



Stressful Life Events and Problem Gambling Among Chinese Lottery Gamblers: The Mediating Effects of Coping Strategies and Magical Thinking

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Abstract

Problem gambling poses serious harm to individuals and societies worldwide. This study aims to investigate the relationship between stressful life events and problem gambling, and further explore the mediating role of coping strategies and magical thinking. Currently, the research on problem gambling is widely conducted worldwide. However, due to the unique characteristics of China's gambling industry, research on problem gambling conducted in the Chinese mainland has always been an underrepresented area in international gambling research. This study recruited participants from a province in central China, and data from 483 of them were ultimately analyzed. The data analysis results indicate that task-oriented coping, emotion-oriented coping, avoidance-oriented coping, and magical thinking all serve as mediators in the relationship between stressful life events and problem gambling. Emotion-oriented coping and magical thinking, avoidance-oriented coping and magical thinking, all serve as serial mediators in the relationship between stressful life events and problem gambling. Task-oriented coping and magical thinking did not act as serial mediators in this relationship. This study demonstrates that helping problem gamblers develop effective coping strategies and reduce their level of magical thinking is crucial for treating their problem gambling.

Keywords Stressful life events · Coping strategies · Magical thinking · Problem gambling

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Introduction

Problem gambling is defined as the accumulation of adverse outcomes that impact various aspects of an individual's life, associated with their gambling behavior within a specific timeframe (Allami et al., 2021). This issue is also undergoing rapid development and progress in the Chinese mainland (Chan et al., 2019). Despite the Chinese government's prohibition on all forms of gambling except for "Chinese sports lotteries" and "Chinese welfare lotteries" (Zeng & Zhang, 2007), lottery gambling alone has brought considerable economic benefits to China. In 2015, the sales volume of the Chinese lottery reached approximately \$50 billion (Peng & Ge, 2016), and it is projected that by 2025, the sales volume of the Chinese sports lottery alone will reach approximately \$68 billion (Xu et al., 2020). Research shows that there were more than 200 million lottery gamblers in China, among whom 430,000 people exhibited serious problem gambling tendencies (Chen, 2012). Unfortunately, limited research has been conducted on this substantial population. To effectively address issues related to gambling, it is crucial to undertake thorough theoretical research on problem gamblers (Korn et al., 2003) and investigate the factors that cause problem gambling (Thurm et al., 2023). Previous research has indicated that stressful life events can predict problem gambling, nonetheless, the underlying mechanism of this relationship remains unclear (Buchanan et al., 2020). Some scholars have attempted to establish comprehensive models to explain how problem gambling arises and persists (Blaszczynski & Nower, 2002; Oei & Goh, 2015), and this study aims to build upon these studies to enhance understanding of this issue. There is evidence suggesting that magical thinking, as an irrational belief, is more prevalent among Chinese individuals (Risen, 2016). However, research on the relationship between magical thinking and problem gambling among adult gamblers is rare. Taking into account these aforementioned factors, this study will explore the predictive effect of stressful life events on problem gambling and determine the mediating role played by coping strategies and magical thinking. Additionally, previous research on Chinese gambling has mainly focused on the overseas Chinese populations, as well as individuals from Hong Kong and Macau, there is relatively limited research specifically targeting gamblers in the Chinese mainland (Fong et al., 2014; Kim et al., 2014; Tang & Oei, 2011; Tang & Wu, 2012). This limitation will be addressed in the current study by supplying a sample of gamblers from the Chinese mainland.

Stressful Life Events and Problem Gambling

People may attempt to mitigate the harm caused by stressful life events through various consumption activities (O'Guinn & Faber, 1991). However, this behavior can also lead to individual impulse consumption (Sneath et al., 2009), thereby reinforcing excessive consumption of certain products like alcohol, food and drugs (Enoch, 2011; Heatherton & Baumeister, 1991), triggering substance and behavioral addictions (Nordfjaern et al., 2010; Tang et al., 2014). Stressful life events refer to unwanted, unplanned, uncontrollable, observable events with a distinct onset and offset that often mean significant life changes (Carlson, 2014), it is more common among individuals from low-income backgrounds, ethnic minority groups, and the younger demographic (Hatch & Dohrenwend, 2007). Stressful life events are constantly changing throughout an individual's life course (Donald-Sherbourne et al., 1992; Thomas et al., 2019), and may vary in different populations (Hatch & Dohrenwend, 2007). The study found that when individuals suffer stressful life events, they

may use gambling to cope (Jacobs, 1986), which means stressful life events may be predictors of problem gambling (Thurm et al., 2023). The more stressful life events an individual experiences, the greater the likelihood of engaging in problem gambling behaviors (Wang et al., 2020). Although problem gambling can also bring a lot of life stress to individuals (Hing et al., 2014; Langham et al., 2015), several longitudinal research has shown that stressful life events can significantly predict future problem gambling (El-Guebaly et al., 2015; Luce et al., 2016; Williams et al., 2015), which provides more compelling evidence for the association between the two. Qualitative research has revealed that the psychological drive is the reason why stressful life events lead to problem gambling. Specifically, stressful life events can cause physical and psychological distress to individuals. In order to cope with this distress, some people turn to gambling as a means of distraction (Nuske et al., 2016; Saugeres et al., 2012). Among Chinese (Hong Kong) gamblers, there is a certain correlation between stressful life events and problem gambling (Tang et al., 2007).

However, is the association between stressful life events and problem gambling really so straightforward? Existing evidence suggesting that the relationship between the two is indirect and may involve mediating variables (Tang & Oei, 2011; Thurm et al., 2023). Related research has shown that problem gambling can also be predicted by how a person copes with stress (Bergevin et al., 2006).

Coping Strategies and Problem Gambling

From the perspective of stress theory, when individuals encounter stressors, they will assess both the nature of the stressors and their personal resources. If they perceive the stressors as a threat, they will develop corresponding coping strategies (Lazarus & Folkman, 1984). These strategies refer to “consciously willing to regulate emotions, cognitions, behaviors, physiology, and environment to cope with stressors or environmental demands” (Compas et al., 2001). Jauregui et al. (2017) emphasized that maladaptive coping strategies can promote the occurrence and persistence of problem gambling behavior. Some scholars argue that coping is a crucial factor in identifying whether a gambler exhibits problem gambling behavior (Sharpe & Tarrier, 1993), those who utilize task-oriented coping are better equipped to manage their gambling habits, while those who rely on emotion-oriented coping are more susceptible to developing problematic behaviors. Research suggests that the impact of negative psychological states, such as stress, on gambling behavior depends on individual coping strategies, providing more convincing evidence for the hypotheses of this study (Bergevin et al., 2006; Raylu et al., 2016).

Currently, there are several limitations in the research on the relationship between coping strategies and problem gambling. These studies almost exclusively focus on adolescents, with a scarcity of research conducted on adults (Bergevin et al., 2006; Calado et al., 2017). Furthermore, previous research has often focused on only one type of coping strategy, such as avoidant coping, neglecting the importance of other types of coping strategies (Farrelly et al., 2007). This may result in a limited understanding of the relationship between coping strategies and problem gambling. The present study is dedicated to address these limitations. Firstly, this study focused on adult gamblers. Secondly, this study will cover the three coping strategies proposed by previous research (Endler & Parker, 1990): task-oriented coping (Individuals tend to adopt problem-solving strategies and plans in the face of stressful situations), emotion-oriented coping (individuals tend to use emotional reactions to cope with stressful situations), and avoidance-oriented coping (individuals faced with stressful situations tend to distract themselves or use social interaction to avoid

facing stressful situations). The present study will separately explore the relationships between coping strategies and problem gambling and specifically analyze whether these coping strategies can play a mediating role in it.

In addition to coping strategies, another factor that may be triggered by stressful life events (Keinan, 1994) and influence gambling behavior (Savage et al., 2014; Toneatto, 1999) is “magical thinking”. Relevant studies suggest that irrational beliefs can influence the relationship between coping strategies and problem gambling (Kim & Jang, 2016; Raylu et al., 2016). This study thus speculates that magical thinking, as an irrational belief, can play an important role in the relationship between stressful life events, coping strategies, and problem gambling.

Stress, Magical Thinking and Problem Gambling

Magical thinking refers to a type of thinking that involves making illogical connections between events or actions and their supposed outcomes (Zusne & Jones, 1989). It is often considered irrational. This type of thinking is not only prevalent in children but also commonly observed in healthy adults (Ross & Joshi, 1992). According to Rosengren and French (2013), any thinking that is illogical, irrational, or unscientific can be described as magical thinking. Research has shown that the illusion of control can sustain an individual’s lottery gambling (Griffiths & Wood, 2001), and it is related to individual magical thinking and serves as the core of various forms of magical thinking involving personal behavior (van Elk et al., 2015). Moreover, magical thinking is closely related to gamblers’ gambling cognition: Gambling fallacy has the characteristic of magical thinking (Williams et al., 2022); belief in luck is an aspect of magical thinking (Holub, 2003), and people who believe in their luck tend to act according to magical thinking (Friedland, 1998); belief in external locus of control (God, destiny, or karma) can positively predict magical thinking (van Elk et al., 2015). Keinan (1994) summarized in his research that stress can trigger individuals’ magical thinking from various aspects. One noteworthy aspect is that when individuals experience stressful life events, the stress can lead to a decrease in their perceived sense of control over these events (Fisher, 1986; Lazarus & Folkman, 1984), as a result, they may make various efforts to regain control over the events (Friedland et al., 1992), and magical thinking is one of the strategies adopted for regaining a sense of control (Keinan, 1994). The association between magical thinking and gambling is that magical thinking is one of the predictors of pathological gambling (Passanisi et al., 2017).

Various indications suggest that problem gamblers in China often exhibit higher levels of magical thinking. First of all, China has many idioms and stories that describe people’s magical thinking, such as “*yanerdaoling*” (covering one’s ears while stealing the bell), “*yiyezhangmu*” (being obstructed by a single leaf), “*kezhouqiujian*” (engraving a boat to find a sword), and so on. Furthermore, Chinese people have a strong inclination towards superstition and a deep interest in divination, *Fengshui*, auspicious numbers (e.g., number 6 and number 8), and similar practices (Huang & Teng, 2009; Lam, 2014; Risen, 2016; Zheng et al., 2010), this kind of superstitious belief originates from magical thinking (Jahoda, 1969; Zusne & Jones, 1989). Research has shown that superstition is a manifestation of magical thinking in adults (Rosengren & French, 2013), and both are significant predictors of problem gambling (Holub, 2003; Joukhador et al., 2004; Kim et al., 2014; Passanisi et al., 2017).

Based on the findings discussed above and the correlation between magical thinking and superstition, this study speculates that magical thinking could potentially increase the

likelihood of problem gambling among Chinese gamblers. Furthermore, considering that stressful life events are recognized as one of the instigators of magical thinking (Keinan, 1994), in the investigation of the association between stressful life events and problem gambling, it is more reasonable to think of magical thinking as a mediating factor rather than a moderating one. This study will construct a model to investigate the mediating role of magical thinking in the association between stressful life events and problem gambling.

Proposed Serial Multiple Mediation Model of Stressful Life Events and Problem Gambling

In the previous paragraphs, it was mentioned that both coping strategies and magical thinking can mediate the relationship between stressful life events and problem gambling. So, is there a relationship between these two mediating variables? Relevant research indicates that maladaptive coping strategies can increase individuals' irrational beliefs (Uzun & Gübeş, 2021), this is because they need irrational beliefs to justify the rationality and sustainability of their maladaptive behaviors (Buen & Flack, 2022). Since magical thinking is seen as an irrational belief (Rosengren & French, 2013), this study has reason to believe that there is also a correlation between coping strategies and magical thinking, and it is inferred that coping strategies and magical thinking may serve as serial mediators in the relationship between stressful life events and problem gambling. Therefore, this study proposes a serial multiple mediation model, which stipulates that when gamblers encounter stressful life events, they will adopt coping strategies based on the actual situation. Task-oriented coping requires individuals to be realistic and avoid magical thinking, thereby preventing problem gambling. On the contrary, gamblers who employ maladaptive coping strategies, such as avoidance, fantasy, and emotional responses, may become immersed in magical thinking. When gamblers apply this type of thinking during the gambling process, the severity of their problem gambling tends to worsen.

The specific hypotheses of this study are as follows:

Hypothesis 1: The three coping strategies will mediate the relationship between stressful life events and problem gambling.

Hypothesis 2: Magical thinking will mediate the relationship between stressful life events and problem gambling.

Hypothesis 3: The three coping strategies and magical thinking have a serial mediating effect on the relationship between stressful life events and problem gambling. More precisely, the sequence of influences will be stressful life events → task-oriented coping/ emotion-oriented coping/avoidance-oriented coping → magical thinking → problem gambling (Fig. 1).

Methods

Procedure

Researchers recruited participants at lottery sales outlets in a central province of China. Participants in this survey needed to meet the following criteria: having a habit of purchasing lottery tickets, being Chinese nationals, in addition, due to Chinese laws that prohibit minors from purchasing lottery tickets, participants in this study must be at least 18 years old. All participants provided their consent to participate and had the right to withdraw at

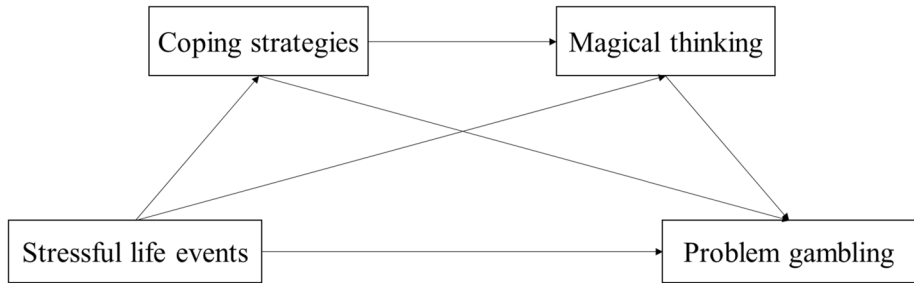


Fig. 1 Coping strategies and magical thinking play a serial mediating role in the relationship between stressful life events and problem gambling

any time for any reason. This study did not involve any participant’s private information. After confirming the eligibility of the participants, the researchers distributed questionnaires to them. All participants received cash rewards upon completing the survey. The questionnaire for this study was created using the “*wenjuanxing*” platform. It is a professional online survey platform that is widely employed by numerous Chinese researchers in their studies.

Participant

A total of 483 (390 males) lottery purchasers were surveyed in this study. The average age of participants was 37.625 years ($SD = 11.845$), with about 67.702% married and 31.884% having received a college education. Approximately 25.466% of the participants were from rural areas, while 74.534% of the participants were from urban areas. More demographic information is presented in Table 1.

Measures

Scale of Assessing Problem Gambling (SAPG)

Problem gambling was measured using the Scale of Assessing Problem Gambling in Chinese edition (SAPG; Li et al., 2012). The scale consists of 19 items divided into four dimensions: Harmful Behavior, Compulsive Disorder, Over Expectation, and Depression Sign. Each item is measured on a 5-point scale, from 1 (almost never) to 5 (always). The higher the score, the more likely the player is to have a problem gambling behavior. Each item of the scale takes lottery gambling as the core for questioning, including “You bought more tickets than you or your family intended”, “You are convinced that you will win and keep buying more tickets”, “You had a problem with your family because you bought lottery tickets”, these items are relevant to possible problems for Chinese lottery gamblers. Previous study has demonstrated that the scale exhibits strong local adaptability, and the overall fit of the confirmatory factor analysis model is good ($NFI = 0.911$, $IFI = 0.917$, $CFI = 0.917$, $RMSEA = 0.05$), and Cronbach’s alpha was 0.906 (Li et al., 2012). Reliability and validity analyses have shown that the Cronbach’s alpha for this scale in this study was 0.942.

Table 1 Demographic data
(*N* = 483)

Participant characteristics	Number (%)
<i>Gender</i>	
Male	390 (80.745%)
Female	93 (19.255%)
<i>Age</i>	
18–35	238 (49.275%)
36–60	234 (48.447%)
61 and older years	11 (2.278%)
<i>Education</i>	
Associate degree and lower	329 (68.115%)
Bachelor's degree	141 (29.193%)
Master's degree and higher	13 (2.692%)
<i>Marital status</i>	
Married	327 (67.702%)
Unmarried	144 (29.814%)
Divorce or Widow	12 (2.484%)
<i>Settlements</i>	
City	360 (74.534%)
Countryside	123 (25.466%)
<i>Monthly income</i>	
0 ¥–3000 ¥ (About 0\$–410\$)	142 (29.400%)
3001 ¥–7000 ¥ (About 410\$–957\$)	245 (50.725%)
More than 7001 ¥ (More than 957\$)	96 (19.875%)

Holmes–Rahe Stress Inventory

To evaluate the life stress of lottery gamblers, the present study utilized the Chinese version of Holmes–Rahe Stress Inventory (Holmes & Rahe, 1967). The scale includes 43 life events, and participants were requested to indicate whether they had encountered any of these events within the past year. Each item is assigned a different score ranging from 11 to 100, and the total score is obtained by summing up the scores of each event experienced by the individual. A higher total score indicates that the participant has experienced more stressful life events and has a higher level of stress.

The Short Form of Coping Inventory for Stressful Situation (CISS)

The Chinese version of the short form of Coping Inventory for Stressful Situations (CISS) (Li et al., 2017) is a 21-item scale used to assess individuals' frequency of using different coping strategies when faced with stressful situations. The scale measures three different coping strategies: task-oriented coping (e.g., “Take corrective action immediately.”), emotion-oriented coping (e.g., “Become very upset”), and avoidance-oriented coping (distraction and social diversion) (e.g., “Buy myself something”, “Visit a friend”). The scale uses a 5-point rating system, ranging from 1 (almost never) to 5 (always). Reliability and validity analyses have shown that the Cronbach's alpha for this scale in this study was 0.912.

Magical Ideation Scale (MIS)

The Magical Ideation Scale (Eckblad & Chapman, 1983; Savage et al., 2014) is a measure used to assess individuals' tendency towards magical thinking, consisting of 15 true–false questions. This scale can be used to evaluate individuals' unrealistic, invalid causal relationships and erroneous beliefs, as well as to assess the degree of paranoid schizophrenia. Due to the lack of a Chinese version of the scale, researchers enlisted the help of English major colleagues for translation. As a result, researchers found that many of the questions, such as “The government is withholding the truth about UFOs” and “I worry that people from other planets might affect things on Earth”, were not applicable to the Chinese cultural group. After preliminary verification, researchers found that some participants did report that they had not encountered such situations. Therefore, this study modified these questions to make them conform to the cognition of the Chinese people, in order to facilitate the smooth progress of the research. Reliability and validity analyses showed that the Cronbach's alpha of this scale in this study was 0.832.

Statistical Analysis

SPSS 26.0 software was used for data analysis. Firstly, descriptive statistics were conducted to analyze the demographic variables (Table 1). Secondly, independent samples *t*-tests were used to examine whether there were significant differences in psychological variables between male and female lottery gamblers. Next, bivariate analyses were performed to test the correlation between the studied variables (Table 2). Finally, bootstrapping analysis using SPSS PROCESS v3.5 (Hayes, 2013) was conducted to test the proposed serial multiple mediation model. The present study set 10,000 bootstrap samples and a 95% confidence interval. Table 3 presents the results of mediation analysis in this study in detail.

Table 2 Correlation matrix for main variables in the present study (N = 483)

	1	2	3	4	5	6
1. Stressful life events	1					
2. Task-oriented coping	.192**	1				
3. Emotion-oriented coping	.277**	.198**	1			
4. Avoidance-oriented coping	.287**	.570**	.498**	1		
5. Magical thinking	.293**	.112*	.460**	.388**	1	
6. Problem gambling	.318**	-.010	.291**	.229**	.273**	1
<i>M</i>	74.674	20.544	16.894	17.623	5.418	23.137
<i>SD</i>	58.075	8.717	4.529	5.011	2.468	8.466

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

Table 3 Bootstrap results to test significance of mediating effects

Path/effect	β	SE	Bootstrapping 95% CI	
			Lower	Higher
<i>Task-oriented coping and magical thinking as mediators</i>				
c Stressful life events → problem gambling	.377	.051	.276	.479
a ₁ Stressful life events → task-oriented coping	.211	.051	.111	.311
a ₂ Stressful life events → magical thinking	.259	.041	.178	.340
a ₃ task-oriented coping → magical thinking	.045	.036	-.026	.117
b ₁ Task-oriented coping → problem gambling	-.091	.045	-.180	-.001
b ₂ Magical thinking → problem gambling	.259	.057	.147	.371
c' Stressful life events → problem gambling	.328	.054	.222	.433
Ind1 (stressful life events → task-oriented coping → problem gambling)	-.019	.007	-.037	-.005
Ind2 (stressful life events → magical thinking → problem gambling)	.067	.021	.032	.115
Ind3 (stressful life events → task-oriented coping → magical thinking → problem gambling)	.003	.002	-.001	.007
<i>Emotion-oriented coping and magical thinking as mediators</i>				
c Stressful life events → problem gambling	.377	.051	.276	.479
a ₁ Stressful life events → emotion-oriented coping	.308	.050	.211	.406
a ₂ Stressful life events → magical thinking	.165	.038	.090	.241
a ₃ Emotion-oriented coping → magical thinking	.335	.034	.268	.401
b ₁ Emotion-oriented coping → problem gambling	.176	.050	.077	.275
b ₂ Magical thinking → problem gambling	.163	.062	.041	.285
c' Stressful life events → problem gambling	.280	.053	.175	.384
Ind1 (Stressful life events → emotion-oriented coping → problem gambling)	.054	.021	.019	.099
Ind2 (Stressful life events → magical thinking → problem gambling)	.027	.013	.006	.058
Ind3 (Stressful life events → emotion-oriented coping → magical thinking → problem gambling)	.017	.008	.004	.035
<i>Avoidance-oriented coping and magical thinking as mediators</i>				
c Stressful life events → problem gambling	.377	.051	.276	.479
a ₁ Stressful life events → avoidance-oriented coping	.316	.050	.218	.414

Table 3 (continued)

Path/effect	β	SE	Bootstrapping 95% CI	
			Lower	Higher
a ₂ Stressful life events → magical thinking	.184	.040	.106	.262
a ₃ Avoidance-oriented coping → magical thinking	.267	.035	.198	.336
b ₁ Avoidance-oriented coping → problem gambling	.099	.049	.003	.196
b ₂ Magical thinking → problem gambling	.212	.060	.094	.330
c' Stressful life events → problem gambling	.289	.054	.184	.395
Ind1 (Stressful life events → avoidance-oriented coping → problem gambling)	.031	.016	.002	.067
Ind2 (Stressful life events → magical thinking → problem gambling)	.039	.016	.014	.076
Ind3 (Stressful life events → avoidance-oriented coping → magical thinking → problem gambling)	.020	.007	.007	.034

Results

Preliminary Analyses

The results of the independent samples *t*-test analysis indicate that there were no significant gender differences in demographic variables and psychological variables.

The results of the bivariate analysis show a positive correlation between stressful life events and problem gambling ($r=0.318$, $p<0.01$). Task-oriented coping did not show a significant correlation with problem gambling ($r=-0.010$, $p>0.05$). Emotion-oriented coping ($r=0.291$, $p<0.01$), avoidance-oriented coping ($r=0.229$, $p<0.01$), and magical thinking ($r=0.273$, $p<0.01$) all exhibited significant positive correlations with problem gambling. More bivariate analysis results are shown in Table 2.

Testing the Proposed Serial Multiple Mediation Models

This study analyzed three serial multiple mediation models. The results revealed that there was a significant total non-mediated effect of stressful life events on problem gambling ($\beta=0.377$, $SE=0.051$, 95% CI [0.276, 0.479]). In the model with task-oriented coping as the mediator, after controlling for task-oriented coping and magical thinking, the direct effect remained significant ($\beta=0.328$, $SE=0.054$, 95% CI [0.222, 0.433]). However, the indirect effects of stressful life events through task-oriented coping and magical thinking on problem gambling were not significant ($\beta=0.003$, 95% CI [- 0.001, 0.007]). The indirect effect of stressful life events through task-oriented coping on problem gambling was found to be significant ($\beta=-0.019$, 95% CI [- 0.037, - 0.005]), the mediating effect accounted for 5.04% of the total effect. Similarly, the indirect effect of stressful life events through magical thinking on problem gambling was significant ($\beta=0.067$, 95% CI [0.032, 0.115]), the mediating effect accounted for 17.77%.

In the model with emotion-oriented coping as the mediator, after controlling for emotion-oriented coping and magical thinking, the direct effect of stressful life events on problem gambling was significant ($\beta=0.280$, $SE=0.053$, 95% CI [0.175, 0.384]). The indirect effects of stressful life events through emotion-oriented coping and magical thinking on problem gambling were also significant, with an estimated effect of $\beta=0.017$, 95% CI [0.004, 0.035], the mediating effect accounted for 4.51%. Specifically, the indirect effect of stressful life events through emotion-oriented coping on problem gambling was significant ($\beta=0.054$, 95% CI [0.019, 0.099]), the mediating effect accounted for 14.32%. Similarly, the indirect effect of stressful life events through magical thinking on problem gambling was significant ($\beta=0.027$, 95% CI [0.006, 0.058]), the mediating effect accounted for 7.16%.

In the model with avoidance-oriented coping as the mediator, after controlling for avoidance-oriented coping and magical thinking, the direct effect of stressful life events on problem gambling was significant ($\beta=0.289$, $SE=0.054$, 95% CI [0.184, 0.395]). The indirect effects of stressful life events through avoidance-oriented coping and magical thinking on problem gambling were also significant, with an estimated effect of $\beta=0.020$, 95% CI [0.007, 0.034], the mediating effect accounted for 5.31%. Specifically, the indirect effect of stressful life events through avoidance-oriented coping on problem gambling was significant ($\beta=0.031$, 95% CI [0.002, 0.067]), the mediating effect accounted for 8.22%. Similarly, the indirect effect of stressful life events through magical thinking on

problem gambling was significant ($\beta=0.039$, 95% CI [0.014, 0.076]), the mediating effect accounted for 10.34%.

The results of the other path analysis are presented in Table 3.

The data analysis supports Hypothesis 1 and Hypothesis 2, which suggest that stressful life events have an indirect effect on problem gambling through the three coping strategies/magical thinking. The data analysis results also partially support Hypothesis 3, which suggests that emotion-oriented coping/avoidance-oriented coping and magical thinking sequentially mediate the relationship between stressful life events and problem gambling.

Discussion

This study focuses on lottery gamblers in mainland China and aims to investigate the internal mechanisms underlying the relationship between stressful life events and problem gambling. Demographic analysis reveals that the majority of Chinese lottery gamblers are male, predominantly in the young to middle-age range. They often exhibit characteristics of lower educational attainment, marital status, urban residence, and lower income. These characteristics align with samples from previous studies in other countries or regions (Pravichai & Ariyabuddhiphongs, 2015; Tang et al., 2007, 2019).

Bivariate correlation analysis yielded results consistent with previous research, confirming significant associations between gamblers' problem gambling and various factors, including stressful life events (Thurm et al., 2023), emotion-oriented coping (Calado et al., 2017), escape-oriented coping (Raylu et al., 2016), and magical thinking (Passanisi et al., 2017). This finding shed light on the psychological factors related to problem gambling among Chinese lottery gamblers.

This study has investigated the mediating role of coping strategies and magical thinking in the relationship between stressful life events and problem gambling. The results indicate that all three coping strategies can act as mediators in the relationship between stressful life events and problem gambling, which expands upon previous research that focused only on a single coping strategy (Farrelly et al., 2007). Specifically, individuals will adopt appropriate coping strategies according based on the type of stressful life events (Amirkhan & Auyeung, 2007), gamblers who predominantly employ task-oriented coping generally show a lower tendency to problem gambling (Calado et al., 2017), while those who lean towards emotion-oriented coping or avoidance-oriented coping tend to engage in problem gambling (Bergevin et al., 2006; Raylu et al., 2016). This conclusion indicates that the development and management of gambling behavior are significantly influenced by coping mechanisms. This study also suggests that magical thinking plays a mediating role in the relationship between stressful life events and problem gambling. This finding further confirms that cognitive distortions related to gambling can mediate the relationship between stress and problem gambling (Thurm et al., 2023). Specifically, gamblers who encountered more stressful life events exhibited higher levels of magical thinking, this type of thinking leads to a higher severity of problem gambling.

This study has further confirmed the serial mediating effect of emotion-oriented coping and magical thinking, aligning with previous research that emotion-oriented coping in stressful situations can exacerbate problem gambling by increasing irrational beliefs about gambling (Kim & Jang, 2016). Furthermore, emotion-oriented coping displays behaviors very similar to emotional dysregulation, which has been previously shown to predict cognitive distortions related to gambling (Estévez et al., 2021), ultimately leading to problem

gambling. The serial mediating role of avoidance-oriented coping and magical thinking is another important finding, which further supports the rationale of the cognitive-behavioral model for gambling behavior (Raylu et al., 2016). Specifically, when dealing with stressful life events, gamblers who tend to use avoidance-oriented coping also resort to gambling as a way to cope. Occasional winning causes them to overestimate their luck further inducing their magical thinking (Nemeroff & Rozin, 2000), resulting in increased time and money invested in gambling, ultimately leading to problem gambling. This study did not uncover evidence substantiating the serial mediating effect of task-oriented coping and magical thinking. This may be because task-oriented coping requires individuals to actively address and minimize the negative impact of problems through positive efforts (Lazarus & Folkman, 1984). Individuals who possess high problem-solving abilities often tend to have positive thinking as well (Steinhardt & Dolbier, 2008), so magical thinking may not occur in them, and it can also help prevent problem gambling to some extent (Goghari et al., 2020; Tang et al., 2011). Another potential reason is the presence of unaccounted confounding variables between the task-oriented coping and other variables, which may introduce interference and impede the significance of the mediating effect. Perhaps future longitudinal studies can provide a more in-depth analysis of the underlying causes.

The study's conclusions have significant practical implications for addressing problem gambling among lottery gamblers in China. Firstly, given the distinct profile of most lottery gamblers in China, it's crucial to prioritize interventions for individuals displaying these characteristics. Secondly, the results of the mediation test show that gamblers who have gone through a lot of stressful life events should be trained in task-oriented coping and reduce their level of magical thinking to prevent or mitigate problem gambling. The study's conclusions also underscore the value of cognitive behavioral therapy (CBT) for problem gamblers. CBT has long been acknowledged as a potent approach for treating problem gambling (Oei et al., 2010; Toneatto & Ladoceur, 2003; Toneatto & Millar, 2004), especially those caused by maladaptive coping strategies and magical thinking. For one thing, CBT is designed to improve individual coping capacity, and one study showed that 77.9% of gamblers with CBT improved their coping capacity and ultimately reduced problem gambling (Petry et al., 2007). For another, CBT can help recognize and modify irrational beliefs gamblers may have and extinguish the urge to gamble, thus promoting recovery from problem gambling (Battersby et al., 2008).

Limitations

The limitations of this study are first reflected in the collection of data in the form of self-report measures, relying on the subjective responses of gamblers and to a certain extent not being able to objectively assess their levels of stress and problem gambling. In addition, the completion of the online questionnaire is not supervised by investigators and therefore may be more subjective. Secondly, the present study only focused on lottery gamblers in one province in central China. However, due to the vast territory of China and the uneven development of different regions in terms of economy, society, and culture, the problem gambling situation may vary across different areas. Therefore, the sample in this study may not be representative, and future studies will be conducted on lottery gamblers from other regions in China to enrich the sample of Chinese lottery gamblers. Finally, it is important to acknowledge that this study had a highly imbalanced gender ratio in the sample (The male to female sex ratio is about 4:1), this is because all the samples in this

study are gamblers who buy Chinese sports lottery, which mainly focuses on sports betting, including betting on football or other sports events, requires certain professional skills and attracts a large number of male gamblers (Merkouris et al., 2016). Sex imbalance limits the ability to conduct comprehensive research on problem gambling across genders. To address this limitation, future studies should aim to expand the data collection to include a larger sample of female lottery gamblers in China, allowing for a more inclusive and representative examination of problem gambling among different genders.

Conclusion

The outcomes of this study indicate that task-oriented coping, emotion-oriented coping, avoidance-oriented coping, and magical thinking can individually serve as mediators in the relationship between stressful life events and problem gambling, respectively. Among them, emotion-oriented coping and magical thinking, as well as avoidance-oriented coping and magical thinking, can play serial mediating roles in this relationship. Despite the limitations of this study, the constructed serial multiple mediation model provides valuable insights into the role of cognitive factors in the relationship between stressful life events and problem gambling.

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Data availability The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Conflict of interest No potential conflict of interest was reported by the authors.

References

- Allami, Y., Hodgins, D. C., Young, M., Brunelle, N., Currie, S., Dufour, M., Flores-Pajot, M. C., & Nadeau, L. (2021). A meta-analysis of problem gambling risk factors in the general adult population. *Addiction, 116*(11), 2968–2977. <https://doi.org/10.1111/add.15449>
- Amirkhan, J., & Auyeung, B. (2007). Coping with stress across the lifespan: Absolute vs. relative changes in strategy. *Journal of Applied Developmental Psychology, 28*(4), 298–317. <https://doi.org/10.1016/j.appdev.2007.04.002>
- Battersby, M., Oakes, J., Tolchard, B., Forbes, A., & Pols, R. (2008). Cognitive behavioural therapy for problem gamblers. In M. Zangeneh, A. Blaszczynski, & N. Turner (Eds.), *In the pursuit of winning problem gambling theory, research and treatment* (pp. 179–197). Springer.
- Bergevin, T., Gupta, R., Derevensky, J., & Kaufman, F. (2006). Adolescent gambling: Understanding the role of stress and coping. *Journal of Gambling Studies, 22*, 195–208. <https://doi.org/10.1007/s10899-006-9010-z>
- Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction, 97*(5), 487–499. <https://doi.org/10.1046/j.1360-0443.2002.00015.x>
- Buchanan, T. W., McMullin, S. D., Baxley, C., & Weinstock, J. (2020). Stress and gambling. *Current Opinion in Behavioral Sciences, 31*, 8–12. <https://doi.org/10.1016/j.cobeha.2019.09.004>
- Buen, A., & Flack, M. (2022). Predicting problem gambling severity: Interplay between emotion dysregulation and gambling-related cognitions. *Journal of Gambling Studies, 38*(2), 483–498. <https://doi.org/10.1007/s10899-021-10039-w>
- Calado, F., Alexandre, J., & Griffiths, M. D. (2017). How coping styles, cognitive distortions, and attachment predict problem gambling among adolescents and young adults. *Journal of Behavioral Addictions, 6*(4), 648–657. <https://doi.org/10.1556/2006.6.2017.068>

- Carlson, D. (2014). Stressful life events. In A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research*. Springer. https://doi.org/10.1007/978-94-007-0753-5_2880
- Chan, C. C., Li, W. W. L., & Chiu, A. S. L. (2019). *The psychology of Chinese gambling: A cultural and historical perspective*. Springer.
- Chen, H. P. (2012). Internet survey among Chinese lottery buyers' behaviors. *Lottery Research Center of China, Beijing Normal University*. Retrieved from <http://www.71.cn/2012/0422/665711.shtml>
- Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin*, *127*(1), 87–127.
- Donald-Sherbourne, C., Meredith, L. S., Rogers, W., & Ware, J. E., Jr. (1992). Social support and stressful life events: Age differences in their effects on health-related quality of life among the chronically ill. *Quality of Life Research*, *1*(4), 235–246.
- Eckblad, M., & Chapman, L. J. (1983). Magical ideation as an indicator of schizotypy. *Journal of Consulting and Clinical Psychology*, *51*(2), 215–225. <https://doi.org/10.1037//0022-006x.51.2.215>
- El-Guebaly, N., Casey, D. M., Currie, S. R., Hodgins, D. C., Schopflocher, D. P., Smith, G. J., & Williams, R. J. (2015). The leisure, lifestyle, & lifecycle project (LLLP): A longitudinal study of gambling in Alberta. Final Report for the Alberta Gambling Research Institute. <https://doi.org/10.11575/PRISM/9908>.
- Endler, N. S., & Parker, J. D. A. (1990). Multidimensional assessment of coping: A critical evaluation. *Journal of Personality and Social Psychology*, *58*, 844–854.
- Enoch, M. A. (2011). The role of early life stress as a predictor for alcohol and drug dependence. *Psychopharmacology (berl)*, *214*(1), 17–31. <https://doi.org/10.1007/s00213-010-1916-6>
- Estévez, A., Jáuregui, P., Lopez-Gonzalez, H., Mena-Moreno, T., Lozano-Madrid, M., Macia, L., Granero, R., Mestre-Bach, G., Steward, T., Fernández-Aranda, F., Gómez-Peña, M., Moragas, L., Del Pino-Gutierrez, A., Codina, E., Testa, G., Vintró-Alcaraz, C., Agüera, Z., Munguía, L., Baenas, I., Valenciano-Mendoza, E., ... Jiménez-Murcia, S. (2021). The Severity of Gambling and Gambling Related Cognitions as Predictors of Emotional Regulation and Coping Strategies in Adolescents. *Journal of gambling studies*, *37*(2), 483–495. <https://doi.org/10.1007/s10899-020-09953-2>
- Farrelly, S., Ffrench, C., Ogeil, R. P., & Phillips, J. G. (2007). Coping strategies and problem gambling. *Behaviour Change*, *24*(1), 14–24.
- Fisher, S. (1986). *Stress and strategy* (1st ed.). Routledge. <https://doi.org/10.4324/9781315627212>
- Fong, L. H., Law, R., & Lam, D. (2014). An examination of factors driving Chinese gamblers' fallacy bias. *Journal of Gambling Studies*, *30*(3), 757–770. <https://doi.org/10.1007/s10899-013-9390-9>
- Friedland, N. (1998). Games of luck and games of chance: The effect of luck-versus chance-orientation on gambling decisions. *Journal of Behavioral Decision Making*, *11*(3), 161–179.
- Friedland, N., Keinan, G., & Regev, Y. (1992). Controlling the uncontrollable: Effects of stress on illusory perceptions of controllability. *Journal of Personality and Social Psychology*, *63*(6), 923–931. <https://doi.org/10.1037//0022-3514.63.6.923>
- Goghari, V. M., Shakeel, M. K., Swan, J. L., Kim, H. S., Sharif-Razi, M., & Hodgins, D. C. (2020). A family study of trauma and coping strategies in gambling disorder. *Journal of Gambling Studies*, *36*(3), 767–782. <https://doi.org/10.1007/s10899-020-09963-0>
- Griffiths, M., & Wood, R. (2001). The psychology of lottery gambling. *International Gambling Studies*, *1*(1), 27–45.
- Hatch, S. L., & Dohrenwend, B. P. (2007). Distribution of traumatic and other stressful life events by race/ethnicity, gender, SES and age: A review of the research. *American Journal of Community Psychology*, *40*(3–4), 313–332.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Heatherton, T. F., & Baumeister, R. F. (1991). Binge eating as escape from self-awareness. *Psychological Bulletin*, *110*(1), 86–108.
- Hing, N., Gainsbury, S., Blaszczynski, A., Wood, R., Lubman, D., & Russell, A. (2014). *Interactive gambling*. Melbourne: Gambling Research Australia.
- Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, *11*(2), 213–218. [https://doi.org/10.1016/0022-3999\(67\)90010-4](https://doi.org/10.1016/0022-3999(67)90010-4)
- Holub, A. (2003). *Construction of the gambling cognitions inventory*. Unpublished Master's Thesis, University of Calgary, Calgary, AB.
- Huang, L. S., & Teng, C. I. (2009). Development of a Chinese superstitious belief scale. *Psychological Reports*, *104*(3), 807–819. <https://doi.org/10.2466/Pr0.104.3.807-819>
- Jacobs, D. F. (1986). A general theory of addictions: A new theoretical model. *Journal of Gambling Behavior*, *2*(1), 15–31. <https://doi.org/10.1007/BF01019931>

- Jahoda, G. (1969). *The psychology of superstition*. Allen Lane/Penguin Press.
- Jauregui, P., Onaindia, J., & Estevez, A. (2017). Adaptive and maladaptive coping strategies in adult pathological gamblers and their mediating role with anxious-depressive symptomatology. *Journal of Gambling Studies*, 33(4), 1081–1097.
- Joukhador, J., Blaszczynski, A., & Maccallum, F. (2004). Superstitious beliefs in gambling among problem and non-problem gamblers: Preliminary data. *Journal of Gambling Studies*, 20(2), 171–180. <https://doi.org/10.1023/B:JOGS.0000022308.27774.2b>
- Keinan, G. (1994). Effects of stress and tolerance of ambiguity on magical thinking. *Journal of Personality and Social Psychology*, 67(1), 48.
- Kim, J., Ahlgren, M., & Bernhard, B. (2014). The mediating effect of depression between superstitious beliefs and problem gambling: A cross-cultural study of Chinese and Caucasians residing in the United States. *Journal of Gambling Issues*, 29, 1.
- Kim, S. B., & Jang, J. I. (2016). The relationship between adolescents' stress coping behavior and gambling addiction: Mediating effect of irrational belief of gambling. *Journal of the Korea Academia-Industrial Cooperation Society*, 17(4), 85–91.
- Korn, D., Gibbins, R., & Azmier, J. (2003). Framing public policy towards a public health paradigm for gambling. *Journal of Gambling Studies*, 19(2), 235–256. <https://doi.org/10.1023/a:1023685416816>
- Lam, D. (2014). *Chopsticks and gambling*. Transaction Publishers.
- Langham, E., Thorne, H., Browne, M., Donaldson, P., Rose, J., & Rockloff, M. (2015). Understanding gambling related harm: A proposed definition, conceptual framework, and taxonomy of harms. *BMC Public Health*, 16, 1–23.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Li, C., Liu, Q., Hu, T., & Jin, X. (2017). Adapting the short form of the coping inventory for stressful situations into Chinese. *Neuropsychiatric Disease and Treatment*, 13, 1669–1675. <https://doi.org/10.2147/NDT.S136950>
- Li, H., Mao, L. L., Zhang, J. J., Wu, Y., Li, A., & Chen, J. (2012). Dimensions of problem gambling behavior associated with purchasing sports lottery. *Journal of Gambling Studies*, 28(1), 47–68. <https://doi.org/10.1007/s10899-011-9243-3>
- Luce, C., Kairouz, S., Nadeau, L., & Monson, E. (2016). Life events and problem gambling severity: A prospective study of adult gamblers. *Psychology of Addictive Behaviors*, 30(8), 922–930.
- Merkouris, S. S., Thomas, A. C., Shandley, K. A., Rodda, S. N., Oldenhof, E., & Dowling, N. A. (2016). An update on gender differences in the characteristics associated with problem gambling: A systematic review. *Current Addiction Reports*, 3, 254–267.
- Nemeroff, C., & Rozin, P. (2000). The makings of the magical mind: The nature and function of sympathetic magical thinking. In K. S. Rosengren, C. N. Johnson, & P. L. Harris (Eds.), *Imagining the impossible: Magical, scientific, and religious thinking in children* (pp. 1–34). Cambridge University Press. <https://doi.org/10.1017/CBO9780511571381.002>
- Nordjaern, T., Hole, R., & Rundmo, T. (2010). Interrelations between patients' personal life events, psychosocial distress, and substance use. *Substance Use & Misuse*, 45(7–8), 1161–1179. <https://doi.org/10.3109/10826080903567863>
- Nuske, E. M., Holdsworth, L., & Breen, H. (2016). Significant life events and social connectedness in Australian women's gambling experiences. *Nordic Studies on Alcohol and Drugs*, 33(1), 7–26.
- O'Guinn, T. C., & Faber, R. J. (1991). Mass communication and consumer behavior. In T. S. Robertson & H. H. Kassarjian (Eds.), *Handbook of consumer behavior* (pp. 349–400). Prentice Hall.
- 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. <https://doi.org/10.1007/s10899-013-9440-3>
- Oei, T. P., Raylu, N., & Casey, L. M. (2010). Effectiveness of group and individual formats of a combined motivational interviewing and cognitive behavioral treatment program for problem gambling: A randomized controlled trial. *Behavioural and Cognitive Psychotherapy*, 38(2), 233–238. <https://doi.org/10.1017/S1352465809990701>
- Okuda, M., Balán, I., Petry, N. M., Oquendo, M., & Blanco, C. (2009). Cognitive-behavioral therapy for pathological gambling: Cultural considerations. *The American Journal of Psychiatry*, 166(12), 1325–1330. <https://doi.org/10.1176/appi.ajp.2009.08081235>
- Passanisi, A., Craparo, G., & Pace, U. (2017). Magical thinking and decision-making strategies among late adolescent regular gamblers: A mediation model. *Journal of Adolescence*, 59, 51–58. <https://doi.org/10.1016/j.adolescence.2017.05.016>
- Peng, Y., & Ge, Z. (2016). Exploration and thinking on the development of sports lottery market in county area of Suzhou. *Open Journal of Business and Management*, 4(04), 686.

- Petry, N. M., Litt, M. D., Kadden, R., & Ledgerwood, D. M. (2007). Do coping skills mediate the relationship between cognitive-behavioral therapy and reductions in gambling in pathological gamblers? *Addiction*, *102*(8), 1280–1291. <https://doi.org/10.1111/j.1360-0443.2007.01907.x>
- Pravichai, S., & Ariyabuddhiphongs, V. (2015). Superstitious beliefs and problem gambling among Thai lottery gamblers: The mediation effects of number search and gambling intensity. *Journal of Gambling Studies*, *31*(4), 1633–1649. <https://doi.org/10.1007/s10899-014-9517-7>
- Raylu, N., Oei, T. P., Loo, J. M., & Tsai, J. S. (2016). Testing the validity of a cognitive behavioral model for gambling behavior. *Journal of Gambling Studies*, *32*(2), 773–788. <https://doi.org/10.1007/s10899-015-9567-5>
- Risen, J. L. (2016). Believing what we do not believe: Acquiescence to superstitious beliefs and other powerful intuitions. *Psychological Review*, *123*(2), 182.
- Rosengren, K. S., & French, J. A. (2013). Magical thinking. In M. Taylor (Ed.), *The Oxford handbook of the development of imagination* (pp. 42–60). Oxford University Press.
- Ross, C. A., & Joshi, S. (1992). Paranormal experiences in the general population. *The Journal of Nervous and Mental Disease*, *180*(6), 357–368. <https://doi.org/10.1097/00005053-199206000-00004>
- Saugeres, L., Thomas, A., Moore, S., & Bates, G. (2012). *Gamblers tell their stories*. Melbourne: Victorian Responsible Gambling Foundation.
- Savage, J. E., Slutske, W. S., & Martin, N. G. (2014). Personality and gambling involvement: A person-centered approach. *Psychology of Addictive Behaviors*, *28*(4), 1198. <https://doi.org/10.1037/a0037413>
- Sharpe, L., & Tarrier, N. (1993). Towards a cognitive-behavioral theory of problem gambling. *The British Journal of Psychiatry*, *162*(3), 407–412. <https://doi.org/10.1192/bjp.162.3.407>
- Sneath, J. Z., Lacey, R., & Kennett-Hensel, P. A. (2009). Coping with a natural disaster: Losses, emotions, and impulsive and compulsive buying. *Marketing Letters*, *20*(1), 45–60. <https://doi.org/10.1007/s11002-008-9049-y>
- Steinhardt, M., & Dolbier, C. (2008). Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. *Journal of American College Health*, *56*(4), 445–453. <https://doi.org/10.3200/JACH.56.4.445-454>
- Tang, C. S., Chua, Z., & Wu, A. M. (2011). Impulsivity, life stress, refusal efficacy, and problem gambling among Chinese: Testing the diathesis-stress-coping model. *International Journal of Stress Management*, *18*, 263–283.
- Tang, C. S., Lim, M. S. M., Koh, J. M., & Cheung, F. Y. L. (2019). Emotion dysregulation mediating associations among work stress, burnout, and problem gambling: A serial multiple mediation model. *Journal of Gambling Studies*, *35*(3), 813–828. <https://doi.org/10.1007/s10899-019-09837-0>
- Tang, C. S. K., & Oei, T. P. (2011). Gambling cognition and subjective well-being as mediators between perceived stress and problem gambling: A cross-cultural study on White and Chinese problem gamblers. *Psychology of Addictive Behaviors*, *25*(3), 511. <https://doi.org/10.1037/a0024013>
- Tang, C. S. K., & Wu, A. M. (2012). Impulsivity as a moderator and mediator between life stress and pathological gambling among Chinese treatment-seeking gamblers. *International Journal of Mental Health and Addiction*, *10*, 573–584. <https://doi.org/10.1007/s11469-011-9355-0>
- Tang, C. S., Wu, A. M., & Tang, J. Y. (2007). Gender differences in characteristics of Chinese treatment-seeking problem gamblers. *Journal of Gambling Studies*, *23*(2), 145–156. <https://doi.org/10.1007/s10899-006-9054-0>
- Tang, J., Yu, Y., Du, Y., Ma, Y., Zhang, D., & Wang, J. (2014). Prevalence of internet addiction and its association with stressful life events and psychological symptoms among adolescent internet users. *Addictive Behaviors*, *39*(3), 744–747. <https://doi.org/10.1016/j.addbeh.2013.12.010>
- Thomas, A. J., Mitchell, E. S., & Woods, N. F. (2019). Undesirable stressful life events, impact, and correlates during midlife: Observations from the Seattle midlife women’s health study. *Women’s Midlife Health*, *5*, 1–13.
- Thurm, A., Satel, J., Montag, C., Griffiths, M. D., & Pontes, H. M. (2023). The relationship between gambling disorder, stressful life events, gambling-related cognitive distortions, difficulty in emotion regulation, and self-control. *Journal of Gambling Studies*, *39*(1), 87–101. <https://doi.org/10.1007/s10899-022-10151-5>
- Toneatto, T. (1999). Cognitive psychopathology of problem gambling. *Substance Use & Misuse*, *34*(11), 1593–1604. <https://doi.org/10.3109/10826089909039417>
- Toneatto, T., & Ladoceur, R. (2003). Treatment of pathological gambling: A critical review of the literature. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *17*(4), 284–292. <https://doi.org/10.1037/0893-164X.17.4.284>

- Toneatto, T., & Millar, G. (2004). Assessing and treating problem gambling: Empirical status and promising trends. *The Canadian Journal of Psychiatry, 49*(8), 517–525. <https://doi.org/10.1177/070674370404900803>
- Uzun, K., & Gübeş, N. Ö. (2021). Relationships between adolescents' irrational beliefs, personality characteristics and stress coping approaches. *Kastamonu Education Journal, 29*(5), 924–940.
- van Elk, M., Rutjens, B. T., & van der Pligt, J. (2015). The development of the illusion of control and sense of agency in 7- to-12-year-old children and adults. *Cognition, 145*, 1–12. <https://doi.org/10.1016/j.cognition.2015.08.004>
- Wang, C., Cunningham-Erdogdu, P., Steers, M. N., Weinstein, A. P., & Neighbors, C. (2020). Stressful life events and gambling: The roles of coping and impulsivity among college students. *Addictive Behaviors, 107*, 106386. <https://doi.org/10.1016/j.addbeh.2020.106386>
- Williams, R. J., Hann, R., Schopflocher, D., West, B., McLaughlin, P., White, N., King, K., & Flexhaug, T. (2015). *Quinte longitudinal study of gambling and problem gambling* [Technical Report]. Ontario Problem Gambling Research Centre. <http://www.uleth.ca/dspace/handle/10133/3641>
- Williams, B. M., Browne, M., Rockloff, M., Stuart, G., & Smith, B. P. (2022). Protective action and risky beliefs: The relationship between religion and gambling fallacies. *Journal of Gambling Studies, 38*(1), 253–263. <https://doi.org/10.1007/s10899-021-10028-z>
- Xu, H., Lin, Y., & Zhou, C. (2020). Prediction models of sports lottery revenue in China. *The International Journal of Electrical Engineering & Education. https://doi.org/10.1177/0020720920940589*
- Zeng, Z., & Dongmei, Z. (2007). A profile of lottery players in Guangzhou. *China. International Gambling Studies., 7*, 265–280. <https://doi.org/10.1080/14459790701601430>
- Zheng, W. Y., Walker, M., & Blaszczynski, A. (2010). Mahjong gambling in the Chinese-Australian community in sydney: A prevalence study. *Journal of Gambling Studies, 26*(3), 441–454. <https://doi.org/10.1007/s10899-009-9159-3>
- Zusne, L., & Jones, W. H. (1989). *Anomalistic psychology: A study of magical thinking* (2nd ed.). Lawrence Erlbaum Associates Inc.

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