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Mood and Audience Effects on Video Lottery Terminal Gambling

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Abstract Little is known about the situational factors associated with gambling behavior. We induced 180 male participants (mean age: 21.6) into a positive, negative, or neutral mood prior to gambling on a video lottery terminal (VLT). While gambling, participants were observed by either a male peer, female peer, or no one. Induced mood had no effect on gambling behavior. Participants induced into a negative mood prior to gambling, however, reported more positive moods after gambling, whereas those with positive and neutral moods reported more negative moods after gambling. Participants observed by either a male or female peer spent less time gambling on the VLT compared to those not observed. Participants observed by a female peer lost less money relative to the other observer conditions. Degree of problem gambling in the last year had little influence on these effects. Some practical implications of these findings are discussed.

Keywords Video lottery terminal · Mood · Audience effects · Peers · Situational factors

Introduction

Risky decision-making has been shown to be influenced by such situational factors as mood states and the presence of an audience. Previous studies have demonstrated that positive mood states generally tend to make people risk-averse (De Vries et al. 2008; Isen and Patrick 1983; but see Hills et al. 2002). Similarly, the presence of an audience also appears to play an important role in motivating risky behavior: Young males tend to take more risks in the company of their peers (reviewed in Daly and Wilson 2001), and some forms of risk-taking are attractive to members of the opposite sex (Farthing 2005; Wilke et al. 2006). Gambling is a form of risk-taking, and so may be similarly influenced by these situational factors.

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Mood and Gambling

Clinical depression is a well-established correlate of problem gambling (Kim et al. 2006; Petry et al. 2005). Mood disorders often predate the onset of problem gambling, and may play a causal role when gamblers seek relief from dysphoric moods (Blaszczynski 1992). Compared to non-problem gamblers, problem gamblers experience more depressive moods prior to gambling (Griffiths 1995), and some evidence suggests that depression is a reliable consequence of problem gambling (McCormick et al. 1984). Although these results suggest that depression and problem gambling are significantly associated, the relationship of non-disordered negative moods and gambling behavior is less clear.

Laboratory experiments in which participants were induced into positive or negative moods prior to engaging in gambling or risky decision-making tasks have produced ambiguous results. Negative mood inductions have been associated with both increased and decreased risk-acceptance in decision-making tasks (Leith and Baumeister 1996; Yuen and Lee 2003). Similar mixed results have been obtained for positive mood inductions, with positive mood having been associated with both increased risk-acceptance (Hills et al. 2002) and, more often, decreased risk-acceptance (De Vries et al. 2008; Isen and Patrick 1983; Isen and Geva 1987; Isen et al. 1988) in risky decision-making and gambling tasks.

Although the influence of prior mood states on gambling behavior is unclear, the effect of gambling behavior on mood changes in problem gamblers is less ambiguous. Problem gamblers report high levels of subjective anxiety, arousal, and excitement during gambling (Brown et al. 2004; Gee et al. 2005; Griffiths 1995). Following gambling, problem gamblers also report elevated positive mood if money was won (Griffiths 1995) and increased negative mood if money was lost (Brown et al. 2004; Hills et al. 2002). Non-problem gamblers experience less excitement during gambling (Griffiths 1995) and appear to show little mood change following gambling, regardless of whether they won or lost (Brown et al. 2004; Hills et al. 2002). Non-problem gamblers induced into a depressed mood prior to gambling, however, have been shown to be more likely to have their mood improved by video lottery terminal (VLT) gambling compared to people not gambling for money or people not gambling at all (Washburn et al. 2003).

Observer Effects and Gambling

In addition to mood, other situational factors such as peer influences, or observer effects, may play an important role in gambling behavior. Gamblers are frequently introduced to gambling by family members or peers (Gupta and Derevensky 1997; Hardoon and Derevensky 2001; Langhinrichsen-Rohling et al. 2004) but much less is known about the social influences that maintain gambling behavior. Amongst youth, being known as a gambler or risk-taker leads to social recognition and higher status among peers (Opie and Opie 1969; Smith and Abt 1984). Young male drivers also take more risks in the presence of peers compared to when they are driving alone (Chen et al. 2000). Risky behavior may also play some role in attracting members of the opposite sex. To both men and women, recreational and social risk-taking in the opposite sex is seen as attractive, but ethical, health, and gambling related risks are not (Wilke et al. 2006). Therefore, reduction of gambling behavior may be observed in the presence of an opposite-sex peer observer.

We are aware of only two laboratory investigations of peer observer effects on gambling behavior. Hardoon and Derevensky (2001) showed that the average gambling wager of girls in grades 4–6 was significantly increased in the presence of peers compared to gambling alone. This effect was not observed for boys. Noval and Mitchell (2003) found

that undergraduate students reliably exhibited more risk-taking behavior in a gambling task in the presence of friends than in the presence of strangers. They attributed this effect to friends providing a "secure base" for taking risks. These studies offer preliminary evidence that peer influence may play an important role in the modulation of gambling behavior, but further investigation is required.

In this experimental study, we sought to clarify previous findings by answering three questions: (1) does the inducement of positive or negative mood affect VLT gambling behavior, (2) does the presence of same-sex or opposite-sex peer observers affect VLT gambling behavior, and (3) are there changes in gamblers' moods stemming from VLT gambling?

Method

Participants

One hundred and eighty male volunteers (Age: $M = 21.6$, SD $= 4.4$; Education: $M = 2.3$ years in University, $SD = 1.1$) were recruited from psychology classes using advertisements for a study on gambling. Problem gamblers were not explicitly targeted, but it was expected that individuals would be recruited that exhibited a full range of gambling habits (from none to recreational to problematic).

Measures

The dependent measure was gambling behavior on a VLT machine (manufactured by WMS Gaming). VLT behavior was evaluated using four measures: amount of money won, length of play, total number of spins, and percentage of time where the minimum number of credits was wagered. Each participant was given $20 worth of credits, and was allowed to play for a maximum of 15 min. The last two measures could not be scored for the "no observer" condition because they required the presence of an observer to measure them. The payback rate on the VLT was 92%. Because the VLT has a negative expected value—more money wagered and longer time played are associated with higher loss of money, on average—"safer" play on the VLT was indicated by winning more money, playing for a shorter amount of time, engaging in a smaller number of spins, and wagering the minimum amount. The sequence of wins and losses during play was random. The minimum bet amount was 25 cents, and the maximum bet amount was $1. The maximum win amount was $1000.

Degree of problem gambling was assessed using the Problem Gambling Severity Index (PGSI; Ferris and Wynne 2001). The PGSI is a reliable and valid nine-item self-report measure of problem and pathological gambling behavior, based on behavior in the last 12 months (e.g., "Have you bet more than you could afford to lose?", 1 = never, 4 = almost always). It categorizes an individual's gambling tendencies into one of four types: non-problem gambling, low-risk gambling, problem gambling, and pathological gambling.

Procedure

Participants were run individually in a quiet room, where they listened to one of three mood-inducing instrumental songs for 5 min. While listening to the music, they were

instructed to think about something upsetting (negative mood), something happy (positive mood), or what they did yesterday (neutral mood). These instructions were concordant with the type of music played. After the song finished, participants wrote a brief paragraph about what they thought about during the music.

The music for the mood induction was selected from Mitchell et al. (1998). The positive mood induction was conducted with "Eine Kleine Nachtmusik" by Wolfgang Amadeus Mozart. The negative mood induction was conducted with "Adagio pour Cordes" by Samuel Barber. Both of these musical pieces have been used in other studies (e.g., Eich and Metcalfe 1989) and have been shown to reliably alter mood. The neutral mood induction was conducted with the sound of ocean waves. This recording was pre-tested, and was shown to elicit neither positive nor negative mood.

Twelve aspects of current mood state (anger, happiness, fear, sadness, arousal, enthusiasm, pessimism, energy, excitement, depression, hostility, and optimism) were assessed immediately after the mood manipulation and immediately after the gambling task using a self-report measure designed for this study. For example, the statement "Right now I feel anger" was rated by participants on a scale of one to seven (1 = not at all, and 7 = extremely).

Following mood induction and evaluation, participants were offered the opportunity to gamble on a VLT in a separate room. The VLT was the same as those found in various establishments in Alberta, Canada, and the laboratory was decorated to approximate an actual VLT location (i.e., alcohol posters, dim lighting). Participants were informed that they had $20 worth of credit to play with, and that they were allowed to cash out at any time. They were not informed of the length of the gambling session. Participants were also informed that the amount of credit they cash out would be given to them in cash, up to a maximum of $50. They were told that any dollar amount exceeding $50 would be converted one-to-one into raffle tickets for a $200 prize drawn at the end of the study. This gave an incentive to continue playing for those few participants who won a large amount of credits early. A $5 movie coupon was given to anyone who lost all of their credits, but participants were not made aware of this compensation at the beginning of the experiment.

Participants were observed by either a female or male peer (a student of similar age at the same university who was a research assistant), or by no one. The peer had a notepad and pencil and appeared to be making observations of the person's play. He/she did not speak or offer advice, except to answer any questions related to the procedure. The same male peer and the same female peer were used for all relevant trials. Participants were randomly assigned to mood induction condition (positive, negative, neutral) and observation condition (no observer, male peer, female peer).

Results

There were no missing values. PGSI scores and all four of the VLT measures were positively skewed. Logarithmic transformations corrected skewness for PGSI scores, amount of money won, length of play, and total number of spins. An inverse transformation was effective in correcting skewness for percentage of time where the minimum number of credits was wagered. All means reported are for non-transformed values, but all analyses were conducted with transformed values.

Participants comprised 63 non-problem gamblers (35.0%), 62 low-risk gamblers (34.4%), 39 problem gamblers (21.7%), and 12 pathological gamblers (6.7%), as assessed by the PGSI. Because of the small sample size of pathological gamblers, problem and

Table 1 Correlations between the four dependent measures obtained from the VLT

	Length of play	Total spins	% Minimum wagers
Money won	−0.203** (.01)	−0.329** (0.00)	0.023 (0.81)
Length of play		0.879** (0.00)	0.402** (0.00)
Total spins			0.341** (0.00)

Notes: The p value for each correlations is provided in parentheses (two-tailed)
** $p < 0.01$; * $p < 0.05$

pathological gamblers were combined for all analyses, resulting in three gambling groups: non-problem, low-risk, and problem gamblers. Non-problem gamblers engaged in gambling activities an average of approximately 4 times per month, low-risk gamblers an average of approximately 8 times per month, and problem gamblers an average of approximately 15 times per month. The four VLT variables were not significantly associated with PGSI scores (all rs < 0.11, all ps > 0.25).

The mean amount of money earned after VLT play was $17.64 (*SD*: $24.90), with a range from $0 to $130. Sixty-one participants (33.3%) lost all of the money they started with on the VLT, and 21 (11.5%) won over $50. Participants played for an average of 4.6 min; five participants (2.8%) played for the full 15 min, and only one participant (0.6%) did not play at all on the VLT. Correlations between the VLT dependent measures are shown in Table 1.

Mood Manipulation Check

One-way analyses of variance (ANOVA) were conducted on each of the 12 mood items to ascertain whether the mood manipulation worked successfully. When participants were exposed to the negative mood condition, they reported feeling significantly more sadness, anger, fear, pessimism, depression, and hostility relative to the neutral mood induction. In the positive mood condition, participants reported feeling significantly more happiness, arousal, enthusiasm, energy, and excitement relative to the neutral mood condition. All differences were statistically significant (all ps < 0.05).

Situational Effects on VLT Gambling Behavior

Mood (happy, sad, neutral) by observer (male, female, none) by gambling severity (non-problem, low-risk, problem) ANOVAs were conducted on three of the four VLT dependent variables (amount of money won, length of play, and percentage of time where the minimum number of credits was wagered). Number of spins was highly correlated with length of play ($r = 0.879$, $p < 0.001$). Furthermore, number of spins showed a very similar pattern of correlation with other VLT variables when compared to length of play. Therefore, we removed number of spins from all subsequent analyses.

Two results of note emerged. A significant main effect of observer on the total amount of money won was obtained, $F(2, 149) = 3.48$, $p = 0.03$, $\eta^2 = 0.045$, $M_{\text{female}} = \$20.33$, $M_{\text{male}} = \$16.74$, $M_{\text{none}} = \$15.86$ (Fig. 1a). Post-hoc Tukey tests indicated that participants earned significantly more money when observed by a female than when not observed at all, $p = 0.04$. No significant difference in earnings was observed between being observed by a female or a male, $p = 0.54$, or between a male and no observer, $p = 0.38$.

No effect of gambling severity or mood was observed on the amount of money won, and no interactions were significant.

A main effect of observer on length of play was also obtained, $F(2, 149) = 4.91$, $p = 0.009$, $\eta^2 = 0.062$, $M_{\text{female}} = 221$ s, $M_{\text{male}} = 270$ s, $M_{\text{none}} = 340$ s (Fig. 1b). Post-hoc Tukey tests indicated that participants spent a significantly shorter amount of time on the VLT when being observed by females compared to not being observed at all, $p = 0.004$. No differences between male observation and no observation, $p = 0.12$, or male observation and female observation, $p = 0.46$, were obtained. No effect of gambling severity or mood was observed on length of play, and no interactions were significant.

These two findings are consistent because, as mentioned before, earnings from the VLT were negatively correlated with time spent gambling.

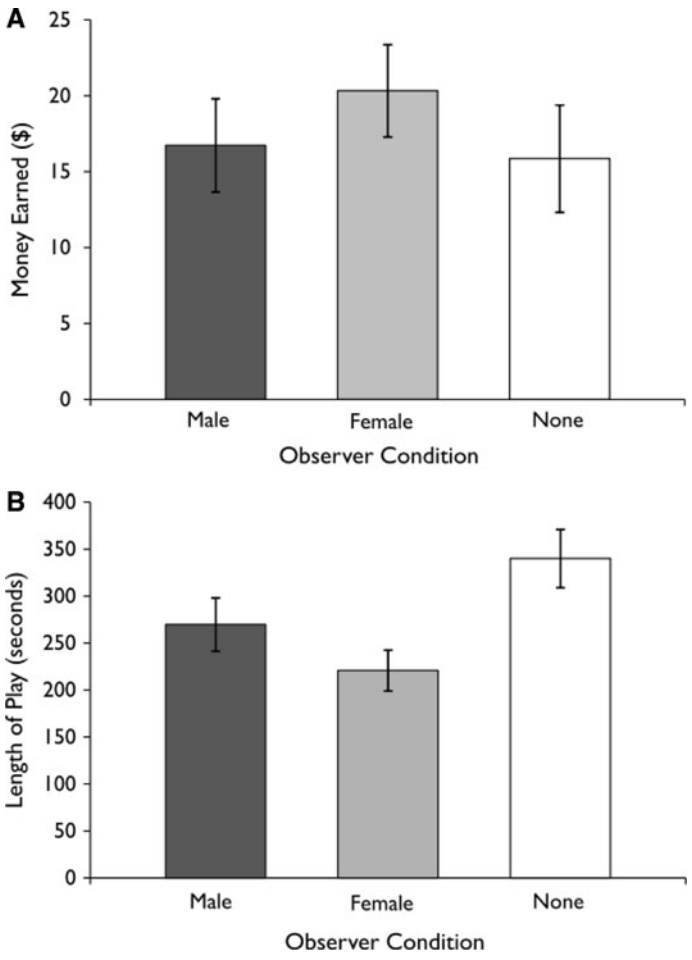

Fig. 1 Money earned ($) and length of play (seconds) on the VLT as a function of observer condition (*M, SE*)

Change in Mood Following VLT Gambling

An exploratory principal components analysis (PCA) with Varimax rotation was conducted on the twelve mood items collected before and after the VLT gambling task. For mood scores prior to the VLT gambling task, two principal components emerged, explaining 53 and 17% of the variance, respectively: positive-valence moods loaded positively on PCA1 (i.e., happiness, arousal, enthusiasm, energy, excitement, and optimism), and negative-valence moods loaded positively on PCA2 (anger, fear, sadness, pessimism, depression, hostility). Similarly, for mood scores collected following the VLT tasks, the same two factors describing positive-valence and negative-valence moods were obtained (explaining 44 and 18% of the variance in mood scores, respectively). Thus, to simplify subsequent analyses, we created two composite scores for mood—positive valence and negative valence—by averaging the mood scores for each category.

Overall, there was no difference in positive mood scores before and after VLT gambling, paired *t*-test, $t(118) = 0.59$, $p = 0.55$, $r = 0.05$. Negative mood scores, however, were significantly higher after VLT gambling, paired *t*-test, $t(118) = -2.28$, $p = 0.02$, $r = 0.21$.

Change in positive and negative mood scores were calculated using the formula, *mood score after VLT gambling minus mood score before VLT gambling*. The positive and negative mood change scores were used as the dependent variables. The amount of money won from gambling was significantly correlated with both negative mood change, $r = -0.246$, $p < 0.001$, and positive mood change, $r = 0.362$, $p < 0.001$.

A mood condition (happy, neutral, sad) by outcome (won money, $n = 40$, lost money, $n = 134$) by gambling severity (non-problem, low-risk, problem) ANOVA was conducted on the negative mood change score. Six participants did not win or lose money; because of this small sample size, we did not include these participants in this ANOVA.

A significant main effect for mood condition was observed on change in negative mood, $F(2, 152) = 12.66$, $p < 0.001$, $\eta^2 = 0.14$; $M_{\text{happy}} = 0.68$, $M_{\text{neutral}} = 0.49$, $M_{\text{sad}} = -0.48$ (Fig. 2a). Post-hoc Tukey tests indicated that compared to participants in the sad condition, participants in the happy and neutral conditions reported significantly increased negative moods following VLT gambling ($p < 0.001$ for both comparisons). No significant difference in negative mood score was observed between participants in the happy and neutral conditions, $p = 0.66$.

A main effect of win/loss outcome was also observed for change in negative mood score, indicating that participants that lost money reported significantly increased negative mood, $F(2, 152) = 18.61$, $p < 0.001$, $\eta^2 = 0.20$, $M_{\text{won}} = -0.53$, $M_{\text{lost}} = 0.48$ (Fig. 3a). No significant two or three-way interactions were observed. Problem gambling severity played no significant role.

We next conducted a mood condition (happy, neutral, sad) by outcome (won money, lost money) by gambling severity (non-problem, low-risk, problem) ANOVA on the positive mood change score. Main effects were once again obtained for both mood condition, $F(2, 152) = 16.87$, $p < 0.001$, $\eta^2 = 0.18$, $M_{\text{happy}} = -0.87$, $M_{\text{neutral}} = -0.20$, $M_{\text{sad}} = 0.84$ (Fig. 2b), and outcome, $F(1, 152) = 59.11$, $p < 0.001$, $\eta^2 = 0.35$, $M_{\text{won}} = 1.42$, $M_{\text{lost}} = -0.55$ (Fig. 3b). Post-hoc Tukey tests indicated that participants in the happy and neutral conditions reported significantly reduced positive moods following VLT gambling compared to participants in the sad condition ($p < 0.001$ for both comparisons). A significant difference was also observed for participants in the happy and neutral conditions: Participants in the happy condition reported larger reduction in positive moods than did participants in the neutral condition ($p = 0.01$). No significant two or

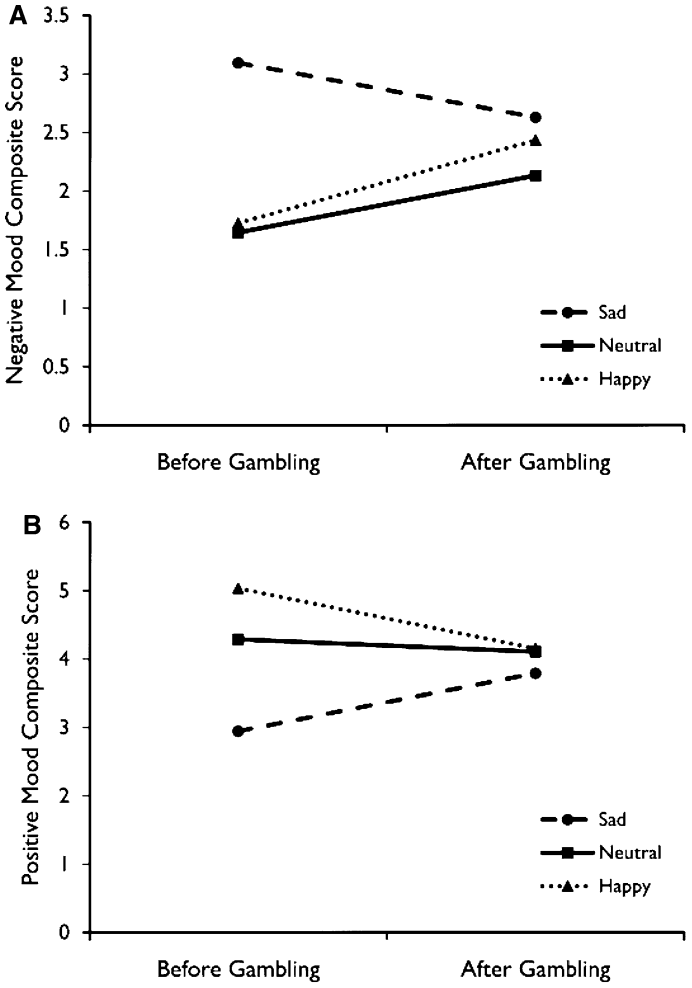

Fig. 2 Change in reported negative and positive moods following VLT play as a function of mood induction condition

three-way interactions were observed, and problem gambling severity again played no significant role.

Discussion

The results suggest that gambling behavior on an actual VLT machine is affected by peer observation but not mood states, and that gambling affects mood. Degree of severity of gambling problems played no role in affecting VLT gambling behavior, and did not interact with mood state or peer observation. Participants earned more money and spent less time playing on the VLT when observed by a female, compared to not being observed at all. Inducing participants into a happy or sad mood prior to playing on the VLT did not affect VLT behavior. Three significant changes in reported mood were observed following

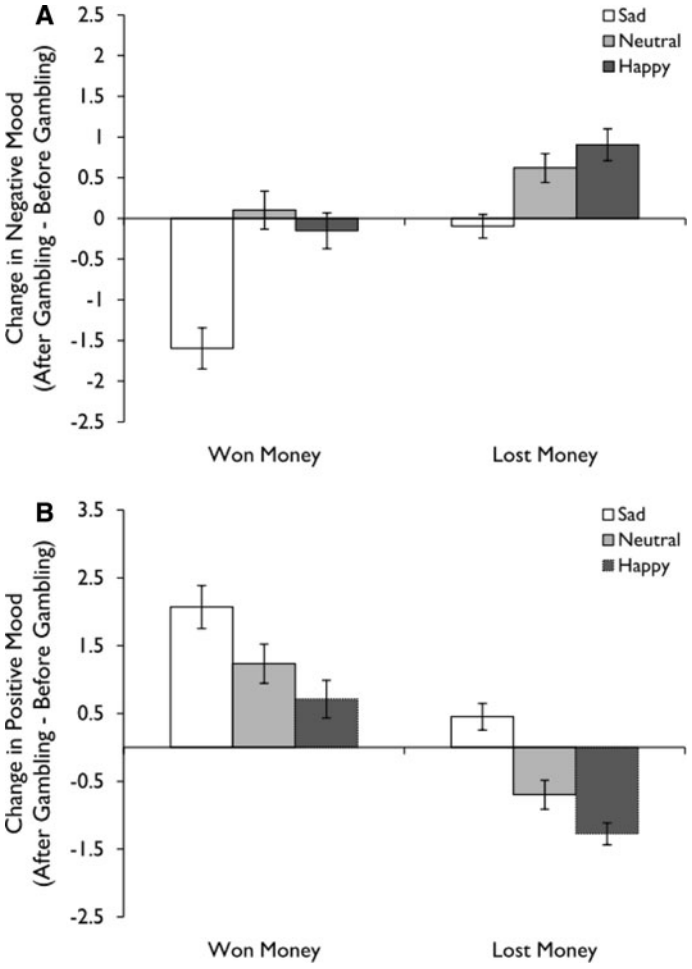

Fig. 3 Change in reported negative and positive moods following VLT play as a function of winning or losing

VLT play. First, participants induced into a sad mood prior to play reported significant reductions in negative mood and significant increases in positive mood following VLT play. Second, participants induced into a happy mood before play reported significant increases in negative moods and significant reductions in positive mood. Third, participants who won money from VLT play reported significantly higher positive moods and lower negative moods following play, and amount of money won was significantly associated with degree of mood change.

Peer Observation and Gambling

Previous research has demonstrated that, in some domains, males tend to take more risks in the presence of same-sex peers (Chen et al. 2000; Daly and Wilson 2001). Our results using a gambling task are not consistent with these findings. Male participants did not elevate gambling behavior in the presence of a male peer. When observed by female peers, males spent less time playing on the VLT. Participants may have intuitively known that

VLT gambling behavior is risky, and unlikely to lead to positive outcomes. Thus, participants may have sought to reduce exposure to the VLT in the presence of a female peer in order to avoid being perceived as recklessly engaging in self-defeating risky behavior.

Another possibility is that participants being observed quietly by a female peer holding a clipboard and taking notes may have construed such observation as negative (i.e., the peer was negatively judging or evaluating the gambler). An enthusiastic or supportive peer observer may have produced different results. Hardoon and Derevensky (2001) found that participants appeared to increase gambling wagers in order to impress peers, and that the recognition of being a "gambler" within a social group may confer social status. Noval and Mitchell (2003) demonstrated that participants engaged in significantly more gambling behavior in the presence of a friend compared to the presence of a stranger. The present study only investigated the effect of peer observation in a non-supportive context. Future research should investigate the nature of peer influences on gambling behavior in both supportive and non-supportive social contexts.

That participants earned more money in the presence of a female observer could be due to one of two possibilities. Participants in this condition may have won more money as a consequence of randomly determined returns from the VLT, or participants earned more as a consequence of engaging in different gambling behavior in the presence of a female peer. It may be more appropriate to characterize this finding by describing participants as having lost less as a consequence of being observed by a female peer, and thus lost more in non-female observer conditions. Participants observed by a female peer spent significantly less time engaging in gambling behavior on the VLT, suggesting the latter. Participants may have ceased play early after earning any profit so as to not incur the risk of losing additional money in the presence of a female.

Although certain types of male risk-taking are perceived to be attractive to females (e.g., recreational, social risk-taking), gambling related risks are not (Wilke et al. 2006). Participants spent the least amount of time gambling in front of a female observer, suggesting that they may have been attempting to reduce participation in a negatively perceived risky behavior. Reduced time gambling in front of a female observer also explains increased earnings in that condition. Earnings from VLT gambling were negatively correlated with time spent gambling in this study, mirroring real-life effects.

Mood and Gambling

Previous studies that have linked mood to gambling have mostly done so for clinical depression or mood disorders, suggesting that depression is both an antecedent and consequence of gambling behavior. Although studies utilizing mood inductions have been shown to affect risk-taking behavior, they have provided inconsistent results: Negative moods have been shown to both increase and decrease risky choices in experimental tasks. Mood inductions have also been shown to have little effect on gambling behavior. Positive and negative mood inductions had no effect on VLT gambling behavior in this study. This finding was not due to an inadequate mood manipulation, because participants reported significant mood changes in the expected direction following the mood induction. It is possible, however, that mood inductions simply do not last long, and thus may not affect gambling behavior. Previous studies have demonstrated little evidence of short-term mood changes affecting gambling behavior (e.g., Clark et al. 2001; Hills et al. 2002).

Although mood induction did not affect gambling behavior on the VLT, significant changes in mood following gambling were observed contingent on win/loss outcomes. Compared to losers, winners experienced significant reduction in negative moods and

significant increase in positive moods following gambling, independent of mood induction condition. This finding is congruent with previous research showing that gambling wins increase positive mood, physiological arousal, and feelings of excitement (e.g., Hills et al. 2002). Large, early wins have been cited as a potential cause of persistent problem gambling, and elevated positive mood may be a proximal mechanism through which this effect manifests (e.g., Custer 1982; Custer and Milt 1985).

Elevated mood as a consequence of gambling wins may play an important role in the maintenance of problem gambling. Mood disorders, including bipolar disorder, dysthymia, and major depression are highly comorbid with problem gambling behavior (reviewed in Petry and Weinstock 2007). Elevated mood resulting from gambling may provide relief from dysphoric moods and thus feed into a cycle of dependence on gambling to regulate mood. Dickerson et al. (1991) demonstrated that dysphoric mood prior to gambling was associated with increased chasing behavior, supporting this notion. Our results suggest that positive mood elevation as a consequence of gambling may be an important proximate mechanism that may serve to motivate future gambling behavior. We did not find, however, that inducing participants into a negative mood resulted in increased gambling behavior, even among problem gamblers. We note that caution in interpreting these results is necessary because of limited power. Future research should utilize a larger sample of problem gamblers to investigate the effect of experimentally-induced mood on facilitating gambling behavior and improving mood.

We also found that participants in the sad mood induction condition reported significantly increased positive moods and reduced negative moods following gambling behavior. Participants in the happy and neutral mood induction conditions reported the opposite. These results partially replicate some previous findings (e.g., Washburn et al. 2003), suggesting that in non-disordered populations, negative moods are elevated following gambling behavior, independent of winning or losing. Washburn et al., however, did not include a neutral mood condition. Figure 2 suggests that participants induced into happy and sad moods may have simply returned to a baseline, neutral mood state after gambling, indicating that gambling may largely eliminate any effect of non-neutral mood manipulations. Because we did not collect baseline measures of mood prior to induction, it is impossible to determine whether participants simply returned to a baseline level of mood following gambling, or exhibited significant increases or decreases in mood state relative to baseline.

Limitations

Several limitations were present in this study. Previous research has shown that young women increase gambling wagers in the presence of peers, compared to gambling alone; this effect was not observed for young men (Hardoon and Derevensky 2001). No other studies, to our knowledge, have investigated sex differences in gambling behavior in response to peer observation. The present study only utilized male participants, and therefore we were unable to evaluate any sex differences in behavior. Future research should investigate whether peer observation or mood induction differentially affects women's gambling behavior as compared to men. Also of concern in this study, the same man or woman was used as a peer observer in all trials. Some characteristic of these individuals may have systematically affected participants' gambling behavior. Future investigation should utilize several different peer observers.

Statistical power in the $3 \times 3 \times 3$ ANOVAs conducted were limited for interaction effects. Cell size for two-way interactions ranged from $N = 11$ to 48. Cell size for three-

way interactions ranged from $N = 2$ to 19. It is therefore possible that the lack of significance for two-way and three-way interactions may be due to limited power, and our results must thus be interpreted with some caution. Similarly, the observed lack of an interaction between win/loss outcome and mood induction condition may be due to a small sample size for participants who won money in each of the three mood conditions ($N_{total} = 40$: $N_{happy} = 11$, $N_{sad} = 14$, $N_{neutral} = 15$), and not necessarily due to a lack of a true effect. Future studies should utilize larger samples, and randomly assign participants to win or loss conditions to investigate any potential interaction between winning effects and induced mood prior to VLT gambling.

Unmeasured variables may play an important mediating role for the relationship between mood and gambling behavior. Cyders et al. (2007), for example, showed that a measure of positive urgency explained variance in positive mood-based risky behavior. Other individual differences more generally associated with risk-acceptance, such as impulsivity, sensation-seeking, or self-control may also play a moderating role in gambling behavior (reviewed in Toneatto and Nguyen 2007).

None of the VLT measures were significantly correlated with degree of problem gambling as measured by the PGSI. These results suggest that VLT gambling in a laboratory setting may not necessarily effectively mirror real-world VLT gambling behavior. The presence of a peer may have significantly changed people's gambling behavior, reducing any associations between the PGSI and VLT dependent measures. This notion is supported by the fact that among participants in the no observer condition, PGSI scores were marginally associated with earnings, $r = -0.238$, $p = 0.07$, indicating that participants that lost more money tended to have more problem gambling tendencies. These participants did not spend more time playing on the VLT, $r = 0.045$, $p = 0.74$, suggesting that people with more problem gambling tendencies may have placed larger bets on the VLT. Further research examining the validity of the VLT in laboratory settings is required.

Implications

Reduced time spent gambling when being observed by a peer compared to not being observed has some practical implications. VLT gambling behavior may be reduced if engaged in under the observation of (non-supportive) others. VLTs are often placed in non-exposed corners of bars and restaurants, fostering a sense of privacy. If VLTs were more openly available and in view of other patrons, people may gamble less or make less risky wagers. In a casino environment, repeated interruptions by staff, for example, demonstrating that patrons are being "watched" may be useful for reducing gambling behavior as well.

Elevated mood as a result of wins are also of practical importance, especially in concert with the observation that participants in happy and neutral moods were significantly more likely to report increased negative affect following gambling. If new gamblers were exposed to an early loss, they may be less likely to engage in VLT gambling behavior in the future. Given that early and large wins often appear to motivate further gambling behavior, guaranteeing an early loss for new participants may be a way to reduce gambling, and may play a useful role in early prevention programs in adolescents.

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