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## Comparing the Contingencies that Maintain Gambling Behavior in an Online Sample of Younger and Older Adults

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Age is a risk factor for developing pathological gambling. Endorsing gambling as an escape has also been associated with the disorder. The present study recruited 120 people either 21-24 years of age or 45 years of age or older so as to determine how age was related to the contingencies that maintain gambling behavior. Results showed that younger adults displayed more gambling problems, as measured by the Problem Gambling Severity Index, than did older adults. Younger adults also endorsed gambling for positive reinforcement to a lesser extent and gambling as an escape to a greater extent than older adults, as measured by the Gambling Functional Assessment – Revised. For both groups, gambling behavior was primarily maintained by positive reinforcement. However, gambling as an escape, but not for positive reinforcement, was a significant predictor of gambling problems. The present results replicate previous research linking age and gambling problems. The results also provide a potential reason for why that link may exist.

*Keywords:* Gambling; Age; Escape; Positive Reinforcement

According to Petry (2005), there are several risk factors for pathological gambling. The strongest factor is substance use and abuse, with substance abusers being at a much higher risk than nonusers. Another factor is ethnicity, with ethnic minorities being at greater risk than those in the majority population. The next factor is sex, with males displaying pathological gambling at a significantly higher frequency than females. Marital status is another risk factor, with individuals who are single or divorced being at greater risk than those who are married. Socioeconomic status is the fifth factor, with the less affluent displaying pathology at a greater frequency than the more affluent. The final risk factor is age. Young adults display higher rates of pathological gambling than older adults.

These factors are not the only ones

associated with pathological gambling, however. In fact, a specific contingency of reinforcement, escape, has been linked to the disorder. Gambling as an escape is recognized as a symptom of pathological gambling (American Psychiatric Association, 2000). Endorsing gambling as an escape has been shown to be strongly correlated with scoring high on measures designed to screen for pathological gambling such as the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987; see Weatherly & Derenne, 2012; Weatherly, Dymond, Samuels, Austin, & Terrell, in press b) and the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001; see Weatherly, 2013). Endorsing gambling as an escape has shown to be related to how individuals gamble in a laboratory situation (e.g., Martner, Montes, & Weatherly, 2012; Weatherly, Montes, & Christopher, 2010). Specifically, participants who score high in gambling as an escape gamble differently (e.g., play more times) than participants who score low in gambling as an escape. Finally, escape contingencies have been integrated into theoretical accounts for why people

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might display pathological gambling (e.g., Blaszczynski & Nower, 2002). Blaszczynski and Nower suggested that emotionally vulnerable individuals were most prone to turn to gambling as an escape.

What is not presently known is how the contingency of escape might be related to the risk factors for pathological gambling as outlined by Petry (2005). For instance, younger adults are more apt to display pathological gambling than are older adults. One could hypothesize that therefore younger adults would be more likely than older adults to endorse gambling as an escape. However, that is not the only possible outcome. Younger adults are less likely to be financially secure than older adults, so that may make them more likely to gambling for positive reinforcement (e.g., winning money). Then again, younger adults might gamble to escape economic hardship. Likewise, one could potentially justify why older individuals, such as retirees, might turn to gambling as an escape (e.g., from boredom).

The present study was designed to determine how the contingencies of positive reinforcement and escape might be related to age. A sample of younger and older adults was recruited. These individuals then completed the Gambling Functional Assessment – Revised (GFA-R; Weatherly, Miller, & Terrell, 2011), which is designed to determine if the respondent's gambling behavior is maintained by positive reinforcement and/or by escape. The participants also completed the SOGS and the PGSI. The hypotheses were that younger adults would be more likely than older adults to display gambling problems, as would be expected from the research literature (Petry, 2005), and that they would also be more likely than older adults to endorse gambling as an escape, which would be consistent with their heightened rates of gambling problems.

## METHOD

### Participants

The participants were 120 (65 males; 55 females) individuals from the United States. Sixty-six of the participants were between 21-24 years of age and 54 participants were 45 years of age or older (with six reporting to be 65 years of age or older). One hundred one (84.2%) were Caucasian. Fifty-two participants (43.3%) reported being single, divorced, or widowed, while 32 (26.7%) reported being in a relationship and 36 (30.0%) reported being married. Ninety-eight participants (81.7%) reported an annual income of less than \$50,000. Thirty-four of the participants (28.3%) indicated that they regularly smoked cigarettes.

Younger (21-24 years of age) and older adults (45 years of age or older) were recruited to participate in this online study. These age ranges were chosen because they ensured that the participants in the different groups differed in age by at least 20 years. Participants completed the study on Amazon's Mechanical Turk (MTurk; <http://www.mturk.com>) and were paid \$0.25 in Amazon.com credit for their participation.

### Materials and Procedure

Participants were first presented with informed-consent information about the study as approved by the Institutional Review Board at the University of North Dakota. The second item they were presented with was a demographic questionnaire that asked about the data reported in the participants section.

The third item presented to the participants was the SOGS (Lesieur & Blume, 1987), which is a self-report measure pertaining to the respondent's gambling history. Lesieur and Blume (1987) proposed that a score of five or more on the SOGS is indicative of the potential presence of pathology. They also reported that the internal consistency of the SOGS was high ( $\alpha = 0.97$ ), although subsequent researchers have reported lower lev-

els of internal consistency ( $\alpha = 0.69$ , Stinchfield, 2002;  $\alpha = 0.81$ , Stinchfield, 2003). Lastly, the SOGS has shown to have good temporal reliability ( $r = 0.89$  at four weeks and  $r = 0.67$  at 12 weeks; Weatherly, Miller, Montes, & Rost, 2012).

The fourth item was the PGSI (Ferris & Wynne, 2001), which is a self-report measure designed for use in the general population. It measures negative consequences associated with the one's gambling. Increasing scores are indicative of an increasing number of negative consequences experienced because of one's gambling. The PGSI has shown to measure one construct (McMillen & Wenzel, 2006), have good internal consistency ( $\alpha = 0.84$ ; Ferris & Wynne, 2001), and good temporal reliability ( $r = 0.78$ ; Ferris & Wynne, 2001).

Lastly, the participants completed the GFA-R (Weatherly et al., 2011). The GFA-R is a self-report functional assessment tool designed to measure whether the individual's gambling behavior is reinforced by positive reinforcement and/or escape. High scores on the positive reinforcement and escape subscales suggest that the individual's gambling is maintained by those contingencies. The GFA-R has good internal consistency ( $\alpha = 0.91$ ; Weatherly et al., 2012) and temporal reliability ( $r = 0.80$  at four weeks and  $r = 0.81$  at 12 weeks; Weatherly et al., 2012). The psychometric properties of the GFA-R have also been replicated when used in a sample from Japan (Weatherly, Aoyama, Terrell, & Berry, in press a) and the United Kingdom (Weatherly et al., in press b).

Participants completed the study on MTurk, which has shown to be a valuable way to collect data from a broad population (e.g., Shapiro, Chandler, & Mueller, 2013; Shapiro & Stewart, 2011). The participants were presented the materials in the order described above and were compensated within three days of completing the materials.

## RESULTS AND DISCUSSION

An initial set of analyses was conducted using the participants' sex, ethnicity, marital status, annual income, and smoking of cigarettes as covariates because these are potentially measures of the other risk factors of gambling and could potentially help account for any effect of participants' age. However, the results did not indicate that these covariates were significant, and therefore they were excluded from the results of the analyses reported below. For all statistical analyses, significance was met at  $p \leq .05$ .

The first analysis was an analysis of variance (ANOVA) on the SOGS scores of the younger ( $M = 2.56$ ,  $SD = 3.5$ ) and older participants ( $M = 1.63$ ,  $SD = 2.94$ ). Although the younger adults scored higher on the SOGS than the older adults, this difference was not statistically significant,  $F(1, 118) = 2.42$ ,  $p = .122$ ,  $\eta^2 = .020$ .

A similar ANOVA was then conducted using participants' PGSI scores as the dependent measure. The results of this analysis were significant,  $F(1, 118) = 5.08$ ,  $p = .026$ ,  $\eta^2 = .041$ , indicating that the younger participants had experienced more negative outcomes because of their gambling ( $M = 3.00$ ,  $SD = 5.14$ ) than had the older participants ( $M = 1.22$ ;  $SD = 2.96$ ).

The next analysis was a two-way mixed model ANOVA, with group serving as the between-subjects variable and GFA-R subscale score serving as the repeated measure. This analysis did not yield a significant main effect of age group,  $F(1, 118) = 0.17$ ,  $p = .681$ ,  $\eta^2 = .001$ , indicating that the total scores on the GFA-R did not differ as a function of age. The main effect of subscale was significant,  $F(1, 118) = 243.26$ ,  $p < .001$ ,  $\eta^2 = .673$ , indicating that participants scored significantly higher on gambling for positive reinforcement ( $M = 19.03$ ,  $SD = 10.92$ ) than for gambling as an escape ( $M = 4.86$ ,  $SD = 7.26$ ). Finally, the interaction between group and GFA-R subscale was also significant,  $F(1,$

118) = 4.93,  $p = .028$ ,  $\eta^2 = .040$ . The younger adults scored lower on gambling for positive reinforcement ( $M = 17.85$ ,  $SD = 11.11$ ) than the older adults ( $M = 20.48$ ,  $SD = 10.61$ ), but higher on gambling as an escape ( $M = 5.52$ ,  $SD = 8.14$ ) than the older adults ( $M = 4.06$ ,  $SD = 6.00$ ).

Despite the difference in the extent to which participants in each group endorsed gambling as an escape, endorsing gambling as an escape was a significant predictor of gambling problems for participants in both groups. This conclusion is supported by the results of several simultaneous linear regressions that were conducted separately for both groups, with their SOGS and PGSI scores as the dependent measure and their GFA-R subscale scores as the predictor variables. When the SOGS scores of the younger adults were subjected to this analysis, the model was significant,  $F(2, 63) = 36.01$ ,  $p < .001$ ,  $R^2 = .533$ . GFA-R escape subscale scores,  $\beta = .706$ ,  $p < .001$ , but not positive reinforcement subscale scores,  $\beta = .047$ ,  $p = .638$ , were significant predictors of SOGS scores. The analysis on PGSI scores of the younger adults again found that the model was significant,  $F(2, 63) = 59.68$ ,  $p < .001$ ,  $R^2 = .655$ . Again, GFA-R escape subscale scores,  $\beta = .842$ ,  $p < .001$ , but not positive reinforcement subscale scores,  $\beta = -.072$ ,  $p = .402$ , were significant predictors of PGSI scores.

The same analyses were repeated on the data from the older adults. When the SOGS scores were analyzed, the regression model was significant,  $F(2, 51) = 26.28$ ,  $p < .001$ ,  $R^2 = .507$  and the GFA-R escape subscale scores,  $\beta = .694$ ,  $p < .001$ , but not positive reinforcement subscale scores,  $\beta = .047$ ,  $p = .446$ , were significant predictors of SOGS scores. The analysis on PGSI scores showed that the model was significant,  $F(2, 63) = 25.86$ ,  $p < .001$ ,  $R^2 = .504$ . Again, GFA-R escape subscale scores,  $\beta = .701$ ,  $p < .001$ , but not positive reinforcement subscale scores,  $\beta = .023$ ,  $p$

= .402, were significant predictors of PGSI scores.

Age is a risk factor for pathological gambling, with one's risk of the disorder decreasing with age. Gambling problems have also been associated with gambling as an escape. The goal of the present study was to determine if endorsing gambling as an escape would also be associated with age. The results indicated that younger adults displayed higher scores on the GFA-R escape subscale than did the older adults. However, both groups displayed significantly higher scores on the GFA-R positive reinforcement subscale than on the escape subscale. Likewise, GFA-R escape scores were significant predictors of gambling problems, as measured by the SOGS and PGSI, for both groups.

The present results therefore offer a potential reason for why age is risk factor for pathological gambling. Whereas older adults endorse gambling for positive reinforcement to a greater extent than younger adults, the younger adults endorse gambling as an escape to a greater extent than older adults. This outcome suggests that the younger adults may be less capable of dealing with aversive situations than are older adults and thus more likely to turn to gambling to escape those situations. Of course, the difference in endorsing gambling as an escape between the age groups may have occurred because the older adults have developed alternative means to deal with aversive situations. Interestingly, the present study attempted to control for the other risk factors of gambling (e.g., socioeconomic status, ethnicity) and including those factors into the statistical analyses would not have changed the results. Thus, whatever is driving the younger adults to endorse gambling as an escape does not appear to be statistically related to the other risk factors for pathological gambling.

With that said, all participants' gambling behavior was maintained to a significantly greater extent by positive reinforcement than

by escape. This result is consistent with other research that has utilized the GFA-R (e.g., Weatherly & Derenne, 2012; Weatherly et al., in press a, b). It might also help explain why the vast majority of people who gamble do not develop problems with gambling; their gambling is primarily maintained by positive reinforcement.

The present study is not without its limitations. All of the data collected represent self-report measures, and therefore one cannot verify their accuracy or be confident that the responses correspond to actual behavior. In terms of race and annual income, the sample was relatively homogenous and different results might have been observed had a more diverse sample been recruited. The present sample also does not qualify as a clinical sample, with only 18 of the 120 participants scoring five or more on the SOGS. Therefore, one cannot conclude that similar relationships would be identified in a sample of clinically diagnosed pathological gamblers. Finally, the data were collected from individuals who were motivated to complete the materials for the equivalent of \$0.25. It is possible that the present results represent some special characteristics of such a sample.

Despite these potential limitations, the present results do support previous research that indicated that younger adults are more likely to suffer from gambling problems than older adults. They also add to those findings that younger adults appear more likely to endorse gambling as an escape, and less like to endorse gambling for positive reinforcement, than older adults. Despite this, the gambling behavior of both younger and older adults is maintained to a greater degree by positive reinforcement than by escape. Likewise, the presence of gambling problems, at least as measured by the SOGS and PGSI, are predicted by endorsing gambling as an escape, but not by gambling for positive reinforcement, for both younger and older adults. Future studies that employ longitudinal research

designs would be helpful in determining how these factors related to gambling change with age.

## REFERENCES

- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4<sup>th</sup> ed., text revision). Washington, D.C.: Author.
- Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction, 97*, 487-499.
- Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index: Final report*. Ottawa, ON: Canadian Center on Substance Abuse.
- 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.
- Martner, S.G., Montes, K.S., & Weatherly, J.N. (2012). Using unsolvable anagrams to induce escape: Will it increase gambling behavior? *Analysis of Gambling Behavior, 6*, 46-53.
- McMillen, J., & Wenzel, M. (2006). Measuring problem gambling: Assessment of three prevalence screens. *International Gambling Studies, 6*, 147-174.
- Petry, N.M. (2005). *Pathological Gambling: Etiology, Comorbidity, and Treatment*. Washington, D.C.: American Psychological Association.
- Shapiro, D.N., Chandler, J., & Mueller, P.A. (2013). Using Mechanical Turk to study clinical populations. *Clinical Psychological Science, 1*, 213-220.
- Shapiro, D.N., & Stewart, A.J. (2011). Parenting stress, perceived child regard, and depression in stepmothers and biological mothers. *Family Relations, 60*, 533-544.

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- Stinchfield, R. (2002). Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behaviors, 27*, 1-19.
- Stinchfield, R. (2003). Reliability, validity, and classification accuracy of a measure of DSM-IV diagnostic criteria for pathological gambling. *American Journal of Psychiatry, 160*, 180-182.
- 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 a). 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 b). 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.
- Weatherly, J. N., Montes, K. S., & Christopher, D. M. (2010). Investigating the relationship between escape and gambling behavior. *Analysis of Gambling Behavior, 4*, 79-87.