Conference Paper

The Impact of Perceived Lottery Knowledge on Problem Lottery Playing: A Moderated Mediation Model

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Abstract

The study explored the mechanism of perceived lottery knowledge in predicting problem in lottery playing through a Moderated Mediation Model centering on overconfidence. A total of 972 Chinese football bettors from nine provinces completed a questionnaire survey. The result showed that: (1) perceived lottery knowledge could positively predict problem lottery playing; (2) perceived lottery knowledge influenced problem lottery playing directly and indirectly through overconfidence; (3) risk perception moderated the mediated path. The indirect effect was stronger for football bettors with low-risk perception than for those with high-risk perception. Implications of consumption and intervention for problem lottery players were discussed.

Keywords: football bettors, problem lottery playing, perceived lottery knowledge, overconfidence, risk perception

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1. Introduction

Football lottery has the characteristics of high appreciation, unpredictability of sports tournament, entrainment and simulation of lottery (Li Hai, 2009). The rapid development of football games and football lottery has brought many adverse effects. Previous studies have shown that football players have more cognitive bias and lottery playing problems than other types of gambling (Jolls & Sunstein, 2006; John, 2009).

Perceived lottery knowledge can affect problem lottery playing. The self-perception of people who buy lottery tickets is perceived lottery knowledge. Compared with the traditional lottery, the guessing results of football lottery is related to the information of the football match, such as team status, the coach's teaching ability, player technology and the experience of the competition (Mao, Zhang & Connaughton, 2014). People who

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buy football lottery generally think that they are "experts" in the field of football, and think they have grasped the relevant knowledge of football. At the same time, with more intense emotional experience (Mao & Zhang, 2014), they tends to invest more time and money to buy football lottery (Gordon, Gurrieri, & Chapman, 2015), which is more likely to indulge in the lottery and lead to the problem playing. Khazaal's (2012) research found that football players who have more football skills and knowledge are more likely to have problems in football gambling.

Overconfidence refers to overconfidence in self judgment, overestimation of success probability and information accuracy (Xie Haidong, 2006). First, perceived lottery knowledge can affect overconfidence. Compared to other types of lottery buyers, the people who buy football lottery often are old football fans. They have their own technical routines in the process of buying lottery tickets for a long time. Such experience leads them to be prone to overconfidence in the process of buying lottery tickets. The perceived knowledge of football lottery players is reflected in their familiarity with major league matches and teams, and the subjective methods and habits they often use to analyze "handicap", "odds", "Kelly Criterion", "water level" and "the strength of team". These "knowledge" and "skills" constitute the "subjective knowledge" of football lottery players' perceived lottery knowledge. People who buy football lottery think that the more "knowledge" they know and "skills" they mastered, the more they think they are "experts" in the field, and produce a high level of overconfidence (Li, et al., 2012). Second, overconfidence can affect the problem playing. According to the cognitive theory of gambling, irrational decision-making caused by bad information processing is an important reason for the occurrence and development of gambling addiction (Sharp, 2002). Overconfidence is a bad perception of lottery buyers' probability of winning the prize in a lottery. Overconfident people who buy lottery tickets believe that they are more likely to win the prize and are more likely to produce the impulse to buy lottery tickets. This excessive purchase of lottery tickets will produce various problems playing. For example, Weiss and Loubier (2010) compared the behaviors of American retired athletes, incumbent athletes and non-athletes, they found out that retired athletes believe that they have more knowledge toward the sports they have been engaged in, and inclined to think that they can control guessing results, so as to invest more time and money, and then, the problem playing appeared. To sum up, perceived knowledge can not only directly affect the problem playing, but also influence problem playing through the indirect effect of overconfidence.

Risk perception can regulate the relationship between overconfidence and problem lottery playing. Gambling risk and protection factor model believes that protective

factors can alleviate the effect of risk factors on problem behavior, and prevent the occurrence and development of problem behavior (Dickson, Derevensky, Gupta, 2004; Luthar, Cicchetti, Becker, 2000). Risk perception is an important protective factor for problem playing (Dickson, L., Derevensky, J. L., & Gupta, 2003), which can regulate or alleviate risk factors, such as the harm of overconfidence to the individual. In particular, lottery buyers who have high risk perception can rationally recognize the probability of winning the prize, and see the possible financial crisis, delay in working time and insomnia. Then, they will relieve the impulse of buying lottery tickets caused by the cognitive deviation of overconfidence, and increase the confidence of buying lottery tickets, and then reduce the level of addiction. There are few studies on the regulation of risk perception to overconfidence and problem lottery playing, but some other studies provide indirect evidence. Spurrier (2015) interviews with lottery buyers with different degree of problems have found that risk perception can regulate the effects of motivation, cognitive bias, self-efficacy and other variables on the problem lottery playing. Canale's (2015) studies show that risk perception regulates the relationship between sensation seeking and problem lottery playing, that is, when risk perception is low, sensation seeking is significantly related to problem lottery playing.

This study proposes a mediated mediation model as shown in Figure 1.
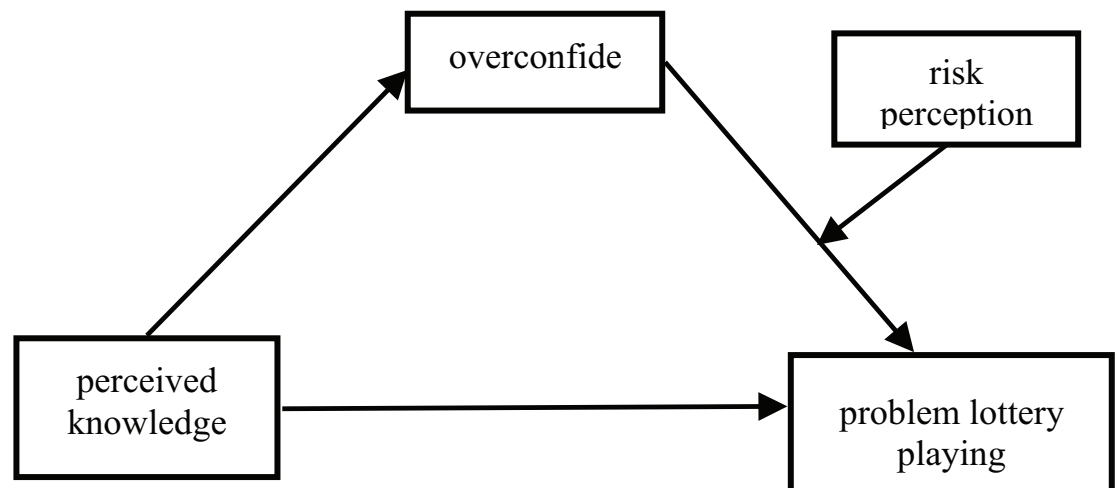

Figure 1: A hypothesis model of relationship among perceived knowledge, overconfidence, risk perception and problem lottery playing.

2. Methods

2.1. Participants

972 valid questionnaires were obtained after the invalid questionnaire was deleted. The subjects were 18~75 years old (M=37.49 years old, SD=11.2 years old), including 875 males (90%) and 97 females (10%).

2.2. Measures

Perceived knowledge scale: referring to the study of Leisa and Ronald (1999), the perceived knowledge of lottery buyers is examined through 3 questions: "I am familiar with all kinds of playing methods of football lottery". "Compared to other lottery buyers, I also count the experts in football lottery". "I know more football lottery than other lottery buyers." Using the 5 point scoring method, from "very disagree" to "very agree", there are 1-5 points respectively. The alpha coefficient is 0.80 in this study.

Problem lottery playing questionnaire: referring to the problem gambling questionnaire compiled by Ferris and Wynne (2001), which is used to measure the severity of problem gambling. The questionnaire contained 9 questions, such as "I always thinking about winning money after losing money". Using the 5 point scoring method, from 1 (never) to 5 (always), the subjects were asked to answer their own lottery situation in the past 12 months. The alpha coefficient is 0.88 in this study.

Overconfidence: referring to the study of Zhou's research (2012), the overconfidence level of lottery buyer is examined through one questions: "if there are 100 lottery buyers, please estimate that the chance of winning the prize will exceed how many lottery buyers (between 0-99)?."

Risk perception: Referring to Shu(2010), risk perception level is examined through one question: "lottery tickets buying is risky." The five point scoring method was used to score 1-5 points from "very disagree" to "very agree".

2.3. Data analysis

In this study, SPSS20.0 was used for all statistical analysis.

3. Results

3.1. Descriptive statistics and correlation analysis of variables

The correlation matrix of the variables was shown in Table 1. Perceived lottery knowledge, problem playing and overconfidence are positively correlated with each other. Risk perception is negatively related with other variables.

TABLE 1: Mean, standard deviation and Pearson correlation coefficient of the variables (n=972).

	M	SD	1	2	3	4	5	6
1.Gender	1.1	0.30	1.00					
2.Age	37.49	11.22	-0.03	1.00				
3.Perceived lottery knowledge	4.01	0.72	-0.09**	0.09**	1.00			
4.Problem lottery playing	3.46	0.62	-0.09**	-0.04	0.22***	1.00		
5. Risk perception	3.53	0.71	-0.04	0.08[2)]	0.18***	-0.12***	1.00	
6. Overconfidence	3.29	0.77	-0.11**	-0.02	0.18***	0.32***	-0.16***	1.00

3.2. The relationship between perceived knowledge and problem lottery playing: A moderated mediation model

Wen Zhonglin's (2012) studies suggests that the mediating effect model of the test needs four steps as shown in table 2. In model 1, the perceived knowledge of the football lottery buyers has a positive effect on the problem lottery playing. It shows that perceived knowledge has a promoting effect on the problem lottery playing (beta =0.25, t=7.75, p<0.001). In model 2, the perceived knowledge has a positive predictive effect on overconfidence (beta =0.20, t=6.46, p<0.001). In model 3, the overconfidence has a positive predictive effect on problem playing (beta = 0.25, t=8.01, p<0.001). The influence of perceived knowledge on problem playing is still significant (beta =0.21, t=6.65, p<0.001). It indicate overconfidence plays a mediating effect between subjective knowledge and problem playing. This reveals that perceived knowledge not only directly affects the problem lottery playing, but also has indirect effects on lottery playing through overconfidence. Suppose 1 is supported. The interaction term between overconfidence and risk perception in model 4 has a negative predictive effect on problem playing (beta =-0.09, t=-3.09, p<0. 01). Risk perception has a regulatory effect on the relationship between overconfidence and problem playing. The delta R2=0.02 of the regulation effect explains 2% of the variation, which increases the interpretation rate from 13% to 15%. Risk Perception is the moderate variable of the relationship between perceived knowledge and problem lottery playing.

TABLE 2: Model test(n=972).

	Model 1 Problem lottery playing		Model 2 Overconfidence		Model 3 Problem lottery playing		Model 4 Problem lottery Playing	
	β	t	β	T	β	t	β	t
Perceived Lottery Knowledge	0.25***	7.75	0.20***	6.46	0.21***	6.65	0.21***	6.6
Risk Perception	-0.16***	-5.15	-0.20***	-6.19	-0.13***	-4.32	-0.14***	-4.14
Overconfidence					0.25***	8.01	0.23***	7.58
Overconfidence * Risk Perception							-0.09*	-3.09
Gender	-0.08*	-2.43	-0.10*	-3.05	-0.05	-1.77	-0.05	-1.61
Age	-0.05	-1.57	-0.02	-0.74	-0.05	-1.52	-0.04	-1.39
R^2	0.08		0.08		0.13		0.15	
F	21.42***		20.16***		31.08***		27.72***	

In order to further explore the moderating effect of risk perception on the relationship between overconfidence and problem playing. We took Z score of risk perception as 0 and positive and negative 1 respectively, and plotted the interaction effect diagram. From Figure 2, we can see intuitively how the influence of overconfidence on lottery playing is regulated by risk perception. The impact of overconfidence on problem playing can be seen from slope, which measures the as overconfidence change per standard deviation and how many standard deviations will be changed. The simple slope test shows (Dearing & Hamilton, 2006) that when risk perception is low (i.e., the standard score of risk perception is equal to -1), with the increase in overconfidence, the problem lottery playing shows a significant upward trend (β = 0.39, t=4.90, p<0.001). Overconfidence increases by one standard deviation, and the problem lottery playing increases by 0.39 standard deviations; When the risk perception is at a general level, the problem lottery playing still shows a significant upward trend (β=0.25, t=4.02, p<0.001). Overconfidence increases by one standard deviation, and problem lottery playing increases 0.25 standard deviation; When the risk perception is high (i.e., the standard score of risk perception is equal to 1), the problem lottery playing shows a significant upward trend(β=0.21, t=5.01, p<0.001). Overconfidence increases by one standard deviation, and problem lottery playing increases by only 0.21 standard deviation. Compare to the less risk perception, the increase is reduced by nearly half. The indirect effect of perceived knowledge on problem lottery playing through overconfidence diminishes with the increasing risk perception.
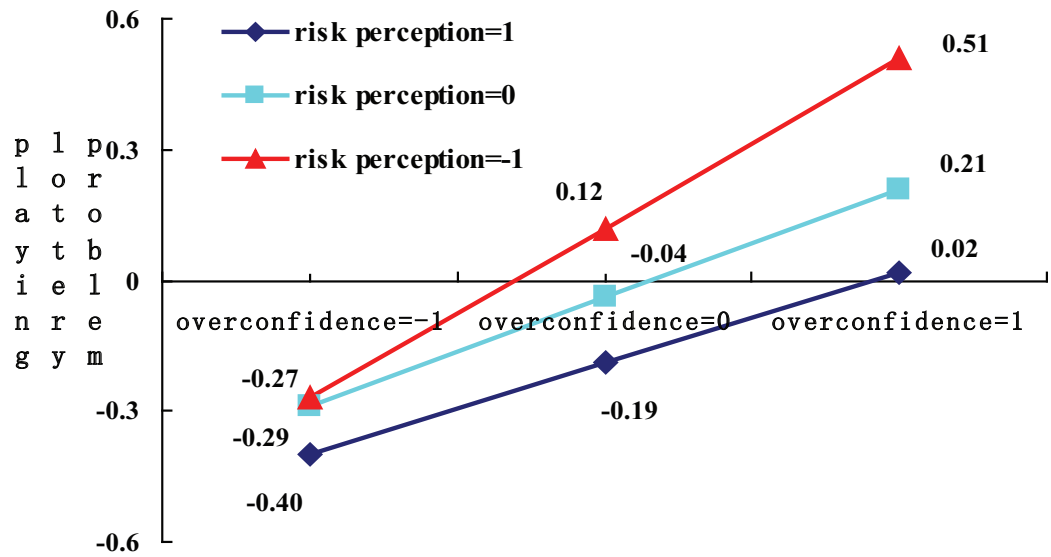
4. Discussion

Figure 2: The adjustment of risk perception to the relationship between overconfidence and problem lottery playing.

4.1. The relationship between perceived knowledge and problem lottery playing

The football lottery players with high perceived knowledge are prone to have capital problems during the lottery buying process. Football lottery buyers have rich experience in buying lottery, and the comprehensive money return rate of football lottery is usually around 60-70%, so most of lottery buyers will inevitably face some certain economic losses after a long time purchase. After a large number of lottery input (funds, energy, emotion, etc.), it is likely to produce a series of negative consequences, which will have a certain harmful effect on the football lottery buyer themselves, their family and society. Earlier interviews found that 10 of the respondents were all exposed to the harm of buying lottery, and more than half of the respondents scored more than 5 points, or even three people reached the highest level of 7.

4.2. The mediating effect of overconfidence

Compared with other gamblers, people who play sports betting usually think that they know football very well. Many of them believe that the odds of predicting the winning or losing of a football match are higher than others (Towfigh & Glockner, 2011), and show overconfidence toward lottery. When the perceived knowledge of the football lottery buyers reaches a certain degree, it may lead to a variety of cognitive deviations,

such as overconfidence and control illusion. Researchers found overconfidence in people with gambling addiction (Goodie, 2005). With the increase of lottery playing skills, the confidence and perceptual control of football lottery playing are increasing, which shows obvious overconfidence and control illusion (Moore & Small, 2007). Towfigh and Glöckner (2011) pointed that the accumulation of gambling knowledge would causes football lottery buyers' overconfidence and control hallucinations, which increased problem lottery playing.

4.3. The moderating role of perceived risk

Some researchers have explored the interaction between risk factors and protective factors of lottery buyers. Tian (2014) found that lottery reject self-efficacy's negative regulating effect on the relationship between gambling cognition and problem lottery playing, which has a protective effect on lottery purchase. Xiaofei Xie (2013) pointed out that when people perceive a high-risk situation information, they tend to choose to reduce risk. The perceived risk of football lottery buyers is mainly embodied in money, time and body. People who have high perceived risk can rationally recognize the probability of winning the lottery, and see the negative consequences, such as financial crisis, the delay of working time and insomnia. When the football buyers have a higher perceived risk, they will take a certain self-protection strategy in the process of buying, and avoid overconfidence and excessive purchase of lottery, so there will be less problem playing. When the perceived risk is low, the overconfidence caused by the perceived knowledge of the football lottery buyers will be transformed into excessive lottery buying, and then the problems of health, funds and other problems will emerge and become the problem lottery playing. We should improve the awareness of the perceived risk of the football lottery buyers, alleviate their buying impulse caused by the cognitive bias of overconfidence and return, and increase the confidence of rational control, and then reduce the appearance of the problem playing.

5. Conclusion

The following conclusions are obtained in this study: (1) football lottery buyers' perceived knowledge has a significant positive predictive effect on problem lottery playing; (2) overconfidence plays a mediating role between perceived knowledge and problem playing; (3) the mediating effect of overconfidence is regulated by perceived

risk. The effect of overconfidence on problem playing is reduced with the increase of perceived risk.

References

[1] Hai Li, Hui Ma, Xiaofei Lou, Dongfeng Liu,& Shurui Chen. (2009). The Necessity and Feasibility of Issuing Guessing Type Horse Lottery in China. *Journal of Shanghai Physical Education Institute. 33*(2), 1-5.

[2] Hui Sang. (2011). The Influence of Perceived Knowledge and Customer Satisfaction on Customer Loyalty. *Journal of Beijing Jiaotong University(Social Science). 10*(1), 84-88.

[3] Haidong Xie. (2006). An Analysis of Company Mergers and Acquisitions Based on Overconfidence Theory. Modern finance and Economics: Journal of Tianjin University of Finance Economics, *26*(10), 37-40.

[4] Zhonglin Wen. (2012). The Analysis of Moderating Effect and Mediating Effect. Educational Science Press.

[5] Xiaofei Xie, Tianling Hu, Jing Lin, & Xi Lu. (2013). Expectation Difference: the risk communication barrier in the crisis. Advances in Psychological Science. *21*(5), 761-774.

[6] Lin Zhang, Nanjun Zhu, Yi Liu, Wendong Liu, & Qin Liu. (2003). Consumer Composition and Consumption Characteristics of Football Lottery in Shanghai. Journal of Shanghai Institute of Physical Education. *27*(4), 1-4.

[7] Hao Zhou, & Lirong Zhou. (2004). Statistical Test and Control Method of Common Method Bias. Advances in Psychological Science. *12*(6), 942-950.

[8] Brucks, M. (1985). The effects of product class knowledge on information search behavior. *Journal of Consumer Research, 12*(1), 1-16.

[9] Burnham, T. A., Frels, J. K., & Mahajan, V. (2003). Consumer switching costs: a typology, antecedents, and consequences. *Journal of the Academy of Marketing Science, 31*(2), 109-126.

[10] Canale, N., Vieno, A., Griffiths, M. D., Rubaltelli, E., & Santinello, M. (2015). How do impulsivity traits influence problem gambling through gambling motives? the role of perceived gambling risk/benefits. *Psychol Addict Behav, 29*(3), 813-823.

[11] Coie, J., Watt, N., & West, S., et al. (1993). The science of prevention. *American Psychologist, 48*, 1013–1022.

[12] Dearing, E., & Hamilton, L. C. (2006). V. contemporary advances and classic advice for analyzing mediating and moderating variables. *Monographs of the Society for Research in Child Development, 71*(3), 88–104.

[13] Dickson, L. M., Derevensky, J. L., & Gupta, R. (2002). The prevention of gambling problems in youth: a conceptual framework. *Journal of Gambling Studies, 18*(2), 97-159.

[14] Dickson, L. M., Derevensky, J. L., & Gupta, R. (2004). Harm reduction for the prevention of youth gambling problems: lessons learned from adolescent high-risk behavior prevention programs. *Journal of Adolescent Research, 19*(2), 233-263.

[15] Dickson, L. M. (2005). Youth gambling problems: the identification of risk and protective factors.

[16] Ferris, J., Wynne, H. J. (2001). The Canadian Problem Gambling Index Final Report. Canadian Centre on Substance Abuse.

[17] Flynn, L. R., & Goldsmith, R. E. (1999). A short, reliable measure of subjective knowledge. *Journal of Business Research, 46*(1), 57-66.

[18] Hai, L., Mao, L. L., Zhang, J. J., Yin, W., Li, A., & Jing, C. (2012). Dimensions of problem gambling behavior associated with purchasing sports lottery. *J Gambl Stud, 28*(1), 47-68.

[19] Goodie, A. S. (2005). The role of perceived control and overconfidence in pathological gambling. *Journal of Gambling Studies, 21*(4), 481-502.

[20] Gordon, R., Gurrieri, L., Chapman, M., Prentice, C., & Cotte, J. (2015). Broadening an understanding of problem gambling: the lifestyle consumption community of sports betting. *Journal of Business Research, 68*(10), 2164-2172.

[21] Jolls, C., & Sunstein, C. R. (2004). Debiasing through law. *Journal of Legal Studies, 35*(1), 199-241.

[22] Kahneman, D., Slovic, P., & Tversky, A. (1974). Judgment under uncertainty: heuristics and biases. *Science, 185*(4157), 1124-1131.

[23] Khazaal, Y., Chatton, A., Billieux, J., Bizzini, L., Monney, G., & Fresard, E., et al. (2012). Effects of expertise on football betting. *Substance Abuse Treatment Prevention & Policy, 7*(1).

[24] Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: a critical evaluation and guidelines for future work. *Child Development, 71*(3), 543-562.

[25] Mao, L. L., Zhang, J. J., & Connaughton, D. P. (2014). Sports gambling as consumption: evidence from demand for sports lottery. *Sport Management Review, 18*(3), 436-447.

[26] Moore, D. A., & Small, D. A. (2007). Error and bias in comparative judgment: on being both better and worse than we think we are. *J Pers Soc Psychol, 92*(6), 972-989.

[27] Oei, T. P., & Goh, Z. (2015). Interactions between risk and protective factors on problem gambling in asia. *Journal of Gambling Studies, 31*(2), 557-572.

[28] Robert Ladouceur, Isabelle Giroux, & Christian Jacques. (1998). Winning on the horses: how much strategy and knowledge are needed?. *Journal of Psychology, 132*(2), 133-142.

[29] Sharpe, L. (2002). A reformulated cognitive-behavioral model of problem gambling: a biopsychosocial perspective. *Clinical Psychology Review, 22*(1), 1-25.

[30] Shu, L., Zhou, K., Yue, S., Rao, L. L., Rui, Z., & Liang, Z. Y. (2010). Anticipated regret, risk perception, or both: which is most likely responsible for our intention to gamble?. *Journal of gambling studies / co-sponsored by the National Council on Problem Gambling and Institute for the Study of Gambling and Commercial Gaming, 26*(1), 105.

[31] Spurrier, M., Blaszczynski, A., & Rhodes, P. (2015). Gambler risk perception: a mental model and grounded theory analysis. *Journal of Gambling Studies, 31*(3), 887-906.

[32] Weiss, S. M., & Loubier, S. L. (2010). Gambling habits of athletes and nonathletes classified as disordered gamblers. *Journal of psychology, 144*(6), 507-521.

[33] Welte, J. W., Barnes, G. M., Tidwell, M. C., & Hoffman, J. H. (2009). The association of form of gambling with problem gambling among American youth. *Psychology of Addictive Behaviors Journal of the Society of Psychologists in Addictive Behaviors, 23*(1), 105-12.

[34] Wickwire, E. M., Whelan, J. P., West, R., Meyers, A., Mccausland, C., & Luellen, J. (2007). Perceived availability, risks, and benefits of gambling among college students. *Journal of Gambling Studies, 23*(4), 507-507.

[35] Zhou, K., Tang, H., Sun, Y., Huang, G. H., Rao, L. L., & Liang, Z. Y., et al. (2012). Belief in luck or in skill: which locks people into gambling?. *Journal of Gambling Studies, 28*(3), 379-391.