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Gambling-Related Beliefs and Gambling Behaviour: Explaining Gambling Problems with the Theory of Planned Behaviour

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Abstract Investigating how gambling frequency and perceptions towards gambling relate to gambling problems has direct relevance for prevention and treatment programs. Accordingly, this study explored the relationship between a diverse group of gambling beliefs, the intention to gamble, gambling frequency, and gambling problems. To facilitate this, the Theory of Planned Behaviour (TPB) was employed to model the influence of gambling attitudes (e.g., the expected emotional and financial outcomes from gambling), social norms (e.g., perceived approval and gambling behaviour of significant others) and cognitive biases (confidence in the ability to determine the outcome of gambling) on the intention to gamble, gambling frequency, and gambling problems. Two hundred and one volunteers completed a questionnaire that assessed these social-cognitive factors and gambling behaviours. Consistent with expectations, the path analysis revealed the TPB determinants predicted gambling frequency and gambling problems, respectively. Interestingly though, there was the direct path between the intention to gamble and gambling problems, and attitudes and gambling frequency. The potential implications for these findings are discussed.

Keywords Gambling · Attitudes · Social norms, cognitive biases · The theory of planned behaviour · Path analysis

Introduction

There is an increasing recognition that gambling problems are an important social issue. For instance, it is known that more than twice as many gamblers experience negative consequences associated with their gambling behaviour than those who reach the criteria of pathological or

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problem gambling (Productivity Commission 2010). Thus, understanding the risk factors that help sustain gambling problems, as they occur across the continuum of gambling involvement, forms an essential part of a public health response. One approach is to consider gambling itself as the risk factor (Currie et al. 2012; Phillips et al. 2013). Another is to examine the role of personal expectations and social influences play in sustaining problematic gambling behaviour (Martin et al. 2010; Moore and Ohtsuka 1997). Notably, these are not mutually exclusive explanations. Rather, investigating how gambling frequency and social-cognitive factors interrelate may advance the understanding of gambling problems. Such information has implications for content of prevention and intervention programs used to reduce gambling problems (Larimer et al. 2012; Martin et al. 2010; Wu and Tang 2012).

Increased levels of participation in gambling have been shown to predict negative gambling outcomes. For example, population level studies have revealed as gambling frequency or involvement increases, there is a concomitant increase in gambling problems, often independent of type of gambling involvement (Afifi et al. 2014; Currie et al. 2012; Kessler et al. 2008; LaPlante et al. 2011; Hansen and Rossow 2012.). Similar findings have been found with studies comprising adolescents (Hansen and Rossow 2008, 2012) and college students (Phillips et al. 2013). There is also a growing body of research that shows a range of social-cognitive factors may influence gambling problems. Specially, attitudes towards gambling (Bouju et al. 2014; Neighbors et al. 2007). perceptions of family and friends gambling behaviour and approval (Meisel and Goodie 2014; Larimer and Neighbors 2003; Neighbors et al. 2007) and personal beliefs in skill (MacLaren et al. 2015; Myrseth et al. 2010) predict problem gambling scores. However, it appears no research to-date has simultaneously examined the role of these social-cognitive factors in relation to gambling frequency and gambling problems. The current study investigates the interrelationships between these known correlates of gambling problems to elucidate possible explanatory pathways.

Theory

Social-cognitive models have been successfully employed in many areas to examine how a diverse range of beliefs and perceptions influence behaviours (Ajzen 2012; Montaño and Kasprzyk 2008). Arguably, two of the most extensively researched social-cognitive models are the Theory of Planned Behaviour (TPB; Ajzen 1991) and its predecessor the Theory of Reasoned Action (TRA; Fishbein and Ajzen 1975). In essence, the TRA posits that intention, which reflects the effort individuals are likely to direct towards engaging in an activity, predict behaviour. In turn, intentions are influenced by the perceived favourability of the outcome from performing the behaviour (attitude) and the extent the activity is perceived to be approved and/or engaged by others (social norms). The TPB adds the construct of Perceived Behavioural Control (PBC), which represents the confidence in one's ability to successfully perform the target behaviour (Ajzen 1991). Meta-analytic reviews support the efficacy of the TPB across a diverse range of behaviours (e.g., Armitage and Christian 2003; Armitage and Conner 2001; McEachan et al. 2011). Specifically, the TPB has been successfully used to model the social-cognitive determinants of unprotected sex (Myklestad and Rise 2008), drink-driving (Armitage et al. 2002), binge drinking (Norman et al. 2007), unsafe injecting drug use (Gagnon and Godin 2009), and gaming addiction (Haagsma et al. 2013).

Although the TRA and TPB have been employed extensively across different domains, relatively few studies have utilised the TRA and TPB to explain gambling behaviour. Nonetheless, the existing research supports the premise of the TPB in this context. For example, Lee (2013) modelled the effects of attitudes, social norms, perceived control and

exposure to media on the intention to gamble. Lee's results revealed attitude and social norms predicted student's intention to gamble at casinos, over and above exposure to gambling promotions and previous gambling behaviour. Hing et al. (2015) found similar results in a study which examined adults' intention to participant in sports betting in the next six months. Other researchers have examined the role of TPB constructs to explain gambling frequency. Martin et al. (2010) found college students' past year gambling frequency was positively related to attitudes, perceptions of family and friends approval of gambling, and perceived control. Consistent with the TPB, intention mediated these relationships. Likewise, Wu et al. (2013) found the TPB explained past year gambling involvement of representative sample of Chinese recruited in Macao. Finally, researchers have employed the TRA/TPB to explain problem gambling scores (Moore and Ohtsuka 1997; Wu and Tang 2012). Specifically, Wu and Tang (2012) found college students' attitudes, normative beliefs (social norms), and PBC were associated with the intention to gamble, which, in turn, predicted gambling problems. Together, these studies underscore the ability of the TPB to explain gambling behaviour, although the interrelationship between gambling frequency, gambling problems and the predictors embedded in the TPB remains unclear.

As mentioned, the TPB shows promise in explaining gambling frequency and gambling problems. However, absent in the previous studies is a measure of perceived skill, or the cognitive biases which are commonly found to be related to gambling problems. For example, Lee (2013) assessed PBC in terms of the ease of availability of gambling, whereas Martin et al. (2010) and Wu and Tang (2012) emphasised the ability to control or self-regulate gambling behaviour. Whilst these measures are compatible with the construct of PBC, they do not incorporate the dimension of beliefs that reflect personal confidence in the ability to succeed (win at gambling), which is also a central characteristic of the construct of PBC (Ajzen 1991). In fact, several studies show that problem gamblers, compared to non-problem gamblers, hold more optimistic views (cognitive biases) in relation to their ability to influence or predict the outcome of chance determined games (MacKillop et al. 2006; MacLaren et al. 2015; Mattson et al. 2008; Myrseth et al. 2010). From a theoretical perspective, it is clear cognitive biases, which have also been referred to as wagering self-efficacy (Wohl et al. 2007), have direct parallels with the self-efficacy component of PBC. Thus, the inclusion of cognitive biases in the TPB framework allows the gambling self-efficacy dimension of beliefs to be represented and their role to be examined in the context of other TPB determinants.

Another consideration is how the construct of attitudes is conceptualised and measured. According to Ajzen (2005). attitudes can be measured directly or indirectly. Direct measures of attitude reflect the perceived favourableness of an object or behaviour (e.g., I think it is wise to gamble). On the other hand, indirect or belief-based measures include statements refer to the specific anticipated outcomes from enacting a behaviour (e.g., gambling to relax, augment positive mood, and make to money). There is evidence to support the direct measures of attitude positively relate to gambling frequency (Kassinove et al. 1998; Orford et al. 2009) and gambling problems (Neighbors et al. 2007). Similarly, research has revealed that both gambling frequency and gambling problems are positively associated with gambling-related beliefs (Bouju et al. 2014; Flack and Morris 2014; Oei et al. 2008; Shead and Hodgins 2009; Strong et al. 2004). One advantage of belief-based measures, over the direct measures, is they are helpful in understanding the specific reasons for behaviour (Montaño and Kasprzyk 2008). Also, in addition to capturing specific reasons for gambling, belief-based measures allow the attributes of affective and instrumental attitudes to be represented as distinct, but related, components. The former represents the pleasurable and enjoyable component of attitudes, whereas the latter the cognitive aspects (Lawton et al. 2007). The current study will assess attitudes using the indirect approach and include both affective and instrumental type beliefs.

Aims and Hypotheses

What the previous studies show is that the intention to gamble, gambling frequency and gambling problems can be explained by the constructs embedded in the TPB. However, none of these studies have examined whether gambling problems are mediated by frequency or if there are direct associations between the TPB determinants and gambling problems. In other words, it is unclear whether gambling itself is the primary risk factor or if other social cognitive influences operate over and above gambling frequency. A second area, which has not been previously explored in the context of the TPB, is the role of cognitive biases. That is, despite previous research investigating the relationships between gambling problems and cognitive biases, it is unknown if these beliefs, independently, explain gambling problems or if they form part of a wider set of beliefs. To redress this gap in knowledge, the current study uses the TPB as a framework to investigate these relationships. Specifically, consistent with the premise of the TPB, it is expected that attitudes, social norms and PBC (cognitive biases) will explain the intention to gamble, which, in turn, will explain gambling frequency. Also, on the basis of previous research, it is expected that gambling frequency will explain gambling problems. The final expectation is the attitudes and social norms will exert their influence on gambling problems via intention and, in turn, gambling frequency. Although this expectation is somewhat speculative, it is congruent the central tenets of the TPB, in that, intention is operationalised as the antecedent of the frequency of behaviour, as opposed to potentially problematic behaviour. The theoretical model is depicted in Fig. 1.

Methods

Participants

Volunteers, over 18 years of age, were recruited from a university campus and via social networks of the researcher. The aim was to obtain a sample ranging from non-gamblers to frequent and problem gamblers. In total, 201 participants (124 female, 75 male and two did not report their gender) returned the questionnaire. One hundred and sixteen (57.7 %) respondents reported their occupational status as employed, 71 (35.3 %) students and 14 (7 %) indicated

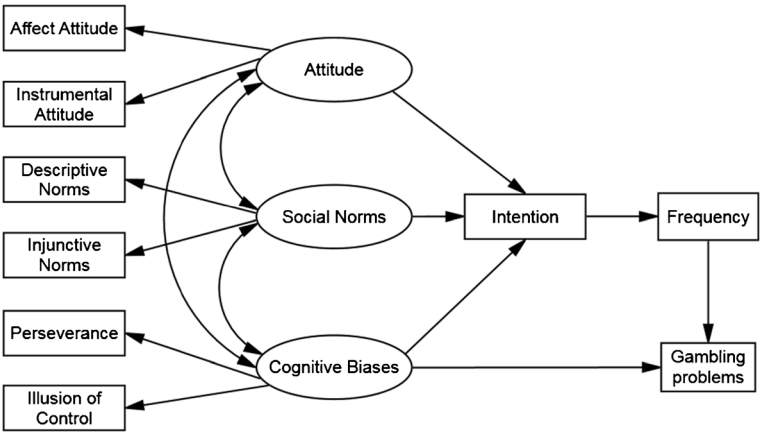

Fig. 1 Theoretical model

they were either on unpaid leave or unemployed. However, it should be noted that students may have reported their occupational status as employed if they were concurrently working and studying. The median age group was 30 to 34 years, with ages ranging from 18 to 64 years. Most respondents engaged in some form of gambling (92 %) within the last 12 months and 36.3 % gambled once a month or more on some activity.

Instruments

Attitude Towards Gambling The Attitude Towards Gambling Scale (ATGS) was developed for the current study. The ATGS comprised 16 statements which reflected either the affective or instrumental dimension of gambling attitudes. The Affect Attitude subscale assessed the emotional response that gambling engenders with four sets of paired items: one item of the set assessed affective beliefs and the corresponding item assessed the perceived importance of the belief. For example, the item 'Playing the pokies can be a fun activity' was paired with the item 'Having fun while playing the pokies is important to me'. The Instrumental Attitude subscale, in contrast, measured the perceptions of gambling in terms of a money making venture. Consistent with the affect subscale, four items assessed the instrumental beliefs (e.g. 'You can come out in front when playing the pokies') with corresponding item to measure the importance (e.g. 'I need to win when playing the pokies'). The term pokies was used as it a colloquial term that Australians use to refer to multi-line video line up games (or video slot machines). All items were rated on 6-point Likert scales ranging from strongly disagree to strongly agree. In accordance with the procedure for scoring belief based attitude scales (Ajzen 2002), the belief items were scored from −3 (strongly disagree) to +3 (strongly agree). The importance items were scored from 1 (strongly disagree) to 6 (strongly agree). The product of each belief and importance item set was summed to form the respective subscales of Affect Attitude and Instrumental Attitude. Positive scores indicated a favourable attitude whereas negative scores indicated an unfavourable attitude towards gambling. Cronbach alpha of Affect Attitudes was 0.88 and Instrumental Attitudes 0.83.

Perceived Social Norms *S*ocial norms were measured with the Subjective Norms Scale (SNS; Moore and Ohtsuka 1997). The SNS assesses two components of subjective norms: beliefs about how appropriate others perceive the respondent's gambling (Injunctive Norms) and the extent an individual perceives their family and friends are involved in gambling (Descriptive Norms). The SNS items were scored on a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). Each of the components of subjective norms is assessed by six items, and a further two items to assess the motivation to comply with friends and family respectively. For the current study, two items were added to each subscale to broaden the range of gambling activities canvassed. For example, 'My family often bet on the races or horses' and 'Most of my family like me to bet on the races or horses'. The subscale of injunctive and descriptive norms was computed by summing the product of each respective belief statement with the motivation to comply. Moore and Ohtsuka reported adequate internal consistency for the full scale ($\alpha = 0.69$). For the current study, the Cronbach alpha was 0.88 for the revised full scale, and 0.83 and 0.86 for the injunctive and descriptive norms subscales, respectively.

Perceived Control The Gamblers' Belief Questionnaire (GBQ; Steenbergh et al. 2002) was used to measure respondents' perceived capacity to win at gambling. The GBQ includes two related but separate subscales that assess gambling related cognitions of Luck/Perseverance (L/P) and Illusion of Control (IOC). The L/P subscale consists of 13 items that reflect an individual's

tendency to overestimate the likelihood of winning. The IOC subscale contains eight items and measures an individual's perception of their ability to determine the outcome of a game. Consistent with the SNS, each of the items was rated on a 6-point Likert type scale. Steenbergh et al. reported good internal consistency for the L/P subscale $\alpha = 0.90$ and the IOC subscale $\alpha = 0.84$. In the current study the Cronbach alpha coefficient was 0.96 for L/P and 0.92 for IOC.

*Gambling Intention***s** The Gambling Intention Scale (GIS; Moore and Ohtsuka 1997) consists of 7 items that assessed how likely an individual was to gamble over the next two weeks. For example, 'In the next 2 weeks I plan to gamble' and 'In the next 2 weeks I intend to play poker machines'. Each item was rated on a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree) and responses were summed to comprise the GIS. Moore and Ohtsuka (1997). reported good internal consistency for GIS ($\alpha = 0.80$). The Cronbach alpha for the current study was 0.92.

Gambling Problems The problems associated with gambling were assessed using the Problem Gambling Scale (PGS; Moore and Ohtsuka 1997). Moore and Ohtsuka (1997) converted the South Oaks Gambling Screen to a Likert type-scale (SOGS; Lesieur and Blume 1987) to provide continuous measure of gambling problems, as opposed to a measure of problem or pathological gambling. The PGS was adopted for the current study because of its consistency with the measurement approach used in the belief based measure and its focus on degree of problems rather than defining categories of gamblers. Each of the SOGS items was scaled on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Moore and Ohtsuka reported a Cronbach's alpha of 0.87. In the current sample, the PGS demonstrated good reliability ($\alpha = 0.96$).

Gambling Frequency The Gambling Frequency (GFS; Moore and Ohtsuka 1997) was used to measure past-year gambling participation. The GFS consists of 10 statements including 'Bet on sports' and 'Played poker machines at the Casino' with the possible responses being (0) Never, (1) Once a year, (2) More than once a year, less than once a month, (3) More than once a month, less than once a week, (4) Once a week or more. Responses were summed to compute the GFS. Moore and Ohtsuka (1997). reported good internal consistency for the GFS ($\alpha = 0.71$). The Cronbach alpha for the current study was 0.86.

Procedure

Ethics approval was obtained from the University's Human Ethics Committee. Students were approached after lectures and were also recruited from the public grounds of the university, such as the coffee shops, general meeting areas and campus residences. Visitors and friends of the students were asked to participate as well. Further copies of the questionnaire were distributed via networks of the researcher using a snowball sampling technique.

Results

Data Preparation

Data were screened using SPSS for Windows Statistical Package. Fifteen cases were excluded from the data analysis due to incomplete responses (i.e., cases with more than two unanswered

question on one or more scales). The attitude and perceived control subscales, and intention, gambling frequency and gambling problems scales were subjected to a logarithmic transformation before inclusion in bivariate correlations or path analysis. The data transformation substantially reduced the skewness. For example, the log transformation of the PGS reduced the skewness from 2.02 (SE = 0.17) to 0.59. The inter-relationships between scales were explored with zero order Pearson product-moment correlations to ensure the data were appropriate to model (see Table 1).

As displayed in Table 1, significant positive relationships exist between the belief subscales and indices of gambling intention and behaviour. In contrast, age was not correlated with any of the variables of interest and sex was not associated with the attitude or the social norms subscales. Sex shared a modest correlation with the perceived control subscales, intention, and the measures of gambling behaviour. Thus, sex was entered as a control variable in the initial models (models not shown). However, as sex did not significantly influence the parameter estimates, the variable was omitted from the ensuing path models.

Path Analysis

Figure 1 depicts the theoretical path model based on the assumptions of the TPB. To test the appropriateness of the proposed model, a path analysis using the Maximum Likelihood method of estimation was performed with AMOS. The adequacy of the path model was assessed with a range of fit indices because of the sensitivity of the Chi Square statistics (Kline 2005). The fit indices employed included the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA) and Standardised Root Mean Residual (SRMR). According to Kline (2005), CFI and GFI estimates greater than 0.95, a RMSEA value of 0.08 or less, and a SRMR value of 0.05 of less are considered to indicate a good fit between the specified model and sample data.

As shown in Table 2, the fit indices revealed the theoretical model was a poor fit to the data. An inspection of the Residual Covariance Matrix (RCM) and Modification Indices (MI) indicated that a path existed between attitude and gambling frequency. Inclusion of this path (model 2) improved the model fit, although the fit remained suboptimal. Subsequent

Table 1 Inter-correlations between belief subscales and indices of gambling and behaviour

Scale/Subscale	1	2	3	4	5	6	7	8	9
1. Affect Attitude	_								
2. Instrumental Attitude	0.69*	_							
3. Injunctive Norms	0.49*	0.36*	_						
4. Descriptive Norms	0.54*	0.48*	0.53*	_					
5. Illusion of Control	0.58*	0.58*	0.36*	0.45*	_				
6. Luck/Perseverance	0.58*	.0.53*	0.38*	0.40*	0.86*	_			
7. Intention	0.65*	0.53*	0.42*	0.53*	0.71*	0.66*	_		
8. Gambling Frequency	0.66*	0.47*	0.34*	0.44*	0.62*	0.58*	0.68*	_	
9. Gambling Problems	0.51*	0.35*	0.22*	0.36*	0.66*	0.66*	0.67*	0.60*	_
10. Age	0.11	0.03	0.03	0.01	0.01	0.04	0.10	0.07	0.01
11. Sex	0.06	0.01	0.10	0.14	0.20*	0.17*	0.27*	0.18*	0.32*

*indicates correlation was significant at $p < .05$

Table 2 Model fit estimates

Model/Fit index	Chi-Square (*df*)	CFI	GFI	RMSEA	SRMR
1. Theoretical model	78.33* (21)	0.95	0.92	0.122	0.054
2. Attitude → Frequency	49.33* (20)	0.97	0.95	0.090	0.032
3. Intention → Gambling problems	41.05* (19)	0.98	0.96	0.080	0.033

* = significant at $p < .01$

inspection of the RCM and MI revealed the model would be improved by including a path between intention and gambling problems. The fit indices indicated model 3 (final model) was a good fit to the data.

Figure 2 shows the final model with the standardised parameter estimates. All paths were significant at $p <$. 05 except for attitude to intention which failed to reach significance ($p >$. 05). Fifty six percent of the variance in gambling frequency was accounted for by intention and attitude ($p < 0.01$), whereas 55 % of the variance of gambling problems scores was explained by gambling intention, frequency and perceived control ($p < 0.01$).

Differences in Affect and Instrumental Attitude

Two repeated measure t-tests with a Bonferroni corrected α of 0.025 were performed to further explore the role of attitude in gambling behaviour. Occasional gamblers (those who gambled < monthly) were found to hold significantly higher affect attitudes ($M = 0.68$, $SD = 14.03$) compared to instrumental attitudes ($M = -6.28$, $SD = 9.29$), $t(143) = 7.53$, $p < 0.001$. Similarly, regular gamblers (those who gambled monthly or more) held significantly higher affect attitudes ($M = 19.06$, $SD = 19.64$) in comparison to instrumental attitudes ($M = 3.69$, $SD = 15.77$), $t(39) = 9.67$, $p < 0.001$. The effect size for the mean difference for occasional gamblers and regular gamblers was medium ($d = 0.60$) and large ($d = 0.88$), respectively.

Discussion

The current study examined the role of gambling frequency and a broad range of social-cognitive constructs in explaining problematic gambling. Specifically, using the TPB as a framework, perceptions about the anticipated outcome of gambling, the influence of others, and beliefs in skill and knowledge were simultaneously modelled to assess their effects on gambling problems via intentions and past year gambling frequency. The findings largely supported the expectations, with the TPB explaining 56 % and 55 % of the variance in gambling frequency and gambling problems, respectively. That is, consistent with the TPB, social norms and cognitive biases predicted intention, which, in turn, predicted gambling frequency. Likewise, gambling frequency correlated with gambling problems. However, counter to expectations, anticipated outcomes (attitude) did not independently relate to gambling intentions.

The ability of intentions to predict past year gambling frequency was consistent with previous research (Martin et al. 2010; Wu et al. 2013). Also, the influences of the perceptions of others gambling behaviour (social norms) and the beliefs in skill and knowledge (cognitive biases) indirectly influenced gambling frequency via plans to gamble. This suggests the behaviours of others and a belief in their own gambling prowess is integral in shaping the

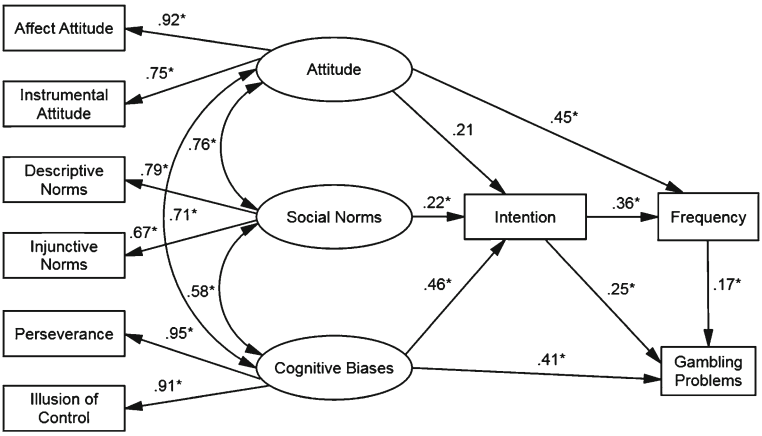

Fig. 2 Final model with standardised parameter estimates

intention to gamble. In contrast, attitude was found to directly relate to gambling frequency, which was unexpected. That is, unlike the social perception and beliefs in skill and control, beliefs about gambling as an enjoyable and a potentially financially rewarding activity directly influenced gambling frequency (which is inconsistent with the premise of the TPB). One reason gambling frequency was directly related to the perceived favourableness of gambling in the current study may be due the way attitude was measured. Perhaps heightened expectations about the mood enhancement and monetary rewards associated with gambling reflect a tendency to act spontaneously (gambling despite plans not too). Conversely, more general views about gambling (e.g., Martin et al. 2010) may better predict future plans to gamble.

To further explore the salient role of attitudes in gambling frequency, the affective and instrumental beliefs were compared. Beliefs reflecting the mood enhancing outcomes of gambling were endorsed higher than the perception of receiving monetary rewards for both occasional and frequent gamblers. Specifically, respondents tended to hold more positive expectations about the emotional benefits of gambling while being more reserved about making a profit, independent of level of gambling involvement. It appears differentiating between perceptions that gambling is a way to experience positive affect (e.g., fun and enjoyment) and the financial outcome expected may be important in understanding gambling behaviours. The current findings are certainly consistent with recent research that shows that gambling for emotion regulation and monetary reasons are related but separate motivations (Dechant 2014; Flack and Morris 2014). It appears that holding increasingly favourable views towards gambling, as a way increase positive mood, and that holding less pessimistic views about winning (or losing) money, increases the likelihood of gambling more frequently.

In addition to the direct effect of gambling frequency on gambling problems, the analysis revealed that both cognitive biases and intention were directly associated with gambling problems. The direct influence of confidence in ability (cognitive biases) on gambling problems is consistent with cognitive theory (Ladouceur and Walker 1996) and the associated research (MacLaren et al. 2015; Mattson et al. 2008; Myrseth et al. 2010). The more novel finding was the path between intention and gambling problems; suggesting gambling frequency is not the only risk factor for gambling problems. Although the TPB predicts the intention to act should exert its influence through action (e.g., gambling frequency), it is plausible that gambling problems may increase in concert with intentions and not necessarily with gambling frequency. Perhaps gambling intensity increases to compensate for a non-commensurate opportunity to gamble.

Another plausible explanation is intention may also reflect more of the urge to gamble and not solely future plans to gamble. There is indirect evidence to support the latter, with recent research indicating gambling urges may serve as an intermediary variable for problematic gambling (Smith et al. 2013). Further research is needed to determine whether intentions and urges are, in fact, similar or distinct constructs. Irrespective of the mechanism involved, it is appears that reducing gambling problems may require more than decreasing gambling frequency. Instead, attempts to redress overly optimistic beliefs about skill and social influences may enhance efforts that attempt to reduce gambling problems by decreasing the intention to gamble.

These finding have both theoretical and practical applications. From a theoretical perspective, the current study extends the previous research by examining the pathways between gambling frequency, social-cognitive influence and gambling problems. Moreover, gambling frequency, as risk factor, appears to be influenced by positive views towards gambling as way to have a good time (and not lose too much money). It also appears gambling frequency may not be the only significant predictor of gambling problems. From a practical perspective, the results indicate it is important to consider the influence of family and friends gambling behaviour and views, in addition to personal beliefs about skill, when attempting to understand an individual's efforts to seeking out gambling opportunities. However, perceptions toward the favourableness of gambling in terms of augmenting positive mood states and pecuniary gain should also be taken into account. That is, despite not being independently related to future plans to gamble and gambling problems, it appears these positive perceptions may directly influence the frequency of gambling that is not planned and, in turn, gambling problems.

Limitations and Future Research

Similar to much of the previous research, the current study assessed the relationship between gambling related-beliefs, intentions to gamble, and retrospective measures of gambling behaviour. Thus, the relationships depicted in the path models may not be causative. Specifically, gambling related-beliefs and gambling intentions may simply reflect past behaviour and not necessarily predict future gambling behaviour. Examining the temporal nature of these relationships would allow the role of these perceptions and intentions to be scrutinised further. Also, given the sampling technique employed, the pathways specified in the current model may not fit other samples. For instance, for those who are attempting to reduce their gambling (or at-risk gamblers) may gamble for quite different reasons. Namely, previous research has revealed the emotional regulation features as a salient reason for continued gambling (e.g., Stewart and Zack 2008; Wood and Griffiths 2007). Thus, it is possible emotion oriented expectations may share a direct relationship with gambling problems. Future research, with a sufficient sample size and diversity, could examine the model fit across dissimilar subsamples.

Another area that could be explored further is role of negative emotions. Although the current findings support the notion that a range of gambling related-beliefs are associated with gambling behaviour, this study did not incorporate belief-based subscales to distinguish between positive and negative types of emotional reinforcement. For example, previous studies (e.g., Dechant 2014; Flack and Morris 2014; Stewart and Zack 2008) have shown the emotional reasons for gambling are multifaceted. Therefore, in addition to including the social and cognitive oriented gambling beliefs, the understanding problematic gambling could be enhanced by assessing beliefs that differentiate between the emotion-focused anticipated outcomes of escape and excitement.

In conclusion, the current study is the first to use the TPB to examine the interrelationships between social-cognitive determinants of behaviour, gambling frequency, and gambling

problems. Namely, the influence of personal, social, and beliefs of control all appear to shape gambling behaviour, albeit in different ways. This diversity of influences demonstrates the complexity involved in potentially problematic gambling behaviour. Acknowledging these different influences, and their interplay with gambling frequency and gambling problems, advances the understanding gambling problems. Incorporating these diverse dimensions of beliefs and perceptions into primary and tertiary level interventions provide an opportunity to enhance the relevance and effectiveness of strategies employed to minimise problem gambling.

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