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Erroneous cognition and gambling intention of youths

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ABSTRACT

Youth gambling has posed a huge challenge to functional youth development in contemporary societies. Various explanations have been suggested for youth gambling intention. We aim to explore the role of erroneous cognition in gambling intention. The study objective is to establish whether erroneous cognitive distortions predict gambling intentions among youth gamblers. Three hundred and nine male adolescents (mean age = 17.31 years, SD = 2.19) completed questionnaires on erroneous gambling-related cognitions and gambling intention. A hierarchical multiple regression analysis revealed that two dimensions of erroneous cognition (illusion of control and interpretative bias) positively associated with gambling intention, while predictive control negatively associated with gambling intention. These findings show that erroneous cognitions are a risk factor in gambling intention. This finding provides steps towards devising appropriate cognitive-based therapeutic tool for the prevention and control of intention to gamble in internet gambling.

Introduction

The youth population live and operate in an environment filled with pervasive, socially, and government approved gambling outlets and shops (Osamika & Mayumgbo, 2016). Globally, findings indicate that youths are more susceptible to developing problem gambling and more vulnerable to negative consequences of gambling than adults (Burge et al. 2006; Gupta & Dereversky, 2000; Hardoon & Derevensky, 2002). Adolescents who gamble are twice likely to become problem gamblers at adulthood (Kessler et al., 2008; Vitaro et al. 2004). In recent times, *bet9ja* (pronounced *betnaija*) has become the most popular internet gambling platform in the Nigeria society as it has been patronized by conservatively, nearly 60% of youths (Awo, 2019). Therefore, the future Nigerian adult population is at risk of problem gambling as the present youth population is enormously exposed to numerous gambling platforms especially the *bet9ja* internet gambling. Just like other betting games, we focus on internet betting as it operates based on the outcome prediction and reward principle.

Numerous studies on youth gambling prevalence (e.g. Dowling et al., 2017; Dixon et al., 2016; Jackson, Dowling, Thomas, Bond, & Patton, 2008) report that individuals under the age of 18 years typically report gambling on lottery, instant scratch tickets, soccer bets, and informal private games, such as wagering with friends. Internationally, estimates of gambling problems in adolescents (in the years 2000–2009) were highly variable, with rates of 0.8% to 6.0% (Volberg et al. 2010). Although these prevalence rates are substantially higher than those reported by adults, there has been some concern that problem gambling rates for youth may be inflated due to multiple situational and measurement issues (Derevensky et al. 2003; Shaffer & Korn, 2002). Consensus exist that gambling among adolescents remains a significant social and public health policy issue, and that gambling in adolescents and young adults has been associated with a range of negative consequences across interpersonal, familial and psychological domains (Blinn-Pike et al. 2010; Delfabbro et al. 2006; Nower et al. 2004). Gambling can emerge from intentions developed mostly during childhood and adolescence (Derevensky et al. 2003). For these reasons, there is need for research that elucidate potential cognitive risk factors that may increase or ameliorate the risk of youth gambling and the subsequent development of gambling-related pathologies.

Gambling is a risk-taking activity with high potential to lose control or even develop addiction. Gambling platforms provide a variety of virtual and visual games (dice, roulette, whot, poker, dog race, football, horse race, soccer etc.) played for money (Oyebisi et al. 2012). It presents a large and highly profitable segment of the gambling industry in Nigeria (Awo, 2019), and is responsible for a proportionately high amount of revenue for individuals, groups and firms. Similar findings were reported for casino and slot machines in the USA. In 2015 alone, across all casinos, USD7.08 billion, approximately 63% of the revenue was generated by betting games in the US city of Nevada (Nevada Gaming Control Board, 2016).

Continued gambling by youths, despite the harm both to themselves (Raylu & Oei, 2009) and their relatives (Wiebe et al. 2003) has called for approaches to understanding the cognition-related errors associated with gambling intention and by extension, gambling behaviour. Research show extant association of erroneous gambling

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cognitions with youth gambling frequency and risk of problem gambling (Mitrovic & Brown 2009; Myrseth et al. 2010). Various erroneous gambling-related cognitions and beliefs have been described and placed in two broad categories: (1) those based upon a misunderstanding of chance and randomness which leads a gambler to believe that the outcome of gambling is more predictable than it actually is (predictive bias/control); and (2) beliefs held by gamblers that they can influence the outcome when in fact the outcome is unpredictable (e.g., illusion of control). These kinds of perceived control over gambling have been hypothesized to cause gamblers to misperceive the economic utility of gambling, thereby leading to gambling persistence despite the objective expectation of monetary loss (Ladouceur & Walker, 1996).

As a perception, feeling and belief that one could control gambling outcomes via personal skill, ability or knowledge, erroneous gambling cognition has been further categorized into three specific forms (Donati et al. 2015; Cosenza & Nigro, 2015; Toneatto, 1999). The first category reflects a belief that one could control gambling outcomes via personal skill, ability or knowledge. This category included active illusionary control where individuals had a belief that relying on superstitious behaviours, on systems or lucky numbers could influence gambling outcomes (e.g. possession of certain objects such as performing specific rituals such as a prayer or having certain mental states such as a positive attitude).

The second category is the predictive control and it reflects beliefs by individuals that they could predict gambling outcomes. It includes beliefs that one had the skill to make accurate predictions regarding positive gambling outcomes based on salient cues (e.g., the weather or hunches) or based on past wins/losses (e.g. expecting that a series of losses will be followed by series of wins). It also included probability errors, such as misunderstanding the nature of probability of outcome (believing that continued gambling increases the probability of winning than losing monies). The third category reflects interpretative bias, which consists of reframing gambling outcomes that would encourage continued gambling despite losses. This includes attributing successes to one's own skill and failures to others' influences or luck or recalling wins more easily than losses, and thus expecting to win at games which they have lost previously (Sharpe, 2002).

While illusion of control (IC) reflects the belief about one's ability to control gambling outcomes via personal skill, ability, expertise or knowledge, interpretative bias (IB) is the belief that one has the mastery skills to interpret the recent trend in gambling outcome, and from there, form an opinion of what the next outcome would look like, and predictive control (PC) is the perception and belief that one can actual predict when an outcome is most likely to appear in a gambling session (Ladouceur, 2004). Erroneous beliefs of these nature have been generally hypothesized to influence gambling persistence despite mounting financial losses (Moodie, 2008; Oei et al. 2008; Tang & Oei, 2011). Despite the huge presence of internet gambling in major Nigerian cities, there is still paucity of empirical evidences of how erroneous cognition is implicated in the initiation and sustenance of youth gambling.

Numerous studies (Donati et al. 2015; Taylor et al. 2014; Cosenza & Nigro, 2015) report that erroneous gambling cognition positively associated with positive gambling attitude and gambling frequency. At present, studies to understand the role of erroneous cognition (such as illusion of control, interpretative bias and predictive control) in the realm of the popular gambling platform in Nigeria are rare. Thus, knowledge of the possible relationship between the constructs, the direction of such a relationship and the question of causality in Nigeria, could be classified as blurred, and we are motivated to fill this gap in knowledge. It is our prediction, therefore that illusion of control, interpretative bias, and predictive control could explain internet gambling intention of youths in Nigeria.

Method

Participants

The study recruited 309 male adolescent volunteers (mean age = 17.31, SD = 2.19) from 4 public secondary schools in South-south Nigeria. They were predominantly Christians (92%) and speak English and Igbani (local) languages as official means of communication. Permision for the study was obtained from the Rivers state Ministry of Education through the Bonny Local Government Education Authority (BLGEA) and the *bet9ja* games company. The South Oaks Gambling Screen Reversed for Adolescents (SOGS-RA; Winters et al. 1993) was administered on them to screen for gambling behaviour and problems gambling. As inclusion and exclusion criteria, those who scored 0 on the SOGS-RA were excluded from the study, while only those with scores of 1 and above were included in the study. The participants were provided with written consent.

Materials

Gambling Intention Scale (GIS)

Moore and Ohtsuka's (1999) Gambling Intention Scale (GIS) was adapted and modified to assess internet gambling intention of youths. The GIS is a self-report inventory rated on a 5 point Likert scale ranging from "Not at all willing" (rated 1) to "Very much willing" (rated 5). The scale items are progressively scored, and an individual's total possible score could range from 9-45 with higher scores (20-45) reflecting higher intention to gamble. Internal consistency reliability of the original GIS as reported by Moore and Ohtsuka (1999) was high (α = .80), and Wong (2016) among Chinese adolescents (α = .92). After modification, the new BIGIS yielded a good reliability measure of *bet9ja* internet gambling intention (α = .79). Examples of items in the GIS are; "In the next two weeks, I will visit gambling shops", "In the next two weeks, I will play as many slips as possible in gambling shops".

Erroneous Gambling-Related Cognition

The illusion of control (IC; 5 items), interpretative bias (IB; 5 items) and predictive control (PC; 5 items) subscales of the Gambling-Related Cognitions Scale (GRCS; Raylu & Oei, 2004) were adapted to measure erroneous gambling-related cognitions. Responses ranged from "Strongly disagree" (rated 1) to "Strongly agree" (rated 7). Higher scores indicate higher erroneous cognition held by the individual in that dimension. Cronbach's alpha for the overall scale was high (α = 0.93). Moderate to high reliability was also found for each of the three subscales: GRCS-PC (α = 0.77); GRCS-IC (α = 0.87); and GRCS-IB (α = 0.91) (Raylu & Oei, 2004). Similar reliability alpha was reported by

Donati et al. (2018). A validation study of the selected three dimensions of the GRCS for erroneous *bet9ja* cognition among college students revealed moderate to high reliability (α = .77, .83, .93 for IC, IB and PC respectively). Example of items in the scale are "Praying helps me win" (IC); "A series of losses will provide me with a learning experience that will help me win later" (PC); and "Relating my losses to probability makes me continue gambling" (IB).

Procedure

The 326 participants who took part in the study were assembled in a hall and assured of anonymity and confidentiality and were given the following definition of gambling before completing the questionnaire: "Gambling involves you going to a *bet9ja* internet gambling shop and betting an item of value (e.g., money, personal possessions) on a sport/ game or event in order to win something of value". The participants were encouraged to direct questions to the research assistants who remained in the hall throughout the study session. Participants completed the questionnaires on the spot and submitted to the research team immediately. The time taken to complete the survey was between 20-35 minutes. They were debriefed at the end of the study on the real purposes of the study. Seventeen (13 were age < 17 years, while 4 scored 0 on the SOGS-RA) of the participants were excluded from the data set. Thus, data from 309 participants were further analyzed. This represents a 95% return rate. The majority (84.7%) had one or more siblings and lived with both parents. Each participant received a writing pen as token for participating in the study.

Design and Data analysis

This study adopted a cross-sectional survey design. Means and standard deviations were computed for the study variables. The connection between erroneous cognition (illusion of control, interpretative bias and predictive control) and gambling intention were investigated in two steps: first, bivariate correlations (Pearson) between the GIS variable and the erroneous gambling-related cognitions were computed. Second, to further investigate the role of the erroneous cognition variables in gambling intention, a hierarchical multiple regression (HMR) analysis was performed in which the GIS score was entered as the dependent variable and the erroneous gambling-related cognitions (illusion of control, interpretative bias, predictive control) constituted the independent variables which were entered in three steps.

Results

Table 1: Table of means, standard deviations and the correlations between the independent and dependent variables.

	Variables	Mean	*SD*	1	2	3
1	Gambling intention	10.66	3.55	-		
2	Illusion of Control	10.57	5.20	.65***	-	
3	Interpretative bias	9.81	4.59	.64***	.69***	-
4	Predictive control	12.96	3.55	-.73***	-.82***	-.71***

Note. $^{**}p<.01$; $^{***}p<.001$.

Cont = predictive control; ** = p<.01; *** = p<.001.

The result on table 1 showed that internet gambling intention positively correlated with illusion of control (*r = .65, p < .001)*, and interpretative bias (*r = .64, p<001),* but negatively correlated with predictive control (*r = -.73, p<01*).

Table 2: Hierarchical multiple regression showing erroneous cognitions as predictors of youth gambling

Predictors	Step 1			Step 2			Step 3		
	B	β	t	B	β	t	B	β	t
Illu_cont	.45	.66	5.79***	.27	.39	2.67**	.07	.10	.54**
Inter-bias				.29	.38	2.58**	.19	.24	1.65**
Pred-cont							-.28	-.47	-2.56**
R^2	.43			.50			.57		
ΔR^2	.43			.07			.07		
F	33.53(1, 46)***			22.18(1, 46)***			18.83(1,46)***		
ΔF	33.53(1,46)***			6.64(1,46)**			6.54(1,46)**		

Note: Illu_cont = illusion of control; Inter_bias = interpretative bias; Pred_cont = predictive control; $^{**}p<.01$; $^{***}p < .01$; ΔR^2 = Change in R^2; ΔF = Change in *F*

Results on table 2 show that illusion of control was entered in step 1 it explained 43% variance in gambling intention, and this variance positively predicted gambling intention (*β = .66, p<.001*). This implies that, an increase of 1 *SD* in illusion of control was associated with an increment of .66 *SD* in gambling intention. In step 2, interpretative bias was entered, and it explained 50% of the variance in gambling intention, and this variance positively predicted gambling intention (*β = .38, p<.01*). This implies that, an increase of 1 *SD* in interpretative bias was associated with an increment of .38 *SD* in gambling intention. Finally, the entrance of predictive control in step 3 of the model revealed that it contributed

57% of the variance in gambling intention, and this variance negatively predicted gambling intention (β = -.47, $p<.01$). This implies that, an increase of 1 *SD* in predictive control was associated with a reduction of -.47 *SD* in bet9ja gambling intention.

Discussion

The aim of this study was to extend knowledge concerning the influence of erroneous gambling-related cognition on gambling intention. Using factors widely investigated in various populations, we examined the predictive roles of three dimensions of erroneous gambling-related cognition in gambling intention in a representative sample of youths. Our findings from a youth sample in Nigeria concur with trends in previous studies (e.g. Donati et al., 2018; Markman et al. 2008), that found erroneous gambling-related cognitions to be important predictors of gambling attitudes. Specific studies among adults found that gambling-related cognitive distortions such as interpretative biases, predictive control and illusion control were strongly and positively associated with gambling attitudes and behaviours (Cowie et al., 2017; Roese & Epstude, 2018). We report similar finding only for illusion of control and interpretative biases. However, we found that predictive control negatively associated with gambling intention.

Illusion of control was observed to be implicated in high gambling intention; high scores on illusion of control were positively associated with high gambling intention scores. This finding lends support to a line of research (Gupta et al., 2013) showing that illusion of control was positively associated with high gambling frequency and in some cases, problem gambling. This is suggestive that youths who feel that they have good control of gambling results or to have good knowledge of the dynamics of gambling, may gamble beyond their imagination as they manifest high gambling intention, and this could lead to problem gambling.

With respect to interpretative bias, research has demonstrated that the association between interpretative bias and youth gambling depended on past experiences with gambling (Gupta et al., 2013). This finding was replicated by the results of the regression analysis in our study: high scores on interpretative bias were positively associated with high gambling intention scores. This finding portends danger of developing problem gambling by youths. This is because the erroneous belief that one can successfully interpret the permutations associated with bet slips (in this instance, gambling slips) has been shown to result in high gambling intention and frequency, and in some instances, problem gambling (Hanss et al., 2014).

Our results show that, of the three erroneous cognitions, only predictive control was a protective factor for gambling intention: high scores on predictive control were negatively associated with high gambling intention scores. This finding, however, differs from previous findings (e.g., Iliceto et al., 2015; Kim et al. 2015) that reported that predictive control was positively associated with gambling intention as youths who believed that they can predict gambling outcomes reported high intent to gamble.

A possible interpretation of these findings is that erroneous cognitions play a key role in the development and maintenance of youth gambling intention. This finding provides some support for the assumption that cognition and thought processes are important for motivating and sustaining gambling activities and shaping gambling-related attitudes among youths. For example, youths' levels of distorted gambling-related cognitions have been found to predict their gambling behaviour (Raylu & Oei, 2002). Beliefs about one's ability to interpret and control gambling outcome act as a viable buffers of gambling intentions, while predictive control attenuates intention to gamble.

Implications for practitioners

The study findings have some implications for psychological intervention and therapy. First, while cognitive explanations have been extensively documented in the gambling literature, the present study examines the contributions of erroneous cognition in gambling intention. As the influence of erroneous cognition on maladaptive behaviours such as gambling habit was widely documented (Donati et al, 2017; Cosenza & Nigro, 2015), our finding findings demonstrate that faulty belief that one has control over gambling outcome, and can interpret options/odds were risk factors in intent to gamble on the gambling platform – they have good potential to boost gambling intention and habit. Thus, it should be included in the cognitive model of interventions. The present findings successfully depict a picture of how adolescent gamblers act and react during bet9ja gambling sessions. Believing that one has huge influence and control over gambling outcomes leads to increased willingness to continue in a gambling session despite evidence of loss of resources during the session. Thus, we suggest that since illusion of control and interpretative bias were associated with high gambling intention, practitioners and therapists should employ techniques that discourage belief and feeling that one actually control or interpret outcomes when handling gambling clients.

Second, our findings demonstrate that the belief that one can predict gambling outcomes was a protective factor against gambling intention - has good potential to decrease willingness to place bets. Thus, it should be included in the cognitive model of treatment and intervention packages. This finding portrays the reactions of youth gamblers during gambling sessions. Believing that one has the ability to correctly predict gambling outcomes enables him to play sparingly. Therefore, we suggest that since predictive control was associated with less intention to place gambling bets, therapists should employ techniques that encourage youths to believe that losses are more likely to occur than wins in gambling.

Finally, this study contributes to a better understanding of why youths are at risk of developing gambling addiction following series of losses. From the viewpoint of controlling gambling initiation and onset, it is important to develop interventions that educate youths on the randomness and probabilistic nature of outcomes and that it does not follow procedural processes of mastery skills. Although, gamblers tend to believe that they could successfully predict outcome of games, practitioners should encourage them that, it is healthier to predict that one is more likely to lose a bet in than win it. This technique protects the individual from engaging in frequent gambling behaviour.

Limitations and suggestions for future research

Though, standardized measures of erroneous gambling-related cognitions and its inherent roles in gambling intention is here established, there are a number of methodological issues that should be put into consideration when interpreting the findings. For example, one limitation of the present study is that we measured gambling intention with the BIGIS. This instrument has not been previously and/or widely used on *bet9ja* gambling intention. We suggest a specific internet gambling intention scale as a more plausible option for measuring gambling intention of youths in future studies.

Another limitation concerns the measurement of erroneous gambling-related cognition. The present study focused on the three dimensions of gambling cognition (illusion of control, interpretative bias and predictive control) that seem more notable during gambling sessions. Although, this choice seems worthwhile as an in-road study into cognitive correlates of gambling in Nigeria, we suggest that future studies should extend the instrument to cover a wider spectrum of gambling cognition components including, for example, belief in luck, expectancy and perceived inability to stop gambling.

Furthermore, our data is cross-sectional and, hence, no causality and directionality inferences can be made on their relationship. For example, erroneous gambling-related cognition may be a result and/or an antecedent of a youth gambling intention (or vice versa). Thus, the controversy of causality continues, a call for controlled or longitudinal research is therefore needed to clarify the directionality of the relationship existing between erroneous gambling-related cognition and gambling intentions. Finally, all data were based on self-report. Therefore, the results may have been influenced by the common method bias (Podsakoff et al. 2003). A controlled research design could in the future control this bias.

Conclusion

The principal conclusion of the study is that cognitive variables are important covariates of youth gambling intention. In particular, youth gambling intention was positively associated with illusion of control and interpretative bias, but, associated negatively with predictive control. This has implications for gambling initiation, prevention and treatment. Treatments, such as cognitive behavioural therapy (CBT) and the solution focus therapy (SFT), which regards gambling intention as a function of erroneous cognition, may be particularly relevant in this regard. Our results indicate that the inclusion of cognitive factors may be an important success factor in the prevention of intents to gamble. Finally, exploring this assumption could present an interesting avenue for subsequent research.

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