Behavior Modification, 33*, 156-174.

Stinchfield, R. (2002). Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behaviors, 27*, 1-19.

Weatherly, J.N. (2013). The relationship between endorsing gambling as an escape and the display of gambling problems. *Journal of Addiction, 2013*, 7 pages.

Weatherly, J.N., Aoyama, K., Terrell, H.K., & Berry, J.C. (in press). Comparing the Japanese version of the Gambling Functional Assessment – Revised to an American sample. *Journal of Gambling Issues*.

Weatherly, J.N., & Derenne, A. (2012). Investigating the relationship between the contingencies that maintain gambling and probability discounting of gains and losses. *European Journal of Behavior Analysis, 13*, 39-46.

Weatherly, J.N., Dymond, S., Samuels, L., Austin, J.L., & Terrell, H.K. (in press). Validating the Gambling Functional Assessment – Revised in a United Kingdom sample. *Journal of Gambling Studies*.

Weatherly, J.N., Miller, J.C., Montes, K.S., & Rost, C. (2012). Assessing the reliability of the Gambling Functional Assessment – Revised. *Journal of Gambling Studies, 28*, 217-223.

Weatherly, J.N., Miller, J.C., & Terrell, H.K. (2011). Testing the construct validity of the Gambling Functional Assessment – Revised (GFA-R). *Behavior Modification, 35*, 553-569.

Weiss, S.M., & Loubier, S.L. (2010). Gambling habits of athletes and nonathletes classified as disordered gamblers. *The Journal of Psychology, 144*, 507-521.

Action Editor: **Andrew Brandt**