How do gamblers maintain and illusion of control?

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A B S T R A C T

Introduction: Gamblers’ enduring illusions of control (IOC) may be one reason why they continue to gamble in the face of sustained losses. If gamblers persist in the belief that they have special skills, knowledge and other advantages when gambling, they may be able to convince themselves it is worth doing again. Maintaining an IOC requires selective attention of the illusion supporting moments during the construction of an evaluation of a gambling session.

Objective: Test the hypothesis that selected moments, specifically the moment of the highest win and the last moment of the gaming session, explain the retrospective evaluation of the session for gamblers high in the illusion of control.

Method: A total of 102 and 35 experienced gamblers were recruited from gambling venues and participated in two studies by gambling on 20 occasions on coin toss outcomes. Participants were asked to evaluate their enjoyment of the gambling experience they had just completed, and completed an IOC Beliefs Questionnaire designed to measure the extent to which they believe they are good at influencing gambling outcomes.

Results: Gamblers with a high IOC use the largest win in their evaluation when they lose. This is consistent with the motivated selective attention hypothesis. Non-threatened gamblers, those with a low IOC or winners, use the final outcome as the determinant of their evaluation of the gaming session.

Conclusion: The results suggest that instead of altering an important characteristic of self, gamblers instead reflect on the moment of the gaming episode that does not threaten, and in fact supports, their ability to find patterns in random events. Indicators of the illusion could be used to assist gamblers in controlling their own behavior.

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Some people repeatedly engage in behaviors that ostensibly are not in their best interest, apparently paying little attention to previous experiences associated with questionable outcomes. Frequent gamblers can perhaps be characterized in this way as people who gamble regularly eventually lose, and the losses can be substantial. For instance, Australians lost more than $20.5 billion in gambling in 2011–2012 with nearly 400,000 people in the moderate risk and problem gambler categories (Productivity Commission, 2010). Why, after experiencing inevitable losses, do frequent gamblers continue to spend money on gambling? The decision to gamble again, for example, should be influenced at least in part by one’s success on and enjoyment of previous occasions. And if constructed accurately, recollections of these experiences should, on average, discount repeated behavior. Several explanations have been offered for questionable behaviors in a gambling context, including pathological influences on decisions (Petry, 2003; Petry & Kiluk, 2002), arousal and other intangible aspects of the experience (Coventry & Hudson, 2001; Moodie & Finnigan, 2005; Sharpe, 2004), susceptibility to cognitive biases such as availability (Wagenaar, 1988) and mistaken perceptions regarding the probability of winning (Gaboury & Ladouceur, 1989), temporal discounting (Rachlin, 1990), habituation (Nowell & Blaszczynski, 2010) and impaired brain functioning (Clark, 2010). Recent reviews however, have established that the risk factors influencing the development of irresponsible gambling are still not clear (Abbott, Volberg, Bellringer, & Reith, 2004; Blaszczynski & Nowell, 2013; Forrest, 2013).

The proposition offered here takes a motivational approach by suggesting that the need to protect and affirm the self (Steele, 1988) is a contributing factor in sustained gambling. The proposal is based on the premise that self-protective forces can guide people’s reflections on past gambling experiences when they believe that they are gifted with special gambling skills. Their motivated retrospective thoughts can facilitate the maintenance of an illusion of control (IOC: Langer, 1975), allowing for continued participation in a potentially harmful activity.
1. Illusions of control

The “illusion of control” (Langer, 1975) occurs when individuals hold fallacious beliefs about their control over uncontrollable events. It is a belief that a skill or ability held by the individual can influence the outcome of a random or chance-determined event. Specifically, some people believe that they are more skilled at predicting an outcome when gambling than other people. The vast majority of IOC research shows that the situation or context influences the degree to which illusory beliefs are manifest (Presson & Benassi, 1996). Typically, an element or outcome of a randomly determined game is manipulated to engender illusory control beliefs. For example, studies illustrate the influence of familiarity with the setting affects control beliefs (Bouts & Van Avermaet, 1992), as does involvement in the game (Davis, Sundahl, & Lesbo, 2000; Dunn & Wilson, 1990; Fleming & Darley, 1990; Ladouceur & Mayrand, 1987; Langer, 1975). The most common situational characteristic used to engender an IOC is the frequency of winning or losing in previous outcomes. For instance, the illusion is more pronounced after a series of wins (Coventry & Hudson, 2001; Dixon, 2000; Thompson, Armstrong, & Thomas, 1998; Thompson et al., 2004), and much less pronounced after a series of losses (Alloy & Abramson, 1979; Gollwitzer & Kinney, 1989; Thompson et al., 2004). Given that losing is more likely than winning in commercial betting settings, the effect of previous performance should make maintaining the IOC in the longer term difficult for frequent gamblers (see Koehler, Gibbs, & Hogarth, 1994). However, repeated losses may not dampen IOC beliefs if the individual is motivated to protect their relatively stable control beliefs, as is suggested here.

In support of this contention, a growing body of work exists suggesting that the IOC is not determined by situational factors alone, and that certain people are more susceptible to the IOC than others (Fenton-O’Creevy, Nicholson, Soane, & Willman, 2003). Males in games of chance with an external locus of control (Hong & Chiu, 1988), people with a desire to control life events (Burger, 1986; Burger & Cooper, 1979; Burger & Schnerringer, 1982), promotion focused individuals (Langens, 2007), people possessing high social power (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009), and people with high self-esteem (Taylor & Armor, 1996; Taylor & Brown, 1988) are known to be more susceptible to the illusion. Although situational characteristics work against the introduction of an IOC in a gambling context, the proposition here is that this influence could be offset when individuals are motivated to protect their own sense of control. According to Thompson et al. (1998), “it seems likely that illusions of control are influenced by various motivations to have a sense of control such as to enhance feelings of self-worth and to feel optimistic about the future” (p. 154). Furthermore, an important component of the IOC is the desire to perform well at the target activity (Thompson et al., 2004). Since the self worth of gamblers who hold strong control illusions rests on their gambling performance, losing may motivate them to selectively construct their evaluations to defend the ego against this threat (Baumeister, 1997): A specific case of confirmation bias designed to protect their self-esteem (Nickerson, 1998).

The importance of the IOC in shaping the psyche and actions of gamblers is established by Steenbergh, Meyers, May, and Whelan (2002) who, via the development of the Gambler’s Belief Questionnaire (GBQ), show that the IOC is predictive of problem gambling. In fact, the IOC beliefs component (the IOC sub-scale of the GBQ) has evidenced strong convergent validity with symptoms of pathological gambling (MacKillop, Anderson, Castelda, Mattson, & Donovick, 2006). Other research on the IOC helps to explain why, showing clearly that motivations arising from these illusions can intrude to bias one’s beliefs, interpretations, and conclusions. For instance, in a number of studies, Wohl and Enzel (2002, 2003, 2009) found the IOC to engender beliefs that luck is a personal quality that can be used to influence chance outcomes in simulated gambling environments. Interestingly, people’s motivations to believe that they have strong gambling abilities, a goal of those with a strong IOC, can bolster their need to find successes when they gamble. Thompson et al. (1998) posit that overestimations of one’s ability to gamble well are especially likely when “the need for the outcome [is] strong and when previous events have undermined a sense of control, leading to the motive to regain control” (p. 154). Thus, for gamblers with strong IOC beliefs, the tendency to focus on successful episodes or particularly lucrative gambles is likely to be strong, particularly when poor gambling performances threaten one’s sense of control.

2. Motivated remembering of previous gambling episodes

2.1. Construction of retrospective evaluations

Research investigating the construction of retrospective evaluations has shown that people do not base their evaluations on the total amount of pain or pleasure felt during experiences, but instead weigh certain moments of the experience more heavily than others (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993; Kahneman, Wakker, & Sarin, 1997; Redelmeier & Kahneman, 1996; Schreiber & Kahneman, 2000). In an investigation of how retrospective evaluations are constructed, Fredrickson and Kahneman (1993) compare their peak–end model to a normative approach of summing the affect intensity of each moment of an experience. They suggest that the normative moment-by-moment approach may describe how pain or pleasure is experienced, but not how the feeling is remembered. Instead, the peak–end approach asserts that retrospective evaluations draw on select moments of an experience in a rule-like fashion. Most moments of an episode are assigned a weight of zero, and are therefore ignored, while other moments are weighted more heavily. The peak–end rule claims that the most influential moments of an experience are: the moment at which the intensity of pleasure or pain was most extreme (the peak), and the final moment (the end: Fredrickson & Kahneman, 1993; Redelmeier & Kahneman, 1996; Varey & Kahneman, 1992). The trend in the final moments of the experience has also been identified as an important determinant during the construction of a retrospective evaluation (Ariely, 1998), as people evaluate an improving trend more positively (Ross & Simonsom, 1991). In summary, the peak–end rule asserts that not all moments in an experience are treated equally. When reflecting on an experience the most affectively intense moment (the peak) and the final moments (the end) exert the most influence on retrospective evaluations. Even these selected moments may not be treated equally (Cowley, 2008a; Cowley, 2008b) because the motivation of the individual retrospectively evaluating the experience could determine which of these moments is most influential in the construction of a retrospective evaluation.

The contention presented here is that individuals with strong IOC beliefs will be motivated to focus on particular winning moments of a gambling experience when their overall performance is poor. Instead of altering their perception of their own skills, high IOC gamblers are expected to focus on certain moments of the losing experience and, consequently, remember a more positive experience. Given that retrospective evaluations are often constructed with a few salient moments of an experience, losing gamblers with a high degree of the IOC should be most likely to focus on the biggest win of a gambling session, and as such, will use the moment disproportionately in the construction of their retrospective evaluation of the event. But for gamblers who are successful in the gambling event, overall performance rather than particular moments of the event should be the primary input for forming retrospective evaluations. Theory supporting these contentions is detailed in the following sections.

2.2. The peak moment and the IOC’s influence on its use in a retrospective evaluation

The peak moment offers an important opportunity for losers with a high IOC. Individuals who lose, in an attempt to make themselves feel as
happy as possible, are motivated to segregate individual wins and losses from the series so they can enjoy a silver lining effect (Thaler, 1985, 1999). In a gambling context, the silver lining effect predicts that when reflecting back on a session where the player ultimately lost money, he or she will remember the peak win as an indication of how successful he or she can be when gambling. Remembering the peak win increases the probability of feeling good about an experience (Cowley, 2008a) and, perhaps more importantly, provides protection of an IOC even when the objective outcome does not support this belief.

Thaler (1985) also found that in a net win situation, individuals were likely to integrate wins and losses to reduce, if not eliminate, the pain associated with losses. If winners ignore the losses, they can protect themselves from any negative feelings about the experience from creeping into the memory for an objectively positive experience. Thaler’s integration rule predicts that neither the peak win nor the peak loss should affect the winner’s remembered pleasantness of a gambling episode. Two predictions arise from these assertions.

H1. The peak win will be a significant factor in the retrospective evaluations of the losers with a high score on the IOC beliefs scale.

H2. The peak win will not be a significant factor in the retrospective evaluations of winners regardless of their IOC beliefs.

2.3. The final moments and the IOC's influence on its use in a retrospective evaluation

The trend gamblers experience at the end of an episode indicates to them whether things are getting better or worse (Ariely, 1998; Fredrickson, 1998, 2000), and further may be indicative of a more general trend for some gamblers. In a gambling context, a winning ‘streak’ at the end (a positive trend) may become salient when constructing a retrospective evaluation because this pattern bodes well for other aspects of their lives. Gamblers believe that their luck comes in streaks (Wagenaar, 1988) that reach beyond the context where the streak is first detected (Darke & Freedman, 1997). In other words, the positive trend indicates that luck is with them and a good day lies ahead which makes winners feel even better about the experience. However, a positive trend may cause frustration for losers, as their luck is turning at the end of the gambling session. Using the same logic, a losing trend at the end introduces negativity into an otherwise positive experience for the winner. Both winners and losers may not want to think about the losing trend at the end because the downward trend may forebode that other negative experiences are looming. Given the complexity in the beliefs of the gambler towards trends, no systematic use of the end in the retrospective evaluation is expected.

The last moment however, could have a systematic impact in the remembered pleasantness of an episode if the gambler can attach a meaning to the outcome (Fredrickson & Kahneman, 1993). Breaking even, at the very least, is often stated as a goal after a gambling session has commenced (Thaler & Johnson, 1990). Certainly, a general reluctance exists among people to finish an experience in the red (Thaler, 1999). The end may be the very moment the loser is motivated to ignore. The last moment is the point at which any hope of a comeback has vanished as the losing result is acknowledged. For the winner, the final moment of the experience is the point upon which their winning status is ensured, and therefore may be weighted more heavily in a retrospective evaluation. For this reason, a hypothesis to be tested here is that although the loser with a high IOC will focus on the peak win (H1), the winner will include the last moment (operationalized here as the final cash position) in their evaluation regardless of their illusions of control.

H3. The final cash position will be a significant factor in the retrospective evaluations of winners regardless of their score on the IOC scale.

3. Study 1

Participants were experienced gamblers who were recruited from a registered club that provides extensive gambling services. Gamblers placed a series of real bets on a familiar game, and then expressed how much they enjoyed the gambling experience. Details of their betting outcomes were recorded to investigate how features of this profile affected their later assessment of the series. Illusion of control beliefs (Steenbergh et al., 2002) and the amount of time normally spent gambling were measured.

3.1. Method

One hundred and two gamblers (60% were female) were recruited from the club’s gaming room. Participants reported that they gambled regularly. In fact, 74% of them indicated that they played gaming machines at least once a week. Groups of four to six gamblers completed the study in a private room at the club. Participants were told that the purpose of the study was to gather their opinions of some new gambling games, which they played for money. Wins and losses were tracked using betting tokens; each participant received $75 worth with which to play. The minimum bet in each game was $1; no maximum bet was set. Consistent with casino practice, a croupier rewarded the gamblers as the outcomes of their bets were revealed. Any winnings from the session could be used in the restaurants and shops in the club.

The gambling session comprised a series of 20 “coin toss” games. In keeping with the tradition of the poker machines these gamblers were accustomed to playing, the game included a series of coin tosses in which players saw six outcomes of a coin toss before betting on the seventh outcome. To simulate 20 coin toss outcome bets, 140 outcomes of a fair coin toss (heads or tails) were generated. A randomly generated series of outcomes was employed. Participants were told that the computer was about to toss a coin 140 times with each toss activated using a keyboard by the study administrator. They were then told that they would be given 20 opportunities to bet on the future outcome of a coin toss. The outcomes were presented electronically. The players saw seven coins, the outcomes of the toss for the first six coins were revealed, but the seventh outcome was concealed. The participants then had the opportunity to gamble on the outcome of every seventh coin toss outcome with all of the information from the previous tosses. After each outcome was revealed, the study administrator distributed winnings and collected losses using tokens. For instance, if the participant bet $5.00 on tails and the coin toss revealed a tail, then the participant kept the $5.00 bet and was awarded an additional $5.00. If instead, the coin toss revealed a head, then the $5.00 bet was lost. The winnings were presented as betting tokens to be cashed in at the end of the session.

After completing the coin toss gambles, the money won by each participant (final cash position minus $75) was tallied. Participants were then asked to evaluate the gambling experience that they had just completed. They indicated whether the experience made them feel good, gave them pleasure, gave a sense of excitement, made them feel delighted, and brought them happiness (7-point scale, anchors “strongly disagree” and “strongly agree”). Responses to the five items were averaged to give an overall measure of experience enjoyment (alpha = .82). Finally, participants completed an IOC beliefs scale (Steenbergh et al., 2002), and reported how often they gamble and how much time they typically spend on each gambling outing.

The IOC beliefs scale, which indicates the extent to which individuals believe that they can influence gambling outcomes and are good at doing so, includes eight statements (e.g., “My knowledge and skill in gambling contribute to the likelihood that I will make money,” “I have more skills and knowledge related to gambling than most people who gamble”; 7-point scale, anchors “strongly disagree” and “strongly agree”; alpha = .81). A principal component analysis was conducted.
on the IOC beliefs scale scores to confirm that its factor structure was unidimensional. As expected, only one factor had an eigenvalue greater than one (eigenvalue = 3.55), confirming the unidimensionality of the scale. Also noteworthy is the finding that the IOC score was not correlated to whether the gambler won or lost during the study ($r = .10, \text{n.s.}$) or the amount of cash won or lost ($r = .03, \text{n.s.}$). This point is important because the absence of an outcome effect suggests that IOC beliefs are somewhat stable.

3.2. Results

Sixty one gamblers won money in the coin toss game and 41 gamblers lost money. The expectation was that the influence of the gamblers’ largest win during the session (peak win) on their enjoyment of the gambling experience would depend on whether they were successful at the game (won or lost money overall). Participants who lost money, and therefore may have felt that their IOC was threatened, were expected to be more likely to focus on the peak win than those who won. And further, the extent to which gamblers embraced illusory control beliefs would increase the tendency to draw on the peak win for gamblers experiencing a net loss overall (H1). For winners (more than $75.00 in betting tokens at the end of the game), the peak win was not expected to be heavily weighted in their retrospective evaluation of the episode (H2). In addition, winners were expected to base their retrospective evaluation on the final cash position of the experience which represents the moment at which current progress becomes a reality (H3).

Fig. 1. Graphic illustration of the independent variables.
To test these predictions, the outcome (win or lose), the final moment (overall monetary outcome), the peak win, the trend at the end (the slope of the outcome for the second half of the session), the score on theIOC scale and all possible interactions as independent factors were included in a stepwise regression with the retrospective evaluation as the dependent variable. See Fig. 1 for a graphic depiction of these variables. A stepwise procedure was used because multicollinearity was found in the full model. The stepwise result specifies terms with acceptable levels of multicollinearity (variance inflation indicator below 10).

The best fitting model was selected using the Cp, Mallows statistic. Of the 31 terms in the initial model, 19 were deleted. Of the 12 remaining terms 3 were significant including the two-way interaction between the peak win and the outcome, $t(88) = -6.21, p < .05, r_{pep} \approx .96$, the final moment and the outcome, $t(88) = 6.36, p < .05, r_{pep} \approx .96$, and the three way interaction between the peak win, the IOC, and the outcome, $t(88) = 9.49, p < .01, r_{pep} \approx .98$.

To understand the nature of the three-way interaction, and to further test the predictions, the evaluations of winning ($n = 61$) and losing ($n = 41$) gamblers were analyzed in two separate stepwise regressions. These regressions included the same variables with the exception of outcome. Retrospective evaluations were predicted as a function of the final moment, the peak win, the trend at the end, illusory control beliefs, and all interaction terms. For gamblers who lost money in the series, 11 items were deleted by the stepwise process. Of the four remaining, the main effect for the peak win was significant, $t(35) = 7.96, p < .01, r_{pep} \approx .98$, as was the interaction between the peak win and the IOC, $t(35) = 5.49, p < .05, r_{pep} \approx .94$. That is, people who had strong illusory control beliefs were more likely than those with weak beliefs to draw on their peak win as a basis for determining how much they remembered enjoying the gambling experience. Therefore H1 was supported by the data. Also noteworthy is the finding that the final moment (or the cash position) was not significant in the determination of the retrospective evaluation, $t(35) = 1.57, n.s.$

The pattern of results was quite different for the regression that included those gamblers who won money in the game, and thus were not threatened by a poor performance. As predicted, the enjoyment reported by winners was based only on the final moment in the game. For gamblers who won money in the series, 9 factors remained. Of the remaining factors, two were significant, the main effect for the final moment, $t(54) = 4.14, p < .05, r_{pep} \approx .92$, and the three-way interaction between the final moment, trend at the end and the IOC, $t(54) = 4.02, p < .05, r_{pep} \approx .92$. Thus for winners, ratings of the gambling experience were affected by the final position (H3 was supported), but not the peak win which was eliminated from the stepwise regression (H2 was supported). The effect was however, qualified by other influences. The final moment became increasingly important to the construction of the retrospective evaluation as the ending trend became more negative, and this pattern was most prominent for gamblers with high levels of IOC. High IOC gamblers focused on their final, winning outcome to a greater extent when their winnings were trending down rather than up at the end. But the retrospective evaluation for gamblers who were low in IOC was driven by their final outcome, regardless of the ending trend.

3.3. Discussion

The results of study 1 reveal that most gamblers used the outcome (win or loss) as a lens for the construction of a retrospective evaluation of the gambling episode. For threatened gamblers—losers with a high IOC—a critical determinant in the construction of their retrospective evaluations was the peak win. Concentrating on the peak win allows gamblers to think about the success they had in an otherwise unsuccessful experience, and facilitates the maintenance of their IOC.

Even when gamblers had a winning session, the influence of the IOC caused variability as to the focus of their attention when constructing their retrospective evaluations. Winners with a low IOC were fairly consistent in drawing on the final moment of play (where their progress became their official outcome) as the primary consideration during the formation of an evaluation regarding the gambling experience. Winners with a high IOC, however, appeared to attend to the final moment to a greater extent when their performance was declining. The inauspicious downturn in gambling performance at the end of the session might also have introduced some threat, even to winners.

4. Study 2

The interpretation of the results of study 1 rests on the assumption that the amount of money won or lost in any particular moment is highly correlated with the degree of pleasure or pain felt by the gambler. Study 2 is designed to test this assumption. In addition, a possible limitation of the design and analysis of study 1 is the assumption of an absence of lag effects: each individual outcome is assumed to elicit feelings independent of the preceding outcome or the feelings generated by the preceding outcome. The assumption runs contrary to previous research (see Skowronski & Carlston, 1989) where contrast and assimilation effects change the perception of a stimulus (in this case, a betting outcome), and the affective reaction (Olson & Pracejas, 2004), based on past stimuli (in this case, the gambling outcome immediately preceding the current outcome). Lagged variables are included to test for any effect of the preceding outcome on the current outcome.

4.1. Method

Thirty-five gamblers (12 males, 23 females) were recruited from a similar gambling establishment as was used in study 1. One gambler was omitted from the analysis because all of the tokens were lost before the end of the session.

The procedure for study 2 was exactly the same as the procedure for study 1 with one important exception. Instead of collecting a retrospective evaluation after the experience, gamblers provided an indication of how they felt immediately after the outcome of each bet by placing an ‘X’ on a continuous scale anchored with a happy face and a sad face.

4.2. Results and discussion

To test whether the current gambling outcome explained the current moment-by-moment evaluation, a time-series cross-sectional analysis was run with the outcome for each bet as the independent variable and moment-by-moment evaluations as the dependent variable. To check for the independence of moment-by-moment evaluations, a lagged outcome variable and a lagged reported feelings variable were included to test whether current moment-by-moment evaluations were affected by the previous outcome or the evaluation associated with the previous outcome. The lagged model assumes that the effect of the input variable X (the cash won or lost) on an output Y (the moment-by-moment evaluation) is distributed over time. If the value of X is changed at time t, then Y will experience some immediate effect at time t, and a delayed effect at time t + 1. In other words, previous outcomes and previous feelings will affect the current feelings. The analysis reveals that the amount of money won or lost very strongly determined the moment-by-moment feelings, $t_{current \ outcome} = 27.09, p < .0001, r_{pep} \approx .99$. Neither of the lagged variables were significant, $t_{lagged \ outcome} = 1.50, n.s.; t_{lagged \ feelings} = 1.84, n.s.$ The results indicate that the current outcome explained the moment-by-moment feelings, and that no remnants of the previous outcome or the feelings associated with that outcome affected the moment-by-moment assessment. The finding is significant because the interpretation of the results of study 1 is based on an assumption that the outcome of each gamble (amount won or lost) determines the moment-by-moment feelings.
5. General discussion

The research presented here reveals that different moments of the gambling experience were disproportionately important in the construction of retrospective evaluations, and that the particular moments with the greatest influence depended on the strength of belief to the IOC of the gambler. When no threat to IOC beliefs is present, either because the gambler won or did not have strong IOC beliefs to protect, the last moment of the experience, when losses or gains were realized, was important in the construction of their retrospective evaluation. This final moment is a typical baseline for evaluations of the gambling experience, because the final outcome is a natural point of salience. But gamblers for whom the IOC was both strong and threatened, due to losses, focused on the peak win as the most salient moment of the experience.

The rationale presented here is that losing gamblers with strong IOC beliefs may feel threatened because they think they have special skills that allow them some degree of control over chance outcomes. When they are losing, these special skills should be questioned. The results suggest that the threat motivates losers with a high IOC to focus on the most pleasant or favorable moment of the experience. Under these conditions, the peak win garners a special status during the gambling experience because they affirm an important aspect of the self. And given retrospective evaluations are constructed based on the most salient moments of the experience, the greater weight associated with the peak win by threatened high IOC losers ensures that the most positive moment becomes a key determinant of these evaluations.

5.1. Implications

5.1.1. Effects of strong illusory control beliefs

Researchers have debated whether the IOC is adaptive or maladaptive (Colvin & Block, 1994; Taylor & Brown, 1984). For example, Taylor and Brown (1988) argue that accurate perceptions of one's control over the world in which they function is not essential to psychological well-being. In their review article, they question the prevailing opinion that the IOC is maladaptive, suggesting that unrealistic optimism allows people to cope with stressful situations and may be a healthy outcome. Nevertheless, they acknowledge that circumstances exist where the IOC can be problematic (Taylor & Brown, 1988, 1994). The present research provides a deeper understanding of both helpful and harmful aspects of having strong IOC beliefs.

On the helpful side, susceptibility to the IOC buffers individuals from negative affective and psychological states (Alloy & Clements, 1992). The results presented here build on the idea of shielding one's self from unpleasant thoughts and feelings by offering a plausible process for the effect. In particular, the present research demonstrates that gamblers with strong IOC beliefs often do not report negative feelings or acknowledge discouraging feedback from losing experiences compared to other gamblers. These findings help to explain previous research suggesting a negative correlation between ones' feelings of depression and strength of their IOC beliefs (Alloy & Abramson, 1979; Golin, Terrell, & Johnson, 1977; Golin, Terrell, Weitz, & Drost, 1979). Obviously, however, a downside of having this buffer exists. The feedback gap fueled by illusory control beliefs is likely to generate a blind spot regarding the damages of heavy gambling, and thus to contribute to irresponsible betting behaviors. Evidence from previous studies supports this assertion, by suggesting that IOC is associated with both high levels of gambling (Partonetto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997) and pathological gambling behaviors (MacKillop et al., 2006; Steenbergh et al., 2002).

5.1.2. Policy implications

The rapid expansion of legalized gambling opportunities in the 1990s in Australia was primarily market driven with decisions based on the belief that increased gambling would provide strong economic and commercial benefits (Hing, 1998). However, significant negative externalities, such as increases in irresponsible gambling, are now being realized (Pinge, 2002; Productivity Commission, 1999, 2010). Along with the economic benefits of the industry (employment and tax revenue) comes the substantial social impact of problem gambling, estimated to be at least $4.7 billion per year (Productivity Commission, 2010).

The results reported here may offer important insights to policy makers and others interested in reducing irresponsible gambling to reign in these costs. First, these findings could indicate that gamblers with high IOC beliefs are more at risk for gambling irresponsibly compared to those with moderate or low scores. However, such beliefs, which fit with a general sense of control over life's outcomes, can serve a useful function. Feelings of control enhance feelings of self-worth and optimism (Thompson et al., 1998), have powerful motivating consequences (e.g., Brickman, 1987; Dember, Galinsky, & Warm, 1992), and contribute to life satisfaction and good health (Deci, Speigel, Ryan, Koestner, & Kaufman, 1982; Seligman, 1975). At the same time, the data collected here show that these types of beliefs can mute negative feedback from past gambling experiences, which is likely to increase the chances of irresponsible gambling decisions. IOC scores reported by gamblers could be a flag indicating people who could be susceptible to gambling problems.

Second, some remedies for irresponsible gambling are suggested by this research. Gamblers suffering from the negative effects of prolonged gambling sessions, and who report high IOC beliefs as well, may benefit from having these beliefs questioned so they can be adjusted. For example, counselors could use the IOC scale as a starting point to explain the erroneous nature of the beliefs. One of the motivations for harboring an IOC is that the illusion allows the gambler to explain random and enigmatic events. Although these can be positive qualities, the gambler needs to understand the boundaries of these beliefs. Those who could be making poor decisions when gambling need to learn that control illusions, and tendencies to seek support and confirmation for these illusions, often may not work in their best interest.

5.2. Limitations and future research

While the retrospective evaluations constructed by the gamblers in study 1 confirmed the hypotheses, the present research has limitations. First, the gambling outcome was not manipulated nor was the final cash position held constant in the studies reported here. Instead the chips were allowed to fall where they may. As the outcomes were randomly generated, the valence of each moment (positive or negative) was randomly distributed across moments and gamblers. However, the weight of the moments is determined by the gambler. The resulting endogeneity is a limitation of the study. Manipulating the intensity and the pattern of the peak wins and losses would provide further insights. Future work could look at the positions of the peak win and peak loss relative to: 1) each other and the end, and 2) the duration of the gambling session. Important differences are likely to exist in the tendency to engage in motivated memory reconstruction with different patterns of wins and losses. A related point is the independence of feelings each gambling outcome generated in study 2. No effect was found for the preceding outcome or feelings generated by the previous outcome on current feelings. However, effects could potentially have been found if more complex patterns of lag affect feelings, such as longer lags or lagged sequences. Whether these patterns influence the relationship between the IOC and retrospective evaluations could also be considered in future research.

Second, the findings were interpreted as initial evidence that gamblers with a high IOC are threatened when they find themselves losing at a game they believe they are skilled at playing. This threat motivates them to edit their memory for the losing experience. The retrospective evaluations were measured here, but future research could investigate whether gamblers distort other, less subjective, aspects of the
experience such as their final cash position or the amount of the peak win which could also affect the evaluation. Also, the threat to the gamblers' IOC was not measured directly here because people are often not aware of motivations to protect the self against threats, though these motivations are influential (Sherman & Cohen, 2006). In fact, if an individual acknowledged the use of a defensive strategy to protect his or her ego, the utility of the strategy would be dramatically reduced if not negated.

Third, the peak–end rule has been used to explain retrospective evaluations in a variety of contexts including people's recollections of pleasant and aversive films (Fredrickson & Kahneman, 1993), unpleasant sounds (Schreiber & Kahneman, 2000), and procedures involving minor discomforts (Kahneman et al., 1993) and substantial pain (medical procedures, Redelmeier & Kahneman, 1996). Note that in most events people encounter in life—including those studied by Kahneman and his colleagues (e.g., painful medical procedures)—people don't have objective indicators. The subjective, qualitative nature of hedonic experience perhaps partially explains why people draw on salient moments to infer enjoyment or displeasure. However, a gambling context is different because monetary outcomes are important to the experience. As shown in study 2, people's hedonic reactions when they gamble are derived, at least in part, from these outcomes. Therefore, the cash outcomes are a relatively objective indicator that approximates gamblers' hedonic responses and facilitates tracking of the ongoing experience. Because one's own responses throughout the experience can be readily tracked in the gambling context, retrospective reports of pleasure during a gambling event can be summarized by the final outcome if no motivation exists to construct the evaluation based on salient moments. The ability to quantify the affective reaction to the experience might explain why the low IOC players depended heavily on the final financial outcome when evaluating the experience. Future studies should test whether the ability to quantify the pain or pleasure felt throughout the experience influences the use of the peak and end moments in the construction of a retrospective evaluation.

Finally, the motivated remembering that was found among the participants in this study may be driven by the objective of the gamblers. Although gamblers may hope to win, they are engaging in a recreational activity where enjoying themselves is an important objective. Future research could manipulate the objective of the gambler. For example, the results may be different if the gamblers are chasing losses or trying to win money for a specific financial expenditure such as paying the rent.

References


