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

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THE CONTINGENCIES CONTROLLING GAMBLING BEHAVIOR: A PRELIMINARY CULTURAL ANALYSIS IN AMERICAN INDIAN UNIVERSITY STUDENTS

Jeffrey N. Weatherly
University of North Dakota

Research on pathological gambling has suggested that the disorder afflicts American Indians at a greater frequency than the majority population. The present study investigated whether potential pathology and/or contingencies maintaining gambling behavior differed between 29 American Indian undergraduate students and 29 Caucasian students who were matched to the American Indian students in terms of sex, age, and grade point average. The American Indian participants scored lower on all dependent measures of gambling than did the Caucasian students, although several of the differences approached, but did not reach, statistical significance. The present results suggest that the increased rates of pathological gambling that have been observed in the American Indian population are not the direct product of ethnicity or race.

Keywords: pathological gambling, functional assessment, American Indians, university students

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Pathological gambling is a significant societal problem. For instance, researchers have estimated that pathological gambling afflicts 1 – 2% of the adult population (see Petry, 2005, for a review). Not only does the disorder directly affect millions of individuals, researchers have also argued that there are serious social and economic repercussions that infiltrate different aspects of society and culture (e.g., see Mawhinney, 2006, for a review).

Pathological gambling does not afflict all groups at an equal frequency, however. Petry (2005) identified several known risk factors for pathological gambling, with one being age. Specifically, the older one gets, the less likely one is to be diagnosed as a pathological gambler (see Petry, 2005). For example, the prevalence of pathological gambling among college students has been shown to be well above that observed in the general population (Petry, Weinstock, Morasco, & Ledgerwood, 2009; Winters, Bengston, Dorr, & Stinchfield, 1998).

Another risk factor for pathological gambling is ethnicity (Petry, 2005) in that members of minority groups suffer from the disorder at a higher rate than members of the majority population. Research suggests that this problem is especially acute in the American Indian population. For instance, Wardman, el-Guebaly, and Hodgins (2001) estimated that the prevalence of pathological gambling among American Indians is up to 15 times that observed for the Caucasian majority.

One possible reason for the increased prevalence of pathological gambling among American Indians is that the disorder has a genetic component. However, that is not the only possibility. Another potential reason is that other factors correlated with ethnicity are contributing to the high rates of pathological gambling. For instance, research has indicated that preva-

Address Correspondence to:
Jeffrey N. Weatherly
Department of Psychology
University of North Dakota
Grand Forks, ND 58202-8380
Phone: (701) 777-3470
Fax: (701) 777-3454
Email: jeffrey.weatherly@email.und.edu

lence rates of drug and alcohol abuse are heightened in the American Indian population (e.g., Young, 1994). This fact is potentially important because the strongest risk factor for pathological gambling is substance abuse (Petry, 2005).

Research from our laboratory would seem to favor the latter explanation. Specifically, we have conducted several experiments in a laboratory environment that have attempted to identify differences in the gambling behavior of American Indians and non Indians. Differences have rarely been found. McDougall, McDonald, and Weatherly (2008) had American Indian and non-Indian participants play a simulated slot machine in the presence of a confederate who was either an American Indian or a non Indian. Results indicated that gambling behavior did not differ between the American Indian and non-Indian participants, nor was the influence exerted by the confederate related to the confederate's ethnicity. Gillis, McDonald, and Weatherly (2008) had American Indian and non Indians play a slot-machine simulation that varied across sessions in how well the simulation paid off. Gambling behavior sometimes varied as a function of the simulation's payback percentage, but no differences in gambling were observed between the American Indian and non-Indian participants. Whitton and Weatherly (2009) was the only study from our laboratory to demonstrate a difference in gambling between American Indian and non-Indian participants. In that study, American Indian participants played significantly fewer hands of video poker than did non-Indian participants.

Failing to find differences in gambling behavior of American Indians and non Indians in a controlled environment suggests that the differences observed in the natural setting are due to factors found in that setting. If that is the case, then it stands to reason that differences in pathological gambling between the American Indian and majority population may be related to differences in the contingencies that are maintaining the gambling. For instance, if gambling among American Indians is related to lowered socioeconomic status, which is another risk factor for pathological gambling (Petry, 2005), then American Indians may be more likely than non Indians to gamble for the purpose of winning money (versus for the entertainment or to escape from boredom). Although we know that rates of pathological gambling differ between the American Indian and majority population, we know little about potential differences in the contingencies controlling the behavior of individuals in these groups. The present study was a preliminary attempt to assess potential differences in this regard.

There are numerous diagnostic measures that have been created to study pathological gambling (see Petry, 2005), with the most commonly used measure being the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). Although identifying potential pathology is important, these tools do not measure why a person gambles. To determine why a person engages in a behavior, one should conduct a functional assessment. The first functional assessment tool for determining the contingencies maintaining gambling behavior, the Gambling Functional Assessment (GFA), was proposed by Dixon and Johnson (2007). The original GFA, however, had several psychometric inconsistencies (e.g., see Miller, Meier, Muehlenkamp, & Weatherly, 2009), which were addressed in the revised version of the GFA (GFA-R; Weatherly, Miller, & Terrell, in press). The GFA-R consists of 16 self-report items that together potentially identify whether the respondent gambles in order to obtain something (i.e., gambling is maintained by

positive reinforcement) or in order to escape from something (i.e., gambling is maintained by negative reinforcement). Likewise, answers to individual questions potentially provide an indication as to the specific outcome or situation that maintains the person's gambling.

In the present study, American Indian and Caucasian university students completed the SOGS (Lesieur & Blume, 1987) and the GFA-R (Weatherly et al., in press). The participants in the different groups were matched in terms of sex, age, and grade point average. Given that the participants were university students, the hypothesis was that the rate of pathological gambling, as measured by the SOGS, would be above the 1 – 2% found in the overall population. Given that the prevalence of pathological gambling is reportedly higher among American Indians than among Caucasians, the hypothesis was that the SOGS scores of American Indians would be significantly higher than that of Caucasians. In terms of the GFA-R, the hypothesis was that a difference would exist between the American Indian and Caucasian students in terms of gambling to get something (e.g., money) inasmuch as the groups differed in socioeconomic status. Also, research has suggested that pathological gambling is associated with gambling as an escape rather than gambling as a means to get something (e.g., Miller, Dixon, Parker, Kulland, & Weatherly, 2010). Thus, given the prediction that rates of potential pathological gambling would be higher for the American Indian participants than the Caucasian participants, the hypothesis was that American Indian participants would score higher than Caucasian participants on the GFA-R in terms of gambling as an escape.

METHOD

Participants

Fifty eight undergraduate students enrolled at the University of North Dakota served as participants. Twenty nine participants self-identified American Indians. After data were collected from these participants, 29 self-identified Caucasian participants were individually matched to the American Indian participants. Participants were matched individually on the basis of sex, age, and grade point average. The 29 Caucasian participants were drawn from a pool of 974 potential respondents. Upon completion of the matching process, each group of 29 participants consisted of 19 females and 10 males. The mean age and grade point average were an identical 21.34 years and 3.16 out of 4.00, respectively.

For the American Indian participants, the modal self-reported annual income was less than $10,000 (72.4%), with seven participants indicating that their parents' annual income was less than $25,000. For the Caucasian participants, the modal self-reported annual income was also less than $10,000 (75.9%). However, only one participant reported that his/her parents' annual income was less than $25,000. One American Indian participant reported being married whereas four of the Caucasian participants reported being married. Three American Indian participants reported being a smoker whereas five of the Caucasian participants reported being a smoker. All participants received (extra) course credit for their participation in the study.

Materials and Procedure

Participants completed the packet of materials in their psychology course. The first item in each packet was an informed consent form that outlined the study as approved by the Institutional Review Board at the University of North Dakota. The second form in the packet was a de-

mographics questionnaire that asked participants about their sex, age, grade point average, ethnicity, annual income, parents' annual income, marital status, and whether or not they smoked.

The next item in the packet was the SOGS (Lesieur & Blume, 1987). The SOGS is the most commonly used diagnostic screening measure for pathological gambling. It is a 20-item self-report measure pertaining to the respondent's gambling history. A score of five or more on the SOGS is indicative of the potential presence of pathological gambling. Research on the SOGS indicates that the measure is internally consistent (Lesieur & Blume, 1987; Stinchfield, 2002) and the scores are reliable across time (Lesieur & Blume, 1987; Poulin, 2002). It should also be noted that previous studies that have attempted to validate the SOGS have included American Indian participants (e.g., Stinchfield, 2002).

The final measure in the packet was the GFA-R (Weatherly et al., in press). The GFA-R is a 16-item self-report measure that assesses the potential reasons for why the respondent gambles. Eight items identify gambling for positive reinforcement and eight items identify gambling for negative reinforcement. Each item is endorsed on a scale of 0 – 6, with higher scores indicating greater endorsement for gambling for that particular outcome. Research on the GFA-R indicates that the measure is internally consistent (Weatherly et al., in press) and that scores are reliable across time (Weatherly, Miller, Montes, & Rost, in press).

RESULTS AND DISCUSSION

Participants' scores on the SOGS were analyzed by conducting an analysis of variance (ANOVA). The difference approached, but did not reach, statistical significance, $F(1, 56) = 3.88$, $p = .054$, $\eta^2 = .065$. Contrary to the hypothesis, the mean SOGS scores for the American Indian participants (Mean = 0.34, SD = 0.77) was below that of the Caucasian participants (Mean = 1.52, SD = 3.11). None of the American Indian participants scored five or more on the SOGS whereas two Caucasian participants scored five or more.

Participants' scores on the GFA-R were analyzed by conducting a two-way (Group by GFA-R category) mixed-model ANOVA. In this analysis, group served as the between-subjects factor and participants' sum scores on the eight separate questions on the GFA-R intended to identify gambling for positive or negative reinforcement served as the within-subjects measure. Results showed that the main effect of group was significant, $F(1, 56) = 10.53$, $p = .002$, $\eta^2 = .158$, with the American Indian participants displaying lower scores on the GFA-R than the Caucasian participants. The main effect of GFA-R category was also significant, $F(1, 56) = 96.21$, $p < .001$, $\eta^2 = .632$, with participants scoring higher on the questions pertaining to gambling for positive reinforcement relative to gambling for negative reinforcement. Lastly, the interaction between group and GFA-R category was significant, $F(1, 56) = 8.17$, $p = .006$, $\eta^2 = .127$.

Because the interaction was significant, tests for simple effects were conducted. The American Indians scored significantly lower than the Caucasian participants on the items assessing gambling for positive reinforcement, $F(1, 56) = 10.64$, $p = .002$, $\eta^2 = .160$ (American Indian: Mean = 11.28, SD = 10.68; Caucasian: Mean = 21.97, SD = 14.05). However, the groups did not differ significantly on the items assessing gambling for negative reinforcement, $F(1, 56) = 3.12$, $p = .083$, $\eta^2 = .053$ (American Indian: Mean = 0.97, SD = 2.86; Caucasian: Mean = 3.17, SD = 6.09). The American Indian participants scored significant-

ly higher on gambling for positive reinforcement (Mean = 11.28, SD = 10.68) than for negative reinforcement (Mean = 0.97, SD = 2.86), $F(1, 28) = 32.33$, $p < .001$, $\eta^2 = .536$. The Caucasian participants also scored significantly higher on gambling for positive reinforcement (Mean = 21.97, SD = 14.05) than for negative reinforcement (Mean = 3.17, SD = 6.09), $F(1, 28) = 64.03$, $p < .001$, $\eta^2 = .696$.

The influence of the participants' annual income and their parents' annual income were tested by conducting separate linear regressions on participants' SOGS scores, as well as their GFA-R scores for gambling for positive and negative reinforcement. These factors were not significant predictors in any of the regression models.

In terms of responses to individual items on the GFA-R, the American Indian participants had the highest rating for the item "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" (Mean = 1.93, SD = 2.03). In terms of gambling for negative reinforcement, the highest score was observed for the item "I gamble when I feel stressed or anxious" (Mean = 0.21, SD = 0.68). The most endorsed item for gambling for positive reinforcement by the Caucasian participants was the same as for the American Indian participants (Mean = 3.76, SD = 2.43). However, the most endorsed item for gambling for negative reinforcement was "I gamble to get a break from work or other difficult tasks" (Mean = 0.69, SD = 1.29).

The literature on gambling indicates that American Indians suffer from pathological gambling at a significantly higher rate than the majority population (Wardman et al., 2001). However, the exact reason for this difference is not known. One possibility is that this difference is one of ethnicity or race. Another possibility is that the difference is the outcome of other factors correlated with the American Indian population. The current results support this latter possibility. In the present study, American Indian and Caucasian participants were matched in terms of age, sex, and grade point average. The American Indian participants displayed lower levels of potential pathological gambling, as measured by the SOGS (Lesieur & Blume, 1987), than the Caucasian participants, although this result only approached statistical significance. The American Indian participants displayed a significantly lower proclivity to gamble for positive reinforcement relative the Caucasian participants. Their scores for gambling for negative reinforcement were also lower than that for the Caucasian participants, but the difference was not statistically significant.

Thus, none of the hypotheses were supported. However, one could argue that this lack of support represents good news about American Indians and pathological gambling. Not only was the rate of potential pathological gambling below that of the Caucasian participants, the number of American Indian participants scoring five or more on the SOGS was zero. Thus, in the current sample of American Indians, the rate of pathological gambling appears to be below that of the general population and well below the rate previously reported in the American Indian population (e.g., Wardman et al., 2001). The same cannot be said of the Caucasian participants. Two Caucasian participants scored five or more on the SOGS, suggesting that the rate of pathological gambling for this group was above that found in the general population.

The American Indian participants were also significantly less likely than the Caucasian participants to identify positive reinforcement as the contingency maintaining their gambling behavior. With that said, both the American Indian and Caucasian

participants gave the highest rating to the same item (i.e., gambling for the social aspects). Together, these results suggest that the gambling behavior of American Indian participants was not differently governed relative to the gambling behavior of the Caucasian participants.

The differences in gambling maintained by negative reinforcement were not statistically significant. However, it is notable that the mean score for the American Indian participants was lower than that of the Caucasian participants, consistent with the trend observed for the SOGS and GFA-R positive reinforcement scores. Low scores on measures of gambling for escape are promising because, as noted above, gambling as a means of escape is a potentially strong predictor of pathological gambling (Miller et al., 2010). It may also be worth noting, however, that in terms of the most endorsed item on the GFA-R in terms of gambling as an escape, the American Indians most endorsed the item of gambling to escape stress or anxiety whereas the Caucasian participants most endorsed gambling to escape work or difficult tasks. Future research may be warranted to determine if such a difference is a reliable one because, if it is, attempts to prevent pathological gambling may need to differ between populations.

Before the current results are generalized broadly, there are a number of aspects of the present procedure that should be recognized. First, the sample sizes used in the present study were not large. Despite this potential deficit, not only were significant differences detected, but the effect sizes for the group effects were in the moderate range. Second, the sample was regionally isolated in the sense that all the participants were enrolled at the University of North Dakota. Third, it is possible that the present results represent an interaction between the instruments used and cultural differences. That is, one cannot assume that the American Indian and Caucasian participants interpreted the questions on either the SOGS or the GFA-R the identical way. Fourth, although no influence of socioeconomic status was found in the current study, it is quite possible that such a relationship would be observed had more sensitive measures of this status been used. One could also argue that the present results are limited because none of the American Indian participants were currently living on a reservation. Thus, inasmuch as pathological gambling is a problem on reservations, finding low rates of pathology in a sample of American Indians not living on the reservation may not be surprising. It is, however, important. Clearly, one would need to replicate the present procedure using a sample of American Indians residing on a reservation to determine whether the present results would be replicated in that setting. But finding different results in that setting would not negate the present results. Rather, such results would indicate that the factors contributing to pathological gambling are found in that setting. Researchers and mental-health professionals could then set about trying to determine what those factors might be and address them.

It may also be the case that there are individual differences between American Indian students who enroll in an off-reservation university and those who attend tribal colleges. Then again, it may also be the case that the environment at an off-reservation university may differ from that at tribal colleges and that this difference might contribute to differences in gambling problems observed among American Indians in the two settings. The present study cannot address which, if either, of these possibilities might be true. However, both possibilities would seem to be important areas for future studies.

Finally, the present results should promote the use of the GFA-R by researchers. Designed as a functional assessment tool, its original purpose was to identify the contingencies maintaining the respondent's gambling behavior so that behavior could be modified. However, as demonstrated in the present study, it also shows the promise of being able to identify differences that may exist across groups. Future research will be needed to determine whether the GFA-R is as, or even more, sensitive to such differences as measures of pathological gambling, such as the SOGS, that have been used in such research for decades.

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