

# Convergent Validity of Measures of Cognitive Distortions, Impulsivity, and Time Perspective With Pathological Gambling

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The present study investigated the convergent validity of the Gamblers' Beliefs Questionnaire (GBQ; T. A. Steenbergh, A. W. Meyers, R. K. May, & J. P. Whelan, 2002), Gambling Passion Scale (GPS; F. Rousseau, R. J. Vallerand, C. F. Ratelle, G. Mageau, & P. J. Provencher, 2002), Eysenck Impulsivity Questionnaire (EIQ; S. B. G. Eysenck & H. J. Eysenck, 1978), and Stanford Time Perception Inventory (STPI; P. C. Zimbardo & J. N. Boyd, 1999) in reference to pathological gambling. The authors recruited 105 undergraduates representing categories of pathological gamblers, potential pathological gamblers, and nonpathological gamblers and administered the measures under neutral conditions. Both subscales of the GBQ and GPS and the Impulsivity subscale of the EIQ exhibited strong convergent validity, whereas the STPI showed weaker correspondence with symptoms of pathological gambling. Applications and limitations of these findings are discussed.

*Keywords:* pathological gambling, assessment, cognitions, impulsivity, time perspective

Valid assessment of pathological gambling remains a developing area of research (Ladouceur & Toneatto, 2003; Raylu & Oei, 2002; Steenbergh, Meyers, May, & Whelan, 2002). For example, as in the case of other addictive disorders (e.g., Sayette, 1999), pathological gamblers exhibit a variety of cognitive distortions, such as skill misperceptions, skewed temporal orientation, superstitions, and interpretive biases (Caron & Ladouceur, 2003; Langer, 1975; Toneatto, 1999). However, a lack of valid measures has impeded the systematic investigation of these factors.

Two promising measures that have undergone preliminary validation are the Gamblers' Beliefs Questionnaire (GBQ; Steenbergh et al., 2002) and the Gambling Passion Scale (GPS; Rousseau, Vallerand, Ratelle, Mageau, & Provencher, 2002). The GBQ is a two-factor self-report measure that assesses two core cognitive distortions in pathological gamblers, Luck/Perseverance and Illusion of Control. Similarly, the GPS is a two-factor measure of an individual's self-reported passion for gambling (Rousseau et al., 2002). Based on Vallerand et al.'s (2003) binary conception of passion, the GPS assesses obsessive and harmonious passion for gambling (Rousseau et al., 2002). During initial validation studies, performance on both the GBQ and GPS has been demonstrated to correspond with gambling behavior (Ratelle, Vallerand, Mageau, Rousseau, & Provencher, 2004; Rousseau et al., 2002; Steenbergh et al., 2002).

Impulsivity is a personality trait that has been extensively discussed in reference to addictive behavior (Sher, Trull, Bartholow, & Vieth, 1999) but has been understudied in pathological gambling using validated measures (Raylu & Oei, 2002). Among the studies using validated measures, a relatively stable finding by those using the Eysenck Impulsivity Questionnaire (EIQ; Eysenck & Eysenck, 1978) has been higher self-reported impulsivity in pathological gamblers relative to controls (Alessi & Petry, 2003; Blaszczynski, Steel, & McConaghy, 1997; Nower, Derevensky, & Gupta, 2004).

Another construct that has been hypothesized to be relevant to pathological gambling (Hodgins & Engel, 2002) is time perspective, or an individual's orientation toward the past, present, and future. Time perspective can be assessed using the Stanford Time Perception Inventory (STPI; Zimbardo & Boyd, 1999). In a preliminary study, Hodgins and Engel (2002) found that subscales of the STPI discriminated between pathological gamblers and recreational gamblers.

All of the aforementioned assessment measures may be relevant to understanding the underlying mechanisms of pathological gambling; however, they have not been extensively validated in reference to pathological gambling or to each other. As such, the goal of this study was to evaluate the convergent validity of these measures. Convergent validity may be defined as the extent to which measures commonly correspond in terms of group performance (Campbell & Fiske, 1959). These measures were administered to undergraduate collegiate gamblers who were selected to represent various degrees of gambling behavior, from recreational to pathological gamblers.

## Method

### Participants

For both theoretical and statistical reasons, this study examined individuals reporting a range of gambling problems. There has been considerable

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debate as to the validity of strict demarcations between pathological and nonpathological gambling status (National Research Council, 1999; Stinchfield, 2002; Toce-Gerstein, Gerstein, & Volberg, 2003; Walker & Dickerson, 1996). In addition, the principal statistical analyses were correlational; we considered the use of a continuous measure of gambler status to provide the most valid and fine-grained assessment of the association between the dependent variables. Therefore, we sought a sample that would include individuals with and without gambling problems as well as individuals representing an intermediate point. Pathological gambler (PG) status was operationalized as a score of 5 or above on the South Oaks Gambling Scale (SOGS; Lesieur & Blume, 1987, described in more detail below), nonpathological gambler (NPG) status was operationalized as a score of 0 on the SOGS, and potential pathological gambling (PPG) status was operationalized as a SOGS score of 1, 2, 3, or 4.

The SOGS was initially administered in a group setting to 451 students from the Binghamton University Department of Psychology Human Subject Pool. All potential participants who met criteria for either the PG (5%) or PPG (8%) status were contacted, and all agreed to participate in the study. As PG and PPG participants were enrolled, randomly selected students with gambling experience from the remaining group were contacted and invited to participate. One hundred five undergraduate students were recruited; the sample sizes for the PG, PPG, and NPG samples were 24, 40, and 41, respectively. All participants were permitted to select their choice of 1.5 required research credits or \$10; approximately 25% selected the financial compensation.

Participants were predominantly male (75.5%) and approximately 19 years old ( $M = 19.45$ ,  $SE = 0.22$ ). The majority of participants were Caucasian (54.8%), with 30.6% reporting Asian ethnicity and small proportions reporting Latino (8.1%) and African American (6.5%) ethnicity. Mean SOGS scores were 7.67 ( $SD = 2.82$ ) for the PG sample, 1.85 ( $SD = 1.00$ ) for the PPG sample, and 0 for the NPG sample. According to the nonsymptom-oriented section of the SOGS, the modal participant for the PG sample reported engaging in seven different gambling activities on a regular basis. Of these, the most common were card games (95.5%), scratch cards (90%), skill games (86.3%), and dice games (77.2%). For the PPG sample, the modal participant reported engaging in six gambling activities on a regular basis. Of these, the most common were card games (72.5%), scratch cards (72.5%), raffles (72.5%), and casino gambling (60%). For the NG sample, the modal participant reported engaging in two gambling activities on a regular basis. Of these, the most common were scratch cards (72.5%), card games (42.5%), and bingo (42.5%). All participants in the NPG condition reported some experience with gambling.

## Procedure

Individuals who qualified for the study were contacted by research assistants and scheduled for a 90-min appointment as part of a larger ongoing study of cognitive and behavioral mechanisms in pathological gambling. The participants then completed the packet of self-report questionnaires, counterbalanced to avoid order effects, in a neutral experimental room.

## Measures

**SOGS.** The SOGS is a 20-item psychometrically validated measure of pathological gambling. Items reflect symptoms of pathological gambling, and a criterion score of 5 has been validated for identifying pathological gamblers (Lesieur & Blume, 1987). The SOGS converges with the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) diagnostic criteria for pathological gambling (Stinchfield, 2002) and has been validated for use in collegiate samples (Ladouceur et al., 2000). The version used in this study requested information about lifetime gambling behavior.

**GBQ.** The GBQ is a 21-item measure of gambling beliefs that yields two factor scores: Luck/Perseverance, reflecting an individual's perception that chance is favorable for him or her; and Illusion of Control, reflecting

an individual's perception that his or her behavior influences chance occurrences. Preliminary research has suggested that the GBQ has good internal and test-retest reliability, and good construct validity (Steenbergh et al., 2002).

**GPS.** The GPS is a 10-item measure assessing two types of passion for gambling, Obsessive Passion and Harmonious Passion. The former is theorized to reflect a controlled internalization of gambling as part of one's identity that creates an internal pressure to gamble, whereas the latter is theorized to be an autonomous internalization of gambling that fosters a decision to gamble (Rousseau et al., 2002). Preliminary research suggests that the GPS has good internal reliability and construct validity (Rousseau et al., 2002; Ratelle et al., 2004).

**EIQ.** The EIQ is a 63-item measure of impulsivity that has been demonstrated to have good psychometric properties (e.g., Eysenck, Pearson, Easting, & Allsopp, 1985). The EIQ yields three subscales: Impulsivity, defined as a combination of risk taking and nonplanning; Empathy, defined as capacity to identify with others' experiences; and Venturesomeness, defined as thrill- and adventure-seeking proneness.

**STPI.** The STPI is a 56-item psychometrically validated instrument with five factors related to how an individual views time. Future orientation is proposed to assess an individual's general orientation to future events. Past-Negative orientation is proposed to assess a regretful perspective toward a past that is perceived as having included trauma, sadness, and pain. Past-Positive orientation is proposed to assess a warm, sentimental view of an individual's past. Present Hedonistic orientation is proposed to assess a risk-taking and impulsive perspective. Present Fatalistic orientation is proposed to assess a hopeless and helpless perspective on the present. The STPI has been demonstrated to have good strong reliability and validity (Zimbardo & Boyd, 1999).

## Results

All analyses were conducted with SPSS 11.5. To explore convergent validity, we calculated Pearson's product-moment correlations for each of the measures in reference to the SOGS and each other; Table 1 summarizes these results. The criterion for convergent validity was based on previously reported convergent validity research in the assessment of pathological gambling. Petry (2003) reported convergent validity between the SOGS and the Addiction Severity Index–Gambling Scale (Lesieur & Blume, 1992), with correlations from .27 to .44 in three different samples. Similarly, Neighbors, Lostutter, Larimer, and Takushi (2002) included the SOGS in a study of adaptations of addictions-related measures for use with pathological gamblers and reported correlations of .30 to .55. On the basis of these findings, we selected a correlation of .30 as the threshold criterion for establishing convergent validity. A power analysis revealed that the probability for detecting correlations of .30 in a sample of 105 participants at the .05 significance level would be 88%. Each measure's internal reliability was assessed using Cronbach's (1951) alpha and was generated as follows: SOGS  $\alpha = .79$ , GBQ  $\alpha = .95$ , GPS  $\alpha = .91$ , EIQ  $\alpha = .79$ , and STPI  $\alpha = .85$ .

Statistically significant positive correlations were detected between the SOGS score and both GBQ subscales, both GPS subscales, and the EIQ-Impulsivity subscale. All of these correlations reached the criterion of .30. In addition, among these subscales, significant positive correlations with each other were observed. In terms of the STPI, only the Present Fatalistic subscale met the criterion for convergent validity; however, the Present Hedonistic subscale indicated a statistically significant association, and the Future subscale indicated a significant negative correlation. Both Present Fatalistic and Present Hedonistic subscales showed signif-

Table 1

*Correlations Between Measures of Cognitive Distortions, Impulsivity, and Time Perspective Across Categories of Gambling Behavior*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. South Oaks Gambling Scale	—												
2. GBQ-Luck/Perseverance	.65***	—											
3. GBQ-Illusion of Control	.54***	.85***	—										
4. GPS-Obsessive Passion	.63***	.62***	.61***	—									
5. GPS-Harmonious Passion	.40***	.65***	.73***	.59***	—								
6. EIQ-Impulsiveness	.39***	.42***	.34**	.32**	.24*	—							
7. EIQ-Venturesomeness	-.05	.14	.13	-.01	.20*	.29*	—						
8. EIQ-Empathy	-.14	-.05	-.16	.03	-.13	-.05	-.12	—					
9. STPI-Present Hedonistic	.24*	.38***	.37***	.27**	.28**	.65***	.45***	-.08	—				
10. STPI-Past Positive	-.04	.02	-.08	-.05	.04	-.19	-.07	.17	.03	—			
11. STPI-Present Fatalistic	.30**	.46***	.37***	.27**	.29**	.46***	.05	-.01	.51***	.04	—		
12. STPI-Past Negative	.16	.28**	.24**	.18	.06	.31*	-.04	.23*	.28**	-.03	.45***	—	
13. STPI-Future	-.20*	-.11	-.13	-.15	-.135	-.44***	-.12	.29**	-.23*	.49***	-.22	.03	—

Note. GBQ = Gamblers' Beliefs Questionnaire; GPS = Gambling Passion Scale; EIQ = Eysenck Impulsivity Questionnaire; STPI = Stanford Time Perception Inventory.

\*  $p < .05$ . \*\*  $p \leq .01$ . \*\*\*  $p \leq .001$ .

icant correlations with the GBQ and GPS subscales and the EIQ-Impulsivity scale.

To clarify potential differences in the magnitude of correlations within the different samples, we examined those variables that exhibited significant positive correlations with the criterion variable, SOGS score, in the PPG and PG samples; the NPG sample could not be examined as all SOGS scores were zero. Table 2 summarizes these results. Because analyzing the data within each sample substantially reduced statistical power, we examined magnitudes of correlation. Notably larger correlations were evident in the PPG sample in terms of the GBQ Luck/Perseverance subscale and both the Obsession and Harmonious Passion subscales of the GPS, whereas the PG sample exhibited observably higher correlations in terms of the EIQ's Impulsivity subscale and the STPI's Present Hedonistic subscale.

Table 2

*Correlations Between SOGS Score and Measures of Cognitive Distortions, Impulsivity, and Time Perspective Within the Potential Samples*

Variable	Potential pathological gamblers SOGS ( $n = 40$ )	Pathological gamblers SOGS ( $n = 24$ )
SOGS	1	1
GBQ-Luck/Perseverance	.38*	.38
GBQ-Illusion of Control	<b>.34*</b>	.13
GPS-Obsessive Passion	<b>.33*</b>	.11
GPS-Harmonious Passion	<b>.41**</b>	.11
EIQ-Impulsiveness	.01	<b>.57**</b>
STPI-Present Hedonistic	-.01	<b>.28</b>
STPI-Present Fatalistic	.22	.39

Note. The nonpathological gambling sample is not included because all SOGS values were zero. Notably larger correlations in each column are in boldface. SOGS = South Oaks Gambling Scale; GBQ = Gamblers' Beliefs Questionnaire; GPS = Gambling Passion Scale; EIQ = Eysenck Impulsivity Questionnaire; STPI = Stanford Time Perception Inventory.

\*  $p < .05$ . \*\*  $p \leq .01$ .

## Discussion

This study sought to assess the convergent validity of cognitive distortions, impulsivity, and time perspective in reference to pathological gambling. The GBQ, GPS, and EIQ-Impulsivity subscales satisfied the stipulated criterion, converging with SOGS score. In addition, these measures were highly correlated among each other, suggesting they tapped overlapping facets of the underlying latent construct of "pathological" gambling. However, it is also possible that performance on these measures is collinear with latent constructs not examined in this study, spuriously generating these interrelationships. Nonetheless, these findings support previous proposals that cognitive distortions (e.g., Ladouceur & Walker, 1996; Toneatto, 1999) and impulsivity (e.g., Alessi & Petry, 2003; Nower et al., 2004) are core processes related to gambling behavior and contribute to the accumulating literature validating the GBQ and GPS.

There are additional, more fine-grained, aspects of these findings that warrant discussion. Of interest, the strongest relationship indicated was a high-magnitude positive correlation (.85) between the two subscales of the GBQ, suggesting that cognitive distortions appear to be present together. Equally notable was a high-magnitude correlation (.73) between the Illusion of Control subscale of the GBQ and the Harmonious Passion subscale of the GPS. This suggests that individuals who perceive themselves to be more in control of gambling outcomes experience gambling more harmoniously, or vice versa. Future research may be able to clarify this relationship, perhaps using a measure of internal-external locus of control (Marsh & Richards, 1987; Rotter, 1966).

Results for the STPI subscales were more ambiguous. Only the Present Fatalistic subscale met the criterion for convergent validity with SOGS performance. However, the Present Hedonistic subscale indicated a significant positive correlation, and the Future subscale indicated a significant negative correlation to the SOGS score. Taken together, these three subscales suggest that in addition to the aforementioned measures that met the criterion, symptoms of pathological gambling generally corresponded with a present-centered time orientation. Neither past-orientation sub-

scale showed significant relationships with symptoms of pathological gambling.

Of note, a strong positive correlation was evident between the EIQ's Impulsivity subscale and the Present Hedonistic subscale of the STPI, which converges with Zimbardo and Boyd's (1999) conceptualization of a present hedonistic time perspective. The present results are also consistent with Hodgins and Engel's (2002) findings regarding the Present Hedonistic and Present Fatalistic subscales and gambling.

The differences in magnitude of correlations between the PPG and NPG samples are also of interest. Higher correlations between cognitive variables and symptoms of pathological gambling were evident in the PPG sample relative to the PG sample, whereas higher correlations between both impulsivity and the related construct of Present Hedonistic time perspective were evident in the PG sample relative to the PPG sample. Speculatively, these data suggest that cognitive distortions might contribute to lower levels of problems with gambling, whereas trait-level impulsivity might result in more pathological involvement with gambling. This finding further corroborates the role of impulsivity as a cardinal feature of pathological gambling (Alessi & Petry, 2003; Nower et al., 2004).

Aspects of these findings may potentially be fruitfully applied in clinical settings. The GBQ and GPS might be of clinical utility for the cognitive-behavioral approaches to pathological gambling that have been described in the literature (e.g., Ladouceur, Boisvert, & Dumont, 1994; Ladouceur et al., 2001; Sylvain, Ladouceur, & Boisvert, 1997). All the extant cognitive-behavioral treatments include assessment of cognitions relating to gambling (Ladouceur et al., 1994, 2001; Sylvain et al., 1997) and, given the low cost and ease of administration, both measures could significantly contribute to case conceptualization, identification of cognitive distortions, and cognitive restructuring. For example, for either individual cognitive therapy (e.g., Ladouceur et al., 2001) or group cognitive therapy (e.g., Ladouceur et al., 2003), the measures could be administered prior to a discussion of the role of cognitions in behavior. Subsequently, clients could be provided easily with individualized feedback as to their constellation of cognitions about gambling. The discussion then could segue to additional cognitions that are individually relevant. Thus, the GBQ and GPS could contribute therapeutically by both introducing clients to their own self-reported cognitive distortions and facilitating identification of other cognitive distortions.

The principal limitations to the present study were its relatively small sample size and use of a collegiate sample. In the first case, although the power for detecting variables that satisfactorily converged with pathological gambling symptoms was adequate, it is possible that the relatively small samples were not representative of individuals at each level of gambling. The sufficient power permitted identifying statistically significant relationships at and above the threshold for convergent validity; however, this threshold (.30) represents only a small amount of the variance between these variables (i.e., threshold  $r^2 = .09$ ), leaving much of the relationship between variables unexplained. In the second case, whether these findings would transfer to a noncollegiate adult sample recruited using the same approach remains to be determined. Symptoms of pathological gambling in adolescents and younger adults might be quite different from those in older adults; such a finding would be highly relevant for screening, prevention, and treatment. This remains an empirical question. Therefore,

direct examination of this question, as well as further validation of the GBQ and GPS in adult samples, would be worthwhile.

In summary, this study examined the convergent validity of a number of assessment measures toward improving the etiological understanding and treatment of pathological gambling. The GBQ, GPS, and EIQ-Impulsivity subscales indicated convergent validity; however, the results relating to time perspective were more ambiguous. These findings support and extend previous evidence that cognitive distortions and impulsivity are core features of pathological gambling, and suggest assessment measures to enhance cognitive-behavioral treatment approaches for this disorder.

## References

- Alessi, S. M., & Petry, N. M. (2003). Pathological gambling severity is associated with impulsivity in a delay discounting procedure. *Behavioural Processes*, 64, 345-354.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Blaszczynski, A., Steel, Z., & McConaghy, N. (1997). Impulsivity in pathological gambling: The antisocial impulsivist. *Addiction*, 92, 75-87.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validity by the multi-trait multi-method matrix. *Psychological Bulletin*, 56, 81-105.
- Caron, A., & Ladouceur, R. (2003). Erroneous verbalizations and risk taking at video lotteries. *British Journal of Psychology*, 94, 189-194.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- Eysenck, S. B. G., & Eysenck, H. J. (1978). Impulsiveness and venturesomeness: Their position in a dimensional system of personality description. *Psychological Reports*, 43, 1247-1255.
- Eysenck, S. B. G., Pearson, P. R., Easting, G., & Allsopp, J. F. (1985). Age norms for impulsiveness, venturesomeness and empathy in adults. *Personality & Individual Differences*, 6, 613-619.
- Hodgins, D. C., & Engel, A. (2002). Future time perspective in pathological gamblers. *Journal of Nervous & Mental Disease*, 190, 775-780.
- Ladouceur, R., Boisvert, J., & Dumont, J. (1994). Cognitive-behavioral treatment for adolescent pathological gamblers. *Behavior Modification*, 18, 230-242.
- Ladouceur, R., Bouchard, C., Rheaume, N., Jacques, C., Ferland, F., Leblond, J., & Walker, M. (2000). Is the SOGS an accurate measure of pathological gambling among children, adolescents and adults? *Journal of Gambling Studies*, 16, 1-24.
- Ladouceur, R., Sylvain, C., Boutin, C., Lachance, S., Doucet, C., & Leblond, J. (2003). Group therapy for pathological gamblers: A cognitive approach. *Behaviour Research & Therapy*, 41, 587-596.
- Ladouceur, R., Sylvain, C., Boutin, C., Lachance, S., Doucet, C., Leblond, J., & Jacques, C. (2001). Cognitive treatment of pathological gambling. *Journal of Nervous & Mental Disease*, 189, 774-780.
- Ladouceur, R., & Toneatto, T. (2003). Treatment of pathological gambling: A critical review of the literature. *Psychology of Addictive Behaviors*, 17, 284-292.
- Ladouceur, R., & Walker, M. (1996). A cognitive perspective on gambling. In P. M. Salkoskvis (Ed.), *Trends in cognitive and behavioural therapies* (pp. 89-120). New York: Wiley.
- Langer, E. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311-328.
- Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, 144, 1184-1188.
- Lesieur, H. R., & Blume, S. B. (1992). Modifying the Addiction Severity Index for use with pathological gamblers. *American Journal of Addiction*, 1, 240-247.
- Marsh, H. W., & Richards, G. E. (1987). The multidimensionality of the



- Rotter I-E Scale and its higher order structure: An application of confirmatory factor analysis. *Multivariate Behavioral Research*, 22, 39–69.
- National Research Council, Committee on the Social and Economic Impact of Pathological Gambling. (1999). *Pathological gambling: A critical review*. Washington, DC: National Academy Press.
- Neighbors, C., Lostutter, T. W., Larimer, M. E., & Takushi, R. Y. (2002). Measuring gambling outcomes among college students. *Journal of Gambling Studies*, 18, 361–370.
- Nower, L., Derevensky, J. L., & Gupta, R. (2004). The relationship of impulsivity, sensation seeking, coping, and substance use in youth gamblers. *Psychology of Addictive Behaviors*, 18, 49–55.
- Petry, N. M. (2003). Validity of a gambling scale for the Addiction Severity Index. *Journal of Nervous and Mental Disease*, 191, 399–407.
- Ratelle, C. F., Vallerand, R. J., Mageau, G. A., Rousseau, F. L., & Provencher, P. (2004). When passion leads to problematic outcomes: A look at gambling. *Journal of Gambling Studies*, 20, 105–119.
- Raylu, N., & Oei, T. P. (2002). Pathological gambling: A comprehensive review. *Clinical Psychology Review*, 22, 1009–1061.
- Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcements. *Psychological Monographs*, 80, Whole No. 609.
- Rousseau, F., Vallerand, R. J., Ratelle, C. F., Mageau, G., & Provencher, P. J. (2002). Passion and gambling: On the validation of the Gambling Passion Scale (GPS). *Journal of Gambling Studies*, 18, 45–66.
- Sayette, M. A. (1999). Cognitive theory and research. In K. Leonard & H. T. Blane (Eds.), *Psychological theories of drinking and alcoholism* (2nd ed.; pp. 247–291). New York: Guilford Press.
- Sher, K. J., Trull, T. J., Bartholow, B. D., & Vieth, A. (1999). Personality and alcoholism: Issues, methods, and etiological processes. In K. Leonard & H. T. Blane (Eds.), *Psychological theories of drinking and alcoholism* (2nd ed.; pp. 54–105). New York: Guilford Press.
- Steenbergh, T. A., Meyers, A. W., May, R. K., & Whelan, J. P. (2002). Development and validation of the Gamblers' Beliefs Questionnaire. *Psychology of Addictive Behaviors*, 16, 143–149.
- Stinchfield, R. (2002). Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behaviors*, 27, 1–19.
- Sylvain, C., Ladouceur, R., & Boisvert, J. M. (1997). Cognitive and behavioral treatment of pathological gambling: A controlled study. *Journal of Consulting and Clinical Psychology*, 65, 727–732.
- Toce-Gerstein, M., Gerstein, D. R., & Volberg, R. A. (2003). A hierarchy of gambling disorders in the community. *Addiction*, 98, 1661–1672.
- Toneatto, T. (1999). Cognitive psychopathology of problem gambling. *Substance Use & Misuse*, 34, 1593–1604.
- Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Leonard, M., et al. (2003). Les passions de l'ame: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85, 756–767.
- Walker, M. B., & Dickerson, M. G. (1996). The prevalence of problem and pathological gambling: A critical analysis. *Journal of Gambling Studies*, 12, 233–249.
- Zimbardo, P. C., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, 77, 1271–1288.

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