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COMPARING THREE STRATEGIES OF MOTIVATING GAMBLING BEHAVIOR IN THE LABORATORY ENVIRONMENT

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The present study compared three methods of motivating participants' gambling behavior in a laboratory environment. Thirteen university students played in three sessions of video poker, which differed in whether participants were 1) asked to play "as if" gambling real money, 2) staked with real money, and 3) in competition with other participants for a gift card. Also measured was whether participants' reported annual income would influence their gambling behavior under these conditions. Results showed that the number of hands played and the accuracy of game play did not differ across the different sessions. The number of credits bet, which is a metric of risk, was significantly different across sessions. Participants bet the least credits when they were playing for actual money or competing for a gift card, but their betting did not differ between these two conditions. Results also showed that all dependent measures varied directly with annual income. The present results suggest that using competition for a prize may produce similar gambling behavior as having participants risk actual money, and may have the benefit of being more cost efficient. The results also suggest, however, that gambling researchers should measure their participants' financial status, as that may influence how participants behave in laboratory experiments on gambling.

Keywords: gambling, motivation, financial status, university students

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The opportunity to engage in gambling is greater than ever, with most states offering some form of gambling. A meta-analysis of gambling prevalence surveys has shown a positive correlation between increased gambling in the general population with increased pathological gambling (Shaffer, Hall & Vander Bilt, 1999). As of 2006, worldwide estimates of pathological gambling were 0.4 to 1.9% (Petry, 2006). Though this percentage may seem small, when considering that pathological gambling is associated with marital problems, financial crimes, and suicide, it is apparent that pathological gambling is a serious social concern (Petry & Armentano, 1999). A study conducted by the National Gambling Impact Study Commission (2000) concluded that pathological and problem gamblers cost society approximately $5 billion per year for productivity reductions, social services, and creditor losses.

For the treatment and prevention of pathological gambling to be most effective, the contingencies that maintain gambling behavior must be identified. However, very little of the research on gambling involves direct experimentation, partly due to legal and ethical constraints of simulating the consequences faced by actual gamblers. Participants gambling in the laboratory environment typically face lower personal risk than those in actual gambling situations. The task of researchers then is to create an environment which

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accurately simulates real gambling behavior while remaining within the boundaries of ethical research.

A common strategy used by gambling researchers to overcome this ethical barrier is to ask participants to treat laboratory credits as if they had actual value (e.g., Nastally, Dixon, & Jackson, 2010). In such studies, the amount of credits won or lost by the participant has no bearing on his or her compensation. This approach is based on the assumption that participants actually will treat the credits as they would their own money.

An alternative method, in which participants actually risk something of value, has also been used. A study conducted by Weatherly and Brandt (2004) using a slot-machine simulation, staked participants with amounts of money that varied between groups (Experiment 1) or across conditions (Experiment 2). Participants played with credits worth $0.00, $0.01, or $0.10. The results indicated that the monetary value of laboratory credits significantly affected participants' gambling behavior; when the monetary value of the credits was smaller, participants bet more and played more trials than when the credits had a higher value. These results were replicated by Weatherly and Meier (2007) in a study that had participants play video poker. The results of that study also showed that the value of laboratory credits did not influence how accurately participants played however, only how much they bet.

Another risk-simulating strategy used by some researchers that is both legal in most states and could potentially produce results similar to playing with real money is to create a competition among participants for something of value (e.g., a gift card). Dixon and Schreiber (2002), for instance, had participants play video poker and compete for a prize rather than staking each individual with actual money. The participant who completed the video-poker session with the most credits received a $50 gift card. Several other studies have used a similar "gift-card competition" model to motivate participants' gambling performance (Dixon & Jackson, 2008; Dixon, Nastally, Jackson, & Habib, 2009; Johnson & Dixon, 2009). It was seemingly assumed by these researchers that a competition among participants for the gift card would be sufficient to create risk; however, none of these studies measured the actual effectiveness of the gift card in this regard.

Though asking participants to play as if they were risking real money, playing with staked money, and competing for a gift card have been used to control participants' gambling behavior, there has not been research comparing these three strategies. Such a comparison would provide researchers with important information in regards to which risk-consequence strategy is most appropriate and could potentially reduce the cost of research. For example, if competing for a gift card is as effective in motivating participants' gambling behavior as staking them with real money, it may be more cost efficient for researchers to use a gift card, rather than cash, when studying large groups of participants.

Another factor that might influence participants' motivation to gamble in a laboratory environment is their own financial situation. Phrased differently, $5 in staked money or a $50 gift card may have different subjective values (i.e., be more or less reinforcing) to different participants depending on the participants' financial status. If that is the case, then one might expect that behavior in the laboratory situation would be associated with the participants' financial status. To our knowledge,

no studies to date have attempted to empirically test this idea.

The present research was designed to compare the three popular strategies of simulating risk in gambling research: playing as if risking real money, gambling with real money, and competing for a gift card. The comparison was made by assessing differences in the number of trials played, number of coins bet, and accuracy of game play by participants playing video poker in each of these three scenarios.

Based on previous research (Weatherly & Brandt, 2004; Weatherly & Meier, 2007), it was predicted that asking participants to play "as if" risking real money would result in both a higher number of hands played and coins bet compared to gambling with staked money or competing for a gift card. It was also hypothesized that the influence of playing for actual money or a gift card would vary as a function of the participant's annual income such that the higher the participant's income, the more coins he or she would bet.

METHOD

Participants

Thirteen individuals (6 females, 7 males) enrolled at the University of North Dakota volunteered to participate in this Institutional-Review-Board-approved study. To participate, individuals needed to be at least 21 years of age and score below five on the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). One potential participant was dismissed from the study due to failing to meet the SOGS-score criterion. That participant was replaced. Participants ranged in age from 21 to 30 years of age (Mean = 23.62 years, SD = 3.40 years); SOGS scores ranged from zero to four (Mean = 1.08, SD = 1.44). One participant self-identified as American Indian, two as Asian, one as Asian/Caucasian, and nine as Caucasian. Participants received (extra) course credit for their participation, as well as whatever they earned or had remaining in the sessions that they played for something of value. One participant also won a $50 gift card. In terms of self-reported annual income, 6 participants reported making less than $10,000 per year, 5 reported making between $10,000 and $25,000 per year, one reported making between $25,000 and $50,000 per year, and one reported making more than $50,000 per year. No measure was taken of the participants' previous experience playing video poker.

Apparatus

The experiment was conducted in a 4-by-2-m room. The room contained a table, two chairs and a desktop computer. The video-poker software used was WinPoker 6.0 (see Jackson, 2007). The poker game used was "Jacks-or-Better," which is a variation of standard five-card-draw poker. The player is dealt five cards that s/he can choose to hold or discard, then draw new cards. The five cards remaining after the draw determine the outcome of the hand. Players were allowed to bet one to five credits per hand. Obtaining at least a pair of Jacks was necessary for returning the original bet, with increasing payouts for increasingly better hands (i.e., straights, flushes, full houses, etc.).

The software recorded a variety of dependent measures each session. Of particular interest was the number of hands played, number of coins bet, and number of errors made during play. These dependent measures were chosen because they reflect persistence of play, amount of risk taken, and accuracy, respectively. All plays that resulted in a potential reduction of the player's optimal rate of return were recorded as errors. Players were not notified of the best play for each hand nor whether they had made the optimal

choice. The only information provided to the player was the potential return for each winning card combination given the number of coins bet.

Materials and Procedure

Participants were run individually. At the beginning of the session, the researcher verified the participant's age and initiated the informed-consent process, which included a form outlining the procedure as well as any potential risks of the present study. After the participant provided informed consent, the researcher asked him or her to complete the SOGS (Lesieur & Blume, 1987) and a demographic questionnaire. The SOGS is a survey designed to assess the individual's gambling history; it is also used as a measure for pathological gambling, with a score of five to more indicating potential pathology. While the participant was completing the demographic questionnaire, the researcher scored the SOGS. If the participant scored five or more on the SOGS, he or she was provided with (extra) course credit, if applicable, and dismissed. For participants who scored below five on the SOGS, the researcher read the following instructions:

> You will now be given the opportunity to play video poker. Specifically, you will be playing the game Jacks or Better, which is a 5-card-draw poker game that returns your bet for finishing the hand with at least a pair of Jacks and payouts increase for increasingly better hands. You have been staked with 100 credits.* Your goal should be to end the session with as many credits as you can. The game will end when you have lost all your credits, you choose to quit, or 15 min has elapsed. Do you have any questions?

Questions were answered by repeating the appropriate portion of the instructions.

Each participant completed three sessions of video poker, which were counterbalanced across participants. In one session, the 100 credits had no monetary value, in another each credit had a value of $0.05, and in the third the credits had no monetary value, but participants were told that the individual with the most credits remaining at the end of this particular session, compared to all other participants in the study, would receive a $50 gift card to a major retail store. Prior to the session in which the credits had no monetary value, "These credits have no monetary value, but we ask that you treat them as if they did" was read at the point where the asterisk appears in the instructions. Before the session in which the credits had monetary value, "These credits have a value of $0.05. In other words you have been given $5 with which to gamble. You will be paid in cash at the end of the experiment for the number of credits you have remaining at the end of this particular poker session" was read at the point where the asterisk appears in the instructions. Prior to the session in which the participant's credits were compared to all other participants, "These credits have no monetary value. However, at the end of this study, the participant who had the most credits at the end in this particular session will receive a $50 gift card to a major retailer" was read at the point where the asterisk appears in the instructions.

For each session, participants played video poker until one of the three criteria for ending the session was met. Upon completion of a session, the participant completed a filler survey while the researcher recorded the data generated from the session. After completing the third session, the participant was debriefed, paid in cash for the number of credits s/he had remaining in the session where credits held a monetary value, given credit in his or her psychology class (if applicable), and dismissed.

RESULTS AND DISCUSSION

Separate one-way repeated-measures analyses of covariance were used to analyze the number of trials played, total number of credits bet, and accuracy of individual participants in each of the type of sessions. The participants' self-reported annual income served as the covariate in these analyses[1]. The consequence of each gambling session (e.g., "as if", money, or gift card) did not significantly alter the number of hands played by participants, $F < 1$, partial eta2 = .072. The covariate of annual income was significantly related to the number of hands played by participants, $F(1, 11) = 7.68$, $p = .018$, partial $eta^2 = .411$. Specifically, the number of hands participants played increased as self-reported annual income increased. Results in these, and all following, analyses were considered significant at $p < .05$.

The consequence of the gambling sessions was significantly related to the total number of coins bet by participants, $F(2, 22) = 3.84$, $p = .037$, partial $eta^2 = .259$. The effect of annual income was also significant, $F(1, 11) = 5.25$, $p = .043$, partial $eta^2 = .322$. A visual analysis of the data suggested that participants bet more credits when they were asked to play "as if" the credits were worth money (Mean = 344.15 credits bet per session, SD = 306.39) than they did when the credits were actually worth money (Mean = 313.15 credits bet per session, SD = 307.43) or the participants were playing for a gift card (Mean = 311.92 credits bet per session, SD = 245.03), which was expected given previous research. Most germane to the present study, however, was whether differences in betting occurred when participants were playing for money or for a gift card. When the number of credits bet in these two sessions were compared using a one-way analysis of variance[2] , no significant difference was observed $F < 1$, partial $eta^2 = .000$. Thus, it can be concluded that participants did not bet differently when they were betting with real money vs. when they were playing for a gift card. In terms of annual income in the omnibus analysis, the number of credits bet per session varied directly with participants' self-reported annual income.

The different consequences did not significantly influence how accurately participants played video poker in the three sessions, $F(2, 22) = 1.92$, $p = .170$, partial $eta^2 = .149$. However, the covariate of annual income $F(1, 11) = 11.91$, $p = .005$, partial $eta^2 = .520$ was significant. Interestingly, accuracy of play increased as self-reported annual income increased.

The results of this study were in accordance with others like it (Weatherly & Brandt, 2004; Weatherly & Meier, 2007). Participants bet fewer coins when they played for something of value (e.g., gift card or money) compared to "as if" risking something valuable. Consistent with Weatherly and Meier (2007), the number of hands played and accuracy of game play did not significantly vary between sessions. Thus, it appears that the effect of adding a real consequence to the gambling session manifests itself in the risk that the participants take.

When comparing gift card and money sessions, the number of hands played,

[1] Research exists that suggests that participants who score 3 – 4 on the SOGS may differ from those who score 0 – 2 on certain measures of gambling (e.g., Chase & Clark, 2010). Statistical analyses were conducted with SOGS scores also serving as a covariate. However, the effect of SOGS score was never significant and therefore was excluded from the analyses presented here.

[2] An analysis of variance, rather than an analysis of covariance, was used in the analysis because the effect of the covariate was not significant in this follow-up analysis.

number of coins bet, and accuracy of play did not vary significantly. This result is potentially financially beneficial for future gambling researchers who are looking for realistic and economical ways to motivate their participants. The use of a gift card allows researchers to know exactly how much the study will cost no matter how large the group of participants. This finding would appear to validate comparisons between the results of studies that exclusively used a gift card or money as the consequence of gambling.

However, it is not yet known if the effect of having a chance to win a prize varies as a function of the size of the prize or the chances of winning it. For instance, there is no guarantee that the same results would have been observed had participants competed for a $25, rather than a $50, gift card. Likewise, had participants competed for a $100 gift card, they may gave gambled significantly less than participants staked with $5 in cash. Future research should pursue these possibilities.

The covariate of annual income was significantly related to all three dependent measures. Participants with a higher annual income did not play more conservatively when playing for something of value than when playing "as if" gambling something valuable; they played more hands and bet more coins than those of lower income. This result is somewhat intuitive. The relative value of $5 or a chance to win $50 is inversely related to one's income. Those with a higher income may have found the consequence of the gambling session to be less valuable, and therefore less reinforcing, than those with a lower income, resulting in less conservative game play (i.e., playing more hands and betting more coins). However, those with a higher income played more accurately. It is difficult to reconcile these results as it would stand to reason that less conservative game play would result in decreased accuracy (or no difference in accuracy). It is unclear what attributes of a high wage earner contribute to more accurate video-poker play.

Based on the effects of the covariate, one would expect that a person with high income would bet more money in a real gambling environment; however, this seems at odds with accepted demographics of pathological gamblers, in particular, that they are typically of a lower socioeconomic status (Welte, Barnes, Wieczorek, Tidwell & Parker, 2001). The disparity between the results of this research and gambling demographics could exist for several reasons. For example, those with a higher income may be better able to recover from gambling losses making it harder to detect them as potential pathological gamblers. Another explanation deals with the participants of this study; none of the participants were believed to be pathological gamblers as assessed by their score on the SOGS. It could be argued that the behaviors observed in this study and the behaviors of pathological gamblers are of two different populations.

The point above alludes to some of the limitations of this study. The many factors involved in gambling research are difficult to control and often vary between individual participants. Parke and Griffiths (2002) outlined some of these factors, one of which being observation of the participant. The participants in this study may have been influenced to gamble in ways they believed to be more socially appropriate due to the observation and recording of their behavior by the researcher. Other limitations related to the sample group include that participants consisted only of university students and pathological gamblers were not included, reducing the ability to generalize these

results. For instance, because a university sample was employed in the study, the typical annual self-reported income was relatively low. It is not yet known whether the present results would be replicated if a community-based sample was employed.

A potential procedural shortcoming also exists. The $5 staked to participants was not physically presented to them until the end of all gambling sessions and prior to dismissal; this may have decreased the salience (i.e. subjective value) of the money. Weatherly, McDougall, and Gillis (2006), for instance, showed that participants' gambling was decreased if they were shown or got to hold the actual money. Future research should present participants with staked money prior to gambling to see if a similar comparison to a gift card can still be made. Also, the present study was conducted only using video poker. It is unknown if these results would be replicated with other forms of gambling such as blackjack or slot machines.

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