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The Four Es of Problem Gambling:

A Psychological Measure of Risk

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Abstract

A focus group of Reno area Gamblers Anonymous members identified 4 psychological traits contributing to risk for problem gambling, including: Escape, Esteem, Excess and Excitement. A panel of four experts authored 240 Likert-type items to measure these traits. By design, none of the items explicitly referred to gambling activities. Study 1 narrowed the field of useful items by employing a quasi-experimental design which compared the answers of Reno area Gamblers Anonymous members (N = 39) to a control sample (N = 34). Study 2 submitted successful items, plus new items authored with the knowledge gained from Study 1, to validation in a random sample telephone survey across Queensland, Australia (N = 2,577). The final 40 item Four Es scale (4Es) was reliable (α = .90); predicted gambling problems as measured by the Canadian Problem Gambling Index of Severity (PGSI, Ferris & Wynne, 2001); and distinguished problem gamblers from persons with alcohol abuse problems. The new scale can provide a basis for further study in harm minimization, treatment, and theory development.

Key Words:

Personality

Aboriginal

Native

The Four Es of Problem Gambling:

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The present research sought to develop a scale that measures psychological factors that contribute to risk for gambling problems. Although there is a growing body of evidence concerning correlates to problem gambling, there is less known about the psychological traits that can predispose persons to disordered gambling (Eber & Shaffer, 2000; Hoyle, 2000; Zuckerman & Kuhlman, 2000).

Definitions of Risk

The use of the term "risk" in problem gambling research takes at least two distinct meanings. In much of the literature risk is used as a term to indicate lesser forms of problem gambling. For example, persons with gambling problems who score between 3-7 on the Canadian Problem Gambling Index of Severity are termed as "moderate risk" gamblers (Ferris & Wynne, 2001). In contrast, the literature also uses risk to designate factors that make a person more prone to gambling problems. For example, past research has explored the comorbidity between problem gambling and other mental health problems, including anti-social personality disorder, alcohol abuse and drug problems (Blaszczynski, Steel, & McConaghy, 1997; Ibanez et al., 2001). These other mental health problems can be seen as potential risk factors for the development of problem gambling.

Although causal relationships are unclear, at least it is possible to conclude that people with anti-social personality disorder, alcohol and/or drug problems are more likely to also have gambling problems. This latter definition is the intended meaning of risk in this research. This investigation differs from other approaches, however, by focusing on psychological traits rather than other correlates.

Trait Risk

Risk for problem gambling is composed of two broad factors, including traits of the individual, and the gambling opportunities in the community. This distinction is important, because not all of the risk factors associated with gambling may be located uniquely within the individual. Other factors, such as exposure to gambling opportunities, will also contribute to the development of gambling problems in any one individual.

We focused our study on the psychological traits of the individual that are decontextualized. In principal, these traits should exist and be capable of measurement in persons with no experience in gambling. This approach will allow the eventual use of the measure to prospectively identify persons who may later develop gambling problems when exposed to suitable opportunities to gamble, or who experience trigger events (e.g., a big win).

Research Aims

The goal of this research program was to develop a trait measure of risk for gambling problems. To date, the research program is comprised of one focus group and 2 studies. First we identified motivations for gambling in a focus group with Reno Nevada area Gamblers Anonymous members. Items were complied to reflect these motivations. Study 1 exposed these items to quasi-experimental groups to test their ability to distinguish problem gamblers from a control sample. Study 2 submitted the items measuring risk for problem gambling to large scale validation in a general population phone survey across Queensland, Australia.

<div align="center">Focus Group</div>

In an initial effort to identify relevant psychological dimensions that characterize risk for problem gambling, a focus group was conducted with Reno area members of Gamblers Anonymous. Approximately eight members, including both males and females, took part in discussions following a regularly scheduled meeting. The conversations were an open exchange of ideas, but were semi-structured around a set of questions devised to explore the motivations behind gambling behavior. These questions included prompts such as "what situations give you the urge to gamble?" and "what are some of the things you like most about gambling?"

In addition to the focus group, the existing literature on problem gambling was researched to identify factors purported to cause problem gambling behavior. The following broad themes emerged from a combined look at both literature and focus group answers: The distinction between "action" and "escape" gambling was found frequently in print (e.g., Blaszcvznski, 2002), and was also well supported by comments from problem gamblers in the focus group. Another frequent theme in problem gambling literature is the relationship between gambling and impulsivity (Langewisch & Frisch, 1998). This theme is represented by the DSM-IV (American Psychiatric Association, 1994) classification of pathological gambling as an impulse control disorder. In support of this idea, Gamblers Anonymous members talked at length about failed attempts to control their impulses or urges to gamble. Lastly, problem gambling behavior may be associated with low self-esteem (Baumeister, 1997). Gamblers Anonymous members indicated that they were motivated to gamble in response to threats to their feelings of self-worth or social acceptance.

In short, the focus groups helped identify 4 motivations for gambling among gamblers anonymous members. To aid in the description of these motivations, these traits were designated the Four Es (4Es) and include: Escape (avoiding social interaction), Esteem

(avoiding negative self-appraisals), Excess (failing to
resist impulses), and Excitement (action sought to
relieve boredom).

Item Development for Study 1

The next stage of the research program sought to
develop a bank of potential items to measure the
underlying 4Es constructs. Four experts, each with a
graduate degree in Psychology, authored a bank totaling
240 potential items.[1] Items were Likert-type (1-5) with
responses ranging from "strongly disagree" to "strongly
agree." Approximately half the original items were
written to be reverse-scored. To help establish construct
validity of the item pool, the items were sorted by 4
independent judges into the 4 categories (Escape, Esteem,
Excitement and Excess). The judges did not have prior
knowledge of the intended construct for each item as
dictated by the original author. An abridged list of 90
items was compiled for Study 1 by selecting only those
items with high category agreement among multiple judges.

Study 1

Method

Participants. Thirty-nine Reno area members of
Gamblers Anonymous (GA) filled out a survey titled "short
form personality questionnaire." Among these members, 13

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[1] The complete item pool is available from the author.

were male and 26 were female, with an average age of 44.6

years. These participants were recruited by the principal

researcher in an open meeting of Gamblers Anonymous. In

addition, a quasi-experimental control group of 34

doctors and nurses at a Reno area Veterans Administration

(VA) hospital were recruited with help from a nurse

practicing at the same hospital. The sample from the

Veterans hospital included 11 males and 23 females, with

an average age of 49.7 years.

<u>Results</u>

The first study was a quasi-experimental design. Two

pre-existing groups were chosen to test for differences

in how they responded to the questions designed to tap

the 4Es of problem gambling. This initial study was used

primarily to refine the scale by selecting the items that

were most likely to be useful, rather than providing a

final validation of the scale.

<u>Item Selection.</u> The 10 best items for each construct

in terms of corrected item-total correlations were

retained for further analysis. Scores were averaged for

each of 4Es based on these sets of 10 items, with

Expectation Maximization (EM) employed for missing

values.

<u>Predicting Group Membership.</u> As predicted, the

scores on each of the 4Es were significantly higher for

members of Gamblers Anonymous when compared with the

control group for average scores on Escape (2.95 vs.

2.17, $\underline{t}$(71) = 4.74, $\underline{p}$ < .01), Esteem (3.55 vs. 3.05,

$\underline{t}$(71) = 3.33, $\underline{p}$ < .01), Excess (3.62 vs. 2.67, $\underline{t}$(71) =

5.93, $\underline{p}$ < .01) and Excitement (3.31 vs. 2.65, $\underline{t}$(71) =

4.27, $\underline{p}$ < .01).

In addition, a logistic regression model was used to

predict from which group participants were recruited

(Veterans Administration Hospital (VA), or Gamblers

Anonymous (GA)). This prediction was based solely on

their answers to the 4Es questions. The dependent

variable was coded (0) for VA and (1) for GA. As before,

the 4 independent variables were simply the mean of all

Likert items across each sub-scale (i.e., 10 items each

for Excitement, Escape and Esteem, and Excess). Scores

for Escape (ß = .91, SE = .55, Odds = 2.48, Wald = 2.77,

$\underline{p}$ < .05), Excess (ß = 1.53, SE = .53, Odds = 4.61, Wald =

8.22, $\underline{p}$ < .01) and Excitement (ß = 1.15, SE = .56, Odds =

3.15, Wald = 4.23, $\underline{p}$ < .05) were able to independently

predict membership in Gamblers Anonymous. The Esteem

construct (ß = .05, SE = .55, Odds = 1.05, Wald = .01, $\underline{p}$

> .05, ns), however, failed to predict group membership

independent of the other factors due to shared variance

with the other constructs.

In summary, Study 1 provided a means for evaluating

items based on: a) assessment of the corrected item-total

correlation for coherence with the construct, and b)

predicting membership in Gamblers Anonymous as opposed to a control group.

<u>Study 1 Discussion</u>

Study 1 demonstrated the utility of Escape, Esteem, Excess and Excitement in identifying Gamblers Anonymous members from a control population. The relative weakness of the Esteem construct in identifying Gamblers Anonymous members pointed to a need for a reassessment of this construct. In addition, the quasi-experimental design used to evaluate the scale had some shortcomings. Beyond gambling difficulties, there were obvious differences between the test and control populations that created room for alternate interpretations as to why the constructs were able to distinguish between the two samples.

Study 1 was useful, however, in providing some rough indication of which items would most likely survive a large scale validation test. In particular, the few items representing the Esteem construct which did correlate with membership in Gamblers Anonymous included negative self-appraisals such as "I rarely live up to my own values or standards." In addition, it appeared that items from the Excitement construct that were successful in predicting membership in Gamblers Anonymous tended to emphasize boredom and restlessness rather than a preference for "exciting" activities. Study 1 became the

basis for a new round of item development.

Item Development for Study 2

Study 2 was a large scale validation of the items that proved useful in Study 1.[1] In addition, new items were authored as a result of findings from Study 1. In particular, the item pool measuring the Esteem construct was extensively updated to reflect statements of negative self-appraisal. New items for the Excitement construct focused on boredom and restlessness, as these themes proved successful in Study 1.

Study 2

Method

Participants. In total, 2,577 persons, including 940 males and 1,637 females, with ages ranging from 18 to 100 years (M = 46.1, SD = 16.2) participated in a phone survey conducted in Queensland, Australia. The cultural identities of the respondents included: Australian (2,161 or 83.9%); English (149 or 5.8%); Indigenous (46 or 1.8%); and others identities (221 or 8.6%) which each represented 1% or less of the sample.

Procedure. A stratified random sample of 4,840 persons was drawn from phone book records within the 11 regions of Queensland, Australia. Interviewees were chosen at random from an enumeration of the adults living in the household. Interviews of 2,577 persons, representing a 53.2% completion rate, took place between

July and October 2003.

In addition to the 4Es instrument, the survey included the Alcohol Use Disorders Identification Test (AUDIT, Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), and the Canadian Problem Gambling Index (CPGI, Ferris & Wynne, 2001).

Results

Study 2 subjected select items from Study 1 to large scale validation. In addition, new items were explored that were developed with the help of Study 1's findings. In total, 21 items for Escape, 21 items for Esteem, 21 for Excess and 20 for Excitement were tested.

Item Selection. Of the 83 items on the questionnaire, a selection procedure was used to reduce the set of items to a more reasonable number for future administration. The top 10 items were selected from each subscale based on the corrected item-total correlations. This procedure helped to ensure that the remaining items were good representations of the traits.

Predicting Gambling Related Difficulties. The first research question asked whether the resulting 40 item scale was capable of reliably predicting problem gambling symptoms as measured by the Canadian Problem Gambling Index of Severity (PGSI, Ferris & Wynne, 2001). For the purposes of this analysis, participants were coded: (0) for those with no gambling related problems, and (1) for

persons with 1 or more gambling related problems as defined by the PGSI. Subscales for each of the 4 traits were calculated by averaging the 10 underlying items, with Expectation Maximization (EM) employed for missing values.

Table 1 shows the mean differences in average scores, on a scale of 1-5, for each of the traits. There were highly significant differences in scores for all 4 constructs, illustrating the utility of the scale in predicting gambling related problems.

[Insert Table 1 Here]

In addition, a logistic regression analysis used dichotomized PGSI Problems as the dependent variable and each of the 4 constructs as independent variables. Results from this analysis showed the factors of Escape (ß = .32, SE = .12, Odds = 1.38, Wald = 6.79, p < .01), Excess (ß = .65, SE = .12, Odds = 1.92, Wald = 31.00, p < .01) and Excitement (ß = .22, SE = .12, Odds = 1.24, Wald = 3.40, p < .05) each independently predict PGSI gambling problems (one-tailed). Because of the shared variance among constructs and slightly higher standard error, Esteem (ß = .04, SE = .16, Odds = 1.05, Wald = 0.07, p > .05, ns) does not significantly predict gambling problems independent of the other 3 factors. Recall, however, from Table 1 that each trait separately predicts gambling problems.

Predicting Gambling Problems vs. Alcohol Abuse. Per
the analysis above, the 4Es of problem gambling reliably
predict gambling problems. However, they should also be
able to discriminate persons with gambling problems from
persons with other substance abuse problems. To
accomplish this comparison, Study 2 also included the
Alcohol Use Disorders Identification Test (Saunders et
al., 1993).

For the purposes of this analysis, participants were
coded into 2 categories based on both original PGSI
scores and AUDIT scores: (0) for those who had alcohol
dependency based on AUDIT score, but no identifiable
gambling problems; and (1) for persons who had 1 or more
gambling problems on the PGSI, but who were not dependent
on alcohol. This classification variable, Gambling vs.
Alcohol, included only 423 participants from the original
sample.

Table 2 shows the mean values for the Four Es for
persons with exclusive gambling problems separate from
those with exclusive alcohol abuse problems. The mean
scores for Escape and Excess were reliably higher for
persons with exclusive gambling problems as opposed to
exclusive alcohol abuse problems. Esteem scores also
demonstrated the predicted pattern, but were not
reliable. The Excitement trait, however, showed the
opposite pattern, with relatively higher scores

predicting exclusive alcohol abuse problems over

exclusive gambling problems.

[Insert Table 2 Here]

A logistic regression was performed using Gambling

vs. Alcohol (1 or 0) as the dependent variable and each

of the 4 traits of Escape, Esteem, Excitement and Excess

as independent variables. Both Escape (ß = .27, SE = .17,

Odds = 1.32, Wald = 2.59, $\underline{p}$ < .05) and Excess (ß = .27,

SE = .16, Odds = 1.31, Wald = 2.87, $\underline{p}$ < .05)

independently distinguished persons with exclusive

gambling problems from those with exclusive alcohol abuse

problems (one-tailed). However, because of shared

variance among the constructs and a slightly higher

standard error, Esteem (ß = .27, SE = .24, Odds = 1.31,

Wald = 1.32, $\underline{p}$ > .05, ns) failed to reliably distinguish

among the groups. In conformity with Table 2, higher

Excitement (ß = -.62, SE = .18, Odds = 0.54, Wald =

11.86, $\underline{p}$ < .01) scores distinguished persons with

exclusive alcohol abuse problems over those with

exclusive gambling problems.

Calibration of the Scale. The 40 item scale

demonstrated 2 important properties: 1) the ability to

predict gambling problems, and 2) the ability to

distinguish persons with gambling problems from persons

with alcohol abuse problems. Thus, the 4E scale is

effective at determining unique risk for problem

gambling. To give the scale practical utility, it is helpful to identify cut-points that define risk categories. The average score on the 40 item scale was 1.96 with a standard deviation of 0.55. As such, for the average of all 40 items on the 4Es scale, the 95% percentile demarcating high scores occurred at a score of 2.86.

Figure 1 illustrates the prevalence of gambling problems for persons scoring less than 2.86 on the 4Es scale (approximately below the 95th percentile), and those scoring higher than this amount (approximately 5% of high scorers). As shown, the risk of problem gambling as judged by the PGSI increases at a rate of approximately 9 fold, or 900%, for people who score high on the scale (0.6% risk versus 5.4% risk). In addition, of high scorers, 22.8% have at least one gambling related problem as measured by the PGSI, while only 6.3% of low scorers have one or more gambling related problems.

[Insert Figure 1 Here]

Reliability. The internal consistency of the scale was evaluated using Cronbach's Alfa. The overall reliability of the 40 item scale was α = .90. The subscales, which are based on only 10 items a piece, necessarily had smaller reliabilities due to fewer measurements. The reliabilities for the subscale included: .82 for Escape, .72 for Esteem, .78 for Excess

and .76 for Excitement. The average inter-item
correlations for each subscale were respectable, at .34
for Escape, .22 for Esteem, .28 for Excess, and .25 for
Excitement.

Four Es scores across major demographic categories.
Mean differences across demographics were tested with a
2x2x3 factorial ANOVA model. The dependent variable was
4E Scores formed by averaging across all 40 items on the
scale, while adjusting for reverse-scored items. The
independent variables included major demographic
groupings across age, gender and ethnicity. For
convenience, age was categorized by a median split, with
45 and under forming one category, and over 45 years the
other. Ethnicity was divided into peoples of European
descent, Indigenous Australians, and all others.

There was a main effect for age, such that persons
45 years of age or less, M = 2.09, SD = 0.58, had higher
scores than older persons, M = 1.82, SD = 0.50, F(1,2537)
= 33.13, p < .01. This finding was consistent with
expectations, as problem gambling is more prevalent among
younger persons. There was also a significant interaction
between gender and age, F(1,2537) = 6.70, p = .01.
Although true for both genders, being older was a more
important factor in explaining lower 4Es scores among
males than among females. There was also a significant
interaction between gender and ethnicity, F(1,2537) =

3.04, p = .05. In contrast to persons of European decent,
Female Indigenous Australians, M = 2.40, SD = 0.71, had
higher scores than male Indigenous Australians, M = 2.23,
SD = 0.68. All other main effects and interactions proved
non-significant.

Factor Analysis. The 4Es scale was constructed such
that each of the 40 items indicates risk for problem
gambling. As such, one should expect the scale to have
relatively high inter-item correlations across sub-
scales. However, each of the four components of risk,
including Escape, Esteem, Excess and Excitement, should
also be somewhat unique. As illustrated in the discussion
above, the selection of factors, and items to represent
those factors, was based primarily on theoretical
considerations rather than statistical analyses. As such,
it is appropriate to test the proposed 4 factor structure
delineated by theory.

A confirmatory factor analysis (CFA) was conducted
with AMOS software. Table 3 shows the means, standard
deviations and factor loadings for each item. Although
there are no generally agreed upon standards for
evaluating the fit of a confirmatory factor analysis,
some common fit indexes are reported here. First, the
Chi-Squared goodness of fit index was X(734) = 5788.68, p
< .01. This statistic is often significant for datasets
with a large number of observations, and thus may not be

particularly instructive. The so-called Relative Chi-square (CMIN/DF), however, provided indications of a poor fit at 7.89 against a standard of 2 through 5. In addition, the Comparative Fit Index (CFI) at .80 is below the generally agreed upon ideal of .90 and above. However, the Root Mean Square Error of Approximation (RMSEA) at .05 challenges these results, indicating a reasonably close fit. In contrast to the other fit indexes, the RMSEA is a parsimony adjusted fit statistic, and thus indicates that the model is a reasonable fit given the number of parameters that have been estimated. [Insert Table 3 Here]

General Discussion

The purpose of this program of research was to identify risk for problem gambling from a psychological perspective. Past measurement of problem gambling, including such scales as the South Oaks Gambling Screen (Lesieur & Blume, 1987) and CPGI (Ferris & Wynne, 2001), are diagnostic of problem gambling. These past scales help to identify persons with gambling problems, but have limited value in understanding the root causes of disordered gambling. A valid psychological model indicating risk can have several benefits. First, the scale can aid in the early identification of persons at risk for a gambling disorder, and thus provide opportunities for harm minimization. The scale may also

prove useful in treating problem gamblers. By identifying

the risk traits, it may be possible to design treatment

solutions that specifically target the separate

motivations behind problem gambling. Lastly, the 4Es

model is a theoretical tool that can indicate directions

for future study.

In discussing the results, we first comment on the

properties of the 4Es scale that have been demonstrated

in the current study and later highlight the practical

significance of the findings.

Properties of the 4Es Scale

Convergent Validity. The 4Es scale predicts gambling

related problems as measured by the PGSI (Ferris & Wynne,

2001). The scale itself, however, makes no direct

reference to gambling activities. This is an important

distinction for two reasons. First, correlation between

scale items and the PGSI are not related simply by

association to experience with gambling. Persons with

more experience in gambling may be at higher risk for

gambling related problems (Parsons & Webster, 2000).

Second, the scale can be answered by persons with no

experience in gambling. Thus, it is possible to identify

psychological risk independent of exposure to gambling

opportunities.

By virtue of its independence with gambling

experiences, the 4Es scale is a test of "risk" and not a

diagnostic test for problem gambling. Other factors, including experience in gambling, culture and peer influence interact with these risk factors to produce problem gambling behavior.

Discriminant Validity. The 4Es scale predicts gambling problems uniquely from alcohol abuse problems. Although the scale appears useful in predicting alcohol abuse as well as problem gambling, relatively higher scores on the Escape and Excess traits uniquely distinguish persons with exclusive gambling related problems from others with exclusive alcohol abuse problems. Therefore, the scale can provide useful hints about what makes gambling problems unique. In a surprise finding, higher scores on the "Excitement" trait help distinguish people with exclusive alcohol abuse problems from those with exclusive gambling problems. In sum, three of the 4 traits reliably help discriminate between problem gambling and alcohol abuse.

Known Groups Validity. Study 1 provided evidence that the 4Es constructs discriminate between known groups, including Reno area members of Gamblers Anonymous and a control group of hospital staffers. This information shows that the 4Es are relevant to treatment seeking populations.

Definition of "High Risk". Problem gambling likely lies along a continuum from minimal problems, to more

severe problems that can be considered pathological. As problem gambling has long been considered a mental health issue that can benefit from treatment (American Psychiatric Association, 1994), the establishment of categories is useful in identifying relative risk. Following past tradition, we found it convenient to identify "cut points" to establish high and low risk for problem gambling as identified by the 4Es scale. Study 2 found that persons with an average score (over 40 items) of greater than 2.86 (approximately the top 5%), had 9 times the risk of being classified as a problem gambler compared to the lower 95th percentile. As a matter of convenience, score above 2.86 are defined as "high risk" while scores below are "low risk." However, in future research it may be possible to identify more explicit criteria for selecting cut points.

Demographic differences. There are important differences in how gambling problems are experienced by sub-groups of the population. In general, these differences are paralleled by the differences among the 4Es scores. As expected, male survey respondents had generally higher 4E scores (M = 2.01, SD = 0.56) than female respondents (M = 1.94, SD = 0.54). In addition, 4E scores decreased with age, which is consistent with previous findings that gambling problems generally decrease with age. These findings regarding age also

suggest that the 4Es are not necessarily stable personality constructs, but rather may be modified over the lifespan. Of course, another possibility is that the 4Es are influenced by cohort effects.

Limitations. The two studies included in this report are insufficient to resolve all issues of scale validity. Some major issues still need testing. A non-exhaustive list of features that would be desirable to demonstrate in future research includes: a) test-retest reliability, b) freedom from response set, c) proven relationships between the scale and other psychological measures (e.g., self-esteem, Rosenberg, 1989), and d) prediction of who will develop gambling problems in the future based on 4Es scores. In addition, literal replication of some of the properties that the scale has demonstrated in these two studies would be desirable. To further the development of the scale, an important task will be to maximize distinction between the factors without impeding the ability of the overall scores to predict risk for problem gambling. This progress would be particularly desirable if the scale was reduced to fewer items to ease administration.

The scale showed strong internal consistency in Study 2 (α = .90). However, internal consistency is only one form of reliability. Another important form of reliability is so-called test-retest. This reliability is

demonstrated by re-administration of the scale to the same persons at a later date, often with a delay of 6 months to a year. This will be an important property to demonstrate in future research.

Practical Significance of Findings

Harm Minimization. The 4Es scale should be able to prospectively identify persons who are at risk for problem gambling. Since problem gambling has a relatively low base-rate with the general population, it is difficult to identify communalities that are at increased risk. However, the 4Es scale can be scored for persons with no background in gambling. Therefore, the scale may be useful in highlighting the characteristics of persons who are relatively more likely to develop problem gambling behavior. This knowledge can be used to target advertising campaigns aimed at harm minimization.

Treatment. The 4 factors of the scale may prove useful in designing treatment programs. For example, new therapies could be designed to reduce gambling motivations emanating from each of the 4 factors. In addition, based on individual high scores within factors, the scale can also provide treatment professionals with indications of which factors should be emphasized during treatment.

Conclusion

The 4 factor model of risk for problem gambling provides a tool that is practical and has the potential to advance theoretical understanding. The model was developed based on focus group discussion with members of Gamblers Anonymous in Reno, enhanced by theory drawn from the literature, and validated with a sample drawn from a household survey of Queensland, Australia. The 4Es distinguish Gamblers Anonymous members from a control population, predict gambling problems in a survey of the general population and distinguish problem gamblers from persons with alcohol abuse problems. In the future, the scale can provide a means of early identification for harm minimization, provide direction for treatment solutions that target risk, and aid future theoretical considerations of the nature of problem gambling, and its similarities and differences with substance abuse.

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Table 1

Mean Values for Predictor Variables as a Function of PGSI

Gambling Symptoms

Variable	1 or more Gambling Problems ($\underline{n}$ = 188)	No Identifiable Gambling Problems ($\underline{n}$ = 2372)	$\underline{t}$(2558)
Escape	2.11	1.66	8.72**
Esteem (low)	2.23	1.89	7.38**
Excess	2.41	1.90	9.90**
Excitement	2.71	2.28	7.30**

**$\underline{p}$ < .01.

Table 2

Mean Values for Predictor Variables as a Function of

Exclusive Gambling Problems vs. Exclusive Alcohol Abuse

Problems

Variable	Exclusive Gambling Problems (n = 118)	Exclusive Alcohol Abuse Problems (n = 305)	t(421)
Escape	2.05	1.89	1.66*
Esteem (low)	2.16	2.07	1.31
Excess	2.32	2.17	1.70*
Excitement	2.55	2.71	1.76*

*p < .05. (one-tailed)

Table 3

Questionnaire: The 4Es of Problem Gambling

Question	Mean[a]	SD	Factor loading	r with PGSI
Factor 1: Escape				
1. I would like to just disappear.	1.52	1.03	.68	.07**
2. I sometimes wish that I would not feel anything.	1.73	1.24	.62	.12**
3. I wish that nobody knew who I was.	1.38	0.84	.65	.14**
4. I feel that I am already living in a prison.	1.46	0.96	.63	.10**
5. I wish that I could take the next flight or bus out of my town.	1.64	1.14	.60	.08**
6. Running away from my problems may be the only solution.	1.27	0.71	.57	.16**
7. Sometimes I think life is too much to handle.	2.04	1.39	.57	.11**
8. It would be good to get away to some place where no one knows me.	2.19	1.43	.53	.09**

Table 3

Questionnaire: The 4Es of Problem Gambling

Question	Mean[a]	SD	Factor loading	r with PGSI
9. I often make excuses to avoid dealing with others.	2.07	1.30	.52	.11**
10. When walking, I often change direction to avoid speaking with others.	1.63	1.06	.46	.07**
Factor 2: Esteem				
11. The things I say and do are foolish.	1.68	1.01	.51	.09**
12. I am miserable to be around.	1.37	0.75	.54	.08**
13. I can be gloomy.	2.52	1.43	.48	.08**
14. I am an irritable person.	1.99	1.27	.43	.09**
15. I feel completely worthless.	1.29	0.75	.57	.09**
16. I am often incompetent.	1.57	0.96	.47	.05*
17. I am often embarrassed by the stupid things I say or do.	2.34	1.42	.44	.05*

Table 3

Questionnaire: The 4Es of Problem Gambling

Question	Mean[a]	SD	Factor loading	r with PGSI
18. I usually feel guilty for something I've said or done.	2.56	1.42	.40	.06**
19. I rarely live up to my own values or standards.	2.13	1.37	.44	.11**
20. I make good decisions. [b]	4.20	0.82	.40	.04*
Factor 3: Excess				
21. I am careful in my decision making. [b]	4.54	0.71	.59	.10**
22. I usually get into trouble because I don't stop to think.	1.83	1.19	.66	.15**
23. I carefully think out all my options before acting. [b]	4.12	1.11	.59	.10**
24. Before deciding to do something important, I will thoroughly think it through. [b]	4.48	0.90	.55	.05**
25. I am never careless with my money. [b]	3.61	1.42	.43	.13**

Table 3

Questionnaire: The 4Es of Problem Gambling

Question	Mean[a]	SD	Factor loading	r with PGSI
26. I speak without thinking.	2.31	1.37	.55	.06**
27. My family never has to worry about how I handle money. [b]	4.38	1.12	.42	.12**
28. I commonly say and do things that I regret later.	2.01	1.25	.58	.09**
29. I often buy things without thinking about whether I really need them.	2.17	1.42	.48	.10**
30. I seldom spend more money than I should. [b]	3.76	1.39	.35	.11**
Factor 4: Excitement				
31. There are times when I get bored with day to day life.	2.75	1.55	.57	.06**
32. I often cannot think of things to keep my mind occupied.	1.79	1.19	.56	.08**

Table 3

Questionnaire: The 4Es of Problem Gambling

Question	Mean[a]	SD	Factor loading	r with PGSI
33. I get very anxious when there is nothing to do.	2.14	1.43	.55	.07**
34. I am a restless and fidgety person.	2.07	1.33	.55	.07**
35. Often times I find myself feeling restless.	3.00	1.51	.55	.08**
36. I usually have too much time on my hands.	1.66	1.17	.50	.10**
37. I am nearly always looking for things to do that keep me from being bored.	2.88	1.64	.50	.04*
38. I often find it hard to concentrate.	2.07	1.31	.46	.07**
39. I worry about other things while at work.	2.80	1.54	.40	.04*
40. I hate quite places, like libraries.	1.90	1.38	.29	.07**

Table 3

Questionnaire: The 4Es of Problem Gambling

Question	Mean[a]	SD	Factor loading	r with PGSI

[a]Each item was answered on a scale of 1 to 5: 1 = Strongly disagree, 2 = Slightly disagree, 3 = Neither agree nor disagree 4 = Slightly agree, 5 = Strongly agree. The means shown are not reverse-scored.

[b]In calculating risk, these items should be reverse-scored.

*p < .05. **p < .01. (one-tailed)

Figure Caption

Figure 1. Percentage of the sample with PGSI designated gambling problems for both low-scorers (bottom 95th percentile, or less than 2.86) and high-scorers (top 5th percentile, or greater than 2.86) on the 4Es Scale.