

# Evaluating the Psychometric Properties of the Sports Betting Motivations Scale – Revised (SBMS-R) in Canadian Sports Bettors

Jonathan David<sup>1,5\*</sup>, Arif Yüce<sup>2,6</sup>, Sevda Gökce Yüce<sup>2,3,7</sup>, Hyoun S. Kim<sup>4,8</sup>,  
Matthew T. Keough<sup>1,9</sup>

**Citation:** David, J., Yüce, A., Yüce, S.G., Kim, H.S., Keough, M.K. (2026). Evaluating the Psychometric Properties of the Sports Betting Motivations Scale – Revised (SBMS-R) in Canadian Sports Bettors. *Journal of Gambling Issues*.

**Editor-in-Chief:** Nigel Turner, Ph.D.

**Received:** 12/15/2025  
**Accepted:** 05/06/2026  
**Published:** 06/26/2026



**Copyright:** ©2026 David, J., Yüce, A., Yüce, S.G., Kim, H.S., Keough, M.K. Licensee CDS Press, Toronto, Canada. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>)

<sup>1</sup> Department of Psychology, York University, Toronto, Ontario, Canada

<sup>2</sup> Department of Sports Management, Eskisehir Technical University, Eskisehir, Turkey

<sup>3</sup> Department of Physical Education and Sport, Graduate School of Health Science, Anadolu University, Eskisehir, Turkey

<sup>4</sup> Department of Psychology, Toronto Metropolitan University, Toronto, Ontario, Canada

<sup>5</sup> ORCID: 0000-0003-0620-0233

<sup>6</sup> ORCID: 0000-0003-3756-3870

<sup>7</sup> ORCID: 0000-0002-2279-2139

<sup>8</sup> ORCID: 0000-0002-0804-0256

<sup>9</sup> ORCID: 0000-0001-8567-2874

\*Corresponding author: Jonathan David: [j david1@yorku.ca](mailto:j david1@yorku.ca)

**Abstract:** Sports betting has grown to become one of the most popular forms of gambling. As such, understanding the traditional gambling motives, as well as sports-specific motives, that drive this behaviour, could be informative for understanding sports gambling problems. This study evaluated the Sports Betting Motivations Scale – Revised (SBMS-R), a scale originally developed in Turkish that we validated in English. We administered the scale to 915 Canadian sports bettors and conducted exploratory structural equation modelling, measurement invariance analyses, and evaluated the convergent, divergent, and criterion validity of the measure. Results showed that we replicated the original factor structure by reducing the scale to 32 items. Invariance testing demonstrated consistent measurement across men vs. women, and low vs. high gambling severity. Regressions showed that ‘money’ and ‘escape’ motives were associated with greater gambling problems, whereas ‘being in the game’ was associated with less gambling problems and greater money spent on bets. We found that other sports-specific motives such as ‘knowledge of the game’ and ‘interest in sports’, were associated with more frequent sports betting. In conclusion, our findings highlight the sports-specific motives associated with sports gambling and suggest that the SBMS-R may be a promising tool to assess these motives.

**Keywords:** Motives, Sports Gambling, Measure Validation, Exploratory Structural Equation Modelling, Gambling Problems.

## Introduction

Sports betting is one of the fastest growing forms of gambling in recent years. This is due in part to technological advancements that make it possible to bet online continuously at any time via smartphone apps, and also because of regulatory changes made in the US and Canada (Bisson, 2025; Evans, 2021). For example, in the first quarter of 2025, sports betting revenue in the US was estimated at \$5.08 billion, which was a 10.8% increase from the first quarter of 2024 (American Gaming Association, 2025). In comparison to other forms of gambling such as race betting and electronic gambling machines (EGMs), emerging evidence suggests that sports betting could be just as harmful as EGMs and race betting (Hing et al., 2017). This literature has found that sports betting, like other forms of gambling, is also associated with several harms, such as psychological distress, financial losses, relationship problems, and substance use problems (Benson et al., 2021; Hing et al., 2016; Nower et al., 2018; Vieira et al., 2023). Given these harms, it is important to understand the psychological motivations that drive sports betting, as previous literature has demonstrated that different forms of gambling may be driven by different motivations (Flack & Stevens, 2019). Understanding these differences may give important clinical insights into which reasons for sports gambling may be considered maladaptive.

One of the most widely used scales for assessing gambling motives is the *Gambling Motives Questionnaire – Financial* (GMQ-F; Dechant, 2014). Although other motives scales have been developed, for example the *Reasons for Gambling Scale* (Luceri & Vergura, 2015), and the *Gambling Outcome Expectancies Scale* (Flack & Morris, 2015), they both capture similar motives to the GMQ-F. The *Gambling Motives Questionnaire* was initially developed by Stewart and Zack (2008) as an adaptation to the *Drinking Motives Questionnaire* (Cooper et al., 1992). This three-dimensional motives measure assessed enhancement motives (i.e., “*Because it’s fun*”), social motives (i.e., “*To be sociable*”), and coping motives (i.e., “*To cheer up when you’re in a bad mood*”). Later on, financial motives were argued to be important particularly for gambling problems (Dechant & Ellery, 2011; McGrath et al., 2010) and a financial subscale was added (i.e., “*To win money*”), with the scale being renamed the *Gambling Motives Questionnaire – Financial* (Dechant, 2014). Several meta-analytic studies have shown that these four motives are robust and important predictors of gambling severity (Alaba-Ekpo et al., 2024; Allami et al., 2025; Tabri et al., 2022). Furthermore, the *Gambling Motives Questionnaire – Financial* has been found to be a valid tool for assessing motives in sports bettors (Maxie et al., 2025). This research found that gambling problems in sports bettors were associated with enhancement, social, coping, and financial motives. However, there may be other unique

sports-specific motivations for sports betting which have not been considered widely among researchers.

Qualitative research has found that individuals engage in sports betting to increase the excitement of their sports viewing, while also allowing bettors to display their skill and knowledge of the sport (Killick & Griffiths, 2021). Given that quantitative research has found that more expertise and knowledge of the game does not result in better monetary gains or accuracy of forecasted outcomes (Cantinotti et al., 2004; Khazaal et al., 2012), researchers have labelled this knowledge-related motive as a cognitive distortion. Researchers have also hypothesised that this kind of motive can lead to the development of increased sports betting and related-harms (Killick & Griffiths, 2021). Thus, these sports-specific motives may be important to measure as they could predict key outcomes.

Recently, Gökce Yüce et al. (2022) developed the Sports Betting Motivations Scale (SBMS) to quantitatively measure these unique sports betting motives. An initial item pool was first developed through an extensive literature review, qualitative interviews with 30 Turkish sports bettors, and the item pool was additionally reviewed by five experts in the field. The researchers then tested the factor structure of their measure through exploratory factor analysis in a large sample of sports bettors, as well as confirmatory factor analysis in a separate sample of sports bettors. Through this process, they found support for a 37-item measure with the following seven subscales: make money, fun, socialization, escape, knowledge of the game, interest in sport, and being in the game. While the SBMS was not developed as an analogue to the GMQ-F, four of these subscales (make money, fun, socialization, and escape) are similar to the four GMQ-F subscales (financial, enhancement, social, and coping, respectively). Bivariate correlations showed that all motives except for 'fun' evidenced positive correlations with sports betting problems. A multiple regression analysis showed that sports betting problems were uniquely associated with wanting to make money, socialize, and be in the game, when controlling for other motives. Wanting to have fun was found to relate to *less* sports betting problems, when controlling for other motives. These findings provide support that sports-specific motives predict important outcomes beyond traditional gambling motives. Although this study represents an advancement in our understanding in the motives that drive sports betting, the scale has not been validated in English and these findings have not been replicated in other samples.

To test the SBMS factor structure in English, we used exploratory structural equation modelling (ESEM), which is a confirmatory approach that combines the strengths of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Marsh et al., 2014). CFA can be overly restrictive because it assumes that items will be pure indicators of the constructs they intend to measure, which is rarely the case (Steenkamp & Maydeu-Olivares, 2023). As such, ESEM allows theoretically plausible small cross-loadings, and often results in improved model fit and

discriminant validity when compared to CFA (Asparouhov & Muthén, 2009; Marsh et al., 2014). Recent psychometric studies in the gambling and addiction literature have also supported the use of ESEM over CFA (e.g., Battaglia et al., 2023; Battaglia et al., 2024; Bernusky et al., 2026; James et al., 2025). Further, ESEM permits invariance testing between groups (configural, metric, scalar) (Asparouhov & Muthén, 2009; Marsh et al., 2014). Given that the SBMS was originally validated in a sample that comprised mostly of men (i.e., approx. 95%) (Gökçe Yüce et al., 2022), we do not know whether the scale functions differently in women. For example, in recent studies, 23-58% of sports bettors were women (Gassmann et al., 2017; Hing et al., 2016; Vieira et al., 2023), and this may be an overlooked demographic (Biggar et al., 2023). Also, it is unclear whether the SBMS functions equally for individuals with high and low levels of gambling severity. Establishing measurement invariance is a prerequisite for valid group comparisons; without at least metric–scalar invariance, observed differences may reflect measurement non-equivalence rather than true latent mean differences (Meredith, 1993; Putnick & Bornstein, 2016; Vandenberg & Lance, 2000).

The aim of the current study was to evaluate the psychometric properties of the English version of the Sports Betting Motivation Scale (SBMS) in a Canadian sample. We sought to replicate the factor structure through exploratory structural equation modelling (ESEM) and then test for measurement invariance in men vs. women, and those with low vs. high gambling severity. Additionally, we tested for internal reliability, convergent and divergent validity, as well as criterion validity. We hypothesised that similar motive subscales would correlate highly with motive subscales on a previously established measure, the Gambling Motives Questionnaire – Financial (GMQ-F); for example, that the SBMS - make money and GMQ-F - financial subscales would correlate highly compared to other subscales. Finally, we hypothesised that all SBMS subscales would correlate with gambling severity and sports betting engagement, and that sports-specific motives would add unique variance over and above traditional gambling motives.

## Methods

### Participants and Procedure

This sample has been described elsewhere (David et al., 2026; Vieira et al., 2023), with dataset, measures, and codebook available on OSF (<https://osf.io/85whc/>). We recruited 1129 participants through AskingCanadians, an online panel representative of the Canadian population. Eligibility criteria included: (1) being at least 18 years old, (2) living in Ontario, Canada, and (3) bet on sports at least once within the past three months. We excluded 209 participants due to a response style that indicated inattentiveness and/or substantial missing data on study variables. Also, we removed 5 participants because they identified as a nonbinary gender (this group was not large enough for gender invariance testing).

Therefore, the final sample consisted of 915 participants (age range = 19 - 87,  $M = 47.69$ ,  $SD = 13.68$ ). There were 706 men (77.2%) and 209 women (22.8%). Our sample had 393 (43.0%) participants with no gambling problems (PGSI = 0), 297 (32.5%) low-risk gambling problems (PGSI = 1-4), 69 (7.5%) moderate-risk gambling problems (PGSI = 5-7), and 156 (17.0%) high-risk gambling problems (PGSI = 8+) (Currie et al., 2013). For our measurement invariance analyses, we combined individuals in the no problem and low-risk categories ( $n = 690$ ; 75.5%), and we also combined individuals in the moderate-risk and high-risk categories ( $n = 225$ ; 24.5%). See Table 1 for sample characteristics. All participants completed the measures below as part of a battery of questionnaires and provided informed consent through Qualtrics.

### Measures

**Sports Betting Motivations Scale - Revised (SBMS-R).** The SBMS was originally validated in Turkish (Gökce Yüce et al., 2022) and was translated to English by AY, who is fluent in Turkish and English. Given the criticisms of back-translation and the false alarms that can emerge with this procedure (i.e., Behr, 2017), we decided to only use a forward translation adaption to English. Similar to the original scale, the SBMS-R consisted of 37 items which measured seven sports betting motives: make money, fun, socialization, escape, knowledge of the game, interest in sport, and being in the game. Items were rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

**Convergent and Divergent Validity: Gambling Motives Questionnaire – Financial (GMQ-F; Dechant, 2014).** The GMQ-F is made up of 16 items and assesses four gambling motives: enhancement, social, coping, and financial. We modified the instructions to replace the word “gambling” with “sports betting”; as such, we specifically asked about motives for sports betting instead of gambling in general. We validated this questionnaire elsewhere (Maxie et al., 2025). Participants rated items on a 4-point Likert scale from 1 (*never or almost never*) to 4 (*almost always or always*). Mean subscale scores were calculated by averaging items for each subscale, with higher scores indicating greater sports betting motives. Internal consistency was good for the enhancement, social, coping, and financial subscales ( $\alpha = 0.88, 0.87, 0.93, \& 0.79$ , respectively).

**Criterion Validity: Gambling Timeline Follow-Back (G-TLFB; Weinstock et al., 2004).** We adapted the G-TLFB, a widely used measure for gambling frequency, to assess participants’ self-assessment of their sports betting behaviours over the past three months. Participants were instructed to input each day they engaged in sports betting using an interactive calendar, and were also asked about how much money they spent, and in which type of activity (in-play bets, single-event betting, parlay bets, systems bets, micro bets, prop bets, and/or daily fantasy sports bets) (see Note 1). We asked participants to use their online sports betting account histories to complete this measure as accurately as possible. We derived the following variables: type of sports betting engaged in, total

number of days in which bets were made, total number of bets, and total money spent on bets.

**Table 1**  
*Sample Characteristics*

	<i>n</i>	%
<b>Age</b>		
19-30	87	9.5
31-40	241	26.3
41-50	209	22.8
51-60	184	20.1
61-70	142	15.5
71-80	48	5.2
81-87	2	0.2
<b>Gender</b>		
Man	706	77.2
Woman	209	22.8
<b>Ethnicity</b>		
East Asian	148	16.2
Latino	15	1.6
Black	17	1.9
White	584	63.8
South Asian	59	6.4
Middle Eastern	21	2.3
Indigenous	9	1.0
Mixed	31	3.1
Other	34	3.7
<b>Employment status</b>		
Full-time work	613	67.0
Part-time work	80	8.7
Not working	148	16.2
<b>Household Income</b>		
Less than \$20,000	15	1.6
\$20,000 – \$39,999	69	7.5
\$40,000 – \$59,999	106	11.6
\$60,000 – \$79,999	111	12.1
\$80,000 – \$99,999	127	13.9
\$100,000 – \$149,999	210	23.0
\$150,000 – \$199,999	130	14.2
Over \$200,000	99	10.8
<b>Type of Sports Betting Engagement*</b>		
Parlay	373	40.8
Single-event	662	72.3
In-play	221	24.2
Daily Fantasy Sports	164	17.9
Systems Bets	106	11.6
Microbets	63	6.9
Prop Bets	113	12.3

*Note.* \* Participants were able to select multiple types of sports betting, particularly if they engaged in the more than one type within the past 90 days.

**Criterion Validity: Problem Gambling Severity Index (PGSI;** Ferris & Wynne, 2001). The PGSI consists of nine items and measures problem gambling. We asked participants to think about their gambling behaviours during the past three months, to be consistent with the G-TLFB. Participants rated items on a 4-point Likert scale from 0 (*never*) to 3 (*almost always*). Total scores were calculated by summing all items, with higher scores indicating greater gambling problems. Internal consistency for the PGSI was excellent in the current study ( $\alpha = 0.95$ ).

### **Statistical Analyses**

We ran exploratory structural equation modelling and invariance testing in Mplus version 8.4 (Muthén & Muthén, 2019). We used the Maximum Likelihood estimator with Robust Standard Errors (MLR), and target (oblique) rotation because we expected the factors to be correlated. We report the following indices of model fit: Chi-square ( $\chi^2$ ), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). To assess measurement invariance, we first evaluated model fit separately for each group to establish configural invariance. We then compared a freely estimated multi-group model (configural) to a model with constrained factor loadings across groups (metric invariance), and to a model with constrained item intercepts (scalar invariance). Differences between configural, metric, and scalar models were evaluated using  $\Delta$ CFI. Invariance was supported if  $\Delta$ CFI  $\leq$  0.01 (Cheung & Rensvold, 2002).

For our validity analyses, we used SPSS version 26 (IBM, 2019). We first examined Pearson correlations among study variables and then ran multiple regressions using the SBMS-R subscales to predict gambling severity and sports betting outcomes. Given that Q-Q plots and histograms showed a severe positive skew for the gambling severity and sports betting outcomes, we applied a natural log transformation to these variables. The log transformation corrected the issues with skew for these variables, approximating normal distributions. All other statistical assumptions were met. Variance inflation factors (VIFs) were all below three, suggesting no major multicollinearity issues.

## **Results**

### **Exploratory Structural Equation Modelling**

We tested the original factor structure of the SBMS-R (37 items) and found that the ESEM model had good fit (see Table 2 for model fit indices), though some items had low primary factor loadings and/or had high cross-loadings (see Supplementary Table 1). Items needed to have a primary factor loading of at least 0.40 and cross-loadings needed to be less than 0.20. A total of seven items (8, 18, 20, 21, 23, 32, 36) either had low primary factor loadings and/or high cross-loadings. As such, we decided to remove five of these items (8, 18, 20, 21, 32) but chose to retain two items (23, 36) that were part of subscales with only three indicators, to avoid under-identifying these important constructs. We then reran the analysis.

We found improved model fit for the 32-item SBMS-R with all items loading onto their intended factor, and with minimal cross-loadings. Although some cross-loadings were slightly above 0.20, we judged these to be minimal, especially in comparison to the primary factor loadings. See Table 2 for model fit indices and Table 3 for standardised factor loadings. This model was used for invariance testing and for validity analyses. All derived subscales were computed by taking the average score of each item set. All subscales had excellent internal consistency: Money ( $\alpha = 0.96$ ;  $\omega = 0.98$ ), Fun ( $\alpha = 0.90$ ;  $\omega = 0.93$ ), Social ( $\alpha = 0.90$ ;  $\omega = 0.92$ ), Escape ( $\alpha = 0.90$ ;  $\omega = 0.92$ ), Knowledge of the game ( $\alpha = 0.84$ ;  $\omega = 0.88$ ), Interest in Sports ( $\alpha = 0.84$ ;  $\omega = 0.87$ ), and Being in the game ( $\alpha = 0.86$ ) (see Note 2). The correlations between subscales ranged from  $r = -0.02 - 0.71$  (see Table 4), demonstrating sufficient discriminant validity between constructs.

**Table 2**  
*Model Fit Summary Statistics*

Model	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA [90% CI]	SRMR
Initial ESEM	906.198	428	0.977	0.964	0.035 [0.032, 0.038]	0.013
Revised ESEM	578.630	293	0.983	0.972	0.033 [0.029, 0.037]	0.012
Gender Invariance						
Men	517.312	293	0.982	0.970	0.033 [0.028, 0.038]	0.013
Women	415.782	293	0.974	0.957	0.045 [0.035, 0.054]	0.016
Configural	942.594	586	0.980	0.966	0.036 [0.032, 0.041]	0.014
Metric	1126.444	761	0.980	0.973	0.032 [0.028, 0.036]	0.025
Scalar	1161.385	786	0.979	0.973	0.032 [0.028, 0.036]	0.025
Gambling Severity Invariance						
Low PGSI (0-4)	536.015	293	0.980	0.967	0.035 [0.030, 0.039]	0.014
High PGSI ( $\geq 5$ )	409.468	293	0.968	0.945	0.042 [0.032, 0.051]	0.021
Configural	952.883	586	0.977	0.961	0.037 [0.033, 0.041]	0.016
Metric	1262.503	761	0.969	0.959	0.038 [0.034, 0.042]	0.033
Scalar	1298.475	786	0.968	0.960	0.038 [0.034, 0.041]	0.033

*Note.*  $p < 0.001$  for all  $\chi^2$  tests; CFI = comparative fit index; ESEM = exploratory structural equation model; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; TLI = Tucker-Lewis index.

**Table 3**  
*Revised Exploratory Structural Equation Model - Standardised Loadings*

Item	Being in the game	Social	Money	Interest in Sports	Escape	Fun	Knowledge of the game	
1	It's enjoyable to watch the sports competition I bet on	<b>0.772</b>	0.013	-0.055	-0.010	-0.002	0.014	0.023
2	It's exciting to bet on the sports competitions I watch	<b>0.981</b>	-0.006	0.029	0.007	-0.003	-0.034	-0.010
3	I like to have people around me to bet on sports	0.068	<b>0.925</b>	-0.058	-0.031	-0.072	0.036	-0.012
4	Betting on sports makes me a more social person	0.009	<b>0.841</b>	0.031	-0.075	0.046	0.029	0.030
5	My friends console me when I lose my sports bet	-0.072	<b>0.584</b>	0.119	-0.046	0.122	-0.079	0.042
7	Sports betting is a good reason to get together with my friends	-0.043	<b>0.798</b>	-0.016	0.090	0.068	0.019	-0.030
10	I like to watch sports matches/competitions I bet with other people around me	0.017	<b>0.637</b>	0.085	0.119	-0.043	0.112	-0.039
9	I bet on sports to improve my financial situation	0.020	0.053	<b>0.862</b>	0.008	-0.082	-0.080	0.070
11	I bet on sports to buy the things that I want	-0.010	0.130	<b>0.759</b>	0.073	-0.004	-0.050	-0.014
12	I bet on sports to earn a side income	-0.011	-0.042	<b>0.927</b>	0.072	-0.066	-0.055	0.048
13	I bet on sports for investment purposes	-0.070	0.057	<b>0.781</b>	0.028	0.061	-0.088	-0.011
14	I bet on sports to improve my quality of life	0.012	0.074	<b>0.749</b>	-0.085	0.192	0.057	-0.103
15	I bet on sports to make money faster	0.001	-0.084	<b>0.986</b>	-0.008	-0.037	0.072	-0.044
16	I bet on sports to get rich	-0.009	0.035	<b>0.856</b>	-0.097	0.084	0.012	-0.051
17	I bet on sports to make easy money	0.005	-0.078	<b>0.850</b>	0.026	-0.100	0.035	0.112
19	I bet on sports to improve my financial condition	0.038	-0.026	<b>0.901</b>	-0.051	0.010	0.013	0.009
6	I bet on sports because I love sports competitions	0.136	0.192	-0.047	<b>0.609</b>	-0.074	-0.056	0.120
22	I bet on sports because I love sports	-0.034	-0.060	0.055	<b>0.866</b>	-0.027	0.079	-0.042
23	I feel good when I bet on sports that I love	-0.017	-0.008	-0.016	<b>0.621</b>	0.252	0.076	0.024
24	I feel less stressed when I bet on sports	-0.050	0.040	0.082	0.166	<b>0.627</b>	-0.081	0.073
25	Sports betting helps me get away from the routine of everyday life	0.015	0.042	0.037	-0.006	<b>0.654</b>	0.116	0.057
27	I feel less tensions in my life thanks to sports betting	0.005	0.067	0.038	-0.014	<b>0.785</b>	-0.016	0.067
29	Sports betting helps to reduce the tensions of daily life	0.041	0.057	0.026	0.031	<b>0.768</b>	-0.006	0.038
26	Betting on sports is exciting	0.173	-0.084	0.128	0.144	0.119	<b>0.522</b>	-0.034
28	I love the excitement of sports betting	0.160	0.023	0.065	0.218	0.137	<b>0.409</b>	0.052
30	It's fun to try my luck with sports betting	-0.009	0.063	0.000	0.040	0.010	<b>0.710</b>	0.052
31	I bet on sports for pleasure	0.060	-0.006	-0.077	-0.010	0.079	<b>0.695</b>	0.045
34	I get excited about the sports matches or competitions I bet on	0.101	0.082	0.049	0.147	-0.034	<b>0.463</b>	0.203
35	I bet on sports because it is fun	-0.004	0.066	-0.072	0.063	-0.072	<b>0.721</b>	0.121
33	I bet on sports to see if my information about the match/outcome are correct	0.005	-0.035	0.061	-0.039	0.050	0.020	<b>0.831</b>
36	I bet on sports to see if my predictions about the match/outcome are correct	-0.029	-0.001	-0.019	-0.011	-0.037	0.214	<b>0.775</b>
37	I bet on sports to prove my knowledge of sports competitions	0.059	0.041	0.007	0.095	0.167	-0.106	<b>0.591</b>

Note. Primary factor loadings are bolded.

### Measurement Invariance

We tested measurement invariance of the SBMS-R (32 items) across gender (men vs women) and gambling severity (low vs high PGSI). We found excellent model fit when running the ESEM separately in each group (i.e., men only, women only, low PGSI, high PGSI), suggesting configural invariance (i.e., equivalent factor structure). For both grouping variables, configural, metric, and scalar invariance models had excellent fit (see Table 2). When we compared nested models,  $\Delta$ CFI values were all below 0.01, suggesting metric invariance (i.e., equivalences of loadings) and scalar invariance (i.e., equivalence of intercepts) across men vs women, and low vs high PGSI. These results support the SBMS-R's psychometric properties across genders and gambling severity groups.

### Convergent, Divergent, and Criterion Validity

See Table 4 for Pearson correlations between all study variables. As hypothesised, we found that the SBMS-R subscales correlated highly with their counterparts in the GMQ-F. For instance, the GMQ-F coping subscale had the highest correlation with the SBMS-R escape subscale ( $r = 0.64$ ), the GMQ-F enhancement subscale had the highest correlation with the SBMS-R fun subscale ( $r = 0.58$ ), the GMQ-F social subscale had the highest correlation with the SBMS-R social subscale ( $r = 0.68$ ), and finally, the GMQ-F financial subscale had the highest correlation with the SBMS-R money subscale ( $r = 0.58$ ). These correlations demonstrate the convergent and divergent validity of the SBMS-R.

We then examined the bivariate relationships between the SBMS-R subscales, gambling severity, and sports betting variables. We found that the SBMS-R money, social, escape, knowledge of the game, and interest in sports subscales were positively related to gambling severity (PGSI;  $r_s = 0.17 - 0.57$ ), the SBMS-R fun subscale was not significantly related to PGSI ( $r = -0.04$ ,  $p = 0.18$ ), and the SBMS-R being in the game subscale was *negatively* related to PGSI ( $r = -0.12$ ). Only SBMS-R fun, escape, knowledge of the game, interest in sports, and being in the game subscales were positively related to the number of sports betting days in the past three months ( $r_s = 0.07 - 0.26$ ). All SBMS-R subscales, except for SBMS-R social, were positively related to the total number of bets in the past three months ( $r_s = 0.08 - 0.25$ ). Only SBMS-R fun, escape, knowledge of the game, interest in sports, and being in the game subscales were positively related to money spent on sports betting in the past three months ( $r_s = 0.10 - 0.21$ ).

**Table 4**  
Means, Standard Deviations, and Pearson Correlations for All Study Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SBMS-R Money	2.40	1.13	-													
2. SBMS-R Fun	3.70	0.79	0.14**	-												
3. SBMS-R Social	2.73	1.00	0.56**	0.30**	-											
4. SBMS-R Escape	2.64	1.05	0.66**	0.42**	0.65**	-										
5. SBMS-R Knowledge of the game	3.36	0.96	0.33**	0.62**	0.38**	0.55**	-									
6. SBMS-R Interest in Sports	3.40	0.96	0.31**	0.71**	0.46**	0.57**	0.59**	-								
7. SBMS-R Being in the game	3.99	0.83	-0.02	0.57**	0.22**	0.17**	0.37**	0.49**	-							
8. GMQ-F Enhancement	2.52	0.75	0.19**	0.58**	0.29**	0.37**	0.43**	0.55**	0.43**	-						
9. GMQ-F Social	1.92	0.77	0.42**	0.28**	0.68**	0.52**	0.34**	0.38**	0.18**	0.48**	-					
10. GMQ-F Coping	1.60	0.78	0.60**	0.16**	0.54**	0.64**	0.31**	0.30**	0.01	0.36**	0.60**	-				
11. GMQ-F Financial	2.31	0.78	0.58**	0.31**	0.37**	0.46**	0.32**	0.36**	0.14**	0.45**	0.43**	0.55**	-			
12. <sup>a</sup> PGSI	0.93	0.98	0.57**	0.04	0.36**	0.45**	0.17**	0.17**	-0.12**	0.14**	0.35**	0.56**	0.42**	-		
13. <sup>a</sup> G-TLFB Total Days	1.80	0.98	<0.01	0.26**	-0.03	0.07*	0.21**	0.21**	0.21**	0.25**	<0.01	-0.02	0.09**	-0.03	-	
14. <sup>a</sup> G-TLFB Total Bets	2.49	1.33	0.14**	0.23**	0.08*	0.18**	0.24**	0.25**	0.17**	0.28**	0.12**	0.15**	0.14**	0.13**	0.78**	-
15. <sup>a</sup> G-TLFB Total Money	4.26	1.81	0.05	0.21**	0.06	0.10**	0.17**	0.20**	0.20**	0.23**	0.11**	0.06	0.12**	0.06	0.63**	0.67**

*Note.* GMQ-F = Gambling Motives Questionnaire – Financial; G-TLFB = Gambling – Timeline Follow-Back; PGSI = Problem Gambling Severity Index; SBMS-R = Sports Betting Motivations Scale - Revised. <sup>a</sup> variable was transformed with natural log due to severe positive skew. \*  $p < 0.05$ , \*\*  $p < 0.01$

We then ran four multiple regressions with all SBMS-R subscales predicting PGSI, number of sports betting days, total bets, and total money spent on bets in the last three months (see Table 5). All dependant variables were log transformed due to severe positive skew. This affects the interpretation of regression coefficients such that a regression coefficient of 1.0 no longer represents a 1-unit increase in the dependent variable for every 1-unit increase in the independent variable but rather represents a 10-fold increase. We found that the SBMS-R subscales explained the most variance in PGSI (36%) and that greater money and escape motives were uniquely associated with greater gambling severity. Consistent with bivariate correlations, being in the game motives were associated with *decreased* gambling severity. We found that greater fun and knowledge of the game motives, and *less* social motives were associated with more days spent sports betting in the last three months, although only 10% of variance was explained by the SBMS-R subscales. In the model for the total amount of bets in the last three months ( $R^2 = 9\%$ ), greater money, knowledge of the game, and interest in sports motives, and *less* social motives were associated with a higher number of sports bets. Finally, we found that only being in the game motives were uniquely associated with greater money spent on bets in the last three months, although only 6% of variance was accounted for by the SBMS-R subscales.

**Table 5**  
*Multiple Regressions for Sports Betting Motivations Scale - Revised*

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	<i>95% CI</i>	
						<i>lower</i>	<i>upper</i>
(Constant)	0.25	0.15		1.64	0.102	-0.05	0.55
Money	0.38	0.03	0.44	11.70	<b>&lt;0.001</b>	0.32	0.45
Fun	-0.01	0.05	<0.01	-0.09	0.927	-0.11	0.10
Social	0.05	0.04	0.05	1.27	0.205	-0.03	0.12
Escape	0.15	0.04	0.17	3.66	<b>&lt;0.001</b>	0.07	0.24
Knowledge of the game	-0.04	0.04	-0.04	-1.07	0.284	-0.12	0.03
Interest in Sports	0.01	0.04	0.01	0.28	0.779	-0.07	0.10
Being in the game	-0.16	0.04	-0.14	-4.15	<b>&lt;0.001</b>	-0.24	-0.09
<b>Dependant Variable = PGSI; <math>R^2 = 0.36</math>, <math>F(7, 906) = 71.16</math>, <math>p &lt; 0.001</math>.</b>							
(Constant)	0.53	0.18		2.94	0.003	0.17	0.88
Money	0.03	0.04	0.03	0.71	0.476	-0.05	0.10
Fun	0.17	0.06	0.13	2.60	<b>0.009</b>	0.04	0.29
Social	-0.18	0.04	-0.18	-4.20	<b>&lt;0.001</b>	-0.26	-0.10
Escape	-0.01	0.05	-0.01	-0.19	0.852	-0.11	0.09
Knowledge of the game	0.11	0.05	0.11	2.43	<b>0.015</b>	0.02	0.20
Interest in Sports	0.08	0.05	0.08	1.62	0.106	-0.02	0.19
Being in the game	0.11	0.05	0.10	2.38	<b>0.017</b>	0.02	0.20
<b>Dependant Variable = G-TLFB Total Days; <math>R^2 = 0.10</math>, <math>F(7, 906) = 14.54</math>, <math>p &lt; 0.001</math>.</b>							

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	95% <i>CI</i>	
						<i>lower</i>	<i>upper</i>
(Constant)	0.68	0.25		2.75	0.006	0.20	1.16
Money	0.15	0.05	0.13	2.80	<b>0.005</b>	0.04	0.25
Fun	0.10	0.09	0.06	1.16	0.246	-0.07	0.28
Social	-0.18	0.06	-0.13	-3.03	<b>0.002</b>	-0.29	-0.06
Escape	0.04	0.07	0.03	0.53	0.600	-0.10	0.17
Knowledge of the game	0.14	0.06	0.10	2.16	<b>0.031</b>	0.01	0.26
Interest in Sports	0.16	0.07	0.11	2.21	<b>0.027</b>	0.02	0.30
Being in the game	0.12	0.06	0.07	1.85	0.064	-0.01	0.25
<b>Dependant Variable = G-TLFB Total Bets; <math>R^2 = 0.09</math>, <math>F(7, 899) = 12.82</math>, <math>p &lt; 0.001</math>.</b>							
(Constant)	1.83	0.37		4.96	<0.001	1.11	2.56
Money	0.09	0.08	0.06	1.21	0.227	-0.06	0.24
Fun	0.21	0.13	0.09	1.61	0.107	-0.04	0.46
Social	-0.12	0.08	-0.06	-1.39	0.166	-0.28	0.05
Escape	-0.05	0.10	-0.03	-0.47	0.638	-0.24	0.15
Knowledge of the game	0.12	0.09	0.06	1.29	0.198	-0.06	0.29
Interest in Sports	0.13	0.10	0.07	1.23	0.219	-0.08	0.33
Being in the game	0.26	0.09	0.12	2.79	<b>0.005</b>	0.08	0.45
<b>Dependant Variable = G-TLFB Total Money; <math>R^2 = 0.06</math>, <math>F(7, 804) = 7.82</math>, <math>p &lt; 0.001</math>.</b>							

*Note.* G-TLFB = Gambling – Timeline Follow-Back; PGSI = Problem Gambling Severity Index. All dependant variables were log transformed. Bolded *p* values are significant predictors,  $p < 0.05$ .

## Discussion

The aim of this study was to validate the revised English version of the Sports Betting Motivations Scale (SBMS-R) in a sample of Canadian sports bettors. We replicated the previously observed factor structure (Gökçe Yüce et al., 2022) through Exploratory Structural Equation Modelling, although we had to drop five items that did not load onto their primary factor and/or cross-loaded onto multiple factors. These dropped items may have cross-loaded for several reasons, most likely differences in samples or language administered. The SBMS-R had 32 items, consisting of seven subscales: Money (9 items), Fun (6 items), Social (5 items), Escape (4 items), Knowledge of the game (3 items), Interest in Sports (3 items), and Being in the game (2 items). These findings add to the evidence of construct validity for the SBMS-R subscales, given that the majority of items behaved similarly across Turkish and Canadian contexts. In addition, we found that the SBMS-R assessed motives equally in men and women, and also for individuals with high and low levels of gambling severity. As hypothesised, we found that the SBMS-R subscales correlated highest with their corresponding subscales in the Gambling Motives Questionnaire – Financial (GMQ-F). This finding adds to the convergent and divergent validity of the SBMS-R.

Our hypotheses regarding the criterion validity of the scale were partially supported, giving interesting insights into the importance of sports-specific motives in predicting sports betting frequency and severity of

gambling problems. Overall, we found that the SBMS-R subscales were more associated with gambling severity rather than frequency measures of sports betting or money spent. In particular, we found that the sports-specific motives added unique predictive variance to all outcomes, over and above the traditionally measured gambling motives (i.e., money, fun, social, escape). Money and escape motives were associated with greater gambling severity, while being in the game was associated with *less* gambling severity. In terms of sports betting outcomes, we found that greater fun, knowledge of the game, and being in the game motives, and *less* social motives were associated with more days spent sports betting in the last three months. Greater money motives, knowledge of the game, interest in sports, and less social motives were associated with a higher number of bets, and greater being in the game motives were associated with increased money spent on bets. These findings partially align with Gökce Yüce et al. (2022), who also found that money motives were associated with sports betting problems. Gökce Yüce et al. (2022) also reported that fun motives were a protective motive, as they were associated with less sports betting problems, but we did not find this. Although these findings may be due to methodological differences (i.e., differences in outcome measures, differences in items included in SBMS-R subscales), they could also reflect cross-cultural differences and gender differences between the samples as well (the Turkish sample was 90% male). Although there may be common motives that are universally related to gambling severity (i.e., money motives), some factors (i.e., fun motives) may be related to less problems in a Turkish context rather than a Canadian context. We also built upon previous findings from Gökce Yüce et al. (2022) in that we examined the relationships between motives and frequency measures of sports betting, supporting the hypothesis that sports-specific motives may be important to consider when predicting sports betting behaviour.

It is interesting that we found Being in the Game to be a negative predictor of gambling problems but a positive predictor of money spent. On the one hand, losing oneself in the game may result in unintentionally spending more money on bets. However, this contradicts the finding that Being in the Game was related to less gambling problems, and could suggest that higher income associated with sports betting could allow individuals to keep betting without financial consequences. Future research is needed to assess this hypothesis. However, a potential issue is that this subscale had few items which may raise questions about the reliability of the measure. On the other hand, short scales with as few as even one item have been shown to be reliable and widely used (e.g., Davey et al., 2007; Rammstedt & John, 2007; Sarvestani et al., 2025), and we did find excellent internal consistency for all subscales. As such, future research should continue to investigate these constructs to understand whether there may be other moderating variables (e.g., gender, culture, income) which may interact to change the relationship between Being in the Game motives and sports

gambling. Future research could also test whether adding items to these short subscales could improve their reliability.

The current study highlights the importance of measuring specific motives relevant to sports betting, rather than general gambling motives. Previous gambling motive measures have assessed enhancement, social, coping, and financial motives (i.e., Dechant, 2014). Consistent with previous literature, we found that escape motives and money motives were related to greater gambling problems (Alaba-Ekpo et al., 2024; Allami et al., 2025; Tabri et al., 2022). In this study, however, we also showed that measuring additional sports-specific motives (i.e., knowledge of the game, interest in sports, and being in the game) is important, particularly given that being in the game was found to be associated with less gambling problems. These sports-specific motives were particularly important for predicting sports betting frequency, given that knowledge of the game motives were related to more sports betting days and more bets in the past three months. Also, greater interest in sports was related to more bets, and being in the game was the only unique predictor of money spent on bets in the last three months. Although there are important similarities between sports betting and traditional gambling, this study supports the observation that this form of gambling may have unique, sports-specific aspects to consider.

The SBMS-R may have practical implications for clinical assessment and interventions. By capturing distinct motivational pathways underlying sports betting behaviour, the measure can help clinicians identify why individuals bet. Understanding one's dominant motives may allow clinicians to tailor interventions; for example, individuals driven by money motives may benefit from cognitive restructuring around probability and expected value, whereas those motivated by escape motives may respond better to coping-skills training. Our data suggested that sports-specific motives may not be directly related to gambling severity, which could suggest these motives may not need to be targeted during interventions. However, given that we found sports-specific motives were related to sports betting frequency and money spent, future research should continue to explore whether this leads to problems. Also, future research should aim to establish a shorter version of this measure so it can easily be administered along with clinical screening measures for gambling problems.

This study is not without its limitations. First, we sampled our participants through an online panel (i.e., convenience sampling). Although data quality can be just as valid in online panels (Kim & Hodgins, 2017; Smith et al., 2016), particularly if filtering out nonattentive responders or dishonest responders, which we did in this study, future research should aim to utilise random sampling procedures to obtain more representative samples. Second, our methodology did not include diagnostic interviews to assess for gambling disorder (American Psychiatric Association, 2022), so future research is needed to determine the clinical utility of the SBMS-R.

Third, we also did not include a measure of sports betting problems per se, but rather included measures of gambling severity (PGSI) and sports betting frequency (G-TLFB variables). Relatedly, our measure of gambling severity may have been affected by other forms of gambling that participants engaged in, which were not assessed by the G-TLFB in this study. To increase relevance to sports betting problems, future research should make use of newly developed measures for sports betting severity (e.g., Gökce Yüce et al., 2022; Graupensperger & Calhoun, 2025), and should assess other forms of gambling to assess harms that are unique to sports betting. Fourth, we excluded gender diverse individuals from analyses because this group was not large enough for gender invariance testing, and we wanted to maintain comparability between ESEM models and maintain a consistent sample for all other analyses. Future research should aim to recruit more representative samples of gender diverse individuals to examine sports gambling in this population. Alternatively, conducting measurement invariance analyses across sex (males vs. females) rather than gender (men vs. women) removes the need to exclude gender diverse individuals, but then ignores self-reported gender (and associated gender roles which may be relevant to acknowledge). Fifth, our grouping of no-problem with low-risk gamblers and moderate-risk with high-risk gamblers may have resulted in clinically heterogeneous groups for invariance testing. While this decision was made for pragmatic reasons (i.e., to ensure adequate sample size in the higher-risk group), future research should replicate our invariance testing with larger samples. Sixth, our assessment of convergent and divergent validity relied on correlational analyses; future research could consider other approaches such as network analysis or structural equation modelling.

### **Conclusion**

In conclusion, this study validated the English version of the Sports Betting Motivations Scale (SBMS-R), highlighting the importance of measuring sports-specific motives when studying sports betting. In particular, we found that the motive for being in the game was associated with spending more money on bets and more frequent betting, but was protective against gambling problems. Other sports specific motives (i.e., interest in sports, knowledge of sports) were also related to more frequent sports betting. We replicated the factor structure of the original scale and demonstrated strong convergent and divergent validity, as well as criterion validity of the SBMS-R. We also found measurement invariance in the SBMS-R between men and women, and between high and low levels of gambling severity, adding to the psychometric support for this measure. Given the recent growth of online and mobile sports betting, our study highlighted that understanding the sports-specific motives (rather than traditional gambling motives) may be important to consider. The SBMS-R may be a promising tool to measure these sports-specific motives for sports betting.

**Note 1:** In-play bets refer to wagers placed during the live game. Single-event betting refers to a pre-game wager on a single outcome of a game. Parley bets combine multiple wagers placed pre-game. Systems bets are similar to parley bets except that individuals can receive partial payout if only one of their wagers are won.

Micro bets are similar to in-play bets, except that the outcomes of the wagers are smaller in scope and settled almost instantly. Prop bets are also similar to in-play bets, except that the outcomes of wagers are focused on the performance of a specific player. Fantasy sports betting involves the building a virtual team of real athletes and competing for daily cash prizes; winners are determined using actual athlete performance at the end of a day.

**Note 2:** We could not compute McDonald's omega for the Being in the game subscale because it only had two items.

**Data Availability**

The data and codebook for this study are available on OSF:  
<https://osf.io/85whc/>

**STATEMENT OF COMPETING INTERESTS**

None declared.

**ETHICS APPROVAL**

The study was approved by Toronto Metropolitan University's Research Ethics Board (REB No. 2022-102; March 21, 2022) and York University's Research Ethics Board (REB No. 2022-147; April 25, 2022).

**RELATIVE CONTRIBUTIONS**

Relative Contributions: All authors conceived of the study. JD and MTK conducted the analyses. JD wrote the first draft of the paper. All authors revised the first draft and approved of the final version.

**ACKNOWLEDGEMENTS AND FUNDING SOURCES**

Funding for this study was provided via a research grant awarded to Hyoun S. Kim and Matthew T. Keough from Greo Evidence Insights (Greo) following an open call for proposals, anonymous peer review, and assessment by an adjudication committee. Funds were provided to Greo by the social responsibility arm of the Ontario Lottery and Gaming Corporation (OLG), a Canadian crown (state owned) corporation responsible for conducting and managing gambling in the province of Ontario, Canada. Greo managed the grant competition and awarding of funds but had no role in the study design; collection, analysis, or interpretation of the data; writing the article; or the decision to submit the article for publication. OLG provided the funds and helped shape the research priorities in advance of issuing the call for proposals but had no other involvement in the research. The other authors declare that they have no known competing financial interests that could have appeared to influence the work reported in this paper.

**RESEARCH PROMOTION**

Research Promotion: This research examined sports-specific motives for sports betting, in addition to traditional gambling motives, in a sample of Canadian sports bettors. "Money" and "escape" motives were associated with greater gambling severity. "Being in the game" motives were associated with less gambling severity.

## References

- Alaba-Ekpo, O., Caudwell, K. M., & Flack, M. (2024). Examining the strength of the association between problem gambling and gambling to escape. A systematic review and meta-analysis. *International Journal of Mental Health and Addiction*.  
<https://doi.org/10.1007/s11469-024-01354-5>
- Allami, Y., Gooding, N. B., Young, M. M., & Hodgins, D. C. (2025). Why you gamble matters: A systematic review and meta-analysis of the association between gambling motivation and problem gambling. *Journal of Gambling Studies*, 41(1), 37-50.  
<https://doi.org/10.1007/s10899-024-10356-w>
- American Gaming Association. (2025, June 18, 2025). *Commercial gaming revenue tracker*. American Gaming Association. Retrieved June 26, 2025 from  
<https://www.americangaming.org/resources/commercial-gaming-revenue-tracker/>
- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders (5th ed., text rev.)*. <https://doi.org/10.1176/appi.books.9780890425787>
- Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 16(3), 397-438.  
<https://doi.org/10.1080/10705510903008204>
- Battaglia, A. M., Flora, D. B., & Keough, M. T. (2023). The Substance Use Risk Profile Scale in adulthood: An exploratory structural equation modelling approach. *Journal of Psychopathology and Behavioral Assessment*, 45(4), 1010-1022.  
<https://doi.org/10.1007/s10862-023-10090-4>
- Battaglia, A. M., Vedelago, L., Coelho, S. G., Baumgartner, C., Schaub, M. P., Stewart, S. H., MacKillop, J., Hodgins, D. C., Wardell, J. D., O'Connor, R. M., Kim, H. S., & Keough, M. T. (2024). Psychometric validation of the Gambling Craving Scale in a treatment-seeking sample. *Journal of Gambling Studies*, 40(3), 1761-1778.  
<https://doi.org/10.1007/s10899-024-10306-6>
- Behr, D. (2017). Assessing the use of back translation: The shortcomings of back translation as a quality testing method. *International Journal of Social Research Methodology*, 20(6), 573-584. <https://doi.org/10.1080/13645579.2016.1252188>
- Benson, G. N. u., Munayi, S., Wanjira, J., & Inyega, j. (2021). Investigating the effects of online sports betting on the perceived social wellbeing of student athletes. *International Journal of Business Ecosystem & Strategy (2687-2293)*, 3(2), 62-72.  
<https://doi.org/10.36096/ijbes.v3i2.259>
- Bernusky, H. C. R., Carusone, J. M., David, J., Lynch, S. J., Battaglia, A. M., Conrod, P. J., Yunus, F. M., Thompson, K. D., Krank, M. D., Hadwin, A. F., Stewart, S. H., & Keough, M. T. (2026). Examining the factor structure of the Substance Use Risk Profile Scale (SURPS) in emerging adults: An exploratory structural equation modeling approach. *Psychological Assessment*. <https://doi.org/10.1037/pas0001450>
- Biggar, B., Kesaite, V., Ukhova, D., & Wardle, H. (2023). Young women sports bettors in the United Kingdom: An overlooked demographic? In *Gambling and Sports in a Global Age* (Vol. 18). Emerald Publishing Limited. <https://doi.org/10.1108/S1476-285420230000018010>
- Bisson, J. (2025). Where is sports betting legal? All 50 U.S. states in-depth review.  
<https://www.sportsbookreview.com/news/legal-sports-betting-states-tracker/>

- Cantinotti, M., Ladouceur, R., & Jacques, C. (2004). Sports betting: Can gamblers beat randomness? *Psychology of Addictive Behaviors, 18*(2), 143-147.  
<https://doi.org/10.1037/0893-164X.18.2.143>
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 9*(2), 233-255. [https://doi.org/10.1207/S15328007SEM0902\\_5](https://doi.org/10.1207/S15328007SEM0902_5)
- Cooper, M. L., Russell, M., Skinner, J. B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment, 4*(2), 123-132. <https://doi.org/10.1037/1040-3590.4.2.123>
- Currie, S. R., Hodgins, D. C., & Casey, D. M. (2013). Validity of the Problem Gambling Severity Index interpretive categories. *Journal of Gambling Studies, 29*(2), 311-327.  
<https://doi.org/10.1007/s10899-012-9300-6>
- Davey, H. M., Barratt, A. L., Butow, P. N., & Deeks, J. J. (2007). A one-item question with a Likert or Visual Analog Scale adequately measured current anxiety. *Journal of Clinical Epidemiology, 60*(4), 356-360. <https://doi.org/10.1016/j.jclinepi.2006.07.015>
- David, J., Kim, H. S., Yüce, A., & Keough, M. T. (2026). Understanding the links between anxiety, depression, and sports betting: The mediating role of sports betting motivations. *Addictive Behaviors, 172*, 108482. <https://doi.org/10.1016/j.addbeh.2025.108482>
- Dechant, K. (2014). Show me the money: Incorporating financial motives into the Gambling Motives Questionnaire. *Journal of Gambling Studies, 30*(4), 949-965.  
<https://doi.org/10.1007/s10899-013-9386-5>
- Dechant, K., & Ellery, M. (2011). The effect of including a monetary motive item on the Gambling Motives Questionnaire in a sample of moderate gamblers. *Journal of Gambling Studies, 27*(2), 331-344. <https://doi.org/10.1007/s10899-010-9197-x>
- Evans, P. (2021). Canada legalizes single-game sports betting, opening up billion-dollar market. <https://www.cbc.ca/news/business/canada-sports-betting-1.6138865>
- Ferris, J. A., & Wynne, H. J. (2001). *The Canadian Problem Gambling Index*. Canadian Centre on Substance Abuse.
- Flack, M., & Morris, M. (2015). Problem gambling: One for the money...? *Journal of Gambling Studies, 31*(4), 1561-1578. <https://doi.org/10.1007/s10899-014-9484-z>
- Flack, M., & Stevens, M. (2019). Gambling motivation: Comparisons across gender and preferred activity. *International Gambling Studies, 19*(1), 69-84.  
<https://doi.org/10.1080/14459795.2018.1505936>
- Gassmann, F., Emrich, E., & Pierdzioch, C. (2017). Who bets on sports? Some further empirical evidence using German data. *International Review for the Sociology of Sport, 52*(4), 391-410. <https://doi.org/10.1177/1012690215597650>
- Gökçe Yüce, S., Yüce, A., Katırcı, H., Nogueira-López, A., & González-Hernández, J. (2022). Effects of sports betting motivations on sports betting addiction in a Turkish sample. *International Journal of Mental Health and Addiction, 20*(5), 3022-3043.  
<https://doi.org/10.1007/s11469-021-00563-6>
- Graupensperger, S., & Calhoun, B. (2025). Validation of a sports betting adaptation to the Problem Gambling Severity Index in young adults. *Journal of Gambling Issues, 55*, 1-24.  
<https://doi.org/10.4309/ETNB6740>
- Hing, N., Russell, A. M., & Browne, M. (2017). Risk factors for gambling problems on online electronic gaming machines, race betting and sports betting. *Frontiers in Psychology, 8*.  
<https://doi.org/10.3389/fpsyg.2017.00779>

- Hing, N., Russell, A. M. T., Vitartas, P., & Lamont, M. (2016). Demographic, behavioural and normative risk factors for gambling problems amongst sports bettors. *Journal of Gambling Studies*, 32(2), 625-641. <https://doi.org/10.1007/s10899-015-9571-9>
- IBM. (2019). *IBM SPSS Statistics for Windows*. In (Version 26.0) [Computer software]. IBM Corp.
- James, R. J. E., Tillsley, J. E., Hitcham, L., Mou, C., Kim, H., & Tunney, R. J. (2025). Disordered gambling, or dependence and consequences: A bifactor exploratory structural equation model analysis of the problem gambling severity index. *Addiction Research & Theory*, 33(2), 122-133. <https://doi.org/10.1080/16066359.2024.2352094>
- Khazaal, Y., Chatton, A., Billieux, J., Bizzini, L., Monney, G., Fresard, E., Thorens, G., Bondolfi, G., El-Guebaly, N., Zullino, D., & Khan, R. (2012). Effects of expertise on football betting. *Substance Abuse Treatment, Prevention, and Policy*, 7(1), 18. <https://doi.org/10.1186/1747-597X-7-18>
- Killick, E. A., & Griffiths, M. D. (2021). Why do individuals engage in in-play sports betting? A qualitative interview study. *Journal of Gambling Studies*, 37(1), 221-240. <https://doi.org/10.1007/s10899-020-09968-9>
- Kim, H. S., & Hodgins, D. C. (2017). Reliability and validity of data obtained from alcohol, cannabis, and gambling populations on Amazon's Mechanical Turk. *Psychology of Addictive Behaviors*, 31(1), 85-94. <https://doi.org/10.1037/adb0000219>
- Luceri, B., & Vergura, D. T. (2015). Gamblers' motivations: Developing a Reasons for Gambling Scale (RGS). *Journal of Customer Behaviour*, 14(1), 33-48. <https://doi.org/10.1362/147539215X14267608004041>
- Marsh, H. W., Morin, A. J. S., Parker, P. D., & Kaur, G. (2014). Exploratory structural equation modeling: An integration of the best features of exploratory and confirmatory factor analysis. *Annual Review of Clinical Psychology*, 10, 85-110. <https://doi.org/10.1146/annurev-clinpsy-032813-153700>
- Maxie, J. J., Coelho, S. G., David, J., Keough, M. T., & Kim, H. S. (2025). Are gambling motives all the same? The psychometric properties of the GMQ-F amongst sports bettors. *Journal of Gambling Studies*, 1-17. <https://doi.org/10.1007/s10899-025-10450-7>
- McGrath, D. S., Stewart, S. H., Klein, R. M., & Barrett, S. P. (2010). Self-generated motives for gambling in two population-based samples of gamblers. *International Gambling Studies*, 10(2), 117-138. <https://doi.org/10.1080/14459795.2010.499915>
- Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, 58(4), 525-543. <https://doi.org/10.1007/BF02294825>
- Muthén, L. K., & Muthén, B. O. (2019). *Mplus*. In (Version 8.4) [Computer software]. Muthén & Muthén.
- Nower, L., Caler, K. R., Pickering, D., & Blaszczynski, A. (2018). Daily fantasy sports players: Gambling, addiction, and mental health problems. *Journal of Gambling Studies*, 34(3), 727-737. <https://doi.org/10.1007/s10899-018-9744-4>
- Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review*, 41, 71-90. <https://doi.org/10.1016/j.dr.2016.06.004>
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41(1), 203-212. <https://doi.org/10.1016/j.jrp.2006.02.001>

- Sarvestani, S., David, J., Nedeljkovic, M., Norberg, M. M., & Moulding, R. (2025). Development of a short and an ultra-brief version of the Saving Inventory-revised (SI-R) for assessing hoarding severity: The SI-R9 and the SI-R3. *Journal of Psychiatric Research*, 182, 177-185. <https://doi.org/10.1016/j.jpsychires.2024.12.026>
- Smith, S. M., Roster, C. A., Golden, L. L., & Albaum, G. S. (2016). A multi-group analysis of online survey respondent data quality: Comparing a regular USA consumer panel to MTurk samples. *Journal of Business Research*, 69(8), 3139-3148. <https://doi.org/10.1016/j.jbusres.2015.12.002>
- Steenkamp, J.-B. E. M., & Maydeu-Olivares, A. (2023). Unrestricted factor analysis: A powerful alternative to confirmatory factor analysis. *Journal of the Academy of Marketing Science*, 51(1), 86-113. <https://doi.org/10.1007/s11747-022-00888-1>
- Stewart, S. H., & Zack, M. (2008). Development and psychometric evaluation of a three-dimensional Gambling Motives Questionnaire. *Addiction (Abingdon, England)*, 103(7), 1110-1117. <https://doi.org/10.1111/j.1360-0443.2008.02235.x>
- Tabri, N., Xuereb, S., Cringle, N., & Clark, L. (2022). Associations between financial gambling motives, gambling frequency and level of problem gambling: A meta-analytic review. *Addiction*, 117(3), 559-569. <https://doi.org/10.1111/add.15642>
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3(1), 4-70. <https://doi.org/10.1177/109442810031002>
- Vieira, J. L., Coelho, S. G., Snaychuk, L. A., Parmar, P. K., Keough, M. T., & Kim, H. S. (2023). Who makes in-play bets? Investigating the demographics, psychological characteristics, and gambling-related harms of in-play sports bettors. *Journal of Behavioral Addictions*, 12(2), 547-556. <https://doi.org/10.1556/2006.2023.00030>
- Weinstock, J., Whelan, J. P., & Meyers, A. W. (2004). Behavioral assessment of gambling: An application of the timeline followback method. *Psychological Assessment*, 16(1), 72-80. <https://doi.org/10.1037/1040-3590.16.1.72>

**Article Submission:** <https://gamb.manuscriptmanager.net/>