

JGI Scholar's Award, Category B

Influence of Social Interaction on Women College Students' Electronic Gambling Machine Behaviour

Rory A. Pfund,¹ Meredith K. Ginley,² James P. Whelan,¹ Samuel C. Peter,¹
Briana S. Wynn,¹ Matthew T. Suda,³ & Andrew W. Meyers¹

¹ Department of Psychology, University of Memphis, Memphis, TN, USA

² Calhoun Cardiology Center-Behavioral Health Division, University of Connecticut Medical School, Farmington, CT USA

³ Department of Preventive Medicine, University of Tennessee Health Science Center, Memphis, TN, USA

Abstract

Social influence affects college students' gambling behaviours. However, few studies have experimentally investigated the influence of social interaction on college students' gambling behaviour, and those studies that have yielded mixed findings. Women college students ($n = 109$) who endorsed recreational gambling behaviour were randomly assigned to gamble on electronic gambling machines (EGMs) in three conditions: warm social interaction from a confederate (i.e., initiating and maintaining conversation), cold social interaction from a confederate (i.e., refraining from initiating and maintaining conversation), or gambling alone. On average, participants in the warm social interaction condition placed significantly fewer spins and spent more time placing bets on the EGMs compared to the cold social interaction and no confederate conditions. When examining gambling behaviour over time, participants in the warm social interaction condition increased their bet size and the time between their bets over time compared to the cold interaction and no confederate conditions. These results suggest that interpersonal interactions significantly affect gambling behaviour. However, future research is needed to investigate these social processes in other forms of gambling and other gambling experiences.

Keywords: social interaction, women gamblers, college students, electronic gambling machines, EGMs

Résumé

L'influence sociale affecte les comportements de jeu des étudiants collégiaux et universitaires. Cependant, peu d'études ont analysé de manière expérimentale

l'influence de l'interaction sociale sur le comportement de jeu des étudiants, et les études ont donné des résultats mitigés. Les étudiantes ($n = 109$) qui ont adopté un comportement de jeu récréatif ont été affectées au hasard à des jeux électroniques en fonction d'une des trois conditions suivantes : avec interaction sociale amicale d'un camarade (c.-à-d., qui amorce et entretient la conversation), avec interaction sociale froide d'un camarade (qui s'abstient d'amorcer et d'entretenir la conversation) ou en solitaire. En moyenne, les participantes en condition d'interaction sociale amicale ont joué beaucoup moins de tours et ont consacré plus de temps à parier sur les appareils de jeu électroniques, comparées à ceux qui étaient en interaction sociale froide ou en solitaire. En examinant le comportement de jeu sur une période donnée, les participantes en condition d'interaction sociale amicale ont augmenté la taille des paris et la durée entre les paris par rapport à celles qui étaient dans une interaction sociale froide et en solitaire. Ces résultats font ressortir que les interactions interpersonnelles affectent de manière importante le comportement du jeu. Cependant, d'autres recherches doivent être effectuées pour analyser ces processus sociaux dans d'autres formes de jeux de hasard et d'autres expériences de jeu.

Introduction

Gambling is a popular recreational activity for college students in the United States (Barnes, Welte, Hoffman, & Tidwell, 2010). This specific population commonly identifies social opportunities as a primary motivator for their gambling (Neighbors, Lostutter, Cronce, & Larimer, 2002). Despite the documented importance of social motives for gambling initiation, few studies have investigated the influence of social interaction on gambling behaviour during a gambling episode. Authors of these experiments have hypothesized that the presence of another person while gambling will intensify gambling behaviour (McDougall, McDonald, & Weatherly, 2008; McDougall, Terrance, & Weatherly, 2011; Molde et al., 2017; Rockloff & Dyer 2007; Rockloff & Greer, 2011; Weatherly, Bushaw, & Meier, 2009). However, their results have been mixed and have not specifically focused on types of social interaction. Research on other addictive and risky health behaviours has more conclusively demonstrated that exposing individuals to various types of social interaction produces differential behavioural responses (e.g., Collins, Parks, & Marlatt, 1985; Harakeh, Engels, Van Baaren, & Scholte, 2007; Hermans, Engels, Larsen, & Herman, 2009). The purpose of the present study was to investigate the role of differential social interaction on specific aspects of gambling behaviour on electronic gambling machines (EGMs).

Gambling is a common activity for college students. In a large international review of adolescent and young adult gambling involvement, gambling prevalence rates were found to vary, but most studies found the majority of participants had gambled within the past year (Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010).

Similarly, for 75% of college students in the United States, gambling constitutes a recreational activity (Barnes et al., 2010). However, a recent meta-analysis found as many as 10% of students will experience adverse gambling-related consequences (Nowak & Aloe, 2014). High rates of involvement and adverse consequences make it critical to understand variables that might contribute to the development of risky gambling behaviour as well as normative/recreational engagement in gambling on students' part (e.g., Goudriaan, Slutske, Krull, & Sher, 2009; Neighbors et al., 2015). The majority of research investigating gambling behaviour has focused on the cognitive, neurobiological, and behavioural factors that correspond with gambling risk (e.g., May, Whelan, Meyers, & Steenbergh, 2005; Petry, 2005). The lack of focus on social factors is surprising given that they are frequently reported as a motivator for students' gambling (Neighbors et al., 2002). Additionally, students who believe their peers are gambling more frequently and spending more money on gambling are more likely to gamble frequently and with greater amounts of money, with women being more likely than men to perceive gambling as occurring more frequently (Larimer & Neighbors, 2003).

Engagement in gambling is often accompanied by social interactions, interactions which may in turn alter gambling behaviour (Bernhard, Dickens, & Shapiro, 2007). Indeed, social facilitation theory suggests that performance on a task such as EGM gambling differs when in the presence of other individuals (Rockloff & Dyer, 2007). One explanation for the differential performance is that individuals may become physiologically aroused, and this arousal will affect their subsequent behaviour (Zajonc, 1965). Several studies have now hypothesized that the physical presence of others may result in physiological arousal that increases bet speed and size, thereby contributing to greater losses (McDougall et al., 2008; McDougall et al., 2011; Molde et al., 2017; Rockloff & Dyer 2007; Rockloff & Greer, 2011; Weatherly et al., 2009). However, the few experimental studies investigating that hypothesis have yielded mixed findings.

An explanation for these mixed findings may be that these prior studies did not manipulate types of social interaction. Studies have demonstrated that variations in the type of social interaction will produce different behavioural responses in alcohol consumption, cigarette smoking, and eating behaviour. For example, participants exposed to a confederate who is displaying warm interactions (e.g., initiating and maintaining a conversation) smoked more cigarettes than those participants instead exposed to a confederate displaying cold interaction (Harakeh et al., 2007). Conversely, participants exposed to a confederate displaying cold interactions (e.g., refraining from initiating and maintaining a conversation) consumed more alcohol and ate more food than participants exposed to a confederate displaying warm interactions (Collins et al., 1985; Hermans et al., 2009).

The effects of exposing gamblers to warm social interaction, cold social interaction, or playing alone have not been experimentally investigated. The present study was designed to investigate the effects of types of social interaction on EGM gambling behaviour. We focused our study sample on only women because women gamblers

are potentially more likely than men to be influenced by social factors (Larimer & Neighbors, 2003), and women college students are more likely than men to gamble in socially safe places (Moore & Ohtsuka, 1997). Same gender confederates were employed since same and mixed sex dyads interact differently (Carli, 1989). EGMs were the focus of the present study since they are most frequently endorsed by women as their favourite form of gambling (Blanco, Hasin, Petry, Stinson, & Grant, 2006; Hing & Breen, 2001; Petry, 2003).

We hypothesized that the introduction of a confederate gambler would result in changes in gambling behaviour among women college students. Specifically, we hypothesized that the presence of a confederate would significantly impact the EGM gambling behaviour of women college students, reflected in differences in the number of spins, bet speed, and bet size, regardless of whether that confederate was displaying warm or cold social behaviours. Additionally, we hypothesized that these differences would occur across the duration of a gambling session, reflecting differing patterns of play rather than simple group mean differences. Given the mixed behavioural responses for alcohol consumption, cigarette smoking, and eating behaviour between warm and cold social interaction, we hypothesized that type of social interaction would differentially influence gambling behaviour but did not hypothesize a direction of difference.

Method

Participants

Participants were 109 undergraduate women recruited from a public university in the mid-South US. The mean age of the sample was 21.28 years ($SD = 5.20$) and ranged from 18 to 48. The sample was ethnically diverse with 53% participants identifying as African American, 37% Caucasian, 5% Hispanic American, 3% Asian American, and 4% indicated other/multiple races. Virtually all participants reported they were never married (92%), 5% were divorced/separated/widowed, and 3% were married. Thirty-five percent of participants had been in college for less than one year, 14% for one year, 24% for two years, 8% for three years, and 19% for four years or more. Demographic information for these participants is displayed in Table 1.

Materials

Demographics questionnaire. This questionnaire assessed participants' age, ethnicity, marital status, and years in college.

South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987). The SOGS was used as a measure of participants' gambling behaviour. Based on the DSM-III criteria for pathological gambling (American Psychiatric Association, 1980), the SOGS is a 20-item, self-report questionnaire for identifying probable pathological gambling. Scores on the SOGS range from 0 to 20, with a score of 1–4 indicating

Table 1.
Demographic Information among Three Social Interaction Groups of Women Recreational Gamblers (N = 109)

Sample characteristic	Social interaction group			Statistic (df)	<i>p</i> -value
	Warm	Cold	No confederate		
<i>n</i> (%)	33 (30)	39 (36)	37 (34)		
Age, <i>M</i> (<i>SD</i>)	21.36 (5.51)	20.13 (2.81)	22.41 (6.56)	$F(2, 106) = 1.86$.16
Ethnicity, <i>n</i> (%)				$\chi^2(8) = 11.79$.16
African American	14 (13)	24 (22)	20 (18)		
Caucasian	13 (12)	12 (11)	14 (13)		
Hispanic American	4 (3)	0	1 (1)		
Asian American	0	1 (1)	2 (2)		
Multiple races/Other	2 (2)	2 (2)	0		
Marital status, <i>n</i> (%)				$\chi^2(4) = 7.21$.12
Married	1 (1)	0	2 (2)		
Never married	29 (27)	39 (36)	32 (29)		
Divorced/separated/widowed	3 (3)	2 (2)	0		
Years in college, <i>n</i> (%)				$\chi^2(8) = 7.00$.54
Less than 1 year	14 (12.8)	15 (13.8)	9 (8.3)		
1 year	2 (1.8)	5 (4.6)	8 (7.3)		
2 years	9 (8.3)	8 (7.3)	9 (8.3)		
3 years	1 (0.9)	4 (3.7)	4 (3.7)		
4 years or more	7 (6.4)	7 (6.4)	7 (6.4)		

Note. Percentages are calculated with non-responders coded as missing.

some problems with gambling and a score of 5 or greater indicating probable pathological gambling.

Brief Assessment of Mood (BAM) (Dean, Whelan, & Meyers, 1990). The BAM is a 6-item questionnaire for assessing state-level mood status and six mood state factors—Anxiety, Depression, Confusion, Anger, Vigor, and Fatigue. The BAM was adapted from the Profile of Mood States (POMS) (McNair, Lorr, & Droppleman, 1971), a measure of psychological distress. Requiring fewer than 30 seconds to administer, the BAM is a means for rapidly assessing changes in mood status or emotional response. For each item, individuals report how they feel “right now” on 5-point Likert-type scales. The BAM total mood disturbance score (BTMD) is calculated by summing the six BAM items after inverting the vigor rating. BTMD scores range from 0 to 24, and greater scores indicate greater severity of psychological distress. The BTMD has high levels of internal consistency ($\alpha = .85$) and is highly correlated with the POMS Total Mood Disturbance Score ($r = .88$) (Dean et al., 1990).

EGM Experience Questionnaire. This questionnaire was comprised of four items designed as manipulation checks. Each participant was asked to indicate whether or not someone was in the room (i.e., the confederate) while they gambled (yes/no), to rate the friendliness of the person in the room, to rate the degree to which

they won or lost more often than the person in the room, and to rate their enjoyment of gambling with the person in the room. We used an 11-point Likert-type scale for the items on the friendliness of the confederate, the perceptions of winning and losing, and the enjoyment of gambling with the other person, with higher scores indicating more friendliness, perceptions of winning more often, and enjoyment.

Confederates. Nine undergraduate women served as confederates for two different types of social interaction. Each confederate was trained by participating in role plays directed by advanced doctoral students in clinical psychology. In the warm social interaction condition, confederates actively engaged participants in friendly conversation about neutral topics (e.g., college life) by asking questions, showing interest, making eye contact, and angling their body towards the participant. In the cold social interaction condition, confederates avoided social interaction by refraining from initiating conversation, providing minimal responses to questions, avoiding eye contact, and angling their body away from the participant. To exert greater experimental control, we limited participant and confederate dyads to women pairings only. Same and mixed sex dyads have been shown to interact differently (Carli, 1989).

All confederates played warm and cold social interaction roles. The number of warm and cold social interaction roles was performed equally by all confederates ($p > .05$). Each confederate interacted with an average of 7.67 participants ($Mdn = 5$), ranging from 2 to 20.

EGM Play. A customized game simulating a traditional slot machine was run on modified commercial EGMs. The win/loss pattern of the game was programmed with a constrained payout that returned 100% of participants' starting credit amount. The program was set prior to the session and generated patterns of wins and losses at the same rate and timing for all participants and confederates. The machine displayed the current dollar credit amount available, the amount of any pending bets, and possible payouts for reel combinations. These machines looked and played identically to an EGM found in a commercial gaming setting, with the exception of not requiring legal currency. The EGM recorded the total number of spins, speed of betting, and the amount of money wagered over the course of play. Speed of betting was measured in milliseconds.

Procedure

This study was approved by and conducted in compliance with the University's Institutional Review Board. Participants were randomly assigned to gamble with a confederate displaying warm social interaction, a confederate displaying cold social interaction, or alone.

Pre-gambling phase. Participants and confederates met jointly with the experimenter upon arrival to the laboratory. To mask the identity of the confederate, the experimenter interacted similarly with both participants and confederates

throughout the experiment. The experimenter escorted participants and confederates into a conference room and seated them at opposite ends of a table to ensure that they were unable to interact. Participants and confederates were then instructed to complete the SOGS, BAM, and demographics questionnaire.

Gambling phase. Upon completion of the questionnaires, each participant and confederate moved into a simulated casino setting with three adjacent EGMs along one wall. Participants were seated at the right hand machine and confederates were seated at the left hand machine, with one EGM separating them from each other. Once seated, the experimenter explained that the participants would be entered into a raffle with the number of raffle entries dependent on the number of credits earned during EGM play. The greater the number of credits, the greater the chance each participant would have to win a prize, which was a \$25 gift card to a local movie theatre. This raffle was modeled from other studies as a way to simulate more realistic gambling (e.g., Floyd, Whelan, & Meyers, 2006; Ginley, Whelan, Keating, & Meyers, 2016). Previous research has demonstrated that hypothetical rewards are discounted at similar rates to real rewards (Madden, Begotka, Raiff, & Kastern, 2003).

Participants and confederates were instructed to gamble for as long as they would like, but that they must each gamble for at least 15 minutes. At this time, confederates began interacting with participants in their warm or cold role. Consistent with real casino conditions, the casino space did not have a clock. The confederates were instructed to continue playing at least until the participant decided to stop. If participants and confederates were still gambling after 45 minutes, the experimenter entered the casino to instruct them to cease playing. No participants attempted to stop gambling prior to the 15-minute mark.

Post-gambling phase. Upon conclusion of the gambling phase, participants and confederates were escorted back into the conference room. They were all instructed to sit at opposite ends of a table to ensure that they each were unable to interact with any others. Participants and confederates then completed the EGM Experience Questionnaire. Following the completion of this questionnaire, participants were debriefed and the identity of the confederates was revealed.

Analytic Plan

Descriptive statistics on the demographic variables and gambling behaviour for the sample as a whole were examined. Next, manipulation checks were conducted to ensure the validity of the warm and cold interaction conditions by performing descriptive statistics and independent samples *t*-tests. We then performed a one-way multivariate analysis of variance (MANOVA) on participants' number of spins on an EGM, time spent making bets, and bet sizes among the three social interaction conditions. This analysis was followed by a repeated measures generalized linear model to assess the effects of condition on bet speed and bet size over the course of play. When a significant result was found, effect sizes were reported and interpreted.

Results

Preliminary analyses of participants' gambling behaviour and psychological distress were completed. Fifty-eight percent ($n = 63$) of participants reported that they had gambled during the past 12 months, which was higher than the 42% of college students who had gambled, according to a previous study (LaBrie, Shaffer, LaPlante, & Wechsler, 2003). Most participants (83%) were recreational gamblers as indicated by a score of zero on the SOGS. The remaining 17% had a SOGS score between 1 and 4 evidencing some sub-clinical level of gambling problems. The average BTMD score on the BAM was 4.03 ($SD = 2.20$), indicating a low level of psychological distress. Scores on the SOGS and BAM were unrelated ($r = .04$, $p = n.s.$). We found no differences in SOGS scores or BAM scores across the three social interaction groups (all $ps = n.s.$). There were also no differences in the number of spins ($p = .34$), time to bet ($p = .92$), or credits wagered ($p = .45$) between participants who did or did not report having gambled during the past 12 months.

Manipulation Checks

Participants in the warm, cold, and no confederate conditions were asked whether or not another person was in the room. Those participants in the warm and cold conditions were also asked to rate the friendliness of the confederate, the perceptions of their winning and losing, and the enjoyment of gambling with the other person. All participants assigned to either the warm or cold condition indicated that someone was in the room with them while gambling. Conversely, all participants in the no confederate condition indicated that they gambled alone.

Participants in the warm condition ($M = 9.42$; $SD = 1.20$) rated the confederate as significantly more friendly than participants in the cold condition ($M = 2.71$; $SD = 2.40$), $t(69) = 14.54$, $p < .001$, $d = .82$. As expected since both the confederate and the participant were playing the same neutral gambling scenario, we found no differences in whether participants perceived themselves as winning or losing more often than than the confederate between the warm ($M = 4.64$; $SD = 2.25$) and cold ($M = 4.11$; $SD = 2.98$), $t(69) = .84$, $p = .41$. Participants in the warm condition ($M = 9.06$; $SD = 1.60$) found gambling with the other person significantly more enjoyable than the cold condition ($M = 4.08$; $SD = 2.55$), $t(69) = 9.68$, $p < .001$, $d = .55$. The differences in friendliness and enjoyment between the warm and cold social interactions constituted medium to large effects, which confirmed participants experienced a meaningful difference in interaction with the confederate based on the condition.

Changes in Gambling Behaviour across Social Interaction Conditions

To test our hypotheses, we performed a one-way MANOVA on participants' number of spins, time to bet, and credits wagered among the three social interaction conditions. We found a significant multivariate main effect, Wilks' Lambda = .02, $F(3, 6) = 1375.47$, $p < .001$. There were two univariate significant main effects: the number of

participants' spins ($F(2, 106) = 3.91, p = .02, \text{partial } \eta^2 = .07$) and speed of betting ($F(2, 106) = 15.66, p < .001, \text{partial } \eta^2 = .23$). The effect size for number of spins was small and the effect size for speed of betting was medium.

Post-hoc tests revealed that participants in the warm social interaction condition made significantly fewer spins on the EGM ($M = 219.36, SD = 14.16$) compared to the cold social interaction ($M = 266.51, SD = 13.03$) and no confederate conditions ($M = 267.14, SD = 13.38$). Participants in the warm condition also spent a significantly longer time placing bets ($M = 4003.53, SD = 336.95$) compared to the cold ($M = 1585.196, SD = 309.50$) and no confederate conditions ($M = 1969.09, SD = 318.22$) ($ps < .001$).

When time to bet was modeled as a repeated measure variable, there was a significant overall effect of bet speed over the course of EGM play (Wald $\chi^2 = 226.15, p < .001$). Specifically, there was a significant linear decrease in the bet speed for participants in the warm social interaction condition compared to the no confederate condition (Wald $\chi^2 = 195.83, p < .001, \beta = -1816.04$) and cold social interaction condition (Wald $\chi^2 = 118.97, p < .001, \beta = -1439.85$). Additionally, there was a significant linear increase in the bet speed for participants in the cold social interaction condition compared to the no confederate condition (Wald $\chi^2 = 56.47, p < .001, \beta = -376.19$). For each spin on the EGM, participants in the warm social interaction condition decreased their betting speed by approximately 1,800 milliseconds (or 1.8 seconds) compared to the no confederate condition and approximately 1,400 milliseconds (1.4 seconds) compared to the cold social interaction condition.

There was no significant difference in the mean overall size of bet, but there was a significant overall linear effect of size of bet over time by condition (Wald $\chi^2 = 131.59, p < .001$). Participants in the warm social interaction (Wald $\chi^2 = 91.22, p < .001, \beta = .13$) and no confederate (Wald $\chi^2 = 101.98, p < .001, \beta = .13$) conditions increased their bet size over time compared to the cold social interaction condition. Participants in the warm social interaction and no confederate conditions increased their bet size by .13 credits for each spin on the EGM compared to the cold social condition. This increase equates to spending approximately \$1 extra every 8 spins than those in the cold social condition.

Discussion

This study examined whether the physical presence of a woman confederate gambler influenced women college student participants' gambling behaviour and whether the type of social interaction differentially influenced EGM play. In line with our hypothesis, participants gambled significantly differently when exposed to a confederate gambler displaying warm versus cold social interaction. Specifically, participants exposed to a confederate displaying warm social interaction placed larger bets over the course of the gambling session and decreased the speed of their betting as the EGM gambling session progressed. Conversely, participants increased the speed of their bets when exposed to a confederate displaying cold social interaction.

These findings were partially consistent with the literature on other health-risk behaviours where different aspects of risk behaviour increased based on warmth or coldness of the confederate's social interaction. For example, warm social interactions have been shown to increase alcohol use and eating behaviour (Collins et al., 1985; Hermans et al., 2009). Cold social interactions have been shown to increase the number of cigarettes smoked (Harakeh et al., 2007).

Our findings were partially consistent with social facilitation theory and other experimental studies manipulating the physical presence of others during gambling. Similar to the present findings, other studies have found that the physical presence of another person intensified EGM gambling by increasing the frequency and size of bets (McDougall et al., 2011; Rockloff & Dyer, 2007; Weatherly et al., 2009). However, our results indicated that gambling would intensify in different ways depending upon the type of social interaction. Warm social interactions appeared to result in increases in bet size and decreases in bet speed whereas cold social interactions appeared to result in increases in bet speed. These seemingly contradictory results may be because of the division of attention between the friendly confederate and participants.

Our study raised important questions about the specific context of social interactions during a gambling session. In our study, experimenters gave confederates explicit instructions to not discuss gambling throughout the EGM gambling experience. However, we suspect that these results would have differed if confederates explicitly discussed the gambling experience with participants. Early studies demonstrated social interactions while gambling with friends involved commentary on winning/losing experiences, encouragement, and coaching (Henslin, 1967). Studies of other health-risk behaviours have incorporated modelling or imitation behaviour (Bandura, 1977) in which confederates played a participant who appears to encourage or discourage health risk behaviour. For future gambling studies, it may be important for confederates to initiate gambling and encourage or discourage participants to gamble. Such encouragement may produce different results.

A potential implication of these results may be that the presence of another person is a risk factor for excessive gambling. Individuals who gamble while engaging in a warm social interaction may place riskier bets. By contrast, individuals who gamble while engaging in a cold social interaction may speed up the rate of their gambling. These two scenarios emphasize the need for contextually-sensitive responsible gambling interventions. For those persons engaged in a warm social interaction (e.g., gamblers who have gone to the casino to play with friends), limits on the respective sizes of bets might be important for reducing harm. For those engaged in a cold social interaction (e.g., gamblers who have gone to the casino alone and are sitting close to other players they do not know personally), it may call for breaks in play that are accompanied by a warning or personal appraisal messages (Błaszczynski, Cowley, Anthony, & Hinsley, 2016).

The methods presented in the current study allowed for a richer account of social interaction and its effects on gambling. We examined multiple dimensions of social

interaction by manipulating whether a confederate exhibited warm or cold social interaction. Similar studies with recreational gamblers have not mentioned types of social interaction or lacked detail in their description of social interactions between participants and others. The description in Weatherly and colleagues (2009) appeared to most closely resemble our cold social interaction condition because confederates were instructed “not to initiate conversation” (p. 39). In that study, participants exposed to a confederate also intensified gambling behaviour, a finding which was consistent with our own results.

Several methodological limitations should be considered when interpreting these findings. Although the specific sample of young, non-problematic women gamblers used in this study may minimize generalizability, EGMs are a preferred form of gambling for females (Blanco et al., 2006; Hing & Breen, 2001; Petry, 2003). This study was also limited in that the standardized winning/losing condition, while fairly representative of the typical experience of a slot-machine gambler, fails to inform researchers as to which in-game factors might moderate the influence of friendly or unfriendly social interaction on game-play.

Despite these limitations, the present study employed multiple methodological enhancements to previous studies investigating the influence of social interaction on gambling behaviour. These improvements demonstrated that investigating gambling within the social context is worthy of future study. Future research should investigate the effects of social interaction among different samples and under different gambling conditions. While the present study used a sample of young, non-problematic gambling women, future research should investigate the effect of social interaction on mixed-gender dyads and problematic gamblers. Different conditions might include different settings (i.e., outside the laboratory), different forms of gambling (e.g., card games), or different in-session experiences (e.g., winning versus losing patterns, consuming alcohol or not consuming alcohol). Card games appear inherently more social than EGM gambling in that, with card games, individual players are forced to interact with a dealer and other players; and studies suggest that winning and losing each produces different respective experiences for an individual gambler (e.g., Ginley et al., 2016; Sharpe, 2004). Another future direction might be examining perceptions of and interests in other individuals who are present in the gambling context. In sum, an account of gambling behaviour without consideration of the social context in which it occurs would accordingly be incomplete. This study takes an important early step towards a model which incorporates these understudied social components in such behaviour.

References

- American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: American Psychiatric Association.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

Barnes, G. M., Welte, J. W., Hoffman, J. A., Tidwell, M. O. (2010). Comparisons of gambling and alcohol use among college students and noncollege young people in the United States. *Journal of American College Health, 58*, 443–452. doi:10.1080/07448480903540499

Bernhard, B. J., Dickens, D. R., & Shapiro, P. D. (2007). Gambling alone? A study of solitary and social gambling in America. *UNLV Gaming Research & Review Journal, 11*, 1–14. Retrieved from: <https://pdfs.semanticscholar.org/d000/26410235cd37b68079c7ce6da4932a7b4d37.pdf>

Blanco, C., Hasin, D., Petry, N., Stinson, F., & Grant, B. (2006). Sex differences in subclinical and DSM-IV pathological gambling: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine, 36*, 943–953. doi:10.1017/S0033291706007410

Blaszczynski, A., Cowley, E., Anthony, C., & Hinsley, K. (2016). Breaks in play: Do they achieve intended aims? *Journal of Gambling Studies, 32*, 789–800. doi:10.1007/s10899-015-9565-7

Carli, L. L. (1989). Gender differences in interaction style and influence. *Journal of Personality and Social Psychology, 56*, 565–576. doi:10.1037/0022-3514.56.4.565. Retrieved from: http://www.communicationcache.com/uploads/1/0/8/8/10887248/gender_differences_in_interaction_style_and_influence.pdf

Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology, 53*, 189–200. doi:10.1037/0022-006X.53.2.189

Dean, J. E., Whelan, J. P., & Meyers, A. W. (1990, October). *An incredibly quick way to assess mood states: The incredibly short POMS*. Paper presented at the meeting of the Association for the Advancement of Applied Sport Psychology, San Antonio, TX.

Floyd, K., Whelan, J. P., & Meyers, A. W. (2006). Use of warning messages to modify gambling beliefs and behavior in a laboratory investigation. *Psychology of Addictive Behaviors, 20*, 69–74. doi:10.1037/0893-164X.20.1.69

Ginley, M. K., Whelan, J. P., Keating, H. A., & Meyers, A. W. (2016). Gambling warning messages: The impact of winning and losing on message reception across a gambling session. *Psychology of Addictive Behaviors, 30*, 931–938. doi:10.1037/adb0000212

Goudriaan, A. E., Slutske, W. S., Krull, J. L., & Sher, K. J. (2009). Longitudinal patterns of gambling activities and associated risk factors in college students. *Addiction, 104*, 1219–1232. doi:10.1111/j.1360-0443.2009.02573.x

- Harakeh, Z., Engels, R. C. M. E., Van Baaren, R. B., & Scholte, R. H. J. (2007). Imitation of cigarette smoking: An experimental study on smoking in a naturalistic setting. *Drug and Alcohol Dependence*, *86*, 199–206. doi:10.1016/j.drugalcdep.2006.06.006
- Henslin, J. M. (1967). Craps and magic. *American Journal of Sociology*, *73*, 316–330.
- Hermans, R. C. J., Engels, R. C. M. E., Larsen, J. K., & Herman, C. P. (2009). Modeling of palatable food intake: The influence of quality of social interaction. *Appetite*, *52*, 801–804. doi:10.1016/j.appet.2009.03.008
- Hing, N. & Breen, H. (2001). Profiling lady luck: An empirical study of gambling and problem gambling amongst female club members. *Journal of Gambling Studies*, *17*, 47–69. doi:10.1023/A:1016640332005. Retrieved from: <https://pdfs.semanticscholar.org/1a6d/d03a0cdeecb9a1445e80814417d1c5aaa273.pdf>
- LaBrie, R. A., Shaffer, H. J., LaPlante, D. A., & Wechsler, H. (2003). Correlates of college student gambling in the United States. *Journal of American College Health*, *52*, 53–62. doi:10.1080/07448480309595725
- Larimer, M. E., & Neighbors, C. (2003). Normative misperception and the impact of descriptive and injunctive norms on college student gambling. *Psychology of Addictive Behaviors*, *17*, 235–243. doi:10.1037/0893-164X.17.3.235
- 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. doi:10.1176/ajp.144.9.1184. Retrieved from: <http://www.walker.d.people.cofc.edu/360/AcademicArticles/LesieurBlume1987.pdf>
- Madden, G. J., Begotka, A. M., Raiff, B. R., & Kastern, L. L. (2003). Delay discounting of real and hypothetical rewards. *Experimental and Clinical Psychopharmacology*, *11*, 139–145. doi:10.1037/1064-1297.11.2.139
- May, R. K., Whelan, J. P., Meyers, A. W., & Steenbergh, T. (2005). Gambling-related irrational beliefs in the maintenance and modification of gambling behavior. *International Gambling Studies*, *5*, 155–167. doi:10.1080/14459790500303147
- McDougall, C. L., McDonald, J. D., & Weatherly, J. N. (2008). The gambling behavior of American Indian and non-Indian participants: Effects of the actions and ethnicity of a confederate. *American Indian and Alaska Native Mental Health Research*, *14*, 59–74. doi:10.5820/aian.1403.2007.59
- McDougall, C. L., Terrance, C., & Weatherly, J. N. (2011). The effect of male confederate presence, betting, and accuracy of play on males' gambling on blackjack. *The Psychological Record*, *61*, 411–424. doi:10.1007/BF03395769

McNair, D. M., Lorr, M., & Droppleman, L. F. (1971). *Manual for the profile of mood states*. San Diego, CA: Educational and Industrial Testing Service.

Molde, H., Mentzoni, R., Hanss, D., Sagoe, D., Andersen, S. L., & Palleen, S. (2017). People around you—do they matter? An experimental gambling study. *International Gambling Studies*, *17*, 349–365. <https://doi.org/10.1080/14459795.2017.1333130>

Moore, S. M., & Ohtsuka, K. (1997). Gambling activities of young Australians: Developing a model of behaviour. *Journal of Gambling Studies*, *13*, 207–236. doi:10.1023/A:1024979232287

Neighbors, C., Lostutter, T. W., Cronce, J. M., & Larimer, M. E. (2002). Exploring college student gambling motivation. *Journal of Gambling Studies*, *18*, 361–370. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.511.5144&rep=rep1&type=pdf>

Neighbors, C., Rodriguez, L. M., Rinker, D. V., Gonzales, R. G., Agana, M., Tackett, J. L., & Foster, D. W. (2015). Efficacy of personalized normative feedback as a brief intervention for college student gambling: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *83*, 500–511. doi:10.1037/a0039125

Nowak, D. E., & Aloe, A. M. (2014). The prevalence of pathological gambling among college students: A meta-analytic synthesis, 2005–2013. *Journal of Gambling Studies*, *30*, 819–843. doi:10.1007/s10899-013-9399-0

Petry, N. M. (2003). A comparison of treatment-seeking pathological gamblers based on preferred gambling activity. *Addiction*, *98*, 645–655. doi:10.1046/j.1360-0443.2003.00336.x

Petry, N. M. (2005). *Pathological gambling: Etiology, comorbidity, and treatment*. Washington, DC: American Psychological Association.

Rockloff, M. J., & Dyer, V. (2007). An experiment on the social facilitation of gambling behavior. *Journal of Gambling Studies*, *23*, 1–12. doi:10.1007/s10899-006-9042-4

Rockloff, M. J., & Greer, N. (2011). Audience influence on EGM gambling: The protective effects of having others watch you play. *Journal of Gambling Studies*, *27*, 443–451. doi:10.1007/s10899-010-9213-1

Sharpe, L. (2004). Patterns of autonomic arousal in imaginal situations of winning and losing in problem gambling. *Journal of Gambling Studies*, *20*, 95–104. doi:10.1023/B:JOGS.0000016706.96540.43

Volberg, R. A., Gupta, R., Griffiths, M. D., Ólason, D. T., & Delfabbro, P. (2010). An international perspective on youth gambling prevalence studies. *International Journal of Adolescent Medicine and Health*, 22, 3–38. doi:10.1515/IJAMH.2010.22.1.3. Retrieved from: <https://pdfs.semanticscholar.org/f39d/938f1af59aaaf3c8a642e6963444ddec527e.pdf>

Weatherly, J. N., Bushaw, B., & Meier, E. (2009). Social influence when males gamble: Perceptions and behavior. *Analysis of Gambling Behavior*, 3, 36–47.

Zajonc, R. B. (1965). Social facilitation. *Science*, 149, 269–274. doi: 10.1126/science.149.3681.269. Retrieved from: <http://www2.psych.ubc.ca/~schaller/Psyc591Readings/Zajonc1965.pdf>

Submitted May 18, 2017; accepted September 5, 2017. This article was peer reviewed. All URLs were available at the time of submission.

For correspondence: Rory A. Pfund, M.S., University of Memphis, Department of Psychology, 202 Psychology Building, Memphis, TN 38152-3230.
E-mail: rorypfund@gmail.com

Competing interests: None declared (all authors).

Ethics approval: The University of Memphis Institutional Review Board approved this study on January 16, 2015 (IRB #3565).

Acknowledgements: We would like to thank all the undergraduate research assistants who served as confederates for this study.