

editorial/éditorial

Editorial: Announcing the Winner of the Inaugural JGI Scholar's Award for Research Excellence (Category A: Clinical, Social, and/or Policy Research)

In 2015, the *Journal of Gambling Issues* (JGI) Editorial Board announced our plans to institute an annual Scholar's Award. The goal of this new award was to support outstanding scholars in the problem gambling research area. We hoped to increase submissions to the journal from up-and-coming gambling researchers and to profile their work each year in a special issue. Graduate scholars and postdoctoral fellows conducting research in problem gambling were invited to submit their best work for consideration for the award and for publication in the journal. We invited submissions in two streams: Category A – Clinical, Social, and/or Policy Research; and Category B – Cognitive, Developmental, Biobehavioral, and/or Neuroimaging Research. We received more submissions than we had anticipated: a total of 13, six for Category A and seven for Category B. Submitted articles underwent the normal double-blind peer-review process that we use at the *JGI* for regular research manuscripts. All manuscripts that passed the peer-review process were then sent to one of two sets of judges (one set for each stream) comprising members of the *JGI* Editorial Board. The judges for a given stream represented expertise across the research domains within the stream (e.g., Category A had clinical, social, and policy expertise represented across the judges). Judges conducted independent, blind evaluations of the manuscripts in their stream on five dimensions: (1) innovation of design and concept, (2) theoretical contribution, (3) coverage of the relevant literature, (4) scientific rigor, and (5) quality of the analysis and discussion. Each judge assigned ratings on a scale of 1–10 to each paper in each of these five dimensions. A total score on a scale of 5–50 was calculated for each paper for each judge and the three judges' scores were totalled for each paper. The highest total score across judges determined the winning paper. The judges' contributions in reviewing and rating the papers submitted for the Scholar's Award are very much appreciated.

Given the relatively large number of submissions and the high rate of success of the submissions in the peer-review process, we have decided to publish the two streams of papers in two separate special sections of the *Journal*. In this issue, we announce the winner of the Inaugural Scholar's Award for Category A: Clinical, Social, and/or Policy Research. We also devote a section of this issue to the publication of the six Category A submissions, including the winning Category A paper. The announcement of the Category B winner and a second special section devoted to publication of the accepted Category B papers will appear in the next issue of the *JGI*.

All six submissions in Category A passed the peer-review process. The Category A judges had a hard task in front of them in selecting a winner. Judges reported being impressed with the quality of the submissions. They reported that the papers are all well written and that each makes a contribution to the exploration of the particular dimension of problem gambling that is their focus. In spite of the difficult job they were tasked with, the judges produced ratings that were quite consistent and a clear winner emerged.

It gives me great pleasure to announce the winner of the *JGI* Scholar's Award for Category A. Our inaugural winner is Stergios Xouridas, a PhD candidate at the Gambling Research Center at the University of Hohenheim in Stuttgart, Baden-Württemberg, Germany. His current research interests include the statistical epidemiology of gambling and the spatial distribution of electronic gambling machines. He will be awarded a prize of \$1,000 Canadian in recognition of his fine work. Xouridas is conducting his doctoral research under the supervision of Professor Tilman Becker. His winning paper is entitled "An Ecological Approach to Electronic Gambling Machines and Socioeconomic Deprivation in Germany." Given the substantial evidence internationally of a positive association between the density of electronic gambling machines (EGMs) and greater participation in and expenditure on gambling (see review by Vasiliadis, Jackson, Christensen, & Francis, 2013), as well as the observed associations between socio-economic variables (e.g., unemployment and immigrant status) and problem gambling (Lesieur & Blume, 1987), Xouridas et al. examined whether there was a statistical association between EGM density and indices of socio-economic deprivation across 244 communities within Baden-Württemberg state in Germany. Xouridas and colleagues' careful analysis found significant associations between the EGM density in a community and three socio-economic indices: unemployment rates, migrant status, and high school education levels within the community. The strongest association was the positive correlation between EGM density and rates of unemployment. Their results have important implications that argue for an area-based harm minimization policy. Specifically, Xouridas and colleagues suggest that EGM densities should be decreased specifically in communities with high levels of unemployment in order to protect a segment of the population who are most vulnerable to accessible gambling activities. Xouridas et al. recognize that they are suggesting policy implications from data that are not conclusive regarding causality (i.e., correlational data). Nonetheless, they cite the "principle of precaution" from international law (Andorno, 2004). They argue that this principle supports making policy decisions in the area of public health on the basis of evidence that is not conclusive whenever serious harms to human health might be anticipated if preventative action is not taken.

While Xouridas' paper emerged as the clear winner, the remaining five Category A submissions were of notably high quality as well. Three clinical papers examined new therapeutic modalities for problem gamblers or their significant others. One study by Nicole Nayoski of the University of Calgary and her supervisor examined the efficacy of a therapy approach adapted for assisting concerned significant others of problem gamblers (i.e., Community Reinforcement and Family Training [CRAFT]).

This randomized controlled trial (RCT) found greater effect sizes for outcomes for both the concerned significant others and the problem gambler for those who received the CRAFT intervention as a therapist-supported individual intervention than those randomized to a self-help version of the CRAFT intervention. Another study by Melissa Stewart of Dalhousie University and her colleagues used a case series approach to conduct a pilot evaluation of a new therapeutic approach for problem gamblers that involves matching the therapeutic strategies to the primary motivation underlying the problematic gambling behavior (i.e., enhancement/action or coping/escape). The results of this case series show promise for this new ‘BEAT Gambling’ intervention in reducing a variety of problematic gambling indices at both immediate post-treatment assessment and 3- and 6-month follow-ups paving the way for a more stringent test of this new intervention approach. A study by Nicholas Harris of Lakehead University and his supervisor used the RCT method to examine the efficacy of a novel group-based cognitive behavioral therapy (CBT) intervention designed specifically for internet problem gamblers. Their promising results showed superior outcomes on three of four gambling indices for those randomized to the active CBT intervention relative to those assigned to a waiting list control, and these therapeutic gains were maintained at 3-month follow-up. In addition to these clinical papers, we also had submissions in the social and policy subcategories. A French language contribution by Annie Goulet of the University of Laval and her colleagues examined the interesting construct of ‘economic violence’ (i.e., domination behaviors involving financial control) in the context of the family lives of problem gamblers from the perspective of the gamblers’ female partners, using a case-control methodology. Women in a relationship with a problem gambler were shown to be more likely than controls to have experienced conjugal economic violence behaviors (e.g., partner hiding financial information to ensure continuation of his gambling activities) and to have committed economic violence behaviors themselves (e.g., limiting the partner’s access to finances often as a protective strategy), underlining the complex nature of conjugal economic violence in the context of problem gambling. The final paper by Tess Armstrong from Central Queensland University and her colleagues (“Crimping the Croupier”) should win a prize for the most creative title! Their study involved a national environmental scan in Australia to identify features of gaming products in which electronic and mechanical automation has replaced or enhanced human croupiers. Survey results revealed that automation has led to gambling products that can intensify players’ level of engagement, with the unfortunate attendant potential for increases in gambling-related harm. This study paves the way for *in vivo* research to examine this concerning issue more thoroughly.

We hope you will enjoy reading this set of impressive contributions from these emerging scholars in the problem gambling field. We look forward to announcing the inaugural Category B Scholar’s award winner, and to publishing the accepted Category B papers, in a special section of our next issue of the *Journal*.

Sherry H. Stewart, PhD, Editor-in-Chief

Éditorial: Annonce du gagnant de la bourse inaugurale JGI pour l'excellence en recherche (Catégorie A: recherche clinique, sociale ou politique)

En 2015, le comité de rédaction du *Journal of Gambling Issues* (JGI) a annoncé son projet d'instituer une bourse de recherche annuelle. Le but de cette nouvelle bourse vise à soutenir les chercheurs d'exception dans le domaine des problèmes liés au jeu compulsif. Notre intention était d'augmenter l'envoi d'articles à la revue de la part de chercheurs œuvrant dans ce domaine et de présenter chaque année leurs travaux, dans un numéro spécial. Les chercheurs boursiers de cycles supérieurs et les boursiers de recherches postdoctorales qui effectuent des recherches sur la dépendance au jeu ont été invités à soumettre leurs meilleurs travaux pour l'obtention de la bourse et leur publication dans le journal. Nous avons donc lancé l'invitation à soumettre un dossier dans l'un des deux volets : la catégorie A pour la recherche clinique, sociale ou politique; et la catégorie B pour la recherche cognitive, développementale, biocomportementale ou en neuroimagerie. Or, nous avons reçu plus de propositions que prévu : sur un total de treize, six étaient de la catégorie A et sept de la catégorie B. Les articles présentés ont été soumis à l'examen à double insu par les pairs qui collaborent normalement avec *JGI* pour les documents de recherche réguliers. Tous les manuscrits qui ont réussi l'examen par les pairs ont ensuite été envoyés à l'un des deux groupes de juges (un groupe pour chaque catégorie), formés des membres du conseil éditorial du JGI. Les juges d'un groupe donné apportaient une expertise dans les domaines de recherche de la catégorie (p. ex., pour la catégorie A, on retrouvait parmi les juges des experts en recherche sociale, clinique et politique). Les juges ont évalué de manière indépendante et à l'aveugle les manuscrits de leur catégorie en tenant compte de cinq critères : 1) l'innovation sur le plan de la conception et des notions, 2) la contribution théorique, 3) la couverture de la documentation pertinente, 4) la rigueur scientifique et 5) la qualité de l'analyse et de la discussion. Chaque juge a attribué une note sur une échelle de 1 à 10 à chaque document, en fonction de chacun des cinq critères. Un pointage total sur une échelle de 5 à 50 a été donné à chaque document, par chacun des juges, et le pointage total des trois juges a été calculé pour chaque document. Le gagnant est celui qui a eu le pointage total le plus élevé. Les contributions des juges pour l'examen et la notation des documents soumis pour la bourse de recherche ont été d'un apport précieux.

Étant donné le nombre relativement important de documents soumis et leur taux élevé de succès dans l'examen par les pairs, nous avons décidé de publier les deux catégories de documents dans deux sections spéciales distinctes du *Journal*. Dans le présent numéro, nous présentons le gagnant de la première bourse *JGI* pour l'excellence en recherche, dans la catégorie A : recherche clinique, sociale ou politique. Nous consacrons également une section de ce numéro à la publication des six documents soumis dans la catégorie A, y compris le document qui a remporté la palme. Le prochain numéro de

JGI fera connaître le gagnant de la catégorie B et comportera également une section spéciale consacrée à la publication des documents acceptés de cette catégorie.

Les six documents présentés dans la catégorie A ont réussi l'examen par les pairs. Les juges de la catégorie A ont en effet eu la difficile tâche de sélectionner un gagnant. Ils ont déclaré avoir été impressionnés par la qualité des documents soumis : ils étaient bien rédigés et chacun apportait une contribution à l'exploration de la dimension particulière de la problématique du jeu abordée. Malgré la difficulté de la tâche qui leur incombait, les juges ont produit un barème tout à fait cohérent et ont pu désigner un gagnant de manière précise.

C'est avec grand plaisir que je vous présente le gagnant de la bourse de recherche *JGI* de la catégorie A. Notre premier lauréat est Stergios Xouridas, un candidat au doctorat au Gambling Research Center de l'Université de Hohenheim, à Stuttgart, Baden-Württemberg, en Allemagne. Ses sujets de recherche actuels portent notamment sur l'épidémiologie statistique des jeux de hasard et la distribution géographique des machines de jeux électroniques. Il recevra une bourse de 1 000 \$ canadiens en reconnaissance de son excellent travail. Monsieur Xouridas mène ses recherches de doctorat sous la direction du professeur Tilman Becker. L'article qui lui a valu la première place est intitulé « *An Ecological Approach to Electronic Gambling Machines and Socioeconomic Deprivation in Germany* » [Une approche écologique aux machines de jeu électroniques et la défavorisation socio-économique en Allemagne]. En tenant compte de la preuve substantielle à l'échelle internationale d'une corrélation positive entre la densité des appareils électroniques de jeu et la participation et les dépenses en jeux (voir l'analyse faite par Vasiliadis, Jackson, Christensen et Francis, 2013), et des liens observés entre les variables socio-économiques (p. ex., chômage et statut d'immigrant) et les problèmes de jeu (Lesieur et Blume, 1987), monsieur Xouridas et ses collègues ont examiné s'il y avait une association statistique à faire entre la densité et les indices de privation socio-économique dans 244 communautés de l'état du Bade-Wurtemberg, en Allemagne. Lui et ses collègues ont minutieusement analysé les associations significatives constatées entre la densité de ces appareils dans une communauté et trois indices socio-économiques : le taux de chômage, le statut d'immigrant et le taux de diplomation au niveau secondaire au sein de la communauté. L'association la plus forte était la corrélation positive entre la densité des machines de jeu et le taux de chômage. Leurs résultats ont une portée telle qui encourage la création d'une politique de réduction des dommages par secteur. En particulier, Stergios Xouridas et ses collègues suggèrent que la densité des appareils de jeux puisse être réduite dans les communautés où le taux de chômage est élevé afin de protéger un segment de la population qui est plus vulnérable aux activités de jeux de hasard qui se trouvent à leur portée. L'auteur et ses collègues reconnaissent qu'ils proposent des implications en matière de politique d'après des données qui ne sont pas concluantes quant à la causalité (c.-à-d., les données de corrélation). Néanmoins, ils appliquent le « principe de précaution » du droit international (Andorno, 2004). De leur avis, ce principe justifie la prise de décisions politiques dans le domaine de la santé publique, même en l'absence de preuves concluantes, chaque fois que de

graves préjudices pour la santé humaine pourraient se produire si des mesures préventives n'étaient pas prises.

Bien que le document de monsieur Xiourdas se soit nettement démarqué pour l'obtention de la bourse, les cinq autres documents présentés dans la catégorie A sont aussi de très haute qualité. Trois documents cliniques portent sur de nouvelles modalités thérapeutiques pour les joueurs compulsifs ou leurs proches. Une étude réalisée par Nicole Nayoski de l'Université de Calgary et son superviseur examinait l'efficacité d'une approche thérapeutique adaptée pour aider les proches de joueurs compulsifs (p. ex., la formation *Community Reinforcement and Family Training* [CRAFT]). Cet essai clinique randomisé a permis de constater des effets plus importants pour les proches concernés et le joueur compulsif qui ont reçu la formation CRAFT dans le cadre d'une intervention individuelle soutenue par un thérapeute que les candidats randomisés qui ont suivi la formation CRAFT en version libre-service. Une autre étude réalisée par Melissa Stewart de l'Université Dalhousie et ses collègues a utilisé une série de cas pour procéder à une évaluation pilote d'une nouvelle approche thérapeutique pour les joueurs compulsifs. Cette approche consiste à déterminer des stratégies thérapeutiques en fonction de la principale motivation sous-jacente à la compulsion (p. ex., valorisation/action ou adaptation/fuite). Les résultats de cette étude de cas sont prometteurs pour la nouvelle forme d'intervention *BEAT Gambling* en ce qui concerne la réduction de divers signes de compulsion, à la fois immédiatement après l'évaluation post-traitement et de trois à six mois après l'intervention. Cette étude ouvre la voie à une série de tests rigoureux pour cette nouvelle approche d'intervention. Pour sa part, Nicholas Harris de l'Université Lakehead, avec son superviseur, a réalisé un essai clinique randomisé pour étudier l'efficacité d'une nouvelle thérapie cognitivo-comportementale de groupe, conçue spécifiquement pour les joueurs compulsifs sur Internet. Les résultats prometteurs ont été supérieurs pour trois des quatre indices de jeu pour les personnes ayant suivi une thérapie cognitivo-comportementale par rapport à celles du groupe témoin placé sur une liste d'attente, et ces gains thérapeutiques ont été maintenus à trois mois de suivi. En plus de ces documents cliniques, nous avons aussi reçu des documents dans les sous-catégories sociale et politique. Une contribution de langue française par Annie Goulet de l'Université de Laval et ses collègues apportait un éclairage sur l'instauration de la « violence économique » (c.-à-d. les comportements de domination incluant un contrôle financier) dans la vie familiale des joueurs compulsifs, abordée du point de vue de leurs partenaires féminins, en utilisant une méthodologie de cas-témoins. Les femmes en relation avec un joueur compulsif couraient plus de risques que les témoins de connaître des comportements de violence économique conjugale (p. ex., dissimulation de l'information financière à la conjointe pour assurer la poursuite des activités de jeu) et d'avoir elles-mêmes des comportements de violence économique (p. ex., limiter l'accès du partenaire aux finances, souvent comme stratégie de protection). Cette analyse met en relief la nature complexe de la violence conjugale économique dans le contexte du jeu compulsif. Le document final présenté par Tess Armstrong de l'Université Central Queensland et ses collègues (« *Crimping the Croupier* » [Enchâsser le croupier]) devrait remporter un prix pour le titre le plus créatif. Cette

étude portait sur une analyse contextuelle nationale menée en Australie pour répertorier les caractéristiques des produits de jeu dans lesquels l'automatisation électronique et mécanique a remplacé ou amélioré les croupiers humains. L'analyse révèle que l'automatisation a conduit à des produits de jeu qui peuvent rehausser le niveau de participation des joueurs et présentent un potentiel d'augmentation des dommages liés au jeu. Cette étude ouvre la voie à une recherche *in vivo* pour examiner cette question de manière plus approfondie.

Nous souhaitons que la lecture de cette série de contributions impressionnantes de la part de nouveaux chercheurs dans le domaine du jeu compulsif vous soit d'un grand apport. Nous avons hâte d'annoncer le gagnant de la bourse de recherche de la catégorie B et de publier les documents acceptés dans cette catégorie, dans une section spéciale de notre prochain numéro.

Sherry H. Stewart, PhD, rédactrice en chef

References

Andorno, R. (2004). The precautionary principle: A new legal standard for a technological age. *Journal of International Biotechnology Law*, 1, 11–19. doi:10.1515/jibl.2004.1.1.11

Lesieur, H. R., et 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.

Vasiliadis, S. D., Jackson, A. C., Christensen, D., et Francis, K. (2013). Physical accessibility of gaming opportunity and its relationship to gaming involvement and problem gambling: A systematic review. *Journal of Gambling Issues*, 28, 1–46. doi:10.4309/jgi.2013.28.2

review

Parent problem gambling: A systematic review of prevention programs for children

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Abstract

Parent problem gambling (PG) has pervasive adverse effects on children. These children experience considerable losses such as loss of trust, loss of safety and stability, as well as financial and emotional losses. They are at greater risk for maltreatment and mental health disorders, and they are also at risk for intergenerational transmission of PG. These children are two to four times more likely to develop PG than children of non-PG parents. To date, there has been a dearth of research examining the impact of parent PG on children, and even less research focusing on reducing risks in children of PG parents. The goal of this systematic review was to identify PG prevention programs for children and examine the types of prevention used and whether these programs target specific subgroups. Our search retained 16 studies examining PG prevention programs for children. Results indicated that all of the PG prevention programs in the selected studies are universal and do not target children of PG parents or any other specific subgroups. A large gap is the absence of secondary and tertiary PG prevention programs for children. Another gap is the lack of family focused prevention strategies which the substance use literature has shown to be the most effective form of prevention. Further research is needed on parent PG and ways of reducing risks and increasing protective factors in children and families. A public health framework must be adopted to delay onset, reduce risks and minimize consequences in children of PG parents.

Keywords: parent, children, youth, problem gambling, intergenerational transmission, prevention programs

Résumé

Les problèmes de jeu (PJ) d'un parent ont des effets négatifs profonds sur ses enfants. Les enfants dont un parent a un PJ vivent d'importantes pertes, notamment de

confiance et du sentiment de sécurité et de stabilité, en plus d'éprouver une détresse émotionnelle et financière. Ils présentent également un risque plus élevé de maltraitance, de maladie mentale et de transmission intergénérationnelles des PJ. Ces enfants sont en effet de deux à quatre fois plus susceptibles de connaître un PJ que les enfants dont les parents n'ont pas de PJ. À ce jour, très peu d'études ont examiné les répercussions des PJ d'un parent sur ses enfants, et encore moins ont porté sur les moyens de diminuer les risques chez les enfants dont un parent a un PJ. L'objectif de cette revue systématique était de cerner les programmes de prévention des PJ qui visent les jeunes et d'examiner les méthodes de prévention utilisées, afin de déterminer si des sous-groupes particuliers sont ciblés par les programmes. Nous avons retenu pour notre recherche 16 études portant sur des programmes de prévention des PJ chez les jeunes. Les résultats indiquent que tous les programmes de prévention des PJ analysés dans ces études sont universels et ne ciblent pas les enfants dont un parent a un PJ ou tout autre sous-groupe particulier. L'absence de programmes secondaires et tertiaires de prévention des PJ chez les enfants constitue une importante lacune, de même que le manque de stratégies de prévention axées sur la famille. Les études sur la consommation de drogue et d'alcool ont démontré que les stratégies de ce type représentent la forme de prévention la plus efficace. De plus amples recherches sont nécessaires sur les parents ayant un PJ et les moyens de réduire les risques et d'accroître les facteurs de protection pour les enfants et les familles. Un plan d'ensemble en santé publique doit être adopté afin de retarder le commencement des comportements associés au jeu, de réduire les risques et d'atténuer le plus possible les conséquences sur les enfants dont un parent a un PJ.

Introduction

Problem gambling is a public health issue with adverse consequences for individuals and families. The rate of problem gambling in adults is 2.3% internationally, 2.4% in Canada, and 3.2% in the United States (Williams, Volberg, & Stevens, 2012). The rates of youth problem gambling are considerably higher—4 to 8% of youth have a severe gambling problem and 10 to 15% of youth are deemed to be at-risk of problem gambling (Messerlian, Derevensky & Gupta, 2005). Among adults with a gambling problem, the highest rates are in young adults aged 18 to 25 (Wiebe, Mun, & Kauffman, 2006). Problem gambling is associated with many co-occurring difficulties. Petry, Stinson, and Grant (2005) conducted a lifetime prevalence and comorbidity survey of disordered gambling with other psychiatric disorders (N=43,093). The study found that lifetime pathological gambling was highly comorbid with other addictions such as alcohol use disorder (73.2%), drug use disorder (38.1%), and nicotine dependence (60.4%). High rates of mental health concerns, such as mood disorders (49.6%), anxiety (41.3%) and personality disorders (60.8%), were among individuals with lifetime disordered gambling. Research has also reported high rates of trauma (Felsher, Derevensky & Gupta, 2010; Hodgins et al., 2010) and suicidality

(Ledgerwood, Steinberg, Wu, & Potenza, 2005; Marshall & Wynne, 2003) among problem gambling individuals. Furthermore, problem gambling is associated with elevated rates of financial problems, bankruptcy, unemployment (Marshall & Wynne, 2003), and legal issues (Toce-Gerstein, Gerstein, & Volberg, 2003).

Research has shown that problem gambling not only affects the individual, but also has adverse effects on families (Darbyshire, Oster, & Carrig, 2001; Dowling, Jackson, Thomas, & Frydenberg, 2010; Kourgiantakis, Saint-Jacques, & Tremblay, 2013). For each individual with a gambling problem between 8 and 10 others are directly affected by this problem (Lobsinger and Beckett, 1996). Problem gambling families have higher rates of child maltreatment, family violence, and separation and divorce (Kourgiantakis et al., 2013). According to Dowling et al. (2010) problem gambling adversely affects the physical and emotional health of partners/spouses and children. Darbyshire et al. (2001) found that children coping with parental problem gambling experience “pervasive loss.” These children experience loss of the parent due to reduced emotional and physical availability, financial and material losses, as well as loss of safety, stability and trust (Darbyshire et al., 2001; Kourgiantakis et al., 2013). A Canadian longitudinal study (N=142) found that children of problem gambling parents are more likely to experience depression and conduct problems than children who do not have a problem gambling parent. The study also reported that ineffective parenting plays an important role in the child’s overall adjustment (Vitaro, Wanner, Brendgen, & Tremblay, 2008).

In addition to these consequences, children who have a problem gambling parent are also at risk for intergenerational transmission of problem gambling. These children are two to four times more likely to develop a gambling problem than are children of non-problem gambling parents (Dowling et al., 2010; Stark et al., 2014). Research has shown that genetic factors influence the etiology of a gambling problem (Eisen et al., 2001), although environmental factors such as social modeling also influence the risk of intergenerational transmission of problem gambling (Dowling et al., 2010; Stark et al., 2014). Parental gambling significantly affects children’s attitudes towards gambling, as well as gambling behaviours (Derevensky, 2012; Dowling et al., 2010) since most youth begin gambling with parents or other family members. Furthermore, children with a problem gambling parent tend to start gambling at a much younger age (Derevensky, 2012; Dowling et al., 2010). Derevensky (2012) reports that 65% of youth gamble with family members and start gambling for money as early as age nine. Other risk factors that augment the risk of intergenerational transmission of problem gambling include poor coping strategies in the child and parent(s), mental health concerns, substance use, family conflict, and ineffective parenting (Stark et al., 2014). Children may be coping with mental health and addiction concerns not only in the problem gambling parent, but also the non-problem gambling parent. According to Dowling et al. (2010) parental problem gambling is linked with psychopathology in the non-problem gambling parent, and this influences the transmission of problem gambling in children.

Considering the magnitude of risk for children raised in problem gambling families, a public health approach that employs “denormalization, promotion, protection, and harm reduction principles” is needed (Messerlian et al., 2005, p. 75). This public health framework uses all three forms of prevention—primary or universal, secondary or indicated, and tertiary or selective (Dickson-Gillespie, Rugle, Rosenthal, & Fong, 2008). Each form of prevention includes its own goals. Primary prevention programs target the general public or whole population groups, such as children and youth, regardless of identified risk or need (Dickson-Gillespie et al., 2008). Youth who do not gamble are classified under this level of risk, and this classification includes approximately 80% of youth (Messerlian et al., 2005). Primary prevention programs attempt to prevent the onset of gambling behaviour from becoming at-risk gambling. The goal of this stage is to increase awareness of the risks and consequences associated with problem gambling (Messerlian et al., 2005). These prevention programs do not specifically target children or youth deemed to be at-risk, such as children of problem gambling parents, and can be community-based programs or school-based prevention programs.

Secondary prevention targets youth at risk of developing problem gambling behaviour which includes children of problem gambling parents (Dowling et al., 2010). According to Messerlian et al. (2005), 10 to 15% of youth are at risk of developing severe problem gambling behaviour. Secondary prevention programs aim to identify, assess, and provide appropriate rapid interventions for children at risk in order to prevent more severe problem gambling from developing (Dowling et al., 2010; Messerlian et al., 2005). Other goals of secondary prevention strategies are to develop improved coping skills, better problem solving abilities, and healthier activities (Messerlian et al., 2005). Secondary prevention programs also reduce social normalization of gambling or positive gambling expectancies, and can also address other co-occurring disorders (Dowling et al., 2010). Secondary prevention programs can be offered in schools or through community or social service settings (Dowling et al., 2010).

Tertiary prevention programs target those children and adolescents presenting signs and symptoms of problem gambling behaviour (Messerlian et al., 2005), as well as parents with gambling problems. Effective treatment for problem gambling parents is estimated to have an effect on children’s overall adjustment (Dowling et al., 2010). However, empirical problem gambling research to support this claim does not yet exist. A systematic review by Kourgiantakis et al. (2013) found that no studies examining the effects of parent problem gambling treatment and recovery on children have taken place. However, we know from the robust literature on substance use that effective family-focused interventions for the treatment of parental substance use can have positive, secondary or indirect effects on children’s psychosocial adjustment (Kelley & Fals-Stewart, 2002). Certain tertiary prevention programs include interventions for children raised in problem gambling families, and family-oriented interventions for problem gambling, as well as treatment programs and services for problem gambling adolescents (Dowling et al., 2010).

In 2001, Darbyshire et al. stated that “there seems to have been very little research interest in the lives and experiences of children living in families where a parent has a pathological gambling problem” (p. 26). It has been 15 years since that statement was made, and it is important to examine whether there has been greater research on the risks of parent problem gambling on children, as well as studies on prevention programs to reduce these risks. Ladouceur, Goulet, & Vitaro (2013) conducted a systematic review that examined the effectiveness of child and youth problem gambling prevention programs. This study did not identify any programs that targeted children of problem gambling parents although this was not the aim of the review. However, the authors did note that the gap in practice and research is a large one. Our study will build on the research conducted by Ladouceur et al. (2013), and examine these three questions: (1) Do any of the problem gambling prevention programs for children and youth target a specific subgroup? (2) Which types of prevention are used in problem gambling prevention programs for children and youth? (3) What are the gaps in the forms of prevention problem gambling programs for children and youth?

Method

Inclusion criteria

This systematic review includes studies examining any form of prevention of problem gambling in children or youth using quantitative, qualitative or mixed methods designs written in English or French. All studies included in this review were empirical studies written or published between 2000 and 2014, and included published and unpublished reports.

Search Strategy

This systematic review followed guidelines outlined in a seven-step model for social research developed by Cooper (2010). A systematic literature search was conducted through five relevant databases: PsycINFO, Medline via Ovid, Social Services Abstracts, and Sociological Abstracts. We searched for studies in all of the databases between 2000 and 2014 under title and abstracts, using the following keyword search terms: *gambl** AND (*prevent** OR *intervention** OR *child**). This search strategy followed recommendations made by Cooper (2010) to use broad conceptual definitions to protect validity. This search strategy resulted in high-sensitivity results. However, since there is a dearth of research on this topic, it was important to scan all of the literature potentially relevant to the study. Thus we also searched Google Scholar, as well as the websites of the following centres: Ontario Problem Gambling Research Centre, National Centre for Responsible Gambling, Responsible Gambling Council, and the International Centre for Youth Gambling Problems and High-Risk Behaviour. We also conducted a manual search of the reference lists of all the primary articles retrieved. Moreover, we emailed three gambling researchers who have published research on children and problem gambling. We also communicated

to gambling researchers and clinicians internationally, via the Gambling Issues International Listserv, requesting literature and resource recommendations.

Results

We identified 2,153 article titles through all of the database searches, specifically 1,376 from PsycINFO, 638 from Medline via Ovid, 80 from Sociological Abstracts, 53 from Social Service Abstracts, and 6 from other sources (see Figure 1). A large proportion of these articles we rejected at the first stage because they were duplicates or because the article did not meet inclusion criteria when reading the abstract and title. We retained 98 articles at this point representing a retention rate of 4.5% of the studies identified in the search. The majority of those excluded were: (1) literature reviews, editorials, discussion papers, books and book chapters ($n=30$), or (2) articles with another research focus ($n=39$). There were 29 articles retrieved and assessed for eligibility (30% of the studies screened were retained). Of these 29 studies, 13 were excluded. All of the articles that were excluded (except one) did not meet inclusion criteria because they did not examine problem gambling prevention programs for children and adolescents. Certain of the studies concerned adult samples only. Many of the studies that did not meet inclusion criteria examined gambling awareness, attitudes, and behaviour among significant adults, such as parents, teachers, and mental health professionals. Whereas these studies did provide interesting results and could guide future prevention strategies, they nevertheless did not meet inclusion criteria. One article was excluded (Williams et al., 2004) because it provided preliminary results for another study (Williams, Wood, & Currie, 2010), one which was retained. In other words, it was a duplicate that was not detected in the first stage of screening, and this finding was confirmed through contacting the author.

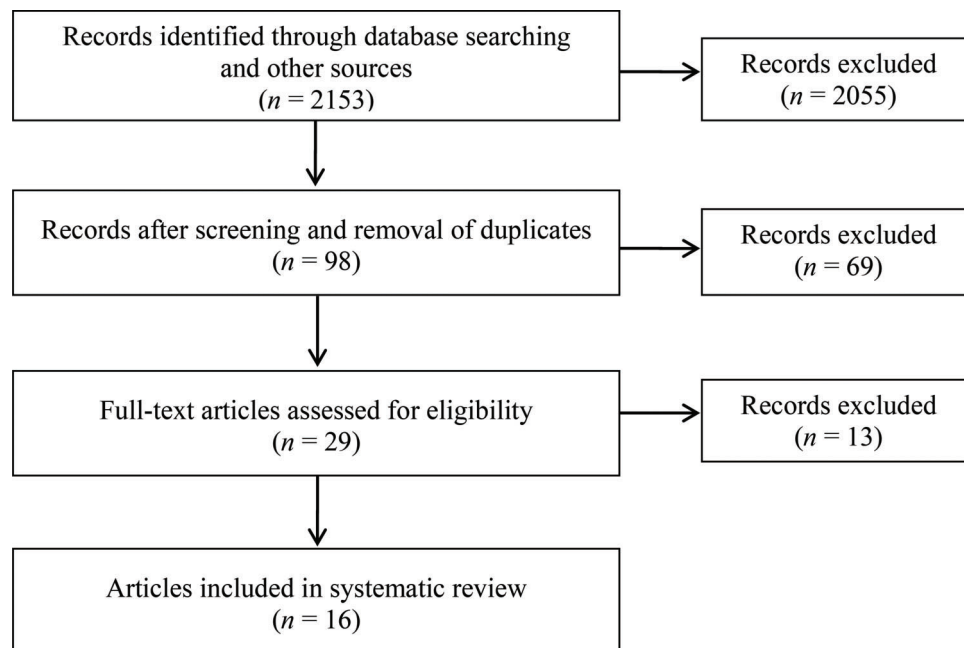


Figure 1. Flowchart of empirical studies between 2000 - 2014 identified, screened and assessed for eligibility

A total of 16 articles were retained for this systematic review. This represents a retention rate of 55% of the studies assessed for eligibility. Table 1 presents the methodological characteristics of each study included in the review. Three of the studies (19%) were research reports and the remaining 13 articles were published in scientific journals. One article presented two problem gambling prevention program studies (Ladouceur et al., 2004a), which accordingly means we are reporting on 17 studies published in 16 articles. As a result, some variance may emerge in the totals we report. All of the studies, with the exception of one by Korn et al. (2006), used quantitative methods ($n=16$). Fifteen studies used control/comparison groups (88%), and 13 studies randomly assigned participants to groups. One study did not specify how participants were assigned to treatment and control groups (Turner, Macdonald, Bartosuk, & Zangeneh, 2008a). Thirteen studies were conducted in Canada—76% of the selected studies. Three studies were conducted in Europe (Romania and Germany), and one in the United States. In terms of language of the programs that were evaluated, one study was conducted in German (6%), 6 studies French (35%), and 10 English (59%). Most of the studies recruited participants through schools and were school-based prevention programs ($n=16$). All of these studies ($n=16$) used samples of students aged 8-19. Only one study recruited youth aged 10-19 through a community organization, and implemented the study in the community (Korn et al., 2006).

All of the studies evaluated or examined primary prevention programs. Eleven studies (65%) evaluated problem gambling prevention programs that were one session in length. The remaining studies ($n=6$) examined programs that ranged between 3 and 10 sessions. Seven studies (41%) did not have any follow up measurements. Most studies with follow up had a single post-test measurement after one to three months. One study had two follow up measurements at three and six months (Ferland, Ladouceur, & Vitaro, 2005). Only one study had three follow up measurements at 3, 6 and 12 months (Lupu & Lupu, 2013). Table 2 provides an overview of the retained studies.

The prevention programs evaluated by these studies can be grouped in two categories. The first category includes programs that increase knowledge about gambling and modify misconceptions about gambling. The second category of prevention programs does also include the information in the first category, but examines skills in the participants as well. The majority of the studies in this review aimed to increase participants' knowledge about gambling, and change erroneous beliefs about gambling ($n=12$). Five studies evaluated programs that not only aimed to increase knowledge and change beliefs, but also develop skills. Most of the studies ($n=16$) found that these programs can increase knowledge and change attitudes towards gambling in children and youth. A study evaluating a one-hour program by Turner et al. (2008a) showed that participants absorbed only a slight increase in knowledge about random events. Another study found that, while participants did report that the website raised awareness about gambling, the study nevertheless could not determine if there were changes in gambling knowledge and beliefs (Korn et al., 2006). Only two studies in this review showed that there were changes in gambling behaviour post-intervention (Walther, Hanewinkel, & Morgenstern, 2013;

Table 1
Methodological Characteristics of Selected Studies (N=16¹)

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Ferland, Ladouceur, & Vitaro	2002	Prevention of problem gambling: Modifying misconceptions and increasing knowledge	Modify erroneous beliefs about gambling in children using a French video-based intervention "Lucky."	N = 424 students in grades 7 & 8	Quebec, Canada	Quantitative Control group with random assignment. No follow up.	Lucky (one session French video) Primary prevention	Misconceptions about gambling were modified in students.
Ferland, Ladouceur, & Vitaro	2005	Efficacité d'un programme de prévention des habitudes de jeu chez les jeunes: Résultats de l'étude pilote. [Efficacy of a youth gambling prevention program: Results from a pilot study].	Modify attitudes and knowledge about gambling, improve problem solving skills, decrease gambling involvement.	N = 1,113 students, 12 - 14 years old	Quebec, Canada	Quantitative Control group with random assignment. Post-test evaluations and follow up at 3 and 6 months.	Three-session youth gambling prevention workshop Primary prevention	Workshop was effective at modifying attitudes and knowledge about gambling, but not gambling behaviour. No significant changes in problem solving skills.
Korn, Murray, Morrison, Reynolds, & Skinner	2006	Engaging youth about gambling using the internet	Evaluation of a multimedia website developed to prevent gambling problems in youth.	N = 34 youth, 10 - 19 years old, recruited through community organizations	Ontario, Canada	Qualitative No comparison group. No follow up.	Youthbet.net (one session) Primary prevention	Website raised awareness in youth about gambling and youth's own gambling behaviour. The website's influence on gambling knowledge, attitudes, and behaviour could not be determined.

Table 1
Continued

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Ladouceur, Ferland, Roy et al.	2004	Prévention du jeu excessif chez les adolescents: Une approche cognitive [Prevention of excessive gambling in youth: A cognitive approach].	Two studies included in one paper. Study 1: Evaluate the effectiveness of a one-session prevention program at reducing erroneous beliefs in students. Study 2: Compared the effectiveness of a gambling prevention program when facilitated by a teacher or a gambling professional.	Study 1: <i>N</i> = 345 students in grades 7 & 9 Study 2: <i>N</i> = 520 students in grades 7 - 9	Quebec, Canada	Study 1: Quantitative Control group with random assignment. No follow up. Study 2: Quantitative Comparison group, no control group. No follow up.	Count Me Out (one session) Primary prevention	Study 1 showed that erroneous beliefs were reduced in students and the reduction was greater in those with a higher number of misconceptions at baseline. Study 2 showed that all of the experimental conditions were effective at reducing erroneous beliefs in youth, but there was greater effect size for students at risk who received the gambling prevention programs delivered by gambling experts.
Ladouceur, Ferland, & Vitaro	2004	Prevention of problem gambling: Modifying misconceptions and increasing knowledge among Canadian youths.	Modify erroneous beliefs about gambling in children using an English version of video-based intervention "Lucky."	<i>N</i> =506 students in grades 7 & 8 recruited through four schools	Quebec and New Brunswick, Canada	Quantitative Control group with random assignment. No follow up.	Lucky (one session English version video) Primary prevention	The English version seems to be as effective as the French version. Misconceptions about gambling were modified in students through the video.

Table 1
Continued

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Lavoie & Ladouceur	2004	Prevention of gambling among youth: Increasing knowledge and modifying attitudes toward gambling	Evaluate the effectiveness of a video "Lucky" aimed at modifying erroneous beliefs and attitudes about gambling.	<i>N</i> = 273 students in grades 5 & 6	Quebec, Canada	Quantitative Control group with random assignment. No follow up.	Lucky (one session French video) Primary prevention	Video increased knowledge about gambling and reduced misconceptions.
Lemaire, de Lima, & Patton	2004	It's your lucky day: Program evaluation.	Evaluate the effectiveness of a pilot gambling prevention program aimed at increasing knowledge, dispelling myths, and increasing ability to identify warning signs of PG.	<i>N</i> = 894 students in grades 7 & 8	Manitoba, Canada	Quantitative Control group with random assignment. Follow up at one month.	It's Your Lucky Day (one session) Primary prevention	Grade 7 students showed greater knowledge about PG and myths at post-test than grade 8 students. Both grade levels were unable to recognize gambling warning signs at post-test, and they did not show increased awareness of PG services.
Lupu & Lupu	2013	Gambling prevention program for teenagers	Compare the effects of two programs (Amazing Chateau and REE) on erroneous cognitions about gambling among adolescents.	<i>N</i> = 75 students, ages 12 - 13, recruited through school	Romania	Quantitative Control group with random assignment. Follow up at 3, 6, and 12 months.	Amazing Chateau and Rational Emotive Education (10 sessions) Primary prevention	Primary prevention programs using REE plus computer assisted education about gambling was more effective at changing erroneous beliefs about gambling, than REE alone.

Table 1
Continued

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Taylor & Hillyard	2009	Gambling awareness for youth: An analysis of the "Don't gamble away our future" program	Raise awareness about gambling and change faulty beliefs about gambling.	<i>N</i> = 8,455 students, aged 8-18, from primary, secondary, postsecondary schools, and juvenile detention centre	Illinois, United States	Quantitative No control group. No follow up.	Don't Gamble Away Our Future (one session) Primary prevention	Students had greater knowledge after the program than before, and younger children and younger children improved scores more than older children
Todirita & Lupu	2013	Gambling prevention program among children	Compare the effects of two programs (Amazing Chateau and REE) on erroneous cognitions about gambling among adolescents.	<i>N</i> = 81 students, aged 12 - 13	Romania	Quantitative Control group with random assignment. Follow up weekly for 10 weeks.	Amazing Chateau and Rational Emotive Education (10 sessions) Primary prevention	Primary prevention programs with REE were more effective at changing erroneous beliefs about gambling.
Turner, Macdonald, Bartosuk, & Zangeneh	2008a	The evaluation of a 1-h prevention program for problem gambling	Evaluate a program aimed at improving students' knowledge of random chance, and improve coping strategies and attitudes about gambling.	<i>N</i> = 374 students, grades 5-12	Ontario, Canada	Quantitative Control group Follow up for post-test at 2 months.	1-hour prevention program (one session) Primary prevention	There were no changes in coping skills, attitudes, and gambling behaviour, and a slight improvement in students' understanding of random chance.

Table 1
Continued

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Turner, Macdonald, & Somers	2008b	Life skills, mathematical reasoning and critical thinking: A curriculum for the prevention of problem gambling.	Evaluate a program aimed at increasing understanding of random events, increasing knowledge of coping skills and self-monitoring.	$N = 201$ students in grades 10-12	Ontario, Canada	Quantitative Control group with random assignment. Follow up weekly for 7 weeks.	Curriculum supplement for health and math on PG prevention (6 lessons and 1 summary) Primary prevention	There was improvement in student knowledge of random events, self-monitoring, and coping skills.
Vitaro et al.	2005	Évaluation des ateliers de sensibilisation sur les risques associés aux jeux de hasard et d'argent: Première partie [Evaluation of a gambling awareness workshop: Part one].	Evaluate a workshop aimed at increasing knowledge, changing attitudes and behaviours regarding gambling. The study also examined differences in workshops led by PG trained teachers versus teachers who had not been trained.	$N = 2,848$ students in grades 10 & 11	Quebec, Canada	Quantitative Control group with random assignment. Follow up (post-test) at 2-3 months.	Youth Gambling: An awareness and prevention workshop- Level II (one session) Primary prevention	Both experimental groups showed improvement in knowledge and attitudes about PG. The group who received the workshop given by trained teachers showed greater improvement. There were no changes in gambling behaviours.

Table 1
Continued

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Walther, Hanewinkel, & Morgenstern	2013	Short-term effects of a school-based program on gambling prevention in adolescents.	Test the short-term effects of an intervention for students in grades six and seven regarding gambling knowledge, problematic attitudes and beliefs, and gambling behaviour.	$N = 2,109$ students in grades 6 & 7	Germany	Quantitative Control group with random assignment. Follow up at 20 weeks for control group (mean interval from baseline to post-test). Follow up at 31 weeks for treatment group (mean interval from baseline to post-test).	Vernetzte www.welten (one session) Primary prevention	There was improvement in student knowledge and attitudes, and beliefs. There was also a slight decrease in gambling behaviour.
Williams	2002	Final report: Prevention of problem gambling: A school-based intervention.	Evaluate whether a prevention program is successful improving knowledge, cognitive errors, attitudes, coping skills and behaviour regarding PG in students.	$N = 282$ students, aged 14 - 19	Alberta, Canada	Quantitative Control group with random assignment. Post-treatment one week following intervention and follow up at 3 months.	Five-session PG prevention workshop (adaptation of 3-session Quebec program)	There were important changes at 3-month follow up with gambling knowledge, attitudes, and cognitive errors. There were no changes in gambling behaviour.

Table 1
Continued

AUTHORS	YEAR	TITLE	OBJECT OF STUDY	SAMPLE SIZE & TYPE	SAMPLE ORIGIN	DESIGN FOLLOW UP	PROGRAM NAME & FORM OF PREVENTION	RESULTS
Williams, Wood, & Currie	2010	Stacked Deck: An effective, school-based program for the prevention of problem gambling.	Evaluate a gambling prevention program and its effectiveness at changing gambling attitudes, knowledge, fallacies, decision making and problem solving skills, and gambling behaviour.	$N = 1,253$ students, grades 9-12	Alberta, Canada	Quantitative Control group with random assignment. Follow up at 4 months.	Gambling: A Stacked Deck(5 sessions) Primary prevention	Program showed changes in gambling knowledge, attitudes, and fallacies. There were also improved decision and problem solving skills, and decreased gambling frequency. Program emphasized the importance of skill development.

¹There were 16 articles retained, but one article reported on 2 studies.

Table 2
Overview of selected studies (N=17)²

Samples	Children and youth (Age range = 8 - 19 years)
Country	Canada (75%) Europe (18%) USA (6%)
Method	Quantitative (94%) Qualitative (6%)
Control group	Control group (88%) No control group (12%)
Random assignment	Yes (76%) No (18%) Did not specify (6%)
Recruitment and implementation setting	School (94%) Community organization (6%)
Follow up measurement	No (41%) Yes (59%)
Form of prevention	Primary (100%)
Preventive programs ³	Amazing Chateau (<i>n</i> = 2) Count Me Out (<i>n</i> = 2) One-hour prevention program (<i>n</i> = 1) Curriculum adjunct (<i>n</i> = 1) Don't Gamble Away Our Future (<i>n</i> = 1) Five-session prevention (<i>n</i> = 1) It's Your Lucky Day (<i>n</i> = 1) Lucky (<i>n</i> = 3) Youth Gambling (<i>n</i> = 1) Rational Emotive Education (<i>n</i> = 2) Stacked Deck (<i>n</i> = 1) Three-session workshop (<i>n</i> = 1) Vernetzte (<i>n</i> = 1) Youthbet.net (<i>n</i> = 1)

Williams et al., 2010). Five studies evaluated the effects of the program on skills such as decision making, problem solving, coping, and self-monitoring (Ferland et al., 2005; Turner et al., 2008a; Turner, Macdonald, & Somerset, 2008b; Williams, 2002; Williams et al., 2010). Three out of the five studies showed changes in coping skills, self-monitoring, problem solving and/or decision making (Turner et al., 2008b; Williams, 2002; Williams et al., 2010).

Discussion

This systematic review aimed to identify studies on problem gambling prevention programs for children and youth, and examine whether any of these studies target

²We are reporting on 17 studies in 16 publications since one article contained two studies.

³The number of programs exceed 17 since Todirita & Lupu (2012) and Lupu & Lupu (2013) compared two programs (Amazing Chateau & REE) in both studies.

specific subgroups. Another goal of the review was to describe the types of prevention used in these programs. The final objective was to identify gaps in the types of problem gambling prevention programs for children and youth. It is important to note that this review did not appraise the effectiveness of the prevention programs evaluated by the studies that were retained and assessed. A study on the effectiveness of problem gambling prevention programs for children was conducted by Ladouceur et al. (2013). The present study built on the work by Ladouceur et al. (2013) with a specific focus on the types of prevention and the subgroups of children being targeted.

Our review identified 16 empirical studies that have evaluated problem gambling prevention programs for children and youth since 2000. None of the programs evaluated in these studies targeted specific subgroups. With the exception of one study by Korn et al. (2006), all of the studies were school-based prevention programs targeting entire school populations. Each of the studies retained in this review focused on primary or universal prevention programs. Several gaps were noted in the problem gambling prevention programs examined in this review. There are no secondary or tertiary forms of prevention in any of these studies. None of these prevention programs target children who have a problem gambling parent even though the risks are much higher for these children (Dowling et al., 2010).

Since the research on children and parent problem gambling is very limited, it is thus important to examine the more robust research on prevention programs for children of substance-abusing parents. An examination of the research in the field of prevention programs for children of substance abusing parents highlights other gaps in problem gambling prevention programs for children. Reviews of prevention programs for children of substance using parents emphasise the importance of family-based programs (Bröning et al., 2012; Kumpfer, Alvarado, & Whiteside, 2003; Usher, McShane, & Dwyer, 2015; Velleman, Templeton, & Copello, 2005). According to Kumpfer et al. (2003) family-based intervention programs have effect sizes that are two-to-nine times greater than child focused approaches. Substance use prevention research shows that effective family strengthening programs should be included in all prevention programs for children (Kumpfer et al., 2003; Velleman et al., 2005). Family strengthening programs reduce risks while they also reinforce the family unit. This increases protective factors and builds resilience (Velleman et al., 2005). Velleman, Mistral, and Sanderling (2000) found that a key task of substance use prevention programs for children is to improve skills in parents. These skills include those that facilitate family cohesion, communication and problem solving, as well as the monitoring and supervision of children. Effective programs also help parents develop “substance related skills.” Parents increase their knowledge on substance use and learn about modelling behaviours and attitudes. In these programs parents also learn to talk to their children about substance use and misuse.

Problem gambling researchers have also argued that parents should be part of problem gambling prevention strategies (Dowling et al., 2010). A study by Dowling et al. (2010) identified gambling attitudes, motives and expectancies as important risk

factors in the familial transmission of problem gambling. The importance of parent awareness of problem gambling risks and consequences was also demonstrated by another study that found that 61% of parents do not perceive gambling as a concern among adolescents, and 57% of parents gamble with their children. The study also found that there are gender differences with fathers perceiving gambling as less serious than mothers, particularly among teenage boys versus teenage girls (Shead, Derevensky, & Meerkamper, 2011).

Since most problem gambling prevention programs are delivered through schools, it is imperative that teachers and school mental health professionals also receive information on problem gambling risk factors and negative consequences, as well as adequate training on delivering effective prevention programs for children. Two recent studies surveying mental health professionals and teachers found that problem gambling was ranked as the least important adolescent issue among a list of many other issues. Teachers and mental health professionals reported feeling ill-equipped to deal with problem gambling (Derevensky, St. Pierre, Temcheff, & Gupta, 2014; Temcheff, Derevensky, St. Pierre, Gupta, & Martin, 2014). The researchers urged school boards to develop student gambling policies similar to those established for drugs, alcohol, smoking, bullying, and violence (Temcheff et al., 2014).

Conclusion

It is clear from this review that there has been only meagre change since Darbyshire et al. (2001) affirmed that there was little research interest on the impact of parent problem gambling on children. A public health model needs to be used to guide future research, clinical practice, and policies on gambling and children. A public health framework comprises primary, secondary, and tertiary prevention strategies. The research on prevention programs for children of substance abusing parents indicates that the most effective programs are family focused. Our study shows that no problem gambling prevention programs using a family focused approach are in operation, and a lack exists of secondary and tertiary problem gambling prevention strategies for children and families.

More research is needed to understand how children are affected by parent problem gambling, and what types of prevention programs are most effective for these children. It is also important to perform more longitudinal research on the adjustment of children growing up in problem gambling families. Schools, community centres, and mental health and addiction facilities need to be better equipped to screen, assess, and treat children who have a problem gambling parent, as well as children who may be at-risk. These children need to be part of the services given to problem gambling parents. Further education and training is required for parents, clinicians, and school personnel. Universal, selective, and indicated programs are needed, must be developed for the developmental level of the audience, and should be designed with cultural sensitivity. Finally, there needs to be a shift from the individual focus in mental health and addiction research and treatment to a more family-centred paradigm.

References

- Bröning, S., Kumpfer, K., Kruse, K., Sack, P. M., Schaunig-Busch, I., Ruths, S., ... & Thomasius, R. (2012). Selective prevention programs for children from substance-affected families: A comprehensive systematic review. *Substance Abuse Treatment, Prevention and Policy*, 7, 1–17. doi:10.1186/1747-597X-7-23
- Cooper, H. (2010). *Research synthesis and meta-analysis*. Thousand Oaks, CA: Sage Publications.
- Darbyshire, P., Oster, C., & Carrig, H. (2001). The experience of pervasive loss: Children and young people living in a family where parental gambling is a problem. *Journal of Gambling Studies*, 17, 23–45. doi:10.1023/A:1014536315167
- Derevensky, J. L. (2012). *Teen gambling: Understanding a growing epidemic*. New York: Rowman & Littlefield.
- Derevensky, J. L., St. Pierre, R. A., Temcheff, C. E., & Gupta, R. (2014). Teacher awareness and attitudes regarding adolescent risky behaviour: Is adolescent gambling perceived to be a problem? *Journal of Gambling Studies*, 30, 435–451. doi:10.1007/s10899-013-9363-z
- Dickson-Gillespie, L., Rugle, L., Rosenthal, R., & Fong, T. (2008). Preventing the incidence and harm of gambling problems. *Journal of Primary Prevention*, 29, 37–55. doi:10.1007/s10935-008-0126-z
- Dowling, N. A., Jackson, A. C., Thomas, S. A., & Frydenberg, E. (2010). *Children at risk of developing problem gambling*. Melbourne, Australia: Gambling Research Australia.
- Eisen, S. A., Slutske, W. S., Lyons, M. J., Lassman, J., Xian, H., Toomey, R., ... & Tsuang, M. T. (2001). The genetics of pathological gambling. *Seminars in Clinical Neuropsychiatry*, 6, 195–204. doi:10.1053/scnp.2001.22931
- Felsher, J. R., Derevensky, J. L., & Gupta, R. (2010). Young adults with gambling problems: The impact of childhood maltreatment. *International Journal of Mental Health & Addiction*, 8, 545–556. doi:10.1007/s11469-009-9230-4
- Ferland, F., Ladouceur, R., & Vitaro, F. (2002). Prevention of problem gambling: Modifying misconceptions and increasing knowledge. *Journal of Gambling Studies*, 18, 19–29. doi:10.1023/A:1014528128578
- Ferland, F., Ladouceur, R., & Vitaro, F. (2005). Efficacité d'un programme de prévention des habitudes de jeu chez les jeunes: Résultats de l'étude pilote [Efficacy of a youth gambling prevention program: Results from a pilot study]. *Encéphale*, 31, 427–436. doi:ENC-9-2005-31-4-0013-7006-101019-200520038

- Hodgins, D. C., Schopflocher, D. P., el-Guebaly, N., Casey, D. M., Smith, G. J., Williams, R. J., & Wood, R. T. (2010). The association between childhood maltreatment and gambling problems in a community sample of adult men and women. *Psychology of Addictive Behaviour, 24*, 548–554. doi:10.1037/a0019946
- Kelley, M. L., & Fals-Stewart, W. (2002). Couples-versus individual-based therapy for alcoholism and drug abuse: Effects on children's psychosocial functioning. *Journal of Consulting & Clinical Psychology, 70*, 417–427.
- Korn, D., Murray, M., Morrison, M., Reynolds, J., & Skinner, H. A. (2006). Engaging youth about gambling using the Internet. *Canadian Journal of Public Health, 97*, 448–453.
- Kourgiantakis, T., Saint-Jacques, M.-C., & Tremblay, J. (2013). Problem gambling and families: A systematic review. *Journal of Social Work Practice in the Addictions, 13*, 353–372. doi:10.1080/1533256X.2013.838130
- Kumpfer, K. L., Alvarado, R., & Whiteside, H. O. (2003). Family-based interventions for substance use and misuse prevention. *Substance Use & Misuse, 38*, 1759–1787. doi:10.1081/JA-120024240
- Ladouceur, R., Ferland, F., Roy, C., Pelletier, O., Bussières, E.-L., & Auclair, A. (2004a). Prévention du jeu excessif chez les adolescents: Une approche cognitive [Prevention of excessive gambling in youth: A cognitive approach]. *Journal de Thérapie Comportementale et Cognitive, 14*, 124–130. doi:10.1016/S1155-1704(04)97459-9
- Ladouceur, R., Ferland, F., & Vitaro, F. (2004b). Prevention of problem gambling: Modifying misconceptions and increasing knowledge among Canadian youths. *Journal of Primary Prevention, 25*, 329–335. doi:10.1023/B:JOPP.0000048024.37066.32
- Ladouceur, R., Goulet, A. & Vitaro, F. (2013). Prevention programmes for youth gambling: A review of the empirical evidence. *International Gambling Studies, 13*, 141-159.
- Lavoie, M.-P., & Ladouceur, R. (2004). Prevention of gambling among youth: Increasing knowledge and modifying attitudes toward gambling. *Journal of Gambling Issues, 10*, 1–10. doi:10.4309/jgi.2004.10.7
- Ledgerwood, D. M., Steinberg, M. A., Wu, R., & Potenza, M. N. (2005). Self-reported gambling-related suicidality among gambling helpline callers. *Psychology of Addictive Behaviour, 19*, 175–183. doi:10.1037/0893-164X.19.2.175
- Lemaire, J., de Lima, S., & Patton, D. (2004). *It's your lucky day: Program evaluation*. Winnipeg, MB: Addictions Foundation of Manitoba. Retrieved from: <http://digitalcollection.gov.mb.ca/awweb/pdfopener?smd=1&did=17368&md=1>

- Lobsinger, C., & Beckett, L. (1996). *Odds to break even: A practical approach to gambling awareness*. Sydney, Australia: Relationships Australia.
- Lupu, I. R., & Lupu, V. (2013). Gambling prevention program for teenagers. *Journal of Cognitive & Behavioural Psychotherapies*, 13, 575–584.
- Marshall, K., & Wynne, H. (2003). Fighting the odds. *Perspectives on Labour and Income*, 4(12), 5–13.
- Messerlian, C., Derevensky, J., & Gupta, R. (2005). Youth gambling problems: A public health perspective. *Health Promotion International*, 20, 69–79. doi:10.1093/heapro/dah509
- Petry, N. M., Stinson, F. S., & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 66, 564–574. doi:10.4088/JCP.v66n0504
- Shead, W., Derevensky, J., & Meerkamper, E. (2011). Your mother should know: A comparison of maternal and paternal attitudes and behaviors related to gambling among their adolescent children. *International Journal of Mental Health & Addiction*, 9, 264–275. doi:10.1007/s11469-010-9279-0
- Stark, S., Kourgiantakis, T., Lobo, D., & Tepperman, L. (2014). *Children of problem gambling parents: A critical review of risks and prevention strategies*. Guelph, ON: Ontario Problem Gambling Research Centre.
- Taylor, L. M., & Hillyard, P. (2009). Gambling awareness for youth: An analysis of the “Don’t Gamble Away Our Future” program. *International Journal of Mental Health & Addiction*, 7, 250–261. doi:10.1007/s11469-008-9184-y
- Temcheff, C. E., Derevensky, J. L., St-Pierre, R. A., Gupta, R., & Martin, I. (2014). Beliefs and attitudes of mental health professionals with respect to gambling and other high risk behaviour in schools. *International Journal of Mental Health & Addiction*, 12, 716–729. doi:10.1007/s11469-014-9499-9
- Toce-Gerstein, M., Gerstein, D. R., & Volberg, R. A. (2003). A hierarchy of gambling disorders in the community. *Addiction*, 98, 1661–1672. doi:10.1111/j.1360-0443.2003.00545.x
- Todirita, I. R., & Lupu, V. (2013). Gambling prevention program among children. *Journal of Gambling Studies*, 29, 161–169. doi:10.1007/s10899-012-9293-1
- Turner, N. E., Macdonald, J., Bartosuk, M., & Zangeneh, M. (2008a). The evaluation of a 1-h prevention program for problem gambling. *International Journal for Mental Health & Addiction*, 6, 238–243. doi:10.1007/s11469-007-9121-5

Turner, N. E., Macdonald, J., & Somerset, M. (2008b). Life skills, mathematical reasoning and critical thinking: A curriculum for the prevention of problem gambling. *Journal of Gambling Studies*, 24, 367–380. doi:10.1007/s10899-007-9085-1

Usher, A. M., McShane, K. E., & Dwyer, C. (2015). A realist review of family-based interventions for children of substance abusing parents. *Systematic Reviews*, 4, 1–12. doi:10.1186/s13643-015-0158-4

Velleman, R. D. B., Mistral, W., & Sanderling, L. (2000). *Taking the message home: Involving parents in drugs prevention (DPAS [Drugs Prevention Advisory Service] Paper 5)*. London, UK: DPAS.

Velleman, R. D. B., Templeton, L. J., & Copello, A. G. (2005). The role of the family in preventing and intervening with substance use and misuse: A comprehensive review of family interventions, with a focus on young people. *Drug & Alcohol Review*, 24, 93–109. doi:10.1080/09595230500167478

Vitaro, F., Paré, R., Trudelle, S. & Duchesne, J. (2005). Évaluation des ateliers de sensibilisation sur les risques associés aux jeux de hasard et d'argent. Première partie Rapport présenté à l'Agence de développement de réseaux locaux de Services de santé et de services sociaux de Montréal. Montréal: Direction de santé publique.

Vitaro, F., Wanner, B., Brendgen, M., & Tremblay, R. E. (2008). Offspring of parents with gambling problems: Adjustment problems and explanatory mechanisms. *Journal of Gambling Studies*, 24, 535–553. doi:10.1007/s10899-008-9096-6

Walther, B., Hanewinkel, R., & Morgenstern, M. (2013). Short-term effects of a school-based program on gambling in adolescents. *Journal of Adolescent Health*, 599–605. doi:10.1016/j.jadohealth.2012.11.009

Wiebe, J., Mun, P., & Kauffman, N. (2006). *Gambling and problem gambling in Ontario 2005*. Toronto, ON: Responsible Gambling Council.

Williams, R. J. (2002). *Final report: Prevention of problem gambling: A school-based intervention*. Edmonton, AB: Alberta Gaming Research Institute. Retrieved from: https://www.uleth.ca/dspace/bitstream/handle/10133/370/Williams_prevention.pdf?sequence=1

Williams, R. J., Volberg, R. A., & Stevens, R. M. G. (2012). *The population prevalence of problem gambling: Methodological influences, standardized rates, jurisdictional differences, and worldwide trends*. Edmonton, AB: Alberta Gaming Research Institute. Retrieved from: [https://www.uleth.ca/dspace/bitstream/handle/10133/3068/2012-PREVALENCE-OPGRC%20\(2\).pdf?sequence=3](https://www.uleth.ca/dspace/bitstream/handle/10133/3068/2012-PREVALENCE-OPGRC%20(2).pdf?sequence=3)

Williams, R. J., Wood, R. T., & Currie, S. R. (2010). Stacked deck: An effective, school-based program for the prevention of problem gambling. *Journal of Primary Prevention*, 31, 109–125. doi:10.1007/s10935-010-0212-x

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Parental and peer influences on emerging adult problem gambling: Does exposure to problem gambling reduce stigmatizing perceptions and increase vulnerability?

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Abstract

Research has identified 18 to 30 years olds as the biggest spenders on gambling activities, with significantly higher prevalence of gambling problems than other age groups. Identifying the factors that influence the development of gambling problems in young people is important for guiding prevention strategies. This study aimed to analyse how emerging adult problem gambling is influenced by the people around them. In particular, we explored whether perceived parental and peer problem gambling predicted emerging adult problem gambling, and whether reduced gambling self-stigma mediated these relationships. A community sample of 188 Australian gamblers aged 18 to 29 ($M = 21.41$, $SD = 2.99$) completed three versions of the Problem Gambling Severity Index (PGSI) and the Gambling Perception Scale. Results indicated that perceived parental and peer gambling were positively related to emerging adult problem gambling. While reduced gambling helping stigma was related to higher problem gambling, stigma did not mediate the links between significant others' gambling and emerging adult problem gambling. We conclude that social influences are important in the development of problem gambling for young people, and that older male emerging adults who have a gambling mother are at most risk of problem gambling.

Keywords: problem gambling, emerging adults, stigma, peers, parents

Résumé

La recherche a établi que le groupe des 18 à 30 ans dépense plus que les autres tranches d'âge dans des activités de jeu et que la prévalence des problèmes de jeu y est beaucoup plus élevée. Il est important de déterminer les facteurs qui ont une influence sur l'apparition du jeu problématique chez les jeunes afin d'orienter les

stratégies de prévention. La présente étude visait à analyser comment les jeunes adultes ayant un problème de jeu sont influencés par leur entourage. En particulier, nous avons tenté de déterminer si la présence de problèmes de jeu perceptibles chez les parents et les pairs permettait d'expliquer l'apparition de problèmes de même nature chez les jeunes adultes et si une diminution de l'autostigmatisation à l'égard du jeu avait un effet sur cette influence. Un échantillon issu d'une communauté donnée et composé de 188 joueurs australiens âgés de 18 à 29 ans (moyenne = 21,41; écart-type = 2,99) a rempli trois versions du formulaire de l'Indice de gravité du jeu problématique (ICJE) et de l'Échelle de perception du jeu problématique. Les résultats indiquent que la perception de problèmes de jeu chez les parents et les pairs est positivement reliée à la présence de tels problèmes chez les jeunes adultes. Alors qu'une réduction de la stigmatisation du jeu problématique est reliée à une augmentation des problèmes de jeu, la stigmatisation n'exerce quant à elle aucune influence sur les liens entre les comportements associés au jeu des proches et les problèmes de jeu des jeunes adultes. L'influence de l'entourage joue donc un rôle important dans l'apparition du jeu problématique chez les jeunes, et les jeunes hommes adultes d'un âge plus avancé dont la mère est une joueuse présentent le risque le plus élevé de connaître des problèmes de jeu.

Introduction

Problem gambling poses a significant economic, social, and psychological burden to society, with prevalence rates as high as three percent in parts of North America and Europe (Gowing et al., 2015). Australians are reported to be the biggest gamblers worldwide, with the highest gambling expenditure and loss per person (Williams, Volberg, & Stevens, 2012). A recent study indicated that 0.6% of Australian adults were considered problem gamblers (individuals who reported a high rate of gambling-related harm, loss of control, or negative consequences for themselves and others in their social network), while an additional 3.7% of adults were considered to be at moderate risk of becoming problem gamblers (Gainsbury et al., 2014).

The prevalence of problem gambling varies according to age. Delfabbro and Thrupp (2003) found that young adults between 18 and 30 years have significantly higher prevalence of gambling problems than older adults. This age group also spends the most money on gambling, and has a higher rate of gambling disorders (American Psychiatric Association, 2013; Australian Government Productivity Commission, 2005), which is thought to be attributable to the increased tendency for young adults to risk-take, along with their limited understanding of the possible consequences (Derevensky, Gupta, & Winters, 2003). In addition, young adults in industrial societies also experience a delayed transition from adolescence to adulthood, because of prolonged educational pursuits and delayed marriage and childbirth (Arnett, 2000). Developmental milestones associated with this newly conceptualized period of

emerging adulthood include gaining financial independence and exploring identity, which involves facing novel challenges autonomously, with decreased reliance on previously established support structures such as school and family (Arnett, 2000). With newly gained financial and behavioural autonomy, emerging adults can explore new interests, which might include gambling. Indeed, many problem gamblers have been found to initiate gambling behaviour during this stage of life (Shaffer & Hall, 2001).

Gambling Onset

According to the American Psychiatric Association (2013), the age of onset of gambling can occur during adolescence through to older adulthood. While some research provides mean gambling onset ages of around 34 in women and 20 to 23 in men, multiple studies indicate an onset age as young as 10 years old (Delfabbro & Thrupp, 2003; Echeburúa, González-Ortega, de Corral, & Polo-López, 2011; Tavares, Zilberman, Beites, & Gentil, 2001). Across the research it is evident that the age of both gambling and problem gambling onset is lower in males than females, yet female problem gambling develops in a shorter time period (American Psychiatric Association, 2013; Echeburúa et al., 2011). Multiple studies have also indicated that an earlier onset of gambling behaviours leads to increased gambling severity or risk of problem gambling, along with more social, medical and psychiatric problems (Burge, Pietrzak, & Petry, 2006; Burge, Pietrzak, Molina, & Petry, 2004; Rahman et al., 2012; Volberg, 1994). Clearly, emerging adulthood status is important in the initiation and development of problem gambling and research is needed to determine the particular risk factors and developmental pathways relating to problem gambling in this cohort.

Social Learning and Modelling

Research suggests that social learning assists in the development of an individual's subjective norms, which can result in the development and normalizing of gambling behaviours (Blaszczynski & Nower, 2002; Moore & Ohtsuka, 1997), with one study showing that over 67% of 14 to 25 year olds surveyed had gambled with family (Moore & Ohtsuka, 1997). Delfabbro and Thrupp (2003) found that adolescents with family and peers who either gambled or approved of the behaviour, presented with significantly higher levels of gambling behaviours. This finding further enforces the notion that social gambling norms, developed through social learning, are strong predictors of adolescent gambling, and such early onset can be predictive of gambling severity (Burge et al., 2004).

In retrospective accounts of gambling behavior, 25% to 40% of adult problem gamblers have reported that their parents were also problem gamblers (Hardoon & Derevensky, 2001). In a sample of individuals diagnosed with a problem gambling disorder, Grant and Kim (2002) found that over 26% of participants reported that their father gambled problematically, and between 20% and 25% reported that their mother gambled problematically. Vachon, Vitaro, Wanner, and Tremblay (2004)

identified regression pathways between adolescent gambling frequency and both paternal and maternal gambling frequency and severity. Vachon et al. (2004) proposed that the associations found between parental and adolescent gambling behaviours result from parental modelling of gambling behaviours and the presentation of gambling in a positive way.

Gupta and Derevensky (1998) reported that “parents are willing role models to their children’s gambling” (p. 323), suggesting that parents are often aware of and accepting of their children’s gambling behaviours (Hardoon & Derevensky, 2001). Campbell, Derevensky, Meerkamper, and Cutajar (2011) assessed parental attitudes towards their children’s gambling and found that child gambling was perceived as less problematic than other risky behaviours. Delfabbro and Thrupp (2003) suggest that parental gambling influence can also be unintentional, with children observing parental excitement when they win or even when they are waiting for the lottery results on television. Gambling may also be encouraged by the inclusion in times of family gambling of such activities as sports bets, horse races and card games, which are generally positive times of excitement and socializing (Delfabbro & Thrupp, 2003; Hardoon & Derevensky, 2001). Such positive contact with gambling during these times may influence children’s beliefs about gambling and winning (Moore & Ohtsuka, 1997), specifically in regard to developing positive attitudes towards gambling and an understanding that it is a socially acceptable activity. Furthermore, involvement in, or even just observation of gambling allows children to learn how to gamble and the processes involved, increasing future accessibility. In addition to the evidence of a parental influence on gambling, research has shown a strong link between gambling behaviours of young people and the behaviour of their peers, particularly in regard to gambling onset and problem gambling (Donati, Chiesi, & Primi, 2013; Hardoon & Derevensky, 2001; Moore & Ohtsuka, 1997).

Donati, Chiesi, and Primi (2013) reported peer gambling to be more strongly associated with adolescent at-risk problem gambling than parental gambling. They found that adolescents with peers who gambled were 1.64 times more likely to fit the classification of an at-risk problem gambler than those without gambling peers (Donati et al., 2013). Hardoon and Derevensky (2001) noted that 44% of adolescents reported that the gambling behaviours of their peers led to the initiation of their gambling. Research has postulated that adolescents are more likely than adults to be influenced by peers and to take risks on the basis that they desire peer approval which is gained through displays of bravery and risk-taking (Delfabbro & Thrupp, 2003; Gardner & Steinberg, 2005). In addition, emerging adults typically become immersed in peer relationships and move away from the regulation provided in childhood and adolescence by their parents (Arnett, 2000).

The evidence suggests that parents and peers contribute to the development of social norms and the subsequent development of gambling behaviours, and it is clear that the perceived normality of a behaviour has a significant effect upon one’s engagement in the behaviour. Through greater involvement in gambling behaviours emerging adults are at greater risk of becoming problem gamblers. Furthermore,

how normal a behaviour is considered to be is a determinant of stigma towards that behaviour (Arboleda-Flórez, 2002; Horch & Hodgins, 2008; Quinn & Chaudoir, 2009).

The Role of Stigma

Stigma is socially constructed and allows for an individual or group to be distinguished from the majority based on a perceived identity or a personal attribute. Attributes are generally “shameful” or “negative”, and are typically related to appearance, mental or physical illness, religious background, or pathological behaviours like substance abuse and problem gambling (Arboleda-Flórez, 2002; Horch & Hodgins, 2008; Quinn & Chaudoir, 2009). Hing, Holdsworth, Tiyce, and Breen (2014) suggested that stigma is a tool by which society can differentiate between “normal” and “abnormal” individuals, the consequence of which can be social devaluation and discrimination (Arboleda-Flórez, 2002; Horch & Hodgins, 2008; Quinn & Chaudoir, 2009). Stigma can be conceptualized in two main forms – perceived public stigma and self-stigma. Public stigma is defined as negative societal perceptions about an individual, group or behaviour, which can result in prejudice and stereotyping (Corrigan, Markovitz, Watson, Rowan, & Kubiak, 2003). Self-stigma is the internalization of these negative public views and attaching the corresponding negative stereotypes to oneself.

In regard to gambling, it is important to make a distinction between perceived public stigma towards gambling in general, and that which is directed towards problem gambling. In the Australian context there is little stigma associated with gambling behaviour in general. There are currently high levels of public gambling acceptance and engagement (Australian Government, 2014). It could be argued that this social acceptance and positive presentation of everyday gambling behaviours, may reduce associated stigma through increased interpersonal contact with the gamblers or gambling in general (Hardoon & Derevensky, 2001; Horch & Hodgins, 2008). Problem gambling, however, does carry with it a perceived public stigma, perhaps because of the stigmatizing perceptions of behaviour classed as pathological or “abnormal” (Arboleda-Flórez, 2002; Horch & Hodgins, 2008; Quinn & Chaudoir, 2009). Horch and Hodgins (2013) tested gambling response stereotypes and found that problem gamblers were generally viewed as desperate, irresponsible risk takers. There is a plethora of evidence regarding the negative effects of stigma associated with problem gambling upon an individual, which include anxiety, depression, shame, and reduced help seeking behaviours (Hing et al., 2014).

We suggest that parental and peer problem gambling may influence emerging adult problem gambling behaviour by normalizing gambling and hence reducing internalized public stigma or self-stigma relating to gambling and by extension, problem gambling. In this sense low problem gambling self-stigma may function to promote and worsen problem gambling behaviours. Supporting this, Yi and Kanetkar (2010) found that moderate and high risk gamblers had more positive attitudes to gambling when compared to low risk gamblers. To date, few studies have examined the role of stigmatizing perceptions of problem gambling (Hing et al., 2014). Existing studies

predominantly problematize the stigma associated with problem gambling, specifically in relation to help-seeking behaviours. It is possible, however, that high self-stigma may be associated with fewer problem gambling behaviours, and as such, could be viewed in a positive light. The current study aimed to investigate self-stigma as a potential mediator of the parental and peer effect on emerging adult problem gambling, further informing our knowledge of the developmental pathways relating to problem gambling.

This study used a cross-sectional design and a community sample of Australian emerging adult gamblers to explore these social influences on stigmatizing perceptions and problem gambling behaviour. Based on these aims and relevant past research, the study hypotheses were as follows.

H1: Emerging adult problem gambling would be positively correlated with self-reported perceptions of maternal problem gambling, paternal problem gambling and peer problem gambling.

H2: Problem gambling self-stigma would be negatively correlated with emerging adult problem gambling, as well as self-reported perceptions of maternal problem gambling, paternal problem gambling, and peer problem gambling.

H3: Mediation models were explored, where high perceptions of maternal problem gambling, paternal problem gambling, and peer problem gambling were expected to predict low levels of stigma, which in turn would result in high levels of emerging adult problem gambling.

H4: The three social influences as well as problem gambling self-stigma would account for a significant proportion of variance in emerging adult problem gambling.

Method

Participants

A community sample of 188 Australian emerging adult gamblers, aged 18 to 29 ($M = 21.41$, $SD = 2.99$); 130 females (69.1%), 55 males (29.3%) and 3 undisclosed subjects (1.6%), were recruited online using social media. To be included in the study participants had to be between the ages of 18 and 29 and to have gambled at least once in past 6 months prior to completing the survey. Over 75% of the sample were aged between 18 and 23. Sixty-seven percent of the sample reported a preference for gambling with their peers, while 10% preferred to gamble with their mother, 6% with their father, and 17% preferred to gamble alone.

Measures

Participants were presented with a demographics questionnaire consisting of age, gender, and gambling preferences.

Problem gambling. The Canadian Problem Gambling Index's 9-item Problem Gambling Severity Index (PGSI) (Wynne, 2003) was used to measure and categorize an individual's problem gambling behaviour using a Likert type scale of 0 (Never) to 3 (Almost always). Item scores were summed to produce a total gambling score outcome variable. Total scores of 8 or more are considered to reflect problem gambling with negative consequences and a possible loss of control. Validity testing of the PGSI has indicated greater internal consistency ($\alpha = .84$) than the alternative measures of the South Oaks Gambling Scale (SOGS) or the DSM-IV, while test-retest results have indicated the PGSI (.78) was more reliable than the SOGS (.75) yet less than the DSM-IV (.91) (Wynne, 2003). The PGSI has also been shown to have good content validity, concurrent validity with the SOGS and DSM-IV measures, and had the highest predictive validity through correlations with clinical assessment results (Wynne, 2003). In the current study Cronbach alpha coefficient was $\alpha = .93$.

Participants whose mother gambled were presented the Maternal Problem Gambling Severity Index (MPGSI), to assess the perceived levels of their mother's problem gambling. The instructions of the PGSI were altered to ask participants their perceptions of their mother's gambling. The same process was followed for their fathers (FPGSI) and a gambling peer (PPGSI). Internal reliability tests of the MPGSI produced a Cronbach alpha coefficient of .95. The FPGSI had good internal consistency within the study sample, $\alpha = .95$. The Peer Problem Gambling Severity Index (PPGSI) produced a high Cronbach alpha of .93. Non-gambling mothers and fathers were scored as zero.

Gambling stigma / perceptions. Participants were asked to think of a gambler that they know before completing the 21 item Gambling Perception scale, which was designed to measure the participant's level of stigma towards problem gamblers (see Appendix A). Each item asks for a response relating to problematic outcomes for a gambler. For example, "I would think that it is the gambler's own fault that he/she is in the present condition." This scale is a modified version of the Attributional Model of Public Discrimination Towards Persons with Mental Illness, which has demonstrated good internal reliability (Corrigan et al., 2003). This questionnaire was scored on a scale from 1 to 9. Averaged scores (items representing each construct were summed and divided by the number of items producing a scoring range of 1 to 9) were calculated for the subscales (Table 1) of personal responsibility (gambler is responsible for his/her problems, $M = 6$, $SD = 1.7$), pity (for the gambler, $M = 4.9$, $SD = 1.9$), anger (towards the gambler, $M = 4.5$, $SD = 2.2$), fear (of the gambler, $M = 2.9$, $SD = 1.7$), helping (likelihood of helping the gambler, $M = 5.7$, $SD = 1.7$), and Coercion/Segregation (gambler should be isolated from society, $M = 3$, $SD = 1.6$). The scale includes some reverse scored items and high scores on each of the subscales represent greater stigmatizing attitudes towards problem gambling. Reliability tests of the Gambling Perception scale in the current study produced high internal reliability scores for each of the subscales (above .7 for all subscales except for the Personal Responsibility subscale, which was approaching the cut-off value, .69) (Field, 2013). Principal component analysis using oblique rotation revealed a six factor model for the revised scale (accounting for 71.7% of variance), replicating the factor structure from

Table 1
Descriptive Statistics for Problem Gambling and Stigma Variables

	Mean	SD	Skew	Kurtosis
PGSI	1.64	3.8	2.8	7.3
MPGSI	0.73	2.8	5.1	29.8
FPGSI	1.16	3.4	3.7	15.5
PeerPGSI	2.7	4.5	2.1	5.3
PersResp Stigma	6.0	1.6	-.37	-.39
Pity Stigma	4.8	1.9	-.01	-.32
Anger Stigma	4.5	2.2	.08	-.81
Fear Stigma	2.9	1.7	.83	-.16
Helping Stigma	5.8	1.7	-.36	-.12
CoeSegStigma	3.0	1.5	.77	.6

Note. PGSI = Problem Gambling Severity Index; MPGSI = Maternal Problem Gambling Severity Index; FPGSI = Paternal Problem Gambling Severity Index; PPGSI = Peer Problem Gambling Severity Index; PersResp = Perceived Personal Responsibility; CoeSeg = Coercion/Segregation.

Corrigan et al. (2003) using the original version. Indicators of sampling adequacy were verified by Kaiser-Meyer-Olkin (KMO) .77 and Bartlett's Test of Sphericity ($p < .001$). While certain questions loaded more weakly onto a second factor the items were retained for the current analysis (see Appendix B).

Procedure

Approval for this study was granted by the Federation University ethics committee. Data were collected in 2014. Participants were recruited from online sources such as Facebook, where they were directed to Survey Monkey to complete an online survey.

Analysis

Simple mediation analysis was conducted using PROCESS for SPSS (Hayes, 2013). As correlational findings revealed that only peer gambling was related to stigma, a peer gambling mediation model was tested. The model for simple mediation was model 4 in PROCESS. This conceptual models are shown in Figure 1. As shown, for the simple mediation, there was a proposed direct path from peer problem gambling to emerging adult problem gambling, and also an indirect path through self-stigma. The number of bootstrap samples for bias corrected bootstrap confidence intervals was 10,000, and a bootstrapped 95 confidence interval (CI) was used to infer significance. Significance is supported if the confidence interval does not include zero

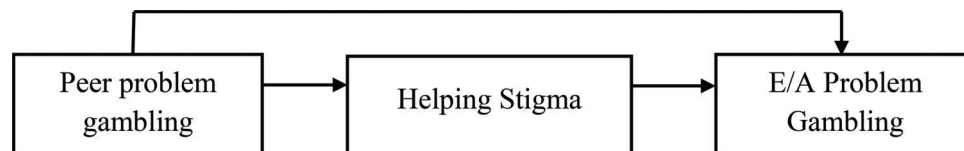


Figure 1. Conceptual path model of the simple mediation model tested in the study.

(Hayes, 2013). The prediction of emerging adult problem gambling was tested using hierarchical regression. Because of concerns over normality 10,000 bootstrapped samples were taken, and a bootstrapped 95 confidence interval (CI) was used to infer significance.

Data were collected and exported from Survey Monkey to IBM SPSS for analysis. Analysis of the skewness values and distribution shapes produced indicated that the variables Age, Gender, PGSI, MPGSI, FPGSI, and PPGSI were positively skewed while the Stigma scales were normally distributed (Table 1). The distribution normality was further explored through the use of the Kolmogorov-Smirnov statistic, which again indicated the assumption of normality was violated for the above variables. Based on problem gambling prevalence rates, community samples are expected to be positively skewed, and as such, the original untransformed data was used throughout the statistical analyses and all analyses utilized bootstrapping procedures.

Results

Gambling severity scale responses indicated that 17 of the 188 participants and 29 peers met the classification of problem gambler (a score of 8 or more), while only 7 mothers and 15 fathers were perceived to be problem gamblers (See Table 2). Descriptive statistics for each of the variables are in Table 1.

In regard to the first hypothesis, as shown in Table 3, Pearson's Bootstrapped correlations indicated that emerging adult problem gambling was positively related to perceived paternal, peer and maternal gambling behaviour, suggesting that perceptions of peer and parental problem gambling are related to emerging adult problem gambling.

In regard to Hypothesis Two, as shown in Table 3, perceived peer gambling was negatively related to problem gambling helping stigma, suggesting that greater exposure to peer gambling is associated with less help related stigmatizing views on problem gambling. That is, high perceived peer gambling was related to a greater likelihood that participants would help a problem gambler. Neither perceived

Table 2
Percentage of Individuals in Each Category of Problem Gambling Severity

Gambling Severity	Percentage			
	E/Adults	Mothers	Fathers	Peers
Non-Problem Gambler	66	91	80.9	58
Low Risk Problem Gambler	17	1.6	6.4	8
Moderate Risk Problem Gambler	8	3.7	4.8	18.6
Problem Gambler	8.9	3.7	7.8	15.4

Table 3

Bootstrapped Pearson's Correlations for Age, Gender, Stigma Subscales, and Problem Gambling

	MPGSI	FPGSI	PPGSI	Age	Gender	PersResp	Pity	Anger	Fear	Helping	CoeSeg
PGSI	.29**	.33**	.29**	.36**	.32**	-.13	-.11	-.05	0	-.18*	-.04
MPGSI		.39**	.07	.05	0	-.06	.02	-.06	.02	-.01	0
FPGSI			.09	.01	.1	0	-.08	.02	.01	.05	.02
PeerPGSI				.25**	.22**	0	0	.04	-.12	-.27**	-.06
Age					.34**	0	-.05	-.04	-.13	-.24**	-.16*
Gender						.11	.01	-.15	-.08	-.1	.05
PersResp							.19*	.1	-.01	.07	.02
Pity								-.1	-.04	.26**	.16*
Anger									.41**	.08	.14
Fear										.26**	.55**
Helping											.32**

Note. PGSI = Problem Gambling Severity Index; MPGSI = Maternal Problem Gambling Severity Index;

FPGSI = Paternal Problem Gambling Severity Index; PPGSI = Peer Problem Gambling Severity Index.

PersResp = Perceived Personal Responsibility; CoeSeg = Coercion/Segregation. Gender: Female = 1, Male = 2

* $p < .05$. ** $p < .01$

maternal problem gambling nor perceived paternal problem gambling were related to problem gambling stigma.

As shown in Table 3, correlations also revealed that helping stigma was negatively related to participant problem gambling, suggesting that lower help-related stigmatizing perceptions were related to higher emerging adult problem gambling. Also of note in Table 3, being male and older were associated with greater problem gambling as well as perceived peer problem gambling.

Simple Mediation

First, we tested the hypothesized mediation model where helping stigma mediated the relationship between perceived peer problem gambling and emerging adult problem gambling. Parental gambling models were not tested as they were not related to stigma (Table 3). The direct effect confidence interval did not contain zero; however, the indirect effect confidence interval did contain zero. The findings are not supportive of mediation by helping stigma on the relationship between perceived peer problem gambling and emerging adult problem gambling. The direct effect of perceived peer problem gambling on emerging adult problem gambling was not explained by helping stigma.

Regression

To determine the best predictors of problem gambling and test hypothesis four we performed a multiple hierarchical regression analysis (Table 4). As age and gender were significantly related to problem gambling, they were included in the hierarchical

Table 4

Statistics for $r = 10,000$ Bootstrapped Regressions for Predictors of Emerging Adult Problem Gambling

	Problem Gambling				
	B	Bias	SE	Sig.	B[95% CI]
Step 1					
Age	.356	-.003	.12	.008	(.115, .601)
Gender	1.82	-.015	.56	.003	(.766, 2.97)
Step 2					
Age	.266	-.014	.12	.043	(.023, .493)
Gender	1.61	-.083	.53	.007	(.517, 2.62)
MPGSI	.254	-.019	.128	.039	(-.006, .487)
FPGSI	.227	.025	.144	.094	(.032, .597)
PPGSI	.118	-.006	.089	.215	(-.065, .284)
Helping	-.116	-.001	.214	.605	(-.52, .311)
PersResp	-.29	-.004	.200	.158	(-.711, .07)
Pity	-.108	.016	.151	.504	(-.386, .197)

Note. B = unstandardized average bootstrap estimate; SE = standard error; Sig = Significance (2-tailed); B[95% CI] = Bootstrapped 95% Confidence interval.

regression model at Step 1, the three social influences of perceived maternal, paternal and peer problem gambling along with helping stigma, personal responsibility stigma, and pity stigma were entered at Step 2.

At Step 1 age and gender explained a significant 17% of the variance in problem gambling, $R^2 = .17$, adjusted $R^2 = .16$, $F(2,172) = 17.7$, $p < .001$.

At Step 2 the three parental/peer facets and the three stigma facets were added and contributed an additional 16% of variance $\Delta R^2 = .16$, $\Delta F(6,166) = 6.62$, $p < .001$. In combination the variables explained 33.1% of the variance in problem gambling, $R^2 = .331$, adjusted $R^2 = .298$, $F(8,166) = 10.25$, $p < .001$. In the final model, being male, older and having higher perceived maternal problem gambling scores were the only significant unique predictors of participants' problem gambling.

Discussion

The aims of the current study were to explore potential social influences in the form of peer and parental problem gambling on emerging adult problem gambling and to determine if these effects occur because of a reduction in gambling-related self-stigma. The results revealed that the participants were more likely to engage in gambling with peers rather than with parents. Participants' peers were also more likely to be perceived as having a gambling problem, when compared to mothers or fathers. Perceived peer problem gambling and parental problem gambling were shown to be positively related to problem gambling in emerging adults (H1). As hypothesized, problem gambling-related self-stigma (specifically helping stigma) was

inversely related to emerging adult problem gambling (H2). Stigmatizing perceptions of problem gambling did not, however, mediate the relationships as expected (H3). When variables were regressed together onto emerging adult problem gambling only gender, age, and perceived maternal problem gambling were significant unique predictors.

In relation to the direct path between perceived parental and peer problem gambling and participant problem gambling, correlations revealed that higher levels of problem gambling were associated with higher levels of perceived peer, maternal, and paternal problem gambling (H1). These findings suggest that a mother and a father's gambling are important in the development of emerging adult problem gambling. Consistent with previous research, these findings also suggest that peer gambling is related to the initiation or maintenance of gambling behaviours in emerging adults and the increased likelihood of developing a gambling problem (Delfabbro & Thrupp, 2003; Donati et al., 2013; Hardoon & Derevensky, 2001). Emerging adults with problem gambling behaviours may also choose to associate with peers who also gamble. Thus, while causation cannot be inferred, it is nonetheless likely that the peer problem gambling is an important influence in emerging adult problem gambling behaviour (Blaszczynski & Nower, 2002). This peer influence may function as Blaszczynski and Nower (2002) suggest through operant and classical conditioning, and may also function through the social development of attitudes towards gambling.

We proposed a mediation model whereby exposure to gambling through family and friends would normalize the behaviour, reduce self-stigma, and increase emerging adult problem gambling. This indirect pathway between one's social influences and gambling through reduced stigma has never been investigated, making the current findings exploratory. As only perceived peer problem gambling was found to be related to helping stigma (H2), the parental models were not tested. The mediation analysis using peer problem gambling was not significant thus rejecting Hypothesis Three. While helping stigma was inversely related to both perceived peer problem gambling and participant problem gambling, this pathway did not explain the relationship between perceived peer problem gambling and emerging adult problem gambling. Our results suggest that while family and peer influences are significant in emerging adult problem gambling, these links are not explained by socialized normalizing of problem gambling behaviours. Research is needed to determine the means by which those we know influence our own gambling behaviours.

Our results also suggest that emerging adults' peers influence their normative attitudes to problem gambling. In particular, it appears that having friends that gamble problematically may increase empathic responses to problem gamblers and increase the likelihood of helping a problem gambler in need. As such, it may be that within friendship groups gambling problems are likely to elicit supportive responses. In contrast, perceived parental problem gambling had no influence on stigmatizing perceptions of problem gambling. It is likely that for emerging adults peer behaviour and interaction with peers would be currently driving their own values more so than

parent interactions. The effects of parental problem gambling at this period of life may be more subtle, and unconscious, as emerging adults transition from adolescent dependence on their parents to more independent status as a young adult (Arnett, 2000).

Interestingly, past research has suggested that peer influence may be more salient for young men than for young women (Cassidy, 2013; Morton, 2003). As there were only 55 men in this study, we were limited in assessing gender differences, however gender was a strong predictor of problem gambling with men scoring higher. Certainly further research is needed to determine if social influences on emerging adult problem gambling are gender specific.

Finally, our regression results revealed that the combined social influences along with three of the stigma subscales (personal responsibility, pity and helping) accounted for 33% of the variance in emerging adult problem gambling (H4). This is a large portion of variance, especially given that there are so many factors known to influence problem gambling in young people (Hardoon & Derevensky, 2001). This finding suggests that significant others play an important role in the development of problem gambling. Interestingly only age, gender and perceived maternal problem gambling were unique predictors in the final model. This suggests that being older, male, and having a maternal gambling influence are the most important factors for increased emerging adult problem gambling. While the influence of gender has been widely reported, the results for age and maternal influence are more intriguing.

It appeared that those in the higher age bracket were also higher problem gamblers. This may be related to higher income and also a greater length of exposure to gambling culture and activities. The importance of maternal gambling is surprising given perceived maternal problem gambling levels in the current study were low ($M = .73$). It appears that when social influences are evaluated together the maternal influence on gambling is strongest, suggesting in turn that, whereas less common in family contexts, the existence of maternal gambling problems is a significant factor for children's future gambling behaviours.

These results are similar to Hayatbakhsh et al. (2006) who conducted a longitudinal study of the predictors of problem gambling development and found that maternal factors were most important. Among the most salient predictors found in their Australian study were being male, low maternal education levels, maternal tobacco and alcohol use in childhood or adolescence, problems in mother-child communication, and having a mother in a de facto relationship during the developing years. It may be that the maternal influence on problem gambling development is under-reported in current literature because of lower female problem gambling levels in general. Our findings also suggest that this maternal influence is not mediated by the development of gambling norms and lower problem gambling self-stigma. As such, future research is needed both to confirm and explain the role of maternal problem gambling in the development of problem gambling behaviours in young people.

Limitations

This study possessed a number of strengths including the use of a sample of emerging adults varying in age, gender and problem gambling severity. The use of the PGSI provided this research project with a highly valid measure of gambling severity. However, modification of this scale to produce measures of perceived maternal, paternal and peer gambling severity, may have also altered the validity and reduced the accuracy of the measures of perceived parental and peer gambling severity. Similarly, the Gambling Perception Scale was adapted from Corrigan et al.'s (2003) Attributional Model of Public Discrimination Towards Persons with Mental Illness scale. It is also difficult to determine the degree to which the scale measured self-stigma towards gambling in general and problem gambling. This distinction has been found to be important as in Australia public gambling stigma is low, whereas public problem gambling stigma is high (Horch & Hodgins, 2008). Participants were asked to think of a problem gambler they knew, and as such, the gamblers imagined or drawn upon would be varied along the problem gambling continuum. Moreover, it has also been argued that explicit measures of attitudes toward sensitive issues are susceptible to social desirability bias (Yi & Kanetkar, 2010). However, as previously explained, the use of modified scales was necessary as pre-existing measures were not readily available. Finally, as a cross-sectional correlational study, with limited socio-demographic information on participants, cause-effect and generalization cannot be concluded.

Conclusion

The results of the study confirmed that perceived peer and parental problem gambling predicts problem gambling in emerging adults. There was no support for the mediating role of stigma despite a weak inverse relationship between helping self-stigma and emerging adult problem gambling. Future research, using robust sample sizes is warranted, given the importance of identifying the predictors of problem gambling behaviours among young adults in a country with high overall acceptance of gambling.

References

- American Psychiatric Association. (2013). Substance-related and addictive disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author
- Arboleda-Flórez, J. (2002). What causes stigma? *World Psychiatry*, 1, 25–26. Retrieved from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1489829>
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55, 469–480. doi:10.1037/0003-066X.55.5.469

Australian Government (2014). *The facts: Problem gambling*. (n.p.). Retrieved from: <http://www.problemgambling.gov.au/facts>

Australian Government Productivity Commission (2005). *Economic implications of an ageing Australia: Productivity Commission research report*. Canberra, AU: Author. Retrieved from: <http://www.pc.gov.au/inquiries/completed/ageing/report/ageing.pdf>

Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction*, 97, 487–499. doi:10.1046/j.1360-0443.2002.00015.x

Burge, A. N., Pietrzak, R. H., Molina, C. A., & Petry, N. M. (2004). Age of gambling initiation and severity of gambling and health problems among older adult problem gamblers. *Psychiatric Services*, 55, 1437–1439. doi:10.1176/appi.ps.55.12.1437

Burge, A. N., Pietrzak, R. H., & Petry, N. M. (2006). Pre/early adolescent onset of gambling and psychosocial problems in treatment-seeking pathological gamblers. *Journal of Gambling Studies*, 22, 263–274. doi:10.1007/s10899-006-9015-7

Campbell, C., Derevensky, J., Meerkamper, E., & Cutajar, J. (2011). Parents' perceptions of adolescent gambling: A Canadian national study. *Journal of Gambling Issues*, 25, 36–53. doi:10.4309/jgi.2011.25.4

Cassidy, R. (2013). “A place for men to come and do their thing”: Constructing masculinities in betting shops in London. *The British Journal of Sociology*, 65, 170–191. doi:10.1111/1468-4446.12044

Corrigan, P., Markowitz, F. E., Watson, A., Rowan, D., & Kubiak, M. A. (2003). An attribution model of public discrimination towards persons with mental illness. *Journal of Health and Social Behavior*, 44, 162–179. doi:10.2307/1519806

Delfabbro, P., & Thrupp, L. (2003). The social determinants of youth gambling in South Australian adolescents. *Journal of Adolescence*, 26, 313–330. doi:10.1016/S0140-1971(03)00013-7

Derevensky, J. L., Gupta, R., & Winters, K. (2003). Prevalence rates of youth gambling problems: Are the current rates inflated? *Journal of Gambling Studies*, 19, 405–425. doi:10.1023/A:1026379910094

Donati, M. A., Chiesi, F., & Primi, C. (2013). A model to explain at-risk/problem gambling among male and female adolescents: Gender similarities and differences. *Journal of Adolescence*, 36, 129–137. doi:10.1016/j.adolescence.2012.10.001

Echeburúa, E., González-Ortega, I., de Corral, P., & Polo-López, R. (2011). Clinical gender differences among adult pathological gamblers seeking treatment. *Journal of Gambling Studies*, 27, 215–227. doi:10.1007/s10899-010-9205-1

Field, A. (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). London, UK: Sage Publications.

Gainsbury, S. M., Russell, A., Hing, N., Wood, R., Lubman, D. I., & Blaszczynski, A. (2014). The prevalence and determinants of problem gambling in Australia: Assessing the impacts of interactive gambling and new technologies. *Psychology of Addictive Behaviors*, 28, 769–779. doi:10.1037/a0036207

Gardner, M., & Steinberg, L. (2005). Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: An experimental study. *Developmental Psychology*, 41, 625–635. doi:10.1037/0012-1649.41.4.625. Retrieved from: <https://secure.uwf.edu/smathews/documents/peerroleinrisktakinggardnerandsteinberg.pdf>

Gowing, L. R., Ali, R. L., Allsop, S., Marsden, J., Turf, E. E., West, R., & Witton, J. (2015). Global statistics on addictive behaviours: 2014 status report. *Addiction*, 110, 904–919. doi:10.1111/add.12899

Grant, J. E., & Kim, S. W. (2002). Gender differences in pathological gamblers seeking medication treatment. *Comprehensive Psychiatry*, 43, 56–62. doi:10.1053/comp.2002.29857

Gupta, R., & Derevensky, J. L. (1998). Adolescent gambling behavior: A prevalence study and examination of the correlates associated with problem gambling. *Journal of Gambling Studies*, 14, 319–344. doi:10.1023/A:1023068925328

Hardoon, K. K., & Derevensky, J. L. (2001). Social influences involved in children's gambling behavior. *Journal of Gambling Studies*, 17, 191–215. doi:10.1023/A:1012216305671

Hayatbakhsh, M. R., Najman, J. M., Aird, R., Bor, W., O'Callaghan, M., Williams, G., ... Heron, M. (2006). *Early life course determinants of young adults' gambling behavior: An Australian longitudinal study*. Brisbane, AU: University of Queensland. Retrieved from: <https://publications.qld.gov.au/storage/f/2014-06-20T01%3A29%3A19.283Z/early-life-course-determinants-of-young-adults-gambling-behaviour.pdf>

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.

Hing, N., Holdsworth, L., Tiyce, M., & Breen, H. (2014). Stigma and problem gambling: Current knowledge and future research directions. *International Gambling Studies*, 14, 64–81. doi:10.1080/14459795.2013.841722

Horch, J. D., & Hodgins, D. C. (2008). Public stigma of disordered gambling: Social distance, dangerousness, and familiarity. *Journal of Social and Clinical Psychology, 27*, 505–528. doi:10.1521/jscp.2008.27.5.505

Horch, J. D., & Hodgins, D. C. (2013). Stereotypes of problem gambling. *Journal of Gambling Issues, 28*, 1–19. doi:10.4309/jgi.2013.28.10

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

Morton, S. (2003). *At odds: Gambling and Canadians; 1919-1969*. Toronto, ON: University of Toronto Press.

Quinn, D. M., & Chaudoir, S. R. (2009). Living with a concealable stigmatized identity: The impact of anticipated stigma, centrality, salience, and cultural stigma on psychological distress and health. *Journal of Personality and Social Psychology, 97*, 634–651. doi:10.1037/a0015815

Rahman, A. S., Pilver, C. E., Desai, R. A., Steinberg, M. A., Rugle, L., Krishnan-Sarin, S., & Potenza, M. N. (2012). The relationship between age of gambling onset and adolescent problematic gambling severity. *Journal of Psychiatric Research, 46*, 675–683. doi:10.1016/j.jpsychires.2012.02.007

Shaffer, H. J., & Hall, M. N. (2001). Updating and refining prevalence estimates of disordered gambling behaviour in the United States and Canada. *Canadian Journal of Public Health, 92*, 168–172. Retrieved from: file:///C:/Users/Boyd/Downloads/102-102-1-PB%20(3).pdf

Tavares, H., Zilberman, M. L., Beites, F. J., & Gentil, V. (2001). Gender differences in gambling progression. *Journal of Gambling Studies, 17*, 151–159. doi:10.1023/A:1016620513381

Vachon, J., Vitaro, F., Wanner, B., & Tremblay, R. E. (2004). Adolescent gambling: Relationships with parent gambling and parenting practices. *Psychology of Addictive Behaviors, 18*, 398–401. doi:10.1037/0893-164X.18.4.398

Volberg, R. A. (1994). The prevalence and demographics of pathological gamblers: Implications for public health. *American Journal of Public Health, 84*, 237–241. doi:10.2105/ajph.84.2.237

Williams, R. J., Volberg, R. A., & Stevens, R. M. G. (2012). *The population prevalence of problem gambling: Methodological influences, standardized rates, jurisdictional differences, and worldwide trends*. (n.p.). Retrieved from: [https://www.uleth.ca/dspace/bitstream/handle/10133/3068/2012-PREVALENCE-OPGRC%20\(2\).pdf?sequence=3](https://www.uleth.ca/dspace/bitstream/handle/10133/3068/2012-PREVALENCE-OPGRC%20(2).pdf?sequence=3)

Wynne, H. (2003). *Introducing the Canadian problem gambling index*. Edmonton, AB: Wynne Resources. Retrieved from: <http://classes.uleth.ca/201201/hlsc3700a/The%20Canadian%20Problem%20Gambling%20Index.pdf>

Yi, S., & Kanetkar, V. (2010). Implicit measures of attitudes toward gambling: An exploratory study. *Journal of Gambling Issues*, 24, 140-164. doi:10.4309/2010.24.9. Retrieved from: <http://jgi.camh.net/doi/pdf/10.4309/jgi.2010.24.9>

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Appendix A

Gambling Perception Scale

Please think of someone you know or imagine a person, who has found themselves in trouble (e.g. financial, relational, criminal) because of gambling; and complete the following questionnaire: (* indicates reverse scored item).

Q1. I would think that it were the gambler's own fault that he/she is in the present condition.

1—2—3—4—5—6—7—8—9

No, not at all

Yes, absolutely

Q2. How controllable, do you think, is the cause of the gambler's present condition?

1—2—3—4—5—6—7—8—9

Not at all under personal control

Completely under personal control

Q3. How responsible, do you think, is the gambler for their present condition?

1—2—3—4—5—6—7—8—9

Not at all responsible

Very much responsible

Q4. I would feel pity for the gambler.*

1—2—3—4—5—6—7—8—9

None at all

Very much

Q5. How much sympathy would you feel for the gambler?*

1—2—3—4—5—6—7—8—9

None at all

Very much

Q6. How much concern would you feel for the gambler?*

1—2—3—4—5—6—7—8—9

None at all

Very much

Q7. I would feel aggravated by the gambler.

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q8. How angry would you feel at the gambler?

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q9. How irritated would you feel by the gambler?

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q10. How dangerous would you feel the gambler is?

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q11. I would feel threatened by the gambler?

1—2—3—4—5—6—7—8—9

No, not at all

Yes, very much

Q12. How scared of the gambler would you feel?

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q13. How frightened of the gambler would you feel?

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q14. If I were an employer, I would interview the gambler for a job.*

1—2—3—4—5—6—7—8—9

Not likely

Very likely

Q15. I would share a car pool with the gambler each day.*

1—2—3—4—5—6—7—8—9

Not likely

Very likely

Q16. How certain would you feel that you would help the gambler?*

1—2—3—4—5—6—7—8—9

Not at all certain

Absolutely certain

Q17. If I were a landlord, I probably would rent an apartment to the gambler.*

1—2—3—4—5—6—7—8—9

Not likely

Very likely

Q18. I think the gambler poses a risk to his/her neighbours unless he/she received treatment.

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q19. I think it would be best for the community if they were put away in a treatment facility.

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q20. How much do you think a treatment facility, where the gambler can be kept away from his/her neighbours, is best?

1—2—3—4—5—6—7—8—9

Not at all

Very much

Q21. If I were in charge of the gambler's treatment, I would force him/her to live in a group home.

1—2—3—4—5—6—7—8—9

Not at all

Very much

Appendix B

Loadings on six principal components for the Gambling Perception Scale

	Component					
	Fear	Pity	Anger	Helping	PersResp	CoeSeg
1. I would think that it were the gambler's own fault...					.724	
2. How controllable, do you think, is the cause...					.756	
3. How responsible, do you think, is the gambler...					.828	
4. I would feel pity for the gambler		.878				
5. How much sympathy would you feel for the gambler?		.846				
6. How much concern would you feel for the gambler?		.659				
7. I would feel aggravated by the gambler			.918			
8. How angry would you feel at the gambler?			.902			
9. How irritated would you feel by the gambler?			.908			
10. How dangerous would you feel the gambler is?	.481		.332			
11. I would feel threatened by the gambler	.942					
12. How scared of the gambler would you feel?	.966					
13. How frightened of the gambler would you feel?	.954					
14. If I were an employer, I would interview the gambler for a job.				-.783		
15. I would share a car pool with the gambler...		.352		-.509		
16. How certain do you feel that you would help the gambler?				-.585		
17. If I were a landlord I probably would rent an apartment to the gambler				-.863		
18. I think the gambler poses a risk to his/her neighbours unless he/she received treatment						.623
19. I think it would be best for the community if they were put in a treatment facility						.758
20. How much do you think a treatment facility...is best?						.910
21. ... I would force him/her to live in a group home						.748

Note. Extraction method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. Coefficients below .3 suppressed. PersResp = Perceived Personal Responsibility; CoeSeg = Coercion/Segregation.

The Social Casino Gaming-Gambling Link: Motivation for Playing Social Casino Games Determines Whether Self-Reported Gambling Increases or Decreases Among Disordered Gamblers

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Abstract

Engagement with social casino games (i.e., free online casino-like games available on social networking sites) has been found to be a risk factor for increased gambling behaviours (Kim, Wohl, Salmon, Gupta, & Derevensky, 2015). However, this may not be true for all social casino gamers. In the current research, we tested the idea that motivation to play social casino games will predict changes in self-reported gambling behaviours among disordered gamblers. Results showed that disordered gamblers ($N = 140$) who were motivated to play social casino games for the social connection it provides or for skill building reported an increase in their gambling. Conversely, playing in order to cope with negative life events or for excitement was not predictive of gambling. However, gamblers who reported playing social casino games to reduce cravings to gamble reported an overall decrease in gambling. The implications of social casino games as a potential harm reduction strategy for *some* disordered gamblers are discussed.

Keywords: social casino gaming, disordered gambling, gambling, motivation, craving, benefits, harm

Résumé

Il a été démontré que jouer à des jeux sociaux de casino (c'est-à-dire des jeux de casino gratuits en ligne accessibles dans les sites de réseautage social) constitue un facteur de risque d'accroissement des comportements liés au jeu (Kim, Wohl, Salmon, Gupta et Derevensky, 2015). Cette affirmation pourrait cependant ne pas être vraie de tous les adeptes des jeux sociaux de casino. Dans le cadre de la présente

recherche, nous avons mis à l'épreuve l'hypothèse selon laquelle la motivation de jouer à des jeux sociaux de casino serait une variable explicative des comportements de jeu autodéclarés chez les personnes ayant un problème de jeu excessif. Les résultats indiquent que les joueurs compulsifs (N=140) dont la motivation à l'égard des jeux sociaux de casino était de créer des liens sociaux ou de parfaire leurs habiletés ont déclaré avoir observé une augmentation de leurs comportements associés au jeu. Inversement, jouer pour mieux faire face à des événements négatifs dans la vie ou pour le plaisir est une motivation qui ne permet d'effectuer aucune prédiction quant aux comportements liés au jeu. Toutefois, les joueurs qui ont dit jouer à des jeux sociaux de casino pour réduire leur envie de jouer ont affirmé avoir observé une diminution de leurs comportements de jeu. L'étude traite des incidences du recours aux jeux sociaux de casino comme stratégie de réduction des effets négatifs du jeu chez certains joueurs compulsifs.

Introduction

Social casino games are free-to-play, casino-like games available on social networking sites (e.g., Facebook). An important aspect of social casino games is that they are designed to mimic the look and feel of online gambling games (Bramley & Gainsbury, 2015; Gainsbury, Hing, Delfabbro, & King, 2014a), which is a possible explanation for why people who engage in social casino gaming are also more likely to gamble (Gainsbury, Russell, & Hing, 2014b; Parke, Wardle, Rigbye, & Parke, 2013). Moreover, some social casino gamers who have never gambled are lured to gambling as a result of their social casino game play. For example, Kim, Wohl, Salmon, Gupta, and Derevensky (2015) showed that 26% of social casino gamers who had previously never gambled online migrated to online gambling when re-contacted 6 months later. With the link between social casino gaming and gambling crystalizing, researchers in the field of gambling studies have expressed concern that frequent engagement with social casino games may normalize gambling behaviour, thus increasing its frequency (Gainsbury et al., 2015b; Griffiths, 2010; Kim et al., 2015).

On the other hand, anecdotal evidence suggests that playing social casino games may reduce future gambling behaviours, especially among disordered gamblers (see Gainsbury, Hing, Delfabbro, Dewar, & King, 2015a). That is, some disordered gamblers may use social casino games as a proxy or substitute for gambling. Disordered gamblers have self-reported that they use social casino games as a substitute to help reduce their gambling (Gainsbury et al., 2015a; Parke et al., 2013). Thus, whether social casino games increase or decrease gambling may stem, in part, from gamblers' motivation for engaging with social casino games. Disordered gamblers may play social casino games, among other reasons, to build their skills at the game, to escape from negative life events (i.e., play as a coping mechanism), for

the excitement (i.e., enhancement), or for the social connections that it can provide—factors that have been shown to facilitate disordered gambling (see S. H. Stewart & Zack, 2008). However, disordered gamblers might also play social casino games to satiate a craving to gamble (Gainsbury et al., 2015a), a motivation that might decrease gambling. To date, however, no empirical study has examined how various motivations for engaging with social casino games (uniquely) influence gambling behaviour. The research herein fills this empirical gap.

Social Casino Gaming and Gambling

Social casino games are readily available for play on popular social networking sites such as Facebook. As a result, it does not take long for users to become aware of the plethora of casino-styled social games available for play. Non-social casino game users can be introduced to these games when their friends share their scores or “like” the page of the social casino gaming operator. Social casino game companies place ads on Facebook in an attempt to entice new users. In fact, social casino game ads are the most common way for players to become aware of social casino games (SuperData, 2015). Additionally, interested users can find social casino games by typing “casino games” into the search bar in Facebook.

Social networking users can now engage in poker, blackjack, and slots, among other casino-styled games. In contrast to gambling games, in social casino games, no money is required to initiate play and no money is won or lost on the game’s outcome. Instead, the social casino gaming operator provides the players with free “seed” credits to wager on the outcome of the game, and the aim of the player is to win more credits for continued play (Vanhatupa, 2013). However, players can purchase additional credits for monetary payment (known as micro-transactions) in order to continue play or progress in the games.

Although monetary-based outcomes are absent from social casino games, some social casino games have been built to have the same auditory stimulations (e.g., alarms, sound of coins dropping into a metal pan) and visual features found in online gambling games—both of which are meant to mimic the look and sounds of land-based gambling games (see Bramley & Gainsbury, 2015). These visual and auditory features of social casino games (akin to gambling games) are potentially positively reinforcing, which may propel further use of the game (Bramley & Gainsbury, 2015; Derevensky, Gainsbury, Gupta, & Ellery, 2013). Given the similarities between social casino games and gambling, it is perhaps unsurprising that many social casino gamers also gamble (Gainsbury et al., 2014b) and that some social casino gamers eventually migrate to online gambling (Kim et al., 2015).

Particularly worrisome from a public health perspective is that social casino gaming has been linked to a greater risk of individuals endorsing indicators of disordered gambling (King, Delfabbro, Kaptsis, & Zwaans, 2014). The reason for this link might be found in people’s motivation to play online games. According to Griffiths (2003), games on the Internet have the potential to provide short-term comfort,

excitement, and/or distraction from daily routines and escape for those who might wish to leave their troubled world behind. In other words, people may be motivated to play social casino games to inject some excitement into their lives or to help them contend with, among other things, daily life problems—motivations linked to disordered gambling (S. H. Stewart & Zack, 2008). To date, however, no research study has examined whether motivation to play social casino games influences subsequent gambling behaviour. The present research was conducted to fill this gap in the literature.

Does Motivation to Play Social Casino Games Influence Subsequent Gambling?

There is an array of possible reasons for why people play social casino games. One potential reason to engage in these games is to build skill for the equivalent gambling game (see Kim, Wohl, Gupta, & Derevensky, 2016). That is, some people may try to hone their gambling skills by playing the free versions of the game, even when skill building is not objectively possible (e.g., in games of pure chance). This is because casino games are constructed to blur the lines between chance and skill, which leads players to believe that they are skilled by virtue of their success at the games (Wohl, Stewart, & Young, 2011). Additionally, the payout rates on free versions of casino games are typically higher than is observed in online or land-based casino games (Sévigny, Cloutier, Pelletier, & Ladouceur, 2005). Putting a dark line under the issue, the success that social casino gamers experience as a result of higher payout rates may lead them to expect the same successes when they gamble, which would have implications for their future gambling behaviour.

Indeed, Frahn, Delfabbro, and King (2015) found that people who played a free version of a casino game with an inflated payout rate (compared with a standard payout rate) placed higher bets during a subsequent gambling session. These investigators argued that the results were due to a false sense of skill that developed in the inflated payout rate condition. In line with this contention, research has shown that people who believe (or are manipulated to believe) that they have gambling-related skill or ability in games of chance gamble with greater frequency and with larger amounts of money than do those who do not have such beliefs (Goodie, 2005; Moore & Ohtsuka, 1999; Wohl & Enzle, 2002, 2003). By extension, disordered gamblers who think that their skills can be enhanced via social casino games may increase their gambling as a result of social casino game play.

Disordered gamblers may also be motivated to engage with social casino games in order to help them cope with negative life events—a situation that would be akin to S. H. Stewart and Zack's (2008) observation that many disordered gamblers use gambling as a means to cope or escape via the dissociation that often occurs as a result of gambling (see also Diskin & Hodgins, 2001; M. J. Stewart & Wohl, 2013; Wood & Griffiths, 2007). Social casino games share many of the same functional characteristics that facilitate dissociation in gambling games (e.g., the auditory and visual stimulation; Bramley & Gainsbury, 2015). As a result, coping needs may be

satisfied via social casino game play, which may in turn decrease gambling behaviour.

Similarly to what occurs with coping motives, there is a symmetry between the social rewards that people get from playing social casino games and gambling. According to Ocean and Smith (1993) and S. H. Stewart and Zack (2008), one of the fundamental motivations for gambling is the opportunity for socialization and the sense of connectedness with others that it can provide. That is, some people are motivated to gamble because it satisfies the player's social needs. Although Gainsbury et al. (2015a) found that socialization is not a common motivation for engaging in social casino games, social casino games may be socially rewarding. Indeed, social casino gaming is typically embedded in social networking sites such as Facebook. In focus groups conducted with social casino gamers, Kim et al. (2016) found that some people play social casino games to feel connected with others. Disordered gamblers who desire social connection may find that engagement with social casino games satisfies their needs for social interactions, which should also result in decreased gambling behaviours.

S. H. Stewart and Zack (2008), as well as others (e.g., Dechant & Ellery, 2011; Lee, Chae, Lee, & Kim, 2007; Lister, Wohl, & Davis, 2015), also provided evidence that some people are motivated to gamble in order to fulfill their psychological need for fun and excitement. These enhancement motives are positively associated with gambling frequency and symptoms of disordered gambling (S. H. Stewart & Zack, 2008). An important aspect of social casino games, is that, like gambling games, they are designed to provide the player with a sense of excitement (Derevensky et al., 2013; Sapsted, 2013). However, the amount of excitement that can be derived from social casino games is limited because nothing of monetary value is wagered (see Wulfert, Franco, Williams, Roland, & Maxon, 2008, for a discussion on the role of money in the excitement of gambling). Thus, disordered gamblers are unlikely to be motivated to play social casino games for enhancement. The lack of enhancement that they derive from social casino games may, in fact, increase subsequent gambling—a place where their enhancement needs can be satisfied.

Lastly, Parke et al. (2013) argued that social casino games might quench the desire to gamble. Put another way, playing social casino games may reduce cravings to gamble. Gambling behaviour may decrease as a result of social casino game play. If this is shown to be the case, social casino games may have a responsible gambling utility, to say nothing of the potential clinical applications (i.e., clinicians may suggest that disordered gamblers play social casino games as a proxy for gambling). Anecdotal evidence supports this contention. Specifically, in a qualitative study conducted by Gainsbury and colleagues (2015a), some social casino gamers reported using these games as a way to help them avoid engaging in gambling. Although social casino games may normalize gambling, it is possible that social casino gaming can also be used to facilitate more responsible (i.e., reduced) gambling among gamblers motivated to reduce their cravings, which could ultimately decrease disordered gambling (see also Parke et al., 2013). In this way, social casino gaming

may serve as a way for some disordered gamblers to help decrease their gambling behaviours.

Motivations for social casino game play do not occur in isolation. People might have any number of motivations for engagement in social casino gaming. For example, people may be motivated to play social casino games to escape and to reduce their craving to gamble. To date, however, no empirical study has examined how motivations for engaging in social casino gaming affect future gambling behaviours, particularly among disordered gamblers who engage in social casino games.

Overview of the Current Research

Although the current body of empirical literature on social casino games has demonstrated that these games may increase gambling among non-gamblers and recreational gamblers (see Gainsbury et al., 2015b; Griffiths, 2010; Kim et al., 2015, 2016), there is a paucity of research examining the effects of social casino game play among disordered gamblers. In order to empirically assess the relationship between motives for playing social casino games and changes in gambling behaviour, we recruited a community sample of disordered gamblers who engage in social casino games. Because of the preliminary nature of this investigation, we were hesitant to make any strong predictions about the impact that motivations would have on gambling behaviour. However, on the basis of the existing literature, we hypothesized that social and coping motives to play social casino games might decrease gambling (because social casino gaming would provide the same reinforcement as gambling). Conversely, we hypothesized that people who play social casino games to build their skill, as well as those who play for enhancement purposes, would report that engagement with social casino games increased their gambling. Lastly, we hypothesized that disordered gamblers who play social casino games to decrease their craving to gamble would report that engagement in social casino games decreased their gambling.

Method

Participants

Two-hundred seventy-one (179 males, 89 females, 3 unreported) gamblers who play social casino games were recruited from Amazon.com's Mechanical Turk (MTurk). Of the 271 participants, 140 were moderate or disordered gamblers (95 males, 43 females, 2 unreported) according to the Problem Gambling Severity Index (Ferris & Wynne, 2001). Because our focus was on the impact of social casino gaming on gambling among people who gamble excessively, all subsequent analyses used this subsample.¹ For the sake of parsimony, we collapsed the subsample across the moderate and disordered categories, but still refer to it as comprising disordered gamblers. The age of the participants ranged from 19 to 70 years ($M = 31.01$, $SD = 10.10$). All participants were provided \$0.75 US for completing the study. Remuneration was based on normative rates for conducting such a study on MTurk

(see Mason & Suri, 2012). Remuneration tends to be low because people on MTurk participate in research out of interest or to pass the time rather than for the sake of monetary compensation, making MTurk a good source of data (Buhrmester, Kwang, & Gosling, 2011).

Procedure

Participants who agreed to participate were provided with a link to the online survey hosted by Qualtrics. After providing consent, participants completed a series of questionnaires that measured the variables of interest. Upon completion of the questionnaires, participants were automatically directed to the debriefing pages.

An ethics certificate was obtained to conduct this study from the Research Ethics Board at the authors' home institution.

Measures

Problem gambling severity. The Problem Gambling Severity Index (Ferris & Wynne, 2001) was used to measure the participant's level of problem gambling. The participants were asked to indicate on a scale of 0 to 3 (0 = *never*, 3 = *almost always*) how often they had experienced a certain behaviour or emotion in the past 12 months. The index consists of nine ($\alpha = .93$) items that assess problem gambling. Examples of questions include the following: "Have you borrowed money or sold anything to get money to gamble?" or "Have you felt that you might have a problem with gambling?" The participant's scores were then summed in order to calculate their level of problem gambling and categorized as either non-problem (0), low risk (1-2), or moderate and problem (3+).

Motivation for playing social casino games. Motives for playing social casino games were assessed by using an abridged, six-item version of the Gambling Motives Questionnaire (S. H. Stewart & Zack, 2008). To this end, two items ($r = .62$) were used to measure coping motives: "I play social casino games to forget my worries" and "I play social casino games to cheer me up when I'm in a bad mood." Two items ($r = .68$) were used to measure social motives: "Because social casino games are what most of my friends do" and "I play social casino games to be sociable." Finally, two items ($r = .42$) were used to measure enhancement motives: "Because I like the feeling I get playing social casino games" and "Because social casino games are fun." The responses for all items were anchored at 1 (*almost never/never*) and 4 (*almost always*).

Skill building. Two items ($r = .73$) of our own design assessed whether playing social casino games was used as a tool to develop skill for later gambling behaviours: "I play social casino games to practice before I play for real money" and "I play social casino games to build my skills." Responses were anchored at 1 (*almost never/never*) and 4 (*almost always*).

Gambling urge reduction. Lastly, playing social casino games for gambling urge reduction was measured by using a six-item scale ($\alpha = .79$) of our own design. Responses were anchored at 1 (*strongly disagree*) and 7 (*strongly agree*). The items included were as follows: “When I play social casino games, it seems to reduce my urge to gamble for real money,” “I purposely play social casino games to reduce my desire to gamble,” “Playing social casino games seems to trigger my desire to gamble” (reverse coded), “My craving to gamble seems to decrease when I play social casino games,” “When I want to decrease my craving to gamble, I often play social casino games,” and “I don’t play social casino games to lessen my gambling-related urges” (reverse coded).

Gambling behaviours. Self-reported changes in gambling behaviour were measured with a single item. The response was anchored at -3 (*My gambling behaviour has decreased as a result of playing social casino games*) and 3 (*My gambling behaviour has increased as a result of playing social casino games*).

Results

Preliminary Results²

Table 1 shows the means and standard deviations of all measured variables, as well as the correlation between measured variables.

Neither age, $ps > .48$, nor sex, $ps > .06$, had an effect on any of the measured variables with the exception of skill building. Specifically, there was an age and sex effect on playing social casino games to build skill, $p = .003$ and $p = .05$, respectively. We therefore controlled for sex and age in all subsequent analyses.³

Participants who reported increased gambling behaviour reported more social motives ($r = .18$, $p = .02$) and a desire to play social casino games to build skill

Table 1

Correlations Between All Measured Variables (Means and Standard Deviations on the Diagonal)

Variable	Social motives	Skill-building motives	Coping motives	Enhancement motives	Urge reduction motives	Gambling behaviours
Social motives	2.14 (.86)	.16	.27***	.29***	.33***	.18*
Skill-building motives		2.64 (.87)	.20**	.28***	.03	.30***
Coping motives			2.31 (.80)	.30***	.21**	.08
Enhancement motives				2.97 (.55)	.14*	.08
Urge reduction motives					4.04 (1.36)	-.31***
Gambling behaviours						.12 (1.26)

* $p < .05$; ** $p < .01$; *** $p < .001$.

($r = .30$, $p < .001$). Participants who reported decreased gambling behaviour reported higher desire to play social casino games to reduce their urges to gamble ($r = -.31$, $p < .001$). Lastly, neither coping nor enhancement motives were significantly related to self-reported changes in gambling behaviour ($r = .09$, $p = .16$; $r = .08$, $p = .19$).

Main Results

In order to assess whether motives for playing social casino games predicted self-reported changes in gambling behaviour, we conducted a multiple regression analysis with all the motives entered simultaneously. This analysis showed that, together, motives for playing social casino games accounted for a significant amount of the variance in self-reported changes in gambling behaviour $F(7, 127) = 6.59$, $p < .001$, $R^2 = .27$, $R^2_{adjusted} = .23$.

Using social casino games to cope with negative life events did not uniquely predict self-reported changes in gambling behaviour, $\beta = .03$, $t(127) = .38$, $p = .70$. That is, disordered gamblers who indicated that they played social casino games for coping motives did not experience changes in their self-reported gambling behaviour as a result of playing social casino games. Likewise, enhancement motives did not uniquely predict self-reported changes in gambling behaviour, $\beta = -.03$, $t(127) = -.31$, $p = .76$. In contrast, motivations that pertained to the social aspect of social casino games, $\beta = .29$, $t(127) = 3.32$, $p = .001$, skill building, $\beta = .28$, $t(127) = 3.35$, $p = .001$, and reducing gambling-related urges, $\beta = -.41$, $t(127) = -5.01$, $p < .001$, all uniquely predicted self-reported changes in gambling behaviour. Specifically, playing social casino games for social reasons and to practice and build up skills for future gambling activity was related to subsequent increases in self-reported gambling. However, as predicted, disordered gamblers who used social casino games as a tool to reduce their urge to gamble reported a decrease in their gambling behaviour as a consequence of playing social casino games.

Discussion

Social casino games are a popular (and profitable) form of gaming on the Internet (Grubb, 2015), a form that has continued to grow at a rapid rate. As a result, increased research attention has been focused on social casino games, which replicate gambling activities (but are free to play). Specifically, researchers have expressed concern that engagement in social casino gaming may be a gateway to online gambling (Gainsbury et al., 2014a) and empirical research has substantiated this concern (Kim et al., 2015). Herein, we started from the premise that social casino gaming may not have a wholly catalyzing impact on gambling, particularly among disordered gamblers. Indeed, anecdotal evidence suggests some disordered gamblers use social casino games as a way to reduce their gambling behaviour (Gainsbury et al., 2015a). We argue that the effects of social casino gaming on gambling behaviours likely depends on the disordered gambler's motivation for playing social casino games.

Results showed that disordered gamblers who were motivated to play social casino games for social reasons reported increased gambling. In other words, social motivations for playing social casino games are a predictor of increased gambling, which was contrary to our hypothesis. It is possible that the social connections provided by playing social casino games are reinforcing to the disordered gambler, but not entirely satisfying because they do not allow face-to-face social contact. We did not, however, collect data on the quality of socialization that social casino games provide. As a result, this possible explanation for the result is purely speculative. We also found that playing social casino games as a means to build skill was associated with increased gambling. This association makes intuitive sense. The player who uses social casino games as a practice ground for gambling should eventually want to apply their newly honed “skill” for real money (i.e., gambling). Additionally, by practicing their gambling skills in a no-risk environment (i.e., no real money wagered), and winning, gambling behaviour may be reinforced and maintained. Thus, playing social casino games to build skill poses a significant risk for some disordered gamblers.

We find it interesting that social casino game play, as motivated by a desire to cope with negative life events, was not associated with changes in gambling behaviour. One possible explanation for this non-significance may be that social casino games do not allow the person to escape their negative life circumstances in the same manner as gambling does. It is possible, for example, that social casino games do not adequately facilitate dissociation—a psychological state in which players lose track of time and space, thus allowing escape from their current lived experiences (see Jacobs, 1986). Dissociation may fail to occur if players are not adequately engaged in the free-to-play version of the casino game. It would behoove researchers to examine this possibility in future studies.

Playing social casino games for enhancement reasons, akin to the case for coping motives, was not a significant predictor of self-reported changes in gambling behaviour. The lack of an effect for enhancement may be because the amount of excitement that can be derived from social casino games is limited when nothing of monetary value is wagered. According to Wulfert and colleagues (2008), the possibility of winning money is the primary source of excitement that players derive from gambling. In the absence of an opportunity to win money, disordered gamblers are unable to satisfy their enhancement needs via social casino gaming, which would undermine any gambling-reducing utility of social casino game play.

An important finding, and in line with our prediction, was that playing social casino games as a means to reduce gambling urges was associated with a decrease in self-reported gambling. Thus, there appears to be some symmetry between social casino game play and noted use of e-cigarettes among smokers or non-alcoholic beverages among problem drinkers. Specifically, e-cigarettes and non-alcoholic beverages are often used as replacement therapies to help with the cessation of cravings for the respective substances (Bullen et al., 2013; Polosa et al., 2013; Siegel, Tanwar, & Wood, 2011). In this light, the results suggest that social casino gaming may be a viable replacement for gambling among *some* disordered gamblers.

Specifically, social casino games might be an effective tool to assist disordered gamblers who want to moderate (i.e., cut down) their gambling behaviours. However, for those with abstinence goals, social casino games might be too similar to online gambling games and may act as a gambling cue (i.e., situations or observations that trigger the desire to gamble). Indeed, gamblers exposed to gambling cues in a virtual environment reported higher levels of craving to gamble than did controls (Park et al., 2015). For gamblers with moderation goals, on the other hand, social casino games may be used in conjunction with gambling to help keep them within their goals of cutting back. In this light, the research presented herein provides (to our knowledge) the first empirical support for the contention that social casino games may be an effective harm reduction strategy for the treatment of disordered gambling. More research is needed to examine the utility of social casino games as a potential harm reduction strategy for disordered gamblers.

Limitations

It is important to note some limitations. First, although the correlation between the two enhancement items was statistically significant, it was not as strong as the correlations observed for the other social casino gaming motive subscales. This lack of a strong correlation may have created noise that contributed to the insignificant effect of enhancement motives on self-reported gambling behaviour change. Second, we used only two items to assess coping, social, enhancement, and skill-building motives to play social games. The rationale for using only two items was that participants who complete online surveys want those surveys to be short (Schulze, Seedorf, Geiger, Kaufmann, & Schader, 2011). Nonetheless, in future research, methodological rigour would be improved by having more than two items to assess each motive. Lastly, participants were asked to subjectively evaluate how playing social casino games has influenced their gambling. An objective measure of gambling behaviour (and changes in that behaviour) was not included in the research. Additionally, the subjective measure did not specify *how* subsequent gambling behaviour changed (i.e., whether there was a change in the amount of time or money spent gambling). A more objective measure of changes in the amount of time and money spent gambling subsequent to playing social casino games would provide a more accurate representation of how social casino gaming influences gambling.

Conclusion

The consequence of social casino gaming has begun to pique the interest of those in the field of gambling studies. To date, most discourse has focused on the potential impact that social casino games may have on the normalization of gambling (Griffiths, 2010) and thus potential migration to gambling (see Kim et al., 2015). In line with this research, we showed that social casino games increased self-reported gambling among disordered gamblers who are motivated to play for social or skill-building reasons. We also showed that social casino games reduced self-reported gambling among disordered gamblers who use the games as a proxy for

gambling. Thus, social casino gaming might not be wholly bad for disordered gamblers.

References

- Bramley, S., & Gainsbury, S. M. (2015). The role of auditory features within slot-themed social casino games and online slot machine games. *Journal of Gambling Studies*, 31, 1735–1751. doi:10.1007/s10899-014-9506-x
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5. doi:10.1177/1745691610393980
- Bullen, C., McRobbie, H., Thornley, S., Glover, M., Lin, R., & Laugesen, M. (2010). Effect of an electronic nicotine delivery device (e cigarette) on desire to smoke and withdrawal, user preferences and nicotine delivery: Randomised cross-over trial. *Tobacco Control*, 19, 98–103. doi: 10.1136/tc.2009.031567
- Dechant, K., & Ellery, M. (2011). The effect of including a monetary motive item on the Gambling Motives Questionnaire in a sample of moderate gamblers. *Journal of Gambling Studies*, 27, 331–344. doi:10.1007/s10899-010-9197-x
- Derevensky, J., Gainsbury, S., Gupta, R., & Ellery, M. (2013). *Play-for-fun/social-casino gambling: An examination of our current knowledge*. Final Report to the Manitoba Gambling Research Program. Retrieved from <https://www.manitobagamblingresearch.com/system/files/private/Full%20Report%20Play%20For%20Fun%20Social%20Casino%20Gambling-%20An%20Examination%20of%20Our%20Current%20Knowledge.pdf>
- Diskin, K. M., & Hodgins, D. C. (2001). Narrowed focus and dissociative experiences in a community sample of experienced video lottery gamblers. *Canadian Journal of Behavioural Science*, 33, 58–64. doi:10.1037/h0087128
- Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index*. Ottawa, ON: Canadian Centre on Substance Abuse.
- Frahn, T., Delfabbro, P., & King, D. L. (2015). Exposure to free-play modes in simulated online gaming increases risk-taking in monetary gambling. *Journal of Gambling Studies*, 31, 1531–1543. doi:10.1007/s10899-014-9479-9
- Gainsbury, S. M., Hing, N., Delfabbro, P., Dewar, G., & King, D. L. (2015a). An exploratory study of interrelationships between social casino gaming, gambling, and problem gambling. *International Journal of Mental Health and Addiction*, 13, 136–153. doi:10.1007/s11469-014-9526-x

- Gainsbury, S., Hing, N., Delfabbro, P. H., & King, D. L. (2014a). A taxonomy of gambling and casino games via social media and online technologies. *International Gambling Studies*, 14, 196–213. doi:10.1080/14459795.2014.890634
- Gainsbury, S., King, D., Delfabbro, P., Hing, N., Russell, A., Blaszczynski, A., & Derevensky, J. (2015b). *The use of social media in gambling*. Gambling Research Australia. Retrieved from <http://www.gamblingresearch.org.au/resources/d06679ec-3577-4cb0-867c-594ce741dbf6/grasocialmediareport.pdf>
- Gainsbury, S., Russell, A., & Hing, N. (2014b). An investigation of social casino gaming among land-based and Internet gamblers: A comparison of socio-demographic characteristics, gambling and co-morbidities. *Computers in Human Behaviours*, 33, 126–135. doi:10.1016/j.chb.2014.01.031
- Goodie, A. S. (2005). The role of perceived control and overconfidence in pathological gambling. *Journal of Gambling Studies*, 21, 481–502. doi:10.1007/s10899-005-5559-1
- Griffiths, M. (2003). Internet gambling: Issues, concerns, and recommendations. *CyberPsychology & Behavior*, 6, 557–568. doi:10.1089/109493103322725333
- Griffiths, M. (2010). Gaming in social networking sites: A growing concern? *World Online Gambling*, 9, 12–13.
- Grubb, J. (2015, January 9). Revenue up big for casino apps as gamers go wild for digital gambling. *Venture Beat* [Blog post]. Retrieved from <http://venturebeat.com/2015/01/09/revenue-up-big-for-casino-apps-as-gamers-go-wild-for-digital-gambling/>
- Jacobs, D. F. (1986). A general theory of addictions: A new theoretical model. *Journal of Gambling Behaviours*, 2, 15–31. doi:10.1007/BF01019931
- Kim, H. S., Wohl, M. J., Gupta, R., & Derevensky, J. (2016). From the mouths of social media users: A focus group study exploring the social casino gaming-online gambling link. *Journal of Behavioural Addictions*, 5, 115–121. doi: 10.1556/2006.5.2016.014
- Kim, H. S., Wohl, M. J., Salmon, M. M., Gupta, R., & Derevensky, J. (2015). Do social casino gamers migrate to online gambling? An assessment of migration rate and potential predictors. *Journal of Gambling Studies*, 31, 1819–1831. doi:10.1007/s10899-014-9511-0
- King, D. L., Delfabbro, P. H., Kaptsis, D., & Zwaans, T. (2014). Adolescent simulated gambling via digital and social media: An emerging problem. *Computers in Human Behaviours*, 31, 305–313. doi:10.1016/j.chb.2013.10.048
- Lee, H. P., Chae, K. P., Lee, H. S., & Kim, Y. K. (2007). The five-factor gambling motivation model. *Psychiatry Research*, 150, 21–32. doi:10.1016/j.psychres.2006.04.005

- Lister, J. J., Wohl, M. J. A., & Davis, G. C. (2015). The dark side of authenticity: Feeling “real” while gambling interacts with enhancement motives to predict problematic gambling behaviours. *Journal of Gambling Studies*, 31, 995–1003. doi:10.1007/s10899-014-9460-7
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon’s Mechanical Turk. *Behavior Research Methods*, 44, 1–23. doi:10.3758/s13428-011-0124-6
- Moore, S. M., & Ohtsuka, K. (1999). Beliefs about control over gambling among young people, and their relation to problem gambling. *Psychology of Addictive Behaviours*, 13, 339–347. doi:10.1037/0893-164X.13.4.339
- Ocean, G., & Smith, G. J. (1993). Social reward, conflict, and commitment: A theoretical model of gambling behaviours. *Journal of Gambling Studies*, 9, 321–339. doi:10.1007/BF01014625
- Park, C. B., Park, S. M., Gwak, A. R., Sohn, B. K., Lee, J. Y., Jung, H. Y., ... Choi, J. (2015). The effect of repeated exposure to virtual gambling cues on the urge to gamble. *Addictive Behaviours*, 41, 61–64. doi:10.1016/j.addbeh.2014.09.027
- Parke, J., Wardle, H., Rigbye, J., & Parke, A. (2013). *Exploring social gambling: Scoping, classification and evidence review*. Final report submitted to the UK Gambling Commission. Retrieved from <http://eprints.lincoln.ac.uk/16412/1/Social%20Gambling.pdf>
- Polosa, R., Caponnetto, P., Morjaria, J. B., Papale, G., Campagna, D., & Russo, C. (2013). Effect of an electronic nicotine delivery device (e-Cigarette) on smoking reduction and cessation: A prospective 6-month pilot study. *BMC Public Health*, 11, 786. doi:10.1186/1471-2458-11-786
- Sapsted, T. (2013). *Social casino gaming: Opportunities for 2013 and beyond*. London, England: FC Business Intelligence.
- Schulze, T., Seedorf, S., Geiger, D., Kaufmann, N., & Schader, M. (2011). Exploring task properties in crowdsourcing: An empirical study on Mechanical Turk. *Proceedings of the 19th European Conference on Information Systems (ECIS)*. Paper 122. Retrieved from <http://aisel.aisnet.org/ecis2011/122>
- Sévigny, S., Cloutier, M., Pelletier, M. F., & Ladouceur, R. (2005). Internet gambling: Misleading payout rates during the “demo” period. *Computers in Human Behaviours*, 21, 153–158. doi:10.1016/j.chb.2004.02.017
- Siegel, M. B., Tanwar, K. L., & Wood, K. S. (2011). Electronic cigarettes as a smoking-cessation tool: Results from an online survey. *American Journal of Preventive Medicine*, 40, 472–475. doi:10.1016/j.amepre.2010.12.006

- Stewart, M. J. & Wohl, M. J. A. (2013). Pop-up messages, dissociation, and craving: How monetary limit reminders facilitate adherence in a session of slot machine gambling. *Psychology of Addictive Behaviours*, 27, 288–273. doi:10.1037/a0029882
- Stewart, S. H., & Zack, M. (2008). Development and psychometric evaluation of a three-dimensional Gambling Motives Questionnaire. *Addiction*, 103, 1110–1117. doi:10.1111/j.1360-0443.2008.02235.x
- SuperData. (2015). *Social casino market – US player insights 2015*. Retrieved from: <https://www.superdataresearch.com/market-data/social-casino-survey/>
- Vanhatupa, J. M. (2013). Business model of long-term browser-based games-income without game packages. *International Journal of Computer Information Systems and Industrial Management Applications*, 5, 195–202.
- Wohl, M. J. A., & Enzle, M. E. (2002). The deployment of personal luck: Sympathetic magic and illusory control in games of pure chance. *Personality and Social Psychology Bulletin*, 28, 1388–1397. doi:10.1177/014616702236870.
- Wohl, M. J. A., & Enzle, M. E. (2003). The effects of near wins and losses on self-perceived personal luck and subsequent gambling behaviours. *Journal of Experimental Social Psychology*, 39, 184–191. doi:10.1016/S0022-1031(02)00525-5.
- Wohl, M. J. A., Stewart, M. J., & Young, M. M. (2011). Personal luck usage scale (PLUS): Psychometric validation of a measure of gambling-related belief in luck as a personal possession. *International Gambling Studies*, 11, 7–21. doi:10.1080/14459795.2010.541270.
- Wood, R. T., & Griffiths, M. D. (2007). A qualitative investigation of problem gambling as an escape-based coping strategy. *Psychology and Psychotherapy: Theory, Research and Practice*, 80, 107–125. doi:10.1348/147608306X107881.
- Wulfert, E., Franco, C., Williams, K., Roland, D., & Maxon, J. H. (2008). The role of money in the excitement of gambling. *Psychology of Addictive Behaviours*, 22, 380–390. doi:10.1037/0893-164X.22.3.380

Endnotes

¹At the request of a reviewer, we also conducted all analyses with the full sample and with only the non-problem and low-risk gamblers. With the full sample, the pattern of results observed was identical to that reported with the moderate-risk and problem gambling sample. However, the results for the non-problem and low-risk gamblers differed on multiple variables. First, both social motives and skill-building motives were no longer significant predictors of changes in gambling behaviour, $\beta = -.14$,

$t(116) = -1.75, p = .08, \beta = .09, t(116) = 1.11, p = .27$, respectively. Second, gender was a significant predictor of changes in gambling behaviour, $\beta = -.18, t(116) = -2.18, p = .03$, with females being more likely to report decreases in gambling behaviour ($r = -.28, p = .001$).

²As part of our preliminary analyses, we assessed whether differences existed between moderate-risk and problem gamblers on any of our measured motivation variables. Results showed problem gamblers were more likely to report playing social casino games for social motives ($M = 2.30, SD = .89$) than were moderate-risk gamblers ($M = 2.00, SD = .82$), $t(138) = -2.10, p = .04$. Problem gamblers were also more likely to report playing social casino games for coping motives ($M = 2.68, SD = .73$) than were moderate-risk gamblers ($M = 1.98, SD = .72$), $t(138) = -5.70, p < .001$. Lastly, problem gamblers expressed a desire to play social casino games in order to reduce their craving to gamble ($M = 4.40, SD = 1.25$) more than moderate-risk gamblers did ($M = 3.74, SD = 1.38$), $t(136) = -2.93, p = .004$. Because the pattern of results remains the same whether these two categories are analyzed together or apart, we collapsed the categories across moderate-risk and problem gamblers for purposes of power.

³The pattern of results was unchanged when gender and age were removed from the multiple regression.

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policy paper

Addressing the Needs of Problem Gamblers With Co-Morbid Issues: Policy and Service Delivery Approaches

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Abstract

Most people with gambling problems have at least one co-occurring condition and many experience multiple co-occurring conditions simultaneously. In many Western jurisdictions, a specialist service response has developed, with separate agencies and workforces established to respond to gambling problems. Despite the number of co-occurring issues that occur alongside gambling, research is limited on the prevalence of problem gambling across some service systems, such as mental health and family service sectors. However, it is reasonable to conclude that significant numbers of people with gambling problems are currently engaged in other health and welfare service sectors. Partnership work with other service sectors is therefore vital to respond to the needs of these people. In Victoria, Australia, a partnership program was established in gambling help services to improve integration and co-ordination between gambling, alcohol and drug, family support, and mental health service sectors. From the experience acquired in developing the program, we seek in this article to outline the benefits and challenges of implementing a cross-sector approach in gambling treatment service systems and to recommend effective strategies to develop a cross-sector approach, including creating an authorising environment at the government policy level.

Keywords: problem gambling, health, co-morbidities, cross-sector collaboration, service delivery

Résumé

La majorité des personnes qui ont des problèmes de jeu présentent au moins un trouble concomitant et un grand nombre, plusieurs troubles concomitants. De nombreux pays occidentaux ont mis en place une structure d'intervention dédiée aux problèmes de jeu, constituée d'organismes et d'effectifs spécialisés. Malgré la

prévalence des troubles concomitants, toutefois, les problèmes de jeu ont peu été étudiés dans des secteurs comme la santé mentale ou les services aux familles. Néanmoins, il est raisonnable de supposer qu'un nombre important de personnes souffrant de problèmes de jeu consultent aussi certains services relevant de la santé et des services sociaux. La collaboration intersectorielle s'impose donc comme un moyen essentiel de répondre à leurs besoins. À Victoria, en Australie, un programme de partenariat a été mis sur pied par les services d'aide spécialisés dans les problèmes de jeu en vue d'améliorer l'intégration et la coordination des services dans différents secteurs d'intervention, soit le jeu, l'alcool et les drogues, le soutien aux familles et la santé mentale. S'inspirant de l'expérience acquise durant l'élaboration du programme, cet article vise deux objectifs : présenter les avantages et les défis d'une approche intersectorielle pour les services de traitement des problèmes de jeu; recommander des stratégies propices à sa mise en place, dont la création d'un contexte favorable sur le plan des orientations gouvernementales.

Co-Morbidities of Gambling

It is well established that people with gambling problems frequently experience co-occurring issues, including mental illness, substance abuse, family and relationship difficulties, health conditions, and social problems such as socio-economic disadvantage, homelessness, and crime (Miller, 2014). Problem gambling is highly associated with co-morbid substance abuse (Petry, Stinson, & Grant, 2005) and mental illness and has also been linked to suicide (Productivity Commission, 1999). Other risk factors associated with problem gambling include unemployment and coming from a lower socio-economic background (Delfabbro, 2011). In addition, emerging evidence suggests that problem gambling may be a specific risk factor for family violence (Suomi et al., 2013). Problem gambling has a much higher prevalence among people in prison (Turner, Preston, McAvoy, & Gillam, 2013) and in homeless populations (Nower, Eyrich-Garg, Pollio, & North, 2014) than it does in the general population.

Most problem gamblers have at least one co-occurring condition. In an online survey of 267 problem gamblers in treatment, less than 2% had not experienced one of the other health conditions studied, in addition to their problem gambling (Haw, Holdsworth, & Nisbet, 2013). Further, most people with gambling problems experience multiple co-occurring conditions simultaneously. A study of 15,000 problem gamblers in Victoria (Billi, Stone, Marden, & Yeung, 2014) found that less than 10% of problem gamblers had no co-occurring condition and nearly 40% of problem gamblers had four or more co-occurring issues (K.Yeung, personal communication, November 2014).

These figures support the view that in the area of health and addiction, co-morbidities should be understood to be the “expectation rather than the exception” (Minkoff & Cline, 2012).

Addressing Complexity in the Problem Gambling Service Sector

There is a huge variation in government health responses to problem gambling. Some approaches include no or limited gambling-specific services in which people with gambling problems are absorbed into self-help systems such as Gambler’s Anonymous. Such models leave people with gambling problems to access the broader health and welfare system themselves in order to address co-morbid mental or physical health conditions. Other jurisdictions fund dedicated gambling treatment services with a specialist workforce to respond to people presenting with gambling problems. Services are usually a combination of clinical and financial counselling, self-exclusion, and community education and are often funded from some form of hypothecated tax or levy on gamblers’ losses. Although there are many benefits of specialist responses to problem gambling, the clinical presentation of many people with multiple conditions requires a service response that is well integrated with other service sectors in order to better meet the multiple needs of clients.

Despite the number of co-occurring issues that may occur alongside gambling, research is limited on the prevalence of problem gambling in some service systems, such as mental health and family service systems (Miller, 2014). Nevertheless, it is reasonable to conclude that significant numbers of people with gambling problems are currently engaged in other health and welfare service sectors. Partnership work with other service sectors is therefore necessary in order to effectively respond to the needs of these people.

It is notable that the uptake of gambling-specific clinical services is often not high. In Australia, only up to about 10% of people with gambling problems access gambling help services (Delfabbro, 2011), a rate not dissimilar to rates in jurisdictions within Canada, the United States, and New Zealand. For clients with multiple issues, the complexity of their needs may hamper access to gambling help services. When problem gambling is identified in other service systems, it is not likely to be the most significant presenting issue. When there is no screening or assessment in other services, the problem may not be identified until well into treatment, because for some clients, the need to address the impact of the gambling may be more critical than the concerns about the underlying gambling behaviour (Department of Justice, 2008).

Problem gambling may be a low priority for the individual; where people with gambling problems are accessing other services, referral to gambling help services for this cohort is more likely to result in non-attendance or early dropout (Department of Justice, 2008). This means that the person affected by gambling is likely to miss out on help with their gambling issues, but not treating the gambling may also have a detrimental impact upon recovery in other areas (Miller, 2014). People with

gambling problems also face significant barriers to help seeking, most prominently community stigma and subjective pessimism regarding the effectiveness of treatment, such that help is not sought until a crisis point has been reached (Bellringer, Pulford, Abbott, DeSouza, & Clarke, 2008). Clients who do seek help tend to do so a considerable time following the initial recognition of the problem, by which time gambling and its associated problems may have become entrenched in these individuals and in their families. Gambling may be framed as a moral issue or a choice by the community, health providers, and affected individuals alike, rather than as an addiction. Such attitudes may underpin the low priority assigned to providing and accessing help for people experiencing problems with gambling.

Over the last 20 to 30 years in Australia and the United States, integrated dual diagnosis systems in the area of mental health and substance abuse have been developed and evaluated. Integrated treatment that simultaneously addresses mental health and substance use conditions is associated with lower costs and better outcomes such as reduced substance use, improved psychiatric symptoms and functioning, decreased hospitalisation, increased housing stability, fewer arrests, and improved quality of life (Drake et al., 2001). Integrated dual diagnosis programs are demonstrably more effective than non-integrated programs. By contrast, dual diagnosis clients in mental health programs that fail to integrate substance abuse interventions have poor outcomes (Drake et al., 2001).

The high co-morbidities between problem gambling, mental health, and substance abuse suggest it would be beneficial to include problem gambling in a dual diagnosis platform. Drake et al. (2001), for instance, note that dual diagnosis is a misleading term because the individuals in this group are heterogeneous and tend to have multiple diagnoses rather than a dual diagnosis. The classification of gambling as an addictive disorder within the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013) provides an added impetus for greater inclusion of gambling services within the broader health and mental health sector.

A recent meta-analysis of the prevalence of psychiatric co-morbidity in treatment-seeking problem gamblers recommends routine systematic screening and comprehensive assessment for co-occurring psychiatric disorders in those seeking treatment for gambling problems. Approaches include screening for multiple psychiatric disorders, or targeted screening for prevalent disorders such as alcohol and substance abuse disorders, mood disorders, and anxiety disorders. The clinical response of specialist gambling agencies to psychiatric co-morbidity should include appropriate referral pathways, or a workforce with adequate skills to appropriately manage these disorders (Dowling et al., 2015).

Systemic responses to addressing complexity in the population of people with gambling problems in Australia have been limited by the fact that historically, gambling help service systems have largely developed in relative isolation from the broader health and human services sector. Gambler's help agencies remain separately funded from alcohol and drug, mental health, and other welfare services, and the development of government policy pertaining to problem gambling service

delivery is often administered through departments (such as justice departments) that do not administer health and human services.

The National Drug Strategy 2010-2015 (Ministerial Council on Drug Strategy, 2011) emphasises the importance of partnerships and integrated service approaches with alcohol and other drug treatment, social welfare, income support, and job services; housing and homelessness services; mental health care providers; and correctional services. Gambling is not specifically mentioned in this strategy and is often neglected at a government policy level when partnerships in the broader health and welfare sector are considered. Without adequate incentives or government commitment to cross-sector integration of problem gambling treatment services, clients with gambling problems and complex co-occurring issues may be overlooked in service delivery responses.

A further area of concern is that the field of gambling utilises multiple terms to identify and describe a person who is experiencing acute levels of distress related to their gambling (e.g. problem gambler, pathological gambler). The same level of confusion exists for individuals who do not meet set diagnostic criteria (e.g. at-risk or recreational gamblers). This issue affects the literature related to gambling (Miller, 2014), but also applies to delivery of treatment services. In order to work effectively with other service areas, the funded gambling treatment service sector and other service sectors need to use consistent terminology to improve responses to people with gambling problems.

Advantages of Incorporating Cross-Sector Collaboration Approaches Into Gambling Treatment Service Systems

Given the evolution of a separate and specialist gambling service response in many jurisdictions, the challenge is to develop and deliver services that are better integrated and coordinated across the range of health and human service areas. Even for those gambling services that are co-located within other health and welfare agencies, integration cannot be assumed.

A substantial body of literature describes the benefits and challenges of cross-sector collaboration. Collaboration can be defined as “working across boundaries and in multi-organizational arrangements to solve problems that cannot be solved – or easily solved – by single organizations or jurisdictions” (O’Leary, 2014). Cross-sector collaboration is a more efficient and effective way of providing services to individuals and families with complex needs. It is widely accepted that collaboration can achieve outcomes that are more effective, efficient, and sustainable than can be realised if organisations work alone (Gray, Mayan, & Sanchia, 2009).

Cross-sector collaboration is increasingly assumed to be both necessary and desirable as a strategy for addressing many of society’s most difficult public health challenges (Bryson, Crosby, & Middleton Stone, 2006):

Problems like inadequate access to care, substance abuse, obesity, environmental hazards, and poverty go beyond the capacity of any single person, organization, or sector to solve. These problems are influenced by a variety of social, economic, environmental, and biological determinants ... Only by combining the knowledge, skills, and resources of a broad array of people and organizations can communities understand the underlying nature of such problems or develop effective and locally feasible solutions to address them. (Lasker & Weiss, 2003)

At the service delivery level, cross-sector collaboration allows agencies and staff to better manage the complex needs of clients. Benefits of cross-sector collaboration for agencies include more efficient distribution of resources, an increase in staff morale resulting from a decrease in isolation, improved transfer of information between professionals resulting in more holistic and coordinated service delivery, and increased responsiveness of services to clients (Davidenko et al.).

It is already acknowledged in the mental health sector that government and organisational promotion of and incentives for cross-sector collaboration are needed, along with education for staff about co-morbidity and capacity, in order for agencies to support shared clients across sectors (Lee, Crowther, Keating, & Kulkarni, 2013).

Barriers to Cross-Sector Collaboration

Although cross-sector collaboration is necessary and desirable, research evidence indicates that it is not easy to achieve (Bryson et al., 2006). The literature on collaboration identifies a number of barriers that have an impact on the ability to implement partnership work effectively between problem gambling and other service sectors.

O’Leary and Gerard (2012) identify the following challenges in introducing collaborative approaches:

- *Relationship challenges:* difficulty achieving stakeholder buy-in, lack of communication, difficulty reaching consensus, turf wars
- *Resource challenges:* time, money
- *Organisational challenges:* reconciling shared mission and goals, different agency cultures, inadequate incentives, lack of leadership, lack of skills on how to collaborate effectively, lack of role clarity

Despite considerable interest and investment in partnership work, because it is difficult to build productive working relationships among people from different backgrounds, many partnerships do not survive their first year and others falter in the development of plans and interventions. It is therefore difficult to document the impact of partnerships in improving community health or service delivery (Lasker & Weiss, 2003).

Development of a Partnership Program in Victorian Problem Gambling Treatment Services

In 2008, the Department of Justice in Victoria (now the Victorian Responsible Gambling Foundation)¹ introduced a partnership development program into the delivery of problem gambling treatment services, with the aim of developing a more integrated response to problem gambling across different service sectors. The program requires gambling help services to develop collaborative partnerships between gambling help, alcohol and other drug, mental health, and family service sectors. It encourages innovative and flexible ways of responding to problem gambling to give clients the opportunity to maintain their primary therapeutic relationship with other services while still receiving a specialist problem gambling intervention. The program supports a “no wrong door” approach to service delivery. Flexible service responses include the following and are provided by all gambling help agencies in Victoria as part of their standard service delivery:

- Problem gambling outreach to agencies already engaged with clients
- Secondary consultations (or advice about problem gambling provided to clinicians in other sectors who require input from a problem gambling clinician in relation to their client’s gambling)
- Single sessions with a problem gambling counsellor² in addition to the ongoing intervention with the clinician from another sector
- Co-counselling sessions in which a problem gambling counsellor and a counsellor from another area are involved in a session or a number of sessions together with the client
- Co-location in which problem gambling counsellors spend scheduled time within another agency or service on a weekly or fortnightly basis

In a survey of partnership development workers delivering this program in 2014,³ the workers reported that they were effectively able to implement the following activities. Percentages refer to the proportion of workers reporting success in achieving these activities:

- establishing positive relationships with other agencies (94%)
- up-skilling staff in other services to provide problem gambling interventions (78%)
- providing secondary consultation (72%)
- uptake of screening questions in other service settings (61%)

¹Until 2012 when the Victorian Responsible Gambling Foundation was established as an independent statutory authority under the Victorian Responsible Gambling Foundation Act (2011), responsibility for administration of problem gambling treatment was within the Victorian Department of Justice.

²Single session therapy is a structured process for meeting with a client that is focussed on achieving realistic and negotiated goals and maximising the value of one or more counselling sessions in recognition of the fact that many clients derive benefit from attending one or two sessions and may not want to attend more regularly (Young, Weir, & Rycroft, 2012).

³The survey was administered to 18 workers whose role was to specifically create partnerships between gambling help and alcohol and other drugs, mental health, and family service sectors. This was not a formal evaluation of the program; however, it provided insights into some of the difficulties in developing and sustaining partnerships with other service sectors.

The most difficult interventions for these workers to implement were as follows:

- providing specialist clinical interventions in other service settings (single session, co-counselling) (69%)
- co-location (62%)
- providing problem gambling-specific satellite or outreach services to agencies with the primary therapeutic relationship with the client (56%)

The partnership development workers identified the following main barriers and constraints to collaboration:

- lack of other sector understanding or recognition of problem gambling as an issue (67%)
- lack of engagement from other services (56%)
- lack of authority to approach other services (33%)
- limited peer support (feeling isolated) (33%)

Effective Strategies for Implementing a Cross-Sector Approach to Problem Gambling

The five principles below are based on the experience of implementing the partnership development program into gambling help services. They draw on the literature of cross-sector collaboration and have been developed specifically for the gambling help sector (The Bouverie Centre and the Victorian Responsible Gambling Foundation, 2014).

Summary of Principles to Assist Cross-Sector Collaboration

1. *Establishment of an authorising environment*: Government, organisational, and clinical leadership is needed to promote and reward collaborative practice and to establish incentives to facilitate integrated care.
2. *System integration* involves the interaction of different service components, including screening, assessment, and treatment planning (ideally across sectors), so that services are delivered in a more efficient and holistic manner, which ultimately benefits clients.
3. *Social capital* is about how people interact and the quality of relationships between individuals and organisations. Without sufficient time being invested in relationships between senior management, managers, and practitioners from different sectors, the necessary goodwill and motivation may not exist to sustain collaborative work.
4. *Co-location* can be a useful mechanism for facilitating collaborative work. However, there needs to be capacity for co-locating staff to participate in team case discussions, contribute to shared care plans, and retain professional supervision and connection to their core discipline. Merely sharing office space is not sufficient to achieve collaboration.

5. *Joint training* can help develop staff commitment to collaboration. Staff training programs can create a common language between services and help overcome barriers to cross-sector collaboration. Through training together, a “community of practice” can be fostered in which practitioners from different professional disciplines begin to see themselves as a team.

Creating an Authorising Environment

Lack of other sector understanding and engagement was identified by partnership development workers in the Victorian gambling help sector as a significant barrier to promoting partnership work. The creation of an “authorising environment” is a critical component in a three-pronged approach in which public sector organisations must (a) create public value, (b) be endorsed by the authorising environment, and (c) be operationally and administratively feasible. Crafting and implementing successful strategy in the public sector requires managers to maximise the degree of alignment among the three identified elements of public value, authorising environment and operational capabilities (Alford & O’Flynn, 2009).

Creating an authorising environment for cross-sector collaboration to occur in problem gambling requires commitment and innovation from government departments and may be hampered by insufficient resources devoted to collaborative goals. Unless government departments prioritise working across sectors to address problem gambling (e.g., through the development of memoranda of understanding at the government level), the needs of people with gambling and related co-morbidities may be overlooked by the broader service system.

However, even if collaboration across services is embraced at the government policy level, extensive barriers to collaboration at the service delivery (agency) level may still remain. Challenges include separate performance management systems, budget systems, and accountability requirements, particularly where agencies are answerable to different funding authorities (Davidenko, Goodyear, Weir, & Sundbery, 2014).

Skill Set for Cross-Sector Collaboration

Effective partnership work requires a specific skill set. Leadership has been identified as a strong predictor of partnership effectiveness (Gray et al., 2009), whereby successful partnerships “benefit from having boundary-spanning leaders who have backgrounds and experience in multiple fields, understand and appreciate different perspectives, can bridge diverse cultures, and are comfortable sharing ideas, resources, and power” (Lasker & Weiss, 2003).

Although much of the literature exploring collaboration in the public sector focuses on organisations, “important is who is representing an organization, agency, or jurisdiction at the table and whether they have the necessary skills to be an effective collaborator” (O’Leary, Yujin, & Gerard, 2012). In implementing the Victorian

partnership development program, clinicians identified not having the right skill set as a significant barrier that had an impact upon their confidence and ability to build capacity in other services to identify and screen for problem gambling. To address the issue of capabilities in Victoria, some gambling help agencies opted to employ workers who demonstrated skills and experience in capacity building work in addition to the existing clinical skill set within the organisation.

The principles outlined in this section have been expanded into a working eight-page document for use in guiding the development of cross-sector collaboration approaches and for the training of staff (The Bouverie Centre and the Victorian Responsible Gambling Foundation, 2014).

Sustaining the Benefits of Cross-Sector Collaboration as an Approach

Implementation science can provide insight into how to deliver sustained improvements in cross-sector collaboration. Thoughtful and effective implementation strategies at multiple levels are essential in implementing cross-sector collaboration, as every aspect, from system transformation to changing service provider behaviour and restructuring organisational contexts, may be fraught with difficulty.

Changes in skill levels, organisational capacity, and organisational culture require education, practice, and time to mature. However, change does not occur simultaneously or even in all parts of a practice or organisation (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Implementing the changes required for gambling services to sustainably collaborate more effectively with other service sectors may demand considerable time and resources prior to measurable improvement of outcomes. Measurement of cross-sector collaboration outcomes is difficult and, although a number of tools have been developed, further work is needed in this area. In relation to the Victorian partnership development program, one clinician noted:

Initially agencies appear confused as to why we are contacting them, often stating that they never see clients with problem gambling issues. After a second or third visit/call/discussion though, this stance has softened and agencies are beginning to report some clients with problem gambling or, more often, affected others as clients.

Conclusion

Most people with gambling problems have at least one co-occurring condition and many experience multiple co-occurring issues, including mental health, substance abuse, family and relationship issues, and social problems such as socio-economic disadvantage, homelessness, and crime (Miller, 2014). Although research is limited on the prevalence of problem gambling in some service systems, such as mental health and family services, in view of the multiplicity of issues experienced, it is

reasonable to conclude that a significant proportion of people with gambling problems are presenting to other service systems for assistance with other issues.

Gambling help services in many jurisdictions provide a specialist response; however, their separation from other health and human service delivery areas (even if located physically within other organisations) means integration can be challenging, reducing the ability to respond effectively to clients with multiple co-morbidities. A number of factors are necessary to facilitate effective collaboration between gambling help and other sectors, including the establishment of an authorising environment at the government policy level. A commitment to cross-sectoral and interdepartmental collaboration may be developed through memoranda of understanding. Consistency of terminology across sectors when referring to people with acute gambling problems, as well as those at risk of developing problems, would improve service responses. Providing staff with the relevant skill set to undertake capacity building work is also crucial to the success of partnership building so that gambling help services can work more effectively with other agencies to raise awareness of gambling as an issue and build referral pathways for clients with multiple co-morbidities. At an agency level, commitment to collaboration is needed from managers within the organisation in addition to clinicians, as leadership is an important predictor of partnership effectiveness (Gray et al., 2009).

The formation of successful partnerships across different sectors can be challenging. However, this process is vital to the creation of a service system capable of responding effectively to the significant number of gamblers with multiple and complex needs.

References

- Alford, J., & O’Flynn, J. (2009). Making sense of public value: Concepts, critiques and emergent meanings. *International Journal of Public Administration*, 32, 171–191.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC: Author.
- Bellringer, M., Pulford, J., Abbott, M., DeSouza, R., & Clarke, D. (2008). *Problem gambling—barriers to help seeking behaviours*. Auckland University of Technology, Gambling Research Centre. Retrieved from <http://www.niphmhr.aut.ac.nz/research-centres/gambling-and-addictions-research-centre/research-reports>.
- The Bouverie Centre and the Victorian Responsible Gambling Foundation. (2014). *Practice guidelines for cross-sector collaboration between health and welfare services and Gambler’s Help*. Retrieved from <http://www.responsiblegambling.vic.gov.au/for-professionals/cross-sector-collaboration>
- Bryson, J. M., Crosby, B. C., & Middleton Stone, M. (2006). The design and implementation of cross-sector collaborations: Propositions from the literature. *Public Administration Review*, 66(S1), 44–55.

- Davidenko, M., Goodyear M., Weir, S., & Sundbery J. (2014). *Cross-sector collaboration: Implications for Gambler's Help*. Melbourne, Victoria, Australia: Victorian Responsible Gambling Foundation.
- Delfabbro, P. (2011). *Australasian gambling review* (5th ed. covering 1992–2011). Adelaide, South Australia: Independent Gambling Authority.
- Department of Justice. (2008). *Strategic policy framework for Gambler's Help services*. Melbourne, Victoria, Australia: Victorian Government.
- Billi, R., Stone, C.A., Marden, P., Yeung, K. (2014). *The Victorian Gambling Study: A longitudinal study of gambling and health in Victoria, 2008–2012*. Melbourne, Victoria, Australia: Victorian Responsible Gambling Foundation.
- Dowling, N. A., Cowlishaw, S., Jackson, A. C., Merkouris, S. S., Francis, K. L., & Christensen, D. R. (2015). Prevalence of psychiatric co-morbidity in treatment-seeking problem gamblers: A systematic review and meta-analysis. *Australian and New Zealand Journal of Psychiatry*, 49, 519–539.
- Drake, R. E., Essock, S. M., Shaner, A., Carey, K. B., Minkoff, K., Kola, L., Rickards, L. (2001). Implementing dual diagnosis services for clients with severe mental illness. *Psychiatric Services* 52, 469–476.
- Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M., & Wallace, F. (2005). *Implementation research: A synthesis of the literature* (FMHI Publication #231). Tampa: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network.
- Gray, E., Mayan, M., & Sanchia, L. (2009). What makes a partnership successful? Lessons to be learnt from the Families First Edmonton Partnership. *Currents: New Scholarship in the Human Services*, 8, 1–19.
- Haw, J., Holdsworth, L., & Nisbet, S. (2013). *Gambling and comorbid disorders (final report for Gambling Research Australia)*. Retrieved from <https://www.responsiblegambling.vic.gov.au/information-and-resources/research/recent-research/gambling-and-co-morbid-disorders>
- Lasker, R. D., & Weiss, E. S. (2003). Creating partnership synergy: The critical role of community stakeholders. *Journal of Health and Human Services Administration*, 26, 119–139.
- Lee, S. J., Crowther, E., Keating, C., & Kulkarni, J. (2012). What is needed to deliver collaborative care to address comorbidity more effectively for adults with a severe mental illness? *Australian and New Zealand Journal of Psychiatry* 47, 333–346.

- Miller, H. (2014). *Complex lives: Co-occurring conditions of problem gambling*. Melbourne, Victoria, Australia: Victorian Responsible Gambling Foundation.
- Ministerial Council on Drug Strategy. (2011). *National drug strategy 2010-2015: A framework for action on alcohol, tobacco and other drugs*. Location: Commonwealth of Australia. Retrieved from [http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/Publishing.nsf/content/DB4076D49F13309FCA257854007BAF30/\\$File/nds2015.pdf](http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/Publishing.nsf/content/DB4076D49F13309FCA257854007BAF30/$File/nds2015.pdf)
- Minkoff, K., & Cline C. (2012, Spring/Summer). Changing the world: Welcoming services for complex systems and issues. *New Paradigm*, 9–13.
- Nower, L., Eyrich-Garg, K. M., Pollio, D. E., & North, C. S. (2014). Problem gambling and homelessness: Results from an epidemiologic study. *Journal of Gambling Studies*, 31, 533–545. doi:10.1007/s10899-013-9435-0
- O’Leary, R. (2014, June). *They say that joining up is hard to do: Why are we still struggling with collaborative public management?* Presentation at the Australia and New Zealand School of Government VPSC Series. Retrieved from <https://www.anzsog.edu.au/magma/media/upload/ckeditor/files/Applied%20Learning/Victoria%20-%20State%20Services%20Authority/Leary%20Slides.pdf>
- O’Leary, R., & Gerard, C. M. (2012). *Collaboration across boundaries: Insights and tips from federal senior executives*. Location: IBM Centre for the Business of Government. Retrieved from <http://www.businessofgovernment.org/sites/default/files/Collaboration%20Across%20Boundaries.pdf>
- O’Leary, R., Yujin, C., & Gerard, C. M. (2012). The skill set of the successful collaborator. *Public Administration Review*, 72, S70–S83.
- Petry, N. M., Stinson, F. S., & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 66, 564–574.
- Productivity Commission. (1999). *Australia's gambling industries* (Report No. 10). Canberra, Australia: Ausinfo.
- Suomi, A., Jackson, A. C., Dowling, N. A., Lavis, T., Patford, J., Thomas, S. A., Cockman, S. (2013). Problem gambling and family violence: Family member reports of prevalence, family impacts and family coping. *Asian Journal of Gambling Issues and Public Health*, 3, 1–15.
- Turner, N. E., Preston, D. L., McAvoy, S., & Gillam, L. (2013). Problem gambling inside and out: The assessment of community and institutional problem gambling in the Canadian correctional system. *Journal of Gambling Studies*, 29, 435–451.

Young, J., Weir, S., & Rycroft, P. (2012). Implementing single session therapy. *Australian and New Zealand Journal of Family Therapy*, 33, 84–97.

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Special Section: *JGI* Scholar's Award, Category A

An Ecological Approach to Electronic Gambling Machines and Socioeconomic Deprivation in Germany

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Abstract

In Germany, gambling research has primarily focused on the broader population in prevalence studies, neglecting the importance and influence of the local socio-economic context in the development and maintenance of gambling disorders. To analyze the interplay between contextual and compositional factors in the market for electronic gambling machines (EGMs) in Germany, we assessed the EGM densities and socioeconomic deprivation in 244 local communities within Baden-Wuerttemberg. Our results suggest that EGM density is statistically associated with 3 socioeconomic determinants: The shares of migrants, unemployed, and high-school-educated people in the communities are statistically significant variables in our linear regression model, whereas younger age, male gender, and marital status exhibit no statistical associations with EGM density. The share of unemployed people is the only variable of statistical and practical significance. Our analysis advocates area-based policy measures to minimize gambling-related harm. By decreasing EGM densities in communities with high levels of unemployment, we expect to protect at-risk population strata that are most vulnerable to gambling exposure.

Keywords: EGM, ecological analysis, Germany, risk factors

Résumé

En Allemagne, les travaux de recherche sur la prévalence du jeu portent principalement sur la population générale, négligeant ainsi l'importance et l'influence du contexte socio-économique local dans l'apparition et la persistance des problèmes de jeu. Afin d'analyser l'interaction entre les facteurs contextuels et les facteurs intrinsèques du marché des machines de jeux électroniques (MJE) en Allemagne, nous avons évalué la densité de la répartition de ces appareils dans le Bade-Wurtemberg. Nos résultats donnent à penser que la densité de la répartition des MJE est reliée statistiquement à trois déterminants socio-économiques. Ceux-ci sont la proportion d'immigrants, la proportion de chômeurs et la proportion de

personnes fortement scolarisée dans une même communauté, qui se sont révélées être des variables statistiquement significatives dans notre modèle de régression linéaire, tandis que le jeune âge, l'appartenance au sexe masculin et l'état matrimonial n'ont donné lieu à aucun lien statistique avec la densité de la répartition des MJE. La proportion de chômeurs est la seule variable importante sur le plan statistique et pratique. Notre analyse défend la prise de mesures locales d'atténuation des effets nuisibles liés au jeu. Nous estimons qu'une diminution de la densité de la répartition des MJE dans les communautés présentant un taux élevé de chômage devrait contribuer à protéger les strates à risque de la population qui sont les plus vulnérables en cas d'exposition au jeu.

Introduction

In recent years, the German market for electronic gambling machines (EGMs) has increased by a respectable amount: From 2009 to 2013, the absolute number of EGMs increased from 233,000 to 263,000, while the total turnover of the gaming machine industry increased from 4,965 to 5,550 billion euros (Vieweg, 2013). In Germany, gambling is generally regulated at the federal state level. Authorities in the federal states govern the sectors of lotteries, sports betting, and casinos. EGM gambling in gaming halls, restaurants, and bars is subject to the federal laws of the German Industrial Code (Gewerbeordnung) and the Gambling Ordinance (Spielverordnung). In 2006, the fifth amendment of the Gambling Ordinance considerably improved the framework conditions of gaming operators and increased the incentives for individuals to gamble at EGMs. This was achieved primarily by introducing an accelerated game with higher stakes, profits, and losses. The negative effects of problematic gambling have been recognized as a public health concern by public authorities, and legislators have enacted a new regulatory framework to prevent the development of gambling disorders, the 2008 Interstate Treaty on Gambling (Glücksspielstaatsvertrag). The federal states revised the Interstate Treaty in 2012 (Glücksspieländerungsstaatsvertrag) to implement a more consistent gambling law to include legislative measures for the EGM sector.

Erbas and Buchner (2012) have shown that the quantity of inpatient and outpatient treatments for pathological gambling in Germany has increased significantly during the last decade. However, increased treatment seeking for pathological gambling may not be exclusively attributable to increased gambling availability. The rise in the number of treatment-seeking individuals can also be explained by increased awareness of the dangers associated with gambling. The public has been made aware of the dangers by mass media campaigns and by labels and warnings on gambling tickets. The Federal Centre of Health Education (BZgA) provides a nationwide telephone helpline and Internet self-help programs to counsel on

problematic gambling behavior. To advertise lotteries, providers have been legally obligated since 2008 to provide gambling addiction warnings and telephone helplines for those who want confidential advice. Furthermore, legal regulations require operators to display information leaflets on problematic gambling in gaming halls, and EGMs are required to display a telephone helpline linked to the BZgA. All of the above-mentioned measures have increased public awareness of gambling and produced a profound effect on treatment-seeking rates. In response, some federal states have started to finance specialized counseling centers for pathological gamblers (Buchner et al., 2015).

Multiple epidemiological studies in Germany have provided estimates of the proportion of pathological and problematic gamblers. Large community-based epidemiological studies that reported gambling prevalence rates for Germany were conducted by Bühringer, Kraus, Sonntag, Pfeiffer-Gerschel, and Steiner (2007) and Buth and Stöver (2008); other notable studies in this context include periodic studies from the BZgA (Haß, Orth, & Lang 2012), a study by Sassen et al. (2011), and the study of Pathological Gambling and Epidemiology (PAGE) conducted by Meyer et al. (2011).

To give an overview of the German gambling market, we will briefly discuss the BZgA studies. They were the only repeated cross-sectional analyses in Germany (BZgA, 2008, 2010, 2012, 2014). The four population-wide representative studies were conducted in the years 2007, 2009, 2011, and 2013 and assessed gambling behavior and gambling-associated attitudes and problems in the population aged 16 to 65 years. By using random digit-dial sampling, the study investigators collected data by means of computer-assisted telephone interviews. The sample size for each of the years 2007, 2009, and 2011 was 10,000, with only landline telephone numbers. The latest BZgA study in 2013 used a dual-frame approach, in which 10,001 landline telephone numbers and 1,500 mobile phone numbers were included in the analysis. To ensure comparability between the studies, we considered only the results of the sample with landline telephone numbers. Response rates for the BZgA studies were 63.3% in 2007, 61.6% in 2009, 59.9% in 2011, and 56.8% in 2013. Gambling participation rates in the 12 months preceding the BZgA surveys decreased significantly over time, from 55.0% in 2007 to 53.8% in 2009 to 50.7% in 2011 to 44.9% in 2013. The decline in participation rates could be observed for both genders and across all age groups. The 12-month prevalence of the most popular gambling activity, “lotto 6 out of 49,” decreased significantly from 35.5% in 2007 to 28.7% in 2013. In contrast, the 12-month prevalence of gambling on EGMs has increased steadily from 2.2% in 2007 to 2.7% in 2009 to 2.9% in 2011 to 3.0% in 2013. The greatest increases were evident among young males. For example, the 12-month prevalence of EGM gambling increased for 18-to 20-year-old males from 5.8% in 2007 to 19.3% in 2013 and for 21-to 25-year-old males from 5.1% in 2007 to 14.4% in 2013.

For 2009, 2011, and 2013, the BZgA surveys assessed the severity of gambling problems with the South Oaks Gambling Screen (Lesieur & Blume, 1987). The 12-month prevalence of pathological gambling decreased from 0.45% in 2009 and

0.49% in 2011 to 0.38% in 2013. The 12-month prevalence of problematical gambling decreased from 0.64% in 2009 to 0.51% in 2011 to 0.45% in 2013. In describing the socioeconomic profiles of problematic and pathological gamblers, a multivariable analysis showed that male gender, immigration background, and being unemployed were significant predictor variables at the 5% significance level.

The German literature has primarily focused on prevalence studies to delineate the distribution of gambling across population segments. However, the population is not the only relevant focal point in an epidemiological study. For a complete epidemiological description of gambling, we need to include spatial or temporal dimensions in our analysis (Suzuki, 2012). Our analysis focuses on the viewpoint of place-based health research, which perceives gambling as a complex phenomenon with interconnected relationships between gambling activities and the social environment, consisting of not only the gambling venues, but also the socio-economic, cultural, and political contexts (Korn & Shaffer, 1999).

Contextual factors that characterize the social and physical environment of gamblers play an increasingly important role in the study of gambling by demonstrating how the local context of the neighborhood influences the gambling behavior of individuals (Marshall, 2009). One possible contextual effect that helps explain the development and maintenance of gambling disorders concerns the availability and accessibility of EGMs. Various authors have shown that employees of casino and gaming venues exhibit higher rates of gambling disorders than the general population does, providing evidence that increased exposure to gambling at an individual level is associated with gambling-related harm (Hing & Gainsbury, 2011; Shaffer & Hall, 2002; Shaffer, Vander Bilt, & Hall, 1999; Wu & Wong, 2008). Analyzing gambling at an area level, Marshall (2005) noted that gambling providers could induce demand for gambling by placing EGMs at favorable geographical locations. Increased gambling prevalence rates and higher gambling expenditures would then be supply-driven, or at least demand for gambling would be encouraged by the supply side. The location and number of EGMs are situational determinants of gambling and may explain why some people start gambling and why certain socioeconomic classes are particularly vulnerable to specific forms of gambling (Griffiths, 1999).

The proposition that the supply side encourages or induces gambling activity remains controversial. For example, Govoni, Frisch, Rupcich, and Getty (1998) found no difference in the prevalence rates of pathological and problem gambling or the per capita gambling expenditure after a new casino opened, whereas Ladouceur, Jacques, Ferland, and Giroux (1999) established an association between increased opportunities for gambling and the prevalence of pathological gambling. Other studies have established significant associations between gambling problems and residential proximity to casinos (Welte, Barnes, Wiczorek, Tidwell, & Hoffman, 2007; Welte, Wiczorek, Barnes, Tidwell, & Hoffman, 2004), as well as between gambling prevalence and per capita density of EGMs (Storer, Abbott, & Stubbs, 2009). Vasiliadis, Jackson, Christensen, and Francis (2013) reviewed the existing empirical literature on the interrelation between physical accessibility and gambling

involvement in Australia, Canada, New Zealand, Norway, and the United States and reiterated the substantiated evidence of a positive relationship between higher EGM density and higher gambling participation and expenditure.

In addition to the inclusion of contextual effects, gambling behavior at an area-unit level can be described by compositional factors such as socioeconomic characteristics or lifestyle-related variables of the local population (Welte, Wiecezorek, Barnes, & Tidwell, 2006). For instance, various international studies have shown that EGM density is higher in socioeconomically deprived areas (Pearce, Mason, Hiscock, & Day, 2008; Wardle, Keily, Astbury, & Reith, 2014; Wheeler, Rigby, & Huriwai, 2006). Socioeconomic characteristics of the area, such as the unemployment rate, may also be considered risk factors. These variables predict or are closely associated with the development and maintenance of gambling disorders, and there are many ways to select variables in order to measure relative deprivation. For example, to assess ecological associations between small-area population characteristics and the location of gaming machines, Wheeler et al. (2006) used New Zealand's Deprivation Index, which is composed of census-based measures of income, unemployment, amenity access, and education. In addition to socioeconomic risk factors, we can also include other risk factors in our analysis, such as genetic vulnerabilities (Lobo & Kennedy, 2009), neurobiological factors (Iancu, Lowengrub, Dembinsky, Kotler, & Dannon, 2008), and personality traits and disorders (MacLaren, Fugelsang, Harrigan, & Dixon, 2011), as well as mental and substance use disorders (Dowling et al., 2015). Not all of the above-mentioned factors are available at the aggregate level. Hence, our analysis focused on socioeconomic factors, where group-level data were collected and made available by the Federal Statistics Office of Germany and the Statistical Offices of the federal states. To the best of our knowledge, no German study has examined the spatial variation of EGMs. Therefore, we set out to analyze the statistical associations between EGM densities and socioeconomic characteristics in small-area units.

Method

Regional Data for the State of Baden-Wuerttemberg

For our analysis, we focused on the state of Baden-Wuerttemberg (BW), one of 16 federal states in Germany. The state of BW lies in southwestern Germany and is bordered by the states of Rhineland-Palatine to the northwest, Hessen to the north, and Bavaria to the east; it shares borders with two countries, France to the west and Switzerland to the south (see Figure 1). BW is the third largest of the federal states, with an area of 35,751 square kilometers and a population of approximately 10.8 million people.

Because our ecological study design used aggregate-level data, as our unit of spatial analysis, we chose local communities (Gemeinden), which correspond to the lowest administrative tier in BW. In total, there are 1,101 local communities in BW, but we considered only communities with populations over 10,000, leaving us with 244 local



Figure 1. The federal state of Baden-Wuerttemberg, one of 16 federal states in Germany.

communities for our analysis. Our 244 communities comprised approximately 7.3 million inhabitants, which amounts to approximately 68% of the total population of BW.

The data originated from three sources. The first data set concerned the EGM locations in BW and was compiled by Trümper and Heimann (2012), who restricted their analysis to communities with a population of at least 10,000. For each of these 244 communities, they gathered information regarding the granted gambling concessions and the number of gambling establishments and EGMs from the respective public order offices (Ordnungsamt; effective date: January 1, 2012). A total of approximately 31,000 EGMs were included in our analysis.

The community data sets for our socioeconomic variables originated from the publicly available 2011 European Union Census and from data files for 2012 that were made available to us by the Statistical Office of BW upon our request.

Socioeconomic Risk Factors for Germany

We used the PAGE study to derive valid socioeconomic risk factors for our regression models (Meyer et al., 2011). With 15,023 participants, the PAGE study included the largest community-based sample in Germany. It used computer-assisted telephone interviews with a stratified and clustered sampling design conducted from January 2010 to March 2011, and it included individuals between 14 and 64 years of

age. Of the interviews with the 15,023 participants, 14,022 were based on landline telephone numbers and 1,001 were based on mobile phone numbers, with the aim of including disadvantaged populations that did not have landline telephones. For the landline telephone survey, the response rate was calculated at 44.5% and the cooperation rate at 54.6%. For the mobile phone survey, the response rate stood at 36.8% and the cooperation rate at 57.3%. Using the guidelines of the American Psychiatric Association, the PAGE study categorized gambling severity according to the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*; American Psychiatric Association, 1994). The researchers categorized the severity of gambling problems into two subthreshold categories of gambling problems: one with one or two symptoms and one with three or four symptoms from the *DSM-IV*. Pathological gambling was defined by the presence of five to 10 symptoms from the *DSM-IV* criteria. In total, the 12-month prevalence rates for pathological gambling stood at 0.3% in comparison to subthreshold gambling problems with one or two criteria at 1.4% and three to four criteria at 0.3% (Meyer et al., 2011). As expected, the lifetime prevalence rates were substantially higher, standing at 1.0% for pathological gambling, 5.5% for subthreshold gambling with one to two criteria, and 1.4% for subthreshold gambling with three to four criteria. Meyer et al. (2011) used a multinomial logistic regression to quantify the relative risk for pathological gambling in relation to given sociodemographic risk factors; Table 1 summarizes their results with respect to the diagnosis of lifetime pathological gambling.

Table 1
Multinomial Logistic Regression of Lifetime Diagnosis of Pathological Gambling on Socioeconomic Risk Factors

Socioeconomic risk factor	OR	95% CI	p
Age	0.96	[0.95, 0.98]	< .001
Gender			< .001
Male	10.71	[5.42, 21.17]	
Female	Reference value		
School education			.003
<10 years education	2.43	[1.46, 4.05]	
10 years education	1.97	[1.21, 3.20]	
>10 years education	Reference value		
Marital status			.87
Married	1.06	[0.52, 2.14]	
Unmarried/divorced	Reference value		
Migration background			.002
Yes	2.32	[1.39, 3.86]	
No	Reference value		
Unemployment status			< .001
Yes	3.26	[1.74, 6.08]	
No	Reference value		

Note: The lifetime diagnosis of pathological gambling was the dependent variable in this model, with 1 = lifetime diagnosis and 0 = no lifetime diagnosis. OR = odds ratio; CI = confidence interval. Adapted from Meyer et al. (2011).

For the PAGE study, Table 1 shows that the odds ratios associated with younger age, male gender, less school education, migration background, and unemployment status are statistically significant at the 5% level ($p < .05$).

Consistency of the socioeconomic risk factors. Socioeconomic risk factors may vary according to the types of gambling, implying that not all forms of gambling are homogeneous (Moragas et al., 2015). We needed to make sure that the socioeconomic risk factors from the PAGE study accurately described the profile of EGM players. In the PAGE study, the participants were interviewed about different forms of gambling such as poker, lotteries, sports and horse betting, and illegal gambling. Meyer et al. (2011) used refined models and analyses to determine which gambling type was associated most significantly with gambling disorders. First, in a multivariate logistic regression for the diagnosis of lifetime pathological gambling, the participants who self-reported more than 10 days of gambling activity demonstrated that gambling on EGMs was the most significant variable associated with pathological gambling, exhibiting the highest odds ratio (odds ratio = 6.3, 95% confidence interval [CI] [4.1, 9.8], $p < .01$), followed by poker (odds ratio = 5.0, 95% CI [2.8, 8.9], $p < .01$). Second, pathological gamblers were asked to self-report which of the gambling forms had the strongest impact in developing their gambling problems. A total of 108 of 116 pathological gamblers offered an answer, with the majority ($n = 54$ pathological gamblers) designating EGMs as the most significant contributor in developing gambling problems, followed by poker in second place ($n = 16$ pathological gamblers).

Ecological Analysis

Selecting variables from the PAGE study and using them in an ecological analysis makes sense because a community-based analysis offers a good starting point to assess the significance of risk factors at the ecological level. In contrast, the indiscriminate choice of explanatory variables may lead to spurious correlations and unfounded statistical associations at the ecological level.

We needed to translate the variables from Table 1 into operable aggregate-level variables. For our model, we defined younger age as the share of 15- to 29-year-olds in each community population. “Male gender” referred to the share of males in each community, and the share of migrants and unemployed individuals in the communities represented the risk factors “migration background” and “unemployment status” from the PAGE study. “School education” was captured by the share of high school graduates in the community, with high school graduation referring to finishing the 12 to 13 required years of secondary education in Germany (*Abitur*). At the individual level, marital status was not a predictor for a lifetime diagnosis of pathological gambling in the PAGE study ($p = .87$, cf. Table 1). Nevertheless, we used the share of married persons in our ecological study to assess whether this variable was associated with EGM density at an aggregate level. All of our socioeconomic risk factors were expressed per 1,000 individuals to remove variations

Table 2
Description of Variables for Our Ecological Analysis

Dependent variables	
EGM density	Number of EGMs per 1,000 population for each community
Independent variables	
Younger age	Number of 15- to 29-year-olds per 1,000 population for each community
Male gender	Number of males per 1,000 population for each community
High school graduation	Number of high school graduates (<i>Abitur</i>) per 1,000 population for each community
Marital status	Number of married persons per 1,000 population for each community
Migration background	Number of persons with migration background per 1,000 population for each community
Unemployment status	Number of unemployed persons per 1,000 population for each community

Note: EGM = electronic gambling machine.

arising from differences in population size across communities. Table 2 summarizes information regarding the variables that we used in our ecological analysis.

For the 244 communities in BW, Table 3 displays the mean, standard deviation, minimum, and maximum of our variables.

Statistical Methods

To analyze our data, we used the ordinary least squares method in a multiple linear regression model. Because all of our data were continuous, we assessed the statistical significance using Student's two-tailed *t* test, with the significance level set to .05. We did not adjust alpha levels to compensate for the familywise error rate, as this would have compromised the statistical power of our analysis. Effect sizes were quantified by the unstandardized coefficients of the regression model, as well as by the unadjusted and adjusted coefficients of determination. We confirmed the validity of the regression model, but those results are not shown here; that is, we tested for the absence of heteroscedasticity and multicollinearity, the independence and normality of the error terms, and the proper model specification. The statistical program STATA 13 was used for the analyses.

Results

A multiple regression analysis for 244 communities in BW was conducted to evaluate the relationship between EGM density and the socioeconomic risk factors of younger age, male gender, high school graduation, marital status, migration background, and unemployment status. The regression equation was found to be statistically significant, $R^2 = .29$, adjusted $R^2 = .27$, $F(6, 237) = 15.8$, $p < .001$. The results of the regression model are depicted in Table 4.

Table 3
Description of the Data Set for Our Ecological Analysis

Socioeconomic risk factor	<i>M</i>	<i>SD</i>	Minimum	Maximum
EGM density	4.0	2.6	0.2	16.0
Younger age	172.1	17.3	137.0	301.0
Male gender	490.6	7.4	463.4	510.0
High school graduation	160.9	59.0	68.1	515.0
Marital status	479.1	26.0	347.0	527.6
Migration background	98.3	33.3	31.6	209.0
Unemployment status	20.4	5.1	8.5	40.9

Note: EGM = electronic gambling machine.

Table 4
Linear Regression of EGM Density on Socioeconomic Risk Factors for 244 Communities in Baden-Wuerttemberg

Socioeconomic risk factor	<i>b</i>	95% CI	<i>SE</i>	<i>p</i>
Younger age	0.003	[-0.022, 0.029]	0.013	.806
Male gender	-0.027	[-0.072, 0.017]	0.023	.226
High school graduation	-0.014	[-0.021, -0.008]	0.003	< .001
Marital status	-0.013	[-0.032, 0.007]	0.010	.203
Migration background	0.020	[0.011, 0.030]	0.005	< .001
Unemployment status	0.140	[0.076, 0.205]	0.033	< .001

Note: EGM = electronic gambling machine; *b* = unstandardized regression coefficient; CI = confidence interval.

Of six socioeconomic risk factors, only three were statistically significant at the 5% level. All other things being equal, communities with larger shares of unemployed individuals or migrants were significantly associated with higher EGM densities ($p < .001$), whereas the share of high school graduates in communities was negatively associated with EGM densities ($p < .001$). The remaining three socioeconomic risk factors—i.e., the share of males, married, and younger people in the communities—failed to reach statistical significance.

As every socioeconomic risk factor was measured in the same units, we were able to compare the unstandardized regression coefficients for each factor. The variable of unemployment status, as indexed by its unstandardized coefficient of 0.140, was shown to have the strongest relationship to EGM density. This indicated that for every additional unemployed person per 1,000 individuals, there was a predicted increase in the quantity of EGMs by 0.140 per 1,000 individuals. In comparison, the unstandardized coefficients of the statistically significant variables of migration

background ($b = 0.020$, $p < .001$) and high school education ($b = -0.014$, $p < .001$) were considerably smaller.

The CIs in Table 4 provided a range of plausible values for the regression parameters. The 95% CI suggests that if we were to repeat the analysis over and over, the CI would contain the true parameter 95% of the time. The 95% CI for unemployment status was [0.076, 0.205], suggesting that the quantity of EGMs in the communities was raised by at least 0.076, and perhaps by as much as 0.205 per 1,000 individuals. For the statistically significant variables of migration background and high school education, and the nonsignificant variables of younger age, male gender, and marital status, the smallest lower limit of the CIs stood at -0.072 and the highest upper limit at 0.030. The highest upper limit of 0.030 belonged to the variable of migration background. It was considerably smaller than the upper limit of the unemployment status and hence practically nonsignificant. The smallest lower limit of -0.072 for the variable of male gender might have been of practical significance, yet the CI contained the value of 0, nullifying the statistical and practical significance of the effect size. Thus, of the socioeconomic risk factors in our analysis, only the unemployment status was both statistically and practically significant. Table 5 illustrates paradigmatically the communities with the five top and bottom numbers of EMGs per 1,000 population, alongside the share of unemployed people.

The descriptive statistics confirm the regression results. The communities with the top five EGM densities consistently had greater unemployment shares than did the communities with the bottom five EGM densities.

Table 5
*Communities with Top and Bottom Five EGM Densities, Alongside
Unemployment Statistics*

Community	EGMs per 1,000 population	Unemployed per 1,000 population
<i>Top Five</i>		
Kehl	16.0	26.3
Oehringen	15.4	22.8
Riedlingen	13.7	25.0
Geislingen	11.9	27.7
Waldshut-Tiengen	10.1	23.3
<i>Bottom Five</i>		
Leingarten	0.4	15.6
Heddesheim	0.3	20.0
Gundelfingen	0.3	18.2
Kraichtal	0.3	15.5
Ubstadt-Weiher	0.2	13.6

Note. EGM = electronic gambling machine.

Discussion

Practical Conclusions

Starting from an evaluation of socioeconomic risk factors in the PAGE study, we used those individually based variables at the group level and assessed their usefulness in an exploratory analysis. For the first time in Germany, we used an ecological study design to investigate the associations between EGM density and socioeconomic deprivation at the community level.

Our analysis demonstrates a statistically significant association between EGM density and the three socioeconomic risk factors of unemployment status, migration background, and high school graduation. Judging from the effect size indices, only unemployment status is also of practical interest. With an average density of four EGMs per 1,000 individuals in the 244 communities of BW (cf. Table 3), the increase in the quantity of EGMs per additional unemployed individual ($b = 0.140$) is of considerable practical significance. The importance of unemployment status at the aggregate level is in line with findings from other ecological correlation studies (Pearce et al., 2008; Wardle et al., 2014; Wheeler et al., 2006). The results of our study provide preliminary indications that gambling providers place EGMs at geographical locations with relatively high unemployment rates. Further research should investigate whether this relationship also holds true for other geographical areas in Germany.

We cannot establish statistically or practically significant ecological correlations between EGM density and the share of married, male, or younger people. This is in contrast to other community-based epidemiological studies that have consistently associated gambling disorders at the individual level with younger age and male gender (e.g., Blanco, Hasin, Petry, Stinson, & Grant, 2006; Kessler et al., 2008). However, these individually based risk factors do not necessarily hold at an ecological level. The atomistic fallacy in epidemiological research describes situations in which associations between variables at the individual level may differ from associations between variables measured at the ecological level (Diez Roux, 2002). Therefore, in some cases, we may not be able to predict the behavior of groups from the behavior of individuals.

One possible solution is to reexamine statistical associations at a finer scale of ecological analysis. In future studies, we can investigate whether statistical associations exist at the city level, similar to the study of Gilliland and Ross (2005), which assessed the spatial distribution of EGMs and the socioeconomic conditions for the municipalities of Montreal and Laval. For example, Stuttgart, the state capital of BW, would provide an ideal field for carrying out an ecological gambling study. If the socioeconomic risk factors of male gender, marital status, and younger age remain nonsignificant at the city level, we can approve their nonsignificance at the ecological level with greater confidence.

Our analysis is only a starting point for investigating the complex set of interactions between socioeconomic area characteristics and EGM density. Caution is advised when moving from statistical associations at an ecological level to causal interpretations and relationships. In order to strengthen the evidence base for a relationship between socioeconomic deprivation and environmental exposure to EGMs, further longitudinal or repeated cross-sectional studies need to assess how changes in the socioeconomic environment affect the distribution of EGMs. An extension of our ecological model includes time as an important constituent of a time-geographical model. Spatial interdependencies likely vary over space and time, and it is important to identify the most crucial places and environmental contexts over different times to help estimate gambling exposure most effectively (Cummins, 2007).

Studies that examine how participation rates and gambling problems evolve over time provide another valuable research direction. International studies showed that an expansion of EGMs and increased exposure to gambling lead to rapid increases in gambling participation and problem gambling at first, followed by an adaptation period with gradual reductions in gambling participation and problem gambling rates (LaPlante & Shaffer, 2007; Shaffer, Labrie, & LaPlante, 2004; Storer et al., 2009). Factors that scholars believe influence the gradual adaptation of society to gambling include increased public awareness of problem gambling, informal social controls, expansion of treatment and self-help organizations, and regulatory and public health measures (Abbott, Stone, Billi, & Yeung, 2015). In a meta-analysis of 34 surveys in Australia and New Zealand, Storer et al. (2009) demonstrated that increased problem gambling prevalence rates are linked to higher EGM density. However, in a multivariable regression analysis, they also showed how problem gambling prevalence decreased over time at a rate of 0.09% per annum. In a meta-analysis of 202 studies from 1975 to 2012, Williams, Volberg, and Stevens (2012) affirmed the decrease in gambling participation and problem gambling rates. The downward trend began in the late 1990s in North America and in the early 2000s in Australia and Europe.

The authors of two recent studies in Sweden and Australia only partially affirmed the adaptation hypothesis. In comparing the results of the Swedish Gambling Study in 1997–1998 and the Swedish Longitudinal Gambling Study in 2008–2009, Abbott, Romild, and Volberg (2014) showed that past-year gambling participation declined from 88.0% to 71.6%, whereas past-30 days participation in EGMs increased from 3.0% to 4.0%. The authors found, contrary to the prediction of the adaptation hypothesis, a statistically significant increase in the prevalence of lifetime probable pathological gambling from 1997–1998 to 2008–2009, with no significant changes in the prevalence of lifetime problem gambling and of 12-month probable pathological or problem gambling.

For Australia, Abbott et al. (2015) compared the results of the 2003 Victorian Longitudinal Community Attitudes Survey and the 2008 Victorian Gambling Study

and found significant reductions in gambling participation rates for the previous 12 months, as well as for the monthly and weekly participation frequencies. Gambling participation on EGMs for the previous 12 months decreased from 33.4% in 2003 to 21.5% in 2008, affirming the adaptation hypothesis. Here again, in contrast to the predictions of the adaptation hypothesis, there is no evidence of prevalence rate reductions in problem and moderate-risk gambling.

For Germany, the BZgA studies offer insight into the processes of exposure and adaptation (BZgA, 2014). The repeated cross-sectional analyses allow us to monitor patterns of change over time. Gambling participation rates in the 12 months preceding the surveys decreased from 55.0% in 2007 to 44.9% in 2013, affirming the adaptation hypothesis. Contrary to the general trend of decreasing participation rates in nearly all gambling activities, the 12-month prevalence of EGM gambling steadily increased from 2.2% in 2007 to 3.0% in 2013. The increases in 12-month prevalence rates of EGM gambling were most evident in 18- to 20-year-old males and 21- to 25-year old males. In the first group, the prevalence rate quadrupled from 5.8% in 2007 to 23.5% in 2013, and in the second group, it more than doubled from 5.1% in 2007 to 12.8% in 2013. It is interesting to note that the prevalence rate for the male age group of 26- to 35-year-olds increased only slightly from 5.8% in 2007 to 7.7% in 2013. How differential exposures and vulnerabilities to EGMs lead to gender and age disparities merits a systematic analysis. Does increased EGM availability explain the rise in prevalence rates among males aged 18 to 20 and 21 to 25 years? Is the male age group of 26- to 35-year-olds not vulnerable to increased EGM exposure, or has the process of adaptation decreased prevalence rates? It is also possible that the lower prevalence rate for the 26- to 35-year-old males is biased downward because the age bracket covers a 10-year range, whereas the 18- to 20-year bracket covers only a 3-year range and the 21- to 25-year bracket covers only a 5-year range. In epidemiological terms, we need to exhibit the changes in prevalence rates over time by age-period-cohort modeling strategies. In decomposing age, period, and cohort effects, we might be able to determine why certain age groups are more susceptible to increased EGM availability and which age groups are less affected or more able to adapt to the negative effects of gambling by an accumulation of exposure experience.

As far as problematic and pathological gambling behavior is concerned, the adaptation hypothesis seems not to hold from a viewpoint of statistical significance, although a trend is observed toward lower rates. The 12-month prevalence of pathological gambling in the BZgA studies decreased from 0.45% in 2009 and 0.49% in 2011 to 0.38% in 2013. The 12-month prevalence of problematical gambling decreased from 0.64% in 2009 to 0.51% in 2011 to 0.45% in 2013. The decreases in the proportion of problem and pathological gamblers in both male and female respondents were statistically nonsignificant at the 5% level.

With the 2012 Interstate Treaty on Gambling, legislators plan to implement harm minimization policies based on geographical criteria. The minimum distance regulation in BW obliges gaming halls to keep a straight-line minimum distance of

500 m from each other, as well as from child and youth facilities. These provisions will come into effect after a transitional period that ends in July 2017, with some experts expecting a 55% reduction in the number of EGMs and a 68% reduction in the number of gaming halls (Becker & Heinze, 2015; Vieweg, 2013). Area-based policies and locally targeted interventions offer promising possibilities to combat gambling problems; on the basis of our results, public authorities should focus on decreasing EGM density in communities with relatively high unemployment rates.

To support our policy recommendation, we refer to a principle that originated from German national environmental law during the 1970s (Myers, 2002): The “principle of precaution,” translated from the German word *Vorsorgeprinzip*, found its way into international law in the fields of environmental policy, natural resource management, and biodiversity conservation and more recently emerged as a principle of international law in international treaties and national policy statements (Andorno, 2004). The precautionary principle calls for preventive measures in public health affairs whenever potential harm to human health or the environment may be anticipated. This principle of practical decision making provides policymakers with the guidance to forestall potential adverse effects in the face of uncertainty of impact and causality.

We have reasonable grounds for concern that increased availability of EGMs raises the threat of gambling-related harm to human health. With the precautionary principle, we err on the side of caution, shifting the burden of proof about absence of harm from the public to the gambling industry. Policy makers should not wait until evidence of gambling-related harm from increased EGM availability is established beyond all reasonable doubt before taking preventive measures. Instead, they are permitted to act on the basis of evidence that is not conclusive.

Directions for Future Research

Future research should focus on two extensions to our model: multilevel and spatial regression models (Anselin, 1988; Diez Roux, 2002). Multilevel methods consider the concomitant inclusion and analysis of individual and ecological variables within a single model. In a multilevel analysis of gambling, the effect and influences of the neighborhood are a separate contextual level that acts on the individual gambling activity among the local population. For instance, living in a privileged socioeconomic environment might offer a protective effect with regard to at-risk gambling because migrant populations are less likely to reside in these neighborhoods and therefore the local population is less likely to adopt the behaviors of these vulnerable populations. In addition to capturing the simultaneous effects of individual and group-level variables on individual-level outcomes, multilevel models can incorporate interactions across levels. For example, the interaction between EGM density and socioeconomic risk factors can be reciprocal in nature: Neighborhoods with a high density of EGMs might be unattractive to populations of higher socioeconomic status, and when those populations avoid living in those neighborhoods, rental costs and property prices can decrease, which in turn attracts individuals with low

socioeconomic status. By focusing on the nested structure of the data, multilevel analysis helps explain the ways that higher-level environments affect the decisions of individuals.

Whereas multilevel models consider only the correlation within neighborhoods, spatial regression models focus on the inter-neighborhood correlation structure. We expect an interaction between neighboring units that depends on geographical distance or shared borders. Future research should focus on the use of regression models with spatially varying parameters to capture the local variations over different geographical areas and to improve the understanding of local relationships and spatial variations in gambling behavior.

References

Abbott, M. W., Romild, U., & Volberg, R. A. (2014). Gambling and problem gambling in Sweden: Changes between 1998 and 2009. *Journal of Gambling Studies*, 30, 985–999. doi:10.1007/s10899-013-9396-3

Abbott, M., Stone, C. A., Billi, R., & Yeung, K. (2015). Gambling and problem gambling in Victoria, Australia: Changes over 5 years. *Journal of Gambling Studies*. Advance online publication. doi:10.1007/s10899-015-9542-1

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Andorno, R. (2004). The precautionary principle: A new legal standard for a technological age. *Journal of International Biotechnology Law*, 1, 11–19. doi:10.1515/jibl.2004.1.1.11

Anselin, L. (1988). *Spatial econometrics: Methods and models*. Dordrecht, the Netherlands: Kluwer.

Becker, T., & Heinze, K. (2015). *Auswirkungen geplanter Abstandsregelungen und Regelungen zu Konzessionsgrößen auf Spielhallen am Beispiel ausgewählter Kommunen in Baden-Württemberg* [The effects of distance and concession regulations on gaming halls: A case study on selected communities in Baden-Wuerttemberg] (Research Report No. 3). Stuttgart, Germany: University of Hohenheim, Gambling Research Center.

Blanco, C., Hasin, D. S., Petry, N., Stinson, F. S., & Grant, B. F. (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

Buchner, U. G., Erbas, B., Stürmer, M., Arnold, M., Wodarz, N., & Wolstein, J. (2015). Inpatient treatment for pathological gamblers in Germany: Setting,

utilization, and structure. *Journal of Gambling Studies*, 31, 257–279.
doi:10.1007/s10899-013-9430-5

Bühringer, G., Kraus, L., Sonntag, D., Pfeiffer-Gerschel, T., & Steiner, S. (2007). Pathologisches Glücksspiel in Deutschland: Spiel- und Bevölkerungsrisiken [Pathological gambling in Germany: Gambling and population based risks]. *Sucht*, 5, 296–308.

Buth, S., & Stöver, H. (2008). Glücksspielteilnahme und Glücksspielprobleme in Deutschland: Ergebnisse einer bundesweiten Repräsentativbefragung [Gambling and gambling problems in Germany: Results of a national survey]. *Suchttherapie*, 9, 3–11.

BZgA. (2008). *Glücksspielverhalten und problematisches Glücksspielen in Deutschland 2007* [Gambling behavior and problem gambling in Germany in 2007]. Köln, Deutschland: Bundeszentrale für gesundheitliche Aufklärung.

BZgA. (2010). *Glücksspielverhalten in Deutschland 2007 und 2009. Ergebnisse aus zwei repräsentativen Bevölkerungsbefragungen* [Gambling behavior in Germany in 2007 and 2009: Results of two representative population surveys]. Köln, Deutschland: Bundeszentrale für gesundheitliche Aufklärung.

BZgA. (2012). *Glücksspielverhalten und Glücksspielsucht in Deutschland. Ergebnisse aus drei repräsentativen Bevölkerungsbefragungen 2007, 2009 und 2011* [Gambling behavior and gambling addiction in Germany. Results of three representative population surveys in 2007, 2009, and 2011]. Köln, Deutschland: Bundeszentrale für gesundheitliche Aufklärung.

BZgA. (2014). *Glücksspielverhalten und Glücksspielsucht in Deutschland 2013* [Gambling behavior and gambling addiction in Germany in 2013]. Köln, Deutschland: Bundeszentrale für gesundheitliche Aufklärung.

Cummins, S. (2007). Commentary: Investigating neighbourhood effects on health—Avoiding the ‘Local Trap’. *International Journal of Epidemiology*, 36, 355–357.
doi:10.1093/ije/dym033

Diez Roux, A. V. (2002). A glossary for multilevel analysis. *Journal of Epidemiology & Community Health*, 56, 588–594. doi:10.1136/jech.56.8.588

Dowling, N. A., Cowlishaw, S., Jackson, A. C., Merkouris, S. S., Francis, K. L., & Christensen, D. R. (2015). Prevalence of psychiatric co-morbidity in treatment-seeking problem gamblers: A systematic review and meta-analysis. *The Australian and New Zealand Journal of Psychiatry*, 49, 519–539. doi:10.1177/0004867415575774

- Erbaş, B., & Buchner, U. G. (2012). Pathological gambling: Prevalence, diagnosis, comorbidity, and intervention in Germany. *Deutsches Ärzteblatt International*, 109, 173–179. doi:10.3238/arztebl.2012.0173
- Gilliland, J. A., & Ross, N. A. (2005). Opportunities for video lottery terminal gambling in Montréal: An environmental analysis. *Canadian Journal of Public Health*, 96, 55–59.
- Govoni, R., Frisch, G. R., Rupcich, N., & Getty, H. (1998). First year impacts of casino gambling in a community. *Journal of Gambling Studies*, 14, 347–358.
- Griffiths, M. (1999). Gambling technologies: Prospects for problem gambling. *Journal of Gambling Studies*, 15, 265–283.
- Haß, W., Orth, B., & Lang, P. (2012). Zusammenhang zwischen verschiedenen Glücksspielformen und glücksspiellozierten Problemen. Ergebnisse aus drei repräsentativen Bevölkerungs-Surveys der Bundeszentrale für gesundheitliche Aufklärung (BZgA) [Relationship between different gambling activities and gambling associated problems: Results from three representative surveys conducted by the Federal Centre for Health Education (BZgA)]. *Sucht*, 58, 333–345. doi:10.1024/0939-5911.a000207
- Hing, N., & Gainsbury, S. (2011). Risky business: Gambling problems amongst gaming venue employees in Queensland, Australia. *Journal of Gambling Issues*, 25, 4–23. doi:10.4309/jgi.2011.25.2
- Iancu, I., Lowengrub, K., Dembinsky, Y., Kotler, M., & Dannon, P. N. (2008). Pathological gambling: An update on neuropathophysiology and pharmacotherapy. *CNS Drugs*, 22, 123–138.
- Kessler, R. C., Hwang, I., LaBrie, R., Petukhova, M., Sampson, N. A., Winters, K. C., & Shaffer, H. J. (2008). DSM-IV pathological gambling in the National Comorbidity Survey Replication. *Psychological Medicine*, 38, 1351–1360. doi:10.1017/S0033291708002900
- Korn, D. A., & Shaffer, H. J. (1999). Gambling and the health of the public: Adopting a public health perspective. *Journal of Gambling Studies*, 15, 289–365.
- Ladouceur, R., Jacques, C., Ferland, F., & Giroux, I. (1999). Prevalence of problem gambling: A replication study 7 years later. *Canadian Journal of Psychiatry*, 44, 802–804.
- LaPlante, D. A., & Shaffer, H. J. (2007). Understanding the influence of gambling opportunities: Expanding exposure models to include adaptation. *American Journal of Orthopsychiatry*, 77, 616–623. doi:10.1037/0002-9432.77.4.616

- 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.
- Lobo, D. S. S., & Kennedy, J. L. (2009). Genetic aspects of pathological gambling: A complex disorder with shared genetic vulnerabilities. *Addiction*, 104, 1454–1465. doi:10.1111/j.1360-0443.2009.02671.x
- MacLaren, V. V., Fugelsang, J. A., Harrigan, K. A., & Dixon, M. J. (2011). The personality of pathological gamblers: A meta-analysis. *Clinical Psychology Review*, 31, 1057–1067. doi:10.1016/j.cpr.2011.02.002
- Marshall, D. (2005). The gambling environment and gambler behaviour: Evidence from Richmond-Tweed, Australia. *International Gambling Studies*, 5, 63–83. doi:10.1080/14459790500099471
- Marshall, D. (2009). Gambling as a public health issue: The critical role of the local environment. *Journal of Gambling Issues*, 23, 66–80. doi:10.4309/jgi.2009.23.4
- Meyer, C., Rumpf, H.-J., Kreuzer, A., de Brito, S., Glorius, S., Jeske, C., ... John, U. (2011). *Pathologisches Glücksspielen und Epidemiologie (PAGE): Entstehung, Komorbidität, Remission und Behandlung* [Pathological gambling and epidemiology (PAGE): Onset, comorbidity, remission, and treatment.]. Endbericht an das Hessische Ministerium des Innern und für Sport. Greifswald/Lübeck, Deutschland: Universitäten Greifswald und Lübeck.
- Moragas, L., Granero, R., Stinchfield, R., Fernández-Aranda, F., Fröberg, F., Aymamí, N., ... Jiménez-Murcia, S. (2015). Comparative analysis of distinct phenotypes in gambling disorder based on gambling preferences. *BMC Psychiatry*, 15, 173. doi:10.1186/s12888-015-0459-0
- Myers, N. (2002). The precautionary principle puts values first. *Bulletin of Science, Technology & Society*, 22, 210–219. doi:10.1177/02767602022003005
- Pearce, J., Mason, K., Hiscock, R., & Day, P. (2008). A national study of neighbourhood access to gambling opportunities and individual gambling behaviour. *Journal of Epidemiology & Community Health*, 62, 862–868. doi:10.1136/jech.2007.068114
- Sassen, M., Kraus, L., Bühringer, G., Pabst, A., Piontek, D., & Taqi, Z. (2011). Gambling among adults in Germany: Prevalence, disorder and risk factors. *Sucht*, 57, 249–257. doi:10.1024/0939-5911.a000115
- Shaffer, H. J., & Hall, M. N. (2002). The natural history of gambling and drinking problems among casino employees. *The Journal of Social Psychology*, 142, 405–424. doi:10.1080/00224540209603909

- Shaffer, H. J., LaBrie, R. A., & LaPlante, D. (2004). Laying the foundation for quantifying regional exposure to social phenomena: Considering the case of legalized gambling as a public health toxin. *Psychology of Addictive Behaviors*, 18, 40–48. doi:10.1037/0893-164X.18.1.40
- Shaffer, H. J., Vander Bilt, J., & Hall, M. N. (1999). Gambling, drinking, smoking and other health risk activities among casino employees. *American Journal of Industrial Medicine*, 36, 365–378.
- Storer, J., Abbott, M., & Stubbs, J. (2009). Access or adaptation? A meta-analysis of surveys of problem gambling prevalence in Australia and New Zealand with respect to concentration of electronic gaming machines. *International Gambling Studies*, 9, 225–244. doi:10.1080/14459790903257981
- Suzuki, E. (2012). Time changes, so do people. *Social Science & Medicine*, 75, 452–456. doi:10.1016/j.socscimed.2012.03.036
- Trümper, J., & Heimann, C. (2012). *Angebotsstruktur der Spielhallen und Geldspielgeräte in Deutschland 2012* [The supply-side structure of gaming halls and electronic gaming machines in Germany in 2012]. Unna, Deutschland: Arbeitskreis gegen Spielsucht e.V.
- Vasiliadis, S. D., Jackson, A. C., Christensen, D., & Francis, K. (2013). Physical accessibility of gaming opportunity and its relationship to gaming involvement and problem gambling: A systematic review. *Journal of Gambling Issues*, 28, 1–46. doi:10.4309/jgi.2013.28.2
- Vieweg, H.-G. (2013). *Wirtschaftsentwicklung Unterhaltungsautomaten 2012 und Ausblick 2013* [Economic development of the German coin-operated gaming and amusement machine industry 2012 and outlook for 2013]. Institute for Economic Research at the University of Munich. Retrieved from: <http://www.vdai.de/ima2013/ifo-wirtschaftsstudie-dt.pdf>
- Wardle, H., Keily, R., Astbury, G., & Reith, G. (2014). ‘Risky places?’: Mapping gambling machine density and socio-economic deprivation. *Journal of Gambling Studies*, 30, 201–212. doi:10.1007/s10899-012-9349-2
- Welte, J. W., Barnes, G. M., Wieczorek, W. F., Tidwell, M.-C. O., & Hoffman, J. H. (2007). Type of gambling and availability as risk factors for problem gambling: A tobit regression analysis by age and gender. *International Gambling Studies*, 7, 183–198. doi:10.1080/14459790701387543
- Welte, J. W., Wieczorek, W. F., Barnes, G. M., & Tidwell, M.-C. O. (2006). Multiple risk factors for frequent and problem gambling: Individual, social, and ecological. *Journal of Applied Social Psychology*, 36, 1548–1568. doi:10.1111/j.0021-9029.2006.00071.x

Welte, J. W., Wieczorek, W. F., Barnes, G. M., Tidwell, M.-C., & Hoffman, J. H. (2004). The relationship of ecological and geographic factors to gambling behavior and pathology. *Journal of Gambling Studies*, 20, 405–423. doi:10.1007/s10899-004-4582-y

Wheeler, B., Rigby, J., & Huriwai, T. (2006). Pokies and poverty: Problem gambling risk factor geography in New Zealand. *Health & Place*, 12, 86–96. doi:10.1016/j.healthplace.2004.10.011

Williams, R. J., Volberg, R. A., & Stevens, R. M. G. (2012). *The population prevalence of problem gambling: Methodological influences, standardized rates, jurisdictional differences, and worldwide trends*. Report prepared for the Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care. Retrieved from: <http://hdl.handle.net/10133/3068>.

Wu, A. M. S., & Wong, E. M. W. (2008). Disordered gambling among Chinese casino employees. *Journal of Gambling Studies*, 24, 207–217. doi:10.1007/s10899-007-9068-2

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Crimping the Croupier: Electronic and mechanical automation of table, community and novelty games in Australia

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Abstract

Technological innovation has increased electronic and mechanical automation to traditional games that replace or augment human croupiers, and also change how the games are enjoyed. Little is known about how these automated products may influence people's gambling or entice new players to try these table and community games. Research regarding the characteristics of electronic gaming machines (EGMs) has provided insights into the potential consequences associated with technological enhancements. However, without knowing how these products differ to their traditional counterparts, it is difficult to begin to understand their implications on player expenditures and product safety. An Australian national environmental scan of these electronically and mechanically enhanced table-game and community-game products was conducted to identify the characteristics of these automated products Australia-wide. Based on EGM research (Armstrong & Rockloff, 2015), the "VICES" framework was identified as an appropriate organising principle for surveying the features of automated products. The VICES acronym specifies 5 criteria by which automated products might differ from traditional table-games: (v)isual and auditory enhancements, (i)llusion of control, (c)ognitive complexity, (e)xpedited play, and (s)ocial customisation. The findings suggest that automation provides the potential for the provision of products that intensify gambling engagement with the attendant potential for gambling-related harm. Further research, however, is needed to find if this potential harm is manifest in real-world gambling environments.

Keywords: gambling products, automation, technology

Résumé

L'innovation technologique a entraîné l'accroissement d'une automatisation mécanique et électronique des jeux de hasard traditionnels qui, en remplaçant ou

complétant le travail des croupiers, a transformé la manière de jouer. Il existe peu de connaissances sur la façon dont les jeux de hasard automatisés peuvent influencer les joueurs dans leur pratique du jeu ou inciter de nouvelles personnes à essayer les jeux sur table automatisés et en réseau. La recherche sur les caractéristiques des machines de jeux électroniques (MJE) a fourni certaines données relativement aux conséquences possibles associées à l'avancement technologique des jeux de hasard. Il est toutefois difficile de déterminer la sécurité des produits automatisés et leurs répercussions sur les dépenses des joueurs si l'on ne connaît pas ce qui les distingue des jeux de hasard traditionnels. Une analyse du contexte national australien concernant les jeux de hasard en réseau et les jeux sur table automatisés a permis de cerner les caractéristiques de ces produits à l'échelle du pays. À partir des résultats de la recherche sur les MJE (Armstrong et Rockloff, 2015), il a été déterminé que le cadre « VICES » constituait un principe d'organisation des données adéquat pour évaluer les caractéristiques des produits automatisés. L'acronyme « VICES » renvoie à cinq critères susceptibles de permettre de distinguer les produits automatisés des jeux sur table traditionnels : « V » réfère à une expérience visuelle et auditive accrue, « I » à une illusion de contrôle, « C » à la complexité cognitive, « E » à un rythme de jeu expéditif et « S » à une personnalisation sociale. Les constatations de l'étude laissent entendre que l'automatisation des jeux de hasard permet l'offre de produits qui intensifient l'expérience de jeu et sont ainsi susceptibles d'entraîner des effets nuisibles découlant de cette intensification. Davantage de recherche est cependant requise pour déterminer si ces effets nuisibles possibles se manifestent également dans les environnements de jeu du monde réel.

Introduction

Technology offers ways for manufacturers to enhance gambling products in order to attract and retain consumers. Advancing computer technology has been used to enhance the appeal of EGMs and develop online gambling; and has provided greater opportunity to enhance traditional table games or community games (e.g., Bingo). Casino table games and community style or novelty games are becoming more readily available to both operators and consumers in automated or enhanced form. Despite the pervasiveness of automated products in the marketplace, there has been minimal investigation targeted at identifying and defining what may be termed an “automated product”. In order to explore how these products may result in different patterns of usage compared to traditional versions, it is vital to define what constitutes an automated product and the characteristics that make these products unique. Here we define an automated product as: “any product that incorporates the technology of EGMs to alter the relationship between the player and croupier”. That is, products that have been electronically and/or mechanically enhanced to potentially alter consumer behaviour. Using this definition, a national environmental scan was conducted to determine the types of automated products currently available

in Australia, and identified the salient features that make these products unique compared to their traditional versions.

There has been much investigation into gambling product characteristics that entice play and encourage intense gambling. Given the relatively low market penetration of automated products and the disproportionate harm associated with EGMs, majority of this research has focused on the structural characteristics of EGMs. Structural characteristics are created by the manufacturer and play an important role in the reinforcement and perpetuation of gambling behaviour (Griffiths, 1999, 2003; Griffiths, Parke, Wood, & Parke, 2006; Parke & Griffiths, 2006). Features most commonly cited refer to auditory or visual features, event frequencies (e.g., wins and losses), payout probabilities, perceptions of skill requirements, the frequency of payouts, or the interval or period between the wager and outcome. Many of these features are designed to increase arousal or appeal and can often be configured to either facilitate excessive gambling or as a means to potentially reduce the harm associated with EGMs (Dixon, Trigg, & Griffiths, 2007; Griffiths et al., 2006). Based on this research and the structural characteristics of EGMs, a framework to assess the characteristics of automated products was developed referred to as the VICES framework (Armstrong & Rockloff, 2015). VICES is an acronym that refers to features of automated products based on five salient criteria: visual and auditory enhancements; illusion of control; cognitive complexity; expedited play; and social customisation. Each of these features influences the way people engage with a product and potentially increases the appeal of gambling.

Visual displays and intricate graphics increase player engagement and can result in greater betting persistence (Ladouceur & Sévigny, 2002); while auditory features, particularly when paired with winning outcomes, increase arousal, anticipation and urgency resulting in the reinforcement of faster, more excessive gambling (Delfabbro, Flazon, & Ingram, 2005; Dixon et al., 2007; Griffiths & Parke, 2005; Parke & Griffiths, 2006; Spenwyn, Barrett, & Griffiths, 2010). Together, dynamic computerised graphics and event-dependant sound effects can give the impression that gambling is a lucrative and exciting experience, enticing people to gamble while stimulating gambling persistence (Griffiths & Parke, 2005; Parke & Griffiths, 2006). Traditional products generally rely on gambling environments to provide sensory stimulation. Automated products offer an opportunity to incorporate rich graphics or auditory features that may increase betting intensity and persistence.

Automated products that incorporate enhanced features allow for the inclusion of game characteristics that promote an illusion of control over chance events. A meta-analysis investigating factors influencing an illusion of control found the largest effect sizes were related to personal control and skill related judgements; suggesting that when subjects had an active part in the situation, they experienced a heightened sense of control (Stefan & David, 2013). Multiple studies have shown that active control over gaming apparatus increases confidence resulting in larger wagers (Davis, Sundahl, & Lesbo, 2000), and misperceptions regarding personal influence on game outcomes (Ladouceur & Sévigny, 2005). Information such as hot and cold

streaks or lucky numbers may create an illusion of control over random events (Griffiths & Parke, 2005). While active participation is a feature of many traditional products, digitalisation can offer gamblers with more features or information such as comprehensive game history, statistics or player feedback that increases perceived control.

Side bets, bonuses, jackpots or other features that increases the volume of information can overload mental resources (Bedny, Karwowski, & Bedny, 2012; Wixted, 2004) and cause people to use simplifying strategies to process information that impairs rational decision-making (Payne, 1976). For instance, bonus or game features that offer “free spins” or extra turns can make people believe they are getting something for nothing that may potentially lead to riskier gambling (Livingstone et al., 2008). Johnson and Bruce found that greater complexity increased risk-taking in horse-race betting (1998) but reduced the total amount wagered (1997). Despite reducing overall expenditure, greater complexity may result in prolonged playing times and the experiences of losses as people take risks in order to master what is deemed a difficult task. Greater volumes of information may result in incoherence that causes gamblers to make riskier, superficial gambling decisions based on simplified decision-making strategies.

Digitalisation and mechanical automation may allow for products to be designed to increase betting intensity. Faster rates of play can increase the frequency of outcomes; prolonging playing time (Delfabbro et al., 2005; Ladouceur & Sévigny, 2006) and encouraging misperceptions surrounding the frequency of winning returns (Griffiths et al., 2006). In contrast to traditional versions where speed and expenditure is somewhat restricted by external influences (such as other players, the croupier’s actions, etc.); automated products may be more comparable to EGMs in terms of expedited play, where rate of play is predominantly determined by the player and intervals between wager and outcome are relatively small.

Particular features may either increase or decrease the social nature of the gambling experience. The presence of other gamblers can elicit behaviours that are designed to portray oneself in a socially desirable manner, including riskier betting (Geen, 1991; Rockloff & Dyer, 2007). For instance, in order to avoid being seen as a novice or unlucky people will try to appear more skilled showing greater gambling persistence despite mounting losses (Rockloff, Greer, & Fay, 2011; Rockloff & Dyer, 2007). Similarly, the presence of others can increase information loads and consequently inhibit the efficient information processing (Geen, 1991; Payne, 1976). Automated products that offer private betting may limit the propensity for people to gamble in a way they deem socially desirable.

This paper reports on an Australian national environmental scan that catalogued and assessed the characteristics of automated products currently available to consumers and venue operators. In order to ensure a systematic and comprehensive survey of all available automated products in the marketplace; the scan was conducted in three separate stages. Stage one consisted of in-venue visits to Australian casinos to survey

products already available to Australian consumers. Stage two involved researchers attending the Australasian Gaming Exhibition 2015 (AGE) to catalogue automated products being displayed and promoted to Australian venue operators. Stage three involved scanning industry print and online media to catalogue products being developed and released by manufacturers. The aim of this research was to determine how EGM features are being used to enhance traditional games in order to direct further investigations into the potential behavioural and product-safety consequences associated with automated gambling products.

Method

Product Inclusion Criteria

Automated products were sourced from Australian casinos, the AGE and by surveying industry media. Australian casinos included in the environmental scan were: Star Casino Sydney, Jupiter's Casino Gold Coast, Casino Canberra, Treasury Casino Brisbane, Crown Melbourne Casino, Adelaide Casino, and the Crown Perth Casino. Industry media referred to trade and manufacturer material from the past ten years (mid-2004 to mid-2014), and included websites, online and hard copy journals and magazines, and advertising materials collected from the AGE.

For inclusion in the scan, products were required to be traditional games that had been enhanced, modified or digitalised to incorporate technological features that altered the relationship between the player and the croupier (or caller). Level of automation was determined as either semi-automated, fully-automated, or fully digitalised. Semi-automated products were those that were partially digitalised but still required a live croupier or host (e.g., a live roulette wheel spun by the croupier with electronic betting). Fully-automated products did not require a croupier but relied on mechanical parts (e.g., an automated, mechanical roulette wheel with electronic betting). For a product to be considered fully-digitalised, it was to be completely computerised with no croupier or mechanical components (e.g., a video or animated image of a roulette wheel with electronic betting). Traditional games referred to those historically free from automation or that had been technologically enhanced that were considered either casino style games (i.e., baccarat, roulette, blackjack etc.), community style games (bingo and keno), and/or novelty games (such as pai gow dominoes and pachinko); but excluded EGMs.

Design

The Australian national environmental scan used a repeated, national cross sectional design. This ensured that the sample was not skewed by seasonal events or influences, and guaranteed the inclusion of products operating and distributed under varying legal jurisdictions.

Measures

A coding schema was developed that outlined features associated with technological enhancements according to the VICES framework (Armstrong & Rockloff, 2015). This provided a comprehensive set of criteria by which automated products could be surveyed and catalogued. Information regarding game type, number of simultaneous players and level of automation was also collected. Table 1 provides the full coding schema developed for assessment of automated products according to the VICES framework.

Procedure

The environmental scan included both research and review strategies for collecting automated product information. During stage one of the environmental scan, the researchers visited casinos across Australia and surveyed products already available

Table 1
Environmental Scan Coding Schema for Automated Products

Preliminary description	Product name Manufacturer Game type Level of automation Number of simultaneous players
Visual/Audio Enhancements	Nature of displays Use of animation Use of audio stimulus
Illusion of Control	Player feedback Communal Player Aide Data (game statistics) Active vs Passive Control of Mechanisms
Cognitive Complexity	Structural characteristics (options, features, functions and information additional to basic game play) Task Complexity (number of choices available to players, number of decisions required by players)
Expedited Play	Concurrent games at once Speed of typical game play Game refresh rate Game down-time Maximum and minimum expenditure per game Frequency of reinforcement
Social Customisation	Privacy Facilitation of social interaction Spectators/audience Competition (shared or independent game mechanism, communal jackpots or prizes)
Other information	Number of units on site (venue-visits only) Source Target audience Any other features not otherwise indicated above

for public consumption. When on site, the casino floor was systematically surveyed for products that met the inclusion criteria. Observations were made about salient features relevant to the VICES catalogue criteria and immediately recorded using a handheld digital voice recorder. Directly following the venue visit, observations were entered into an electronic database using the environmental-scan coding schema (see Table 1). Researchers did not participate in any gambling activities whilst surveying automated products in casinos.

In stage two, the researchers attended the 2014 Australasian Gaming Exhibition to survey products available to Australian gaming operators. A systematic scan of manufacturer's exhibits was conducted to identify any products that could be considered automated according to the definition given above. Data was collected by assessments of machine features, exhibit displays and consultations with the marketing staff of the manufacturers. Observations were recorded using a handheld digital voice recorder. Recordings were then transcribed and entered into the electronic database coding schema. Advertising materials from product exhibitions such as catalogues, flyers and other print media were also collected to be included in stage three of the scan.

Stage three of the environmental scan involved reviewing current industry media. Researchers scanned each trade-source for products that met the inclusion criteria. Features either detailed within an article, advertisement or clearly observable in photographs or images were catalogued using the environmental scan coding scheme. As many of these resources were distributed or manufactured internationally, stage three included some automated products identified from a global marketplace that were not yet installed in Australian casinos.

Results

As features of particular types of gambling products differed substantially, casino based products and community style/novelty games were assessed separately. The thematic analysis was conducted by calculating the prevalence of different automated products based on manufacturer and model (rather than the total number of automated products). For instance, some venues had multiple versions of the same product and thus, this was counted only once. Information gathered from each stage of the environmental scan was collated and subject to a thematic analysis to identify trends in automated product characteristics. Product features that were most frequently observed were considered to be salient features of automated products.

Survey of Automated Casino Products

Casino products refer to any table games or casino based products traditionally free from automation or that have been enhanced to include EGM features. Table 2 displays product parameters such as type of game, automation level and number of

Table 2

Thematic Analysis of Product Type, Level of Automation and Automated Features and Number of Players by Environmental Scan Stage for Automated Casino Products

		Casino Visit	AGE	Industry Media	Total
Type of Game	Baccarat	4	1	9	14
	Blackjack		2	19	21
	Big Wheel	4	1	2	7
	Craps	1		7	8
	Poker			10	10
	Roulette	13	3	27	43
	Sic Bo		1	8	9
	Unspecified			3	3
	Multi-games	5	1	13	19
	Roulette/Baccarat	2		1	
	Roulette/Slots			1	
	Roulette/Baccarat/Sic Bo	2		4	
	Roulette/Baccarat/ Virtual Horses			1	
	Roulette/Blackjack/Bingo			1	
	Roulette/Keno/Poker	1			
	Roulette/Baccarat/Sic Bo/Craps			1	
	Roulette/Baccarat/Sic Bo/ Big Wheel			1	
	Roulette/Baccarat/Sic Bo/ Blackjack		1		
	Roulette/Baccarat/Sic Bo/Slots			1	
	Roulette/Baccarat/Sic Bo/Craps/ Blackjack			1	
Level of Automation	Semi-automated	4		33	37
	Fully-automated	15	8	37	60
	Fully-digitalised	9	3	27	39
Automation Features	Physical/manual game	5		20	25
	Mechanical game	8	5	24	37
	Video/virtual game			25	25
	Live croupier/host	2		13	15
	Live streamed Croupier/host	24	1	6	7
	Digital croupier/host		3	7	10
	Digital animated croupier		2	12	14
	1			7	7
Number of Simultaneous Players	2-10	23	9	70	102
	11-20	19		10	29
	21-30	21		2	23
	31-40	3			3
	41-50	5			5
	51-60	5			5
	61-70	2			2
	Up to 50			2	2
	Up to 99			1	1
	Expandable/Unlimited	7	6	20	33

simultaneous players. Table 3 presents the results from the thematic analysis using the VICES criteria.

Type of gambling product and location. Thematic analysis based on type of casino game showed that nationwide, roulette was the most prevalent game featured in automated form; findings that were consistent across all stages of the environmental scan. The popularity of roulette was also highlighted by its inclusion in every automated multigame system identified. Blackjack was shown to have the second highest prevalence score but this was only true for the AGE and the industry trade-media scan. No Australian casino featured automated blackjack products. Baccarat was the third highest rated casino game in automated form and was the second most frequent product available in Australian casinos; matched only by big-wheel products. Baccarat featured on all but two of the multigame systems identified by the environmental scan. The industry media scan also identified sic bo, poker and craps to be featured frequently in automated form, but this was not replicated in Australian casino product distribution nor at the AGE. Multigame systems were widespread, particularly in Australian casinos and industry media; and predominantly incorporated roulette and baccarat with slots or other casino, community or novelty games. Some venues had several of the same product. For instance, the Crowne Perth Casino had 2 Novo-touch Multi-Roulette tables and the Sydney Casino had 2 Aruze Big Wheel products and 2 Interblock Roulette tables. See Table 2 for the frequency of game type by each stage of the environmental scan.

Level of automation. Semi-automated and fully-digitalised products had similar availability in the marketplace; but Australian casinos tended to have more fully-digitalised products than semi-automated. Across all stages of the scan, products were most likely to be classified as fully-automated; that is, not requiring a live croupier but incorporating mechanical components (i.e., mechanical betting - coin or token operated - or game apparatus). The prevalence of fully-automated products was evident by a greater number of products incorporating mechanical game play apparatus (such as mechanical roulette wheels or vibrating dice domes/cylinders) than both manual (physical cards, wheel or die) and virtually digitalised game components. Fully-automated products tended to rely on digitalised betting that negated the need for a live croupier while game play was mechanically operated. Some products despite not requiring a croupier (due to being fully-automated or fully-digitalised) were still found to have a digital human-model or animated croupier or host. While not as common, many of the products could run live streamed games with footage of live croupiers or hosts while all betting was electronic. The most commonly found form of croupiers or hosts were live, physically present croupiers that were required for semi-automated products. Table 2 displays the thematic analysis for the level of automation present in automated casino products found in the scan.

Number of simultaneous players. Most commonly observed throughout each stage of the scan were products marketed or configured to accommodate between

Table 3
Thematic Analysis of Automated Casino Products based on the VICES Framework Criteria

		Casino Visits	AGE	Industry Media	Total
Visual & Auditory Features	Individual Playing Screen	17	9	62	88
	Game view	9	1	7	17
	Personal betting	10		1	11
	Game history	2			2
	Game statistics	2		2	4
	Touchscreen	7	5	19	31
	Shared Screen	14	6	44	64
	Game view	9	3	8	20
	Game statistics/history	2	2	3	7
	Croupier or host		3	2	5
	Individual betting		3	4	7
	No shared screen	1	3	4	8
	Visual Animations	9	8	28	45
	Event dependent	2	5	10	17
	3D graphics			4	4
	Adaptive/configurable		1	7	8
	Lighting/illumination			8	8
	Minimal animations	1	2	2	5
	LED signage			7	7
	Sound	1	3	10	14
	Event dependent	1	3	6	10
Control Features	Game history	4	6	29	39
	Game statistics	8	4	27	39
	Player feedback		1	5	6
	Player starts game	1	3	14	18
	Game starts automatically		1	1	2
	Physical control of game apparatus		2	9	11
	No additional control features	3	4	2	9
Complexity Features	Strategic betting	7	2	8	17
	Side bets		2	26	28
	Progressive jackpots			21	21
	Additional betting options	4	1	30	35
	Additional features			13	13
	Display customisation		3	3	6
	Help menu/betting guides		4	17	21
	Language settings			7	7
	Same rules as traditional		1	4	5
	No additional complexity features	4	7	1	12
Expedited Play Features	Faster than traditional			10	10
	60-80 spins per hour			3	3
	10 sec time limit		3	4	7
	20-30 secs between games	2	4	8	14
	Operator configurable time between bets	1		17	18
	Manual control over game timer	6	1		7
	No faster than traditional		1		1

Table 3
Continued

		Casino Visits	AGE	Industry Media	Total
Social Features	Instant payouts			3	3
	Operator configurable min/ max spend			20	20
	Multi-denomination			16	16
	Time scheduled availability of denominations			9	9
	Re-bet/high bet button		1	8	9
	Multigame	12	1	18	31
	Concurrent games		1	13	14
	Private betting	13	8	16	37
	Public game play		2	1	3
	Public players bets			1	1
	Public players hands (but not bets)		3	9	12
	Community style		1	13	14
	Communal jackpots	2	2	5	9
	Bet against other players			2	2
	Comparable to traditional version	5		9	14
	Minimal privacy		1	2	3

1 and 10 people. Automated casino products that could have between 11 and 20 simultaneous players were the second most prevalent followed closely by products that allowed for 21-30 simultaneous players. Many of the products offered endless expansion allowing venue operators to adapt the numbers based on demand or allocation for space; a feature used frequently in Australian casinos. See Table 2 for the thematic analysis of the number of simultaneous player accommodated by automated products.

Visual and auditory enhancements. The majority of automated products consisted of a combination of individual and shared screens. Some products only had individual screens but these were usually semi-automated products that used physical gaming apparatus and a live croupier. Stand-alone machines that were fully-digitalised were less likely to have a shared screen as they were commonly not linked to a main station or other individual machines. Individual displays were predominantly touchscreen and provided gamblers with game views and outcomes, individual betting, and game history and/or statistics. Shared screens offered similar features but also displayed footage of the host or croupier either streamed live, animated or a video-playback model. Most of the products included some form of animated, graphic or visual enhancements on either individual or shared displays that were often event dependent. Visual features unique to automated products included 3D images and adaptive or configurable visual features; for instance, graphics that could be changed dependent on the season, sponsors or current themes and events. Sound effects were less evident, but for those products that incorporated

sound, it was often event dependent and included intricate or detailed musical pieces. Some games had more involved animations in lieu of distracting sound effects. *Table 3* presents the full thematic analysis for visual and auditory enhancements of automated casino products.

Illusion of control features. Results from the thematic analysis are presented in *Table 3*. Communal player aide data such as game statistics and history featured frequently in many of the automated products regardless of the type of game. Player feedback was reported far less frequently than other forms of player data. Many of the products allowed for players to control game initiation with some providing physical control over gaming apparatus.

Cognitive complexity. Many products were observed to include strategic betting and additional betting options (i.e., betting on single or double zero roulette wheels; placing wagers on banker, player or tie). Side betting and progressive jackpots were shown to be common features of automated products sourced from industry media but were not observed to feature on any of the products identified in Australian casinos. The industry media scan also observed multiple games that reported additional features such as the ability to double wins using a “double spot feature”. Many products contained help menus, strategic betting guides or other informative material such as “dealer’s tips”. However, most of the games surveyed through casino visits and the AGE did not appear to include any additional complexity features. *Table 3* displays the thematic analysis of complexity characteristics of automated casino products.

Expedited play. Results from the thematic analysis are presented in *Table 3*. Many of the products surveyed allowed for the time between bets and subsequent rate of play to be configured by the venue operator. It was uncommon for games to have specific time configurations for the machines (particularly as most were operator configurable). Those games that did have specific time-configurations included automated products that were able to provide 60-80 gamers per hour with 10 second time limits for making bets or initiating game play. Many of the products allowed for control over game initiation or the game timer, however, if players failed to begin gameplay the game would automatically run every 20-30 seconds. Few sources, however, overtly stated that products were faster than their traditional counterparts.

In terms of expenditure, minimum and maximum betting amounts were predominantly operator configurable and many of the products were multi-denominational. Many allowed for time scheduling of particular denominations or included additional features that accelerated play rate (i.e., fast bet options such as re-bet and high bet features that allow gamblers to automatically repeat a bet or place the highest wager on the table).

One of the major features of automated products related to expedited play was the high frequency of multigames. Many products offered additional games at the

one terminal that could be played simultaneously. As mentioned earlier, many of these products were purely multigame products that clearly incorporated numerous games for players to choose (see Table 2 for the prevalence of multigame products). Many other products were marketed or presented as an individual game (i.e., purely roulette or baccarat) but included other games for gamblers to play at the same station. Often, automated products that offered multigame options allowed for players to play more than one type of game simultaneously, significantly increasing the rate of play.

Social customisation. Despite most products allowing players to gamble at the same table, a large proportion of products included private betting as wagering was not made public to others and tended to be conducted on gamblers' individual playing screen. Few products were observed to maintain the social nature of traditional versions. This was most commonly displayed by public access to players' hands or decisions (but not bets), and having gamblers wager on a central game (community style games often displayed on a shared screen). Some products included player interaction either through communal style jackpots or direct one-on-one competition. See Table 3 for the full thematic analysis.

Survey of Community and Novelty Style Games

Community and novelty games included any games that were not casino based or EGMs, but that appeared to be technologically enhanced. No automated versions of community or novelty games were identified at the AGE. All findings pertaining to these types of automated products refer strictly to results from casino visits and the industry media scan. Table 4 displays type of game, level of automation and the number of simultaneous players. Table 5 presents the results from the thematic analysis using the VICES criteria.

Type of gambling product and location. Casino visits identified only a few automated products with all but one being located at the same venue: the Crowne Casino in Perth, Western Australia. Community style and novelty automated products are largely underrepresented or absent throughout other states of Australia, with Jupiter's casino on the Gold Coast being the only other venue to have an automated keno product.

The most popular community or novelty game in automated form identified by the scan was automated or digitalised bingo. Multigames were also common, combining community games such as bingo and keno with novelty games (pop n poker), casino games (roulette, blackjack and poker), or slots. Novelty games such as pai gow dominoes and pachinko featured only in casino venues and were not found in any of the industry media sources surveyed. Manufacturer and trade material identified two other novelty games not offered in Australian casinos. Spoils-of-war is a game based on a children's card game (similar to casino wars) where players are pitted against the computer, and to win a player must hold a card with a higher value than the dealer. Race card derby is a game where players make bets on a

Table 4

Thematic Analysis of Product Type, Level of Automation and Automated Features and Number of Players by Environmental Scan Stage for Automated Community and Novelty Products

		Casino	Visit	Industry	Media	Total
Type of Game	Bingo	1		7		8
	Pai Gow Dominoes	1				1
	Keno	2				2
	Pachinko	1				1
	Race Card Derby			1		1
	Spoils of War			1		1
	Multigame	1		5		6
	Bingo/Slots			1		1
	Bingo/Roulette			2		2
	Bingo/Roulette/Blackjack			1		1
	Bingo/Keno/Pop n Poker			1		1
	Roulette/Poker/Keno	1				1
Level of Automation	Semi-automated					
	Fully-automated			3		3
	Fully-digitalised	6		9		15
Number of Simultaneous Players	1 (Standalone)	6		11		17
	10-12			1		1
	Expandable			3		3

Note. Numbers signify the presence of a product based on the manufacturer and product model and do not include multiple instances of the same product.

virtual horse race. Novelty games and keno, however, were far less common than bingo and multigame products. Casinos that included standalone products generally had multiple machines that were either grouped together as seen with EGM lounges or spread throughout the casino making the total per site figure difficult to determine.

Level of automation and number of simultaneous players. A majority of these games were comparable to EGMs as they were standalone units that were predominantly fully-digitalised; requiring no croupier, host or mechanical parts. For standalone units, each station allowed for one player but multiple machines could be banked together as seen in pokie lounges to increase simultaneous play. Products that were fully-automated were similar to automated casino products as they consisted of a number of expandable units connected to one automated playing system. Fully-automated community/novelty products generally used some form of automated ball shuffler (similar to the vibrating dice dome/cylinder for casino dice games). This was more prevalent for multigame systems. Some standalone units also included automated or mechanical game components for number selection; for example a mechanical drum to select balls for bingo (and roulette on multigame systems). Table 4 shows the thematic analysis for automation and the number of simultaneous players for community and novelty automated products.

Table 5

Thematic Analysis of Automated Community and Novelty Games based on the VICES Framework Criteria

		Casino Visits	Industry Media	Total
Visual and Auditory Features	Individual Playing Screen	6	12	18
	Touchscreen		1	1
	No touchscreen	1		1
	Keypad entry	2		2
	Animations	1	6	7
	3D graphics		1	1
	Illumination		1	1
	Shared display		2	2
	Sound effects		3	3
	Event dependent		1	1
Control Features	Statistics		1	1
	No additional control features	6	9	15
Complexity Features	Bonuses/jackpots		6	6
	Purchase additional balls		5	5
	No additional complexity features	6	1	7
Expedited Play Features	Fast paced		2	2
	Multigame	1	5	6
	Concurrent games		3	3
	Multiple “hands/cards”		5	5
	Manual game control (timer)	6	1	7
Social Features	Private betting	5	13	18
	Shared prizes	1	2	3
	No shared prizes	2		2

Visual and auditory enhancements. Given majority of these products were standalone, most of them had individual playing screens that were either touchscreen or used keypads for bet selections. Animations were found to be a feature on many of the products with some including 3D graphics and illumination. Minimal auditory enhancements were identified. See Table 5 for the full thematic analysis.

Illusion of control and cognitive complexity. Features that increase control or the complexity of the game were far less prominent for community and novelty products compared to casino products. Minimal community/novelty products offered statistics or other information to aide game play decisions and did not incorporate any additional control features compared to their traditional counterparts. No additional complexity features were identified for products surveyed during casino visits. From the media scan, some products reported bonus features, jackpots and the option to purchase additional balls to extend game play. While the ability to purchase additional balls is a feature of complexity, it can also increase a perception

of control as players can make a choice that may provide an opportunity to win. See Table 5 for the full thematic analysis.

Expedited play. Majority of these products were manually initiated rather than being controlled by a timer (comparable to EGMs). Similarly to casino-based products, the most prominent feature relating to expedited play was multigame functions. Not only could players often choose to play a variety of games simultaneously, many of the bingo systems allowed players to wager on multiple cards concurrently. See *Table 5* for the full thematic analysis.

Social customisation. Generally these types of products did not offer a great amount of social interaction. Players predominantly played on private units so others were unable to view their betting and wagering decisions with only a minimal number of products offering communal or shared prizes. See Table 5 for the thematic analysis.

Discussion

The environmental scan sought to determine the features associated with automated products according to the VICES framework (Armstrong & Rockloff, 2015). The aim was to distinguish salient characteristics that may work to entice new players or encourage reckless betting. Results show that automation significantly alters the delivery of traditional casino and community/novelty games.

Community style products were predominantly located in Perth (which has substantially different gaming legislation to other states) and encouraged isolated, single player gambling. Table-game products were far more prevalent in Australian casinos and were often configured to accommodate multiple simultaneous players. Marketing automated casino games for 1-10 players reflects similar sizes to traditional games. It seems that manufacturers market a conservative or traditional size to accommodate a broader market; allowing for venue operators to expand at their will. Australian venue operators have taken advantage of expandable products; with for a common configuration of products that accommodated anywhere from 31 to 70 simultaneous players.

Automated products allow for the incorporation of personalised displays that offer rich visual and auditory stimulation. For example, one of the most advanced visual features was the use of holographic images by Interblock for displaying the host and game play. Visual graphics may increase player engagement and appeal, while the ability to incorporate event-dependent dynamic sound effects may reinforce and encourage more intense betting compared to traditional games that rely on naturalistic visuals and sounds. There were minimal auditory enhancements identified for community style and novelty products, and this was unexpected given the technological similarity of these games to EGMs.

Automated products offer new ways to increase player involvement and perceived control, often allowing players control over game initiation and apparatus. For example, levers that spin the big wheel or control over dice rolls on digitalised sic bo products can enhance the degree of involvement in the game. Control features may not often be available on traditional forms but can be incorporated into both casino and community style automated products with relative ease. Further, simply having interaction with the machine (particularly for community style games) could be enough to increase perceived control compared to traditional versions (i.e., bingo that has no interaction other than with the playing card can have more player interactions on the machine-version).

Much of the data pertaining to casino products complexity was derived through industry media as obtaining such information is difficult when observing others engaging with the product. Many of the casino products contained help menus, strategic betting guides or other informative material such as “dealer’s tips” to aide gamblers in engaging with the product and making their wagering decisions. In contrast, community style products had minimal additional complexity and instead reflected the relative simplicity of choices associated with the ever-popular EGM. The findings indicate that automated products can be developed either for simplicity and ease-of-use (community style games) or complexity (interactive table-game products).

Automated products may significantly influence expedited play. Traditional casino games often have particular tables allocated to particular denominations or game types. Multi-denominational products and those that offer numerous games on one station minimise the necessity for players to gamble at a different table to modulate their bet-size; thereby reducing the time between subsequent bets. While the actual speed of betting has not yet been established, it would be expected to be more similar to the fast play of EGMs, since the initiation of a bet is often user-dependent and not reliant on other gamblers’ wagering. Multigame systems offer players the ability to place multiple wagers simultaneously; increasing the frequency or rate at which a person can gamble.

Automated products provide a social climate for all gamblers. Those who prefer different types of games can gamble together rather than on different tables or locations in the casino. The social nature of traditional casino tables has been largely preserved by having a central game linked to individual stations. However, private betting decreases the likelihood that gambling behaviour may be influenced by the presence of others. Additionally, those who wish to avoid social interactions can still play these automated versions, as many products offer an individual betting experience similar to EGMs. Community style games that traditionally encourage social interactions are far more isolating in automated form; representing the style of gambling offered by EGMs that provide no communal features.

Limitations

The environmental scan was reliant on observation and therefore, there was limited opportunity to explore the dynamics of the product. Important information regarding auditory enhancements or additional features that influence control, speed of play or complexity may have been overlooked or under-represented. Similarly, the industry media scan that was reliant on reports from manufacturers who have sales-oriented motives when discussing product features. Although we analysed the features of these products that are likely to change behaviour, the design of the study precluded an analysis of the effects of these innovations on gambling involvement. Future research will be needed to draw firm conclusions on the relative safety of these technological innovations.

Conclusions

Technological enhancements allow for features to be added that increase immersion and potentially encourage elevated play by automatic betting functions, reducing the time between games and reinforcing betting behaviours with intricate graphics, animations and sound. Casino-based automated products offer all the features of traditional versions in size and functionality but with additional enhancements similar to EGMs; the latter being a product most associated with gambling-related problems in Australia. Conversely, community style and novelty automated products have been designed to replicate some of the functionality of EGMs; and as such, may result in similar patterns of gambling behaviour given the overlap in features associated with excessive gambling.

Having established the characteristics associated with various types of automated products, it is important to determine what features may be most appealing to consumers who experience gambling-related harm. In order to identify features that may be instrumental in initiating automated product consumption, there is a need to identify those who are engaging with these product and those who may potentially use these products in lieu of traditional versions. In future research, it will then be possible to use the characteristics identified in the environmental scan to ascertain which features are the most appealing, and how these features may alter the relative popularity and safety of these forms of gambling.

References

- Armstrong, T., & Rockloff, M. (2015). Gambling innovation: the implications of automation for traditional casino and community games. Unpublished manuscript.
- Bedny, G. Z., Karwowski, W., & Bedny, I. S. (2012). Complexity Evaluation of Computer-Based Tasks. *International Journal of Human-Computer Interaction*, 28(4), 236–257. <http://dx.doi.org/10.1080/10447318.2011.581895>

- Davis, D., Sundahl, I., & Lesbo, M. (2000). Illusory Personal Control as a Determinant of Bet Size and Type in Casino Craps Games1. *Journal of Applied Social Psychology*, 30(6), 1224–1242. <http://dx.doi.org/10.1111/j.1559-1816.2000.tb02518.x>
- Delfabbro, P., Flazon, K., & Ingram, T. (2005). The effects of parameter variations in electronic gambling simulations: Results of a laboratory-based pilot investigation. *Gambling Research*, 17(1), 7–25.
- Dixon, L., Trigg, R., & Griffiths, M. (2007). An empirical investigation of music and gambling behaviour. *International Gambling Studies*, 7(3), 315–326. <http://dx.doi.org/10.1080/14459790701601471>
- Geen, R. G. (1991). Social Motivation. *Annual Review of Psychology*, 42(1), 377–399. <http://dx.doi.org/10.1146/annurev.ps.42.020191.002113>
- Griffiths, M. (1999). Gambling Technologies: Prospects for problem gambling. *Journal of Gambling Studies*, 15(9), 265–283. <http://dx.doi.org/10.1023/A:1023053630588>
- Griffiths, M. (2003). Internet Gambling: Issues, concerns, and recommendations. *CyberPsychology and Behaviour*, 6(6), 557–568. <http://dx.doi.org/10.1089/109493103322725333>
- Griffiths, M., Parke, A., Wood, R., & Parke, J. (2006). Internet Gambling: An overview of psychosocial impacts. *UNVL Gambling Research and Review Journal*, 10(1), 27–39.
- Griffiths, M., & Parke, J. (2005). The psychology of music in gambling environments: An observational research note. *Journal of Gambling Issues*, 13. <http://dx.doi.org/10.4309/jgi.2005.13.8>
- Johnson, J. E. V., & Bruce, A. C. (1997). An empirical study of the impact of complexity on participation in horserace betting. *Journal of Gambling Studies*, 13(2), 159–172.
- Johnson, J. E. V., & Bruce, A. C. (1998). Risk strategy under task complexity: A multivariate analysis of behaviour in a naturalistic setting. *Behavioral Decision Making*, 11(1), 1–17.
- Ladouceur, R., & Sévigny, S. (2002). Symbols Presentation Modality as a Determinant of Gambling Behavior. *The Journal of Psychology*, 136(4), 443–448. <http://dx.doi.org/10.1080/00223980209604170>
- Ladouceur, R., & Sévigny, S. (2005). Structural Characteristics of Video Lotteries: Effects of a Stopping Device on Illusion of Control and Gambling Persistence.

Journal of Gambling Studies, 21(2), 117–131. <http://dx.doi.org/10.1007/s10899-005-3028-5>

Ladouceur, R., & Sévigny, S. (2006). The impact of video lottery game speed on gamblers. *Journal of Gambling Issues*, 17. <http://dx.doi.org/10.4309/jgi.2006.17.12>

Livingstone, C., Woolley, R., South Australia, Independent Gambling Authority, La Trobe University, & Australian Institute for Primary Care. (2008). The relevance and role of gaming machine games and game features on the play of problem gamblers: report. Adelaide: Independent Gambling Authority.

Parke, J., & Griffiths, M. (2006). The psychology of the Fruit Machine: The role of structural characteristics (Revisited). *International Journal of Mental Health Addiction*, 4(2), 151–179. <http://dx.doi.org/10.1007/s11469-006-9014-z>

Payne, J. W. (1976). Task complexity and contingent processing in decision making: An information search and protocol analysis. *Organizational Behavior and Human Performance*, 16(2), 366–387. [http://dx.doi.org/10.1016/0030-5073\(76\)90022-2](http://dx.doi.org/10.1016/0030-5073(76)90022-2)

Rockloff, M. J., & Dyer, V. (2007). An Experiment on the Social Facilitation of Gambling Behavior. *Journal of Gambling Studies*, 23(1), 1–12. <http://dx.doi.org/10.1007/s10899-006-9042-4>

Rockloff, M. J., Greer, N., & Fay, C. (2011). The Social Contagion of Gambling: How Venue Size Contributes to Player Losses. *Journal of Gambling Studies*, 27(3), 487–497. <http://dx.doi.org/10.1007/s10899-010-9220-2>

Spenwyn, J., Barrett, D. J. K., & Griffiths, M. D. (2010). The Role of Light and Music in Gambling Behaviour: An Empirical Pilot Study. *International Journal of Mental Health and Addiction*, 8(1), 107–118. <http://dx.doi.org/10.1007/s11469-009-9226-0>

Stefan, S., & David, D. (2013). Recent developments in the experimental investigation of the illusion of control. A meta-analytic review: A meta-analysis of the illusion of control. *Journal of Applied Social Psychology*, 43(2), 377–386. <http://dx.doi.org/10.1111/j.1559-1816.2013.01007.x>

Wixted, J. T. (2004). The Psychology and Neuroscience of Forgetting. *Annual Review of Psychology*, 55(1), 235–269. <http://dx.doi.org/10.1146/annurev.psych.55.090902.141555>

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Motivation-Matched Approach to the Treatment of Problem Gambling: A Case Series Pilot Study

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Abstract

The aim of the present case series was to provide a preliminary assessment of the utility of a motivation-matched treatment for problem gamblers. On the basis of their primary underlying motivations for gambling, 6 problem gamblers received either action-motivated ($n = 4$) or escape-motivated ($n = 2$) treatment. Drawing upon a cognitive-behavioural framework, this 6-session motivation-matched treatment was designed to address gamblers' maladaptive motivations for gambling (i.e., the need or desire for "escape" or "action"), as well as the effects of conditioning and maladaptive thinking patterns unique to each gambling motive subtype. Assessments were conducted at pre-treatment, post-treatment, and 3- and 6-month follow-up. Primary outcome measures included gambling behaviour (i.e., gambling frequency, time, and money spent gambling), severity of gambling problems, and gambling-related impairment or disability; secondary outcome measures included gambling-related craving, gambling abstinence self-efficacy, positively and negatively reinforcing gambling situations, and gambling outcome expectancies. Overall, participants showed pre- to post-treatment improvements on the majority of these measures, with relatively less immediate post-treatment treatment gains observed on measures that assessed positively and negatively reinforcing gambling situations and gambling-related impairment or disability. However, treatment gains at the 3- and 6-month follow-up were shown for most participants on these latter measures as well. Findings suggest promise for this novel treatment approach. The next step in this line of research is to conduct a randomized, controlled trial to compare the efficacy of this motivation-matched treatment for disordered gambling with treatment as usual.

Keywords: Problem gambling, motivation, treatment, pilot study, reliable change index, motivation-matched treatment, case series

Résumé

L'objectif de la présente étude de série de cas était d'effectuer une évaluation préliminaire de l'utilité d'une thérapie tenant compte des motivations chez les personnes ayant un problème de jeu. En fonction de leurs principales motivations sous-jacentes à l'égard du jeu, six joueurs excessifs ont reçu un traitement axé sur le jeu motivé par l'action ($n = 4$) ou motivé par la fuite ($n = 2$). S'inspirant du cadre cognitivo-comportemental, les six séances de thérapie tenant compte de la motivation ont été conçues dans le but de traiter les motivations au jeu relevant d'une mésadaptation (soit le besoin ou le désir de « fuite » ou d'« action ») ainsi que défaire le conditionnement et les schèmes de pensée mésadaptés propres à chaque sous-type de motivation au jeu. Des évaluations ont été réalisées avant et après la thérapie, et par la suite un suivi a été effectué trois et six mois plus tard. Les mesures des principaux résultats touchaient les comportements associés au jeu (la fréquence des séances de jeu, leur durée et le montant d'argent dépensé), la gravité des problèmes de jeu et les pertes ou incapacités liées au jeu, alors que les mesures des résultats secondaires concernaient l'envie de jouer, l'auto-efficacité de l'abstinence à l'égard du jeu, le renforcement positif et négatif des situations de jeu et les attentes quant à l'issue des jeux de hasard. De manière générale, la plupart de ces mesures ont donné lieu chez les participants à une amélioration entre les évaluations précédant et suivant la thérapie, quoique que les gains observés dans l'évaluation faisant immédiatement suite à la thérapie aient été relativement moins importants dans le cas des mesures portant sur le renforcement positif et négatif des situations de jeu et sur les pertes ou les incapacités liées au jeu. Toutefois, des améliorations concernant ces mesures ont été observées chez la plupart des participants lors des suivis effectués trois mois et six mois après la thérapie. Les constatations de l'étude laissent supposer que cette nouvelle approche thérapeutique est prometteuse. La prochaine étape dans ce domaine de recherche sera de mener un essai clinique randomisé afin de comparer l'efficacité d'une thérapie contre le jeu excessif tenant compte des motivations par rapport à l'approche thérapeutique habituelle.

Introduction

Despite advances in research and treatment, problem gambling (PG) is a significant public health concern. Further, research examining theoretical models and evidence-based treatments for PG is still in its infancy compared with research on other addictive behaviours (Ledgerwood & Petry, 2005). One potential reason for this lack of research is that problem gamblers are often viewed as a homogeneous population. Currently, the standard intervention for PG is cognitive behaviour therapy (CBT); however, the usual “one-size-fits-all” approach is only moderately

effective (see Ledgerwood & Petry, 2005). With the emerging recognition that problem gamblers are a heterogeneous population who may respond well to treatments that target this heterogeneity (e.g., Blaszczynski & Nower, 2002), it has been recommended that interventions be geared towards specific subtypes of gamblers (Suomi, Dowling, & Jackson, 2014).

Within addiction research, previous studies highlight the value of designing matched treatments that account for particular personality characteristics of at-risk individuals, as well as comorbid psychopathology (Conrod et al., 2000), while also targeting underlying motives for substance misuse (see Watt, Stewart, Conrod, & Schmidt, 2008). Substance use disorders and PG have increasingly been conceptualized as part of the same category of disorders (i.e., addictive disorders), given that they share many features (e.g., tolerance and withdrawal; for a review, see Mudry et al., 2011). This conceptualization has recently been reflected in the 5th edition of the American Psychiatric Association (APA) *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* (APA, 2013), as pathological gambling, previously categorized as an impulse control disorder, was reclassified within the substance-related and addictive disorders and renamed gambling disorder. Despite these similarities, the effectiveness of matched-treatment interventions has not been tested among problem gamblers. The present case series aims to address this gap by providing a preliminary assessment of the utility of a motivation-matched treatment intervention approach with this population.

Motivations for Gambling

Motivational models of addictive behaviour have proven useful in understanding the development and maintenance of addictive behaviours (e.g., alcohol; for review, see Cooper, Kuntsche, Levitt, Barber, & Wolf, 2015) and assert that people consume substances to obtain desired outcomes (e.g., regulate positive and negative emotions; Cooper et al., 2015). Given the similarities between gambling disorder and substance use disorders as addictive disorders (e.g., APA, 2013; Mudry et al., 2011) and the co-occurrence of both disorders (e.g., Hodgins & Racicot, 2013), it is likely that common motives underlie gambling and substance use. Indeed, many motivational models argue that desires for mood alteration (i.e., negative affect reduction or positive mood enhancement) underlie various addictive behaviours (Cooper et al., 2015), including gambling (Stewart & Zack, 2008).

Drawing upon such findings, research (Shead & Hodgins, 2009; Stewart, Zack, Collins, Klein, & Fragopoulous, 2008) suggests that gamblers can be reliably and validly categorized into one of three subtypes on the basis of their underlying motivations for gambling: (1) escape-motivated gamblers (gamble to cope with or escape from negative emotions, worries, and life concerns); (2) action-motivated gamblers (gamble for enhancement, emotional reward, or the excitement and “rush”); and (3) low emotion regulation gamblers (primary motivation to gamble is unclear, but they are not motivated to gamble to alter internal affective states; instead, they appear to be motivated by external factors, e.g., social affiliation).

The validity of this subtyping scheme has been demonstrated with a variety of clinically relevant criteria, including severity of gambling problems, gambling frequency, and specific gambling outcome expectancies. For example, Yi and colleagues (2015) reported that action-motivated gamblers endorse reward gambling outcome expectancies, whereas escape-motivated gamblers tend to endorse relief gambling outcome expectancies. Research has also found that escape and action motives are strongly associated with PG, whereas social-affiliative motives are more likely to be primarily endorsed by non-problem gamblers and low emotion regulation gamblers (Stewart & Zack, 2008). Escape and action motives are both strongly associated with PG, and problem gamblers with these motives tend to be more resistant to treatment (Daughters, Lejeuz, Lesieur, Strong, & Zvolensky, 2003; Leblond, Ladouceur, & Blaszczynski, 2003). However, escape-motivated gambling is normally characterized by more severe gambling problems and action-motivated gambling by more frequent and excessive gambling behaviour (Stewart & Zack, 2008). This finding is consistent with the broader addictions literature that has consistently found motivations involving coping with negative emotions to be most strongly associated with problematic forms of addictive behaviours (e.g., Birch, Stewart, & Zack, 2006; Cooper, Russell, Skinner, & Windle, 1992). However, the utility of this subtyping scheme for informing treatment-matching efforts aimed at improving PG treatment outcomes remains to be determined.

The most common treatment for PG is CBT (Daughters et al., 2003; Leblond et al., 2003; Rash & Petry, 2014). Despite a range of CBT-based treatments for PG, however, only moderate response rates have been found among gamblers who receive such treatments (see Gooding & Tarrier, 2009, for a review), and this is particularly the case among escape and action-motivated gamblers (Daughters et al., 2003; Leblond et al., 2003). Such findings clearly point to the need to improve on the current therapeutic interventions for PG. One strategy to accomplish this is by designing treatments that target specific subtypes of gamblers. Drawing upon a cognitive-behavioural framework, the premise of motivation-matched treatment for gamblers is to expand on traditional CBT by including components that differentially identify and modify the types of psychological factors (e.g., maladaptive beliefs) related to gambling exhibited by each subtype of gambler (action- and escape-motivated).

Over and above traditional CBT, the goal of gambling-matched treatment is to target the beliefs that impede control of gambling behaviour and to extinguish operant and classic conditioning related to gambling activities, environments, and associated stimuli (i.e., sounds, images, and objects such as money) that make gamblers susceptible to approaching gambling situations. Because these processes are distinct to each subtype of gambler (e.g., action-motivated gamblers perceive gambling as a means of excitement, whereas escape-motivated gamblers perceive it as a means of relieving distress), and because gambling-matched treatment accounts for such differences (Stewart et al., 2011), we hypothesized that matched treatments would lead to positive treatment outcomes in both escape- and action-motivated gamblers. The purpose of the present pilot case series was to conduct a preliminary assessment of the effectiveness of a novel, motivation-matched treatment for PG

before recommending it for more rigorous experimental assessment (i.e., via a randomized controlled trial).

Method

Participants

Participants were recruited from clinician referrals (local community addictions prevention or treatment programs), posters, and referrals from a gambling telephone helpline. Inclusion criteria for the current pilot case series were as follows: (1) classification as a problem gambler¹ (i.e., Problem Gambling Severity Index [PGSI] score of 8 or more; Ferris & Wynne, 2001); (2) proficiency in written and spoken English; (3) minimum 19 years of age; and (4) ability to provide written informed consent. Exclusion criteria included (1) gambling abstinence longer than 2 months prior to intake; (2) concurrently seeking treatment for PG from another therapist; (3) current or lifetime history of psychosis; (4) current alcohol or substance dependence; and (5) current suicidal intent or suicide attempts within the past 5 years. The latter three criteria were exclusionary because of concerns that the needs of problem gamblers with these comorbidities might not be met within this brief intervention.

Nineteen prospective participants passed the telephone screening and were invited for intake assessment (described in the following section). Twelve completed intake assessment and met the inclusion and exclusion criteria. Of these, two withdrew prior to treatment, one after session two, two after session four, and one after session five (all for unknown reasons). As outcome data were not collected for these latter six, they were excluded. The remaining participants who completed all treatment sessions, the post-treatment assessment, and at least one of the follow-up sessions consisted of six Caucasian males who ranged in age from 34 to 56 years ($M = 46.33$, $SD = 9.97$). All were employed, four were married, one was single, and one was separated; all had a grade 12 education and three had postsecondary education; and all were classified as problem gamblers on the PGSI ($M = 17.17$, $SD = 5.71$, range 10–23). On the basis of their primary motivations for gambling (Gambling Motives Questionnaire [GMQ]; Stewart & Zack, 2008), participants received either action-motivated ($n = 4$) or escape-motivated ($n = 2$) treatment.

Measures

Screening measures.

PG symptoms. The nine-item PGSI scale of the Canadian Problem Gambling Index (CPGI; Ferris & Wynne, 2001) assessed the presence and severity of gambling problems during pre-treatment screening. For each item (e.g., “Have you bet more

¹Although the current study recruited problem gamblers whose gambling problem severity was classified as “high risk” on the CPGI (i.e., score of 8 or more), the *BEAT Gambling* treatment is also designed for use in individuals who exhibit scores in the “moderate risk” range of problem gambling severity (PGSI score 3–7).

than you could really afford to lose?”), respondents indicated how frequently they engaged in the behaviour or experienced the consequence in the last 12 months on a scale that ranged from 0 (*never*) to 3 (*almost always*), and those who had a total score of 8 or more were classified as “high risk” or “problem gamblers.”

Comorbid mental health issues. The Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition with Psychotic Screen (SCID-I/P W/PSY SCREEN; First, Spitzer, Gibbon, & Williams, 2002) established current and lifetime Axis I disorders for descriptive purposes and to determine eligibility.

Gambling motives. The 15-item GMQ (Stewart & Zack, 2008) assessed reasons for gambling (i.e., coping, enhancement, social motives). Participants rated how frequently they gambled for each of 15 reasons (e.g., “to relax”; “because it’s exciting”; “to be sociable”) on a scale that ranged from 1 (*almost never or never*) to 4 (*almost always*) and the result was used to categorize participants as “escape”- or “action”-motivated gamblers (based on which subscale had the highest *z*-score by using means and standard deviations from Stewart & Zack, 2008) and to assign them to the appropriate matched treatment.

Primary outcome measures.

Gambling participation. A modified Gambling Activities Screen (GAS; Doiron & Nicki, 2007) assessed changes in gambling participation (e.g., frequency, time spent, money spent) over the past 7 days.

PG severity. The National Opinion Research Center DSM Screen for Gambling Problems (NODS; Gerstein et al., 1999) assessed gambling problems by using 17 items (scored yes or no), with higher scores indicating increased levels of gambling problems. Questions were framed to assess gambling problems over the past 3 months.

Impairment or disability. The three-item Sheehan Disability Scale modified for gambling (SDS-G; Hodgins, 2013) assessed impairment (work, family, social functioning) related to gambling problems. Participants rated each item (e.g., “To what extent has your gambling problem disrupted your work or studies in the past month?”) on a scale that ranged from 0 (*not at all*) to 10 (*extremely*).

Secondary outcome measures.

Craving to gamble. Drawing upon previous research (Tavares, Zilberman, Hodgins, & el-Guebaly, 2005), a five-item modified version of the Penn Alcohol Craving Scale (PACS; Flannery, Volpicelli, & Pettinati, 1999) measured gambling-related craving over the past 7 days. Participants rated frequency, time spent thinking about gambling, difficulty in resisting relapse opportunities, and strength of craving (e.g., “How often have you thought about gambling or about how good gambling would make you feel during the past seven days?”) on a scale that ranged from 0 (*never, none, not at all*) to six (*nearly all, strong, all the time*).

Gambling abstinence self-efficacy. The 21-item Gambling Abstinence Self-Efficacy Scale (GASS; Hodgins, Peden, & Makarchuk, 2004) measured participants' confidence in their ability to control, reduce, or abstain from gambling. For each item, participants indicated how confident they were that they would not gamble (or gamble heavily) in a specific situation (e.g., "I wanted to win"; "I felt pressured by financial debts") on a scale that ranged from 0 (*not at all confident*) to 5 (*extremely confident*).

Positively and negatively reinforcing gambling situations. The 63-item Inventory of Gambling Situations (IGS; Turner & Littman-Sharp, 2001) assessed the frequency of gambling in high-risk situations. Previous research (Stewart et al., 2008) found that the original 10 subscales load on two factors: one that positively reinforces gambling situations (e.g., pleasant emotions, need for excitement) and one that negatively reinforces gambling situations (e.g., worried over debt, unpleasant emotions). Participants rated each item (e.g., "When I was worried about my debts"; "When I felt confident about my gambling skills") on a scale that ranged from 1 (*almost never or never gambled heavily in that situation*) to 4 (*almost always gambled heavily in that situation*).

Affect-regulation gambling outcome expectancies. The 18-item Gambling Affect Expectancy Questionnaire (GAEQ; Shead & Hodgins, 2009) assessed self-reported positive affect-regulation gambling outcome expectancies for reward (e.g., "It would be wonderful to gamble now") and relief (e.g., "I would feel less tense if I gambled now") expectancies. Participants indicated how much they agreed or disagreed with each item on a scale that ranged from 1 (*strongly disagree*) to 7 (*strongly agree*).

The reliability coefficients (i.e., Cronbach's alpha) for these primary and secondary outcome measures are presented in Table 1.

Table 1
Reliability Coefficients (Cronbach's Alpha) and Sources for Outcome Measures

Instrument	Reliability (Cronbach's alpha)	Source
NODS	0.98	Gerstein et al., 1999
PACS	0.92	Ashrafioun et al., 2012
GASS	0.93	Hodgins et al., 2004
IGS		
Positive	0.90	Turner et al., 2013
Negative	0.95	
GAEQ		
Reward	0.90	Yi et al., 2015
Relief	0.94	
SDS-G	0.81	Hodgins, 2013

Note. NODS = National Opinion Research Center Diagnostic Screen for Gambling Problems; PACS = Penn Alcohol Craving Scale; GASS = Gambling Abstinence Self-Efficacy Scale; IGS = Inventory of Gambling Situations; GAEQ = Gambling Affect Expectancy Questionnaire; SDS-G = Sheehan Disability Scale modified for gambling.

Procedure

Six sessions of individual treatment were delivered over 6 weeks. Assessments were conducted at pre-treatment, post-treatment, and 3- and 6-month follow-up.

Assessment. Participants were screened by telephone and those who were eligible were invited to the university for a pre-treatment intake assessment, where they provided written informed consent, underwent the SCID-I/P (First et al., 1998), and completed the GMQ (Stewart & Zack, 2008) and the pre-treatment outcome measures. Eligible participants scheduled a time to commence treatment within 3 weeks of intake assessment. Self-report questionnaires were re-administered three times following treatment: at post-treatment and at 3- and 6-month follow-up sessions.

Treatment protocol. The treatment program *Brief Escape and Action Treatment for Gambling (BEAT Gambling)* is a novel manualized treatment program for problem gamblers (Stewart et al., 2011) consisting of six sessions of individual treatment, delivered over 6 weeks. Sessions were held approximately 1 week apart. Sessions one to four were 90 min long and sessions five and six were 60 min long. Those who could not attend their session rescheduled the following week. Each session taught skills to manage gambling. Drawing upon a cognitive-behavioural framework, therapists (doctoral-level licensed psychologists, supervised clinical psychology graduate students) delivered treatment designed to address specific maladaptive motivations for gambling, as well as the conditioning and unhelpful thinking patterns unique to each subtype.

In session one, all clients shared their history of PG and reflected on what brought them to treatment. They were given feedback about their gambling, introduced to the model of gambling maintenance for treatment (i.e., action-escape model of gambling maintenance), and presented with a decisional balance exercise that examined motivations for seeking treatment. Clients set their goal for treatment (i.e., controlled gambling or abstinence), discussed strategies to help them succeed, and were given a handbook that outlined options to consider when making changes in their gambling.

In session two, all clients were educated on how randomness works in games of chance and were introduced to the functional analysis. Completing functional analyses on any urges or slips that clients experienced formed the basis of a large proportion of the homework assigned between sessions. In action-motivated treatment, time was spent teaching clients to evaluate and consider alternatives to gambling that may be as rewarding or exciting without the negative consequences. In escape-motivated treatment, clients learned about healthier ways to manage stress and negative emotions (e.g., progressive muscle relaxation).

During session three, internal and external triggers were introduced, with a focus on functional analysis, but the action- and escape-based treatments differed in

the types of triggers discussed (i.e., action-motivated treatment included physical sensations, thoughts, and feelings such as restlessness, boredom, or feeling the need for excitement; escape-motivated treatment included stress, anxiety, or sadness). Session four focused on either action-based or escape-based maladaptive thinking patterns. This discussion was used to complete a more advanced functional analysis and cognitive restructuring activity.

For action-based treatment, session five introduced the concept of urge surfing (i.e., letting thoughts, emotions, or urges to gamble “just be”; learning that these thoughts or feelings come and go but do not have to lead to gambling). For escape-based treatment, distress tolerance was introduced (i.e., learning to tolerate unpleasant emotions rather than trying to control them). In both treatments, time was spent introducing a relapse prevention plan worksheet (with emphases on either action or escape situations with a high risk for relapse), which clients also worked on for homework. Attention was given to discussing therapy termination and consolidating skills learned in therapy. The sixth session served as a wrap-up with a review of the model of gambling maintenance (i.e., action or escape) and the skills learned in therapy, along with completion of the relapse prevention plan worksheet and reflection on progress during treatment.

Data Analytic Strategy

To assess the clinical significance of treatment outcomes, we used three indicators of individual-level change following treatment: (1) The Reliable Change Index (RCI; Evans, Margison, & Barkham, 1998; Jacobson & Truax, 1991), which provides a more liberal index of change; (2) clinically significant change cutoff scores, which provide a more stringent index of change (Evans et al., 1998; Jacobson & Truax, 1991); and (3) reliable changes defined as being equal to or exceeding a decrease of 50% in gambling behaviour (e.g., Mohr, Boudewyn, Goodkin, Bostrom, & Epstein, 2001).

The RCI is a useful data analytic strategy for small sample sizes in which inferential statistical techniques are deemed inappropriate, such as in a case series (Evans et al., 1998). The RCI uses instrument reliability scores to indicate whether an individual has demonstrated clinically significant improvement from their baseline pre-treatment assessment scores by using the following formula:

$$SE_{Diff} = SD_1 \sqrt{2\sqrt{1} - r}$$

Normally, SD_1 denotes the standard deviation (SD) of the baseline observations across study participants. Because of the small sample size ($N = 6$), instrument SD s were identified in the literature and substituted to provide a more accurate value for the population. This method has been previously used in other clinical pilot studies (e.g., Zlotnick, Johnson, Miller, Pearlstein, & Howard, 2001). Additionally, r denotes the reliability (Cronbach’s alpha) of the measure, which was drawn from the literature for

each outcome measure.² Reliability coefficients and sources are presented in Table 1; means, *SDs*, and corresponding sources from the literature are presented in Table 2; and the means and standard deviations from the literature are reported alongside those from the sample in Table 3. In line with the recommendations of Jacobson and Truax (1991), scores were deemed reliably changed if they exceeded the RCI (cutoff = 1.96) by using the following formula:

$$RCI = \frac{(X_2) - (X_1)}{SE_{diff}}$$

Where X_1 denotes the subject pre-test score and X_2 the subject post-test score.

Calculating cutoff criteria for clinically significant change is another useful tool in the assessment of clinical treatment efficacy. Cutoff scores were calculated by using the following formula:

$$Cutoff = \frac{(Mean_{clin} \times SD_{norm}) + (Mean_{norm} \times SD_{clin})}{SD_{norm} + SD_{clin}}$$

Scores at or exceeding this cutoff are within the healthy population range and were deemed clinically significant or recovered. Likewise, scores below this cutoff, but exceeding the RCI, were deemed reliably changed or improved (Evans et al., 1998; Jacobson & Truax, 1991).

The aforementioned data analytic strategy was used for all outcome measures (NODS, PACS, IGS, GAEQ, GASS, SDS-G), but was not used to assess changes in GAS outcomes. The GAS comprises a series of single-item measures, and so reliability scores cannot be calculated. Therefore, reliable changes were defined as being equal to or exceeding a decrease of 50% in each gambling behaviour, a method previously used in similar studies in which the use of clinically significant change indicators was inappropriate (e.g., Mohr et al., 2001).

Results

Five participants reported video lottery terminals (VLTs) as their preferred, most problematic form of gambling. As their treatment goal, four chose abstinence from VLT gambling, whereas one (Participant 4; P4) chose to limit VLT gambling to twice per month and \$40 per episode. During the third session, P4 reduced his goal to \$20 per session. The remaining participant (P3) reported horse racing, sports betting, and poker as his preferred, most problematic forms of gambling and chose abstinence as his goal. At post-treatment, one participant (P4) achieved abstinence,

²Cronbach's reliability coefficients were calculated for the sample ($N = 6$) and ranged from .84 (GAEQ relief and SDS-G) to .97 (GAEQ reward and PACS), indicating good reliability of all outcome measures. The results are consistent when either set of coefficients is used in data analysis (i.e., literature vs. sample).

Table 2
Means, Standard Deviations, Sources for Outcome Measures, and Cutoff Scores

Instrument	Population							Reliable change (RCI)	Clinical cutoff score
	Healthy control		Source	Pathological gambling		Source			
	M	SD		M	SD				
NODS	0.3	0.4	Ledgerwood et al., 2012	8	1.7	Ledgerwood et al., 2012	2.2	1.8	
PACS	4.6	5.4	Ashrafioun, McCarthy, and Rosenberg, 2012	21.8	8.6	Caselli and Spada, 2015	6.7	11.2	
GASS	73.7	36.6	Winfree, Meyers, and Whelan, 2015	46.3	23.9	Hodgins, Currie, Currie, and Fick, 2009	17.5	57.1	
IGS	6.9	2.2	Dowling, Lorains, and Jackson, 2015	64.3	17.8	Stewart and Wall, 2005	15.6	13.0	
Positive									
Negative	6.6	2.2		45.2	20.8		12.9	10.2	
GAEQ	25.0	9.0	Stewart and Wall, 2005	32.4	10.5	Yi et al., 2015	9.2	28.4	
Reward									
Relief	15.9	7.7		32.6	12.0		8.1	22.4	
SDS-G	0.7	1.5	Huppert, Simpson, Nissenson, Liebowitz, and Foa, 2009	3.2	2.8	Black et al., 2007	2.8	1.5	
Family									
Work	0.9	2.3		4.0	3.1		2.4	2.2	
Social	0.6	1.1		3.3	2.6		2.6	1.4	

Note. RCI = Reliable Change Index; NODS = National Opinion Research Center Diagnostic Screen for Gambling Problems; PACS = Penn Alcohol Craving Scale; GASS = Gambling Abstinence Self-Efficacy Scale; IGS = Inventory of Gambling Situations; GAEQ = Gambling Affect Expectancy Questionnaire; SDS-G = Sheehan Disability Scale modified for gambling.

Table 3

Comparison of Population Means and Standard Deviations With Sample Means and Standard Deviations

Instrument	Population				Sample	
	Healthy control		Pathological gambling			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
NODS	0.3	0.4	8.0	1.7	7.7	2.9
PACS	4.6	5.4	21.8	8.6	15.5	8.0
GASS	73.7	36.6	46.3	23.9	50.7	23.1
IGS	6.9	2.2	64.3	17.8	41.8	21.8
Positive						
Negative	6.6	2.2	45.2	20.8	42.4	18.1
GAEQ	25.0	9.0	32.4	10.5	32.1	17.4
Reward						
Relief	15.9	7.7	32.6	12.0	29.8	11.5
SDS-G	0.7	1.5	3.2	2.8	6.8	3.4
Family						
Work	0.9	2.3	4.0	3.1	3.8	3.1
Social	0.6	1.1	3.3	2.6	4.8	3.5

Note. NODS = National Opinion Research Center Diagnostic Screen for Gambling Problems; PACS = Penn Alcohol Craving Scale; GASS = Gambling Abstinence Self-Efficacy Scale; IGS = Inventory of Gambling Situations; GAEQ = Gambling Affect Expectancy Questionnaire; SDS-G = Sheehan Disability Scale modified for gambling.

whereas the remaining five reported gambling one to two times over the course of treatment. Overall, all six treatment completers displayed significant reductions or improvements from pre- to post-treatment on various outcome measures (Table 4).

Primary Outcome Measures

Gambling participation. On the GAS, four participants (67%) reported post-treatment reductions in gambling activity (i.e., frequency, time, money). Three participants (P3, P4, P6) considerably reduced gambling frequency, and four (P2, P3, P4, P6) significantly reduced the amount of time and money spent gambling, which were maintained at follow-up. P1 reported no change in gambling frequency and an increase in the amount of time and money spent gambling post-treatment, whereas P5 reported no significant change in gambling frequency, time, or the amount of money spent gambling post-treatment. Despite this, significant reductions in all three measures of gambling participation were observed at follow-up for these two participants.

PG severity. For PG severity (NODS; Gerstein et al., 1999), three participants (P4, P5, P6) showed significant reductions at post-treatment (50%), which were maintained at follow-up. The remaining participants (P1, P2, P3) showed no

Table 4
Raw Scores and Percentage Change in Scores From Treatment Completers on Outcome Measures

Participant	Measure	Pre-treatment	Post-treatment	3-Month follow-up	6-Month follow-up	% Reduction from pre- to post-treatment	% Reduction from pre-treatment to 3-month follow-up	% Reduction from pre-treatment to 6-month follow-up
P1 ^a Escape	GAS	Frequency	1	1	-	0	0	-
		Time	30	120	-	-300	-300	-
		Money	45	140	-	-211	-211	-
	NODS		8	2*	-	-13	75	-
	SDS-G	Work	3	1**	-	67	100	-
		Social	9	8	-	11	67	-
		Family	9	9	-	0	67	-
	PACS		20	4**	-	80	70	-
	GASS		65	97*	-	49	9	-
	IGS	Positive	42.46	44.88	-	-6	57	-
P2 ^{b, c} Escape		Negative	47.67	53.92	-	-13	45	-
	GAEQ	Reward	51.5	11**	-	78	46	-
		Relief	39	12**	-	69	64	-
	GAS	Frequency	2	2	0*	0	-	100
		Time	480	240*	0*	50	-	100
		Money	670	100*	0*	85	-	100
	NODS		8	8	7	0	-	14
	SDS-G	Work	6	9	5	-33	-	16
		Social	6	7	7	-14	-	-14
		Family	7	9	7	-22	-	0
PACS GASS IGS			16	7**	8**	56	-	50
			48	81**	44	-25	-	8
		Positive	35.08	54.09	33.02	-54	-	6
		Negative	42.49	52.19	36.5	-23	-	14
	GAEQ	Reward	25	24	17	4	-	32
		Relief	39	22**	35	44	-	10

Table 4
Continued

Participant	Measure	Pre-treatment	Post-treatment	3-Month follow-up	6-Month follow-up	% Reduction from pre- to post-treatment	% Reduction from pre-treatment to 3-month follow-up	% Reduction from pre-treatment to 6-month follow-up
P3 ^a Action	GAS	Frequency	17	2*	-	88	100	-
		Time	3420	250*	-	92	100	-
	NODS SDS-G	Money	1420	200*	-	86	100	-
		Work	10	10	-	0	20	-
	PACS GASS	Social	8	9	-	-13	38	-
		Family	8	9	-	-13	38	-
	IGS	Positive	9	9	-	0	22	-
		Negative	23	20	-	13	30	-
	GAEQ	Reward	16	55*	-	-71	-64	-
		Relief	76.55	56.27	-	27	40	-
P4 ^a Action	GAS	Frequency	63.07	58.92	-	7	23	-
		Time	51	42	-	18	20	-
	NODS SDS-G	Money	31	38	-	-23	-23	-
		Work	3	0*	-	100	0	-
	PACS GASS	Social	130	0*	-	100	75	-
		Family	128	0*	-	100	63	-
	IGS	Positive	2	0**	-	100	100	-
		Negative	0	0	-	0	0	-
	GAEQ	Reward	0	0	-	0	0	-
		Relief	0	0	-	0	0	-
P5 Action	GAS	Frequency	85	100	-	-100	-400	-
		Time	8.49	7.3	-	-18	-12	-
	NODS SDS-G	Money	10.42	15.5	-	14	-7	-
		Work	12	9	-	-49	3	-
	PACS GASS	Social	9	9	-	25	-25	-
		Family	2	2	-	0	0	-
	IGS	Positive	200	120	-	0	50	50
		Negative	100	100	-	40	98	100
	GAEQ	Reward	9	4*	-	0	90	96
		Relief	5	5	-	56	67	56

Table 4
Continued

Participant	Measure	Pre-treatment	Post-treatment	3-Month follow-up	6-Month follow-up	% Reduction from pre- to post-treatment	% Reduction from pre-treatment to 3-month follow-up	% Reduction from pre-treatment to 6-month follow-up
P6 Action	Social	2	4	0**	0**	-100	100	100
	Family	8	8	5*	4*	0	38	50
		16	13	13	13	19	19	19
	PACS	48	94**	87**	83**	96	89	81
	GASS	45.52	37.5	29.52*	26.51*	18	35	42
	IGS	36.61	22.16*	23.64*	30.52	39	35	16
	GAEQ	38	17**	22**	22**	55	42	42
		36	13**	13**	12**	64	64	67
	GAS	4	1*	0*	1*	75	100	75
		101	1*	0*	1*	99	100	99
		211	2*	0*	5*	99	100	98
	NODS (year/3 months)	9	1**	0**	0**	89	100	100
	SDS-G	1	0	0	0	100	100	100
	Work	4	1**	0**	0**	75	100	100
	Social	8	1**	0**	0**	88	100	100
	Family	18	16	0**	0**	11	100	100
	PACS	42	85**	99**	100**	103	148	150
	GASS	42.62	42.26	31.83	25.04*	1	25	41
	IGS	53.85	44.58	34.36*	19.14*	17	36	65
	GAEQ	15	15	9	9	0	40	40
		25	16**	9**	9**	36	64	64

Note. GAS = Gambling Activities Screen (over past 7 days); NODS = National Opinion Research Center Diagnostic Screen for Gambling Problems; PACS = Penn Alcohol Craving Scale; GASS = Gambling Abstinence Self-Efficacy Scale; IGS: Inventory of Gambling Situations; GAEQ = Gambling Affect Expectancy Questionnaire; SDS-G = Sheehan Disability Scale modified for gambling. *3-month follow-up data not available for P2. *6-month follow-up data not available for P1, P3, and P4. *P2 voluntarily abstained from gambling for 7 days prior to treatment and so timeline follow-back data were used to calculate baseline GAS score.

* Reliable change.

** Clinically significant change.

improvement by post-treatment; however, P1 displayed a reliable improvement by the 3-month follow-up (67%).

Impairment or disability. On the SDS-G (Hodgins, 2013), treatment decreased functional impairment or disability for P1 and P6 post-treatment (33%), with improvements by P1 at work and by P6 in social and family life, which were maintained at follow-up. By the 3-month follow-up, P1 also significantly improved in social and family functioning. P3 and P5 exhibited no immediate changes post-treatment, but showed a significant decrease in impairment by follow-up. P2 and P4 did not report improvement in any of the domains of impairment. However, P4 reported no functional impairment related to gambling problems at pre-treatment, and this remained the same at post-treatment and follow-up. In summary, 67% of participants showed some improvements in functional impairment or disability following treatment.

Secondary Outcome Measures

Craving to gamble. P1 and P2, both escape motivated, exhibited significant post-treatment reductions in craving to gamble (PACS), which were maintained at follow-up. Action-motivated gamblers did not exhibit post-treatment reductions, but two additional participants (P3, P6) showed significant improvement by the 3-month follow-up, increasing the proportion of significant responders to 67%. One action-motivated participant (P4) was already within the clinically healthy range at baseline, and so significant improvement on this measure was not anticipated. One participant (P5-action) did not exhibit reductions in gambling-related craving at any of the time points.

Gambling abstinence self-efficacy. Considerable improvements were observed in participants' confidence in their ability to abstain from or to control gambling on the GASS (Hodgins et al., 2004). All participants reported increased gambling abstinence self-efficacy at post-treatment (83%), with the exception of P4, whose baseline score was already within the clinically healthy range at baseline. Likewise, P1 was already within the healthy range, but his gambling abstinence self-efficacy nonetheless reliably increased from pre- to post-treatment. All treatment gains were maintained with the exception of P2, whose score had returned to baseline by the 6-month follow-up.

Positively and negatively reinforcing gambling situations. In relation to the assessment of high-risk situations associated with gambling (IGS; Turner & Littman-Sharp, 2001), little improvement was observed post-treatment, with one participant (P5) displaying a significant reduction in gambling in negatively reinforcing gambling situations. In contrast to the overall lack of treatment gains on this measure post-treatment, reliable improvements were shown by most participants at follow-up. P1 and P6 improved in response to negative gambling situations by the 3-month follow-up, and P6 improved in response to positive situations by the 6-month follow-up. P3 and P5 improved in positive and negative situations by

the 3-month follow-up, but only P5's treatment gain in positive situations persisted at the 6-month follow-up. P4's baseline assessment was already within the clinically healthy range at baseline, and so improvement was not anticipated. Taken together, 67% of participants showed some improvements on this measure following treatment.

Affect-regulation gambling outcome expectancies. On the GAEQ (Shead & Hodgins, 2009), two participants (P1, P5) exhibited significant reductions in their endorsement of reward and relief outcome expectancies by post-treatment, which were maintained at follow-up. For reward outcome expectancies, three participants (P2, P4, P6) were in the clinically healthy range at baseline, and so improvements were not expected. For relief outcome expectancies, two participants (P2, P6) displayed significant reductions in outcome expectancies; however, treatment gains were maintained only for P6 at follow-up. Only one participant (P3) did not improve. Again, P4 was already within the clinically healthy range at baseline, and so improvements were not anticipated. In summary, 67% of participants showed a reduction in their endorsement of reward and relief outcome expectancies following treatment.

Discussion

The current pilot case series provided a preliminary investigation of the efficacy of a cognitive behavioural treatment for PG (*BEAT Gambling*) that is matched to gamblers' primary underlying motivations (i.e., *escape-motivated* vs. *action-motivated* gamblers). Results provide support for the merits of this novel treatment as a potentially effective intervention for PG. Participants' scores on the primary outcome measures revealed considerable pre- to post-treatment reductions: 100% of participants exhibited significant post-treatment gains on at least one primary outcome measure. Overall, four participants (67% of the sample) exhibited a significant reduction in gambling activity post-treatment, with five participants (83% of the sample) displaying reduced gambling activity by follow-up. Specifically, one participant (P4) abstained from gambling and three (P2, P3, P6) exhibited a marked reduction in gambling. The gambling activity of two participants (P1, P5) was not significantly reduced post-treatment, but P5 significantly reduced his gambling activity across all domains (frequency, time, money) by the 3-month follow-up, which was maintained at the 6-month follow-up. Post-treatment reductions in PG severity were observed for three participants (50% of the sample), with another participant exhibiting a delayed response; 67% of the sample exhibited significantly reduced impairment in PG severity by the follow-up period. For functional impairment or disability associated with gambling (SDS-G), two participants (33%) exhibited significant improvements by post-treatment, which were retained at follow-up. Two participants (P3, P5) exhibited a delayed response, with no immediate improvements post-treatment, but improvement by follow-up. Overall, 67% of the sample exhibited a significant reduction in the degree of disability or impairment that resulting from gambling by the follow-up assessment.

Secondary outcome measures revealed pre- to post-treatment reductions in craving to gamble (33%) and the endorsement of reward (33%) and relief (67%) gambling outcome expectancies, as well as noteworthy increases in participants' confidence in their ability to control or abstain from gambling (83%) at post-treatment. These treatment gains were largely maintained at the 3- and 6-month follow-up. Although only modest changes were observed in participants' pre- to post-treatment scores on measures assessing gambling in high-risk situations, in the majority of cases, treatment gains were observed at the 3-month follow-up that were largely maintained at the 6-month follow-up.

For some participants, gains on certain measures were not observed post-treatment, but were apparent at follow-up assessment (i.e., SDS-G, PACS, IGS). One explanation for this finding is the “sleeper effect,” in which treatment gains increase over time—an effect that has been reported in previous clinical trials that assessed the effectiveness of CBT (e.g., Carrollet al., 2009). The sleeper effect has been attributed to learning mechanisms that improve affective control and cognitive functioning over time (Potenza, Sofuglu, Carroll, & Rounsaville, 2011). In the present study, treatment gains may have increased over time because participants acquired skills in therapy but did not have an opportunity to fully apply them by the post-treatment assessment. Once applied, the experience may have elicited the extinction of gambling-related urges and behaviours in response to triggers, thus accounting for treatment gains at follow-up assessment. In addition, one of the outcome measures assessed gambling impairment or disability (i.e., SDS-G), and one would expect to observe changes in gambling behaviour following treatment prior to observed reductions in gambling impairment or disability (e.g., it would take some time to recover from family and financial disruption due to gambling). Lastly, the outcome measures used in the current study were previously validated instruments for use with problem gamblers and used varying timelines (e.g., GAS: past 7 days vs. NODS: past 3 months). It is possible that the minimal post-treatment change observed on some outcome measures may be due to the long assessment time frame. For example, the NODS assesses PG severity over 3 months. Because the time gap between pre-treatment and post-treatment assessment was 6 weeks, immediate improvements may not be apparent post-treatment but are observable at follow-up. Future outcome studies may consider using a consistent time frame of assessment across outcome measures.

A number of limitations of the current study should be noted. First, the retention rate for this study was low (50%). Although high dropout rates are a commonly reported barrier to CBT treatment of PG (Rash & Petry, 2014), it is important to consider the possibility that the participants retained in this study may have differed regarding their motivation to abstain from gambling relative to the dropouts. Additionally, all but one participant in the current study reported VLTs as their most problematic form of gambling. As such, results may not generalize to gamblers who report other forms of gambling (e.g., poker, online gambling) as most problematic. That said, VLT gambling is a relatively more addictive form of gambling (Doiron &

Nicki, 2001) and as a consequence, problematic VLT gamblers may be an ideal population to assess the effectiveness of a novel PG treatment. Nonetheless, further research should assess the clinical utility of this motivation-matched PG treatment in samples of non-VLT problem gamblers.

One additional limitation relates to the means by which gamblers were classified in the current study classification of gamblers. Specifically, participants were classified within the motivational group on the basis of their highest *z*-score on the GMQ coping and enhancement scales (Stewart & Zack, 2008). In the event that a participant's scores were high on both measures, they could not be classified as a "pure" action or escape gambler. Future research could examine whether such dually motivated gamblers respond differently to the matched treatment than do those who are more purely motivated to gamble as a means of coping or excitement.

Baseline scores were consistently low for P4, who was already within the normal population range on many of the outcome measures. This led to a potential floor effect, in which treatment gains could not be observed at the post-treatment and follow-up assessments. Regardless of this, P4 scored within the PG range on the PGSI during pre-screening and responded well to treatment, exhibiting treatment gains in overall gambling behaviour that were largely maintained at follow-up. Because of the design of the present case series pilot study, treatment gains were evaluated individually via indicators of reliable and clinically significant change (Jacobson & Truax, 1991). Therefore, we decided to include P4 in the analyses, despite low baseline scores on many of the outcome measures. It is important to note that because P4 exhibited a reduction in gambling following treatment but no reliable change on the secondary outcomes, conclusions cannot be drawn with respect to the mediators of his changes in gambling behaviour (e.g., increased self-efficacy to abstain from heavy gambling).

The results of the current research point to the possible utility of this intervention as a potentially viable treatment for PG. They also provide support for a more comprehensive assessment of the utility of the *BEAT Gambling* intervention. That said, because of the small sample size, conclusions about overall treatment effectiveness should be drawn tentatively. The goal of the present pilot case series was to assess the potential of the motivation-matched treatment for further more rigorous experimentation. In order to ensure that improvements from pre-treatment levels observed in the present study reflect treatment effects rather than extraneous factors (e.g., regression to the mean on the outcome measures), a replication of this pilot study with a larger sample size, randomization, and comparison to a treatment-as-usual control is needed.

In summary, given the positive outcomes in this study and the overall magnitude of change on the majority of outcome measures, further research investigating the efficacy of targeting underlying motives as part of interventions for PG is certainly warranted. In addition to a randomized controlled trial, future research should examine the role of theoretically relevant mediators of treatment change and assess

whether such differences are due, for example, to matched treatment-induced changes in affect-regulation gambling outcome expectancies (i.e., reward and relief gambling outcome expectancies on the GAEQ; Shead & Hodgins, 2009), or to co-morbid psychopathology (e.g., changes in co-morbid mood and anxiety disorder diagnoses mediate the treatment effects in the escape-motivated treatment).

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Ashrafioun, L., McCarthy, A., & Rosenberg, H. (2012). Assessing the impact of cue exposure on craving to gamble in university students. *Journal of Gambling Studies*, 28, 363–375.

Black, D. W., Stephan, A., Coryell, W. H., Argo, T. P., Forbush, K. T., Shaw, M. C., Allen, J. (2007). Bupropion in the treatment of pathological gambling: A randomized, double-blind, placebo-controlled, flexible-dose study. *Journal of Clinical Psychopharmacology*, 27, 143–150.

Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction*, 97, 487–499.

Birch, C. D., Stewart, S. H., & Zack, M. (2006). Emotion and motive effects on drug-related cognition. In R. W. Wiers & A. W. Stacy (Ed.), *Handbook on Implicit Cognition and Addiction*. (pp. 267-280). Thousand Oaks, CA: Sage Publications.

Carroll, K. M., Ball, S. A., Martino, S., Nich, C., Babuscio, T. A., & Rounsaville, B. J. (2009). Enduring effects of a computer-assisted training program for cognitive behavioural therapy: A 6-month follow-up of CBT4CBT. *Drug and Alcohol Dependence*, 100, 178–181.

Caselli, G., & Spada, M. M. (2015). Desire thinking: What is it and what drives it? *Addictive Behaviours*, 44, 71–79.

Conrod, P. J., Stewart, S. H., Pihl, R. O., Côté, S., Fontaine, V., & Dongier, M. (2000). Efficacy of brief coping skills interventions that match different personality profiles of female substance abusers. *Psychology of Addictive Behaviours*, 14, 231–242.

Cooper, L. M., Kuntsche, E., Levitt, A., Barber, L. L., & Wolf, S. (2015). Motivational models of substance use: A review of theory and research on motives for using alcohol, marijuana, and tobacco. In K. J. Sher (Ed.), *The Oxford handbook of substance use disorders* (Volume 1, pp. 1–53). Oxford, United Kingdom: Oxford University Press.

- Cooper, M.L., Russell, M., Skinner, J.B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, 4, 123 – 132.
- Daughters, S. B., Lejeuz, C. W., Lesieur, H. R., Strong, D. R., & Zvolensky, M. J. (2003). Towards a better understanding of gambling treatment failure: Implications of transitional research. *Clinical Psychology Review*, 23, 573–586.
- Doiron, J. P., & Nicki, R. M. (2001). Epidemiology of problem gambling in Prince Edward Island: A Canadian microcosm? *Canadian Journal of Psychiatry*, 46, 413–417.
- Doiron, J., & Nicki, R. (2007). Prevention of pathological gambling: A randomized controlled trial. *Cognitive Behaviour Therapy*, 35, 74–84.
- Dowling, N. A., Lorains, F. K., & Jackson, A. C. (2015). Are the profiles of past-year internet gamblers generalizable to regular internet gamblers? *Computers in Human Behavior*, 43, 118–128.
- Evans, C., Margison, F., & Barkham, M. (1998). The contribution of reliable and clinically significant change methods to evidence-based mental health. *Evidence Based Mental Health*, 1, 70–72.
- Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index: User's manual*. Ottawa, Canada: Canadian Centre on Substance Abuse.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition with Psychotic Screen (SCID-I/P W/PSY SCREEN)*. New York, NY: Biometrics Research, New York State Psychiatric Institute.
- Flannery, B. A., Volpicelli, J. R., & Pettinati, H. M. (1999). Psychometric properties of the Penn Alcohol Craving Scale. *Alcohol: Clinical and Experimental Research*, 23, 1289–1295.
- Gerstein, D., Murphy, S., Toce, M., Hoffman, J., Palmer, A., Johnson, R., Sinclair, S. (1999). *Gambling impact and behavior study: Report to the National Gambling Impact Study Commission*. Chicago, IL: National Opinion Research Center at the University of Chicago.
- Gooding, P. & Tarrier, N. (2009). A systematic review and meta-analysis of cognitive-behavioural interventions to reduce problem gambling: Hedging our bets? *Behaviour Research and Therapy*, 47, 592–607.
- Hodgins, D. C. (2013). Reliability and validity of the Sheehan Disability Scale modified for pathological gambling. *BMC Psychiatry*, 13, 177.

Hodgins, D. C., Currie, S. R., Currie, G., & Fick, G. H. (2009). Randomized trial of brief motivation treatments for pathological gamblers: More is not necessarily better. *Journal of Consulting and Clinical Psychology*, 77, 950–960.

Hodgins, D. C., Peden, N., & Makarchuk, K. (2004). Self-efficacy in pathological gambling treatment outcome: Development of a Gambling Abstinence Self-efficacy Scale (GASS). *International Gambling Studies*, 4, 99–108.

Hodgins, D. C., & Racicot, S. (2013). The link between drinking and gambling among university students. *Psychology of Addictive Behaviours*, 27, 855–892.

Huppert, J. D., Simpson, B. H., Nissenson, K. J., Liebowitz, M. R., & Foa, E. B. (2009). Quality of life and functional impairment in obsessive-compulsive disorder: A comparison of patients with and without comorbidity, patients in remission, and healthy controls. *Depression and Anxiety*, 26, 39–45.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59, 12–19.

Leblond, J., Ladouceur, R., & Blaszczynski, A. (2003). Which pathological gamblers will complete treatment? *British Journal of Clinical Psychology*, 42, 205–209.

Ledgerwood, D. M., Orr, E. S., Kaploun, K. A., Milosevic, A., Frisch, G. R., Rupcich, N., & Lundahl, L. H. (2012). Executive function in pathological gamblers and healthy controls. *Journal of Gambling Studies*, 28, 89–103.

Ledgerwood, D. M., & Petry, N. M. (2005). Current trends and future directions in the study of psychosocial treatments for pathological gambling. *Current Directions in Psychological Science*, 14, 89–94.

Mohr, D. C., Boudewyn, A. C., Goodkin, D. E., Bostrom, A., & Epstein, L. (2001). Comparative outcomes for individual cognitive-behavior therapy, supportive-expressive group psychotherapy, and sertraline for the treatment of depression in multiple sclerosis. *Journal of Consulting and Clinical Psychology*, 69, 942–949.

Mudry, T. E., Hodgins, D. C., el-Guebaly, N., Wild, T. C., Colman, I., Patten, S. B., & Schopflocher, D. (2011). Conceptualizing excessive behaviour syndromes: A systematic review. *Current Psychiatry Reviews*, 7, 138–151.

Potenza, M. N., Sofuglu, M., Carroll, K. M., & Rounsaville, B. J. (2011). Neuroscience of behavioural and pharmacological treatment for addictions. *Neuron*, 69, 695–712.

Rash, C. J., & Petry, N. M. (2014). Psychological treatments for gambling disorder. *Psychology Research and Behavior Management*, 7, 285–295.

- Shead, N. W., & Hodgins, D. C. (2009). Affect-regulation expectancies among gamblers. *Journal of Gambling Studies*, 25, 357–375.
- Stewart, S. H., Buckley, M., Darredeau, C., Sabourin, B., Zahradnik, M., Hodgins, D., & Barrett, S. P. (2011). *Brief Escape and Action Treatment for Gambling (BEAT Gambling): Action and escape therapist manuals*. Halifax, Canada: Dalhousie University, Department of Psychology and Neuroscience.
- Stewart, S. H., & Wall, A. (2005). *Mood priming of reward and relief gambling expectancies in different subtypes of gamblers*. Guelph, ON: Ontario PG Research Centre.
- Stewart, S. H., & Zack, M. (2008). Development and psychometric evaluation of a three-dimensional Gambling Motives Questionnaire. *Addiction*, 103, 1110–1117.
- Stewart, S., Zack, M., Collins, P., Klein, R., & Fragopulous, F. (2008). Sub-typing pathological gamblers on the basis of affective motivations for gambling: Relations to gambling problems, drinking problems, and affective motivations for drinking. *Psychology of Addictive Behaviors*, 22, 257–268.
- Suomi, A., Dowling, N. A., & Jackson, A. C. (2014) Problem gambling subtypes based on psychological distress, alcohol abuse and impulsivity. *Addictive Behaviors*, 39, 1741–1745.
- Tavares, H., Zilberman, M. L., Hodgins, D. C., & el-Guebaly, N. (2005). Comparison of craving between pathological gamblers and alcoholics. *Alcoholism: Clinical and Experimental Research*, 29, 1427–1431.
- Turner, N., & Littman-Sharp, N. (2001). *Inventory of Gambling Situations users guide*. Toronto, ON: Centre of Addictions and Mental Health.
- Turner, N.E., Littman-Sharp, N., Toneatto, T., Liu, T., & Ferentzy, P. (2013). Centre for Addiction and Mental Health Inventory of Gambling Situations: Evaluation of the factor structure, reliability, and external correlations. *International Journal of Mental Health and Addiction*, 11, 526 – 545.
- Watt, M. C., Stewart, S. H., Conrod, P. J., & Schmidt, N. B. (2008). Personality-based approaches to treatment of co-morbid anxiety and substance use disorder. In S. H. Stewart & P. J. Conrod (Eds.), *Anxiety and substance use disorders: The vicious cycle of comorbidity* pp. 201–219). New York, NY: Springer.
- Winfrey, W. R., Meyers, A. W., & Whelan, J. P. (2015). Validation of a Spanish adaptation of the gambling self-efficacy questionnaire. *International Gambling Studies*, 13, 271–280.

Yi, S., Stewart, M., Collins, P., & Stewart, S. H. (2015). The activation of reward versus relief gambling outcomes expectancies in regular gamblers: Relations to gambling motives. *Journal of Gambling Studies*, 31, 1515–1530. doi:10.1007/s10899-014-9474-1

Zlotnick, C., Johnson, S. L., Miller, I. W., Pearlstein, T., & Howard, M. (2001). Postpartum depression in women receiving public assistance: Pilot study of an interpersonal-therapy-oriented group intervention. *The American Journal of Psychiatry*, 158, 638–640.

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Violence économique et stratégie de contrôle chez les couples où l'homme est joueur problématique

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Résumé

Les problèmes de jeu de l'un des deux partenaires de vie entraînent des conséquences sur la vie conjugale, dont une détérioration des finances. Dans ce contexte, les partenaires peuvent adopter des comportements de contrôle sur les finances du ménage. Quelles stratégies utilisent les conjointes de joueurs problématiques pour contrôler leurs habitudes et dépenses de jeu ? Ces comportements s'apparentent-ils à de la violence conjugale économique ? Pour explorer ces questions, des entrevues téléphoniques ont été réalisées auprès de 156 participantes, dont 54 femmes percevant un problème de jeu chez leur conjoint. Les résultats montrent que les femmes en couple avec un joueur problématique rapportent en plus grande proportion avoir manifesté et subi des comportements de violence économique. Certains contexte et motifs entourant la violence économique faite par les femmes soutiennent une fonction protectrice. Les femmes considèrent que les comportements de violence économique de leur conjoint viseraient à assurer la poursuite des activités de jeu. De plus, près de 80 % des femmes préoccupées par les habitudes de jeu de leur conjoint utilisent des stratégies visant à contrôler ses habitudes de jeu, dont les dépenses de jeu. La complexité d'évaluer la violence conjugale de type économique en contexte de jeu problématique est discutée.

Keywords: jeu problématique, violence économique, couples, stratégies de contrôle

Abstract

Gambling problems of one of the life partners bring consequences on conjugal life, including a deterioration of finances. In this context, partners may adopt control behaviors over the household finances. What strategies do partners of problem gamblers use to control their partner's gambling habits and expenses? Are these behaviors similar to economic conjugal violence? To explore these questions, telephone interviews were conducted with 156 women, 54 of which perceived their partner as having a gambling problem. Results showed that a greater proportion of women in a relationship with a problem gambler reported having committed and

experienced economic violence behaviors. Some contexts and motives associated with economic violence perpetrated by women lend support to a protective function. Women consider that their partner's economic violence behaviors were aimed at ensuring continuation of gambling activities. Moreover, nearly 80% of women concerned with their partner's gambling habits used strategies to control their gambling habits, including gambling expenditure. The complexity of assessing economic conjugal violence within a problem gambling context is discussed.

Introduction

Le jeu pathologique, ou *Gambling Disorder*, se caractérise par des comportements de jeu persistants et récurrents qui entraînent une détresse ou un dysfonctionnement important (American Psychiatric Association, 2013). Un joueur qui ne présente pas suffisamment de symptômes pour recevoir un diagnostic mais qui vit des conséquences négatives est considéré comme un joueur à risque (Shaffer, Hall, & Vander Bilt, 1999). Les appellations *jeu problématique* et *problèmes de jeu* sont utilisées pour référer, à la fois, au jeu à risque et au jeu pathologique.

Parmi les conséquences négatives majeures des problèmes de jeu, certaines sont d'ordre financier : pertes d'argent, endettement, difficultés à subvenir aux besoins, etc. (Ferland et al., 2008; Kalischuk, Nowatzki, Cardwell, Klein, & Solowoniuk, 2006; Morasco, Weinstock, Ledgerwood, & Petry, 2007). Ces conséquences affectent le joueur et ses proches, surtout sa conjointe¹ (Shaw, Forbush, Schlinder, Rosenman, & Black, 2007).

Les sphères de vie conjugale et familiale du joueur problématique se trouvent aussi affectées par ses habitudes de jeu. L'étude de Tepperman, Korn et Lynn (2006) dévoile que les joueurs pathologiques – avec un score de 5 ou plus sur 20 au *South Oaks Gambling Screen* (SOGS; Lesieur & Blume, 1987) – sont trois fois plus susceptibles que les joueurs non problématiques de déclarer que leurs habitudes de jeu ont conduit à des problèmes familiaux. Steinberg (1993) dénote un manque de confiance persistant chez les conjointes de joueurs problématiques malgré que ces derniers aient cessé le jeu. Trudel et al. (2008), dans une étude effectuée auprès de couples dont l'un des partenaires présente un problème de jeu ($n = 84$) et de couples de non-joueurs ($n = 40$), révèlent que les premiers obtiennent des scores moins élevés sur plusieurs indicateurs de fonctionnement conjugal : ajustement dyadique, fonctionnement sexuel, perception de la communication et croyances relationnelles.

¹Cet article s'intéresse au vécu et aux perceptions des conjoints de joueurs pathologiques, ainsi qu'aux conséquences auxquelles ils font face. Puisque les hommes sont plus à risque de développer un problème de jeu (Johansson, Grant, Kim, Odlaug, & Götestam, 2009) et que les problèmes de jeu sont plus courants chez les hommes (Kairouz & Nadeau, 2014), nous utilisons le masculin pour référer aux joueurs problématiques et le féminin, pour référer aux conjointes.

Le fonctionnement conjugal ainsi ébranlé, les conflits peuvent dégénérer en comportements violents. Une méta-analyse de Dowling et al. (2014) montre une relation positive entre les problèmes de jeu et la violence conjugale. Des études révèlent que les joueurs problématiques sont plus nombreux que les non-joueurs/joueurs sans problème à commettre des actes de violence verbale et physique envers leur conjointe (Afifi, Brownridge, MacMillan, & Sareen, 2010; Korman et al., 2008). Des conjointes de joueurs problématiques rapportent aussi être victimes de comportements de violence psychologique, verbale et physique (Lorenz & Shuttlesworth, 1983; Muelleman, DenOtter, Wadman, Tran, & Anderson, 2002), et ce, en plus grand nombre que les conjointes de joueurs sans problème (Goulet & Giroux, 2015). Les conjointes de joueurs problématiques se montrent également plus violentes verbalement et physiquement que les autres femmes (Goulet & Giroux, 2015).

La violence conjugale est multidimensionnelle et prend différentes formes : physique, psychologique, verbale, sexuelle et économique (DeKeseredy & Dragiewicz, 2009; ministère de la Santé et des Services sociaux du Québec [MSSS], 1995). La violence économique a reçu moins d'attention que les autres formes de violence (Adams, Sullivan, Bybee, & Greeson, 2008; Weaver, Sanders, Campbell, & Schnabel, 2009). Malgré les difficultés à la conceptualiser, des études récentes montrent que les abus économiques représentent une forme de violence qui se distingue des autres (Postmus, Plummer, & Stylianou, 2015; Stylianou, Postmus, & McMahon, 2013).

La violence économique se manifeste par des comportements visant à dominer l'autre, à lui soutirer son pouvoir décisionnel, comme limiter son accès aux informations et aux ressources financières ou matérielles du ménage, et à contrôler ses activités financières (MSSS, 1995). La violence économique se présente aussi sous forme verbale (p. ex., ridiculiser le partenaire quant à son apport financier au ménage). Fawole (2008) définit plutôt la violence économique en abordant le thème du maintien des finances familiales par un conjoint abusif qui prend seul toutes les décisions.

Adams et al. (2008) définissent la violence économique par des comportements qui limitent la capacité d'une personne à acquérir, à utiliser ou à maintenir ses ressources économiques, menaçant sa sécurité financière et son potentiel d'autosuffisance. Ils extraient deux dimensions de ce type de violence : le contrôle, sur l'emploi ou les finances, et l'exploitation, telle qu'exprimée par le vol d'argent ou l'obligation de donner ses avoirs. Jouer à des jeux de hasard et d'argent avec l'argent de son conjoint correspond aussi à cette deuxième dimension. Le sabotage de l'emploi représente une troisième dimension de la violence économique et se manifeste par des comportements tels qu'obliger le partenaire à quitter son emploi ou à demeurer sans emploi, ou à le menacer de le faire (Postmus, Plummer, McMahon, Murshid, & Kim, 2012; Postmus et al., 2015; Stylianou et al., 2013).

Rares sont les études qui abordent la prévalence de la violence économique dans les couples (Fawole, 2008). Une enquête populationnelle a toutefois été réalisée auprès

de 2 120 femmes adultes en couple dans la dernière année (Riou, Rinfret-Raynor & Cantin, 2003), et 1,7 % des répondantes ont rapporté s'être vues empêcher par leur conjoint de connaître le revenu familial ou d'y avoir accès (Riou et al., 2003). Aucune information n'est cependant fournie quant au contexte entourant cette manifestation de violence économique.

Le contexte conjugal dans lequel se trouvent le joueur pathologique et sa conjointe semble propice aux comportements s'apparentant à la violence économique. Par exemple, Down et Woolrych (2010) observent que, parmi 18 joueurs problématiques ayant des problèmes financiers actuels ou passés, 80 % camouflent quotidiennement les preuves de jeu, les avertissements bancaires et les relevés de cartes de crédit, limitant ainsi l'accès de la conjointe aux informations financières du couple.

Considérant les stressseurs financiers rapportés par les conjointes de joueurs problématiques (Kalischuk et al., 2006), tels que l'endettement et les prêts contractés, ces dernières pourraient aussi réagir par des comportements de contrôle à connotation violente. Par exemple, Boutin et Ladouceur (2006) suggèrent qu'elles pourraient s'immiscer dans la vie privée du joueur en ouvrant son courrier ou en fouillant dans ses effets personnels, surveiller ses dépenses ou limiter son accès aux ressources financières du ménage.

Boutin et Ladouceur (2006) mettent l'accent sur l'importance pour le proche du joueur problématique d'assurer sa sécurité financière. Heineman (1987), dans une intervention destinée aux conjointes, leur suggère de prendre la totalité du contrôle des finances et de répartir ce contrôle lorsque le joueur est en mesure d'assumer ses responsabilités. Des manuels d'autotraitements (p. ex., Hodgins, Toneatto, Makarchuk, Skinner, & Vincent, 2007) ou de planification financière (p. ex., National Endowment for Financial Education [NEFE], 2000) pour les conjointes de joueurs proposent aussi des stratégies pour reprendre le contrôle des finances et protéger leurs avoirs. En regard de ces stratégies, la ligne semble mince entre des comportements aidants et ceux s'apparentant à la violence économique. Le construit de *contrôle des finances* apparaît d'ailleurs mal opérationnalisé dans la littérature à ce sujet.

Il y a donc lieu de s'interroger sur plusieurs points : quels comportements adoptent les conjointes de joueurs problématiques pour gérer les finances du couple ou celles du joueur? Ces comportements se rapprochent-ils de ceux qui sont propres à la violence économique? Le contrôle des finances dans les couples où le conjoint masculin présente un problème de jeu se différencie-t-il de celui qui est exercé par les conjoints des couples sans problème de jeu? Des réponses à ces questions permettraient de pallier le manque de littérature à ce sujet (Down & Woolrych, 2010).

La présente étude vise à décrire les comportements de violence et de contrôle économique dans les couples où le conjoint masculin présente un problème de jeu. Le premier objectif de l'étude consiste à comparer les femmes dont le conjoint est

perçu² comme un joueur problématique (groupe JP) à celles dont le conjoint est perçu comme un joueur non problématique (groupe JNP) quant à la proportion d'entre elles qui, dans la dernière année, ont (1) manifesté de la violence économique envers leur conjoint et (2) subi de la violence économique de la part de leur conjoint. Il est attendu que la proportion de femmes du groupe JP diffèrera de celle du groupe JNP, pour la violence économique tant manifestée que subie.

L'étude comprend deux objectifs exploratoires : (1) décrire les motifs entourant les comportements de violence économique manifestés par les femmes et leur perception des motifs entourant les comportements dont elles se disent victimes; (2) explorer les stratégies utilisées par les femmes du groupe JP pour contrôler (a) les habitudes de jeu (fréquence et temps de jeu) et (b) les dépenses de jeu du conjoint.

Méthode

Participants

Cette étude consiste en l'analyse d'une partie des données collectées par Goulet et Giroux (2015) entre février 2009 et juillet 2010 auprès de 156 femmes adultes en couple, lors d'entrevues téléphoniques portant sur la violence conjugale et les problèmes de jeu. Ces femmes adultes en couple depuis au moins un an ont été recrutées par des annonces placées dans différents journaux de Québec et de Montréal et envoyées par courriel aux membres de la communauté universitaire de l'Université Laval (étudiants et employés). Les femmes sont divisées en deux groupes selon le score obtenu au SOGS modifié; 54 femmes sont incluses dans le groupe JP et 102, dans le groupe JNP.

Caractéristiques sociodémographiques des participantes. Les 54 femmes du groupe JP sont en couple depuis en moyenne 9,3 ans ($ET = 9,3$) alors que les 102 femmes du groupe JNP le sont depuis 9,5 ans ($ET = 9,6$). Alors que 70 % des femmes du groupe JP cohabitent avec leur conjoint depuis 9,2 ans ($ET = 10,8$), 79,4 % des femmes du groupe JNP vivent en cohabitation depuis 9,3 ans ($ET = 10,1$). Les femmes des deux groupes ne se différencient pas sur ces variables, $p > 0,05$. Le tableau 1 présente les caractéristiques sociodémographiques des participantes et de leur conjoint.

Instruments de mesure

Les données ont été colligées par le biais d'entrevues téléphoniques semi-structurées d'une durée approximative de 50 minutes. Les entrevues ont été effectuées par la

²Le terme « perception » (p. ex., « conjoint perçu comme un joueur problématique ou non problématique ») réfère à l'évaluation faite par les participantes des problèmes de jeu de leur conjoint au moyen de l'instrument de dépistage *South Oaks Gambling Screen* (Lesieur & Blume, 1987), modifié pour les fins de l'étude (SOGS modifié). Une description détaillée de l'instrument est présentée dans la section Instruments de mesure.

Tableau 1

Proportion (%) des participantes et de leur conjoint, selon les groupes, pour les données sociodémographiques, telles que rapportées par les participantes

Caractéristiques ^a	Participant·es		Conjoint·es	
	Groupe JP (n = 54)	Groupe JNP (n = 102)	Groupe JP (n = 54)	Groupe JNP (n = 102)
État civil actuel				
Célibataire	31,5	33,3	—	—
Conjointe de fait	42,6	32,4	—	—
Mariée	18,5	32,4	—	—
Autre (veuve, divorcée)	7,4	2,0	—	—
Âge (années)				
18-34	44,4	56,9	37,0	49,0
35-54	35,2	34,3	37,0	37,3
55 et plus	20,4	8,8	25,9	13,7
Scolarité complétée				
Élémentaire/Secondaire	40,7	22,5*	59,3	30,4**
DEP, ASP ou collégial	38,9	35,3	24,1	32,4
Études universitaires	20,4	42,2*	16,7	37,3**
Occupation actuelle				
Travail	33,3	49,0	64,8	66,7
Études	13,0	29,4	3,7	18,6**
Ni travail ni étude	53,7	21,6**	31,5	14,7**
Lieu de naissance				
Province de Québec	92,6	82,4	81,5	82,4
Autre	7,4	17,6	18,5	17,6
Appartenance religieuse				
Catholique	79,6	83,3	77,8	82,2
Autres	20,4	16,7	22,2	17,8
Revenu annuel brut personnel (\$) ^{bc}				
Moins de 20 000	54,9	53,5	—	—
Entre 20 000 et 30 000	19,6	16,8	—	—
Entre 30 000 et 40 000	17,6	16,8	—	—
Plus de 40 000	7,8	12,9	—	—
Revenu annuel brut du ménage (\$) ^d				
Moins de 20 000	11,5	12,0	—	—
Entre 20 000 et 40 000	13,5	10,0	—	—
Entre 40 000 et 60 000	32,7	24,0	—	—
Plus de 60 000	11,5	30,0	—	—
Ne s'applique pas ^e	30,8	24,0	—	—

Note. Reproduit avec la permission de Goulet et Giroux (2015).

* p < 0,05.

** p < 0,01.

^a Les analyses statistiques effectuées avec ces données ont consisté en des tests de proportions (khi carré de Pearson) permettant de vérifier si des différences sont présentes entre les groupes (participant·es JP et participant·es JNP, conjoint·es JP et conjoint·es JNP). Lorsque des différences ont été relevées, des décompositions du khi carré ont été faites avec un seuil de signification à 0,05. Aucune analyse statistique n'a été effectuée pour comparer les participant·es aux conjoint·es.

^b n = 51 pour le groupe JP et n = 101 pour le groupe JNP.

^c Les femmes n'ont pas eu à répondre quant au revenu annuel brut personnel de leur conjoint.

^d n = 52 pour le groupe JP et n = 100 pour le groupe JNP.

^e Les conjoint·es ne mettent pas leurs revenus en commun, indépendamment du fait qu'ils cohabitent ou non.

première auteure et par deux assistantes de recherche au doctorat en psychologie, formées à l'entrevue.

Données sociodémographiques. Treize questions à choix de réponse ont permis de recueillir ces informations : âge, état civil, habitation, revenus d'emploi annuels, appartenance religieuse, occupation principale et scolarité.

Stratégies de contrôle des habitudes de jeu et des dépenses de jeu du conjoint. Cinq questions ont été développées aux fins de cette étude. La première permettait de demander aux participantes si elles s'étaient inquiétées à l'idée que leur conjoint joue trop d'argent, trop souvent ou trop longtemps à des jeux de hasard et d'argent. Dans l'affirmative, il leur était demandé : « Avez-vous tenté différentes actions ou stratégies pour contrôler les habitudes de jeu de votre conjoint? Si oui, lesquelles? » et « Avez-vous tenté différentes actions ou stratégies pour contrôler les dépenses de jeu de votre conjoint? Si oui, lesquelles? ».

Dépistage des problèmes de jeu. La version française originale (Ladouceur, 1991) du SOGS (Lesieur & Blume, 1987), un outil de dépistage du jeu pathologique, a été utilisée pour dépister les problèmes de jeu chez les femmes. L'instrument comporte 20 items à réponses multiples et dichotomiques permettant de classer les répondants en trois catégories : joueur sans problème (score de 0 à 2), à risque (score de 3 ou 4) et pathologique probable (score de 5 ou plus). La fidélité de consistance interne de l'instrument original est de 0,97 et son coefficient de fidélité, de 0,71 (Lesieur & Blume, 1987).

Nous avons également utilisé le SOGS dans une version adaptée, non validée et nommée *SOGS modifié*, afin de répartir les participantes entre les groupes selon leur perception des habitudes de jeu du conjoint. Les items de l'instrument ont été modifiés pour permettre aux participantes de se positionner sur les habitudes de jeu de leur conjoint. Par exemple, l'item « Vous êtes-vous déjà disputé avec des personnes vivant avec vous à propos de la manière dont vous gérez votre argent? » est devenu « Votre conjoint s'est-il déjà disputé avec vous ou avec d'autres personnes à propos de la manière dont il gère son argent? ». Un score égal ou supérieur à 3 conduisait à classer les participantes dans le groupe JP. Le SOGS et le SOGS modifié ciblent les 12 mois précédant la cueillette de données.

Violence économique. Un questionnaire de 16 questions conçu pour l'étude s'inspirait de la définition de la violence économique d'Adams et al. (2008) et du questionnaire *Évaluation de mes comportements violents* (Morin, 2007), mais n'a fait l'objet d'aucune validation scientifique.

Tous les énoncés ont été développés pour mesurer la violence économique selon cinq construits : dénigrement verbal de l'apport financier ou de l'occupation professionnelle (deux énoncés); mensonges et dissimulation (un énoncé); et contrôle abusif des dépenses (deux énoncés), des avoirs (deux énoncés) et des activités professionnelles (un énoncé). Pour chacun des énoncés, les participantes indiquaient

si elles avaient manifesté ce comportement envers leur conjoint (p. ex., « Avez-vous déjà ridiculisé l'emploi de votre conjoint? »). Dans l'affirmative, elles étaient invitées à se prononcer sur le nombre de fois où ce comportement était survenu dans la dernière année et sur les raisons/contextes de son apparition. Pour ce même énoncé, les participantes indiquaient si elles avaient été victimes du comportement (p. ex. « Est-ce que votre partenaire a déjà ridiculisé votre emploi? »). En cas de réponse affirmative, elles étaient invitées à en indiquer la fréquence et les raisons/contextes, selon leurs perceptions.

Autres questionnaires utilisés. Un questionnaire maison portant sur les habitudes de jeu des participantes et de leur conjoint, de même que la version française du *Alcohol, Smoking and Substance Involvement Screening Test* (ASSIST; WHO ASSIST Working Group, 2002), ainsi que trois des cinq échelles de la version française du *Conflict Tactics Scales – Revised* (CTS-R; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) ont été utilisés, mais les résultats ne sont pas rapportés dans le cadre de cet article (voir Goulet & Giroux, 2015).

Procédure

Les données pertinentes aux objectifs de cette étude proviennent de la banque de données de Goulet et Giroux (2015). Le même échantillon est utilisé sans transformation de données ou retrait de participantes.

Un certificat de conformité éthique (2008-283 R-1) a été délivré par l'un des comités sectoriels d'éthique de la recherche de l'Université Laval, soit le Comité en psychologie et en sciences de l'éducation. Considérant les enjeux liés à la confidentialité, différentes mesures ont été prises lors du recrutement et de la cueillette de données afin de favoriser la sécurité des participantes. Par exemple, suivant les recommandations de l'Organisation mondiale de la santé (OMS, 2003) quant aux études sur la violence effectuées auprès de femmes, les annonces de recrutement ne faisaient pas mention du véritable thème de la recherche, mais d'une étude portant sur les habitudes de vie et les relations conjugales. Le choix d'utiliser un échantillon composé uniquement de femmes (au lieu des deux membres du couple) et celui d'effectuer une cueillette de données par téléphone visaient également à favoriser la sécurité des femmes, le dévoilement de soi et la confidentialité des données. L'article de Goulet et Giroux (2015) fournit une description plus détaillée des mesures mises en place.

Analyses statistiques. Les analyses statistiques ont été effectuées avec le logiciel SPSS, version 20.0. Le test du khi carré de Pearson a servi à comparer les groupes quant à la proportion de femmes qui rapportaient avoir manifesté des comportements de violence économique ou en avoir été victimes. Pour pallier les distributions non normales, des analyses non paramétriques de *U* de Mann-Whitney sur deux

échantillons indépendants ont permis de comparer les groupes quant au nombre moyen de comportements manifestés ou reçus. Les tests statistiques ont été effectués au seuil alpha de 0,05.

Pour chacune des questions ouvertes sur les motifs/contextes des comportements violents et les stratégies de contrôle (objectifs exploratoires 1 et 2), des grilles de codification ont été construites par la première auteure. Pour ce faire, une démarche inductive suivant des principes mis de l'avant par Thomas (2006) a permis de créer les codes à partir des données brutes. Après révision et une fois la grille de codification finalisée, chaque réponse a été codée. À la suite de cette démarche, des analyses descriptives de chacune des variables catégorielles ont été conduites afin de répondre aux objectifs exploratoires.

Résultats

Violence économique

Comportements manifestés par les femmes. Les femmes du groupe JP sont plus nombreuses à rapporter au moins un comportement de violence économique dans la dernière année (61,1 % des 54 femmes) que celles du groupe JNP (42,6 % des 101 femmes), $\chi^2(1, 155) = 4,84$, $p = 0,028$. Le nombre moyen de comportements ne diffère pas entre les femmes du groupe JP ($M = 18,6$; $ET = 21,8$) et du groupe JNP ($M = 16,3$; $ET = 25,6$), $U = 642,0$, $p = 0,473$.

Le tableau 2 présente pour chacun des items du questionnaire la proportion de femmes de chaque groupe qui endossent l'énoncé et le résultat au test de proportion³. Deux différences significatives ressortent : les femmes du groupe JP sont plus nombreuses que celles du groupe JNP à cacher des informations à leur conjoint sur le budget et à refuser de lui laisser de l'argent, $< 0,05$.

Tel que l'indiquent les données du tableau 2, les motifs les plus évoqués par les participantes du groupe JP pour justifier les comportements manifestés sont la volonté d'assurer sa protection économique, celle de contrôler des dépenses perçues comme excessives et inutiles, et celle de cacher des dépenses personnelles.

Comportements subis par les femmes. Significativement plus de femmes du groupe JP (74,1 %) rapportent avoir été victimes de violence économique dans la dernière année, comparativement aux femmes du groupe JNP (43,6 %), $\chi^2(1, 155) = 13,19$, $p < 0,01$. Le nombre moyen de comportements ne diffère pas entre les groupes JP ($M = 88,6$; $ET = 21,8$; $Mdn = 12,0$) et JNP ($M = 46,0$; $ET = 220,9$; $Mdn = 12,0$), $U = 790,5$, $p = 0,420$.

³À noter que le tableau 2 ne présente que les résultats détaillés pour chacun des items du questionnaire maison sur la violence économique. Les comparaisons générales entre les groupes (proportions et moyennes de comportements) n'apparaissent que dans le texte.

Tableau 2

Violence économique : Proportion (%) de femmes des groupes JP et JNP par comportements manifestés et par motifs invoqués

Items		Femmes JP (n = 54)	Femmes JNP (n = 101)
1. Ridiculiser le type d'emploi du conjoint	% ^a	5,6	2,0
	χ^2 (dl)	1,441 (1)	
	Valeur p	0,230	
Motifs ^b			
Chicanes	% (n)	33,3 (1)	0,0 (0)
Se défendre d'insultes	% (n)	66,7 (2)	50,0 (1)
Autres (n'aime pas l'horaire)	% (n)	0,0 (0)	50,0 (1)
2. Prendre le contrôle des finances de la maison ou de celles du conjoint	% ^a	38,9	28,7
	χ^2 (dl)	1,667 (1)	
	Valeur p	0,197	
Motifs ^b			
Accord commun	% (n)	52,4 (11)	89,7 (26)
Contrôler des dépenses jugées abusives ou inutiles	% (n)	42,9 (9)	6,9 (2)
Sous la pression du conjoint	% (n)	0,0 (0)	3,4 (1)
Faire des dépenses jugées inutiles	% (n)	4,8 (1)	0,0 (0)
3. Empêcher le conjoint d'avoir ou de conserver un emploi	% ^a	1,9	2,0
	χ^2 (dl)	0,003 (1)	
	Valeur p	0,956	
Motif ^b			
Bien-être du couple/du conjoint	% (n)	0,0 (0)	100,0 (2)
Emploi jugé comme sous-payé	% (n)	100,0 (1)	0,0 (0)
4. Interdire le conjoint de faire des dépenses personnelles	% ^a	13,0	13,9
	χ^2 (dl)	0,024 (1)	
	Valeur p	0,876	
Motifs ^b			
Contrôler des dépenses jugées abusives ou inutiles	% (n)	100,0 (7)	78,6 (11)
Conserver l'argent pour soi	% (n)	0,0 (0)	14,3 (2)
Ne sait pas	% (n)	0,0 (0)	7,1 (1)
5. Cacher des informations au conjoint sur les finances alors qu'il devrait être au courant	% ^a	20,4	7,9*
	χ^2 (dl)	5,071 (1)	
	Valeur p	0,024	
Motifs ^b			
Contrôler des dépenses jugées inutiles	% (n)	27,3 (3)	12,5 (1)
Cacher des dépenses jugées inutiles	% (n)	27,3 (3)	37,5 (3)
Se protéger	% (n)	36,4 (4)	25,0 (2)
Parvenir à épargner	% (n)	0,0 (0)	25,0 (2)
Éviter des inquiétudes au conjoint	% (n)	9,1 (1)	0,0 (0)
6. Refuser de laisser de l'argent au conjoint et acheter tout soi-même	% ^a	16,7	4,0*
	χ^2 (dl)	7,394 (1)	
	Valeur p	0,007	
Motifs ^b			
Contrôler des dépenses jugées abusives ou inutiles	% (n)	77,8 (7)	50,0 (2)
Parvenir à se gâter	% (n)	22,2 (2)	0,0 (0)
Conjoint ne donne pas assez d'argent	% (n)	0,0 (0)	25,0 (1)
Ne sait pas	% (n)	0,0 (0)	25,0 (1)

Tableau 2
Continued

Items		Femmes JP (<i>n</i> = 54)	Femmes JNP (<i>n</i> = 101)
7. Obliger le conjoint à remettre sa paye	% ^a	7,4	3,0
	χ^2 (dl)	1,607 (1)	
	Valeur <i>p</i>	0,205	
Motifs ^b			
Contrôler des dépenses jugées inutiles	% (<i>n</i>)	100,0 (4)	66,7 (2)
Conjoint lui doit de l'argent	% (<i>n</i>)	0,0 (0)	33,3 (1)
8. Minimiser la contribution financière du conjoint en lui disant que son salaire est faible et peu important	% ^a	5,6	5,0
	χ^2 (dl)	0,026 (1)	
	Valeur <i>p</i>	0,871	
Motifs ^b			
Chicanes	% (<i>n</i>)	66,7 (2)	60,0 (3)
Sans raison connue	% (<i>n</i>)	0,0 (0)	20,0 (1)
Lorsque le conjoint fait des dépenses jugées non raisonnables	% (<i>n</i>)	33,3 (1)	0,0 (0)
Tenter de le convaincre de chercher un nouvel emploi	% (<i>n</i>)	0,0 (0)	20,0 (1)

Note. Valeur *p* = valeur du seuil alpha ; dl = degré de liberté.

* Différences statistiquement significatives entre la proportion de participantes au seuil alpha, *p* < 0,05;

^a Le pourcentage présenté se rapporte au taux d'endossement de l'item.

^b Le pourcentage présenté pour chacun des motifs a été calculé sur le taux d'endossement de l'item (au lieu de l'échantillon complet).

Le tableau 3 présente pour chaque item la proportion de femmes des deux groupes qui rapportent en être victimes et le résultat au test de proportion⁴. Les participantes du groupe JP se distinguent de celles du groupe JNP sur quatre comportements. Elles sont plus nombreuses à s'être fait ridiculiser quant à l'emploi occupé, à s'être vu empêcher d'avoir ou de conserver un emploi, à s'être fait cacher des informations sur le budget et à s'être vu refuser de conserver de l'argent, car le conjoint achète tout lui-même, < 0,05.

Le tableau 3 décrit les motifs/contextes perçus par les femmes pour expliquer les comportements subis. Les motifs/contextes les plus rapportés par les femmes du groupe JP sont : lors d'une chicane, de la violence sans raison connue, le désir du conjoint de cacher ses dépenses, celui de conserver l'argent pour ses propres besoins et celui d'avoir le contrôle sur sa partenaire.

Stratégies de contrôle

Significativement plus de femmes du groupe JP (79,6 %) que du groupe JNP (6,9 %) se disent inquiètes des habitudes et des dépenses de jeu de leur conjoint, $\chi^2(1, 156) = 85,84$, *p* < 0,001.

⁴À noter que le tableau 3 ne présente que les résultats détaillés pour chacun des items du questionnaire maison sur la violence économique. Les comparaisons générales entre les groupes (proportions et moyennes de comportements) n'apparaissent que dans le texte.

Tableau 3

Violence économique : Proportion (%) de femmes des groupes JP et JNP par comportements subis et par motifs perçus

Items		Femmes JP (n = 54)	Femmes JNP (n = 101)
1. Ridiculiser le type d'emploi de la conjointe	% ^a	24,1	5,9*
	χ^2 (dl)	10,578 (1)	
	Valeur p	0,001	
Motifs ^b			
Chicanes	% (n)	46,2 (6)	33,3 (2)
Se défendre d'insultes	% (n)	7,7 (1)	0,0 (0)
Sans raison connue	% (n)	38,5 (5)	16,7 (1)
Autres (p. ex., convaincre de changer d'emploi)	% (n)	7,7 (1)	50,0 (3)
2. Prendre le contrôle des finances de la maison ou de celles de la conjointe	% ^a	24,1	21,8
	χ^2 (dl)	0,106 (1)	
	Valeur p	0,745	
Motifs ^b			
Accord commun	% (n)	46,2 (6)	77,3 (17)
Contrôler des dépenses jugées inutiles	% (n)	0,0 (0)	9,1 (2)
Contrôler la conjointe	% (n)	38,5 (5)	0,0 (0)
Autres (p. ex., en situation précaire, le pourvoyeur principal décide)	% (n)	15,4 (2)	13,6 (3)
3. Empêcher la conjointe d'avoir ou de conserver un emploi	% ^a	7,4	1,0*
	χ^2 (dl)	4,642 (1)	
	Valeur p	0,031	
Motifs ^b			
Contrôler la conjointe	% (n)	100,0 (4)	0,0 (0)
Jalousie (emploi dans un bar)	% (n)	0,0 (0)	100,0 (1)
4. Interdire la conjointe de faire des dépenses personnelles	% ^a	9,3	12,9
	χ^2 (dl)	0,447 (1)	
	Valeur p	0,542	
Motifs ^b			
Contrôler des dépenses jugées inutiles	% (n)	20,0 (1)	84,6 (11)
Contrôler la conjointe	% (n)	80,0 (4)	7,7 (1)
Conserver l'argent pour lui	% (n)	0,0 (0)	7,7 (1)
5. Cacher des informations à la conjointe sur les finances alors qu'elle devrait être au courant	% ^a	53,7	14,9*
	χ^2 (dl)	26,128 (1)	
	Valeur p	0,000	
Motifs ^b			
Contrôler des dépenses jugées inutiles	% (n)	0,0 (0)	6,7 (1)
Contrôler la conjointe	% (n)	3,4 (1)	0,0 (0)
Cacher des dépenses, dettes, revenus	% (n)	86,2 (25)	80,0 (12)
Autres (p. ex., éviter des inquiétudes)	% (n)	3,5 (1)	13,3 (2)
Ne sait pas	% (n)	6,9 (2)	25,0 (2)
6. Refuser de laisser de l'argent à la conjointe et acheter tout soi-même	% ^a	14,8	5,0*
	χ^2 (dl)	4,456 (1)	
	Valeur p	0,035	
Motifs ^b			
Contrôler des dépenses jugées abusives ou inutiles	% (n)	0,0 (0)	20,0 (1)
Contrôler la conjointe	% (n)	37,5 (3)	0,0 (0)
Cacher des dépenses/garder l'argent	% (n)	62,5 (5)	60,0 (3)
Empêcher les sorties	% (n)	0,0 (0)	20,0 (1)

Tableau 3
Continued

Items		Femmes JP (<i>n</i> = 54)	Femmes JNP (<i>n</i> = 101)
7. Obliger la conjointe à remettre sa paye	% ^a χ^2 (dl) Valeur <i>p</i>	1,9 0,003 (1) 0,956	2,0
Motifs ^b			
Contrôler des dépenses jugées abusives ou inutiles	% (<i>n</i>)	0,0 (0)	50,0 (1)
Contrôler la conjointe	% (<i>n</i>)	100,0 (1)	0,0 (0)
Conserver l'argent pour soi	% (<i>n</i>)	0,0 (0)	50,0 (1)
8. Minimiser la contribution financière de la conjointe en lui disant que son salaire est faible et peu important	% ^a χ^2 (dl) Valeur <i>p</i>	18,5 3,020 (1) 0,082	8,9
Motifs ^b			
Chicanes	% (<i>n</i>)	40,0 (4)	11,1 (1)
Se défendre d'insultes	% (<i>n</i>)	0,0 (0)	11,2 (1)
Sans raison connue	% (<i>n</i>)	60,0 (6)	44,4 (4)
Autres (p. ex., conjointe sans emploi)	% (<i>n</i>)	0,0 (0)	33,3 (3)

Notes. Valeur *p* = valeur du seuil alpha; χ^2 = coefficient du test de proportion, le khi carré; dl = degré de liberté.

* Différences significatives entre la proportion de participantes à un seuil alpha, *p* < 0,05.

^a Le pourcentage présenté se rapporte au taux d'endossement de l'item.

^b Le pourcentage présenté pour chacun des motifs a été calculé sur le taux d'endossement de l'item (au lieu de l'échantillon complet).

Des 43 femmes du groupe JP qui s'inquiètent, 79 % utilisent des stratégies pour contrôler les habitudes de jeu du conjoint. Le tableau 4 présente la fréquence des stratégies utilisées par les participantes du groupe JP.

Les trois stratégies les plus populaires sont, en ordre décroissant : la discussion, la suggestion de ressources d'aide et le divertissement du conjoint pour l'éloigner du jeu.

Parmi les femmes du groupe JP qui s'inquiètent, 67,4 % utilisent des stratégies de contrôle des dépenses de jeu du conjoint. Les deux stratégies les plus populaires consistent en l'instauration ou la prise en charge d'un budget et en la gestion des cartes bancaires (voir le tableau 4).

Discussion

Cette étude consiste à explorer la violence économique chez les couples où la femme perçoit son conjoint comme un joueur problématique, ainsi que les stratégies de contrôle qu'elle déploie.

Les résultats montrent qu'une proportion plus grande de femmes du groupe JP que du groupe JNP rapporte utiliser des comportements de violence économique envers leur conjoint. Rappelons que les comportements sondés s'intègrent à cinq construits :

Tableau 4

Stratégies de contrôle des habitudes de jeu et des dépenses de jeu selon les habitudes de jeu problématiques ou non du conjoint

Stratégies de contrôle ^a	Femmes JP %
Habitudes de jeu	(n = 34)
Discussions	35,3
Suggestion de ressources d'aide	26,5
Divertissement du conjoint pour l'éloigner du jeu	17,6
Avertissements, reproches et menaces	8,8
Contrôle et surveillance du conjoint	5,9
Séparation temporaire d'avec le conjoint	2,9
Suggestion de se bannir des endroits de jeu	2,9
Dépenses de jeu	(n = 29)
Instauration et prise en charge d'un budget	27,6
Gestion des cartes bancaires (débit, crédit)	20,7
Discussions, suggestions et conseils sur les finances	13,8
Aucune mise en commun des avoirs financiers et annulation des comptes conjoints	10,3
Contrôle et gestion de la paye du conjoint	10,3
Entente avec la banque pour interdire les retraits bancaires	3,4
Décision de ne rien laisser au nom du conjoint	3,4
Dissimulation des cartes bancaires et de l'argent liquide	3,4
Conservation de plus d'argent pour soi-même	3,4
Remise au conjoint de sommes d'argent fixes	3,4

^a Aucun test statistique n'a été effectué sur ces données.

le dénigrement verbal, les mensonges et la dissimulation, le contrôle abusif des dépenses, celui des avoirs et celui des activités professionnelles.

En regard de l'une des conséquences du jeu problématique les plus rapportées par les proches, soit les pertes d'argent personnel ou du ménage (Kalischuk et al., 2006), la violence économique faite par les femmes pourrait bien être manifestée de façon réactionnelle. En soutien à cette idée, soulignons que les femmes du groupe JP sont plus nombreuses à cacher au conjoint des informations sur le budget et à refuser de lui laisser de l'argent – deux comportements pouvant contribuer à diminuer ses habitudes de jeu.

Une question fondamentale se pose sur la réelle nature des comportements rapportés. Représentent-ils une forme de violence conjugale au sens strict, soit un comportement de contrôle visant à dominer le partenaire (Stylianou et al., 2013) et à lui retirer son pouvoir décisionnel (MSSS, 1995), ou servent-ils à composer avec les problèmes de jeu? L'exploration des motifs entourant ces comportements conduit à des explications divergentes. D'une part, certains motifs apparaissent directement associés aux dépenses de jeu du conjoint, comme de vouloir contrôler des dépenses abusives ou inutiles. Dans d'autres cas, l'association entre le motif énoncé et les problèmes de jeu du conjoint apparaît moins claire, comme lorsqu'est invoquée la volonté de s'acheter des choses pour se faire plaisir.

Les résultats portent à croire que les comportements de violence économique ne sont pas spécifiques aux conjointes de joueurs problématiques, bien que ces dernières soient plus nombreuses à en manifester. Cependant, certaines motivations les justifiant, entre autres la protection des finances, pourraient être spécifiques aux conjointes de joueurs problématiques. Il ressort également de cette étude que les différents motifs rapportés par les participantes pour justifier leurs comportements en apparence violents ne semblent pas correspondre à la conceptualisation classique de la violence conjugale, voulant que celle-ci ait un objectif de domination et de contrôle du partenaire (voir p. ex., MSSS, 1995; Fawole, 2008; Stylianou et al., 2013; Weaver et al., 2009).

Au vu de ces résultats, une question apparaît justifiée : comment différencier les comportements de violence économique des comportements de protection? Est-ce la façon dont ils sont exercés, leur fréquence d'utilisation ou leurs motivations sous-jacentes? Heineman (1987) propose de considérer que le contrôle des finances du joueur problématique par sa conjointe puisse être adéquat. Les joueurs problématiques interrogés par Tepperman, Korn et Roynolds (2006) perçoivent même certains comportements de contrôle des finances manifestés par leur partenaire comme étant utiles. Ce qui deviendrait inadéquat pourrait alors être la perpétuation de ces comportements alors qu'ils ne sont plus justifiés ou que le joueur n'y est plus consentant.

En ce qui concerne les comportements de violence économique subis, les résultats montrent que les femmes du groupe JP sont plus nombreuses que celles du groupe JNP à s'en dire victimes. Plus précisément, les femmes du groupe JP rapportent en plus grand nombre qu'elles se sont fait dénigrer quant à leur emploi et qu'elles se sont retrouvées dans des situations où leur conjoint les a empêchées d'avoir un emploi, leur a caché des informations sur le budget et ne leur a pas permis de conserver de l'argent.

Certains de ces comportements, tels que de conserver l'argent pour soi et de cacher des informations sur le budget, s'intègrent dans la dynamique des joueurs pathologiques qui tentent de s'approvisionner en argent, comptent sur les autres pour en obtenir et mentent pour camoufler l'ampleur de leurs habitudes de jeu (APA, 2013). Les participantes justifient d'ailleurs ces comportements par le besoin de leur conjoint d'assurer la poursuite de leurs activités de jeu.

À l'opposé, des gestes comme dénigrer l'emploi de sa conjointe ou l'empêcher d'avoir un emploi ne cadrent pas *a priori* avec la dynamique du joueur problématique à la recherche d'argent pour jouer, sauf si celui-ci tente, en dénigrant son emploi, de forcer sa conjointe à se trouver un emploi plus lucratif. Près de la moitié des femmes du groupe JP qui indiquent se faire ridiculiser quant à leur emploi décrivent un contexte de conflit où les insultes sont mutuelles. Toutefois, certaines conjointes (17 %) mentionnent que ces insultes leur sont lancées par le conjoint de manière unilatérale et sans motif connu, ce qui apparaît plutôt comme de la violence

non mutuelle (Weston, Temple, & Marshall, 2005). Le fait d'empêcher sa conjointe d'avoir un emploi semble cadrer avec le sabotage de l'emploi, forme de violence économique récemment conceptualisée par Postmus et al. (2012; 2015). Stylianou et al. (2013) suggèrent d'ailleurs que des travaux futurs sont nécessaires pour mieux comprendre cette dimension de l'abus économique. Dans un contexte conjugal où l'un des conjoints présente un problème de jeu, le sabotage de l'emploi devrait être étudié afin de mieux en comprendre la fonction et d'adapter les interventions en conséquence.

À ce stade-ci de nos connaissances, l'ensemble de ces résultats soulève un questionnement interprétatif qui nécessitera approfondissement. Par exemple, certains comportements en apparence violents, tels que de prendre le contrôle des finances de l'autre, peuvent s'exercer à la suite d'un accord entre les partenaires, comme le montrent les résultats de cette étude. Ce genre de comportements, lorsqu'évalué sans égard au contexte, pourrait à tort être jugé comme de la violence économique. Ce constat appuie l'importance de porter une attention particulière au contexte sous-jacent aux comportements. En comparaison des autres types de violence conjugale, la violence économique comporte une part d'ambiguïté, et son évaluation doit se faire de façon nuancée.

L'étude avait également pour but d'explorer les stratégies utilisées par les femmes qui s'inquiètent des habitudes de jeu de leur conjoint pour contrôler leurs habitudes et dépenses de jeu. Comme premier constat, soulignons qu'une majorité de conjointes du groupe JP se dit inquiète des habitudes et des dépenses de jeu de leur conjoint. Malgré ces inquiétudes, près d'une femme sur cinq rapporte ne pas utiliser de stratégies de contrôle. Cela concorde avec les écrits de Tepperman, Korn et Reynolds (2006), qui relèvent que les conjointes de joueurs se considèrent comme ayant peu d'emprise à changer les habitudes de jeu de ces derniers. Ce sentiment d'impuissance pourrait conduire à la passivité et au retrait.

Pour les femmes qui utilisent des stratégies de contrôle, la plus populaire consiste en des tentatives de discussion. Cette stratégie semble adéquate, bien qu'elle pourrait s'inscrire dans un contexte conjugal où les deux conjoints tendent à ne pas avoir une bonne perception de leur communication (Trudel et al., 2008). Boutin et Ladouceur (2006) suggèrent que les conjointes de joueurs qui souhaitent avoir des discussions tentent de privilégier un moment opportun et d'éviter certains pièges à la communication, comme les critiques, l'apitoiement, la menace et l'affrontement. Cette suggestion trouve écho dans nos résultats, car les reproches, menaces, avertissements et la surveillance sont des stratégies nommées par certaines femmes et qui peuvent s'apparenter à de l'abus économique (Fawole, 2008). L'utilisation de ces stratégies de contrôle plus abusives soulève un questionnement sur leur utilité et leur efficacité.

La seconde stratégie la plus populaire consiste en la suggestion directe ou indirecte de ressources d'aide. La suggestion directe consiste à conseiller au conjoint d'avoir recours à des ressources d'aide et représente une sous-composante de la stratégie la

plus populaire, la discussion, bien que les femmes la nomment comme une stratégie bien distincte. La méthode indirecte consiste plutôt à laisser dans les aires communes de la maison de l'information sur les problèmes de jeu et les ressources d'aide. Concernant le contrôle des dépenses de jeu, les stratégies les plus mentionnées consistent en l'instauration d'un budget et à la prise en charge des finances, suivies par la gestion des cartes bancaires du conjoint. Dans le cadre d'une cueillette de données qualitatives effectuée par Tepperman, Korn et Reynolds (2006), des joueurs problématiques ont identifié certaines façons dont leur conjointe contrôle leurs dépenses de jeu, dont les encouragements à dépenser moins ou à faire un budget et le contrôle complet des finances. Ces stratégies sont décrites comme utiles par certains joueurs, alors que d'autres les perçoivent comme non aidantes (Tepperman et al., 2006). Les écrits de Heineman (1987) et de Hodgins et al. (2007) concordent plutôt pour montrer que, si elles sont appliquées d'un commun accord, ces stratégies apparaissent adéquates et pourraient se révéler aidantes.

L'application de stratégies de contrôle financier, quelles qu'elles soient, pourrait représenter une lourde tâche en octroyant aux conjointes un surplus de responsabilités, ce que déplorent Boutin et Ladouceur (2006), qui les incitent plutôt à n'assumer que les responsabilités qui les concernent. Leur application pourrait aussi entraîner des effets délétères, tels qu'une déresponsabilisation du joueur le maintenant dans un rôle passif face à ses difficultés. Ces stratégies pourraient aussi entraîner un sentiment de frustration chez les conjoints, nuisant ainsi à la relation conjugale. L'évaluation empirique de l'application et de l'efficacité de ces stratégies de contrôle fournirait des indications plus claires sur leurs impacts.

Cette étude comporte certaines limites. Une première limite concerne la non-représentativité de l'échantillon de femmes faisant partie de l'étude. Des études utilisant une méthode d'échantillonnage appropriée (p. ex., par quotas ou stratification) permettraient la généralisation des résultats à la population d'intérêt. Une seconde limite concerne le fait que les résultats découlent de données rapportées par les femmes uniquement et qui se fondent sur leurs seules perceptions. Connaître aussi les perceptions du conjoint pourrait aider à clarifier les résultats obtenus.

Enfin, une autre limite se rapporte à l'instrument non validé ayant servi à évaluer la violence économique. Malgré les limites de l'instrument, sa nature et son format ont permis aux femmes de s'exprimer sur les motifs entourant les comportements de violence manifestés et subis. Les résultats obtenus peuvent servir de tremplin aux études ultérieures.

Conclusion

Cette étude met en évidence plusieurs comportements s'apparentant à la violence économique et qui sont utilisés par les partenaires de couples dont l'homme est perçu comme un joueur problématique. Les motifs invoqués et perçus par les femmes pour expliquer ces comportements apparaissent très liés au problème de jeu du conjoint

plutôt qu'à des intentions de contrôle ou de domination du partenaire. Il serait pertinent de poursuivre les recherches spécifiques à la violence économique dans les couples où l'un des conjoints présente un problème de jeu de façon à mieux en comprendre la signification.

Les résultats de l'étude indiquent aussi qu'une grande proportion de femmes utilise des stratégies de contrôle des habitudes et des dépenses de jeu du joueur problématique. Certaines stratégies semblent appropriées, alors que d'autres apparaissent plus violentes. Les études futures devraient évaluer, au moyen de devis longitudinaux, l'adéquation et l'efficacité de certaines stratégies de contrôle utilisées dans ces couples. Par ailleurs, dans une perspective clinique, les interventions thérapeutiques s'adressant aux couples pourraient servir à améliorer la qualité des relations conjugales, et favoriser ainsi la communication et la mise en place d'actions communes entre les conjoints de façon à éviter de basculer dans des comportements de violence économique.

Références

Adams, A. E., Sullivan, C. M., Bybee, D., & Greeson, M. G. (2008). Development of the Scale of Economic Abuse. *Violence Against Women, 14*, 563-588. doi:10.1177/1077801208315529

Afi, T. O., Brownridge, D. A., MacMillan, H., & Sareen, J. (2010). The relationship of gambling to intimate partner violence and child maltreatment in a nationally representative sample. *Journal of Psychiatric Research, 44*, 331-337. doi:10.1016/j.jpsychires.2009.07.010.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Boutin, C., & Ladouceur, R. (dir.) (2006). *Y a-t-il un joueur dans votre entourage? Tout ce que les proches doivent savoir*. Montréal, Canada : Éditions de l'homme.

DeKeseredy, W. S. & Dragiewicz, M. (2009). *Orientation changeante des politiques publiques : La violence dans les relations intimes, sexospécifique ou bidirectionnelle?* Oshawa, Canada : Imprimeur de la Reine pour l'Ontario, 2009.

Dowling, N., Suomi, A., Jackson, A., Lavis, T., Patford, J., Cockman, S., ... Abbott, M. (décembre 2014). Problem gambling and intimate partner violence: A systematic review and meta-analysis. *Trauma, Violence, & Abuse, 1*-19. doi:10.1177/1524838014561269

Downs, C., & Woolrych, R. (2010). Gambling and debt: the hidden impacts on family and work life. *Community, Work & Family, 13*, 311-328. doi:10.1080/13668803.2010.488096

- Fawole, O. I. (2008). Economic violence to women and girls: is it receiving the necessary attention? *Trauma, Violence, & Abuse*, 9, 167-177. doi:10.1177/1524838008319255
- Ferland, F., Fournier, P.-M., Ladouceur, R., Brochu, P., Bouchard, M., & Pâquet, L. (2008). Consequences of pathological gambling on the gambler and his spouse. *Journal of Gambling Issues*, 22, 219-229. doi:10.4309/jgi.2008.22.5
- Goulet, A., & Giroux, I. (2015). Les comportements violents : comparaison des couples selon que l'homme est perçu ou non par sa conjointe comme un joueur problématique. *Journal of Gambling Issues*, 30, 73-97. doi:10.4309/jgi.2015.30.9
- Heineman, M. (1987). A comparison: The treatment of wives of alcoholics with the treatment of wives of pathological gamblers. *Journal of Gambling Behavior*, 3, 27-40. doi:10.1007/BF01087475
- Hodgins, D. C., Toneatto, T., Makarchuk, K., Skinner, W., & Vincent, S. (2007). Minimal treatment approaches for concerned significant others of problem gamblers: A randomized controlled trial. *Journal of Gambling Studies*, 23, 215-230. doi:10.1007/s10899-006-9052-2
- Johansson, A., Grant, J. E., Kim, S. W., Odlaug, B. L., & Götestam, K. G. (2009). Risk factors for problematic gambling: A critical literature review. *Journal of Gambling Studies*, 25, 67-92. doi:10.1007/s10899-008-9088-6
- Kairouz, S., & Nadeau, L. (2014). Portrait du jeu au Québec : Prévalence, incidence et trajectoires sur quatre ans. Montréal, Canada : Université Concordia.
- Kalischuk, R. G., Nowatzki, N., Cardwell, K., Klein, K., & Solowoniuk, J. (2006). Problem gambling and its impact on families: A literature review. *International Gambling Studies*, 6, 31-60. doi:10.1080/14459790600644176
- Korman, L. M., Collins, J., Dutton, D., Dhayananthan, B., Littman-Sharp, N., & Skinner, W. (2008). Problem gambling and intimate partner violence. *Journal of Gambling Studies*, 24, 13-23. doi:10.1007/s10899-007-9077-1
- Ladouceur, R. (1991). Prevalence estimates of pathological gambling in Quebec. *Canadian Journal of Psychiatry*, 36(10), 732-734.
- 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.
- Lorenz, V. C., & Shuttlesworth, D. E. (1983). The impact of pathologic gambling on the spouse of the gambler. *Journal of Community Psychology*, 11, 67-76. doi:10.1002/1520-6629(198301)11:1<67::AID-JCOP2290110107>3.0.CO;2-O

ministère de la Santé et des Services sociaux. (1995). *Politique d'intervention en matière de violence conjugale : prévenir, dépister, contrer la violence conjugale*. Québec, Canada : Gouvernement du Québec.

Morasco, B. J., Weinstock, J., Ledgerwood, D. M., & Petry, N. M. (2007). Psychological factors that promote and inhibit pathological gambling. *Cognitive and Behavioral Practice*, 14, 208-217. doi:10.1016/j.cbpra.2006.02.005

Morin, M. (2007). *Évaluation de mes comportements violents*. Granby, Canada : Ressource pour hommes de la Haute-Yamaska. Récupéré le 20 juillet 2007 de <http://www.rhhy.qc.ca/index.html>

Muelleman, R. L., DenOtter, T., Wadman, M. C., Tran, T. P., & Anderson, J. (2002). Problem gambling in the partner of the emergency department patient as a risk factor for intimate partner violence. *The Journal of Emergency Medicine*, 23, 307-312. doi:10.1016/S0736-4679(02)00543-7

National Endowment for Financial Education (NEFE). (2000). *Personal financial strategies for the loved ones of problem gamblers*. Washington, DC : NEFE.

Organisation mondiale de la santé (2003). *Priorité aux femmes : Principes d'éthique et de sécurité sur les actes de violence familiale à l'égard des femmes*. Genève, Suisse : Groupe Santé familiale et communautaire, Département Genre et santé de la femme.

Postmus, J. L., Plummer, S-B., & Stylianou, A. M. (2015). Measuring economic abuse in the lives of survivors: Revising the scale of economic abuse. *Violence against Women*, 27. doi:10.1177/1077801215610012

Posmus, J. L., Plummer, S-B., McMahon, S., Murshid, N. S., & Kim, M. S. (2012). Understanding economic abuse in the lives of survivors. *Journal of Interpersonal Violence*, 27, 411-430. doi:10.1177/0886260511421669

Riou, D. A., Rinfret-Raynor, M., & Cantin, S. (2003). *La violence envers les conjointes dans les couples québécois, 1998*. Montréal, Canada : Institut de la statistique du Québec.

Shaffer, H. J., Hall, M. N., & Vander Bilt, J. (1999). Estimating the prevalence of disordered gambling behaviour in the United States and Canada: A research synthesis. *American Journal of Public Health*, 89, 1369-1376. doi:10.2105/AJPH.89.9.1369

Shaw, M. C., Forbush, K. T., Schlinder, J., Rosenman, E., & Black, D. W. (2007). The effect of pathological gambling on families, marriages, and children. *The International Journal of Neuropsychiatric Medicine*, 12, 615-622.

- Steinberg, M. A. (1993). Couples treatment issues for recovering male compulsive gamblers and their partners. *Journal of Gambling Studies*, 9, 153-167. doi:10.1007/BF01014865
- Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The Revised Conflict Tactics Scales (CTS2): Development and preliminary psychometric data. *Journal of Family Issues*, 17, 283-316. doi:10.1177/019251396017003001
- Stylianou, A. M., Postmus, J. L., McMahon, S. (2013). Measuring abusive behaviors: Is economic abuse a unique form of abuse? *Journal of Interpersonal Violence*, 28, 3186-3204. doi:10.1177/0886260513496904
- Tepperman, L., Korn, D., & Lynn, M. (2006). *At Home with Gambling: An exploratory study – Final Report* (rapport présenté à l'Ontario Problem Gambling Research Center). Toronto, Canada.
- Tepperman, L., Korn, D., & Reynolds, J. (2006). *Partner influences on gambling: An exploratory study – Final Report* (rapport présenté à Ontario Problem Gambling Research Center). Toronto, Canada.
- Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, 27(2), 237-246. doi:10.1177/1098214005283748
- Trudel, G., Poirier-Arbour, A., Harvey, P., Boyer, R., Villeneuve, V., Anderson, A., & Ouellette-Ngocsoeng, M. (2008). *Couple et jeu de hasard* (rapport de recherche présenté au Fonds québécois de recherche sur la société et la culture). Montréal, Canada.
- Weaver, T. L., Sanders, C. K., Campbell, C. L., & Schnabel, M. (2009). Development and preliminary psychometric evaluation of the Domestic Violence – Related Financial Issues Scale (DV-F1). *Journal of Interpersonal Violence*, 24, 569-585. doi:10.1177/0886260508317176
- Weston, R., Temple, J. R., & Marshall, L. L. (2005). Gender symmetry and asymmetry in violent relationships: Patterns of mutuality among racially diverse women. *Sex Roles*, 53, 553-571. doi:10.1007/s11199-005-7142-8
- WHO ASSIST Working Group (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Development, reliability and Feasibility. *Addiction*, 97, 1183-1194. doi:10.1046/j.1360-0443.2002.00185.x

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Special Section: *JGI* Scholar's Award, Category A

Cognitive Behavioural Group Therapy for Problem Gamblers who Gamble over the Internet: A Controlled Study

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Abstract

Several studies have found higher rates of problem gambling among Internet gamblers than non-Internet gamblers. Because of easy access and convenience, along with other gaming characteristics, many researchers in the field have advanced the argument that Internet gambling is potentially more addictive and problematic than land-based gambling activities. However, research examining the efficacy of treatments for problem gamblers who gamble over the Internet has not yet been conducted. The purpose of the present study was to examine the efficacy of group cognitive behavioural therapy for self-identified problem Internet gamblers. Thirty-two participants were randomly assigned to either the treatment group ($n = 16$) or wait list (delayed treatment) comparison group ($n = 16$). Results indicated that the treatment was efficacious in improving three of the four dependent variables from pre- to post-test/treatment: number of *DSM-IV* criteria for pathological gambling endorsed, perception of control over gambling, and number of sessions gambled. No significant pre- to post-test/treatment difference was found between groups on desire to gamble. Groups were combined to examine treatment outcome over time, with results showing significant pre- to post-treatment and pre- to three-month post-treatment improvement for all four dependent variables.

Keywords: problem gambling, Internet gambling, cognitive behavioural therapy, control trial

Résumé

De nombreuses études ont observé un taux plus élevé de problèmes de jeu chez les joueurs qui jouent en ligne que chez les autres joueurs. Étant donné l'accès facile et commode du jeu en ligne, qui s'ajoute aux autres caractéristiques des jeux de hasard, de nombreux chercheurs du domaine soutiennent que le jeu en ligne est plus susceptible d'entraîner une dépendance et de devenir problématique que les jeux de

hasard dans le monde réel. Aucune recherche ne s'est cependant penchée sur l'efficacité des différentes thérapies sur les personnes ayant un problème de jeu en ligne. Aussi l'objectif de la présente étude était-il d'examiner l'efficacité d'une thérapie de groupe cognitivo-comportementale menées auprès de personnes ayant un problème de jeu en ligne. Les 32 participants ont été distribués au hasard entre un groupe de thérapie ($n = 16$) et un groupe témoin ($n = 16$) dont les membres ont été inscrits sur une liste d'attente (thérapie retardée). Les résultats indiquent que la thérapie a permis d'améliorer trois des quatre variables évaluées dans le cadre d'un test précédant et suivant le traitement : le nombre des critères du DSM-IV liés au jeu pathologique présents, la perception d'exercer un contrôle sur le jeu et le nombre de séances de jeu. Le test précédant et suivant le traitement n'a révélé aucune différence entre les groupes quant au désir de jouer. Les groupes ont été mélangés pour évaluer les résultats de la thérapie dans le temps et d'importantes améliorations des quatre variables dépendantes ont été observées entre le test précédant la thérapie et ceux effectués après celle-ci et trois mois plus tard.

Introduction

Access to legalized gambling activities has grown substantially in recent years. A major reason for this growth has been the development of the Internet gambling industry (Gainsbury, Wood, Russell, Hing, & Blaszczynski, 2012). Internet gambling is "all forms of gambling on chance events for money (including wagering and betting on skilled games) via the Internet. This includes gambling using computers, mobile phones, or wireless devices connected to the Internet" (Gainsbury, Russell, Hing, Wood, & Blaszczynski, 2013, p. 2). Internet gambling has changed the gambling landscape worldwide, providing consumers with convenient, anonymous, and unlimited access to a wide-range of gambling activities.

Despite various consumer benefits, several concerns about online gambling have been identified. For instance, (1) credit card access allows Internet gamblers to gamble themselves into excessive debt; (2) unlike land-based casinos, Internet casinos cannot monitor the alcohol or drug consumption of their patrons and, as a result, are unable to stop intoxicated patrons from gambling further; (3) Internet gambling characteristics such as the pace of play and the opportunity to play multiple games at once, allow consumers to wager money at faster rates; and (4) the ability to gamble anonymously and privately allows Internet gamblers to gamble excessively without the knowledge of family members or friends (Gainsbury, Parke, & Suhonen, 2013; Griffiths, 2001). Given such concerns, it would appear that characteristics of Internet gambling provides patrons a platform to gamble more often and for longer periods of time than do more traditional means of land-based gambling. From this perspective, it seems that gambling via the Internet may contribute to an increase risk in problem gambling behaviours.

Problem gambling can be defined as “gambling behaviour that creates negative consequences for the gambler, others in his or her social network, or for the community” (Ferris & Wynne, 2001, p. 7). The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-V)* (American Psychiatric Association, 2013) classifies a gambling disorder, more severely, as Substance-Related and Addictive disorder. Research to date suggests a strong relationship between Internet gambling participation and problem gambling behaviours (e.g., Gainsbury et al., 2013; Griffiths & Barns, 2008; Griffiths, Wardle, Orford, Sproston, & Erens, 2009; Shen, Kairouz, Nadeau, & Robillard, 2015; Wood & Williams, 2011). For instance, in a survey of 12,521 international gamblers, Wood and Williams (2011) found that the prevalence of problem gambling was three to four times higher among Internet gamblers (16.4%) than non-Internet (exclusively land-based) gamblers (5.7%). Furthermore, Internet game play has been found to be associated with increased treatment participation among problem gamblers (Braun, Ludwig, Slecza, Bühringer, & Kraus, 2014). Such findings have led many researchers in the field to argue that Internet gambling is more addictive and problematic than land-based gambling activities (Gainsbury et al., 2013; Griffiths & Barns, 2008). However, despite the growing number of studies demonstrating a relationship between Internet gambling and problem gambling, because of methodological limitations within these studies (e.g., cross-sectional designs), the direction of causality of this relationship is unknown (Wood, Williams, & Park, 2012). In other words, it may be the case that problem gamblers are more likely to seek out more gambling opportunities including those via the Internet. Research has also found that problem gamblers are more inclined to regularly participate in multiple gambling activities (McCormack, Shorter, & Griffiths, 2013). In fact, the vast majority of problem Internet gamblers also report utilizing land-based gambling venues (Gainsbury et al., 2012; Wardle, Moody, Griffiths, Orford, & Volberg, 2011). It may also be the case that the characteristics of Internet gambling may contribute to the engagement in problem gambling behaviours. In a qualitative study examining the features of Internet gambling that contribute to a loss of control in gambling behaviours, easy accessibility, ease of gambling on credit, and excessive online promotions, were reported by problem gambling participants as contributors to loss of control (Hing et al., 2014). Regardless of the directionality of this relationship, it is cause for concern, as the Internet has become a means for many to engage in maladaptive gambling behaviours.

Despite the growing concern of Internet problem gambling, to the best of our knowledge, there are no published studies to date that have examined the efficacy or effectiveness of existing treatment modalities on problem gamblers who utilize the Internet as a means of access to gambling. Given the Internet gambling-problem gambling relationship, and that many researchers have argued that gambling over the Internet may be more addictive and problematic than land-based gambling (Gainsbury et al., 2013; Griffiths & Barns, 2008), the argument could be made that problem Internet gambling behaviours may be less responsive to current evidence-based problem gambling treatments. Compared to land-based venues, Internet gambling allows for easier accessibility, an ability to gamble on credit, and

a faster pace of play; characteristics that may make problem gambling behaviours more resistant to change despite treatment. Within the literature, cognitive-behavioural therapy (CBT) has been the most extensively studied and supported treatment for problem gambling (Gooding & Tarrier, 2009). Cognitive behavioural therapy programs for problem gambling often include motivational enhancement, behavioural and cognitive interventions, and relapse prevention knowledge and strategies. Treatment objectives include helping the client understand the origins of his or her gambling problem, and why that problem is maintained over time, while concurrently providing cognitive and behavioural strategies to help break maladaptive patterns of gambling behaviours (Ladouceur & Lachance, 2007). To date, outcome studies examining CBT have utilized samples of problem gamblers who may or may not have gambled over the Internet.

The purpose of the current study was to examine the efficacy of group CBT for problem gamblers who gamble over the Internet. It was hypothesized that the treatment group would show significant improvements, in four gambling-related outcomes, when compared to the wait list comparison group: (1) *DSM-IV* criteria for pathological gambling, (2) urge to gamble, (3) perception of control over gambling, and (4) number of gambling sessions. These outcomes were assessed at pre-treatment, and again at immediate post-treatment, and once more at three-month post-treatment follow-up.

Method

Participants

Participants were 32 self-identified Internet gamblers seeking treatment for problem gambling. Participants included 17 males and 15 females and ranged from 22 to 52 years of age (M age = 34.3 years, SD = 7.3). Seventy-two percent of participants reported being Caucasian/White, 19% Aboriginal (First Nation or Inuit), 6% Hispanic/Latino, and 3% African-Canadian/Black. The most frequently reported land-based gambling games played by participants were slot machines (68.8%), casino table games (e.g., blackjack, roulette) (46.9%), bingo (18.8%), and sports betting (12.5%). Internet gambling games most frequently endorsed included poker (56.3%), slot machines (43.8%), sports betting (40.6%), and casino table games (34.4%). Participants entered the study from January 2012 to June 2014.

Measures

Demographic questionnaire. Individual characteristics including age, sex, ethnicity, marital status, employment status, and student status were assessed.

Gambling Behaviour and Treatment Participation Questionnaire. This brief 6-item gambling behaviour and treatment participation questionnaire was developed by the current researchers to assess the types of Internet gambling and non-Internet gambling activities participated in over the past 12 months. Two items assessed whether problem

gambling treatment had been engaged in before and the final item examined participant treatment outcome goals (e.g., stop gambling completely, cut back on gambling).

DSM-IV-TR Criteria for Pathological Gambling (American Psychiatric Association, 1994). The 10 criteria for pathological gambling were administered in a questionnaire format. Participants were asked to rate each criterion “yes” or “no” based on their respective gambling-related behaviours over the previous month.

Gambling-Related Questions (Ladouceur & Lachance, 2007). This questionnaire is recommended by Ladouceur and Lachance (2007) as a pre- and post-treatment assessment measure for clients of a CBT program for problem gambling. This brief questionnaire measured perception of control over gambling ranging from 0% (not at all) to 100% (totally), desire to gamble ranging from 0 (not at all) to 10 (totally), and gambling frequency as measured by the number of participated gambling sessions. Each of these outcomes was measured over the previous month. This questionnaire has been used as a pre- and post-treatment measure in other studies examining the efficacy of CBT for pathological gambling (Ladouceur et al., 2001; Ladouceur et al., 2003; Sylvain, Ladouceur, & Boisvert, 1997).

Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). The AUDIT is a 10-item self-report questionnaire that measures past-year alcohol consumption, drinking behaviour, and alcohol-related problems. Total scores range from 0 to 40, with a score of eight or more indicating hazardous or harmful alcohol use. The AUDIT has been shown to have good internal consistency and strong validity (Allen, Litten, Fertig, & Barbor, 1997), and was administered in the current study to help ensure no group differences on alcohol consumption and related problems.

The Symptom Checklist -90- Revised (SCL-90-R; Derogatis & Unger, 2010). The SCL-90-R is a screening measure for general psychiatric symptomatology and includes dimensions measuring somatization, obsessive-compulsive, depression, anxiety, phobic anxiety, hostility, interpersonal sensitivity, paranoid ideation, and psychoticism. This self-report questionnaire includes 90 items that are measured on a 5-point scale ranging from 0 (not at all) to 4 (extremely). Summing the scores from all 90 items and dividing by 90 computes the Global Severity Index (GSI). The current study utilized GSI score to help ensure no group differences on general psychiatric symptomatology. SCL-90-R subscale scores were not utilized in the current study.

Desirability Scale of the Personality Research Form (Jackson, 1967). This Desirability scale has 16 items and a high score indicates that the respondent, either consciously or unconsciously, is responding to the items in such a way that is making himself or herself appear desirable. The Desirability scale has been shown to have good test-retest reliability over a two-week interval ($r = .86$) and good internal consistency ($\alpha = .82$). The PRF Desirability Scale has been used in numerous studies

in personality as a detector of mild to extreme participant distortion or faking (e.g., MacNeil & Holden, 2006).

Infrequency Scale of the Personality Research Form (Jackson, 1967). This Infrequency scale has 16 items, and a high score indicates that the respondent may be randomly or carelessly responding to the questionnaire items. Test-retest reliability with a two-week interval ($r = .46$) and internal consistency ($\alpha = .51$) are adequate given the nature of this scale.

Experimental Design and Procedure

Ethics approval for this study was obtained from the appropriate University Research Ethics Board. Participants were recruited from the general community through land-based advertisements, online advertisements, and local media announcements (e.g., newspaper, radio). To be included in the study participants had to have met the following criteria: (1) possess a self-defined problem with gambling and be interested in participating in treatment for problem gambling, (2) have gambled over the Internet in the past 12 months, (3) not already be receiving treatment for problem gambling, and (4) be 19 years of age or older. Participants having met inclusion criteria were assigned to either the treatment group or a wait list comparison group. Participants were sequentially assigned by the order in which they entered the study (i.e., first participant was assigned to the treatment group, second to the wait list comparison group, third to the treatment group, and so on).

Treatment Group. Participants assigned to the treatment group first completed the pre-test measures. These participants were administered 12 weekly sessions, each lasting 90 minutes in length, and groups were comprised of 3 to 5 participants ($M = 4$, $SD = 1$). Immediately following the treatment period (i.e., 12 weeks), the treatment group was administered post-test measures. Participants were also administered follow-up measures at three-months post-treatment. At the three-month follow-up time, participants were sent an e-mail reminding them to complete the follow-up questionnaires. The e-mail included a link to the online questionnaire. Participants were compensated with a \$20 gift certificate for completing the post-treatment and three-month follow-up questionnaires.

Wait List Comparison Group. Participants assigned to the wait list comparison group first completed the pre-test measures and were then notified that they would be receiving treatment in 12 weeks' time. Participants were not notified specifically that they had been assigned to a wait list comparison group. Following the 12-week waiting period, participants completed the post-test measures and were offered the problem gambling treatment. Certain wait list participants engaged in therapy groups that had also included participants who had been assigned to the treatment group and who had not had to engage in the waiting-list period. Wait list participants also completed post-treatment measures following their respective treatment and three-month post-treatment follow-up measures.

Treatment. The treatment program followed Ladouceur and Lachance's (2007) treatment manual for pathological gambling. This CBT program includes four main components: (1) motivational interviewing, (2) behavioural interventions, (3) cognitive interventions, and (4) relapse prevention. Treatment consisted of an initial individual session and 11 weekly group sessions, each 90 minutes in length. The treatment program was tailored for group therapy, as clients were given opportunities during each session to discuss within the group their respective thoughts and feelings regarding their previous experiences with trying to refrain from gambling over the course of the previous week.

Therapist. The therapist was a PhD student in clinical psychology practicing under the supervision of a registered clinical psychologist. This student had previously taken several advanced courses in psychotherapy including courses in CBT and group therapy. In addition, the student had previously engaged in supervised clinical placements consisting of cognitive behavioural group therapy with individuals suffering from maladaptive substance use.

Attrition. Thirty-two participants were randomly assigned to either the treatment ($n = 16$) or wait list comparison group ($n = 16$). Following randomization, three participants dropped out of the study: one participant from the treatment group and two participants from the wait list comparison group. Furthermore, 5 participants assigned to the wait list comparison group declined to participate in treatment following the waiting list period. Several participants completed post-treatment and 3-month follow-up measures despite not attending all treatment sessions or discontinuing treatment while in the treatment phase of the study. See Figure 1 for participant attrition at each stage of the study. Of the 24 participants who began treatment the number of sessions attended by participants ranged from 2 to 12 sessions ($M = 7$, $SD = 2.81$).

Results

Data Screening

Prior to data analyses, data were downloaded from SurveyMonkey into a series of SPSS data files, which were then amalgamated into a single SPSS data file. Descriptive statistics and frequencies of the variables were computed and examined to detect univariate outliers and missing data. No univariate outliers were detected. If a participant failed to answer two or fewer items from the PRF Desirability scale, PRF Infrequency scale, AUDIT, *DSM-IV-TR* criteria for pathological gambling, or any of the SCL-90-R dimensions, those items were replaced with the participant's average score from that particular scale. If the participant failed to answer more than two items from any one of these scales, that total scale score was not calculated for the participant. Infrequency item scores were totalled to examine whether any participants had endorsed over three items on the Infrequency scale. No participants were identified as endorsing three or more Infrequency items.

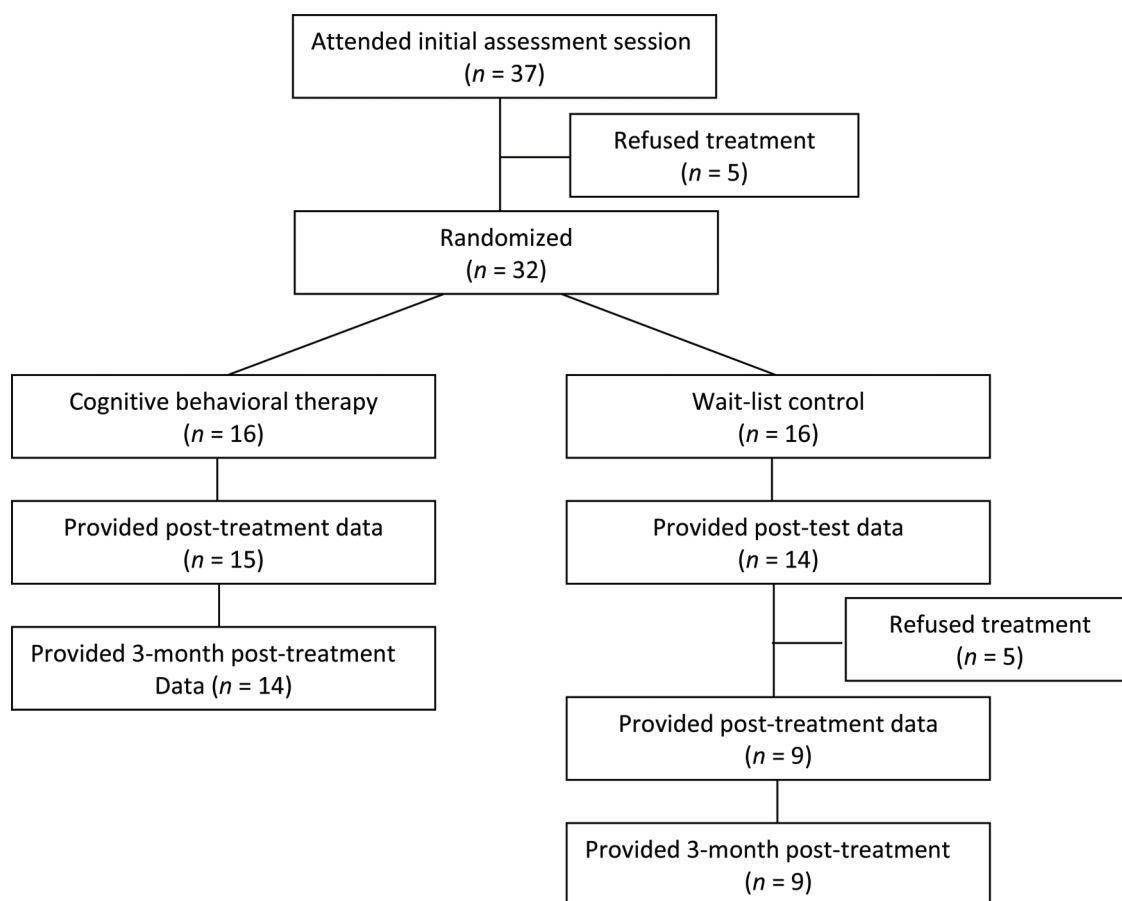


Figure 1. Participant Attrition through the Stages of the Study

Analyses

Pre-Treatment Group Differences. A series of independent sample *t*-tests and chi-square tests were conducted to examine pre-treatment differences between the treatment group and wait list comparison group (Table 1). No significant group differences were found on any demographic variables, pre-treatment measure scores, or on the four outcome measures. In terms of gambling-related and treatment-seeking behaviours, no pre-treatment differences were found on previous problem-gambling treatment engagement or current gambling-related treatment goals.

Comparison of Groups on Post-Treatment Outcome Measures. A one-way MANOVA was utilized to examine group differences on post-treatment outcome measures (*DSM-IV-TR* criteria, urge to gamble, number of gambling sessions, and perception of control). Results showed that group had a significant main effect, $F(4, 21) = 2.7, p = .007$, Wilks' $\lambda = 0.53$, partial $\eta^2 = .47$. A series of post hoc univariate analyses were performed to examine the main effect of group on each of the four post-treatment outcome measures. Results showed a significant difference between group means on *DSM-IV-TR* criteria for pathological gambling, $F(1, 24) = 10.384, p = .004$, partial $\eta^2 = .302$; perception of control

Table 1

Pre-treatment characteristics of the treatment and wait list comparison groups (n = 32)

Variable	Group		<i>t</i>	<i>df</i>	χ^2	<i>p</i>
	Treatment (<i>n</i> = 16)	Wait list (<i>n</i> = 16)				
Age (years)	<i>M</i> = 36.69 (<i>SD</i> = 8.01)	<i>M</i> = 31.81 (<i>SD</i> = 5.79)	1.974			.058
Gender % Male	9 (56.25%)	8 (50.00%)		1	.125	.723
Marital status						
% Unmarried/not	7 (43.75%)	5 (31.25%)		1	.533	.465
Common-law						
% Married/Common-law	6 (37.5%)	10 (62.5%)		1	2.00	.157
% Separated/Divorced	3 (18.75%)	1 (6.25%)		1	1.14	.285
Ethnicity						
% Caucasian/White	12 (75%)	11 (68.75%)		1	.155	.694
% African-Canadian/black	0	1 (6.25%)		1	1.03	.310
% Hispanic/Latino	0	2 (12.5%)		1	2.13	.144
% Aboriginal (First Nation or Inuit)	4 (25%)	2 (12.5%)		1	.821	.365
Employment						
% Employed	12 (75%)	12 (75%)		1	1.00	1.00
% Unemployed	4 (25%)	4 (25%)		1	1.00	1.00
% Student	2 (12.5%)	6 (37.5%)		1	2.67	.102
Psychopathology measures						
AUDIT	<i>M</i> = 7.13 (<i>SD</i> = 6.02)	<i>M</i> = 9.56 (<i>SD</i> = 4.56)	1.291	30		.207
SCL-90-R GSI	<i>M</i> = 0.50 (<i>SD</i> = 0.34)	<i>M</i> = 0.46 (<i>SD</i> = 0.27)	.389	28		.701
Personality Research Form						
Desirability	<i>M</i> = 8.04 (<i>SD</i> = 1.73)	<i>M</i> = 9.00 (<i>SD</i> = 2.13)	1.397	30		.173
Infrequency	<i>M</i> = 0.69 (<i>SD</i> = 1.01)	<i>M</i> = 0.31 (<i>SD</i> = 0.48)	1.337	30		.191
Outcome measures						
<i>DSM-IV</i> criteria	<i>M</i> = 6.50 (<i>SD</i> = 1.32)	<i>M</i> = 7.13 (<i>SD</i> = 1.41)	1.297	30		.205
Perception of control	<i>M</i> = 0.94 (<i>SD</i> = 1.29)	<i>M</i> = 0.46 (<i>SD</i> = 0.63)	1.394	30		.174
Desire to gamble	<i>M</i> = 8.56 (<i>SD</i> = 1.31)	<i>M</i> = 8.50 (<i>SD</i> = 1.03)	.150	30		.882
# of gambling sessions	<i>M</i> = 11.53 (<i>SD</i> = 4.00)	<i>M</i> = 11.75 (<i>SD</i> = 5.09)	.135	30		.893
Previous PG tx % Yes	5 (28.75%)	5 (28.75%)		1	1.00	1.00
Current PG tx goal % abstinence	8 (50.00%)	8 (50.00%)		1	1.00	1.00

Note: tx = treatment, PG = problem gambling

over gambling, $F(1, 24) = 12.585, p = .002$, partial $\eta^2 = .344$; and number of sessions gambled, $F(1, 24) = 5.9, p = .023$, partial $\eta^2 = .197$. Despite being in the expected direction, there was no significant difference between groups on desire to gamble, $F(1, 24) = 2.417, p = .133$. These findings indicate that, at post-treatment, the treatment group endorsed significantly fewer *DSM-IV-TR* criteria, had higher levels of perceived control over its gambling, and participated in fewer gambling sessions than the wait list comparison group following the waiting list period. In contrast, neither group significantly differed on its level of desire to gamble. See Table 2 for outcome measure means and standard deviations.

Clinically Significant Change. To examine clinically significant change between groups, post-treatment/post-waiting list end state functioning was examined for the four outcome measures: *DSM-IV-TR* criteria for pathological gambling, perception of control over gambling, desire to gamble, and gambling frequency as measured by the number of gambling sessions participated in over the previous month. Given that the endorsement of five or more *DSM-IV-TR* criteria are needed for a diagnosis of pathological gambling, the criterion score utilized for this variable was less than five. In accordance with Ladouceur et al. (2003), the criterion scores utilized for perception of control over gambling and desire to gamble were set at seven or more and three or less respectively, while the criterion score for gambling frequency was set at gambling abstinence over the previous month. No significant pre-treatment/pre-waiting list differences were found between groups on these variables. At post-treatment/post-waiting list significantly more treatment group participants (93.3%) than wait list comparison group participants (28.6%) met the *DSM-IV-TR* criterion score, Fisher's exact $z, p < .001$. In other words, significantly more wait list comparison group participants met *DSM-IV-TR* criteria for pathological gambling

Table 2

Means and standard deviations of the outcome measures across groups

	Pre-treatment	Post-treatment	3 months post-treatment
Treatment group	($n = 16$)	($n = 15$)	($n = 14$)
<i>DSM-IV-TR</i> criteria	6.5 (1.32)	2.13 (1.96)	1.94 (2.13)
Perception of control	0.94 (1.29)	5.07 (2.19)	5.46 (2.85)
Desire to gamble	8.56 (1.31)	4.47 (2.85)	4.08 (2.36)
# of gambling sessions	11.53 (4.00)	4.43 (4.80)	3.92 (5.13)
Wait list group	($n = 16$)	($n = 14$)	
<i>DSM-IV-TR</i> criteria	7.13 (1.41)	5.14 (2.35)	
Perception of control	0.46 (0.63)	1.85 (2.58)	
Desire to gamble	8.50 (1.03)	6.47 (2.82)	
# of gambling sessions	11.75 (5.09)	10.71 (6.58)	
Both groups combined	($n = 32$)	($n = 24$)	($n = 23$)
<i>DSM-IV-TR</i> criteria	6.81 (1.38)	2.37 (1.98)	1.79 (2.02)
Perception of control	0.69 (1.03)	4.44 (2.47)	4.96 (2.79)
Desire to gamble	8.53 (1.16)	4.76 (2.73)	4.25 (2.45)
# of gambling sessions	11.64 (4.50)	4.87 (4.56)	4.15 (4.34)

at post-waiting list than did treatment group participants at post-treatment. Despite all being in the expected direction, no significant group differences were found for criterion scores on perception of control over gambling (33.3% of treatment group and 7.7% of wait list comparison group met the criterion score), desire to gamble (46.7% of treatment group and 15.4% of wait list comparison group met the criterion score) or gambling frequency (38.5% of treatment group and 7.1% of wait list comparison group met the criterion score).

Treatment Effects at Post-Treatment and Three-Month Follow-Up Periods. Both groups were combined ($n = 24$) to examine the four outcome measures over time (pre-treatment, post-treatment, three-month post-treatment). A series of one-way repeated measure ANOVAs were utilized for these analyses. To help correct for a violation of sphericity, a Greenhouse-Geisser correction was applied for the *DSM-IV-TR* criteria for pathological gambling analysis. Results showed that time had a significant main effect on *DSM-IV-TR* criteria, $F(1.42, 31.16) = 69.28$, $p < .001$, $\eta^2 = .759$; perception of control $F(2, 40) = 46.88$, $p < .001$, $\eta^2 = .701$; desire to gamble, $F(2, 40) = 27.9$, $p < .001$, $\eta^2 = .583$; and number of sessions gambled, $F(2, 38) = 42.37$, $p < .001$, $\eta^2 = .625$. A priori tests using a Bonferroni correction, adjusting alpha levels to 0.0125 (0.05/4), revealed significant differences in all four outcome measures between pre-treatment and post-treatment time periods and between pre-treatment and three-month follow-up time periods. No significant differences were found between post-treatment and three-month follow-up time periods (Table 3). These findings indicate that the number of *DSM-IV-TR* criteria

Table 3

Bonferroni comparisons for change in dependent variables between pre-treatment, post-treatment, and three-month follow-up time periods (n = 24)

Comparisons	Mean Difference in Outcome Measure	Std. Error	95% CI	
			Lower Bound	Upper Bound
Pre-tx vs post-tx				
<i>DSM-IV-TR</i> criteria	4.26**	.441	3.11	5.4
Perception of control	-4.05**	.44	-5.19	-2.9
Desire to gamble	3.67**	.645	1.98	5.35
# of gambling sessions	7.83**	1.294	5.13	10.52
Pre-tx vs 3-month post-tx				
<i>DSM-IV-TR</i> criteria	4.52**	.533	3.14	5.9
Perception of control	-4.71**	.59	-6.26	-3.17
Desire to gamble	4.24**	.547	2.81	5.67
# of gambling sessions	8.42**	1.29	5.72	11.13
Post-tx vs 3-month post-tx				
<i>DSM-IV-TR</i> criteria	.62	.28	-.99	.47
Perception of control	-.67	.54	-.75	2.08
Desire to gamble	.57	.649	-2.27	1.13
# of gambling sessions	.60	.928	-2.54	1.34

Note: ** $p < .001$. tx = treatment

endorsed, the degree in which participants desired to gamble, and the number of sessions gambled significantly decreased from pre-treatment to post-treatment and that these gains were maintained at three-month follow-up. Furthermore, participants' perception of control over gambling significantly increased from pre-treatment to post-treatment, and this was also maintained at three-month follow-up.

Discussion

Efficacy of Group CBT for Problem Internet Gamblers

Overall, the results of the current study, including the large ($\eta^2 > .19$) effect sizes observed, are consistent with previous research demonstrating the efficacy of group CBT for problem gambling (Carlbring, Jonsson, Josephson, & Forsberg, 2010; Dowling, Smith, Thomas, 2007; Ladouceur et al., 2003; Myrseth, Litlerè, Støylen, & Pallesen, 2009). However, unlike previous studies, the aim of the current study was to examine the efficacy of group CBT for problem gamblers who gamble over the Internet. Previous treatment outcome studies have most certainly included problem gambling participants who gamble over the Internet, many of whom likely utilize the Internet for gambling to varying degrees (Wardle et al., 2011). Some may solely gamble on the Internet, others may frequently or rarely gamble on the Internet and also gamble at land-based venues, and others may only gamble at land-based venues. The current study utilized a sample of participants who self-identified as Internet gamblers. Given the characteristics of Internet gambling, such as unlimited access and convenience, the ability to gamble on credit, faster pace of play, a wider range of gambling activities, and an easier means of hiding excessive gambling from others, certain observers have argued that the Internet may make for a more addictive and potentially problematic experience than land-based venues (Gainsbury et al., 2013; Griffiths & Barns, 2008; McCormack et al., 2013). From this perspective, one could argue that problem Internet gambling behaviours may be less responsive to current evidence-based problem gambling treatments. The current study suggests that group CBT is helpful for problem Internet gamblers and this has important clinical implications. For instance, perhaps treatment programs targeting problem gambling should not necessarily distinguish between Internet and land-based gamblers, but include both in the same treatment groups. After all, as previously discussed, most Internet problem gamblers also report gambling at land-based venues in any case. Furthermore, because the theoretical understandings of why certain persons continue to engage in problem gambling behaviours, such as erroneous cognitions pertaining to the concepts of chance and randomness, do not appear to differ between Internet and land-based gamblers; the motivational, cognitive, and behavioural strategies learned in treatment are applied similarly by both land-based and Internet gamblers. Thus, although it is possible that Internet gambling characteristics may make it more problematic, from a clinical perspective, it may be useful to just view the Internet as another means to engage in gambling as opposed to another type that requires a different intervention.

Attrition. Research has shown high attrition rates in problem gambling treatment usually ranging from 30% to 50% (Ladouceur et al., 2001; Melville,

Casey, & Kavanagh, 2007). Treatment studies examining the efficacy of group CBT for problem gambling have shown similar rates at post-treatment and follow-up periods (Carlbring et al., 2010; Dowling et al., 2007; Jiménez-Murcia et al., 2007; Ladouceur et al., 2003; Oei, Raylu, & Casey, 2010). High attrition at post-treatment and follow-up limit the conclusions from the findings of these studies. However, the issue whether to include those participants who do not provide outcome follow-up data is a controversial one. While study participants who drop out may be less likely to realize treatment success, it is also likely too stringent to assume them to be treatment failures (Dowling et al., 2007; Stinchfield & Winters, 2001). That said, intent-to-treat analyses are sometimes utilized in problem gambling treatment research (e.g., Myrseth et al., 2009; Oei et al., 2010). The current study's attrition rates are less than those previously reported as 23 of 24 (95.8%) and 22 of 24 (91.7%) participants who participated in treatment completed post-treatment and three-month post-treatment follow-up measures respectively. High retention rates observed in the current study are likely, at least partially, because of a result of the data collection methods utilized. An e-mail asking participants to complete post-treatment and three-month follow-up measures was sent to participants, along with a link to the measures available on SurveyMonkey. If participants did not complete the online measures within three days they were sent a reminder e-mail. These measures typically took participants between five to ten minutes, with a \$20 gift certificate as incentive for completion. As a result of utilizing e-mail, some participants completed post-treatment and three-month follow-up measures despite not attending the final treatment session or having previously discontinued treatment. E-mail and online questionnaires may have been particularly effective for this group given its apparent comfort level with technology and the Internet. From this perspective, Internet-based interventions may be particularly appealing among problem Internet gamblers. Similar to Internet access providing boundless opportunity for gambling activities, the Internet also provides huge potential as a medium for treatment (Castrén et al., 2013). Previous research has shown Internet-based CBT programs to be effective for problem gambling (Carlbring & Smit, 2008). Furthermore, Internet-based treatments may also help improve treatment retention rates among this population (Gainsbury & Blaszczynski, 2011). Future problem gambling outcome studies may want to utilize similar data collection methods to those utilized in the current study to help improve study retention rates at post-treatment and follow-up time periods. Moreover, research should continue to examine Internet-based treatments for problem gambling, in particular for those persons who gamble over the Internet.

Limitations

In light of the implications of the current study, several limitations emerge that should be acknowledged. First, the small sample size in the current study necessitates replication. Small sample size can contribute to low statistical power, which can, in turn, decrease the likelihood that statistically-significant findings reflect a true effect and may, in fact, contribute to overestimates of effect size (Button et al., 2013). Of the three significant post-treatment outcome group differences found in the

current study (i.e., *DSM-IV-TR* criteria, perception of control, and number of sessions gambled) the observed power for these analyses ranged from .645 to .925. Furthermore, failure to obtain a significant post-treatment group difference on the outcome desire to gamble was likely because of the inadequate power observed (.320) for this analysis. Small sample size also limited the use of multilevel methods within the current study. Second, although all participants in the current study self-identified as Internet gamblers, Internet gambling frequency was not adequately measured. As problem Internet gamblers gamble over the Internet to varying degrees, as well as gamble at land-based gambling venues, also to varying degrees, it is therefore important for future research to measure better the frequency of Internet gambling involvement. Third, gambling-related outcome measures utilized in the current study were limited to problem gambling symptomology, gambling-related cognitions (e.g., perception of control) and gambling frequency (e.g., number of sessions gambled). As Walker et al. (2006) point out, it is also important for problem gambling outcome studies to assess gambling expenditures (e.g., net financial losses) to obtain a more comprehensive picture of change in problem gambling behaviours. Furthermore, these authors outline the importance of measuring both non-specific (e.g., therapeutic alliance) and specific process variables (e.g., gambling-related erroneous beliefs targeted in cognitive therapy) to examine therapeutic mechanisms of change. Future research should utilize such measures to help better understand factors associated with positive therapeutic change within this population. Fourth, post-treatment follow-up periods in the current study were limited to three-months. Previous treatment outcome studies examining the efficacy of problem gambling treatments have employed follow-up periods ranging from no follow-up to 24 months post-treatment. Given the episodic nature of problem gambling behaviours, longer follow-up periods are particularly useful in this population (López Viets & Miller, 1997). However, historically, problem gambling treatment studies have typically suffered from high attrition rates at follow-up time periods, particularly those of a longer duration. A particular strength of the current study is the low attrition rates observed at post-treatment and three-month follow-up time periods. Future studies should look to replicate these findings utilizing longer-term follow-up. Fifth, the utilization of a wait list comparison group without multiple treatment groups brings with it several disadvantages. Because participants assigned to the wait list knew they were not actively receiving treatment during the waiting period no placebo effect for this group is possible. In contrast, certain participants assigned to the treatment group may, in fact, have simply benefited from an expectation that treatment would help them reduce their respective problem gambling behaviours. Furthermore, because of the ethical concerns with assigning problem gambling participants to a wait list for an extended period of time, there was no wait list comparison group at three-month follow-up in the current study. As a result, improvements in outcome measures at three-months post-treatment could not be definitively attributed to the treatment provided. A next step in problem Internet gambling treatment outcome research is to assign participants to multiple treatment groups to help control for placebo effects. This step should take place so that between group comparisons on outcome measures can be made at post-treatment follow-up periods. Sixth, participants were assigned sequentially to either the

treatment or wait list group based on the order in which they entered the study. As a result, upon entry into the study, the researchers knew to which group participants would be assigned. This fact was a potential threat to the internal validity of the study. Lastly, only one therapist was utilized in this study. As a result, it cannot be determined to what degree therapist characteristics such as age, gender, clinical competency and clinical experience may have contributed to treatment outcomes. It is important that future research examine such factors on treatment outcome among this population.

Overall, the current study was the first to have examined treatment for problem gambling utilizing a sample made up entirely of participants who gamble over the Internet. Findings provide preliminary support for the efficacy of group CBT for problem gamblers who gamble over the Internet.

References

- Allen, J. P., Litten, R. Z., Fertig, J. B., & Barbor, T. (1997). A review of research on the Alcohol Use Disorders Identification Test (AUDIT). *Alcoholism: Clinical and Experimental Research*, 21, 613–619. doi:10.1111/j.1530-0277.1997.tb03811.x
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Braun, B., Ludwig, M., Slecza, P., Bühringer, G., & Kraus, L. (2014). Gamblers seeking treatment: Who does and who doesn't? *Journal of Behavioral Addictions*, 3, 189–198. doi:10.1556/JBA.3.2014.3.7
- Button, K. S., Ioannidis, J. P., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S., & Munafò, M. R. (2013). Power failure: Why small sample size undermines the reliability of neuroscience. *Nature Reviews Neuroscience*, 14, 365–376. doi:10.1038/nrn3475
- Carlbring, P., Jonsson, J., Josephson, H. & Forsberg, L. (2010). Motivational interviewing versus cognitive behavioural group therapy in the treatment of problem and pathological gambling: A randomized controlled trial. *Cognitive Behaviour Therapy*, 39, 92–103. doi:10.1080/16506070903190245
- Carlbring, P., & Smit, F. (2008). Randomized trial of internet-delivered self-help with telephone support for pathological gamblers. *Journal of Consulting and Clinical Psychology*, 76, 1090–1094. doi:10.1037/a0013603
- Castrén, S., Pankakoski, M., Tamminen, M., Lipsanen, J., Ladouceur, R., & Lahti, T. (2013). Internet-based CBT intervention for gamblers in Finland: Experiences

from the field. *Scandinavian Journal of Psychology*, 54, 230–235. doi:10.1111/sjop.12034

Derogatis, L. R., & Unger, R. (2010). Symptom Checklist-90-Revised. In I. B. Weiner & W. E. Craighead (Eds.), *The Corsini Encyclopaedia of Psychology* (Vol. 4, pp. 1743–1744). Hoboken, NJ: John Wiley and Sons.

Dowling, N. Smith, D., & Thomas, T. (2007). A comparison of individual and group cognitive-behavioural treatment for female pathological gambling. *Behaviour Research and Therapy*, 45, 2192–2202. doi:10.1016/j.brat.2006.11.003

Ferris, J., & Wynne, W. (2001). *The Canadian Problem Gambling Index: Final report*. Ottawa, ON: Canadian Centre on Substance Abuse.

Gainsbury, S., & Blaszczynski, A. (2011). A systematic review of Internet-based therapy for the treatment of addictions. *Clinical Psychology Review*, 31, 490–498. doi:10.1016/j.cpr.2010.11.007

Gainsbury, S., Parke, J., & Suhonen, N. (2013). Consumer attitudes towards Internet gambling: Perceptions of responsible gambling policies, consumer protection, and regulation of online gambling sites. *Computers in Human Behavior*, 29, 235–245. doi:10.1016/j.chb.2012.08.010

Gainsbury, S. M., Russell, A., Hing, N., Wood, R., & Blaszczynski, A. (2013). The impact of Internet gambling on gambling problems: A comparison of moderate-risk and problem Internet and non-Internet gamblers. *Psychology of Addictive Behaviors*, 27, 1092–1101. doi:10.1037/a0031475

Gainsbury, S., Wood, R., Russell, A., Hing, N., & Blaszczynski, A. (2012). A digital revolution: Comparison of demographic profiles, attitudes and gambling behavior of Internet and non-Internet gamblers. *Computers in Human Behavior*, 28, 1388–1398. doi:10.1016/j.chb.2012.02.024

Gooding, P., & Tarrier, N. (2009). A systematic review and meta-analysis of cognitive-behavioural interventions to reduce problem gambling: Hedging our bets?. *Behaviour Research and Therapy*, 47, 592–607. doi:10.1016/j.brat.2009.04.002

Griffiths, M., & Barnes, A. (2008). Internet gambling: An online empirical study among student gamblers. *International Journal of Mental Health Addiction*, 6, 194–204. doi:10.1007/s11469-077-9083-7

Griffiths, M., Wardle, H., Orford, J., Sproston, K., & Erens, B. (2009). Sociodemographic correlates of internet gambling: Findings from the 2007 British Gambling Prevalence Survey. *CyberPsychology and Behavior*, 12, 199–202. doi:10.1089/cpb.2008.0196

Griffiths, M. (2001). Internet gambling: Preliminary results of the first U.K. prevalence study. *Journal of Gambling Issues*, 5. Retrieved from: <http://jgi.camh.net/doi/full/10.4309/jgi.2001.5.8>

Hing, N., Cherney, L., Gainsbury, S. M., Lubman, D. I., Wood, R. T., & Blaszczynski, A. (2014). Maintaining and losing control during internet gambling: A qualitative study of gamblers' experiences. *New Media and Society*. doi:1461444814521140

Jackson, D. N. (1967). *Personality Research Form manual* (3rd ed.). Goshen, NY: Research Psychologists Press.

Jiménez-Murcia, S., Álvarez-Moya, E. A., Granero, R., Aymami, M. N., Gómez-Peña, M., Jaurrieta, N., ... & Vallejo, J. (2007). Cognitive-behavioral group treatment for pathological gambling: Analysis of effectiveness and predictors of therapy outcome. *Psychotherapy Research*, 17, 544–552. doi:10.1080/105003300601158822

Ladouceur, R., & Lachance, S. (2007). *Overcoming pathological gambling: Therapist guide*. New York: Oxford.

Ladouceur, R., Sylvain, C., Boutin, C., Lachance, S., Doucet, C., Leblond, J., & Jacques, C. (2001). Cognitive treatment of pathological gambling. *Nervous and Mental Disease*, 189, 774–780. doi:0022-3018/01/18911-774

Ladouceur, R., Sylvain, C., Boutin, C., Lachance, S., Doucet, C., & Leblond, J. (2003). Group therapy for pathological gamblers: A cognitive approach. *Behaviour Research and Therapy*, 41, 587–596. doi:10.1016/S0005-7967(02)00036-0

López Viets, V. C., & Miller, W. R. (1997). Treatment approaches for pathological gamblers. *Clinical Psychology Review*, 17, 689–702. doi:10.1016/S0272-7358(97)00031-7

MacNeil, B. M., & Holden, R. R. (2006). Psychopathy and the detection of faking on self-report inventories of personality. *Personality and Individual Differences*, 41, 641–651. doi:10.1016/j.paid.2006.03.004

McCormack, A., Shorter, G. W., & Griffiths, M. D. (2013). An examination of participation in online gambling activities and the relationship with problem gambling. *Journal of Behavioral Addictions*, 2, 31–41. doi:10.1556/JBA.2.2013.1.5

Melville, K. M., Casey, L. M., & Kavanagh, D. J. (2007). Psychological treatment dropout among pathological gamblers. *Clinical Psychology Review*, 27, 944–958. doi:10.1016/j.cpr.2007.02.004

Myrseth, H., Litlerè, I, Støylen, I. J., & Pallesen, S. (2009). A controlled study of the effect of cognitive-behavioural group therapy for pathological gamblers. *Norwegian Journal of Psychiatry*, 63, 22–31. doi:10.1080/08039480802055139

Oei, T. P. S., Raylu, N., & Casey, L. M. (2010). Effectiveness of group and individual formats of a combined motivational interviewing and cognitive behavioural treatment program for problem gambling: A randomized controlled trial. *Behavioural and Cognitive Psychotherapy*, 38, 233–238. doi:10.1017/S1352465809990701

Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption: Part II. *Addiction*, 88, 791–804. doi:10.1111/j.1360-0443.1993.tb02093.x

Shen, Y., Kairouz, S., Nadeau, L., & Robillard, C. (2015). Comparing problem gamblers with moderate-risk gamblers in a sample of university students. *Journal of Behavioral Addictions*, 4, 53–9. doi:10.1556/2006.4.2015.002

Stinchfield, R., & Winters, K. C. (2001). Outcome of Minnesota's gambling treatment programs. *Journal of Gambling Studies*, 17, 217–245. doi:10.1023/A:1012268322509

Sylvain, C., Ladouceur, R., & Boisvert, J. M. (1997). Cognitive and behavioral treatment of pathological gambling: A controlled study. *Consulting and Clinical Psychology*, 65, 727–732. doi:0022-006X/97/3.00

Walker, M., Toneatto, T., Potenza, M. N., Petry, N., Ladouceur, R., Hodgins, D. C., & Blaszczynski, A. (2006). A framework for reporting outcomes in problem gambling treatment research: The Banff, Alberta Consensus. *Addiction*, 101, 504–511.

Wardle, H., Moody, A., Griffiths, M., Orford, J., & Volberg, R. (2011). Defining the online gambler and patterns of behaviour integration: Evidence from the British Gambling Prevalence Survey 2010. *International Gambling Studies*, 11, 339–356. doi:10.1080/14459795.2011.628684

Wood, R., Williams, R., & Parke, J. (2012). The relationship between Internet gambling and problem gambling. In R. J. Williams, R. T. Wood, & J. Parke (Eds.). *The Routledge International Handbook of Internet Gambling* (pp. 200–211). London: Routledge.

Wood, R. T., & Williams, R. J. (2011). A comparative profile of the Internet gambler: Demographic characteristics, game-play patterns, and problem gambling status. *New Media and Society*, 13, 1123–1141. doi:10.1177/1461444810397650

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The Efficacy of Individual Community Reinforcement and Family Training (CRAFT) for Concerned Significant Others of Problem Gamblers

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Abstract

Treatment options for concerned significant others (CSOs) of problem gamblers are limited, and available treatments focus exclusively on the distress of CSOs. Community Reinforcement and Family Training (CRAFT) is a comprehensive treatment program for CSOs of substance abusers that has been shown to reduce CSO distress in addition to the substance abuser's alcohol or drug behaviour. CRAFT capitalizes on the well-documented fact that family members have considerable influence on the substance abuser's decision to enter treatment. The present study modified the CRAFT approach into an individual treatment format for CSOs of problem gamblers and examined its efficacy in comparison to a CRAFT self-help workbook in a randomized clinical trial. A total of 31 participants were recruited. No statistical differences were found between the groups; however, effect sizes indicated that participants who received the CRAFT individual intervention seemed to have better outcomes than did those who received the CRAFT workbook (decreased days and dollars gambled by the gambler and improved CSO functioning). No differences between groups were found for gambler treatment entry rates over the follow-up period in terms of effect sizes. The results provide initial, but limited, support for the CRAFT approach delivered to CSOs of treatment-resistant problem gamblers in an individual treatment format compared with the self-help workbook format. Further research with larger sample sizes is needed to gauge the efficacy of the CRAFT individual intervention compared with the CRAFT self-help workbook.

Keywords: problem gambling, disordered gambling, significant other, treatment, CRAFT

Résumé

Les options de thérapie offertes aux proches concernés (PC) d'une personne ayant un problème de jeu sont peu nombreuses et concernent exclusivement la détresse qu'ils éprouvent. L'approche Community Reinforcement and Family Training (CRAFT)

est un programme de traitement complet et éprouvé destiné aux PC d'une personne ayant un problème d'alcool ou de drogue qui permet d'atténuer la détresse des PC tout en diminuant les comportements de consommation de la personne souffrant d'une dépendance à l'alcool ou à la drogue. L'approche CRAFT mise sur le fait bien documenté que les membres de la famille exercent une influence considérable sur la décision d'une personne aux prises avec un problème de drogue ou d'alcool d'entreprendre une thérapie. Dans le cadre de la présente étude, l'approche CRAFT a d'abord été modifiée de manière à en tirer un format individuel de thérapie pour les PC d'une personne ayant un problème de jeu, puis au moyen d'un essai clinique randomisé l'efficacité de ce format individuel a été comparée à celle d'un manuel de traitement autonome reposant aussi sur l'approche CRAFT. Au total, 31 participants ont été recrutés pour l'étude. Aucune différence statistique n'a été observée entre les groupes, bien que l'ampleur de l'effet indique que la thérapie semble avoir donné de meilleurs résultats chez les participants ayant reçu une intervention individuelle que chez ceux qui ont reçu le manuel de traitement autonome (diminution de la fréquence en jour des comportements associés au jeu de la personne ayant un problème de jeu et des sommes dépensées par celle-ci, et amélioration de la capacité à fonctionner des PC). Aucune différence entre les groupes n'a été constatée quant au taux de joueurs ayant entrepris une thérapie durant la période de suivi. Ainsi, bien qu'ils soient limités, les résultats de l'étude tendent à démontrer que l'approche CRAFT est plus efficace pour traiter les CP d'une personne ayant un problème de jeu réfractaire au traitement lorsqu'elle prend la forme d'une thérapie individuelle que la forme d'un manuel de traitement autonome. De plus amples recherches portant sur des échantillons plus importants sont cependant nécessaires afin de mieux évaluer l'efficacité d'une intervention individuelle par rapport à un manuel de traitement autonome en ce qui a trait à l'approche CRAFT.

Introduction

Gambling disorder, classified as an addictive disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association [APA], 2013), is defined as “persistent and recurrent maladaptive gambling behaviour that disrupts personal, family or vocational pursuits” (p. 585). The negative consequences incurred from gambling are estimated to affect eight to 10 individuals in the gambler's life (Lobsinger & Beckett, 1996) and have been reported to affect as many as 15 (Lesieur & Custer, 1984). Concerned significant others (CSOs) of problem gamblers typically include individuals who are close to the problem gambler, such as spouses, common-law partners, children, parents, and siblings. The behaviour of problem gamblers can have a severe impact on all aspects of CSOs' lives, including financial and legal problems, personal distress, and

relationship difficulties (Abbott, Cramer, & Sherrets, 1995; McComb, Lee, & Sprenkle, 2009; Petry, 2005; Shaw, Forbush, Schlinder, Rosenman, & Black, 2007).

CSOs of problem gamblers have not received the research or clinical attention that is warranted, given the distress they experience and their important role in recovery. Family influence is often cited by problem gamblers as an important factor in the ultimate decision to quit or reduce gambling behaviour, as well as to maintain abstinence (Hodgins & el-Guebaly, 2004; Hodgins, Makarchuk, el-Guebaly, & Peden, 2002). Conversely, many CSOs of problem gamblers may unintentionally contribute to the gambling problem, typically through enabling behaviours (e.g., they may join the gambler in gambling activities or provide financial bailouts). Relationship problems have also been cited by problem gamblers as a main reason contributing to relapse (Hodgins et al., 2002).

Another benefit of engaging CSOs in treatment is to access those problem gamblers who are resistant to seeking treatment to possibly influence their recovery initiatives. It has been determined that almost 97% of problem gamblers have never sought formal treatment for their gambling problems (Cunningham, 2005; National Gambling Impact Study Commission, 1999). Moreover, Volberg (1998) and others (e.g., Rush, Moxam, & Urbanoski, 2002) have determined that the majority of problem gamblers are not using treatment services, which leaves the CSOs to face the consequences of the problem gambling behaviour unassisted.

Treatment options for CSOs of problem gamblers are limited. In Calgary, Alberta, options include the following three alternatives: (1) a 12-step Gam-Anon group that meets once a week; (2) a 4-week therapist-directed counselling group intended for CSOs of individuals experiencing problems with alcohol, drugs, or gambling; or (3) a self-help workbook based on the Community Reinforcement and Family Training (CRAFT) approach (Makarchuk & Hodgins, 2001). There is also opportunity for some individuals to seek individual counselling through venues such as their Employee Assistance Program. Of these options, only the self-help workbook has been examined empirically.

The self-help workbook (Makarchuk & Hodgins, 2001) is based on CRAFT, an intervention first developed for use with CSOs of treatment-resistant alcoholics (Sisson & Azrin, 1986). The original approach was implemented as a face-to-face intervention delivered in approximately eight sessions. The principles of CRAFT are derived from the Community Reinforcement Approach, which espouses elements of the family system perspective and is grounded in Skinner's behaviour theory (Azrin, 1976). The developers of CRAFT assert that its unique components are the inclusion of the functional analyses of behaviours, the use of positive reinforcers and time outs from positive reinforcers, and the emphasis on the CSO's personal well-being (Smith & Meyers, 2004). The CSOs of problem gamblers learn behavioural skills of reinforcing gambling-free behaviours and withholding reinforcement for gambling behaviours. Avoiding negative reinforcement is also encouraged. For example, family members often enable the gambling behaviour by removing natural consequences that may

act as deterrents to gambling (e.g., paying bills for gamblers). CSOs are taught to let natural consequences occur and how to influence environmental contingencies in order to provide reinforcement for decreased gambling and to withhold reinforcement for gambling. The CRAFT intervention also includes motivational techniques, communication training, and domestic violence precautions (Smith & Meyers, 2004).

CRAFT was revised into a self-help format for CSOs of problem gamblers, which was successfully pilot tested (Makarchuk, Hodgins & Peden, 2002) and also used in a large randomized controlled trial (Hodgins, Toneatto, Makarchuk, Skinner & Vincent, 2007). In both studies, the CSOs who received the CRAFT materials fared better than did the CSOs in the control group, reporting decreased gambling by the problem gambler and more satisfaction with the intervention. However, the groups were equivalent for CSO emotional functioning and relationship functioning, as well as for treatment engagement rates of gamblers. An important finding was that many CSOs reported the need for more support in implementing the strategies and procedures, and the authors concluded that CRAFT delivered in its original format (i.e., individual face-to-face) may increase the efficacy of this approach (Hodgins, Toneatto, et al., 2007).

Given that CRAFT has demonstrated some positive results in a self-help format, we adapted this approach for use with CSOs of problem gamblers in an individual format. We modified the original CRAFT protocol for CSOs of substance abusers for use with CSOs of problem gamblers and tested it in a randomized clinical trial. The primary hypotheses were as follows: (1) Participants who received the CRAFT individual intervention would report higher rates of gambler treatment entry than would participants in the workbook group; (2) participants who received the CRAFT individual intervention would report less gambling by the gambler than would participants in the workbook group; and (3a) participants who received the CRAFT individual intervention would report lower levels of personal distress and (3b) better relationship functioning with the gambler than would participants in the workbook group.

Method

Procedure

This study received ethics approval from the Conjoint Faculties Research Ethics Board. The initial step in this study involved the development of the therapist treatment manual and client handouts, which were designed specifically for use with CSOs of problem gamblers. The CRAFT approach for CSOs of problem gamblers was developed by closely following the original CRAFT protocol for CSOs of substance users (Smith & Meyers, 2004) and included information from the materials that were developed for the self-help workbook for CSOs of problem gamblers (Makarchuk & Hodgins, 2001). After the therapist treatment manual was developed, a treatment integrity checklist for evaluating therapist adherence to the CRAFT protocol was created. Each therapist completed a 6-hour training session on the

CRAFT approach for CSOs of problem gamblers, including a detailed review of the problem gambling therapist manual. Supervision for the CRAFT intervention was provided on a weekly basis by a cognitive-behavioural clinical psychologist, who reviewed tape-recorded sessions and provided feedback. Therapists met biweekly to discuss client cases and brainstorm ideas of how best to implement procedures.

Participants were screened over the telephone to meet the following inclusion criteria: the CSO and the gambler must be 18 years or older; the CSO has a minimum of 3 days a week of contact with the gambler; the CSO is a close relative or partner of the gambler; the gambler is resistant to the suggestion for treatment; the gambler meets the criteria for problem gambling, as reported by the CSO, on the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; APA, 2000) diagnostic criteria for pathological gambling; the CSO reads at a minimum sixth-grade reading level (self-reported); the CSO completes the initial face-to-face and follow-up interviews via the telephone; and the CSO provides the name of a close relative or friend to help locate CSO for post-assessment interviews. Gamblers or CSOs that attended treatment for gambling-related problems in the 2 months prior to screening were excluded.

Participants

Thirty-one CSOs of problem gamblers were recruited over a 17-month period through press releases; paid and unpaid media advertisements (including online sites); local counselling services (including the provincial gambling helpline, pamphlets, and posters); other referral agencies (e.g., Employee Assistance Program therapists); and pamphlets or posters posted in community centres, bars, supermarkets, legions, and churches.

An urn randomization computer program (http://www.commed.uchc.edu/programs/health_services/match/urn/index.html) was used to ensure that an equal number of participants was assigned to each group (individual intervention or the workbook) while stratifying the sample on three variables: gender, relationship to gambler (spouse/non-spouse), and severity of gambling problem (categorized as “high” if number of *DSM-IV-TR* criteria for pathological gambling met was seven or greater and “low” if six or lower).

Self-help workbook group. Participants in this group received the CRAFT self-help workbook (Makarchuk & Hodgins, 2001) following the initial interview. The research assistant provided a brief history on the success of the self-help workbook, and participants were instructed to read through the workbook and complete the exercises on a weekly basis.

Individual intervention group. A research assistant provided participants with the same brief history on the success of the self-help workbook for problem gamblers and they were informed that a therapist would help them work through exercises in individual sessions. Participants in the individual intervention group participated in

eight to twelve 1-hour sessions in which the CRAFT approach was delivered by one of four Masters-level therapists.

Follow-up Interviews

The 3-month and 6-month follow-up interviews were conducted over the telephone by a research assistant who was blind to the treatment condition. A second researcher compiled the follow-up package, which was organized to ensure that the treatment condition was revealed at the end of the interview and the appropriate measures were given.

Measures

Screening.

Concerned Significant Others of Gamblers DSM-IV Screening Questionnaire (Makarchuk *et al.*, 2002). Diagnostically, the number of *DSM-IV* (APA, 1994) symptoms exhibited by the gambler, as reported by the CSO, was calculated by using the Concerned Significant Others of Gamblers DSM-IV Screening Questionnaire. This questionnaire was used at screening to ensure that the gambler was experiencing gambling problems to a significant degree, as reported by the CSO. A significant degree of gambling problems was defined as 4 or more on this scale, indicating that “probable pathological gambling” is likely.

Gambling behaviours and consequences.

Timeline Followback (Sobell & Sobell, 1992). The Timeline Followback method was first developed as an instrument to aid retrospective recall of alcohol consumption and has been modified for use with problem gamblers (Hodgins & Makarchuk, 2003; Weinstock, Whelan, & Meyers, 2004). Examination of CSO and gambler reports of gambling information demonstrates agreement in the “fair” to “good” range (Hodgins & Makarchuk, 2003). Research assistants used this method to aid the CSO in reconstructing the gambling behaviour (frequency in days gambled and dollar amount spent for each type of problem gambling) in the 2 months prior to the initial assessment. Participants provided a rating of how confident they were in the accuracy of gambling information that they reported (not at all, slightly, moderately, extremely). Past treatment involvement of the gambler and treatment sought over the follow-up period was recorded, including type (self-help, informal, and formal treatments) and frequency of treatment.

CSO psychological functioning.

Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI is a 53-item self-report questionnaire that reflects psychological symptoms experienced in the past week. The items are rated on a 5-point Likert scale and yield a Global Severity Index that reflects a general level of distress and has shown excellent test-retest reliability across time. This measure is sensitive to change and has good internal consistency (alpha coefficients ranging from .71 to .85).

Relationship functioning.

Relationship Happiness Scale (RHS; Azrin, Naster, & Jones, 1973). RHS was used to assess current relationship happiness between the gambler and the CSO. Areas of interaction are rated on a scale from 1 (*completely unhappy*) to 10 (*completely happy*). A study of CSOs of problem gamblers reported high retest reliability (intraclass correlation coefficient [ICC] = .77) and demonstrated sensitivity to change (Hodgins, Shead, & Makarchuk, 2007).

Relationship Assessment Scale (RAS; Hendrick, 1988). Four items from the seven-item RAS were used; the three items not included pertained to romantic relationships only. Concurrent validity, predictive validity, and internal consistency are all well established for this instrument. The coefficient alpha for these four questions in a sample of CSOs of problem gamblers was found to be .85 and retest reliability (ICC) to be .86 (Hodgins, Shead, & Makarchuk, 2007).

Satisfaction questions about the program. All participants were questioned regarding (1) satisfaction with the program (quite dissatisfied, indifferent or mildly satisfied, mostly satisfied, very satisfied), (2) the extent to which the program met their needs (none, only a few, most, almost all), and (3) whether they would recommend the program to a friend in need of similar help (definitely not, not really, generally, definitely).

Data Analyses

All data analyses were conducted with PASW Statistics 17 for Windows. Preliminary analysis included screening for accuracy of input, missing data, outliers, and normal distributions, which included examination of profile plots and skewness and kurtosis (Tabachnick & Fidell, 2001). The two groups were compared across all initial assessment variables by using chi-square analysis for categorical measures and *t* tests for continuous measures. The main statistical procedure for all outcome variables compared group differences over the follow-up period by using the generalized linear model with a repeated measures 2×2 analysis of covariance, with one between group factor (group = workbook vs. individual intervention) and one repeated measures factor (time = 3 months, 6 months), with the initial measure entered as a covariate.

Given the small sample size in this study and thus low power, effect sizes with confidence intervals were calculated as a gauge of clinical significance (APA, 2000; Baer & Ahern, 1993; Odgaard & Fowler, 2010; Steiger, 2004). Many researchers have used effect sizes in treatment research to help interpret the magnitude of differences between groups (e.g., Baer & Ahern, 1993, p. 356; O'Farrell, Murphy, Alter, & Fals-Stewart, 2007). Cohen (1988) suggests the following benchmarks for interpretation of effect sizes: $d = 0.8$ or higher is considered a large effect size, $d = 0.5$ is a medium effect, and $d = 0.2$ is a small, but consequential, effect. A Bonferroni correction was used for each hypothesis (i.e., $p < .05$ for Hypothesis 1; $p < .025$ for Hypothesis 2; and $p < .006$ for Hypothesis 3.)

Results

Group Comparison

The two groups were compared across all initial assessment variables. Table 1 shows that the groups did not significantly differ on any of the stratification variables used in the randomization procedure (gender, spouse/non-spouse, *DSM-IV-TR* criteria high/low) or across any of the initial assessment variables. However, several differences seem of prognostic importance, as they may not have been statistically significant because of the small sample size (Altman, 1985). BSI scores were higher in the individual intervention group than in the workbook group. Participants in the individual intervention group also seemed to be dealing with the gambling problem for a longer period (12 vs. 9 years), although this was not statistically significant.

Follow-up Rates

Figure 1 displays a CONSORT flow diagram that depicts enrolment, group allocation, follow-up rates, and total sample used in the analysis. Twenty-one participants (68%) completed all three assessment interviews. Follow-up rates did not differ significantly between the individual intervention and workbook groups for the 3-month follow-up, $\chi^2(1) = .11, p = .54$ (mean 75% vs. 80%, respectively) or the 6-month follow-up, $\chi^2(1) = .011, p = .62$ (mean = 75% vs. 73%, respectively). Overall, by the completion of the interview, the research assistants remained blind in 29% of cases at the 3-month follow-up and 60% of cases at the 6-month follow-up.

We compared the participants who completed the 3- and 6-month follow-up interviews with those who did not complete these interviews by using chi-square analysis for categorical measures and *t* tests for continuous measures. Results are presented in Table 2.

Individual Intervention Group

Treatment integrity was measured with the CRAFT adherence checklist developed for this study. For each therapist, a random group of participants was selected to assess treatment adherence to the CRAFT protocol by using the checklist. Two volunteer research assistants rated all of the individual intervention sessions conducted for seven participants. The agreement between the raters was ranked as high ($ICC = .737, p = .013$, confidence interval [.126, .948]). Therapist adherence to the CRAFT protocol was rated by both raters at an average of 89% ($SD_{\text{Rater1}} = 7.36$; $SD_{\text{Rater2}} = 4.72$; range 84%-98%), with no obvious differences among therapists.

The 16 participants completed a mean of 10.4 sessions ($SD = 2.4$, range 4-12). Despite encouragement from therapists to complete therapy, two participants dropped out of the individual intervention prior to completion because they left the relationship with the gambler (one participant completed four sessions and the other completed six sessions). Both participants provided information at the 3- and

Table 1
Comparison of Each Group for Demographics and Initial Assessment Variables

Characteristics	Individual intervention (<i>N</i> = 16)	Workbook (<i>N</i> = 15)	Statistical comparison, χ^2 or <i>t</i>
CSO characteristics			
Female, <i>n</i> (%)	14 (93%)	14 (88%)	χ^2 (1) = .301, <i>p</i> = .58
Age, mean years (<i>SD</i>)	47 (12.8)	46 (12.9)	<i>t</i> (29) = -.34, <i>p</i> = .73
Marital status, <i>n</i> (%)			χ^2 (5) = 6.44, <i>p</i> = .27
Married	8 (50%)	8 (53%)	
Common law	2 (13%)	4 (27%)	
Separated	1 (6%)	0	
Divorced	0	2 (13%)	
Never married	4 (25%)	1 (6%)	
Widowed	1 (6%)	0	
Number of children, mean (<i>SD</i>)	2.3 (1.6)	1.7 (1.4)	<i>t</i> (29) = -.95, <i>p</i> = .35
Cultural group, <i>n</i> (%)			χ^2 (4) = 5.13, <i>p</i> = .28
Canadian	14 (88%)	12 (80%)	
Italian	0	2 (13%)	
German	1 (6%)	0	
Hungarian	1 (6%)	0	
Chinese	0	1 (6%)	
Highest grade completed, mean (<i>SD</i>)	11.6 (1.0)	11.7 (1.0)	<i>t</i> (29) = .112, <i>p</i> = .91
Higher education, <i>n</i> (%)	4 (25%)	9 (60%)	χ^2 (1) = 3.89, <i>p</i> = .07
Employed (full or part-time), <i>n</i> (%)	14 (93%)	16 (100%)	χ^2 (1) = 1.10, <i>p</i> = .29
CSO relationship to gambler, <i>n</i> (%)			χ^2 (5) = .70, <i>p</i> = .95
Married spouse	7 (44%)	7 (47%)	
Common-law partner	3 (18%)	2 (13%)	
Parent	2 (13%)	2 (13%)	
Child	2 (13%)	3 (20%)	
Boy/girlfriend	1 (6%)	1 (7%)	
Separated spouse	1 (6%)	0	
History of treatment for their significant other's gambling problem, <i>n</i> (%)	2 (13%)	5 (33%)	χ^2 (1) = 1.92, <i>p</i> = .22
BSI (GSI score), mean (<i>SD</i>)	51.4 (39.1)	43.5 (24.7)	<i>t</i> (29) = -.65, <i>p</i> = .52
Relationship Happiness Scale, mean (<i>SD</i>)	4.5 (2.8)	3.9 (1.6)	<i>t</i> (29) = -.77, <i>p</i> = .45
Relationship Assessment Scale, Mean (<i>SD</i>)	9.6 (4.5)	8.5 (2.8)	<i>t</i> (29) = -.81, <i>p</i> = .42
Gambler Characteristics			
DSM-IV-TR criteria, mean/10 (<i>SD</i>)	8.1 (1.2)	8.0 (1.9)	<i>t</i> (29) = -.22, <i>p</i> = .82
Length of gambling problem, mean years (<i>SD</i>)	12.3 (11.7)	9.0 (7.6)	<i>t</i> (29) = -.94, <i>p</i> = .36
History of treatment for gambling problem, <i>n</i> (%)	6 (38%)	7 (47%)	χ^2 (1) = .27, <i>p</i> = .72
Days gambled in past 2 months, mean (<i>SD</i>)	10 (10.3)	8 (7.8)	<i>t</i> (29) = -.59, <i>p</i> = .55
Money gambled in past 2 months, mean (<i>SD</i>)	-\$1794 (1731)	-\$1539 (1387)	<i>t</i> (29) = .45, <i>p</i> = .66

Table 1
Continued

Characteristics	Individual intervention (<i>N</i> = 16)	Workbook (<i>N</i> = 15)	Statistical comparison, χ^2 or <i>t</i>
Type of gambling problem, <i>n</i> (%)			
VLTs/slots	15 (94%)	10 (67%)	χ^2 (1) = 3.64, <i>p</i> = .08
Casino games	6 (38%)	7 (47%)	χ^2 (1) = .27, <i>p</i> = .72
Sports betting	7 (44%)	4 (27%)	χ^2 (1) = .99, <i>p</i> = .46
Card games with friends	4 (25%)	3 (20%)	χ^2 (1) = .11, <i>p</i> = 1.0
Bingo	3 (18%)	0	χ^2 (1) = 3.11, <i>p</i> = .23
Lotto/raffle/Nevada/scratch tickets/keno	3 (18%)	5 (31%)	χ^2 (1) = .51, <i>p</i> = .69
Online gambling	1 (6%)	2 (13%)	χ^2 (1) = .44, <i>p</i> = .60

Note. CSO = concerned significant other; BSI = Brief Symptom Inventory; GST = Global Severity Index; VLTs = video lottery terminals.

6-month follow-ups about whether the gambler entered treatment and the days and dollars gambled over the follow-up period. These participants stated that they did not feel comfortable answering questions on personal or relationship functioning, as they felt it would negatively reflect on the treatment received.

Hypothesis 1: Assessment of treatment entry. We predicted that participants in the individual intervention group would have greater success in engaging the gambler in treatment than would those in the workbook group. The findings do not support the hypothesis: No gamblers entered treatment by the 3-month follow-up, and two gamblers from each group had entered treatment by the 6-month follow-up (17.4%).

Hypothesis 2: Assessment of gambling behaviour. We hypothesized that participants who received the individual intervention would report decreased gambling behaviour by their significant other, reflected by fewer days gambled and dollars gambled over the follow-up period. The analysis of days gambled and dollars gambled excludes those participants who were “not at all” confident (*n* = 5) in their reports of gambling behaviour.

For the variable days gambled, there was no significant time effect, $F(1, 14) = 1.53$, $p = .24$, power = .21; no significant group effect, $F(1, 14) = .14$, $p = .71$, power = .06; and no significant group $\times$ time interaction found, $F(1, 14) = .09$, $p = .91$, power = .05 (means and *SDs* are displayed in Table 3). As seen in Table 3, the magnitude of the difference in days gambled between initial assessment and 6-month follow-up was considered to be small between the groups. The effect sizes over the 6-month follow-up for each group were considered to be medium for the workbook group and large for the individual intervention group.

For dollars gambled, the analysis revealed a significant time effect, $F(1, 13) = 5.35$, $p = .04$, power = .57. No group effect was found, $F(1, 13) = 1.59$, $p = .23$, power = .22,

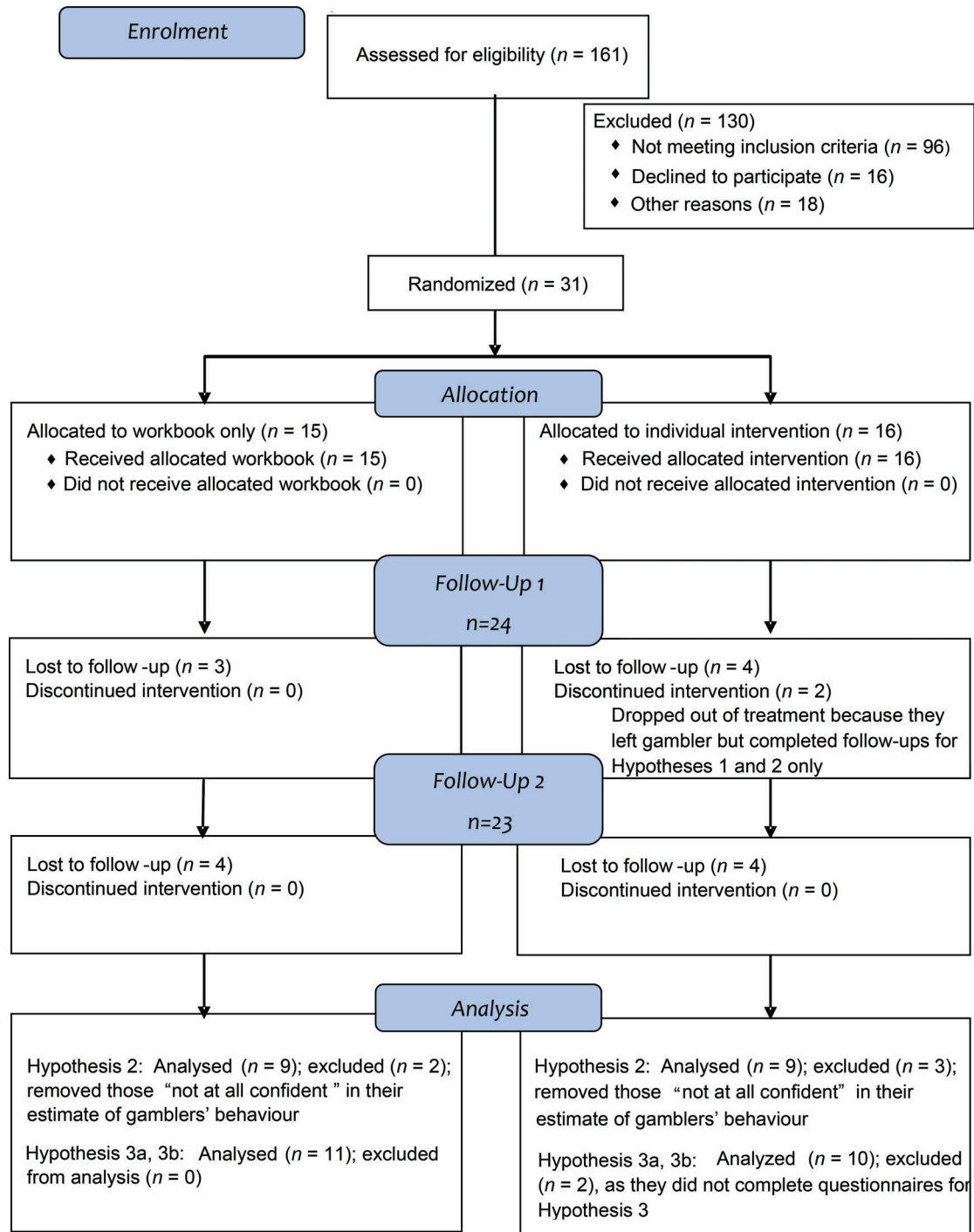


Figure 1. CONSORT flow chart.

and no group $\times$ time interaction was found, $F(1, 13) = .01$, $p = .91$, power = .05. Table 3 displays the covariate-adjusted means for each period. The magnitude of the difference favouring the individual intervention over the workbook group at 6 months approached a medium effect. The magnitude of the difference between the initial

Table 2
Comparison of CSO and Gambler Characteristics and Measured Variables for Those Who Completed Follow-up Interviews and Those Who Did Not

Characteristics	3 Months			6 Months		
	Completed follow-up interview (<i>N</i> = 24)	Did not complete follow-up interview (<i>N</i> = 7)	Statistical comparison χ^2 or <i>t</i>	Completed follow-up interview (<i>N</i> = 23)	Did not complete follow-up interview (<i>N</i> = 8)	Statistical comparison, χ^2 or <i>t</i>
CSO characteristics						
Female, %	88%	100%	χ^2 (1) = .97, <i>p</i> = .45	91%	88%	χ^2 (1) = .10, <i>p</i> = .61
Age, mean (<i>SD</i>)	47 years (10.6)	44 years (18.9)	<i>t</i> (29) = .65, <i>p</i> = .52	46 years (11.0)	47 years (17.5)	<i>t</i> (29) = .16, <i>p</i> = .87
Marital status (married/ common law), %	75%	57%	χ^2 (5) = 5.42, <i>p</i> = .37	70%	75%	χ^2 (5) = 4.19, <i>p</i> = .52
Number of children, mean (<i>SD</i>)	2.2 (1.5)	1.2 (1.3)	<i>t</i> (29) = 1.45, <i>p</i> = .16	2.0 (1.6)	1.9 (1.4)	<i>t</i> (29) = .41, <i>p</i> = .79
Cultural group (Canadian), %	83%	86%	χ^2 (4) = 4.59, <i>p</i> = .33	83%	88%	χ^2 (4) = 4.28, <i>p</i> = .37
Highest grade completed, mean (<i>SD</i>)	10.6 (1.86)	11.7 (.76)	<i>t</i> (29) = 1.49, <i>p</i> = .15	11.7 (1.02)	11.6 (1.06)	<i>t</i> (29) = -.06, <i>p</i> = .96
Higher education, %	46%	29%	χ^2 (1) = .66, <i>p</i> = .67	52%	13%	χ^2 (1) = 3.84, <i>p</i> = .06
Employed (full or part-time), %	96%	100%	χ^2 (1) = .30, <i>p</i> = 1.0	96%	100%	χ^2 (1) = .36, <i>p</i> = .74
CSO relationship to gambler (married/ common law), %	58%	72%	χ^2 (4) = 1.79, <i>p</i> = .78	57%	75%	χ^2 (4) = 7.19, <i>p</i> = .13
	17%	43%	χ^2 (1) = 2.13, <i>p</i> = .17	22%	25%	χ^2 (1) = .04, <i>p</i> = .60

Table 2
Continued

Characteristics	3 Months			6 Months		
	Completed follow-up interview (<i>N</i> = 24)	Did not complete follow-up interview (<i>N</i> = 7)	Statistical comparison χ^2 or <i>t</i>	Completed follow-up interview (<i>N</i> = 23)	Did not complete follow-up interview (<i>N</i> = 8)	Statistical comparison, χ^2 or <i>t</i>
Prior treatment for significant other's gambling problem, %						
BSI, mean (<i>SD</i>)	49.05 (33.57)	40.01 (28.08)	<i>t</i> (29) = .65, <i>p</i> = .52	49.19 (26.23)	40.76 (47.12)	<i>t</i> (29) = .63, <i>p</i> = .53
Relationship Happiness Scale, mean (<i>SD</i>)	4.00 (2.08)	4.86 (2.96)	<i>t</i> (29) = .87, <i>p</i> = .39	4.09 (2.02)	4.50 (3.07)	<i>t</i> (29) = .43, <i>p</i> = .67
Relationship Assessment Scale, mean (<i>SD</i>)	8.67 (3.26)	10.57 (4.99)	<i>t</i> (29) = 1.20, <i>p</i> = .24	8.74 (3.33)	10.13 (4.76)	<i>t</i> (29) = .91, <i>p</i> = .37
Gambler characteristics						
<i>DSM-IV-TR</i> criteria, mean/10 (<i>SD</i>)	8.2 (1.63)	7.7 (1.11)	<i>t</i> (29) = .68, <i>p</i> = .49	8.35 (1.03)	7.25 (2.37)	<i>t</i> (29) = 1.82, <i>p</i> = .08
Length of gambling problem, mean in years (<i>SD</i>)	9.42 (8.80)	15.24 (12.94)	<i>t</i> (29) = 1.38, <i>p</i> = .18	10.41 (9.62)	11.65 (11.50)	<i>t</i> (29) = .30, <i>p</i> = .76
History of treatment for gambling problem, %	42%	43%	χ^2 (1) = .00, <i>p</i> = .64	39%	50%	χ^2 (1) = .29, <i>p</i> = .45
Days gambled in past 2 months, mean (<i>SD</i>)	9.85 (8.78)	7.78 (10.66)	<i>t</i> (29) = -.59, <i>p</i> = .61	9.72 (9.25)	8.44 (9.14)	<i>t</i> (29) = -.34, <i>p</i> = .74
Money gambled in past 2 months, mean amount (<i>SD</i>)	-\$1556 (1420)	-\$2066 (2025)	<i>t</i> (29) = .76, <i>p</i> = .45	-\$1717 (1683)	-\$1539 (1186)	<i>t</i> (29) = .27, <i>p</i> = .79
Type of gambling problem (VLTs/ slots), %	80%	86%	χ^2 (1) = .15, <i>p</i> = .59	83%	75%	χ^2 (1) = .22, <i>p</i> = .49

Note. CSO = concerned significant other; BSI = Brief Symptom Inventory; VLTs = video lottery terminals.

Table 3
Gambling Outcomes by Treatment Group and Effect Size (Cohen's d) for Gambling Outcome Variables Over the 6-Month Follow-up Period for Within Subjects and Between Groups

Gambling behaviour	Initial mean (SD)	3-Month mean (SD)	6-Month mean (SD)	Within subjects effect size ^b , paired samples <i>t</i> test, Cohen's <i>d</i> , CI	Between groups effect size ^b , independent samples <i>t</i> test, Cohen's <i>d</i> , CI
Days gambled					
Workbook (<i>N</i> = 8)	8.25 (9.75)	7.69 (5.97)	5.18 (4.59)	<i>t</i> (7) = 1.75, <i>p</i> = .12, <i>d</i> = 0.62, CI [-.16, 1.36]	<i>t</i> (15) = -.41, <i>p</i> = .69, <i>d</i> = 0.19, CI [< 000, 1.03]
Individual (<i>N</i> = 9)	8.67 (8.90)	6.83 (5.60)	4.36 (4.32)	<i>t</i> (8) = 3.36, <i>p</i> = .01*, <i>d</i> = 1.12, CI [.25, 1.95]	
Dollars gambled					
Workbook (<i>N</i> = 8)	-1568 (1548)	-1496 (1951)	-923 (1392)	<i>t</i> (7) = -.79, <i>p</i> = .45, <i>d</i> = 0.28, CI [.00, .96]	<i>t</i> (14) = .87, <i>p</i> = .39, <i>d</i> = 0.44, CI [-.559, 1.42]
Individual (<i>N</i> = 8) ^a	-1808 (1834)	-943 (1951)	-313 (1392)	<i>t</i> (7) = -2.59, <i>p</i> = .04*, <i>d</i> = 0.92, CI [.00, 1.72]	

Note. CI = confidence interval

^a For dollars gambled, *N* = 8 for the individual intervention group, as one participant would not estimate an amount gambled. ^b All effect sizes are calculated by using the mean difference between initial and 6-month reports.

* Significant at *p* < .05.

estimate of dollars gambled and the 6-month follow-up report was small for the workbook group and large for the individual intervention group.

Hypothesis 3a: Assessment of CSO functioning (BSI). We predicted that participants in the individual intervention group would show greater improvement in personal functioning (i.e., decreased scores on the BSI) compared with those in the workbook group. There was no significant time effect, $F(1, 18) = .01$, $p = .91$, power = .05; group effect, $F(1, 18) = .03$, $p = .87$, power = .05; or group $\times$ time interaction, $F(1, 18) = 1.28$, $p = .27$, power = .19. Means are presented in Table 4. The magnitude of the differences in BSI scores between groups over the 6-month follow-up period was medium. In considering effect sizes over time, both groups revealed medium-to-large effects.

Hypothesis 3b: Assessment of CSO-gambler relationship (RHS, RAS). We predicted that participants in the individual intervention group would report greater improvement in relationship functioning with the gambler than would those in the workbook group. For RHS, no significant time effect was found, $F(1, 18) = 2.04$, $p = .17$, power = .27. The group effect was non-significant, $F(1, 18) = 1.12$, $p = .30$, power = .17, as was the group $\times$ time interaction, $F(1, 18) = .23$, $p = .64$, power = .07. The effect size between the groups was small at 6 months. The individual intervention group demonstrated large effect sizes by 6 months and the workbook group showed medium effects.

For the RAS, no significant effects were found: time effect, $F(1, 18) = .45$, $p = .51$, power = .10; group effect, $F(1, 18) = .05$, $p = .82$, power = .06; or group $\times$ time interaction, $F(1, 18) = .78$, $p = .39$, power = .13 (Table 4). Participants in both groups increased scores, with small effect sizes attained by the workbook group and medium effects by the individual intervention group, with negligible differences between the groups.

Participant Evaluation of the Program

Each participant rated the extent to which the program met their needs, how satisfied they were with the program, and whether they would recommend the program to a friend in need of similar help. As displayed in Table 5, at the 3-month follow-up interview, participants in the individual intervention group were significantly more likely to rate that their needs were met, $\chi^2(3, N = 23) = 11.2$, $p = .011$, and that they would recommend the program, $\chi^2(3, N = 23) = 7.9$, $p = .048$; they were marginally more likely to rate that they were more satisfied with the program, $\chi^2(3, N = 23) = 7.5$, $p = .059$, than were the participants in the workbook group. At the 6-month interview, there was a significant difference between the groups on all three of the measures. Participants in the individual intervention group were more likely to rate that their needs were met, $\chi^2(3, N = 20) = 15.2$, $p = .002$, that they were satisfied with the program, $\chi^2(3, N = 20) = 16.77$, $p = .001$, and that they would recommend the program, $\chi^2(3, N = 21) = 14.3$, $p = .003$.

Table 4
Comparison of Outcome Measures by Treatment Group and Effect Size (Cohen's d) for Gambling Outcome Variables Over the 6-Month Follow-up Period for Within Subjects and Between Groups

Outcome measure	Initial mean (SD)	3-Month Mean (SD)	6-Month mean (SD)	Within subjects effect size ^a , paired samples <i>t</i> test, Cohen's <i>d</i> , CI	Between groups effect size ^a , independent samples <i>t</i> test, Cohen's <i>d</i> , CI
CSO functioning					
Brief Symptom Inventory					
Workbook	44.64 (23.04)	41.16 (26.44)	35.73 (31.60)	$t(10) = 2.38, p = .04^*, d = 0.72, CI [.034, 1.37]$	$t(19) = -.94, p = .36, d = 0.41, CI [-.00, 1.25]$
Individual	54.78 (32.40)	45.63 (27.71)	28.69 (33.21)	$t(9) = 2.49, p = .04^*, d = 0.79, CI [.06, 1.48]$	
Relationship assessment					
Relationship Happiness Scale					
Workbook	4.09 (1.58)	5.11 (1.89)	5.91 (2.49)	$t(10) = -1.99, p = .07, d = 0.60, CI [-.00, 1.22]$	$t(19) = .72, p = .48, d = 0.32, CI [-.55, 1.17]$
Individual	4.20 (2.66)	5.58 (1.90)	7.00 (2.50)	$t(9) = -2.74, p = .02^*, d = 0.87, CI [-.09, 1.57]$	
Relationship Assessment Scale					
Workbook	8.09 (2.59)	10.41 (2.86)	10.38 (4.25)	$t(10) = -1.17, p = .27, d = 0.35, CI [-.00, .94]$	$t(19) = .25, p = .80, d = 0.11, CI [-.75, .97]$
Individual	10.30 (3.53)	9.95 (2.88)	11.48 (4.27)	$t(9) = -1.68, p = .13, d = 0.53, CI [-.00, 1.17]$	

Note. CSO = concerned significant other.

^a All effect sizes are calculated by using the mean difference between initial and 6-month scores.

* Significant at $p < .05$.

Table 5
Comparison of Groups on Satisfaction Questions Regarding the Program at 3- and 6-Month Follow-ups

Group	3 Months					6 Months				
	How satisfied are you with the program?									
	Quite dissatisfied	Mildly dissatisfied/Indifferent	Mostly satisfied	Very satisfied	Quite dissatisfied	Mildly dissatisfied/Indifferent	Mostly satisfied	Very satisfied		
Workbook Individual intervention	2 (16.7%) 1 (9.1%)	5 (41.7%) 0	3 (25%) 4 (36.4%)	2 (16.7%) 6 (54.5%)	2 (18.2%) 0	5 (45.5%) 0	4 (36.4%) 1 (11.1%)	0 8 (88.9%)		
	Did the program meet your needs?									
	None	Only a few	Most	Almost all	None	Only a few	Most	Almost all		
Workbook Individual intervention	2 (16.7%) 0	7 (58.3%) 1 (9.1%)	2 (16.7%) 3 (27.3)	1 (8.3%) 7 (63.6%)	4 (36.4%) 0	4 (36.4%) 0	3 (27.3%) 2 (22.2%)	0 7 (77.8%)		
	Would you recommend the program?									
	Definitely Not	Not really	Generally	Definitely	Definitely Not	Not really	Generally	Definitely		
Workbook Individual intervention	1 (8.3%) 1 (8.3%)	2 (16.7%) 1 (8.3%)	5 (41.7%) 0	4 (33.3%) 10 (83.3%)	2 (18.2%) 0	1 (9.1%) 0	6 (54.5%) 0	2 (18.2%) 9 (100%)		

Discussion

A new intervention for CSOs of problem gamblers was developed and tested in this randomized clinical trial. We predicted that participants who received the individual intervention would have greater success in engaging the gambler in treatment than would those who received the workbook. No differences were found between groups for gambler treatment entry rates, with 17.4% of gamblers attending treatment by the 6-month follow-up. It is unclear why in the current study and both CRAFT studies conducted to date (Hodgins, Toneatto, et al., 2007; Makarchuk et al., 2002) that the CSOs of problem gamblers were not as successful as the CSOs of substance abusers in engaging their significant other in treatment. The rates found in this study are much lower than those achieved in the substance abuse field, which range from 64% to 86% (Meyers, Miller, Hill, & Tonigan, 1999; Meyers, Miller, Smith, & Tonigan, 2002; Miller, Meyers, & Tonigan, 1999; Sisson & Azrin, 1986). One explanation for the differences in treatment engagement between studies of substance abuse and gambling may be that in all the studies by Meyers and colleagues, treatment for the substance abuser was readily available, which is not the case for problem gambling locally. The standard study procedure by Meyers et al. included a 24-hour access pager for weekends and after hours so that the substance abuser could contact someone to schedule an intake appointment, usually within 24-48 hours. In the current study, CSOs provided information to gamblers to attend either Gam-Anon or a counselling intake interview, and then to attend a group or be put on a wait list for individual treatment. Although treatment was available, access was not facilitated in the same way as in previous studies. It is possible that the difference in accessibility and availability of treatments for CSOs of problem gamblers versus substance abusers may account for the differences in treatment entry rates. Future CRAFT studies with CSOs of problem gamblers may offer an empirically supported treatment to the problem gambler that is readily available, thus making these studies more similar to prior CRAFT studies with CSOs of substance abusers.

We also hypothesized that participants who received the individual intervention would report lower levels of gambling behaviour by the gambler than would those who received only the workbook. All participants reported a statistically significant decrease in dollars gambled by the gambler over the follow-up periods. Overall, the magnitude of the decrease in dollars gambled reported by participants in the workbook group was classified as a small effect, whereas those in the individual intervention group achieved a large effect size. For days gambled, there was a small effect between the groups at 6 months, with participants in the workbook group achieving medium effects and those in the individual intervention group showing large effects over time. Such differences between groups in effect sizes provide initial support that CRAFT delivered to CSOs in an individual format is more successful than the CRAFT self-help workbook at influencing positive change in the problem gambler's behaviour.

We predicted that participants in the individual intervention group would show greater improvement in personal and relationship functioning compared with those

in the workbook group. There was no statistical difference between groups. However, effect sizes indicate that participants in both groups displayed improved personal functioning, with a trend for participants in the individual intervention group to show greater improvements compared with those in the workbook group. Both groups displayed decreased scores on the BSI over the follow-up periods, although it was not significant, with greater reductions reported by participants in the individual intervention group than by those in the workbook group. The magnitude of the difference between groups approached a medium effect size, which provides some support for the hypothesis that the individual intervention of CRAFT helped improve CSO personal and relationship functioning compared with the self-help workbook. Differences may also be due to therapist-guided intervention versus self-help intervention. Therefore, future studies would be wise to include a third comparison group of a non-CRAFT face-to-face therapist intervention.

Participants in both groups reported increased happiness in their relationship with the gambler. Slightly greater improvements were seen in the individual intervention group than in the workbook group (large vs. medium effect size, respectively), with a small effect size between groups observed at 6 months. Participants in both groups also rated their relationship with the gambler as improved, with small effect sizes between the groups attained by 6 months.

The majority of CSOs reported favourable evaluations of the program. However, participants in the individual intervention group were more likely to indicate that their needs were met, that they were satisfied with the program, and that they would recommend the program to a friend. The participants in the individual intervention group often cited contact with the therapist as helpful (e.g., therapist provided validation, provided reassurance in using techniques, was non-judgmental), whereas participants in the workbook group reported that there was not enough guidance to implement the techniques.

The urn randomization procedure was statistically successful in stratifying groups with no significant differences across initial assessment variables. Although no statistically significant differences were found, several differences seemed of prognostic importance. Participants in the individual intervention group had higher BSI scores, and they reported that the gambler had a gambling problem for a longer period, spent slightly more money, gambled more days on average, and used video lottery terminals and slot machines more than did those in the workbook group. These differences are noteworthy in that any lack of outcome differences between the groups may be confounded by the fact that the participants in the individual intervention group presented as more distressed and they dealt with a loved one who gambled more than did those in the self-help workbook group. To help counter possible confounds, we entered the initial rating of each outcome variable as a covariate in the analysis.

Methodological strengths of this study include therapist use of a treatment manual, random assignment to treatment condition, and follow-up interviews collected by a research assistant who was intended to be blind to treatment condition, thereby

eliminating interviewer bias. Together, these strengths bolster the internal validity of this study design. However, as mentioned earlier, one third to two thirds of research assistants determined group assignment prior to the end of the follow-up interview, which threatened internal validity.

A number of additional limitations are worth noting. One major limitation is that assessment and outcome measurements used with CSOs of problem gamblers are not well validated. Prior studies that have failed to find differences between groups could not determine whether the lack of differences was due to an actual lack of differences or poor measurement of the construct. Another limitation is that all information regarding the gambler's behaviour was obtained through reports of CSOs. However, in a study that examined precipitants of gambling relapses, overall kappa agreement between gamblers' reports and collateral reports was rated as fair to good (Hodgins & Makarchuk, 2003). In addition, prior research has demonstrated differences between treatment conditions on the basis of CSO reports of gambling behaviour (Hodgins, Toneatto, et al., 2007). Finally, the small sample size poses a major limitation. The final sample size was smaller than initially proposed because of recruitment problems and did not provide sufficient statistical power to detect small group differences. A related limitation is the moderate follow-up rates and the participants who were excluded from the analysis because of low confidence in their ratings, which further limited the sample size used in analysis. As a result of these limitations in sample size, most analysis focused on effect sizes between groups and over time to determine clinical significance.

Overall, the results of this study provide initial support for the provision of the CRAFT intervention in an individual format. Although participants who received the individual intervention did not have statistically better outcomes than did those who received the workbook, effect sizes indicate potential benefits for the individual intervention group. The lack of statistical differences between the CRAFT individual intervention and the CRAFT self-help workbook needs to be further clarified, given the major limitation of the small sample size.

References

- Abbott, D. A., Cramer, S. L., & Sherrets, S. D. (1995). Pathological gambling and the family: Practical implications. *Families in Society*, 76, 213–219.
- Altman, D. G. (1985). Comparability of randomized groups. *The Statistician*, 34, 125-136.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Azrin, N. H. (1976). Improvements in the community-reinforcement approach to alcoholism. *Behavior Research and Therapy*, *14*, 339–348.

Azrin, N. H., Naster, B. J., & Jones, R. (1973). Reciprocity counseling: A rapid learning-based procedure for marital counseling. *Behavior Research and Therapy*, *11*, 365–382.

Baer, L., & Ahern, D. K. (1993). Statistical problems with small sample size. *American Journal of Psychiatry*, *150*, 356–357.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Academic Press.

Cunningham, J. A. (2005). Little use of treatment among problem gamblers. *Psychiatric Services*, *56*, 1024–1025.

Derogatis, L. R. (1993). *Brief Symptom Inventory—Administration, scoring, and procedure manual*. Minneapolis, MN: National Computer Systems.

Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage & the Family*, *50*, 93–98.

Hodgins, D. C., & el-Guebaly, N. (2004). Retrospective and prospective reports of precipitants to relapse in pathological gambling. *Journal of Consulting and Clinical Psychology*, *72*, 72–80.

Hodgins, D. C., & Makarchuk, K. (2003). Trusting problem gamblers: Reliability and validity of self-reported gambling behavior. *Psychology of Addictive Behaviors*, *17*, 244–248.

Hodgins, D. C., Makarchuk, K., el-Guebaly, N. & Peden, N. (2002). Why problem gamblers quit gambling: A comparison of methods and samples. *Addiction Research and Theory*, *10*, 203–218.

Hodgins, D. C., Shead, N. W., & Makarchuk, K. (2007). Relationship satisfaction and psychological distress among concerned significant others of pathological gamblers. *Journal of Nervous and Mental Disease*, *195*, 65–71.

Hodgins, D. C., Toneatto, T., Makarchuk, K., Skinner, W., & Vincent, S. (2007). Minimal treatment approaches for concerned significant others of problem gamblers: A randomized controlled trial. *Journal of Gambling Studies*, *23*, 215–230.

- Lesieur, H. R., & Custer, R. L. (1984). Pathological gambling: Roots, phases and treatment. *The Annals of the American Academy of Political and Social Science*, 474, 146–156.
- Lobsinger, C., & Beckett, L. (1996). *Odds on the break even: A practical approach to gambling awareness*. Canberra, Australia: Relationships Australia.
- Makarchuk, K., & Hodgins, D.C. (2001). *Minimal treatment for concerned significant others of problem gambling. A self-help manual for CSOs of problem gamblers*. Calgary, AB: University of Calgary.
- Makarchuk, K., Hodgins, D. C., & Peden, N. (2002). Development of a brief intervention for concerned significant others of problem gamblers. *Addictive Disorders & Their Treatment*, 1, 126–134.
- McComb, J. L., Lee, B. K., & Sprenkle, D. H. (2009). Conceptualizing and treating problem gambling as a family issue. *Journal of Marital and Family Therapy*, 35, 415–430.
- Meyers, R. J., Miller, W. R., Hill, D. E., & Tonigan, J. S. (1999). Community reinforcement and family training (CRAFT): Engaging unmotivated drug users in treatment. *Journal of Substance Abuse*, 10, 291–308.
- Meyers, R. J., Miller, W. R., Smith, J. E., & Tonigan, J. S. (2002). A randomized trial of two methods for engaging treatment-refusing drug users through concerned significant others. *Journal of Consulting and Clinical Psychology*, 70, 1182–1185.
- Miller, W. R., Meyers, R. J., & Tonigan, J. S. (1999). Engaging the unmotivated for treatment for alcohol problems: A comparison of three strategies for intervention through family members. *Journal of Consulting and Clinical Psychology*, 67, 688–697.
- National Gambling Impact Study Commission. (1999). *National gambling impact study commission final report*. Retrieved from <http://govinfo.library.unt.edu/ngisc/reports/fullrpt.html>
- Odgaard, E. C., & Fowler, R. L. (2010). Confidence intervals for effect sizes: Compliance and clinical significance in the *Journal of Consulting and Clinical Psychology*, 78(3), 287-297.
- O'Farrell, T. J., Murphy, M., Alter, J., & Fals-Stewart, W. (2007). Brief family treatment intervention to promote aftercare among male substance abusing patients in inpatient detoxification: A quasi-experimental pilot study. *Addictive Behaviors*, 32, 1681–1691.

- Petry, N. M. (2005). *Pathological gambling: Etiology, comorbidity, and treatment*. Washington, DC: American Psychological Association.
- Rush, B., Moxam, R. S., & Urbanoski, K. A. (2002). Characteristics of people seeking help from special programs for the treatment of problem gambling in Ontario. *The Electronic Journal of Gambling Issues*, 6, 32–54.
- Shaw, M. C., Forbush, K. T., Schlinder, J., Rosenman, E., & Black, D. W. (2007). The effect of pathological gambling on families, marriages, and children. *CNS Spectrums*, 12, 615–622.
- Sisson, R. W., & Azrin, N. H. (1986). Family member involvement to initiate and promote treatment of problem drinkers. *Behavior Therapy and Experimental Psychiatry*, 17, 15–21.
- Smith, J. E., & Meyers, R. J. (2004). *Motivating substance abusers to enter treatment: Working with family members* (pp. 258–273). New York, NY: Guilford.
- Sobell, L. C., & Sobell, M. B. (1992). Timeline Followback: A technique for assessing self-reported alcohol consumption. In R. Z. Litten & J. P. Allen (Eds.), *Measuring alcohol consumption: Psychological and biochemical methods* (pp. 41–72). NJ: Humana Press.
- Steiger, J. H. (2004). Beyond the *F* test: Effect size confidence intervals and tests of close fit in the analysis of variance and contrast analysis. *Psychological Methods*, 9, 164–182.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn and Bacon.
- Volberg, R. A. (1998). *Gambling and problem gambling among adolescents in New York*. Albany, NY: New York Council on Problem Gambling.
- Weinstock, J., Whelan, J., & Meyers, A. (2004). Behavioral assessment of gambling: An application of the Timeline Followback Method. *Psychological Assessment*, 16, 72–80.

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