Development and Validation of the Gamblers’ Beliefs Questionnaire

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The Gamblers’ Beliefs Questionnaire (GBQ) is a self-report measure of gamblers’ cognitive distortions. GBQ test items were constructed on the basis of theory, empirical evidence, and expert review. Four hundred three adults completed the initial set of items, and 21 items were selected to make up the final GBQ. The factor structure of the GBQ consisted of 2 closely related factors: Luck/Perseverance and Illusion of Control. The full scale showed good internal consistency (α = .92) and adequate test–retest reliability (r = .77). Problem and pathological gamblers scored higher than nonproblem gamblers on the GBQ and its factors. GBQ scores were moderately correlated with the duration of gambling sessions among problem and pathological gamblers, and there was no relationship between GBQ scores and social desirability.

Reviews by Ladouceur and Walker (1996) and Toneatto (1999) support the role of cognitive variables in gambling behavior and suggest that problem gamblers hold cognitive distortions that may contribute to their inability to adequately control their gambling. Furthermore, there is growing support for interventions designed to modify problem gamblers’ erroneous beliefs (Bujold, Ladouceur, Sylvain, & Boisvert, 1994; Ladouceur, Boisvert, & Dumont, 1994; Sylvain, Ladouceur, & Boisvert, 1997). Given the likely role of faulty belief systems in problem gambling, the utility of a valid and efficient method for assessing gambling-related cognitive distortions for clinical and research applications is clear. The present investigation was designed to develop and evaluate a self-report measure of cognitive distortions related to gambling.

A number of cognitive distortions have been identified among gamblers (Toneatto, 1999). Examples of cognitive distortions include an illusion of control, which is the belief that one can influence the outcome of a chance-determined event (Langer, 1975), and the gambler’s fallacy, which is the belief that future outcomes can be predicted on the basis of past outcomes (e.g., if heads has come up on 10 consecutive tosses of a coin, then tails is more likely to come up on the next toss). These and other gambling-related cognitive distortions have been hypothesized to cause gamblers to misperceive the economic utility of gambling and lead to gambling persistence despite the objective expectation of monetary loss (Ladouceur & Walker, 1996).

At present, a limited set of cognitive assessment strategies is available to clinicians and researchers working with gamblers. In fact, only two methods of belief assessment can be found in the literature. Early investigations identified cognitive distortions based on indirect inferences from gamblers’ behavior (Henslin, 1967; Langer, 1975). For example, Henslin (1967) observed that regular craps players would coach new players to take their time when throwing dice and that players would throw the dice harder for larger numbers and softer for smaller ones. Although indirect assessment methods such as these were useful for the initial identification of common cognitive distortions among gamblers, they are impractical for most clinical and research applications.

Ladouceur and his colleagues (Gaboury & Ladouceur, 1988; Ladouceur, Mayrand, Dussault, Letarte, & Tremblay, 1984) developed a more direct method of cognitive assessment of gamblers. Their “thinking aloud” method required gamblers to verbalize their thoughts while gambling. These verbalizations were recorded and later coded as either rational or irrational. Criteria for these categorizations were based on objective rules of randomness and causality. Using the thinking-aloud method, Gaboury and Ladouceur (1988) found that several cognitive distortions could be identified, including references to luck; perceptions of personal skill, control, or ability; personification of a slot machine; statements regarding a system for winning; predictions; and references to cause-and-effect relationships. Although the thinking-aloud method was instrumental in the identification of gambling-related cognitive distortions, its time-intensive nature has limited its use in laboratory and clinical research. Laboratory investigations that have used the thinking aloud method have typically had small sample sizes (e.g., Gaboury & Ladouceur, 1988), and studies of cognitive interventions for problem gamblers have not evaluated cognitive distortions at pre- and posttreatment (e.g., Bujold et al., 1994; Ladouceur et al., 1994; Sylvain et al., 1997).

Findings from studies that have used inferences from gamblers’ behavior and the thinking-aloud method have provided a foundation for exploring the contribution of dysfunctional cognition to problem gambling. However, neither assessment method meets the needs of clinical researchers. Such research requires a valid, time-efficient assessment method.
Walker (1992) and Ladouceur and Walker (1996) have offered similar two-factor models of gamblers’ cognitive distortions. First, there is a core set of beliefs that the gambler has a greater level of control over the outcome of a gambling event than in fact he or she has. The second factor involves a set of beliefs that lead gamblers to overestimate their chances of winning. Whether these two belief sets exist independently has not been explored; however, there seems to be a general consensus that the illusion of control can be differentiated from other types of cognitive distortions that lead to overestimation of one’s chances of winning (Ladouceur & Walker, 1996; Walker, 1992).

The purpose of the present project was to develop and validate a self-report measure of gambling-related cognitive distortions that assesses illusion of control and overestimation of the likelihood of winning. In the first of five interrelated studies we developed the initial content of the instrument. We designed the four remaining empirical studies to: (a) refine the measure and examine the instrument’s internal consistency and factor structure, (b) explore its temporal stability, (c) provide evidence for its convergent validity, and (d) provide evidence for its discriminant validity.

Study 1

Overview

The purpose of Study 1 was to identify the domain of gambling-related cognitive distortions and to generate an initial pool of items for a gamblers’ beliefs questionnaire (GBQ).

Method

Walker’s (1992) and Ladouceur and Walker’s (1996) two-factor models of gambling-related irrational thinking provided the conceptual framework for scale construction. Extant literature regarding gambling-related irrational beliefs was examined, and core beliefs in luck and the illusion of control were identified. Given the possible variations in beliefs that may exist across specific forms of gambling activities (e.g., lottery, roulette, blackjack, slot machines), an effort was made to generate items that would assess general gambling-related cognitive distortions. Once identified, these beliefs were transformed into statements. For example, the belief that one holds specific skills that increase his or her chances of winning was used to represent the illusion of control and was transformed into the statement “My knowledge and skill in gambling contribute to the likelihood that I will make money.”

The initial set of 21 items was sent to three experts in the areas of cognitive psychotherapy, irrational belief assessment, and the cognitive psychology of gambling. The experts were asked to provide feedback regarding item content and to recommend additional items that might be included in the GBQ.

Results

On the basis of feedback from one of the experts, we reworded some items to be less obvious. In addition, four new items were suggested. Item refinement resulted in a pool of 25 items (hereafter referred to as the GBQ–1).

Seven-point Likert-type scales were included with each statement and allowed respondents to rate the extent of their agreement with each item. Anchors for the scale ranged from strongly agree through neutral to strongly disagree. All items were reverse scored so that higher scores were indicative of greater gambling-related cognitive distortion. The directions were “Read each of the following statements carefully. Rate to what extent you agree or disagree with each statement by circling a number.”

Study 2

Overview

The purposes of Study 2 were to (a) refine the GBQ–1 on the basis of factor analytic and internal consistency data and (b) examine the factor structure and internal consistency of the remaining items. On the basis of these findings, we selected a final item pool and determined the scale’s factor structure and internal consistency.

Method

Participants. A sample of 403 participants was drawn from community members (n = 203) and undergraduate students over the age of 21 years (n = 200) at an urban state university. The average age of the sample was 33.2 years (SD = 15.2), and women outnumbered men (57.6% vs. 42.4%). Minorities were well represented among participants (61.0% Caucasian, 25.6% African American, 3.0% Asian, and 10.4% of other or unspecified ethnicity). A majority (85%) of participants reported gambling at least once during their lifetime. Nongamblers were included in the study, as gambling status does not dictate the presence or absence of gambling-related irrational beliefs. On average, participants had gambled approximately 10 times during the past 12 months and had spent over 3 hr gambling on each of those occasions.

Procedure. Most community participants (n = 156) were recruited from local workplaces and mass-transit waiting areas in two large urban areas in the southern United States. These participants were approached by a research associate at the particular recruitment site, informed of the study, and asked to participate. If the individual chose to participate, he or she was provided a consent form, a questionnaire packet, and a pencil and, if consent was provided, asked to complete the questionnaire at that time. An additional 47 community participants were recruited by introductory psychology students and agreed to come to the university and complete the questionnaire at a group-based administration session. Undergraduate participants over the age of 21 years were recruited through the university’s introductory psychology participant pool and completed the questionnaire in a classroom setting. Community and undergraduate participants were informed that they were under no obligation to participate, that they could drop out of the study at any time, and that nonparticipation in the study would have no adverse consequences. All participants were asked to complete the GBQ–1, a gambling involvement questionnaire that provided demographic information and self-reported gambling behavior, and three other measures that were also used in Studies 4 and 5.

Results and Discussion

Exploratory factor analysis. We conducted a principal-axis factor analysis to explore the factor structure of the GBQ–1. The Kaiser–Meyer–Olkin measure of sampling adequacy (.93); Bartlett’s test of sphericity, χ²(300, N = 403) = 4,163.49, p < .001; and the determinant of the matrix (.00003) each indicated that the correlation matrix was appropriate for such an analysis. Five factors with eigenvalues greater than 1.0 were extracted from the matrix. However, examination of the scree plot suggested that either one or two factors should be retained. We used parallel analysis to determine the correct number of factors to retain (Horn, 1965; Zwick & Velicer, 1986). For the purposes of this study, we generated 1,000 random data sets for 403 participants and 25
variables. Eigenvalues for the first two GBQ–1 factors were 8.99 and 1.75, respectively. The eigenvalues of these factors exceeded the eigenvalues of the random data sets, and both factors were retained. The third, fourth, and fifth factors extracted from the GBQ–1 correlation matrix were not retained, because their eigenvalues (1.33, 1.16, and 1.03, respectively) failed to exceed those of the third, fourth, and fifth factors (1.35, 1.30, 1.26, respectively) extracted from the random data sets.

The two factors that were retained accounted for 43.0% of the variance in GBQ–1 scores. We performed oblimin rotation to increase the interpretability of these factors. We examined the factor loadings for each item, and one item failed to load above .30 on either factor. We dropped this item from the item pool. We conducted a second exploratory factor analysis to examine the factor loadings of the remaining 24 items; it revealed that all items loaded above .35 on at least one of the two factors. Fifteen items loaded most heavily on the first factor and shared a common theme in the belief that luck, perseverance, or both, would eventually lead to gambling wins. The second factor consisted of 9 items, which were related to the illusion of control.

**Internal consistency.** We assessed with coefficient alpha the internal consistency of the 24-item GBQ–1 scale and its two factors. Three items, including two from the Luck/Perseverance factor and one from the Illusion of Control factor, were deleted because their item–total correlations with the entire scale and with their respective factors were below .4.

**Factor structure and internal consistency of the GBQ.** The 21 remaining items constituted the final version of the GBQ. Total scores for the GBQ were determined by adding responses for all items. Possible scores could range from 21 to 147. The mean GBQ score for the entire participant sample was 54.59 (SD = 22.19), with scores ranging from 21 to 123.

We used principal-axis factor analysis with oblimin rotation to explore the factor structure of the GBQ. We chose a two-factor solution on the basis of a scree test and parallel analysis. The two factors accounted for 48.3% of the variance and were highly correlated (r = .62). Factor loadings are presented in Table 1. The factors identified in this analysis matched the Luck/Perseverance and Illusion of Control factors identified in exploratory analyses used for item selection. Thirteen items loaded most heavily on the Luck/Perseverance factor. This factor was consistent with Walker’s (1992) delineation of cognitive distortions that lead gamblers to overestimate their chances of winning. The item that loaded most heavily on this factor—“When I lose at gambling, my losses...

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Gamblers’ Beliefs Questionnaire Items and Factor Pattern Matrix</th>
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<tbody>
<tr>
<td>Item</td>
<td>Factor 1</td>
</tr>
<tr>
<td>I think of gambling as a challenge.</td>
<td>.11</td>
</tr>
<tr>
<td>My knowledge and skill in gambling contribute to the likelihood that I will make money.</td>
<td>.14</td>
</tr>
<tr>
<td>My choices or actions affect the game on which I am betting.</td>
<td>−.03</td>
</tr>
<tr>
<td>If I am gambling and losing, I should continue because I don’t want to lose a win.</td>
<td>.48</td>
</tr>
<tr>
<td>I should keep track of previous winning bets so that I can figure out how I should bet in the future.</td>
<td>.15</td>
</tr>
<tr>
<td>When I am gambling, “near misses” or times when I almost win remind me that if I keep playing I will win.</td>
<td>.52</td>
</tr>
<tr>
<td>Gambling is more than just luck.</td>
<td>−.10</td>
</tr>
<tr>
<td>My gambling wins are evidence that I have skill and knowledge related to gambling.</td>
<td>.12</td>
</tr>
<tr>
<td>I have a “lucky” technique that I use when I gamble.</td>
<td>.33</td>
</tr>
<tr>
<td>In the long run, I will win more money than I will lose gambling.</td>
<td>.46</td>
</tr>
<tr>
<td>Even though I may be losing with my gambling strategy or plan, I must maintain that strategy or plan because I know it will eventually come through for me.</td>
<td>.51</td>
</tr>
<tr>
<td>There are certain things I do when I am betting (for example, tapping a certain number of times, holding a lucky coin in my hand, crossing my fingers, etc.) which increase the chances that I will win.</td>
<td>.56</td>
</tr>
<tr>
<td>If I lose money gambling, I should try to win it back.</td>
<td>.65</td>
</tr>
<tr>
<td>Those who don’t gamble much don’t understand that gambling success requires dedication and a willingness to invest some money.</td>
<td>.43</td>
</tr>
<tr>
<td>Where I get money to gamble doesn’t matter because I will win and pay it back.</td>
<td>.74</td>
</tr>
<tr>
<td>I am pretty accurate at predicting when a “win” will occur.</td>
<td>.43</td>
</tr>
<tr>
<td>Gambling is the best way for me to experience excitement.</td>
<td>.61</td>
</tr>
<tr>
<td>If I continue to gamble, it will eventually pay off and I will make money.</td>
<td>.73</td>
</tr>
<tr>
<td>I have more skills and knowledge related to gambling than most people who gamble.</td>
<td>.34</td>
</tr>
<tr>
<td>When I lose at gambling, my losses are not as bad if I don’t tell my loved ones.</td>
<td>.84</td>
</tr>
<tr>
<td>I should keep the same bet even when it hasn’t come up lately because it is bound to win.</td>
<td>.70</td>
</tr>
</tbody>
</table>

*Note.* Directions to the respondent were “Read each of the following statements carefully. Rate to what extent you agree or disagree with each statement by circling a number.” Each item was rated on a Likert-type scale that ranged from 1 (strongly agree) to 7 (strongly disagree).
are not as bad if I don’t tell my loved ones”—appeared to be indirectly linked to the other items. It may be that respondents who endorse this view believe that they will eventually win back money and that therefore there is no need to tell loved ones of temporary losses. Scores for this factor could range from 13 to 91. In this study, the mean Luck/Perseverance factor score was 30.21 (SD = 14.02, range: 13–76).

The eight items loading on the second factor were homogeneous in content and referred to a skill orientation toward gambling. This belief that one can influence the outcome of a chance event has been termed the illusion of control and has been linked to gambling behavior. For example, Langer (1975) found that individuals placed higher wagers on games that fostered an illusion of control. Scores on the Illusion of Control factor could range from 8 to 56. The mean factor score in this study was 24.38 (SD = 9.95, range: 8–53).

We examined the internal consistency for the 21-item GBQ. Coefficient alpha for the GBQ was .92, and alphas for the Luck/Perseverance factor and the Illusion of Control factor were .90 and .84, respectively.

The GBQ was designed to assess the two-factor conceptualization of gambling-related cognitive distortions (Ladouceur & Walker, 1996; Walker, 1992). The evidence presented here supports the ability of the GBQ to measure these two related constructs. It is noteworthy that these data represent the first empirical support for the differentiation between illusion of control and other gambling-related cognitive distortions. Internal consistency for the GBQ and the Luck/Perseverance factor was favorable. The Illusion of Control factor had a slightly lower coefficient alpha. This may have been due to the modest eight items in this subscale, or to the possibility that illusion of control is not a unitary dimension.

Further study of the factor structure measured by the GBQ is warranted. Of particular interest is the potentially causal role that illusion-of-control beliefs may play in the development of cognitive processes related to overestimation of winning. In addition, the question remains whether this factor structure applies to a population of problem gamblers.

Study 3

Overview

The purpose of Study 3 was to determine the temporal stability of the GBQ and its factors within an adult undergraduate population. Participants completed the GBQ during class and again within 2 weeks of the initial administration. We examined the correlations among full-scale and factor scores across the two test administrations.

Method

Participants. A subsample of undergraduate students (N = 93) who completed Study 2 agreed to participate in further research for course credit. These participants were 60.2% female and 39.8% male and were ethnically diverse (African American = 22.6%, Caucasian = 68.8%, and those of other ethnic background = 8.6%). The mean age of the sample was 25.4 years (SD = 5.25) and, over the past year, participants gambled on average of 7.2 occasions and spent 2.4 hr gambling per occasion. There was no difference in gender, χ²(1, N = 199) = 0.00, p = .97; ethnicity, χ²(2, N = 198) = 5.20, p = .07; age, t(2,198) = 1.86, p = .07; or average duration of gambling sessions, t(2,183) = 0.37, p = .71, between this subsample and the undergraduates who chose not to participate in this study. Participants reported gambling more frequently over the past 12 months (M = 7.2, SD = 18.8) than did nonparticipants (M = 3.0, SD = 5.6), t(2,188) = 2.09, p = .04.

Procedure. Participants who had completed Study 2 were telephoned and invited to complete an additional set of questions. Those who consented to participate completed the GBQ 2 weeks after the initial administration date.

Results and Discussion

We used Pearson correlation coefficients to examine the relationship between GBQ full-scale and factor scores. The retest correlation for full-scale scores was .77. Retest correlations for Luck/Perseverance and Illusion of Control factor scores were .71 and .77, respectively.

The examination of the test–retest reliability of the GBQ provided the first demonstration of the temporal stability of gambling-related cognitive distortions. Unfortunately, the lack of empirical data from other studies of gamblers’ beliefs makes interpretation of the coefficient reported here difficult. A few studies have examined the temporal stability of measures of irrational thinking; however, it is not clear that findings based on more general constructs of irrational beliefs are similar to gambling-related cognitive distortions. For example, Malouff and Schutte (1986) evaluated the Belief Scale, a widely used measure of general irrational beliefs, and reported a reliability coefficient of .89 for a 2-week test–retest interval. That coefficient was higher than the GBQ test–retest coefficient of .77. Whether this difference was due to measurement error or reflected actual differences in the stability of the constructs measured by the GBQ remains to be determined.

The test–retest reliability data reported here were gathered from undergraduates. Those who chose to participate in this study gambled more frequently than nonparticipants from the undergraduate pool did. It is unclear what effect gambling frequency may have on the stability of irrational beliefs. Although frequent gambling may expose individuals to more opportunities to solidify gambling-related irrational beliefs, it may also serve to disconfirm such beliefs.

Study 4

Overview

In Study 4 we examined the convergent validity of the GBQ by exploring its relationship with measures of problem gambling and gambling behavior. The cognitive perspective of problem gambling holds that gambling-related irrational beliefs are important in the maintenance of excessive gambling behavior (e.g., Ladouceur & Walker, 1996). On the basis of this assumption, higher levels of irrational beliefs should be found among individuals with gambling problems. Furthermore, among those with gambling problems, higher levels of cognitive distortions would be expected to be correlated with lengthier gambling sessions. In this study we examined (a) whether participants identified as problem or pathological gamblers scored higher on the GBQ than nonproblem gamblers and (b) whether higher GBQ scores were correlated with
longer gambling sessions among problem and pathological gamblers.

Method

Participants. The participants (N = 371) were undergraduate students (n = 192) and community members (n = 179) who had completed Study 2. Thirty-two (18%) of the initial 403 participants in Study 2 were not included in this study, because they did not complete all of the items on both measures of problem gambling.

Gambing involvement questionnaire. A short gambling involvement questionnaire, which was designed for this study, provided basic demographic information, including participants’ age, gender, marital status, education level, and family income. In addition, participants’ gambling frequency, average duration of gambling sessions, and wagering levels were assessed.

South Oaks Gambling Screen. The South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) is a 20-item self-report measure that was developed as a screening instrument for pathological gambling. SOGS items pertain to gambling problems over the individuals’ lifetime and are based on criteria from the third edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-III; American Psychiatric Association, 1980) criteria for pathological gambling. The SOGS has been reported to be internally consistent (α = .97) and possess adequate 1-month test-retest reliability (rs = −.61−.70; Lesieur & Blume, 1987). Convergent validity for the SOGS has been demonstrated by analyzing the relationship of SOGS scores with counselors’ assessments of gambling involvement (r = −.86, p < .001) and with classification based on DSM-III-R criteria (American Psychiatric Association, 1987) for pathological gambling disorder (r = .94, p < .001; Lesieur & Blume, 1987). Scores on the SOGS range from 0 to 20, and commonly used cutoff scores of 3 or 4 and 5 or greater have been used to identify problem and pathological gamblers, respectively (Volberg, 1997).

Massachusetts Gambling Screen DSM–IV Questionnaire. The Massachusetts Gambling Screen DSM–IV (MAGS DSM–IV; Shaffer, LaBrie, Scanlan, & Cummings, 1994) is a 12-item self-report measure based on DSM–IV (American Psychiatric Association, 1994) criteria for pathological gambling. Respondents are asked to indicate the presence or absence of diagnostic symptoms over the past 12 months. This measure has shown adequate internal consistency for research purposes (α = .87; Shaffer et al., 1994). A score of 5 or greater has been used to identify pathological gamblers (Shaffer et al., 1994).

Procedure

We conducted two sets of analyses of variance (ANOVAs) to examine whether individuals with gambling problems in the past year or over the course of their lifetime scored higher on the GBQ and its factors than those without problems. First, we used MAGS DSM–IV scores to classify participants’ past-year gambling behavior. We identified 11 pathological gamblers and 360 nonpathological gamblers using a recommended cutoff score of 5 (Shaffer et al., 1994). We then used ANOVAs to determine whether groups differed on GBQ full-scale or factor scores. Second, we classified participants on the basis of their scores on the SOGS, which provided an index of lifetime gambling problems. We used scores of (a) less than 3, (b) 3 or 4, and (b) 5 and higher to classify nonpathological (n = 317), problem (n = 22), and pathological gamblers (n = 32), respectively. We conducted a second set of ANOVAs to determine whether SOGS-identified groups differed on GBQ full-scale or factor scores. Finally, we used correlational analyses to explore the relationship between length of gambling session and GBQ full and factor scores among SOGS-identified problem and pathological gamblers.

Results and Discussion

The ANOVA of the GBQ full-scale scores revealed that pathological gamblers identified with the MAGS DSM–IV (M = 75.55, SD = 18.34) scored significantly higher than nonpathological gamblers (M = 53.93, SD = 22.40), F(1, 369) = 10.03, p = .002, d = .97. Pathological gamblers also scored significantly higher than nonpathological gamblers on the Luck/Perseverance and Illusion of Control factors, F(1, 369) = 8.69, p = .003, d = .90, and F(1, 369) = 8.53, p = .004, d = .90, respectively.

An ANOVA of the GBQ full-scale scores among SOGS-identified nonproblem (M = 52.50, SD = 22.21), problem (M = 60.73, SD = 18.82), and pathological gamblers (M = 70.94, SD = 21.50) revealed significant differences among these three groups, F(2, 368) = 11.16, p < .001. Follow-up contrasts indicated that problem and pathological gamblers (M = 66.39, SD = 20.61) scored significantly higher than nonproblem gamblers on the GBQ, t(368) = 4.06, p < .001, d = .63. However, there was no significant difference between problem and pathological gamblers, t(53) = 1.68, p = .09, d = .50. The results of this second contrast should be interpreted with caution because of the limited sample sizes and medium effect size, which resulted in a power coefficient of .42 (Cohen, 1988). An ANOVA also revealed significant differences among SOGS-identified groups on Luck/Perseverance and Illusion of Control factor scores, F(2, 368) = 7.84, p < .001, and F(2, 368) = 12.55, p < .001, respectively. Follow-up contrasts indicated that problem and pathological gamblers scored higher than nonproblem gamblers on the Luck/Perseverance, t(368) = 3.22, p = .001, d = .53, and Illusion of Control factors, t(368) = 4.53, p < .001, d = .48. No differences between problem and pathological gamblers were detected on either the Luck/Perseverance, t(53) = 1.72, p = .09, d = .48, or Illusion of Control factors, t(53) = 1.32, p = .19, d = .36. These analyses suggested trends for differences; however, their relatively small sample sizes and medium effects limited the power of follow-up analyses.

We examined the relationship between the average amount of time spent per gambling occasion and GBQ full-scale and factor scores for the 52 of the 54 problem and pathological gamblers who provided an estimate of the average duration of a gambling occasion. Pearson correlation coefficients revealed moderate relationships between the average amounts of time spent per gambling occasion and GBQ full-scale and Luck/Perseverance factor scores (rs = .43 and .48, p < .001, respectively). No significant relationship between average time spent per gambling occasion and Illusion of Control factor scores was detected (r = .21, p > .05).

Consistent with the theory proposed by Ladouceur and Walker (1996), participants identified by the SOGS as gambling in problematic ways over the course of their lifetimes scored significantly higher than nonproblem gamblers on the GBQ. Likewise, individuals who had gambled at clinically significant pathological levels in the past year, as indicated by MAGS DSM–IV scores, had higher scores on the GBQ than nonpathological gamblers did. There is prior empirical support for these findings. Baboushkin, Hardoon, Gupta, and Derevensky (1997) reported that, relative to nonpathological gamblers, pathological gamblers made more irrational statements while gambling.

There was a trend for SOGS-defined pathological gamblers to score higher than problem gamblers on the GBQ. That no statistically significant differences at p < .05 between these groups.
were found should be viewed tentatively because of the limited statistical power available for this analysis. The limited sample of gamblers in both groups, coupled with a moderate effect size, resulted in a 58% chance that a significant difference between groups would have been missed, if in fact such a difference existed (Cohen, 1988). However, if these findings are accurate and the GBQ does not differentiate between problem and pathological gamblers, then there are at least four possible explanations for such findings. First, there may truly be no difference between problem and pathological gamblers in their gambling-related irrational beliefs. Alternatively, it may be that the GBQ does not assess other important domains of irrational beliefs that might potentially differentiate between problem and pathological gamblers. Third, SOGS measurement error may have led to misclassification of some participants, which would have skewed the results of this analysis (Abbott & Volberg, 1996). Finally, true differences between problem and pathological gamblers may not be due to endorsement of irrational beliefs.

This study provides additional convergent validity for the GBQ by showing that GBQ full-scale and Luck/Perseverance factor scores were correlated with the average length of time that problem and pathological gamblers spent gambling. This finding, too, is consistent with that of Ladouceur and Walker (1996), who hypothesized that cognitive distortions among individuals with gambling problems may be responsible for the maintenance of gambling behavior once it has been initiated. That Illusion of Control factor scores did not correlate with the average duration of gambling sessions was surprising. It may be that beliefs about one’s ability to control the outcome of a gambling event are directly challenged over the course of the gambling session and, with mounting evidence against these beliefs, individuals may quit gambling earlier. This finding clearly warrants further exploration.

Study 5

Overview

Study 5 was designed to explore the discriminant validity of the GBQ. Given the concern of one expert rater about the “obviousness” of irrational belief items, we deemed it important to examine the relationship between social desirability response biases and GBQ total and factor scores.

Method

Participants who were involved in Study 2 were asked to complete a measure of social desirability. Of those 403 participants, 393 (91.1%) completed every item on both the GBQ and the social desirability measure and were included in this study.

These participants completed the Social Desirability Scale (SDS; Crowne & Marlowe, 1964), which is a 33-item self-report measure of an individual’s tendency to endorse items in a socially desirable manner. Each item is presented in the form of a statement, and respondents are asked to indicate whether each statement is true or false as it pertains to them. The SDS has good internal reliability (K-R 20 = .88) and temporal stability (1 month test–retest \( r = .88 \); Crowne & Marlowe, 1964).

Results and Discussion

A Pearson correlation coefficient revealed no significant relationship between the SDS and the GBQ \( (r = -.03; p > .05) \). SDS scores were not correlated with the Luck/Perseverance \( (r = -.02; p > .05) \) or Illusion of Control factors \( (r = -.03, p > .05) \), either. These findings suggest that full-scale and factor scores were not affected by participants’ tendencies to respond in a socially desirable way.

General Discussion

Given the growing concern over problem gambling and the hypothesized role that cognitive distortions may play in problematic gambling behavior, it is clear that a measure of gambling-related cognitive distortions could prove quite useful to clinicians and researchers. Therefore, we conducted this series of studies to develop and evaluate a self-report assessment tool for evaluating gambling-related cognitive distortions.

Initial scale construction was based on existing conceptualizations of gambling-related cognitive distortions and input from expert raters. We used factor and internal consistency analyses to select items. The final 21-item GBQ measured two related constructs: belief in luck/perseverance and the illusion of control. Full-scale and factor scores exhibited good internal consistency. Evidence of convergent validity was provided by two separate analyses that compared GBQ full-scale and factor scores across nonproblem and problem gamblers. Consistent with Ladouceur and Walker’s (1996) cognitive perspective on gambling, participants with gambling-related problems reported higher levels of cognitive distortions than those without gambling problems. Furthermore, among those with gambling problems, GBQ full-scale and Luck/Perseverance factor scores were moderately correlated with the average length of their gambling sessions. One study of divergent validity revealed that GBQ scores were not related to social desirability biases.

One possible limitation of the GBQ may be the general nature of the items. None of the items address beliefs specific to certain types of gambling (e.g., slot machines, blackjack, horse racing). However, recent efforts to measure illusion of control across specific gambling activities have shown limited success (Kassinove, Davidson, & Sukhodolsky, 1998). Another possible limitation of the GBQ involved the construct-driven approach that was used to develop the instrument. By selecting scale items that were theoretically based, it is possible that we overlooked new and potentially important domains of the construct.

Future studies are necessary to examine the properties of the GBQ across various demographic characteristics (e.g., gender, race, age). Given the largely nonclinical nature of the sample used in the present series of studies, data from more representative clinical samples of gamblers will also aid in the validation of the GBQ for clinical assessment. Similarly, the properties of the GBQ, including its predictive utility, within specific gambling populations (e.g., horse track betters, roulette players, slot players) should be examined to ensure the accuracy and utility of the measure.

This series of studies provides initial support for the use of the GBQ in both research and clinical situations. The GBQ needs further examination. As a treatment planning and outcome measure, it may aid clinicians in conducting cognitively based treatments for problem gambling as well as provide important information on the impact of such treatments on gambling-related cognitive distortions.
References


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