

Predicting Gambling Propensity and Behavior
The Role of Social Axioms and Distortive Beliefs

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We would like to express our appreciation to Victoria Ka-Ying Hui for her generous help with data collection.

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Funding: This project was supported in part by the General Research Fund (#541212) and Humanities and Social Sciences Prestigious Fellowship Scheme (#35000418) from the

Research Grants Council, Hong Kong.

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Abstract

Theory and research have revealed the impact of cognitive factors on propensity for gambling, but the role of generalized beliefs and their underlying mechanisms receive little attention. In the present research, we operationalized generalized beliefs as social axioms (Leung et al., 2002) and tested how the axiom factors of fate control and social cynicism affected the likelihood to gamble in hypothetical scenarios (Study 1) and the actual behaviour of gambling (Study 2). In Study 1, we found that both fate control and social cynicism positively predicted the propensity to participate in horse betting and casino gambling among university students ($n = 184$). The effect of fate control was mediated by perceived benefit of gambling, whereas social cynicism affected gambling propensity directly. In Study 2, we showed the same effects of fate control and social cynicism on gambling frequency among at-risk adolescents ($n = 547$), and identified two types of gambling-related cognition (i.e., distortive gambling cognitions and attitudes towards money) as mediators. Overall, this research provided evidence for the importance of social beliefs in formulating specific gambling cognitions and gambling behaviours, shedding light on intervention strategies for helping frequent gamblers through altering their worldviews in general and risk-taking beliefs in particular.

Keywords: risk-taking, social axioms, fate control, social cynicism, gambling

Predicting Gambling Propensity and Behaviour

The Role of Social Axioms and Distortive Beliefs

Belief is an important element that shapes individuals' behaviours (Fraser & Gaskell, 1990; Furnham, 1988). Some behaviours involve risk-taking. Research on risk-taking has received attention from various fields, including personality psychology (e.g., Treloar, Morris, Pedersen & McCarthy, 2012), clinical psychology (e.g., Andresen 2000), industrial-organizational psychology (Pennings & Smidts, 2003), and economic psychology (e.g., Schubert, Brown, Gysler & Brachinger, 1999). The present research attempts to investigate risk-taking from an individual difference perspective and examine how general and specific beliefs affect risk-taking propensity and behaviour.

Specific beliefs and risk propensity

Past research has shown that specific beliefs play a significant role in risk-taking propensity across various types of risky behaviours, such as gambling, binge drinking, and high risk driving. For example, Toneatto, Vettese and Nguyen (2007) summarized three categories of beliefs about gambling. The first type of belief is that one can control gambling outcomes via personal skills, ability or knowledge. The second type refers to ways in which one can predict gambling outcomes based on strong predictive skills and the pattern of past wins and losses or by misunderstanding the nature of probability. The third category reflects interpretative bias, the belief that positive outcomes of gambling are more likely to occur simply because winning has not occurred for a long time. These beliefs about gambling have been found to be positively correlated with motivation towards gambling, gambling-related problems, and negative mood (Raylu & Oei, 2004).

Specific beliefs influence not only gambling, but also other risky behaviours such as

binge drinking and high risk driving. Binge drinkers tend to be overconfident about their driving ability and ability to handle alcohol, although they exhibit similar levels of optimism about the adverse outcomes of heavy alcohol consumption (Sloan, Eldred, Guo & Xu, 2013). Likewise, in the context of high risk driving, people who believe that they are less likely to be injured or killed in a car crash than their peers are more likely to speed (Job, Hamer & Walker, 1995).

The afore-mentioned beliefs are domain-specific, but generalized beliefs about how the world functions, or worldviews, have received less attention in the risk-taking literature. We aim at addressing the question of how worldviews contribute to the study of risk propensity, especially gambling. While there are different types of risky behaviours, such as drug abuse, heavy drinking, speeding, and unsafe sex, the focus of this research is gambling because of its unique characteristics: a) the rewards and costs of gambling are easy to observe and measure; b) the outcome of gambling (either win or loss) is immediate; and c) the probability of winning or losing is usually the same.

Generalized beliefs about the world

Worldviews are propositions that people endorse about the world and how it functions (Koltko-Rivera, 2004). Some worldviews are broad in scope, such as social beliefs (Leung et al., 2002), which capture the perceived relationship between two broad entities or concepts. These domain-general beliefs are termed “social axioms”, defined by Leung and Bond (2008) as “generalized beliefs about people, social groups, social institutions, the physical environment, or the spiritual world as well as about categories of events and phenomena in the social world. These generalized beliefs are encoded in the form of an assertion about the relationship between two entities or concepts” (p. 198).

Multicultural studies have been conducted in more than 40 cultural groups to investigate

the factor structure of social axioms (Leung & Bond, 2009). A five-factor structure has been identified and validated pan-culturally, including social cynicism, reward for application, social complexity, fate control, and religiosity. Of the five axioms, fate control and social cynicism are especially relevant to the present research.

Fate control and propensity for gambling

Fate control refers to a belief that life events are predetermined and influenced by impersonal, external forces, such as fate, destiny, and luck (Leung et al., 2002). Fate control also includes an additional component assessing whether events are pre-determined and predictable, together with the belief that something can be done to modify one's fate. It is a dynamic construct, with mixed relations to subjective well-being, such as self-esteem, interpersonal harmony (Safdar, Lewis, & Daneshpour, 2006), wishful thinking, and distancing in the face of life challenges (Bond et al., 2004).

People who believe in fate control hold positive views towards the outcome of their behaviours. When participants were asked to recall what was brought to mind in response to a list of self-report items in an optimism scale (Life Orientation Test; Scheier, Carver, & Bridges, 1994), belief in fate was one of the two major sources of optimism (Sohl, Moyer, Lukin, & Knapp-Oliver, 2011). Those who held belief in fate saw the world as a just world and were more willing to be accepting, showed restraint, and had plans while coping with stress and problems. Applying optimism to risk-taking propensity, people high in fate control may hold biased views on the outcome of their behaviours, especially in the context of gambling. Tang and Wu (2010) showed that gamblers with a strong belief in fate control were more likely to think that gambling could bring positive outcomes and were unable to resist the urge to gamble. Gamblers have the assumption that their beliefs about gambling are true without external validation, and this

assumption leads to gambling persistence even when they are losing money (Ladouceur & Walker, 1996).

In addition, gamblers are also more optimistic about their ability to obtain a favourable outcome, which is a strong motivator to gamble. This over-optimism among gamblers is referred to as the illusion of control (Langer, 1975) and defined as, “an expectancy of a personal success probability inappropriately higher than the objective probability would warrant” (p. 313). Despite claiming to know about chance and randomness, people often behave as if they can control the outcome of such events (Langer, 1975). When a gambler’s perception of control over the outcome of an event increases, so does the tendency to take part in gambling. Empirically, people who believed in luck were more confident and bet more than non-believers (Darke & Freedman, 1997). Belief in luck was a significant predictor of gambling frequency in the football lottery, Chinese lottery, and Baccarat (Zhou, Hui, Yue, Gui-Hai, Li-Lin, Zhu-Yuan, & Shu, 2011), and gambling severity (Wong & Tsang, 2011).

Therefore, we hypothesize that people believing in fate control are more likely to hold a positive view on gambling. In particular, they are more likely to over-focus on the positive outcome of gambling (i.e. the benefit of winning) and are more optimistic about their control over the occurrence of such a favourable outcome. Hence, we hypothesize that those with high levels of fate control will focus more on the positive outcome of gambling (i.e. perceived benefit), which in turn will increase their likelihood to gamble. Thus, we will examine how perceived benefit of gambling mediates the effect of fate control on gambling propensity in Study 1. In Study 2, focus will be put on the mediating effect of biased gambling cognition (e.g., the illusion of control over the gambling outcome) on the link between fate control and gambling frequency.

Social cynicism and propensity for gambling

Another axiom dimension, social cynicism, portrays a negative view of human kind (Leung et al., 2002). It focuses on the corrosiveness of power, the lack of trust in authority and social institutions, and a suspicion of people using unethical means for attaining goals. With this negative view of the social world, individuals may be predisposed towards greater self-absorption and have a lower concern for humanity.

Studies using multiple well-being indicators converge to show that social cynics walk on a path of inner darkness. Social cynicism engendered lower levels of self-esteem through the mediation of negative social feedback (Lai, Bond, & Hui, 2007). Not only does social cynicism relate to greater loneliness and lower self-esteem (Neto, 2006), but it also predicts lower levels of life satisfaction (Chen, Fok, Bond & Matsumoto, 2006). These variables are associated with excessive risky behaviours, such as pathological gambling (e.g. Lemmens, Valkenburg & Peter, 2011; Wang, Chen, Lin & Wang, 2008), alcohol consumption and risky sexual behaviours (Wild, Flisher, Bhana & Lombard, 2004).

Social cynics lack trust in others and tend to choose competition, avoidance, and accommodation rather than collaboration and compromise during interpersonal conflicts (Bond et al., 2004; Chen & Zhang, 2004). They do not consider or adapt to the other party's goals. Extending this other party to a wider social context, social cynics show less compliance in a diverse set of normative conduct, exhibiting behaviour such as drink driving, littering, and driving above the speed limit (Oceja, 2009).

Dinca and Iliescu (2009) described the social image of a typical social cynic as a "rather unsociable person, with undeveloped social skills, who does not strive to be liked by those around and does not care about the impression she or he leaves behind." (p. 155). Hence, social

cynics are prone to be more protective when they encounter others, fulfilling their cynical prophecy about the probable outcomes from living (Leung & Bond, 2004). Therefore, social cynics may be more likely to value the tangible benefit of gambling (usually money), which is able to provide them with a sense of protection in an environment that they do not trust.

Wood, Gupta, Derevensky, and Griffiths (2004) showed that more than half of the gamblers in their study endorsed the desire to win money as a main reason for gambling. Winning money is the strongest motive for both recreational and problem gamblers, followed by excitement (Platz & Millar, 2001). The same study showed that problem gamblers see winning money is more important than recreational gamblers do. Therefore, emphasis on money is one of the key influences for problematic gambling.

Given the strong emphasis on money among gamblers holding cynical beliefs, we hypothesize that social cynicism is positively correlated with gambling propensity through the value of money as the beneficial consequence of gambling. In this research, Study 1 will examine how the perceived benefit of gambling mediates the effect of social cynicism on gambling propensity. Study 2 will focus on the mediation effects of the attitudes towards money and distortive gambling cognitions on the link between social cynicism and gambling frequency.

Study 1

In the first study, we aimed to test the effects of fate control and social cynicism on the likelihood of gambling through perceived benefit of gambling. Specifically, we hypothesized that perceived benefit would mediate the effects of fate control and social cynicism on gambling likelihood.

Method

Participants

A total of 184 undergraduate students (117 females; $M_{age} = 20.7$, $SD = 1.70$) were recruited from two universities in Hong Kong to participate in this study. They were recruited through subject pool and advertisement emails among university students in their respective university. They completed the following measures on a voluntary basis.

Measures

Fate control and social cynicism. The 8-item subscale of fate control and the 18-item subscale of social cynicism were extracted from the Social Axioms Survey (SAS; Leung et al., 2002). The SAS measures generalized beliefs that one endorses about the world's functioning. Respondents rated how much they agreed with each statement on a 5-point Likert scale ranging from 1 (*strongly disbelieve*) to 5 (*strongly believe*). Sample items are "Fate determines one's successes and failures" (fate control, $\alpha = .58$) and "People will stop working hard after they secure a comfortable life" (social cynicism, $\alpha = .74$). Although the alpha of fate control appeared to be low, it reflects the characteristics of this axiom factor. Compared with other axioms, fate control showed the lowest congruence in the 40 cultural groups (Leung & Bond, 2004).

Likelihood to gamble and perceived benefit. Two gamble-related scenarios, namely horse betting and casino gambling, were chosen from the original Risk Situation Questionnaire (Rohrman, 2004). The horse-betting scenario described a person in debt receiving betting tips from a friend, while the casino-gambling scenario described a toss game where there were equal chances of winning and losing. After reading each scenario, respondents were asked to rate the perceived benefits of gambling on an 11-point scale ranging from 0 (*not at all*) to 10 (*very favourable*). They also rated their likelihood of taking the risk on an 11-point scale ranging from 0 (*definitely will not*) to 10 (*definitely will*). Overall perceived benefit and gambling likelihood were averaged across the four scenarios

Results

Correlational analyses

Means, standard deviations, and inter-correlations of the variables are presented in Table 1. Fate control and social cynicism were positively correlated with gambling likelihood, $r(183) = .18, p < .05$, and $r(183) = .20, p < .001$, respectively. In addition, fate control was positively correlated with perceived benefit of gambling, $r(184) = .17, p < .05$. Perceived benefit was positively correlated with gambling likelihood, $r(183) = .49, p < .001$. Thus, fate control was positively related to the proposed mediator, which was in turn related to the dependent variable, suggesting the possibility of a mediation effect.

Testing mediating effect

All model testing in this study was based on the analysis of covariance structures using the EQS program (Bentler, 1995). Generally, values of comparative fit index (CFI) and non-normed fit index (NNFI) over 0.90 and root-mean-square error of approximation (RMSEA) below 0.08 indicate adequate fit (Byrne, 1994). We tested our model of fate control and social cynicism affecting gambling likelihood through perceived benefit as mediator (see Figure 1). Since this model had no degree of freedom, there was no goodness-of-fit estimate for this model.

The paths from fate control to perceived benefit and from perceived benefit to gambling likelihood were significant, with standardized coefficients being .18 and .47, respectively, $ps < .05$. The indirect effect from fate control to gambling likelihood was .31, $p < .05$. The Sobel test statistic for the mediating model was also significant at 2.32 ($p < .05$), indicating that perceived benefit of gambling fully mediated the effect of fate control on gambling likelihood.

The path from social cynicism and gambling likelihood was also significant, with a standardized coefficient of 0.16, $p < .05$. Since the path from social cynicism and perceived

benefit was $-.02$, $p > .05$, social cynicism affected gambling likelihood directly without working through perceived benefit.

Thus, in Study 1, we found that both fate control and social cynicism were positively linked with the propensity to take risks in gambling scenarios, but the two axiom factors differed in their pathways to gambling likelihood. The impact of fate control was mediated by perceived benefit of gambling, whereas social cynicism affected gambling likelihood directly.

Study 2

After testing the impact of social axioms on risk-taking propensity in hypothetical scenarios, Study 2 aimed to further examine the impact of fate control and social cynicism in a real life context. In this study, we recruited youth samples who participated in gambling activities.

Method

Participants

Participants in this study were recruited via the District Youth Outreaching Social Work Teams (YOTs), one of the major social services for youth in Hong Kong. YOTs provide counselling and guidance to young people aged 6 to 24 who normally do not participate in conventional social or youth activities. Both genders and different ages of young people were invited to ensure the variability of demographic background.

Before administering the questionnaires, the agency workers of the YOTs were first briefed about the study, including the principal aim of the study, the selection criteria for respondents, the anonymous and voluntary nature of the study and the standardized procedure for administering the study. Then the questionnaires were administered to small groups of participants in activity rooms of the YOTs by the trained outreach social workers. Participants

were informed of the purpose of the study and assured of the confidentiality of their personal data and their responses.

A total of 547 adolescents (150 females; $M_{age} = 17.3$, $SD = 2.51$) participated in the study. Their age ranged from 12 to 27, with 96.3% of them being 22 or below. Nearly half (49.4%) were students and 9.5% had dropped out from school.

Measures

Distortive gambling cognitions. We adopted the 23-item Gambling Related Cognitions Scale — Chinese (Raylu & Oei 2004) to assess gambling related distortive cognitions. Respondents rated how much they agreed with each statement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores indicating higher levels of cognitive distortion (e.g., “When I have a win once, I will definitely win again”). It consists of five subscales, namely illusion of control, predictive control, interpretative bias, gambling-related expectancies, and perceived inability to stop gambling. The inter-correlations between the five sub-scales were high, ranging from .62 to .79 and suggesting a high level of co-variation between factors. Oei, Lin and Raylu’s (2007) validation study on this scale confirmed that general cognition had a good fit for the Chinese sample. We thus averaged all items and constructed a general gambling cognition ($\alpha = .94$).

Attitudes towards Money. The Money Ethic Scale (Tang, 1995) is a 12-item scale measuring the meanings that people ascribe to money (e.g., “Money is a symbol of success”). Respondents rated how much they agreed with each statement on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating more positive attitudes towards money ($\alpha = .75$). It has been translated into Chinese and applied on Taiwanese students (Tang, Furnham, & Wu-Davis, 2002).

Gambling frequency. Fifteen types of gambling were listed, such as card games, horse betting, sports betting, dice games, casino games, online gambling, doing the lottery and other Chinese-style games (e.g., *u* and *Pai Gow* poker). Respondents were asked to indicate the frequency of their participation in each type in the past twelve months, from 0 (*none*) to 4 (*every day*). The respondents who did not participate in any type of gambling in the past twelve months were excluded from this study. A gambling frequency score was computed by averaging the score of each gambling type. Gambling frequency is a behavioural indicator of risk-taking propensity for gambling.

Fate control and social cynicism. Similar to Study 1, the subscales of social cynicism and reward for application from the Social Axioms Survey (Leung et al., 2002) were used in this study. The Cronbach's alphas were .65 and .75, respectively.

Results

Correlational analyses

Means, standard deviations, and inter-correlations of the variables are presented in Table 2. Social cynicism was positively correlated with gambling distortive cognitions and attitudes towards money, $r(509) = .32$, and $r(533) = .30$, respectively, $ps < .001$. Similarly, fate control was positively correlated with both variables, $r(513) = .27$, and $r(536) = .22$, respectively, $ps < .001$. Furthermore, gambling distortive cognitions and attitudes towards money were positively correlated with gambling frequency, $r(518) = .40$, and $r(542) = .21$, respectively, $ps < .001$.

Testing mediating effects

Path analysis was conducted by using the EQS program. We tested the hypothesized model with gambling distortive cognitions and attitudes towards money mediating the effects of social axioms (social cynicism and fate control) on gambling frequency (See Figure 2). Since the

paths from social cynicism and fate control to gambling frequency were not significant, these two paths were removed for subsequent analysis (see Figure 3). Using the maximum likelihood (ML) estimation method, the goodness-of-fit was acceptable, $\chi(2) = 0.77$, CFI = 1.00, NNFI = 1.02 and RMSEA = 0.00. The paths from social cynicism to gambling distortive cognitions (standardized coefficient = .25, $p < .001$) and to attitudes towards money (standardized coefficient = .26, $p < .001$) were significant. Similarly, the paths from fate control to gambling distortive cognitions (standardized coefficient = .19, $p < .001$) and to attitudes towards money (standardized coefficient = .14, $p = .003$) were also significant.

In addition, the paths from gambling distortive cognitions and attitudes towards money to gambling frequency were significant, with standardized coefficients = .37 and .11, respectively, $ps < .05$. To test the indirect effects of social cynicism and fate control on gambling frequency, Sobel tests for the four mediating paths were conducted. The Sobel test statistics for the paths from social cynicism to attitudes towards money and distortive gambling cognitions were 2.50, $p = .01$ and 4.74, $p < .001$, respectively. Similarly, the Sobel test statistics for the paths from fate control to attitudes towards money and distortive gambling cognition were 2.02, $p = .02$ and 3.77, $p < .001$, respectively. These results indicated that gambling distortive cognitions and attitudes towards money fully mediated the effects of fate control and social cynicism on gambling frequency.

Comparing mediating effects

Our model showed that both gambling distortive cognitions and attitudes towards money were significant mediators for the relations of social cynicism and fate control with gambling frequency. Next, we compared the strength of mediation effects between the two mediators.

To identify which mediator was linked to social cynicism more strongly, we first

constructed a model constraining the path from social cynicism to attitudes towards money and the path from social cynicism to distortive gambling cognitions. The paths from social cynicism to attitudes towards money and gambling cognitions were .30 and .16, respectively, $ps < .05$. The chi-square of this constrained model was 21.02 ($df = 4$). The chi-square difference between this constrained model and the original model was $\chi(1) = 5.65, p < .05$, indicating that the two mediating paths were significantly different and that attitudes towards money was a stronger mediator for social cynicism.

Similar procedures were used to compare the two mediating paths for fate control. The paths from fate control to distortive gambling cognitions and attitudes towards money were .19 and .16, respectively, $ps < .05$. The chi-square of the constrained model was 20.17 ($df = 4$). Therefore, the chi-square difference between this constrained model and the original model was $\chi(1) = 5.57, p < .05$, indicating that the two mediating paths were significantly different and that distortive gambling cognitions was a stronger mediator for fate control.

In Study 2, we identified the pathways from social cynicism and fate control to gambling frequency through attitudes towards money and gambling distortive cognitions as mediators. Attitudes towards money was a stronger mediator for social cynicism, whereas distortive gambling cognitions was a stronger mediator for fate control.

General Discussion

The present research proposed a model using world-views to predict gambling propensity and behaviour with specific beliefs about gambling as mediators. In Study 1, we adopted hypothetical scenarios and found that both fate control and social cynicism were positively linked with the likelihood to gamble. The effect of fate control was mediated by perceived benefit of gambling, whereas social cynicism affected likelihood to gamble directly. In Study 2,

we recruited at-risk adolescents and revealed that the relations of social cynicism and fate control to gambling frequency were mediated through distortive gambling cognitions and attitudes towards money.

Generalized beliefs are important in studying gambling

General beliefs about the world represent the conceptual framework of life and how individuals see the world function (Leung & Bond, 2004). They not only affect individuals' attitudes and perception, but also have influences on decisions and actions (Chen et al., 2016; Sue, 1990). They provide basic premises for individuals to derive specific beliefs to deal with given situations (Tang & Wu, 2010). For example, social axioms predicted the lay beliefs of Chinese adolescents about the causes and cures of psychological problems (agoraphobia and schizophrenia) and social problems (child abuse and corruption) (Chen & Bond, 2012). In gambling context, belief in fate control influenced problem gambling through expectancy bias and self-efficacy (Tang & Wu, 2010). Our study provided further evidence to support the generic world-view nature of social axioms as a fundamental psychological construct in predicting gambling behaviours.

Social cynicism is related to the disliking of the self and mistrust of other social beings (Leung et al., 2002), while a core component of fate control belief is that there are impersonal, external forces that determine life events (Leung et al., 2002). Due to lack of trust towards others and believing that life is out of one's own control, people with high levels of social cynicism and fate control respectively may have fewer resources to solve problems, resulting in higher likelihood to use wishful thinking (Bond et al, 2004), a type of avoidant coping strategy that hopes for the best without taking actions. Therefore, wishful thinking tendency could result in illusionary control and over-optimistic towards winning.

On the other hand, people with both fate control and social cynicism beliefs have higher perceived stress in daily life (Kuo, Kwantes, Towson, & Nanson, 2006). Gambling research has shown that problematic gamblers experience more daily stressful events and perceive each stressful event more impactful (Elman, Tschibelu, & Borsook, 2010). Therefore, people high in social cynicism and fate control may have higher gambling urges and use gambling to temporarily direct their attention away from their stressful lives, conducive to higher gambling frequency.

Unpacking the effects of generalized beliefs on gambling

To unpack the mechanisms underlying the relations between world-views and gambling propensity and behaviour, the mediation effects of specific beliefs about gambling were found. In Study 1, perceived benefit of gambling mediated the effect of fate control on likelihood to gamble. In Study 2, distorted beliefs about gambling and positive attitudes towards money mediated the effects of fate control and social cynicism on gambling frequency. Taken together, endorsing fate control and social cynicism increases gambling propensity and behaviour because such beliefs over-focus the positive side of gambling and downplay the negative side of gambling.

Previous studies showed that problem gamblers held more distorted beliefs towards gambling. For example, regular gamblers, and pathological and problem gamblers had greater overconfidence in their betting decisions than non-problem gamblers (Goodie, 2005). Gamblers assume their cognitions about gambling to be true without external validation, and this assumption leads to gambling persistence despite losing money (Ladouceur & Walker, 1996). The present results confirmed the findings from previous studies, and also discovered a possible source of illusionary belief among gamblers, which is fate control. Fate control denotes that life

events are predetermined by an impersonal force, and yet things can be done to modify one's fate (Leung et al., 2002). It is a source of optimism as well (Sohl et al., 2011), which explains our results that people with higher fate control perceived more benefit from gambling and more control over the gambling outcome in Study 1. Yet, social cynics' gloomy world-view does not work through these mechanisms, so perceived benefit could not account for such effects on gambling likelihood.

Rather, this research identified that attitudes towards money and distortive cognitions mediated the relations between social cynicism and gambling frequency in Study 2. Previous research found that winning was the most important motive for both recreational and problem gamblers (Platz and Millar, 2001), outweighing other motives including excitement, exploration, and being with friends. Another study by Stewart, Zack, Collins, Klein and Fragopoulos (2008) revealed that 56% of the gamblers whom they studied were enhancement gamblers who gambled for positive reinforcement such as money. Thus, money was clearly an important motive for gambling. However, the studies above have yet to explain the reasons behind these patterns.

The present results supported the importance of money in driving gambling behaviour. In addition, the mediating path between social cynicism, attitudes towards money and gambling frequency suggested that social cynicism was a possible reason why gamblers put more focus on money. It is the component of mistrust of human nature, authority figures, and social institutions that generates a sense of insecurity. The present results indicate that social cynics place a higher value on money. Being distrustful of the world, social cynics may be more likely to hold on to the tangible benefit of gambling (usually money), which has the ability to provide them with a sense of protection in an environment that they do not trust.

These results indicate that generalized beliefs about the world affect one's beliefs in a

specific domain, hence affecting behavioural tendency and actual behaviours in that domain. In particular, young people who had a strong belief in fate control were more likely to have distorted beliefs about gambling, which served as a stronger mediator to predict higher frequency of gambling behaviour. On the other hand, those who were inclined towards cynical belief were more likely to believe in the power of money, which served as a stronger mediator to predict higher gambling frequency. Thus, the two social axioms, fate control and social cynicism, exerted significant effects on gambling intention and frequency.

Limitations and Future Directions

First, this research aimed to understand the impact of social axioms on gambling behaviours. We studied both university students and at-risk youth samples. However, the current samples could not represent the whole student population and at-risk youth population. Further studies could be conducted to examine the census data for representative samples in Hong Kong.

Secondly, the reliability of fate control in both Studies 1 and 2 was low ($\alpha = .58$ in Study 1 and $\alpha = .65$ in Study 2). The low reliability of fate control compared with other axiom factors has been observed across different cultural groups (Leung et al., 2012). Therefore, in future studies, we could explore other variables that are similar to fate control, such as negotiable fate (Au et al., 2011) and examine their impact on gambling behaviours.

Thirdly, this research used a cross-section research design, which cannot infer causal relationships of the variables. Hence, longitudinal studies could be conducted to examine the impact of social axioms across time, which help us further understand how the change of social axioms affects the increase/ decrease in gambling likelihood and frequency of gambling.

Fourth, the independent variables and mediators in the present study are all cognitive factors. Future research may identify mitigating factors other than attitudes, Take control belief

as an example, Chaturvedi, Chiu, and Viswanathan (2009) suggested that people suffer from immutable constraints (e.g. countries in lower GDP and people in lower literacy levels) develop higher levels of negotiable fate, implying that socio-cultural context affects the prevalence of belief in fate. Such contextual factors can be explored to understand the antecedents of risk-taking behaviors.

Practical Implications

Problematic gambling creates problems not only for individuals, but also for their families, and the whole community. This research underscored the importance of social axioms in predicting gambling behaviours through cognitive mediators. The findings could have important practical implications on helping gamblers reduce their gambling frequency by changing their beliefs about the world. Previous research by Chen, Wu, and Bond (2009) showed that external and environmental forces influenced both self-views and world-views, leading to psychological outcomes (suicidal ideation in their study). Therefore, one possible intervention for frequent gamblers is to alter their beliefs about the world through external and environmental forces. Gambling prevention and treatment programs can also help at-risk adolescents and university students examine their general beliefs about the social environment and specific attitudes toward money and gambling rather than holding distorted assumptions. Addressing these cognitive distortions will bring about positive change of gambling behaviour.

References

- Andresen, B. (2000). Six basic dimensions of personality and a seventh factor of generalized dysfunctional personality: A diathesis system covering all personality disorders. *Neuropsychobiology, 41*, 5-23.
- Bentler, P. M. (1995). *EQS: Structural equations program manual*. Encino, CA: Multivariate Software, Inc.
- Bond, M. H., Leung, K., Au, A., Tong, K. –K., & Chemonges-Nielson, Z. (2004). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18*, 177-191.
- Byrne, B. M. (1994). *Structural Equation Modeling with EQS and EQS/ Windows: Basic concepts, applications, and programming*. Thousands Oaks, CA: Sage Publications.
- Chen, L. & Zhang, J. (2004). Relation between general social beliefs and interpersonal conflict resolution styles. *Chinese Journal of Clinical Psychology, 12*, 151-153. (in Chinese)
- Chen, S. X., & Bond, M. H. (2012). Lay beliefs about psychological and social problems among adolescents: Motivational and cognitive antecedents. *Journal of Applied Social Psychology, 42*, 170-194.
- Chen, S. X., Fok, H. K., Bond, M. H., & Matsumoto, D. (2006). Personality and beliefs about the world revisited: Expanding the nomological network of social axioms. *Personality and Individual Differences, 41*, 201-211.
- Chen, S. X., Lam, B. C. P., Wu, W. C. H., Ng, J. C. K., Buchtel, E. E., Guan, Y., & Deng, H. (2016). Do people's worldviews matter? The why and how. *Journal of Personality and Social Psychology, 110*, 743-765.

- Chen, S. X., Wu, W. C. H., & Bond, M. H. (2009). Linking family dysfunction to suicidal ideation: The mediating roles of self-views and world-views. *Asian Journal of Social Psychology, 12*, 133-144.
- Darke, P. R., & Freedman, J. L. (1997). The belief in good luck scale. *Journal of Research in Personality, 31*, 486-511
- Dinca, M., & Iliescu, D. (2009) Linking social axioms with behavioral indicators and personality in Romania. In K. Leung, & M. H. Bond (Eds), *Psychological aspects of social axioms: Understanding global belief system* (pp. 145-162). New York: Springer.
- Elman I, Tschibelu E, Borsook D (2010) Psychosocial stress and its relationship to gambling urges in individuals with pathological gambling. *Am J Addict 19*(4): 332–9.
- Fraser, C., & Gaskell, G. (1990). *The social psychological study of widespread beliefs*. Oxford, UK: Glarendon.
- Furnham, A. (1988). *Lay theories*. London: Pergamon.
- Goodie, A. S. (2005). The role of perceived control and overconfidence in pathological gambling. *Journal of Gambling Studies, 21*, 481-502.
- Job, R. F. S., Hamer, V., & Walker, M. (1995). The effects of optimism bias and fear on protective behaviour. In D. Kenny, & R. F. S. Job (Eds.), *Australia's adolescents: A health psychology perspective* (pp. 151-156). Armidale: New England University Press.
- Koltko-Rivera, M. E. (2004). The psychology of worldviews. *Review of General Psychology, 8*, 3–58.
- Kuo, B. C. H., Kwantes, C. T., Towson, S., & Nanson, K. M. (2006). Social beliefs as determinants of attitudes toward seeking professional psychological help among ethnically diverse university students. *Canadian Journal of Counselling, 40*, 224-241.

- Ladouceur, R. (2004). Perceptions among pathological and nonpathological gamblers. *Addictive Behaviors, 29* (3), 555–565.
- Ladouceur, R., & Walker, M. (1996). A cognitive perspective on gambling. In P. M. Salkoskvis (Ed.), *Trends in cognitive and behavioral therapies* (pp. 89–120). New York: Wiley.
- Lai, J. H., Bond, M. H., & Hui, N. H. (2007). The role of social axioms in predicting life satisfaction: A longitudinal study in Hong Kong. *Journal of Happiness Studies, 8*, 517–535.
- Langer, E. (1975). The illusion of control. *Journal of Personality and Social Psychology, 32*, 311–328.
- Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2011). Psychosocial causes and consequences of pathological gaming. *Computers in Human Behavior, 27* (1), 144–152.
- Leung, K., & Bond, M. H. (2004). Social axioms: A model for social beliefs in multicultural perspective. *Advances in Experimental Social Psychology, 36*, 119–197.
- Leung, K., & Bond, M. H. (2008). Psycho-logic and eco-logic: Insights from social axiom dimensions. In F. van de Vijver, D. van Hemert, & Y. P. Poortinga (Eds.), *Individuals and cultures in multilevel analysis* (pp. 197–219). Mahwah, NJ: Erlbaum.
- Leung, K., & Bond, M. H. (Eds.). (2009). *Psychological aspects of social axioms: Understanding global belief systems*. New York: Springer SBM.
- Leung, K., Bond, M. H., de Carrasquel, S. H., Muñoz, C., Hernández, M., Murakami, F., Yamaguchi, S., Bierbrauer, G., & Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33*, 286–302.
- Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., III, Gornick, L. J., Amponsah, B., ...

- Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the Five-Factor Model of personality. *Journal of Cross-Cultural Psychology, 43*, 833-857.
- Neto, F. (2006). Dimensions and correlates of social axioms among a Portuguese sample. *Individual Differences Research, 4*, 340-351.
- Oceja, L. (2009). Process of transmission and change of social axioms and their behavioral influence in Spanish culture. In K. Leung, & M. H. Bond (Eds), *Psychological aspects of social axioms: Understanding global belief system* (pp. 129-141). New York: Springer.
- Oei, T. P. S., Lin, J., Raylu, N. (2007). Validation of the Chinese version of the Gambling related cognitions scale (GRCS-C), *Journal of Gambling Studies, 23*, 309-322.
- Pennings, J. M. E., & Smidts, A. (2003). The shape of utility functions & organizational behavior, *Management Science 49* (9), 1251-1263.
- Platz, L. & Millar, M. (2001). Gambling in the context of other recreation activity: A quantitative comparison of casual and pathological student gamblers. *Journal of Leisure Research. 33* (4), 383-395.
- Raylu, N., & Oei, T. P. S. (2004). The Gambling Related Cognitions Scale (GRCS): Development, confirmatory factor validation and psychometric properties. *Addiction, 99*, 757-769.
- Rohrman, B. (2004). Risk Attitude Scales: Concepts and Questionnaires. Project Report, Department of Psychology, University of Melbourne <Available at <http://www.rohrmannresearch.net/pdfs/rohrmann-racreport.pdf>>.
- Safdar, S., Lewis, J. R., & Daneshpour, M. (2006). Social axioms in Iran and Canada: Intercultural contact, coping and adjustment. *Asian Journal of Social Psychology, 9*, 123-

131.

- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the life orientation test. *Journal of Personality and Social Psychology, 67*, 1063-1078.
- Schubert, R., Brown, M., Gysler, M., Brachinger, H. W. (1999). Financial decision making: Are women really more risk averse? *The American Economic Review, 89*, 381-385.
- Sloan, F. A., Eldred, L. M., Guo, T., & Xu, Y. (2013). Are people overoptimistic about the effects of heavy drinking? *Journal of Risk and Uncertainty, 47* (1), 93-127.
- Sohl, S. J., Moyer, A., Lukin, K., & Knapp-Oliver, S. K. (2011). Why are optimists optimistic? *Individual Differences Research, 9*, 1-11.
- Stewart, S. H., Zack, M., Collins, P., Klein, R. M., & Fragopoulos, F. (2008). Subtyping pathological gamblers on the basis of affective motivations for gambling: Relations to gambling problems, drinking problems, and affective motivations for drinking. *Psychology of Addictive Behaviors, 22* (2), 257-268.
- Sue, D. W. (1990). *Counseling the culturally different: Theory & practice* (2nd ed.). New York: Wiley.
- Tang, T. L. P. (1995). The development of a short money ethic scale: Attitudes toward money and pay satisfaction revised. *Personality and Individual Difference, 19* (6), 809-816.
- Tang, T. L. P., Furnham, A., Wu-Davis, G. M. T. (2002). The meaning of money: The money ethic endorsement and work-related attitudes in Taiwan, the USA and the UK. *Journal of Managerial Psychology, 17* (7), 542-563.
- Tang, C. S., & Wu, A. M. (2010). Direct and indirect influences of fate control belief, gambling expectancy bias, and self-efficacy on problem gambling and negative mood among

- Chinese college students: A multiple mediation analysis. *Journal of Gambling Studies*, 26, 533–543.
- Toneatto, T., Vettese, L., & Nguyen, L. (2007). The role of mindfulness in the cognitive-behavioral treatment of problem gambling, *Journal of Gambling Issues*, 19, 91-100.
- Treloar, H. R., Morris, D. H., Pedersen, S. L., & McCarthy, D. M. (2012). Direct and indirect effects of impulsivity traits on drinking-and-driving behavior in young adults. *Journal of Studies on Alcohol and Drugs*, 73, 794-803.
- Wang, L. S., Chen, J. Y., Lin, M. C., & Wang, M. C. (2008), The relationship between leisure satisfaction and life satisfaction of adolescents concerning online games, *Adolescence*, 43, 177–184.
- Wild, L. G., Flisher, A. J., Bhana, A., & Lombard, C. (2004). Associations among adolescent risk behaviours and self-esteem and six domains. *Journal of Child Psychology and Psychiatry*, 45 (8), 1454-1467.
- Wood, R. T. A., Gupta, R., Derevensky, J. L., & Griffiths, M. (2004). Video game playing and gambling in adolescents: Common risk factors. *Journal of Child and Adolescent Substance Abuse*, 14, 77-100.
- Wong, S. S. K., & Tsang, S. K. M. (2011). Validation of the Chinese version of the Gamblers' Belief Questionnaire (GBQ-C). *Journal of Gambling Studies*, 28, 561-572.
- Zhou, K., Hui, T., Yue, S., Gui-Hai, H., Li-Lin, R., Zhu-Yuan, L., & Shu, Li. (2011). Belief in luck or in skill: Which locks people into gambling? *Journal of Gambling Studies*, 28 (3), 379-391.

Table 1

Means, Standard Deviations, and Intercorrelations among the Measures in Study 1

Measure	Mean	S.D.	Correlation			
			1	2	3	4
1. Social cynicism	3.06	0.39	-			
2. Fate control	3.01	0.50	.33***	-		
3. Perceived benefit of gambling	5.07	2.23	.05	.17*	-	
5. Likelihood to gamble	3.79	1.84	.20**	.18*	.49***	-

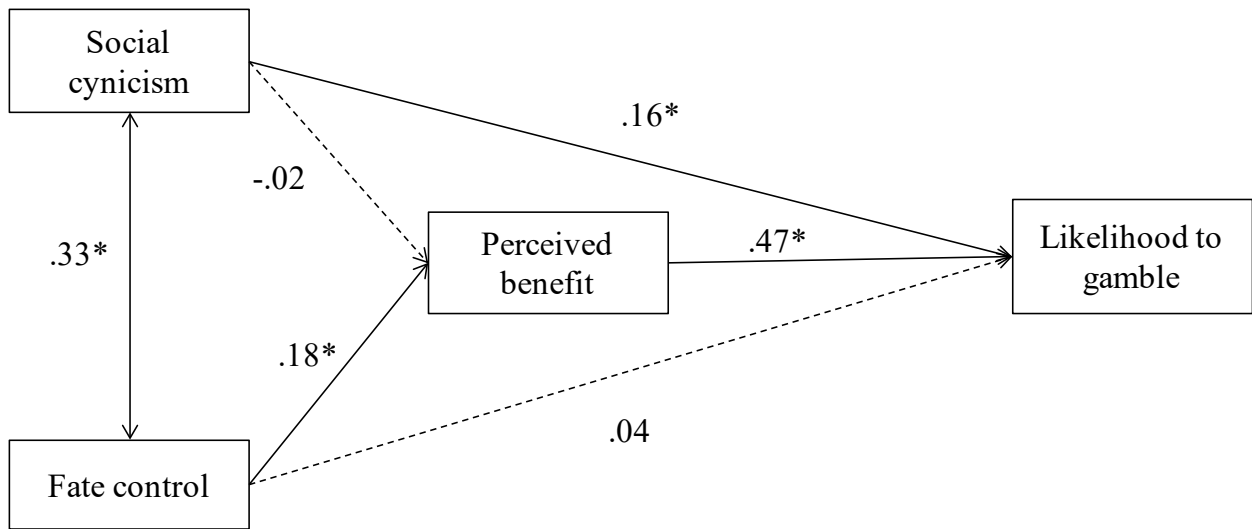
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2

Means, Standard Deviations, and Intercorrelations among the Measures in Study 2

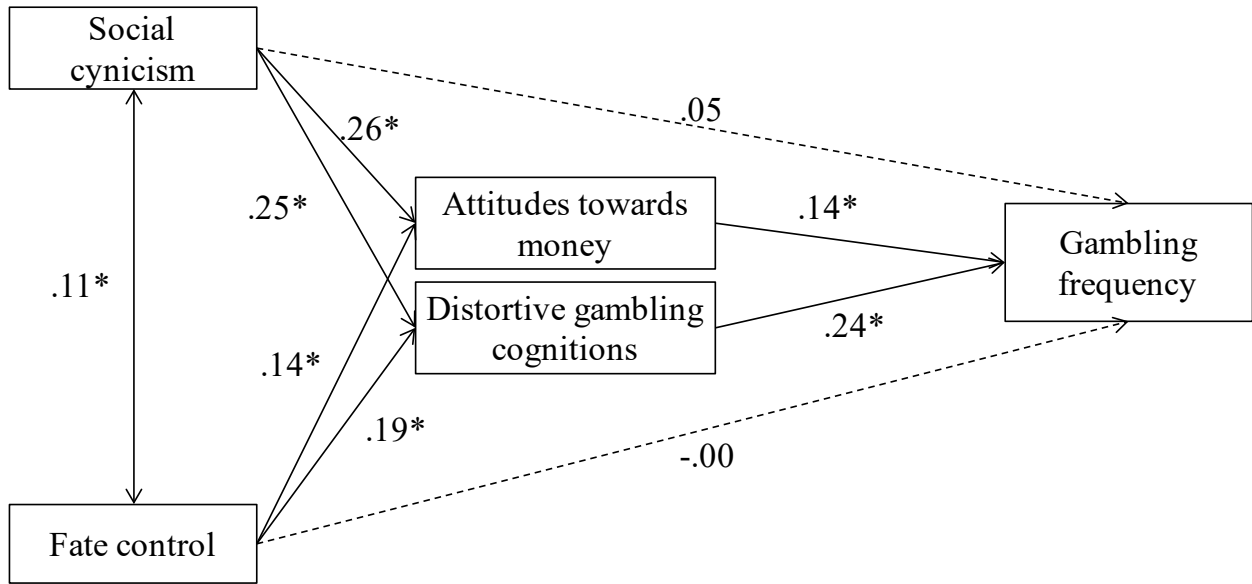
Measure	Mean	S.D.	Correlation				
			1	2	3	4	5
1. Social cynicism	3.32	0.47	-				
2. Fate control	2.94	0.58	.39***	-			
3. Distortive gambling cognitions	3.27	1.15	.32***	.27***	-		
4. Attitudes towards money	3.41	0.57	.30***	.22***	.27***	-	
5. Gambling frequency	1.64	0.47	.16***	.09*	.40***	.21***	-

* $p < .05$, *** $p < .001$.



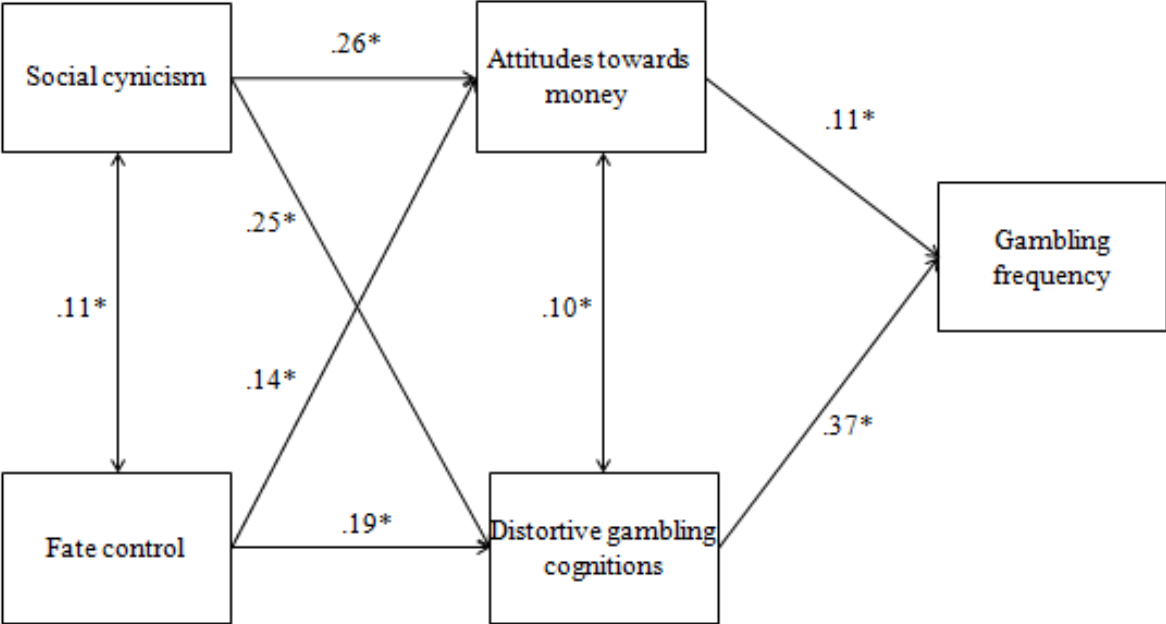
* $p < .05$

Figure 1. Path model in Study 1



* $p < .05$

Figure 2. Path model in Study 2



* $p < .05$

Figure 3. Final path model in Study 2