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Anticipated Regret, Risk Perception, or Both: Which is Most Likely Responsible for Our Intention to Gamble?

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Abstract The current study investigated whether risk aversion or regret aversion could be related to a lower intention to gamble, and whether the type of gambling was a moderator of this relationship. The study took place in Macau, often called "the Las Vegas of East Asia." A total of 373 Macau residents completed a questionnaire survey dealing with thirteen types of gambling. The results showed that risk perception and anticipated regret had a significant negative effect on the intention to gamble. This negative effect was domain-specific, varying with the type of gambling. Our findings indicated that neither risk aversion nor regret aversion can uniquely explain an individual's risk-taking tendency consistently. Instead, which factor plays a greater role in lowering the intention to gamble—regret aversion, risk aversion, or both—is itself dependent on the type of gambling involved. The finding that not all gambles are created equal could be useful in gambling prevention and advertising appeal by providing a basis for understanding the role that cognitive and emotional factors play in different types of gambling.

Keywords Risk perception \cdot Anticipated regret \cdot Intention to gamble \cdot Type of gambling \cdot Moderator effect

Introduction

"Risk perception," as a function of consequences (the dollar at risk from the purchase decision) and uncertainty (the person's feeling of subjective uncertainty that he or she

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could gain or lose from the transaction), is how people perceive and understand risks (Cox and Rich 1964). Bauer (1960) identified risk perception as an influence on consumer behavior. Since that time, the concept of risk and risk perception has become entrenched as an integral part of consumer behavior research (Cox 1967; Cox and Rich 1967; Perry and Hamm 1969; Sheth and Venkatesan 1968; Spence et al. 1970).

In the 1970s, a small group of cognitive psychologists with a background in the experimental study of decision making became very interested in investigating how people react in regard to risks (SjÖberg et al. 2004). Wide (1978) indicated that people usually show a tendency to decrease risk if they receive information that a situation involves high risk. Bazerman (1986) also pointed out that in the aggregate, risk-aversion is the dominant attitude toward risk. On the other hand, Bromiley and Curley (1992) assumed that risktaking is influenced jointly by the situation and by characteristics of the decision maker. Respondents have shown different degrees of risk-taking between different decision domains including games of chance/gambling, financial investing, business decisions, and personal decisions (MacCrimmon and Wehrung 1986, 1990). Personal decisions can be further broken down into categories that differ in content and thus in familiarity and controllability, variables known to affect risk perception and risk taking: health/safety decisions (seatbelt usage, smoking), recreational decisions (sky diving versus bowling), social decisions (confronting coworkers or family members), and ethical decisions (cheating on exams, terminating a comatose family member's life support) (Slovic et al. 1986).

Empirical investigations have shown systematic individual, group, and cultural differences in perceptions of the riskiness of risky choice options (Bontempo et al. 1997; Weber 1988; Slovic 1997), and greater agreement on expected returns (Weber et al. 1992). Observed differences in risk perception tend to be in the direction and of the magnitude to account for observed individual and group differences in risk taking, without requiring any assumptions about differences in attitude towards risk as it is perceived (Weber 1998). In other words, after accounting for differences in the perception of the riskiness of choice alternatives, perceived-risk attitude (the value of coefficient b, i.e. people's willingness to select an alternative with a particular level of risk) has shown considerable cross-group and cross-situational consistency (Weber 1998). Likewise, Kahneman and Tversky (1979) suggested that people have an

S-shaped utility function which is risk averse for losses and risk seeking for gains.

While the vast majority of these studies focus on cognitive factors in decision making, a growing body of research emphasizes the importance of emotion in decision making. In the past decades, research into the relationship between emotion and decision making has focused on the anticipated emotions (Bell 1982; Loomes and Sugden 1982; Savage 1951, 1954). Anticipated emotions are typically not experienced in the immediate present but are expected to be experienced in the future. These emotions, including the disappointment or regret that might arise from counterfactual comparisons, are a component of the expected (Loewenstein et al. 2001).

Originally, Savage (1951, 1954) proposed a 'minimax regret principle' for decision making under uncertainty (that is, when possible outcomes can be specified but their probabilities cannot). This principle seeks to minimize the possible post-decisional regret for having chosen the relatively worse option. The idea is that decision makers are more likely to choose the option with the smallest maximum possible regret. Bell (1982) and Loomes and Sugden (1982) explicitly incorporated the anticipatory aspects of regret into their model of decision making, called "regret theory." In this

action-based theory, the utility of a choice option additionally depends on the feelings evoked by the outcomes of rejected options. People compare the actual outcome with what the outcome would have been if a different choice had been made, and experience emotions as a consequence. People experience regret when the foregone outcome would have been better, and rejoicing when the foregone outcome would have been worse. These emotional consequences of the decisions are furthermore anticipated and taken into account when making decisions in situations of uncertainty. Thus, the tendencies to avoid negative post-decisional emotions such as regret, disappointment, and selfrecrimination and to strive for positive feelings and emotions such as rejoicing, elation and pride are assumed to be important determinants of individual decision making (Zeelenberg et al. 1996).

The potential importance of anticipated regret is evidenced in the early development of modern risky choice literature. Ritov and Baron (1990) argued that anticipated regret explained why participants refused a (hypothetical) vaccination with a slight chance of fatal side effects, despite the incomparably higher death rate posed by the disease. Bar-Hillel and Neter (1996) found that anticipated regret from giving up a winning lottery ticket decreases people's willingness to exchange their original lottery ticket for a new one, even if the new ticket yields an objectively greater expected return. In a comprehensive study of the Dutch postcode lottery, Zeelenberg and Pieters (2004) showed that the regret people expected to feel if they decided not to play and discovered that their neighbor had won significantly contributed to their intention to participate in the lottery in the near future. Tochkov (2009a) reported that problem gambling was associated with the choice of the risky gamble in both risky feedback conditions and safe feedback conditions indicating less sensitivity to anticipated regret. Studies in cognitive neuroscience also provide evidence for regret aversion. Patients with lesions of the orbitofrontal cortex do not report regret and do not anticipate negative consequences of their choices (Camille et al. 2004). Follow-up studies with fMRI techniques corroborated the role of the orbitofrontal cortex in the experience of regret (Coricelli et al. 2005).

Several studies (Josephs et al. 1992; Richard et al. 1996; Simonson 1992) have shown that anticipated regret forces participants toward the safe option, showing risk-aversion. However, Zeelenberg et al. (1996) argued that participants always tend to make regret-minimizing choices rather than risk-minimizing choices. That is, people make choices to minimize their possible future regret, and these choices can be either relatively risk-seeking or relatively risk-avoiding.

Although researchers have done much work in this area, it seems that there is still no consensus on many basic questions. Whether a decision maker is risk averse or regret averse, and whether regret aversion results in higher risk aversion are open to question and require further investigation. With this background in mind, our study probes how gambling behavior, which could be conceptualized as a risky behavior, relates to risk perception and anticipated regret. Quickly becoming "the Las Vegas of East Asia," Macau's highly developed casino gambling industry provides a rich research environment for the study of gambling. The current study was conducted at Macau University of Science and Technology, and explored the relationships between risk perception, anticipated regret, and intention to gamble. It was predicted that risk perception and anticipated regret would negatively effect the intention to gamble, and that this effect would be domain-specific, meaning that it would be moderated by the type of gambling.

Methods

Participants

An opportunity sample of 373 participants was included in this study. All participants were from the School of Continuing Studies and the Faculty of Management and Administration at Macau University of Science and Technology, and ranged in age from 18 to 55 (78.3% being 18–25 years old). Of the 358 participants who disclosed their gender, 219 were females and 139 were males. Most of our participants were part-time students, and came from diverse backgrounds. In this sample, 130 participants held part-time jobs, while 243 did not. Of those with part-time jobs, 40% (52/130) work in the gambling industry. This is fairly representative of the overall employment structure of Macau.¹ These participants were all healthy volunteers and were given a small gift (worth approximately 5 Macau Pataca) for their participants. Participants' demographic characteristics are presented in Table 1.

Materials

A questionnaire was designed by using a 5-point Likert-scale to measure participants' risk perception of gambling, anticipated regret over losing, and intention to gamble across 13 types of gambling. These types were presented in the following order: Fantan, Baccarat, Greyhound racing, Cussec, Football lottery, Paikao, Horse racing, Blackjack, Roulette, Chinese lottery, Mahjong, Stud poker, and Slot machines. For each type of gambling, three rating questions were used to assess risk perception, anticipated regret, and intention to gamble, separately. The questions are as follows:

- How likely would you be to bet your daily income on each game? (1 = not at all, 5 = very much)
- How much regret would you feel if you lost your daily income by gambling on each game? (1 = not at all, 5 = very much)
- How risky do you perceive betting on each game to be? (1 = not at all risky, 5 = extremely risky)

The questions were interspersed among other questions, which measured dialectical thinking, adding up to a lengthy questionnaire. There were also some general demographic items embedded, including gender, age, and occupation.

Procedure

Before participants were asked to answer these and other questions, oral informed consent was obtained from them. They were assured that their answers would be kept confidential, and it was emphasized that their lecturers would not know how they responded. To increase anonymity, the participants were surveyed in large groups (approximately 20–30),

¹ The Statistics and Census Service released results of the Employment Survey for the third quarter of 2008. Analyzed by industry, a large portion of the employed population was engaged in recreational, cultural, gaming and other services (24.2%) or hotels, restaurants and similar activities (12.7%). Please refer to the DSEC web site for detailed information (http://www.dsec.gov.mo/Statistic/LabourAndEmployment/EmploymentSurvey2008Q3.aspx?lang=en-US).

Table 1 Demographics of the participants (N = 373)

Variable	Percentage (n			
Gender				
Female	58.7% (219)			
Male	37.3% (139)			
Not disclosed	4.0% (15)			
Age				
18-25 years	78.3% (292)			
26-35 years	10.7% (40)			
36-45 years	3.2% (12)			
46-55 years	0.8% (3)			
Not disclosed	7.0% (26)			
Work part-time or not				
Yes	34.9% (130)			
No	65.1% (243)			
The occupation distribution of part-time jobs				
Gaming and associated services	40% (52)			
Industry and commerce	38.5% (50)			
Professional, such as doctors, lawyers, etc.	12.3% (16)			
Civil servants	3.8% (5)			
Self employed	2.3% (3)			
Not disclosed	3.1% (4)			

and the questionnaire was administered anonymously. Once participants completed the survey, they were thanked and debriefed.

Results

Risk Perception and Anticipated Regret as Predictors of Intention to Gamble

For each participant, three mean scores were calculated separately, for the total of 13 types of gambling: intention to gamble, anticipated regret, and risk perception. The descriptive statistics and Pearson correlations between risk perception, anticipated regret and intention to gamble are shown in Table 2. Anticipated regret was positively correlated with risk perception (r = 0.402, p < 0.01). Higher risk perception and anticipated regret were related to a lower intention to gamble (r's = -0.198, -0.168, p < 0.01, respectively). However, these correlations were relatively low. This may be due to other variables that

Table 2 Descriptive statistics and correlation matrix for the relationship between risk perception, anticipated regret and intention to gamble (N = 373)

	М	SD	Anticipated regret	Risk perception		
Anticipated regret	3.439	1.322				
Risk perception	3.462	0.731	0.402**			
Intention to gamble	2.254	0.930	-0.168**	-0.198 * *		

** p < 0.01

might have influenced the relationship between risk perception/anticipated regret and the intention to gamble. A multivariate linear stepwise regression analysis, using the original scores for each gambling type and of each participant, revealed that anticipated regret, risk perception, and the type of gambling were the significant predictors of intention to gamble, together explaining 9.9% of the total variance. Relatively speaking, anticipated regret was more predictive than the other two, explaining 6.2% of the variance alone.

In order to explore the relationship further, we divided the data into groups based on the types of gambling, so that we could examine the correlations between risk perception, anticipated regret and intention to gamble in each type of gambling. The results indicate significant positive relationships between risk perception and anticipated regret in each type of gambling. That is, participants with higher risk perception of gambling tended to anticipate more regret for losing their daily income from it. Risk perception and anticipated regret were significantly correlated with the college students' intention to gamble in twelve types of gambling except Paikao. That is, participants who reported higher risk perception and more anticipated regret were less likely to engage in all of the following types of gambling: Fantan, Baccarat, Greyhound racing, Cussec, Football lottery, Horse racing, Blackjack, Roulette, Chinese lottery, Mahjong, Stud poker, and Slot machines (see Table 3).

Gambling	Gambling gross revenue (MOP million) ^a	М	SD	Risk perception and anticipated regret	Anticipated regret and intention to gamble	Risk perception and intention to gamble	
Fantan	925	1.76	1.207	0.313**	-0.188**	-0.146**	
Baccarat	67437	2.53	1.403	0.300**	-0.219**	-0.188**	
Greyhound racing	576	1.81	1.227	0.256**	-0.157**	-0.142**	
Cussec	11141	2.85	1.441	0.210**	-0.187^{**}	-0.105*	
Football lottery	2189	2.34	1.387	0.290**	-0.188**	-0.161**	
Paikao	587	1.62	1.126	0.246**	-0.038	-0.053	
Horse racing	4547	1.91	1.331	0.276**	-0.169**	-0.119*	
Blackjack	9093	2.59	1.391	0.284**	-0.245^{**}	-0.195^{**}	
Roulette	1673	2.20	1.351	0.176**	-0.131*	-0.262^{**}	
Chinese lottery	34	1.92	1.255	0.321**	-0.153**	-0.284**	
Mahjong	_ ^b	3.02	1.546	0.370**	-0.253**	-0.312**	
Stud poker	3106	2.13	1.293	0.271**	-0.135**	-0.165 **	
Slot machines	13426	2.63	1.368	0.239**	-0.269**	-0.190**	

Table 3 Actual gambling gross revenue, descriptive statistics of intention to gamble, and correlations for the relationship between risk perception, anticipated regret and intention to gamble (N = 373)

^a The gross revenue from different gaming activities in 2003–2008 reported by the Gaming Inspection and Coordination Bureau of the Macao Special Administrative Region (Please refer to the DICJ web site for detailed information, http://www.dicj.gov.mo/EN/index.htm)

^b Mahjong was excluded because it is mainly played by friends and family members at home rather than in a casino

* p < 0.05, ** p < 0.01

As seen from the data in Table 3, the correlations between risk perception/anticipated regret and intention to gamble were probably different from one type of gambling to the other. The lowest correlation (r = -0.038, p > 0.05) between anticipated regret and intention to gamble was found in Paikao, which did not reach a statistically significant level, while the highest significant correlation (r = -0.269, p < 0.01) was observed for Slot machines. The lowest correlation (r = -0.053, p > 0.05) between risk perception and intention to gamble was also found in Paikao, again not reaching a statistically significant level, whereas the highest (r = -0.312, p < 0.01) was observed for Mahjong. This indicates that the type of gambling might be a moderator of the effects of risk perception and anticipated regret on the intention to gamble. More precisely speaking, the relationship between risk perception/anticipated regret and intention to gamble might be different from one type of gambling to another, and thus is likely to be domain-specific. To test this hypothesis, the moderator effect of the gambling type was evaluated by using multiple regression analyses.

Testing the Moderator Effects of Gambling Type on the Relationship between Risk Perception and Intention to Gamble

Following Frazier et al. (2004), we created an interaction term, which is the product of gambling type (dummy coded) and the risk perception measure (*z*-scored). Then we regressed the intention to gamble on the gambling type code and the *z*-scored risk perception measure in the first step and the interaction between the gambling type and risk perception measure in the second step. The output is presented in Table 4.

A significant change in R^2 between the two steps indicates a significant interaction (Pedhazur 1982). As the output in Table 4 shows, the R^2 change associated with the interaction term was 0.006, reaching a statistically significant level ($\Delta F = 2.544$, p < 0.01). This means that there was a significant interaction between risk perception and gambling type.

Testing the Moderator Effects of Gambling Type on the Relationship between Anticipated Regret and Intention to Gamble

Next, we recoded the gambling type using dummy coding and standardized the anticipated regret variable in the first instance, and then created the interaction term, (the product of the gambling type code and the *z*-scored anticipated regret measurement), so that we could test the moderator effects. In a multiple regression equation predicting intention to gamble, anticipated regret and gambling type were entered into the equation first. Then the interaction term was entered in the second step. The output is presented in Table 5.

Table 4 Testing moderator effects of gambling type on the relationship between risk perception and intention to gamble using multiple regression (N = 373)

Step and	l variable	R^2	Adjusted R^2	ΔR^2	ΔF
Step1	Gambling type and risk perception (z-score)	0.123	0.121	0.123	52.155***
Step2	Gambling type \times risk perception	0.129	0.124	0.006	2.544**

Step and variable		R^2	Adjusted R^2	ΔR^2	ΔF	
Step1	Gambling type and anticipated regret (z-score)	0.123	0.121	0.123	52.141***	
Step2	Gambling type \times anticipated regret	0.128	0.123	0.005	2.131*	

Table 5 Testing the moderator effects of gambling type on the relationship between anticipated regret and intention to gamble using multiple regression (N = 373)

* p < 0.05, *** p < 0.001

The results of the moderation analysis are shown in Table 5. There was a significant interaction between anticipated regret and gambling type ($\Delta R^2 = 0.005$, $\Delta F = 2.131$, p < 0.05).

In order to interpret the meaning of the interaction, it was necessary to explore it further. Therefore we divided the data into groups based on the types of gambling to examine the relationship between risk perception/anticipated regret and intention to gamble in each type by multivariate regression analysis. The output is shown in Table 6.

Table 6 indicates that in the three types of Fantan, Cussec, and Horse racing, the regression coefficient was significant for anticipated regret (β 's = -0.158, -0.173, -0.147, p < 0.01, respectively) but was not significant for risk perception (β 's = -0.097, -0.069, -0.078, p > 0.05, respectively). This means that it was not risk perception but anticipated regret that was a negative significant predictor of intention to gamble. That is, participants' unwillingness to bet on Fantan, Cussec, and Horse racing was not due to risk aversion but to regret aversion. In Baccarat, Greyhound racing, Football lottery, Blackjack, Mahjong, and Slot machines, the regression coefficients were significant for both anticipated regret (β 's = -0.179, -0.129, -0.154, -0.206, -0.159, -0.237, p < 0.05, respectively) and also risk perception (β 's = -0.135, -0.109, -0.117, -0.137, -0.253, -0.134, p < 0.05, respectively). In other words, participants who reported more anticipated regret and higher

Gambling	Anticipated regret				Risk perception				F	Sig
	В	β	t	Sig	В	β	Т	Sig		
Fantan	-0.117	-0.158	-2.955	**	-0.108	-0.097	-1.810		8.511	***
Cussec	-0.172	-0.173	-3.315	**	-0.091	-0.069	-1.322		7.627	**
Horse racing	-0.124	-0.147	-2.771	**	-0.091	-0.078	-1.468		6.534	**
Baccarat	-0.165	-0.179	-3.384	**	-0.166	-0.135	-2.550	*	12.692	***
Greyhound racing	-0.098	-0.129	-2.442	*	-0.110	-0.109	-2.058	*	6.833	**
Football lottery	-0.137	-0.154	-2.901	**	-0.141	-0.117	-2.198	*	9.252	***
Blackjack	-0.191	-0.206	-3.960	***	-0.192	-0.137	-2.624	**	15.473	***
Mahjong	-0.154	-0.159	-3.028	**	-0.342	-0.253	-4.813	***	24.983	***
Slot machines	-0.217	-0.237	-4.646	***	-0.148	-0.134	-2.617	**	18.156	***
Roulette	-0.074	-0.088	-1.725		-0.288	-0.246	-4.839	***	15.140	***
Chinese lottery	-0.055	-0.069	-1.320		-0.289	-0.261	-4.976	***	17.126	***
Stud poker	-0.082	-0.097	-1.830		-0.169	-0.139	-2.617	**	6.901	**
Paikao	-0.018	-0.027	-0.500		-0.047	-0.046	-0.863		0.642	

Table 6 Summary of multivariate regression predicting intention to gamble in each type of gambling (N = 373)

* p < 0.05, ** p < 0.01, *** p < 0.001

risk perception of these six types of gambling are less likely to engage in them. This means that participants, who were unwilling to bet on Baccarat, Greyhound racing, Football lottery, Blackjack, Mahjong, and Slot machines, are both regret averse and risk averse. In Roulette, Chinese lottery, and Stud poker, the regression coefficient was significant for risk perception (β 's = -0.246, -0.261, -0.139, p < 0.01, respectively) but was not significant for anticipated regret (β 's = -0.088, -0.069, -0.097, p > 0.05, respectively). That is, the more risk averse the participants are, the less likely they are to bet on Roulette, Chinese lottery, and Stud poker, while anticipated regret is not a factor. Finally, the regression coefficient was not significant for either anticipated regret or for risk perception (β 's = -0.027, -0.046, p > 0.05) in the case of Paikao. This indicates that risk perception and anticipated regret are not responsible for the likelihood of participating in Paikao.

Discussion

In this study we explored whether risk aversion or regret aversion could be related to a lower intention to gamble, and whether the type of gambling would moderate the relationship between risk perception/anticipated regret and the intention to gamble among a sample of 373 college students in Macau. With 130 participants holding part-time jobs, and 40% (52/130) of these serving in the gambling industry, the sample is fairly representative of the employment structure of Macau. Within this representative sample, risk perception and anticipated regret were found to have a significant negative effect on the intention to gamble. This finding generally indicates that both risk aversion and regret aversion can be observed in decision making. The higher the risk perception people have, the less likely they are to engage in risky behavior. Moreover, the emotional consequences of decisions are anticipated and taken into account when making decisions under uncertainty. Thus, the tendency to avoid negative post-decisional emotions such as regret, disappointment, and self-recrimination is assumed to be an important determinant of individual decision making (Zeelenberg et al. 1996).

Interestingly, the results of the present study showed that not all gambles are created equal. The negative effects of risk perception and anticipated regret on the intention to gamble were domain-specific. Participants have not shown themselves to be consistently risk averse or regret averse across different gambling categories. In the first category domain, which included Fantan, Cussec, and Horse racing, it was regret aversion that was responsible for participants' unwillingness to bet. In the second domain of Roulette, Chinese lottery, and Stud poker, it was risk aversion that was responsible for the lower intention to gamble. In the third domain, which included Baccarat, Greyhound racing, Football lottery, Blackjack, mahjong, and Slot machines, both regret aversion and risk aversion worked together to lower participants' intention to gamble. In the fourth domain, Paikao, neither risk aversion nor regret aversion was responsible for participants' unwillingness to bet. A potential concern with these results is that the relationships between risk perception/anticipated regret and intention to gamble in these four different domains differ as the result of factors other than the variables tested in the experiment alone.

These results indicate that neither risk aversion nor regret aversion can consistently explain an individual's risk-taking tendencies in gambling. Whether it is regret aversion, or risk aversion, or both that is responsible for the low intention to gamble depends itself on which game they are playing. These findings probably indicate that these two accounts (risk aversion/regret aversion) may have their own realm of validity. In which domain is the risk aversion or regret aversion account applicable? Finding answers to this question might be useful for achieving a more comprehensive theory that incorporates the strengths of each of these two accounts. Further understanding of the individual's risk-taking tendencies might involve complementing the analysis with a 'systemic' view, which takes into account all risk domains.

According to the statistics presented by the Gaming Inspection and Coordination Bureau of the Macao Special Administrative Region, the gross revenues from Baccarat, Slot machines, Cussec, Blackjack, and Horse racing in 2003–2008 were relatively higher than other types of gambling (see Table 3). In the present study, we found that participants' intentions to gamble are relatively higher in Mahjong, Cussec, Slot machines, Blackjack, and Baccarat (see Table 3). These two ranking orders are to some extend consistent with each other (tau (11) = 0.55, p = 0.01 for Kendall rank correlation analysis excluding Mahjong, which is generally played at home rather than in a casino). This has helped add credibility to the results of our study.

It should also be mentioned that Macau's gambling receipts increased by 22% in 2006 to reach 55.9 billion patacas (\$6.95 billion), placing Macau just ahead of the Las Vegas strip, previously the global leader (A report from The Economist, Jan 25th, 2007). Nevertheless, it was also reported that Macau residents are not as keen on gambling as commonly assumed (Sun and Li 2005; Chen 2003). Whether the domain-specific findings from this particular sample collected from this particular place have more practical applications is an interesting topic worth exploring further in the future.

This study gives us a preliminary idea of the roles of risk perception and anticipated regret as predictors of intention to gamble in different gambling types. The results of this pilot study might be useful in gambling prevention. A previous study (Richard et al. 1996) has suggested that the anticipation of regret proceeding from gambling outcomes could serve as a natural inhibitor to continuous gambling. In a recent study, Tochkov (2009a, b) proposed that less regret or the poor anticipation of regret might contribute to excessive gambling and thus need to be addressed in cognitive treatments of problem gambling. In light of our findings, we suggest that both anticipated regret and risk perception should be addressed in gambling prevention. However, whether prevention is best served by enhancing anticipated regret, or increasing awareness of the risks of gambling, or both, depends itself on the gamble involved. Specifically, enhancing people's anticipated regret might be a better way to discourage them from betting on Horse racing, whereas increasing their awareness of the risks of gambling could work better for dissuading them from playing Roulette. We suggest that these recommendations can serve as guidelines for public service advertising. It is also hoped that these strategies can be used as references by both local and international organizations, such as the Yat On Center (in Macau), Gestao Financeira e Jogo Finanical Management and Gambling (in Macau), Gamblers Anonymous, the International Center for Youth Gambling Problems and High-Risk Behaviors, etc.

Additionally, our findings might be useful for advertising appeal by providing a basis for understanding the roles that cognitive and emotional factors play in different kinds of gambling. We suggest that, in advertising campaigns, the domain of gambling category should also be considered. For instance, Chinese lottery advertising should take into account people's risk aversion, which is the major factor in keeping them from playing. For Horse racing advertising, on the other hand, how to minimize regret aversion should be more strongly considered. These findings can be used to accelerate the development of the gambling industry.

The results of our study should be considered as exploratory. Several improvements can be expected in future research. First, the present study was conducted by assessing reactions to thirteen types of gambling. These types include both strategic gambles that are influenced by a level of skill and non-strategic gambles that are not affected by skill. Participants' perceived 'skill' at the strategic gambling might have effects on the intention to gamble, risk perception, and anticipated regret, while the perceived 'skill' at non-strategic gambling might have little or no effect. Thus, future studies measuring the respondent's perceived skill may shed additional light on the role of domain-specificity in moderating the effects of risk perception and anticipated regret on intention to gamble. Second, it should be noted that what we measured was intention to gamble, but not actual gambling gross revenue, the possible discrepancy between behavioral intention and actual behavior might limit the generalizability of our results to real-world settings. Future research should thus focus on investigating the relationships between risk aversion/regret aversion and gambling behavior in more natural settings. A worthwhile avenue would be to administer the questionnaire to pathological gamblers before, during, and/or after actual gambling.

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