Instrument Development for the FocaL Adult Gambling Screen (FLAGS-EGM): A Measurement of Risk and Problem Gambling Associated with Electronic Gambling Machines

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Abstract

Previous research, based on a survey of 374 electronic machine gamblers living in Ontario, Canada, led to the selection of statements and the creation of ten constructs for the development of a new instrument, the FocaL Adult Gambling Screen for Electronic Gambling Machines (FLAGS-EGM). In this study, we used the Partial Least Squares Path Analysis form of Structural Equation Modelling to produce a hierarchical set of the ten constructs with proven predictive power for problem gambling. Receiver Operating Characteristic analysis identified cut off values for all of the constructs that predicted the target values with the desired degree of accuracy. Active gamblers were placed in five categories: No Detectable Risk, Early Risk, Intermediate Risk, Advanced Risk and Problem Gamblers. As described here, the FLAGS-EGM instrument has the potential to be applied in many situations in which identification of at-risk EGM gamblers is needed.

Résumé

Des recherches fondées sur une enquête menée auprès de 374 joueurs de jeux de hasard électronique ont conduit à la sélection d'énoncés et à la création de dix construits destinés à la mise au point d'un nouvel instrument appelé *FocaL Adult Gambling Screen for Electronic Gambling Machines* (FLAGS-EGM). Nous avons eu recours à une analyse des pistes causales par la technique des moindres carrés, une forme d'analyse des équations structurelles, en vue de produire un ensemble hiérarchique constitué des dix construits ayant démontré une efficacité prédictive relativement aux problèmes de jeu. Une analyse de la fonction d'efficacité du récepteur a permis de définir des valeurs seuils pour tous les construits ayant prédit des valeurs cibles avec le degré de précision anticipé. Les joueurs actifs ont été répartis en cinq catégories : aucun risque détectable, risque précoce, risque intermédiaire, risque accru et joueur compulsif. L'instrument FLAGS-EGM

pourrait s'appliquer à un grand nombre de situations où il est nécessaire d'identifier les joueurs à risque parmi ceux qui s'adonnent aux jeux de hasard électronique.

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Introduction

Few gambling assessment screens have been specifically designed to identify an individual's risk for harmful consequences prior to the onset of actual problems. It was our objective, in developing the FLAGS-EGM, to create such an instrument. The FLAGS-EGM also categorized individuals as problem gamblers, although this was not in fact its main purpose. We also wanted to design a screen that could be self-administered. During the extensive development phase of this research (Schellinck, T., Schrans, Schellinck, H., & Bliemel, in press) we focused on ensuring the statements considered for inclusion in the instrument were clearly understood and consistently interpreted by gamblers (Appendix). Ideally, this measure would educate and alert individuals regarding the likelihood of their risk of becoming problem gamblers and motivate them to adopt behaviours that would reduce their chances of experiencing harms.

Maddern and Rogala (2006) administered a 36-statement pilot version of the instrument to a sample of at-risk gamblers. These individuals found the statements were easy to understand and were an accurate assessment of their beliefs and behaviours. Many subjects indicated that it would motivate them to change their behaviours in regards to gambling. Buckley (2013) found that administering the FLAGS-EGM to a sample of gamblers and then providing them with their indicators of risk and classification of risk significantly increased their readiness to change their gambling behaviour.

We tested the validity and reliability of the five reflective and five formative constructs in the FLAGS-EGM (Table 1) as a further step in developing the instrument (Schellinck T. et al., in press). In the current study, we modelled the relationships among these constructs to determine the nature and timing of their influence in the evolution of a problem gambler. Constructs found to be significantly positioned along the path to problem gambling were used to create indicators of risk. If any of the variables were hierarchical in nature, those variables found to precede other constructs were considered to be earlier indicators of risk. Using Receiver Operating Characteristic (ROC) analysis (Metz, 2006) we examined the predictive nature of the constructs to establish cut offs such that individuals who scored at or above the designated level would be considered at risk. Those constructs found to be directly connected to the problem gambling constructs were considered indicative of the most advanced level of risk.

As described in Schellinck, T. et al. (in press) the new instrument was based on a research model previously created to identify antecedents of problem gambling as

Table 1

Construct Type and Number of Statements in each FLAGS-EGM Construct

Construct	Construct Type	Number of Statements
Erroneous Cognitions Beliefs	Formative	5
Erroneous Cognitions Motives	Formative	4
Preoccupation Desire	Reflective	4
Preoccupation Obsession	Reflective	2
Risky Behaviours Earlier	Formative	6
Risky Behaviours Later	Formative	6
Impaired Control Continue Play	Reflective	5
Impaired Control Begin Play	Reflective	3
Negative Consequences	Formative	14
Persistence	Reflective	4
FLAGS-EGM Instrument (Beta): Total Statements		53

well as on an extensive review of the literature. To create the instrument structure and scoring system we needed to complete the following steps:

- Demonstrate that the construct scores were related to harms due to gambling,
- Establish a hierarchy to the constructs in terms of when they would be manifested prior to the gambler becoming a problem gambler,
- Determine sum score levels for each construct that would accurately provide an indication that a person can be characterised as at risk by this construct, and
- Set criteria by which these indications would assign gamblers to various levels of risk.

Partial Least Squares Path Analysis form of Structural Equation Modelling (PLS-SEM) (Chin, 1998; Chin & Newsted, 1999; Hair, Ringle, & Sarstedt, 2011) was used to achieve steps 1, 2 and 4. We chose this method as PLS-SEM has become the common one of investigating in the area of management research the cause-effect relations between latent constructs. It maximises the explained variance of the dependent latent constructs similar to multiple regression analysis. In particular, when the goal of the model development process is prediction and theory development, as it was here, PLS-SEM is viewed as the most appropriate method of analysis (Hair et al., 2011). PLS-SEM provides many advantages over standard Structural Equation Modelling. It identifies key driver constructs when predicating a target construct, can easily accommodate both formative and reflective constructs, is used for exploratory research into structural theory, and is suitable for use in a complex structural model with many constructs and indicators. Moreover, PLS-SEM can be used with a relatively small sample. The analysis is built on the properties of Ordinary Least Squares (OLS) regression which means that traditional methods of estimating the sample power as outlined by Cohen (1992) can be used (Hair, Hult, Ringle, & Sarstedt, 2013). Our largest construct (Negative Consequences) had 14 items which, extrapolating from figures presented by Hair et al. (2013, p. 21), indicated that a sample size of 293 or larger would provide a power of 80% or better, a minimum R^2 of 0.1 and a 1% significance level. Our sample size of 374 was clearly adequate for the required analysis.

To establish accurate sum score levels for each construct (step 3, above) ROC analysis, using each construct as a predictor of an appropriate target variable, was required. In this case, ROC analysis was used to assign cut off points on the summed scores to provide indicators of risk for respondents. Combinations of these indicators were used to allocate electronic machine gamblers to risk categories.

Method

Information obtained from a sample of regular EGM gamblers who played "the slots" on average at least once a month over the previous year was used to develop the instrument. Over a five-day period, potential respondents were asked to participate in a research panel as they entered a casino in Ontario, Canada. Telephone interviews were conducted in April and May of 2009 with the sample of panel members. A total of 422 surveys were completed out of 610 eligible panel members (69.2%), with 48 disqualified because of respondent selection criteria (e.g., played slots less than once per month over the previous year), leaving 374 completed surveys available for analysis. This sample comprised 150 males (40.1%) and 224 females (59.9%); the median age was 63 with ages ranging from 23 to 89. The first language of 85.5% of the participants was English, 46.8% were retired and 2.1% were unemployed.

The participants indicated they had never received any treatment or services for substance use or gambling or mental health issues. Slightly over half of participants (53.5%) indicated they gambled weekly or daily on the slots. 70.1% also purchased lottery tickets at least once a month, 2.4% had participated in Internet gambling in the last year, 2.1% played casino table games monthly, 10.6% played card games for money monthly, 11.5% went played bingo in bingo halls monthly, and 7.2% gambled on horse racing monthly.

The survey comprised 132 dichotomous statements that were randomized for each participant to reduce the risk of common method bias (Bliemel & Hassanein, 2007). The survey also gathered demographic information, general gambling behaviour and playing patterns. Briefly, the statements were formed into a set of five formative and five reflective constructs, with 53 statements, for inclusion in the FLAGS-EGM instrument. The specific process through which the statements were formed, and the logic underlying the process, is described in Schellinck, T. et al. (in press).

PLS-SEM Analysis

Four criteria were established by Urbach and Ahlemann (2010) that can be used to evaluate the validity of the SEM-PLS model derived using the ten constructs:

- Coefficients of determination (R^2) where values of 0.670, 0.333 and 0.190 were considered substantial, moderate and weak respectively.
- Significant path coefficients using bootstrapping with 5000 runs.
- Independent latent variables having substantial impact on dependent latent values (f_2) with values of 0.35, 0.15 and 0.02 considered to be large, medium and low effect levels.
- Predictive Relevance (Q^2) where the threshold for significant impact was > 0.

Development of Risk and Problem Gambling Categories

To classify gamblers into risk categories we grouped the constructs based on the following six criteria: 1. The constructs were ordered based on the hypothesized direction of causality confirmed by the strongest predictive relationships found in the PLS-SEM model. 2. Constructs in the PLS-SEM model needed to be directly connected to constructs in the next highest level of risk/problem gambler. 3. The latter constructs needed to have a major impact (f_2) on the higher risk/problem gambler constructs. 4. Higher risk/problem gambler constructs should be influenced by lower risk constructs. 5. Cognitive-based constructs—such as risky beliefs and motives, when placed at the beginning of the PLS-SEM model—were designated early indicators and grouped accordingly. 6. If a gambler exhibited behavioural based indications (i.e., Impaired Control and Risky Practices) they were classified at a more advanced risk level (i.e., Intermediate or Advanced Risk levels). Once gamblers were engaged in risky behaviours they were considered to be at a more advanced stage in the progression towards becoming a Problem Gambler.

It should be noted that three of the constructs were split into two parts during the construct development phase of the study: Preoccupation Desire and Preoccupation Obsession, Impaired Control Continue and Impaired Control Begin, and Risky Practices Earlier and Risky Practices Later (Schellinck, T. et al., in press). Each resulting pair had an earlier and later risk construct that could be inferred based on the frequency of responses to the statements and their ultimate positioning in the PLS-SEM model. Consequently, the decision was made to place those gamblers who had an indication of risk on the later risk constructs into the Advanced Risk category.

ROC Analysis

The two criteria used to assign indicator cut offs for each of the ten constructs were sensitivity (true positive rate) and 1 minus (-) specificity (false negative rate) as determined by ROC analysis (Metz, 2006). The accuracy of a predictor variable or model, in correctly classifying a person (the target value in the target dichotomous state variable), could be assessed over the range of the predictor variable's values. For each possible value of the predictor variable a classification matrix was produced and the sensitivity, specificity and the chi-square statistic for the matrix calculated. ROC analysis used these values to produce a graph of the ROC curve based on sensitivity and 1- specificity such that the power of the model to classify gamblers could be assessed visually.

As a diagonal line in the graph indicates a performance level no better than chance, the greater the separation of the ROC curve from the diagonal the better the model's performance. The degree of separation is summarized by the total area under the curve; the closer to 100% area coverage under the curve, the better the model performance. The ROC analysis also produces an overall significance test. As Conigrave, Hall, and Saunders (1995) recommended, the predictor variable indicator value was selected at the point in the ROC curve that corresponded with the maximized chi-square test score. This approach weighted the sensitivity and specificity equally.

The state variable used depended on the construct being evaluated. As FLAGS-EGM is a hierarchical model, we did not expect the constructs at the beginning of the hierarchy (i.e., Risky Beliefs and Motives) to predict the target value at the end of the hierarchy (i.e., problem gambling) accurately. Negative Consequences and Persistence were evaluated using a score of 8+ on the PGSI as the state value. The PGSI Problem Gambler category was chosen as the value because it is commonly used to identify problem gamblers and because it has been shown to have considerable convergent validity with other instruments, such as the DSM-IV (Ferris & Wynne, 2001). The other constructs were evaluated using the indicators in the higher levels of risk as the target values. Specifically, the FLAGS-EGM Problem Gambler indicator was used as the target variable for Preoccupation Obsession, Impaired Control Begin and Risky Practices Later. The FLAGS Advanced Risk indicator was used for Risky Practices Earlier and Impaired Control Continue. The FLAGS-EGM Intermediate Risk indicator was used for Preoccupation Desire, Risky Cognitions Motives and Risky Cognitions Beliefs.

Comparison to PGSI

A modified version of the Problem Gambling Severity Index (PGSI) component of the Canadian Problem Gambling Index (Ferris & Wynne, 2001) was administered during the interview to provide a measure of problem gambling status and to assess concordance in categorizing EGM gamblers as at risk or Problem Gamblers with the new instrument. The statements in the PGSI were modified (see Table 8 for the modified statements) by specifically referencing slot play and casino play as the form of gambling indicated in the statements. This change ensured that the two instruments would be referencing the same behaviour when it came to identifying sources of the risk or problem gambling status. To compare the success of PGSI and FLAGS-EGM in this context we created two dichotomous variables that identified problem gamblers in each of the instruments and which produced a tetrachoric correlation as a measure of concordance. The tetrachoric correlation is considered the appropriate statistic, rather than Pearson or Spearman correlations or the kappa statistic, when comparing two categories (Bonett & Price, 2005; Uebersax, 1987).

As the PGSI has two risk categories and the FLAGS-EGM has three, we needed to combine two of the FLAGS-EGM categories together to compare the risk classifications between the two instruments. The PGSI uses a fairly wide range of scores (3–7) to assign gamblers to its Medium Risk category. Consequently, for comparison purposes, we combined the Intermediate and Advanced Risk categories of the FLAGS-EGM into a single category equivalent to the PGSI Medium Risk category. As some of the gamblers could fall into either the No Detectable Risk/No Risk or the Problem Gambler categories at either end of the scale for both instruments, in this instance it would not be appropriate to use the tetrachoric correlation. We measured overlap by taking the sample of all gamblers identified as at risk by either instrument and determined the percent of common assignment to risk level.

To aid in interpreting any discrepancies found between the classification by the two instruments we created four discrepancy segments, PGSI at Low Risk or Medium Risk but FLAGS-EGM No Detectable Risk, PGSI No Risk but FLAGS-EGM at Early Risk or higher, PGSI Low Risk but FLAGS-EGM Intermediate Risk or higher, and PGSI Medium Risk and FLAGS-EGM Problem Gamblers. Each segment was compared on the ten FLAGS-EGM constructs and the nine PGSI statements. Author judgment was used to interpret the results.

Results

Risk Levels Based on Partial Least Squares Analysis

Using SmartPLS the analysis started with a saturated model using all ten constructs, all constructs connected, and then, non-significant paths removed. The direction of the significant paths was then reversed, one path at a time, to ensure the largest coefficients occurred when the path was in the expected direction. The resulting eighteen paths were all significant at the $p < 0.05$ level based on t-scores derived from 5,000 bootstrapping runs (Figure 1).
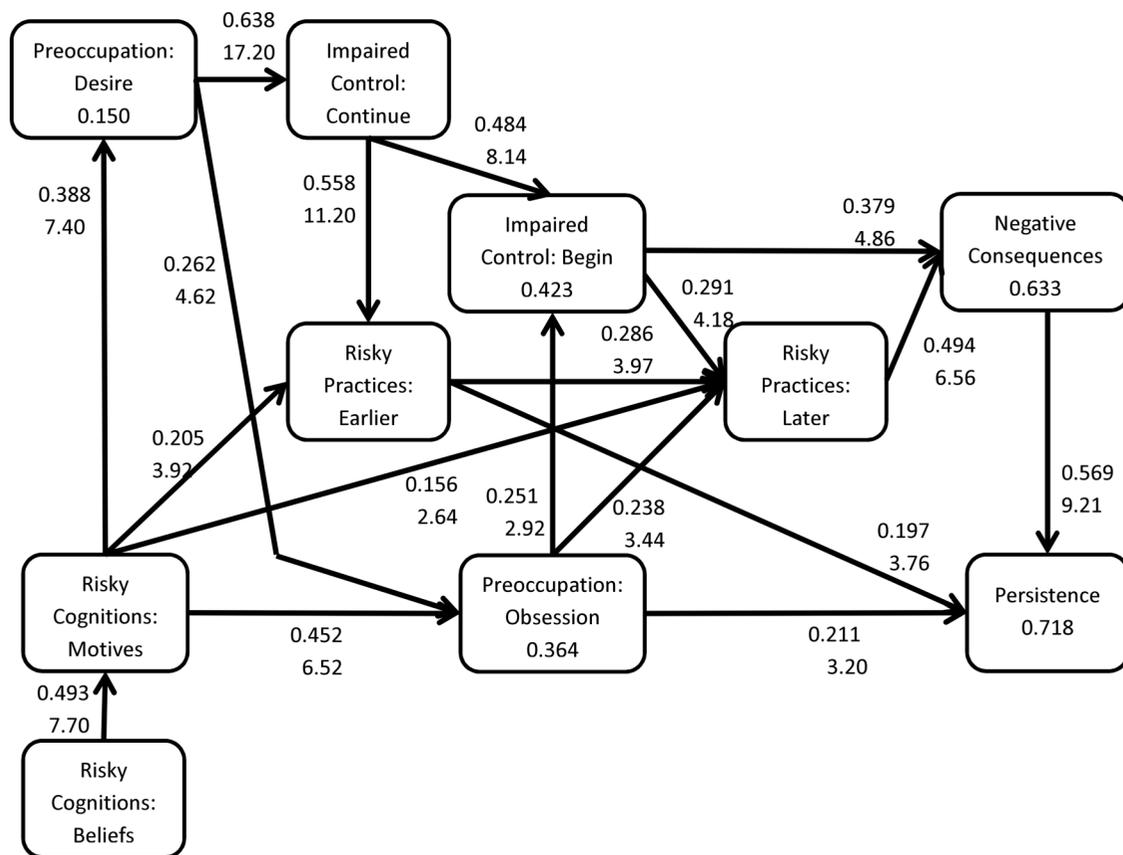

Figure 1. PLS Model Showing Path Coefficients, T-Scores and Variance Explained in Each Construct

Table 2

Effect Size (f_2) of Constructs on Selected Target Constructs

	Risky Practices Later	Negative Consequences	Persistence
Risky Cognitions Beliefs	0.20	0.16	0.19
Risky Cognitions Motives	0.47	0.33	0.38
Preoccupation Desire	0.29	0.28	0.30
Risky Practices Earlier	0.29	0.14	0.28
Impaired Control Continue	0.32	0.34	0.32
Preoccupation Obsessed	0.32	0.25	0.36
Impaired Control Begin	0.34	0.54	0.34
Risky Practices Later		0.49	0.28
Negative Consequences			0.57

Note. Values of 0.35, 0.15 and 0.02 are considered to be large, medium and low effect levels.

The variance explained (R^2) was .633 for Negative Consequences and .718 for Persistence, which puts the model into the substantial variance explained range. Similarly, the variance explained for Risky Practices Earlier and Risky Practices Later was .636 and .613 respectively.

The relative effect size (f_2) for each preceding construct on the target construct (listed at the top of the column) (Chin, 1998) is presented in Table 2. All of the effect levels were above, or near, the medium level of 0.15 suggested by Urbach and Ahlemann (2010). Risky Practices Later was strongly influenced by Risky Cognitions Motives (0.47), while Negative Consequences was strongly influenced by Impaired Control Begin (0.54) and Risky Practices Later (0.49). Negative Consequences (0.57) had the most effect on Persistence. All ten constructs met the criterion for predictive relevance (Q^2) of values greater than zero, as shown in Table 3.

Classifying Gamblers into Five Categories

Gamblers who had an indication of both Negative Consequences and Persistence were placed into the Problem Gambler category. As a result of the path analysis, three constructs—Impaired Control Begin, Risky Practices Later and Preoccupation Obsession—were designated as Advanced Risk indicators based on two criteria: Each was found to lead directly into one of the problem gambling constructs of Negative Consequences or Persistence, and each was significantly influential on either Negative Consequences or Persistence (Figure 1). Two constructs were designated as Intermediate Risk indicators: Impaired Control Continue and Risky Practices Earlier. Both led to Advanced Risk constructs and were linked in the PLS-SEM model progressively to lower risk constructs.

Three constructs were used to identify Early Risk gamblers. Risky Cognitions Beliefs was found only to influence Risky Cognitions Motives and was positioned at the very start of the path with no other constructs influencing it. Its overall effect on either Negative Consequences or Persistence was lowest of all constructs, at 0.16

Table 3

Predictive Relevance of Latent Variables for Persistence

	Predictive Relevance (Q^2)
Risky Cognitions Beliefs	0.294
Risky Cognitions Motives	0.122
Preoccupation Desire	0.091
Risky Practices Earlier	0.246
Impaired Control Continue	0. 285
Preoccupation Obsessed	0.249
Impaired Control Begin	0.314
Risky Practices Later	0.315
Negative Consequences	0.247

and 0.19 respectively. As Risky Cognitions Motives is a formative construct and located in the PLS-SEM model, where it affects both earlier and later constructs, we used this construct to identify those gamblers who were earlier in the hierarchy of risk for problem gambling. These individuals have yet to exhibit risky practices or impaired control and yet had indications of risky cognitions. The intent was to use this construct to identify persons who have a clear indication of risk before they are gambling in a risky manner. Preoccupation Desire had fairly large levels of influence (0.28–0.30) on Negative Consequences and Persistence. As this construct followed Impaired Control Motives and was found to influence Impaired Control Continue and Preoccupation Obsession, it was located early on the path to problem gambling.

Table 4 summarizes the criteria used for classifying machine gamblers to one of the five levels of risk for problem gambling.

Setting Criterion Levels for Constructs as Indicators

For all ten constructs analyzed using ROC analysis the statistical significance for the models was $p < 0.000$. The results are summarized in Table 5. Sensitivity ranged from 41.4% to 90.5%. Preoccupation Obsession and Risky Cognitions Motives had sensitivities of 41.1% and 43.1% respectively; Negative Consequences and Impaired Control Continue had sensitivities of 90.5% and 83.1% respectively. Specificity ranged from 81.1% to 99.0%, with Risky Cognitions Beliefs scoring the lowest and Preoccupation Obsession scoring the highest.

Six of the constructs formed indicators based on cut offs of two: Persistence, Preoccupation Obsession, Impaired Control Begin, Risky Practices Later, Risky Cognitions Motives and Risky Cognitions Beliefs. The four constructs with cut offs of three were Negative Consequences, Risky Practices Earlier, Impaired Control Continue and Preoccupation Desire.

Table 4

FLAGS Five Levels of Player Risk for Machine Gambling

Risk Level	Label	Description
Level V	Problem Gambler	A Problem Gambler is a person who flagged as exhibiting both Negative Consequences and Persistence and is characterized as having experienced harm in association with gambling yet is persisting in gambling.
Level IV	Advanced Risk	Those persons at Advanced Risk are not flagging as a Problem Gamblers (i.e., scoring on Negative Consequence and Persistence) but hold one or more indications on the five constructs directly connected to either Negative Consequences or Persistence. Three of these constructs are Impaired Control Begin, Preoccupation Obsessed and Risky Practices Later. Negative Consequences and Persistence are included as it is possible that a person only flagged on one of these constructs and, therefore, has not (yet) reached the threshold for identification as a problem gambler.
Level III	Intermediate Risk	Those at Intermediate Risk are not Problem or Advanced Risk gamblers, but have been flagged on one or more of the Intermediate Risk constructs. The Intermediate Risk constructs are Impaired Control Continue and Risky Practices Earlier. Intermediate Risk Gamblers are not triggering on Negative Consequences or exhibiting signs of Persistence. While higher in the risk hierarchy than the Early Risk Gamblers these players comprise individuals at pre-harm risk levels.
Level II	Early Risk	Those at Early Risk have flagged on at least one of Risky Cognitions Beliefs, Risky Cognitions Motives or Preoccupation Desire but are not triggering the Advanced Risk or Problem Gambling constructs and are also characterized as a pre-harm risk group.
Level I	No Indication of Risk	Those at No Indication of Risk do not flag on any of the risk indicators although it is possible that they answered yes to one or more statements making up some of the constructs. For those subjects who answered yes to at least one statement there was insufficient certainty for us to say there was an indication on one of the dimensions.
Level 0	Non-Gambler	A Non-Gambler is at no-risk currently because he or she is not now engaging in behaviours that could lead to harm.

A Profile of Indications for Gamblers at Each of the Five Risk Levels

Table 6 presents the percentage of respondents with indications of risk for the total sample as well as for the five FLAGS-EGM risk categories. For this particular sample, the most prevalent risk indicator was Impaired Control Continue at 23.5%, followed by three indicators with a similar prevalence: Preoccupation Desire (18.4%), Risky Practices Earlier (17.9%) and Risky Cognitions Motives (17.1%). Risky Practices Later (12.8%), Risky Cognitions Beliefs (8.8%) and Impaired Control Begin (8.6%) had a relatively low prevalence in this sample. Only 3.7% of the sample had an indication of Preoccupation Obsession.

Problem Gamblers. As shown in Table 6, individuals classified as Problem Gamblers because of indications of both Negative Consequences and Persistence

Table 5

Results of ROC Analysis for Ten FLAGS-EGM Constructs

Construct	State Variable Value	Cut Off Chosen	% Indicated	Sensitivity	Specificity	Area Under Curve
Persistence	PGSI 8 +	2	11.0%	76.2%	97.2%	95.0%
Negative Consequences	PGSI 8 +	3	9.9%	90.5%	94.9%	95.6%
Preoccupation Obsession	FLAGS-EGM PG	2	3.7%	41.4%	99.04%	78.1%
Impaired Control Begin	FLAGS-EGM PG	2	8.6%	65.5%	96.2%	91.4%
Risky Practices Later	FLAGS-EGM PG	2	12.8%	82.8%	93.0%	95.0%
Risky Practices Earlier	FLAGS-EGM Advanced Risk	3	17.9%	70.8%	93.2%	89.0%
Impaired Control Continue	FLAGS-EGM Advanced Risk	3	23.5%	83.1%	89.0%	89.8%
Preoccupation Desire	FLAGS-EGM Intermediate Risk	3	18.4%	53.2%	95.8%	82.7%
Risky Cognitions Motives	FLAGS-EGM Intermediate Risk	2	17.1%	43.1%	93.6%	75.7%
Risky Cognitions: Beliefs	FLAGS Intermediate Risk	2	27.3%	47.7%	81.1%	68.0%

all had an indication of Impaired Control Continue (100%). They were also likely to have indications of Risky Practices Earlier (89.7%), Risky Practices Later (82.8%) and Risky Cognitions Motives (82.8%). A large proportion of the Problem Gamblers also had indications of Impaired Control Begin (65.5%) and Preoccupation Desire (62.1%). Preoccupation Obsession (41.1%) and Risky Cognitions Beliefs (31.0%) were common, but not frequent indicators for Problem Gamblers.

Advanced Risk. Some of those categorized as Advanced Risk had indications of Persistence (33.3%) or Negative Consequences (22.1%), but not both, as this would have categorized them as Problem Gamblers. The most common indicators of risk for this category were Impaired Control Continue (69.4%), Risky Practices Later (66.7%), Risky Practices Earlier (55.6%) and Preoccupation Desire (55.6%). Both Risky Cognitions Motives (38.9%) and Impaired Control Begin (36.1%) were fairly prevalent among the Advanced Risk Gamblers, while Risky Cognitions Beliefs (22.2%) and Preoccupation Obsession (14.3%) were less prevalent.

Intermediate Risk. Impaired Control Continue was the most prevalent indicator (77.3%) for those in the Intermediate Risk category. Also, somewhat important were Risky Practices Earlier (47.7%) and Preoccupation Desire (45.5%). Both Risky

Table 6

Percent of FLAGS-EGM Risk/PG Segments with Specific Indications of Risk

Constructs	All Gamblers N = 374	No Risk N = 226	Early Risk N = 39	Intermediate Risk N = 44	Advanced Risk N = 36	Problem Gambler N = 29
Persistence	11.0%	0.0%	0.0%	0.0%	33.3%	100%
Negative Consequences	9.9%	0.0%	0.0%	0.0%	22.2%	100%
Preoccupation Obsession	3.7%	0.0%	0.0%	0.0%	14.3%	41.4%
Impaired Control Begin	8.6%	0.0%	0.0%	0.0%	36.1%	65.5%
Risky Practices Later	12.8%	0.0%	0.0%	0.0%	66.7%	82.8%
Impaired Control Continue	23.5%	0.0%	0.0%	77.3%	69.4%	100.0%
Risky Practices Earlier	17.9%	0.0%	0.0%	47.7%	55.6%	89.7%
Preoccupation Desire	18.4%	0.0%	28.2%	45.5%	55.6%	62.1%
Risky Cognitions Motives	17.1%	0.0%	43.6%	20.5%	38.9%	82.8%
Risky Cognitions Beliefs	8.8%	0.0%	35.9%	4.5%	22.2%	31.0%

Cognitions Motives (20.5%) and Risky Cognitions Beliefs (4.5%) have low prevalence among those in this category.

Early Risk. For Early Risk Gamblers, the key indicators were Risky Cognitions Motives (43.6%), followed by Risky Cognitions Beliefs (35.9%) and Preoccupation Desire (28.2%).

Comparison of FLAGS-EGM to the PGSI

The overall distribution by risk categories was somewhat similar for the two measures (Table 7). FLAGS-EGM identified 60.4% as No Detectable Risk, 10.4% as Early Risk, 11.8% as Intermediate Risk, 9.6% as Advanced Risk and 7.8% as Problem Gamblers. The PGSI identified 54.8% as No Risk, 19.3% as Low Risk, 20.3% as Medium Risk and 5.6% as Problem Gamblers. The PGSI found 39.6% of the sample to be at risk compared to 31.8% for the FLAGS-EGM.

Comparison of the classification Problem Gambler by the two instruments produced a tetrachoric correlation of 0.947, indicating a very high degree of agreement between the two instruments in terms of identifying problem gamblers. Using the

Table 7

Overlap in Classification by Risk Categories Between FLAGS-EGM and PGSI

PGSI Categories	FLAGS Categories					
	No Detectable Risk	Early Risk	Intermediate Risk	Advanced Risk	Problem Gambler	Total
No Risk	47.1%	6.4%	0.8%	0.5%	0.0%	54.8%
	176	24	3	2	0	205
Low Risk	11.2%	2.4%	4.3%	1.1%	0.3%	19.3%
	42	9	16	4	1	72
Medium Risk	2.1%	1.6%	6.7%	7.2%	2.7%	20.3%
	8	6	25	27	10	76
Problem Gambler	0.0%	0.0%	0.0%	0.8%	4.8%	5.6%
	0	0	0	3	18	21
Total	60.4%	10.4%	11.8%	9.6%	7.8%	100.0%
	226	39	44	36	29	374

PGSI as the "gold standard" for categorizing an individual as a Problem Gambler, the sensitivity of the FLAGS-EGM measure was 85.7%, while the specificity was 96.9%. The PGSI identified 21 problem gamblers in the sample of 374 while the FLAGS-EGM identified 29. Eleven (37.9%) of those identified as problem gamblers by the FLAGS-EGM were not categorized as such by the PGSI. Only three individuals were categorized as problem gamblers by the PGSI and not by the FLAGS-EGM. This particular result produced an overlap of only 56.2% subjects being identified as a Problem Gambler by both instruments.

The overlap of those gamblers categorized at any level of risk by either instrument (with the FLAGS-EGM Intermediate Risk and Advanced Risk categories combined) was 33.9%. The greatest source of discrepancy between the two measures occurred when a gambler was categorized as At Risk by one instrument and at No Risk or No Detectable Risk by the other. This particular inconsistency happened in 21.1% of the cases.

Table 8 presents the profile of the four discrepancy segments in terms of the percentage of gamblers in those segments having indications on each of the ten FLAGS-EGM constructs, as well as the percentage of those gamblers responding either sometimes or more often to each of the nine PGSI statements.

Discussion

PLS-SEM was used successfully to create a model to identify risk for problem gambling and to classify an individual as a Problem Gambler. The model utilized all ten constructs developed for this purpose and passed the four tests specified by

Table 8

Comparisons of Discrepancy Segments

FLAGS (% flagged on construct)	PGSI At Risk – FLAGS-EGM No-Risk (*n* = 50)	FLAGS-EGM At Risk – PGSI No-Risk (*n* = 29)	PGSI Low Risk – FLAGS-EGM Higher Risk (*n* = 21)	FLAGS-EGM PG – PGSI Medium Risk (*n* = 10)
Risky Cognitions Beliefs	0.0%	44.8%	0.0%	10.0%
Risky Cognitions Motives	0.0%	37.9%	33.3%	80.0%
Preoccupation Desire	0.0%	24.1%	42.9%	30.0%
Risky Behaviours Earlier	0.0%	10.3%	42.9%	80.0%
Impaired Control Continue	0.0%	17.2%	57.1%	100.0%
Impaired Control Begin	0.0%	3.4%	0.0%	40.0%
Risky Behaviours Later	0.0%	3.4%	23.8%	60.0%
Preoccupation Obsession	0.0%	0.0%	0.0%	20.0%
Negative Consequences	0.0%	6.9%	0.0%	100.0%
Persistence	0.0%	6.9%	4.8%	100.0%
PGSI (% responded sometimes or more often)				
You bet more on the slot machines at a casino than you could really afford to lose?	54.0%	0.0%	42.9%	90.0%
You needed to gamble on the slot machines at a casino with larger amounts of money to get the same feeling of excitement?	14.0%	0.0%	19.0%	30.0%
When you gambled on the slot machines at a casino, you went back another day to try and win back the money you lost?	38.0%	0.0%	33.3%	60.0%
You borrowed money or sold anything to get money to gamble on the slot machines at a casino?	2.0%	0.0%	4.8%	30.0%
You felt that you might have a problem with gambling on the slot machines at a casino?	10.0%	0.0%	23.8%	90.0%
People have criticized your betting or told you that you had a gambling problem with slot machines at a casino, regardless of whether or not you thought it was true?	14.0%	0.0%	14.3%	50.0%
You have felt guilty about the way you gamble, or what happens when you gamble on the slot machines at a casino?	24.0%	0.0%	14.3%	80.0%
Your gambling on slot machines at a casino has caused you any health problems, including stress or anxiety?	2.0%	0.0%	0.0%	10.0%
Your gambling on slot machines at a casino has caused any financial problems for you or your household?	0.0%	0.0%	0.0%	40.0%

Urbach and Ahlemann (2010). Specifically, the coefficients of determination were sufficient, the path coefficients were significant, the independent latent variables had medium impact on dependent latent variables, and all constructs had a predictive relevance greater than 0.0. In addition, ROC analyses identified the optimal cut off to form indicators of risk that met our criteria. As a result of these analyses, gamblers were classified as being in one of five categories as described in detail immediately below.

Problem Gamblers

Indications of both Negative Consequences and Persistence were required before an individual was considered to be a Problem Gambler. It should be noted that in creating the Negative Consequence construct, we did not address all possible forms of harm. We did not ask questions about aggressive or illegal behaviours, relationship problems, mental illness or attempted suicide. We hypothesized that individuals suffering these more severe consequences of gambling would also "flag" on the less severe and more generally-phrased statements. Moreover, queries of this nature could be viewed as threatening and therefore left unanswered by some respondents or lead others to stop participating in the survey altogether. Researchers who want to know the prevalence of these more severe consequences could include additional questions but would need to exclude them when deriving the Negative Consequences indicator.

The FLAGS-EGM instrument categorized 7.8% of the individuals as problem gamblers compared with 5.6% as identified by the PGSI for the same sample. Without further research, it cannot be determined if the FLAGS-EGM would always have a higher identification rate. It may be that the fourteen negative-consequence statements triggered recognition on the part of respondents as to the harms they had experienced, thereby identifying gamblers who would not in fact be classified as problem gamblers using the PGSI.

Advanced Risk

Individuals with Advanced Risk could have indications of either Persistence or Negative Consequences in contrast with Problem Gamblers who displayed both characteristics. Preoccupation Obsession, Risky Practices Later and Impaired Control Begin were also associated with Advanced Risk (Table 6). A third of the Advanced Risk group also had an indication of Persistence. This finding is an important indicator of risk in this group as it identifies those respondents who admit they intend to continue gambling despite the fact that it will lead to further harms.

Although 22.2% of those designated as being at Advanced Risk had an indication of Negative Consequences, they were not in fact persisting in gambling. There are several possible explanations for this. Some gamblers, once they had experienced harms, may in turn have found ways to control their gambling behaviour. Others may have stopped gambling within the one-year time frame designated in the

instrument and thus did not have an indication of persistence. Still others may have only recently experienced harms and had yet to become persistent in their gambling behaviour. Regardless, however, of their respective particular situations, these gamblers were nonetheless placed in the Advanced

Risk category because they experienced Negative Consequences. The mere possibility of their relapsing or persisting in gambling was sufficient to warrant assigning them to this category.

Impaired Control Begin influenced Risky Practices Later and also had a direct and fairly strong impact on Negative Consequences (Fig. 1). The Responsible Gaming Device (RGD) and RG Tracking System, designed by Techlink Entertainment Systems and tested in Windsor, Nova Scotia (Schellinck & Schrans, 20067), includes built-in self-exclusion features, as well as an option to track expenditures over extended periods; this specific option could help a gambler overcome Impaired Control Begin. This feature would also be particularly useful where—via wide-area networks in smaller venues, such as bars and clubs—EGMs are provided. Assistance delivered by Gamblers Anonymous and counsellors, as well as venue exclusion programs, are specifically designed to work with individuals with this degree of impaired control.

Risky Practices Later also had a strong connection to Negative Consequences (Fig. 1). By limiting the amount of money that can be borrowed on the premises, and by ensuring that loan sharks are kept away, the operators or staff of venues could be of help to gamblers who are attempting to borrow money. Pre-commitment could be effective in assisting such individuals reduce these highly risky practices.

Intermediate Risk

The reflective construct Impaired Control Continue and the formative construct Risky Practices Earlier were the indicators of Intermediate Risk (Table 6). Impaired Control Continue, in turn, had a strong influence on Risky Practices Earlier and Impaired Control Begin (Fig. 1). This latter relationship suggests that gamblers first lose control during a session, and then later lose control between sessions because of an inability to resist gambling again.

Both Impaired Control Continue and Risky Practices Earlier were mainly associated with behaviours that would occur "on the floor," and which gamblers themselves could potentially cut back on. Consequently, interacting with individuals on location during a gambling session could be important in reducing their risk levels. These gamblers would most likely benefit from responsible gambling features such as the Live Action component of the My Play system (Schellinck & Schrans, 2007; Schellinck & Schrans, 2011). This feature provides a gambler with real-time monitoring of gambling activities, including cumulative spending during the session. Such a finding provides support for a role of My Play or a similar program to help individuals control their risky behaviours once identified.

Gamblers who were administered the FLAGS-EGM instrument have been shown to be motivated to control their gambling (Buckley, 2013). Providing gamblers access to the FLAGS-EGM while on the floor, either in the form of a pamphlet (Buckley, 2013) or on screen through the EGM interface, could be helpful in reducing risky practices in the casino.

Early Risk

A respondent needed to endorse statements associated with Risky Cognitions Motives, Risky Cognitions Beliefs or Preoccupation Desire to be classified as an Early Risk gambler. A relatively large proportion of the entire sample, i.e., 17.1%, had, regardless of their level of risk, an indication of Risky Cognitions Motives. In contrast, Risky Cognitions Beliefs appeared to be a risk factor early for certain gamblers (Fig. 1). Risky Cognitions Motives, with the largest number of paths leading from it in the PLS-SEM model influenced Preoccupation Desire, Preoccupation Obsession, Risky Behaviour Earlier and Risky Behaviour Later, and was the third most common indicator for the Problem Gamblers. These results suggest that it may be more effective to lower an individual's risk by reducing risky motives than by reducing risky beliefs. Moreover, these results emphasize the need for investigation into the factors underlying motives in the effort to decrease risk due to gambling.

Preoccupation Desire, experienced by 62.1% of the Problem Gamblers, had a very strong influence on Impaired Control Continue, the most common indicator for risk. Reducing the entertainment value of the gambling experience, changing the reinforcement schedule by changing the frequency and nature of wins, or reducing the marketing material received by the gambler, might each in turn affect the gambler's desire to gamble. Gamblers have little control over these influences, and changes to these elements that might reduce Preoccupation Desire will likely need to be initiated by the gambling providers and regulators.

No Detectable Risk

For gamblers to be placed in the No Detectable Risk category, FLAGS-EGM would not have given any indications of risk or harms because of gambling within the last year. Gamblers may have endorsed a few of the statements but not enough of them within a construct to provide sufficient evidence for an indication of risk on that criterion. Certain of these gamblers may indeed have been at risk or problem gamblers in the past but at least for the previous year they are not in these categories. Certain of these gamblers will also have personal or situational factors that could lead to higher risk levels associated with gambling, levels that we have not measured. Nonetheless, these factors have as yet not manifested themselves in terms of cognitions about gambling, impaired control, preoccupation, risky practices or harms and persistence, and therefore are likely to remain at that risk level until

something in their environment triggers changes that lead to elevated risk levels. This instrument would at that time identify these persons.

Comparison of the FLAGS-EGM to the PGSI

Overall, the sizes of the risk segments created by FLAGS-EGM and the PGSI are similar. However, the number of Problem Gamblers identified by the FLAGS-EGM is somewhat larger. The two instruments differed markedly in terms of assigning individuals to specific levels of risk. In fact, they agreed in only about one-third of the cases. As well, one-fifth of those in the sample were assigned to a risk category by just one of the instruments. The profile of four discrepancy segments (Table 8) provides more insight as to why the two instruments classified gamblers into different risk categories. As discussed below, these results suggest FLAGS-EGM is a more appropriate instrument for identifying and categorizing gamblers at risk of becoming a Problem Gambler.

Segment One. Segment One comprised those individuals who were categorized as at risk (Low Risk and Medium Risk) by the PGSI and No Detectable Risk by the FLAGS-EGM. These persons may rarely exhibit the characteristics identified in the PGSI as 94% of the responses by those in this segment were "Sometimes." The single largest contributor (54.2%) to designating these persons as at risk by the PGSI is the statement "you bet more than you could really afford to lose." In a casino environment overspending may occur "sometimes" for a variety of reasons unrelated to risk. For example, friends are not ready to leave, the bus is not ready to go, a friend is winning or the environment is exciting. FLAGS-EGM has a similar statement but it does not categorize gamblers, based on this statement alone, as at risk. The PGSI also classifies gamblers as at risk if they "sometimes" feel guilty about their gambling; a number of gamblers (24%) in this segment indicated that they sometimes feel as this. These feelings of guilt may be mediated by just being present in the casino environment regardless of one's gambling behaviour. Individuals are cautioned constantly to "play within their limits," or "gamble responsibly." This reminder could lead them to agree that they sometimes feel guilty about their gambling.

The statement in the PGSI "went back another day to try and win back the money you had lost" is meant to identify chasing behaviour. However, as worded, it may have led individuals to endorse this behaviour and thus erroneously led to the PGSI classifying gamblers as Low Risk based on behaviour that is not in fact really chasing behaviour. For example, gamblers who (1) visit the casino more frequently and thus gamble more often in consecutive days, or (2) regularly gamble over two days of the weekend, or (3) go to a casino as a destination, and therefore play for several days in a row, are, in all three cases, more likely to answer "sometimes" to this statement. When asked about their intentions when returning to gamble, such gamblers may admit to wanting "sometimes" to win back the money they had previous lost even though the behaviour was not problematic. To reduce such a frequency bias, the equivalent FLAGS-EGM statement included the phrase "after losing more money than I wanted." The FLAGS-EGM also addressed and clarified the more specific

aspects of the situation ("I usually try to win it back by playing again either later that day or on another day"). In general, gamblers classified as Low Risk by the PGSI but at No Detectable Risk by FLAGS-EGM have answered "sometimes" to questions that may have relatively low thresholds for casino gamblers. Using such a statement could inappropriately classify someone as having a risk for problem gambling based on such a criterion.

Additionally, individuals categorized as Low Risk by the PGSI but as No Detectable Risk by FLAGS-EGM were only required to answer "sometimes" to one question on the PGSI to be identified as Low Risk. These individuals made up approximately two-thirds (63.9%) of PGSI Low Risk Gamblers in this sample and nearly a third (31.1%) of all of those identified by the PGSI as at risk. The PGSI and other instruments that rely on a continuum based on a sum score starting at 1 are effectively categorizing persons based on the endorsement of a single statement. In contrast, individuals that endorsed no more than one statement in all the constructs in FLAGS-EGM were assigned to the No Detectable Risk category. In line with the arguments for using multi-item measures to identify latent constructs (Churchill, 1979) a minimum score of 2—i.e., endorsement of two questions or more—was needed to say *with confidence* that a person holds an indication of risk on any one of the ten constructs in the FLAGS-EGM.

Segment Two.   This group comprised those gamblers not designated by the PGSI as at risk but designated by FLAGS-EGM as Early Risk. Those gamblers who flagged on any of three indicators, Risky Cognitions Beliefs, Risky Cognitions Motives and Preoccupation Desire (Table 8), but did not flag on the more advanced indicators of risk, were designated as Early Risk gamblers. The PGSI does not have statements that cover these indicators. However, the development of the FLAGS-EGM constructs was based on an extensive review of the literature as well as previous research with samples of the gambling population that identified these indicators as risk factors to test and our PLS-SEM analysis showed them to be significantly related to the development of problem gambling. This finding suggests that administering this instrument could provide valuable predictors of individuals at risk for problem gambling that are not currently being assessed by the PGSI.

Segment Three.   These gamblers were classified as Low Risk by the PGSI but are classified as Intermediate or Advanced Risk gamblers by the FLAGS-EGM. The concerns and potential bias associated with the statements in the PGSI, and the alternative approach used in the FLAGS-EGM, can be found in the discussion on Segment One and will not be further described here.

In this case, because most of the responses to the PGSI statements are "sometimes," the total PGSI score does not exceed 2 for these gamblers, placing them in the Low Risk category. In FLAGS-EGM, sometimes exhibiting higher-risk characteristics is deemed to be sufficient reason to place them in a higher risk category. The point is this. By not treating all statements equally in terms of risk indication—i.e., the words "sometimes," "often" and "frequently" are used in the statements to weight effectively the statement itself, and the statements are placed in constructs that are

associated with different risk levels—the FLAGS-EGM can better assign a person to a risk category, based on both the extent and the riskiness of the behaviour. This feature means that the gambler, to have an indication of Intermediate Risk, often needs to spend more time gambling than intended but only needs sometimes to borrow money from other gamblers to be classified as an indication of Advanced Risk.

Segment Four.   Gamblers who were classified as Medium Risk by the PGSI and Problem Gamblers by the FLAGS-EGM were included in this category. Almost all of these gamblers (90%) indicated through the PGSI that they believed they had a gambling problem "sometimes" but this was not enough to categorize them as Problem Gamblers. The difference is because all participants identified as Problem Gamblers in the FLAGS-EGM indicated experiencing at least three harms caused by gambling and exhibited Persistence. In the PGSI, if we assume the last four statements all have to do with negative consequences then the respondents could say they sometimes experience these consequences, but this is not sufficient to move them into the problem gambling category. In the FLAGS-EGM for example, having had problems paying off debts in the last year at all, or sometimes having to juggle money and bills in order to gamble, are indications of negative consequences that led them to be classified as Problem Gamblers. These gamblers indicated experiencing three or more of the fourteen consequences listed in FLAGS-EGM and therefore met the Negative Consequences criterion for Problem Gambler. The main consequences indicated were: (1) They do not want others to know about their gambling behaviours; (2) they feel depressed about their gambling; (3) they believe gambling has interfered with their life's goals, and (4) they do not like the type of person they have become. This finding suggests that the PGSI may not be identifying negative consequences that are related to the gambler's self-perception and state of mind.

A key difference between the FLAGS-EGM classification scheme and that of other instruments such as the PGSI and SOGS is that with the FLAGS-EGM the gambler is classified based on the nature of the indicators flagged. With the former screens, the gambler is classified based on a summed score. Thus, individuals who indicated that they sometimes borrow money to gamble could be placed at a low risk level by the PGSI (depending upon what other statements they endorsed). In comparison, the FLAGS-EGM would consider borrowing money a high-risk behaviour that consequently identified a gambler as Advanced Risk. We believe this method of classification is a major strength of the FLAGS-EGM instrument.

Limitations

Our analysis provides strong evidence that people will progress towards problem gambling if they have these indicators as described in this study. To test this hypothesis further, we need a longitudinal study to measure the movement of gamblers between risk groups over time. Of course, this research is based on a convenience sample of Ontario slot players, and further research is consequently needed to determine if the relationships identified here exist in other jurisdictions. Furthermore, our research applies only to EGM players. When developed in

Schellinck, T. et al. (in press), the Preoccupation Obsession construct passed all validity and reliability tests, except for Composite Reliability, which requires at least three items in the construct to produce an accurate statistic. We therefore used the two statement version of the construct in this phase of the analysis in order to construct the FLAGS-EGM instrument. Further research is being conducted with a revised version of the construct containing four items.

It is often suggested that when conducting the ROC analysis the state variable should be a "gold standard." When conducting ROC analysis on the Negative Consequences and Persistence constructs we used the PGSI score of 8+ as our state variable. However, we are not aware of any validated risk measures that could be used as gold standards, and therefore, as state variables for the constructs in each preceding risk level, had to rely on the risk level indicators already created using ROC analysis within FLAGS-EGM. Thus, those gamblers already classified as Intermediate Risk were the state used in the ROC analysis when analysing the three Early Risk constructs, and the sample size of 309 was more than sufficient for this purpose.

The instrument was designed to identify at risk and Problem Gamblers who are at risk due to EGM gambling. As such, it was done to make the terms in the statements more exact and therefore the instrument more accurate and easier to self-administer. This fact means it cannot be used to measure risk due to other forms of gambling. However, in many jurisdictions that offer wide-area network gambling, EGM gambling is the primary form of gambling, and thus needs to be studied separately. Our experience is that regulators, whose jurisdiction includes a large number of EGMs, as well as gambling providers such as casinos and betting shops, want to measure carefully the impact of EGMs on risk and Problem Gambling exclusive of table games, sports betting and lotteries, and as such the FLAGS-EGM will find many applications.

Conclusions

Using SEM-PLS analysis, we have created an instrument that should provide reliable information to EGM gamblers concerning their risk levels. As summarized below, the FLAGS-EGM has several key characteristics that make it very suitable for use as a measure of gambling risk and harm.

First, based upon its design, the instrument should be highly effective in identifying individuals at risk due to EGM gambling. We have chosen indicators that are proven to be associated with problem gambling (beliefs, motives, impaired control, preoccupation, consequences and persistence). Moreover, the individual must be an active gambler to respond to the statements.

Second, the FLAGS-EGM is easily administered, either by gamblers, themselves, or in a clinical context. Gamblers understood the statements, interpreted them consistently and believed that they were relevant to their situation (Schellinck, T. et al., in press). Consequently, both gamblers and health providers should be able

to assess in an accurate and informative manner individual risk levels caused by gambling.

Third, the instrument could be set up as a responsible gambling (RG) module on gambling machines or players could be invited to fill out the FLAGS-EGM on the Internet at an RG site. When administered via computer the number and nature of risk indicators, and the level of their risk associated with gambling, could be provided automatically to the gambler. Fourth, and perhaps most important, the instrument could provide policy makers with detailed information as to the nature of risk faced by gamblers. Using the FLAGS-EGM in this manner could lead to effective solutions for reducing the potential for the harms associated with gambling.

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Appendix

FLAGS-EGM (Beta)

Risky Cognitions Beliefs

- You can sometimes tell when the machine is about to pay out big because the symbols start getting closer to lining up on the pay line (e.g., almost winning).
- I feel the machines are fixed sometimes so that you can't win on them.
- It is important for me to use a system or a strategy when I play the machines.
- I believe that in the long run I can win playing slots at the casino.
- If a slot machine hasn't had a big pay out in a long time, it is more likely to do so soon.

Risky Cognitions Motives

- I sometimes play the slots in hopes of paying off my debts/bills.
- I sometimes play the slots when I'm feeling down or depressed.
- Gambling on the slots is a way I can try to get some money when I need it.
- can escape by playing the slots whenever I am worried or under stress.

Preoccupation Desire

- If I could play the machines all the time I would.
- I wish I could gamble on the slots more often.
- I would like to play the slots almost every day.
- I like to play the slot machines every chance I get.

Preoccupation Obsession

- I sometimes dream about playing the slot machines.
- I spend more time than I used to thinking about playing the slots.

Risky Practices Earlier

- I sometimes exceed the amount of money I intended to spend in order to win back money I have lost.
- When gambling on the slots I usually use my bank or debit card to get more money so I can keep playing.
- I play max bet if I'm on a winning streak.
- If I win big I am likely to put the money back into a machine and keep playing.
- When gambling on a slot machine I usually play as fast as I can.

- I have sometimes gambled for more than six hours straight when I was playing the slots.

Risky Practices Later

- After losing more money than I wanted on the slots I usually try to win it back by playing again either later that day or on another day.
- When gambling on the slots I usually use my credit card to get more money so I can keep playing.
- When I gamble with friends or family I sometimes stay and continue to play after they have stopped or left.
- I have sometimes borrowed money so I could go and gamble on the slots.
- I have borrowed money from other people at the casino in order to continue gambling.
- I have left the casino to get more money so I can come back and keep on gambling.

Impaired Control Continue

- I often spend more money gambling than I intended.
- Even when I intend to spend a few dollars gambling, I often end up spending much more.
- I sometimes gamble with money that I can't really afford to lose.
- Once I have started gambling on the slots I find it very hard to stop.
- I often spend more time gambling than I intend to.

Impaired Control Begin

- I have tried to cut back on my slots play with little success.
- I have tried unsuccessfully to stop or reduce my gambling on the slots.
- There have been times I have gambled despite my desire not to.

Negative Consequences

- My goals in life have been jeopardized by my slot play.
- I often can't sleep because I am worrying about my slot machine gambling.
- I have had problems paying off debts accumulated from playing the slots.
- Since I started playing the slots I don't like the type of person I have become.
- Sometimes I have to juggle money and bills to cover the cost of my slot machine gambling.
- I wouldn't want anyone to know how much time or money I spend at the casino.

- Sometimes I feel depressed over my slots play.
- Others are disappointed in me because of my gambling.
- I have friends or family who are concerned about my slots play.
- I have sometimes missed events or neglected family, friends or work in order to play the slots.

- When I leave the casino, I have sometimes been short of cash for parking, food, or a ride home.
- I have become somewhat of a loner because of my slot gambling.
- I sometimes have spent time gambling on the slots when I was supposed to be doing something else important.
- My gambling has caused me to have a falling out with the people I used to hang out with.

Persistence

- I continue to play the machines despite experiencing problems or other negative consequences.
- I continue to gamble despite the bad things that happen to me.
- I gamble even though I know it is likely to lead to problems for me.
- Even if money is tight, I continue to play the slots to get big wins.

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