

Assessment Tool to Measure and Evaluate the
Risk Potential of Gambling Products

ASTERIG

A global validation

by

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1 Introduction

Although most individuals who gamble do so without any adverse consequences, some individuals develop a recurrent, maladaptive pattern of gambling behaviour, often called pathological gambling or gambling disorder, that is associated with financial losses, disruption of family and interpersonal relationships, and co-occurring psychiatric disorders. Identifying whether different types of gambling modalities vary in their ability to lead to maladaptive patterns of gambling behaviour is essential to develop public policies that seek to balance access to gambling opportunities with minimizing risk for the potential adverse consequences of gambling behaviour.¹ Until recently, assessing the risk potential of different types of gambling products was nearly impossible. ASTERIG, initially developed in Germany in 2006-2010,² is an assessment tool to measure and to evaluate the risk potential of any gambling product based on scores on ten dimensions. In doing so, it also allows a comparison to be drawn between the addictive potential of different gambling products. Furthermore, the tool highlights where the specific risk potential of each specific gambling product lies. This makes it a valuable tool at the legislative, case law, and administrative levels as it allows the risk potential of individual gambling products to be identified and to be compared globally and across 10 different dimensions of risk potential. We note that specific gambling products should always be evaluated rather than product groups (lotteries, slot machines) or providers, as there may be variations among those product groups that impact their risk potential. For example, slot machines may vary on the amount of jackpot, which may influence their risk potential.

The availability of an objective, systematic tool to assess the risk potential of different gambling products could help medical and psychological scientists, lawyers, judges and policy-makers assess the risk potential of a special gambling product and potentially allow objective comparisons with other gambling products.³

Also, within an international context, the desire for classifying the degree of risk potential of gambling products is beyond controversy. Similar research activities from Great Britain,⁴ Finland⁵ and Sweden⁶ are known. However the empirical base of these operations has not been published, making their assessment difficult.⁷

¹ Cf. Peren (2011).

² ASTERIG was originally published in *The Journal of Gambling Business and Economics*, 2011, Vol. 5, No. 2, pp 54-66. Cf. Peren (2011).

³ Cf. Clement, Goudriaan, van Holst, Molinaro, Moersen, Nilsson, Parke, Peren, Rebeggiani, Stoever, Terlau, Wilhelm (2012).

⁴ GamGARD - Gaming Assessment Measure – Guidance about Responsible Design; <http://www.gamgard.com> [viewed 2013-03-17].

2 Methodology

All gambling products do not have the same risk potential. Gambling products are characterized by situational parameters realized in observable scales that combined, result in more or less distinct risk potential. Significant parameters can be identified through expert consensus within the framework of a Delphi study.⁸

Therefore, two years after ASTERIG was developed, it made sense for it to be validated and updated with the input of an international group of researchers to refine and enhance the instrument. A global survey of experts on gambling disorder research and treatment using a standardized questionnaire was undertaken to improve ASTERIG.

Development of the revised ASTERIG was based on the already existing ASTERIG-model and was completed in two rounds. In the first round, the experts were sent a proposed revision of the original ASTERIG and were asked first to review and to propose improvements for the dimensions (significant parameters) of the ASTERIG-model, including the possibility of giving their own proposed scales. The experts were allowed to change or modify the dimensions as well as the original scales as much as necessary. They were also allowed to suggest addition or deletion of new dimensions and to change the range of the existing dimensions. In the original version there were scales whose range did not include zero. This implied that those dimensions would always contribute to the overall score, regardless of the characteristics of the game.

Based on responses to the first round, results were summarized and a second round was sent to all experts who contributed to the first round. Participants in the survey, conducted in the fall and winter of 2012 are listed in Table 1.

⁵ Product Evaluation Method for Reducing Potential Hazards (Finland); <http://www.veikkaus.fi> [viewed 2013-03-17].

⁶ Playscan (Sweden); <http://www.spelinstitutet.se> [viewed 2013-03-17].

⁷ Cp. Peren (2009).

⁸ The Delphi method is a structured communication technique in form of a systematic, multi-level, and feedback-orientated procedure, in which in several runs interrogations of a panel of experts for problem solving solutions are surveyed, until a pre-defined stop criterion is achieved. Cf. Linstone, H.A., Turoff, M. (1975); http://en.wikipedia.org/wiki/Delphi_method [viewed 2013-03-17].

Experts	Country	Institution
Dr. Carlos Blanco	USA	Department of Psychiatry Columbia University, New York State Psychiatric Institute
Dr. Alex Blaszczyński	AUS	University of Sydney, School of Psychology
Dr. Reiner Clement	GE	Bonn-Rhein-Sieg University, Department of Business
Dr. Jeffrey Derevensky	CAN	McGill University, International Centre for Youth Gambling Problems and High Risk Behaviors
Dr. Anna E. Goudriaan	NL	University of Amsterdam, Academic Medical Center
Dr. David C. Hodgins	CAN	University of Calgary, Department of Psychology
Dr. Ruth J. van Holst	NL	University of Amsterdam, Academic Medical Center
Dr. Ángela Ibáñez	ESP	Alcala University, Department of Psychiatry, Ramon y Cajal Hospital
Dr. Silvia S. Martins	USA	Columbia University, Mailman School of Public Health
Dr. Chantal Moersen	GE	Charité Berlin
Dr. Sabrina Molinaro	I	CNR - Istituto di Fisiologia Clinica Sezione di Epidemiologia Pisa
Dr. Adrian Parke	UK	University of Lincoln
Dr. Franz W. Peren	GE	Bonn-Rhein-Sieg University, Department of Business
Dr. Nancy M. Petry	USA	University of Connecticut, Health Center
Heather Wardle	UK	National Centre for Social Research

Table 1: Experts of global validation of ASTERIG

The experts agreed that the following ten dimensions (parameters) provided a useful framework to examine the risk potential of different gambling products. The experts chose ten relevant dimensions with the following scales, in which higher scores indicate higher risk potential. Those scales have been modified and have been standardized the range of the scales for all dimensions between 0 (of no importance) and 10 (of very great importance). All scales are made symmetric.

1. Event frequency

Definition: Unit of time between stake, gambling result and next stake opportunity.

Scale

> 6 days	> 24 hrs ≤ 6 days	> 1 hr ≤ 24 hrs	> 10 min ≤ 1 hr	> 3 min ≤ 10 min	> 1 min ≤ 3 min	> 15 sec ≤ 1 min	> 5 sec ≤ 15 sec	≤ 5 sec
0	1.25	2.5	3.75	5	6.25	7.5	8.75	10

2. Interval of payback

Definition: Period of time between gambling result and notification of payment or actual receipt of payment.

Scale

> 6 days	> 24 hrs ≤ 6 days	> 1 hr ≤ 24 hrs	> 10 min ≤ 1 hr	> 3 min ≤ 10 min	> 1 min ≤ 3 min	> 15 sec ≤ 1 min	> 5 sec ≤ 15 sec	≤ 5 sec
0	1.25	2.5	3.75	5	6.25	7.5	8.75	10

3. Jackpot

Definition: An extraordinary top prize typically in the form of a large amount of money formed by the accumulation of previous bets.

Scale

non existent	≥ 0 \$ < 100 \$	≥ 100 \$ < 1.000 \$	≥ 1.000 \$ < 10.000 \$	≥ 10.000 \$ < 50.000 \$	≥ 50.000 \$ < 100.000 \$	≥ 100.000 \$ < 1 Mio. \$	≥ 1 Mio. \$
0	1.25	2.5	4	6	7.5	8.75	10

4. Continuity of playing

Definition: Period of time during which it is possible to gamble without interruption.

Scale

≤ 5 min of continuous gambling	> 5 min ≤ 30 min of continuous gambling	> 30 min ≤ 1 hour of continuous gambling	> 1 hour ≤ 3 hrs of continuous gambling	> 3 hrs of continuous gambling
0	2.5	5	7.5	10

5. Chance of winning a profit

Definition: The probability of realizing a profit with each game.

Scale

0%	> 0 % ≤ 0,1 %	> 0,1 % ≤ 0,5 %	> 0,5 % ≤ 1 %	> 1 % ≤ 5 %	> 5 % ≤ 10 %	> 10 % ≤ 25	> 25%
0	1,25	2.5	4	6	7.5	8,75	10

6. Availability

Definition: Possibility of accessing gambling opportunities.

Scale

Gambling opportunities within a radius of > 100 km	Gambling opportunities within a radius from > 25 km to ≤ 100 km	Gambling opportunities within a radius from > 10 km to ≤ 25 km	Gambling opportunities within a radius from > 1 km to ≤ 10 km	Gambling opportunities within a radius of ≤ 1 km	Gambling opportunities at home / workplace
0	2.5	4	6	7.5	10

7. Multiple playing-/stake opportunities

Definition: Opportunity to play several stakes at the same time (e.g. betting on several roulette numbers) or to take part in several gambling opportunities at the same time (e.g. playing different slot-machines at the same time or playing different online-poker-tables on different screens at the same time).

Scales

no multiple playing opportunity and no multiple stake opportunity	multiple playing opportunities or multiple stake opportunities	multiple playing opportunities and multiple stake opportunities
0	5	10

8. Variable stake amount

Definition: Extent to which gamblers can choose or modify their stake amounts while playing.

Scale

no variable (= fixed) stake amount	variable stake, limited stake amount	variable stake, unlimited stake amount
0	5	10

9. Sensory product design

Definition: Auditory and visual effects.

Scale

non-existent	auditory or visual effects exist	auditory and visual effects exist
0	5	10

10. Near wins

Definition: Results when a gambler supposes to almost win (to miss the profit narrowly; a near win).

Scale

non-existent	un-intentionally created, occurring by chance	intentionally created by supplier/ producer, occurring more frequently than random
0	5	10

Given that some dimensions may be more important than others in increasing the risk of potential of the gambling product, the experts were asked to assign weights for each parameter regarding their risk potential. The weights were also standardized between 0 (of no importance) and 10 (of very great importance).

The overall risk potential of a gambling product is obtained by multiplying the weight of each dimension by the score on that dimension and adding up the weighted scores of all ten dimensions. Thus the range ASTERIG is 0-620, where the maximum is obtained by multiplying the resulting individual points of each dimension (which always range from 0-10) by the weight of those dimensions (which could also range theoretically from 0-10, but which are fixed by the experts currently between 4-8). Based on the particular scales and on the general weights of dimensions, the result is a number of points with a maximum of 620 points = 62 (sum of the weights) x 10 (maximum scale), which can be normalized to a maximum score⁹ of maximum 10 by dividing by 62 (i.e., 620: 62)¹⁰.

The different meaning of dimensions of the risk potential of each gambling product can be visualized by a scorecard. Scorecards are suitable for quantitative assessments during analysis of potentials and risks, for the estimation of product- and performance-ideas and further problems. Scorecards are suited for the quantitative evaluation of potential and risk analyses to assess product and service ideas and many other factors.¹¹

⁹ To use scores respectively a scorecard is recommended because one factor (the weights) of the two factors is fixed. The weights do not vary from case to case. A score from maximum 10 means that the risk potential of addiction would be reached in maximum in all dimensions.

¹⁰ By dividing the total points – here at the maximum = 620 points – through 62 (= sum of the fix weights) the total scores are getting normalized into a range between 0-10.

¹¹ Scorecards have been used e.g. in studies for structuring and supporting decisions of companies. See on this topic Clement, Peren (1998). http://en.wikipedia.org/wiki/Peren%E2%80%93Clement_Index [viewed 2013-03-17].

Risk potential criteria	weights	scales	range of value¹²
Event frequency	8	0 - 10	0 - 80
Interval of payback	6	0 - 10	0 - 60
Jackpot	5	0 - 10	0 - 50
Continuity of playing	8	0 - 10	0 - 80
Chance of winning a profit	6	0 - 10	0 - 60
Availability	7	0 - 10	0 - 70
Multiple playing-/stake opportunities	6	0 - 10	0 - 60
Variable stake amount	6	0 - 10	0 - 30
Sensory product design	4	0 - 10	0 - 40
Near wins	6	0 - 10	0 - 60
Totals	62	0 - 10	0 - 620

Table 2: Approach: multiplication of general weights with individual scales

¹² Weights multiply with the minimum/maximum values of the scales.

3 Example

The following example is completely fictitious and is simply presented to illustrate how ASTERIG could be used to assess the risk potential of a gambling product. Assume that there is a game, which we will call *bet-for-soccer* from the also fictitious provider *bets-limited*.

In our example, *bet-for-soccer* has the following attributes:

- In this fictitious national league there are 24 teams that play in 12 matches in different cities on each Saturday.
- Betting on all games is allowed.
- For each match, it is allowed to bet that: (a) team A will win, (b) team B will win (c) there will be a tie. It is possible to bet all three outcomes at the same time. In theory the probability of each outcome is $1/3 = 0.33 = 33.33\%$. But in sports-betting there are always quotes which depend on the voting of all the players (gamblers) who bet on that particular game. For example. 50% of all gamblers could bet for (a) that team A wins, 25% for (b), that team B wins, and 25% for (c), there is a tie. The quotes could theoretically range between 0% and 100%, e.g. when all gamblers would bet for (a) the advantage of team A and nobody for the alternatives (b) and (c).
- The chance of winning a profit and the amount of a possible profit depend on the quotes. If e.g. 50% of all players bet that (a) team A wins, 25% that (b) team B wins and 25% that (c) there is a tie, the quotes would be distributed - after a 10% margin for the provider - as follows: 1.8 if team A wins, 3.6 if team B wins and 3.6 there is a tie. The profits would also be distributed in the equivalent relations. If team A wins those players (gamblers) who bet on this result will get \$1.8 for each \$ they bet. If the other two alternatives are realized, those gamblers would get \$3.6 for each \$ bet.
- The minimum stake is \$1. The maximum allowed stake is \$100 per each match. So the maximum win would be $\$100 \times 90$ (100% quote minus 10% margin for the provider) = \$9.000 for each match. If the gambler bets on each of the 12 games, the maximum stake by this individual could be a total of \$1.200 per week. The maximum win could be $\$9.000 \times 12$ matches = \$108.000 per week.
- There is no jackpot.
- On the webpage of the provider only visual effects exist. There are no auditory effects. Also all other marketing activities use only visual activities.

Based on the description of the fictitious game *bet-for soccer* determines the following scores would be assigned:

1. Event frequency

Unit of time between stake, gambling result and next stake opportunity: > 6 days, because the matches run only every Saturday. Even considering that it is possible to bet on all 12 matches every week, it should be assumed that all 12 stakes would be done once a week in less than one day.

→ **Score: 0**

2. Interval of payback

Period of time between gambling result and notification of payment or actual receipt of payment: ≤ 5 sec, because the bets are run online and the gambling result and notification of payment is given just in time after the soccer match finishes.

→ **Score: 10**

3. Jackpot

An extraordinary top prize typically in the form of a large amount of money formed by the accumulation of previous bets: There is no jackpot.

→ **Score: 0**

4. Continuity of playing

There are maximum 12 possibilities (= matches) per week, per gambling without an interruption. If we assume that all 12 possibilities are used and that all betting are done in one term (without any interruption) and one betting needs in average approximately 5 minutes for each match the period of time during which it is possible to gamble without interruption is maybe maximum $5\text{min} \times 12 = 60\text{ min} = 1\text{ hour}$.

→ **Score: 5**

5. Chance of winning a profit

The probability of realizing a profit with each game is on average 33.33% and in many occasions > 25%.

→ **Score: 10**

6. Availability

"Bet-for soccer" is accessed online. Gambling opportunities are generally at home or at the workplace.

→ **Score: 10**

7. Multiple playing-/stake opportunities

There are multiple playing opportunities (i.e., betting on some or all 12 matches) at the same time (per week) per player (gambler) and by using one userID. There exist multiple (= 12) stake opportunities as well.

→ **Score: 10**

8. Variable stake amount

The stake that gamblers can choose is variable. The stake amount is limited between \$1 (minimum) and \$100 per each match. In total – by betting on all 12 matches – between \$12 and \$1.200 per week.

→ **Score: 5**

9. Sensory product design

Visual effects exist. Auditory effects non-exist.

→ **Score: 5**

10. Near wins

A gambler could suppose to almost win (to miss the profit narrowly; a near win). But in this case it is un-intentionally created by the supplier/producer. It occurs by chance.

→ **Score: 5**

Risk potential criteria	weights (fix)	score (0–10)¹³	example¹⁴
Event frequency	8	0	0
Interval of payback	6	10	60
Jackpot	5	0	0
Continuity of playing	8	5	40
Chance of winning a profit	6	10	60
Availability	7	10	70
Multiple playing-/stake opportunities	6	10	60
Variable stake amount	6	5	30
Sensory product design	4	5	20
Near wins	6	5	30
Totals	62	-	370

Table 3: Approach: multiplication of general weights with individual scales of the fictitious sport betting game *bet-for-soccer*

In Figure 1 the corresponding radar chart is shown. It illustrates the dimension and form of the expanse within the graphic product-profile. Amplitudes of certain dimensions become apparent.¹⁵ Figure 2 shows the structure of the responsibilities, which dimensions account for the risk potential of addiction in that specific case, and which dimensions do not appear to contribute to this risk potential. In this example it becomes apparent that in particular the dimensions “Interval of payback”, “Chance of winning a profit”, “Availability” as well as “Multiple playing and stake opportunities” seem to be important referring to risk potential of addiction. On the other hand the “Event frequency” does not seem to initialize any risk potential at all.

¹³ These points correspond to the arithmetic mean of the individual ratings awarded by the team of experts which would be involved to evaluate the risk potential of the gambling product *bet-for-soccer*, which is here fictitiously assumed.

¹⁴ Weights multiply with the scale in the concrete case.

¹⁵ In a radar or spider chart, the values of the individual categories are displayed along one axis starting at the center of the chart and ending on the outer ring. This clarifies the variations of certain criteria.

Product profile

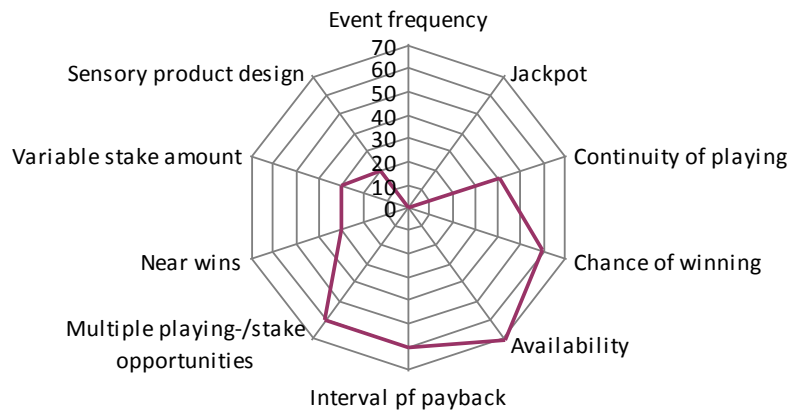


Figure 1: Radar chart showing the risk potential of the fictitious sport betting game *bet-for-soccer*

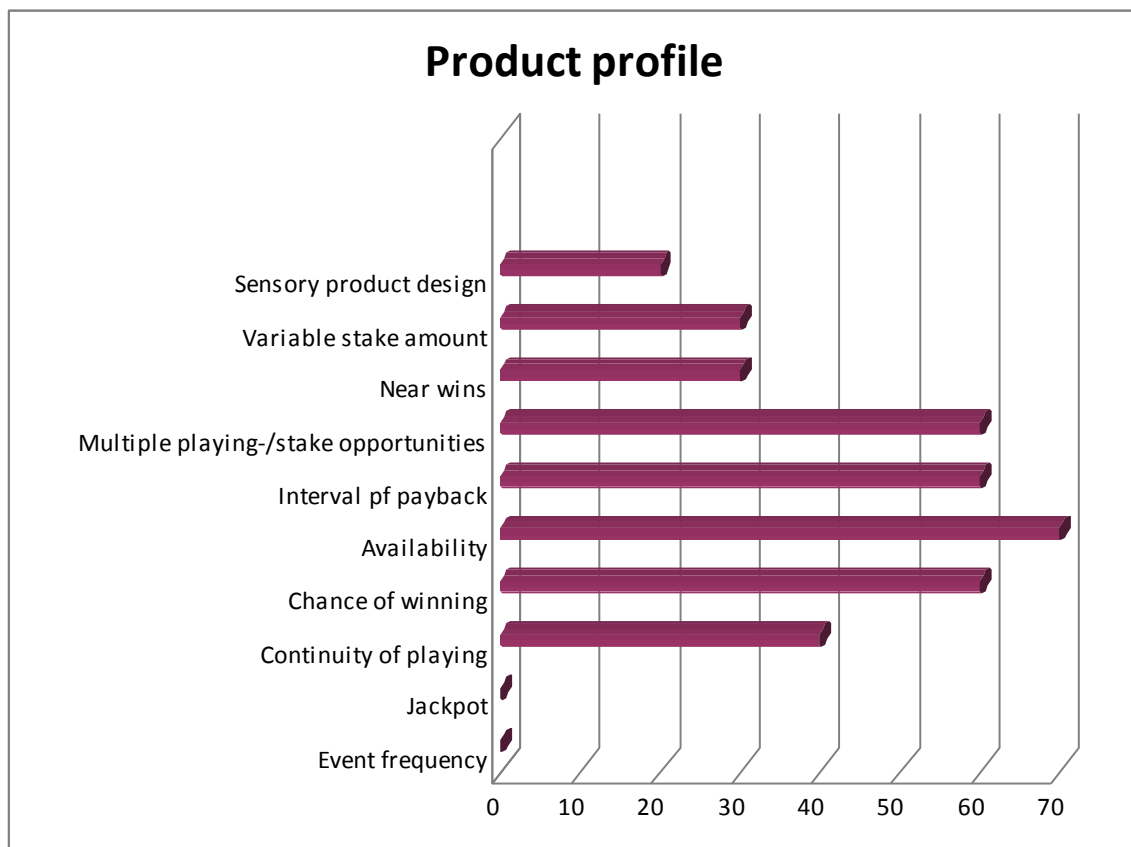


Figure 2: Bar chart showing the risk potential of the fictitious sport betting game *bet-for-soccer*

To analyse the dimensions in greater detail and compare them with each other, it is useful to create a bar diagram in addition to the spider chart (Figure 2).

In total, the risk potential of potential of the fictitious sport betting game *bet-for-soccer* is rated with a score of approximately 5.97, resulting by dividing the total score (370) by 62 (Table 2).

If we classify the total points into five categories of equal amplitude for example¹⁶, the results can be seen to map five categories of risk as shown in table 4. The risk potential of the fictitious sport betting game *bet-for-soccer* can thus be classified as moderate in tendency to high.

¹⁶ Alternatively it would be possible to develop the classification heterogeneous by dint of a cluster analysis that changes maybe in the course of time.

Result	Score	Risk category	Risk potential
1 - 124	> 0 - ≤ 2	A	lowest
125 - 248	> 2 - ≤ 4	B	low
249 - 372	> 4 - ≤ 6	C	moderate
373 - 496	> 6 - ≤ 8	D	high
497 - 620	> 8 - ≤ 10	E	highest

Table 4: Risk potential classification of gambling products

4. Conclusion and future directions

The present Assessment Tool to Measure and Evaluate the Risk Potential of Gambling Products (ASTERIG) measures the possible dimensions of risk potential of gambling products on the basis of numeric scores. In doing so, it also allows a comparison to be drawn between the addiction potentials of different gambling products. Furthermore, the tool highlights where the specific risk potential of each specific gambling product lie.

An indication of the classification of the risk potential of gambling products could be placed on vouchers, in gambling locations or in the computer screen when an online game is started, for example. A visual display that shows the risk potential when starting to use a gambling product could help an individual visualize the possible risk for becoming addicted. Furthermore the individual would be able to assess the risk potential of different gambling products and to compare their risk potentials with each other. ASTERIG could not only be used for existing gambling products, also new ones can be assessed concerning their risk potential.¹⁷

In summary, although gambling is a popular pastime that brings joy and entertainment to many adults, it is associated with risk for the development of maladaptive gambling behaviors, and this risk may depend, at least in part, on the characteristics of the gambling product. The gambling product is only one aspect contributing to the risk of gambling disorders in the context of a complex interaction and a bio-psycho-social context. We hope that the development of ASTERIG may help provide a systematic, objective way to assess this risk potential of gambling products and contribute to develop policies that balance access to gambling for entertainment with minimizing the risk of gambling disorders.

¹⁷ Cp. Peren (2011)

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