



# Adolescent Pathological Gambling: Using IRT to construct a scale based on the new Gambling Disorder criteria

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## From DSM-IV to DSM-V

- ✓The name was changed from *Pathological Gambling* to **Disordered Gambling**
- ✓The disorder was reclassified from *Impulse-Control Disorders not elsewhere classified* to **Substance-Related and Addictive Disorders**
- ✓Nine criterions: One criterion (to commit illegal acts) was eliminated
- ✓Lower threshold for diagnosis from five to four criteria
- ✓Specified time period; symptoms must be present during a 12 month time period

## Aim

Since large-scale prevalence studies suggested that **adolescents** are a high-risk group for developing problem gambling, our aim was to develop a new brief scale to assess pathological gambling among adolescents (**Gambling Behavior Scale for Adolescents, GBSA**) referring to the DSM-V and applying Item Response Theory (IRT).

## Method

### Participants

1187 adolescent gamblers attending high school (59% males, mean age=15.66 years,  $SD=1.71$ ).

### Scale development

A set of 45 items (5 for each DSM-V criterion) was developed. In a pilot study, items were evaluated at both qualitative and quantitative levels. As a result, some items were removed and other items were adapted obtaining a set of 33 items (Table 1).

Table 1. *Synthesis of the steps in the development of the Gambling Behavior Scale for Adolescents (GBSA).*

DSM-V Criteria	Initial Step: 45 items	Second step: 33 items	Third step: 26 item	Final Step: 9 items
Tolerance	5	3	3	1
Withdrawal	5	4	4	1
Loss of Control	5	4	4	1
Preoccupation	5	3	1	1
Escape	5	3	2	1
Chasing	5	4	1	1
Lying	5	4	4	1
Risk/lose relationships/opportunities	5	5	5	1
Bailout	5	3	2	1

We investigated the unidimensionality of the 33-item version evaluating the presence of local dependence (LD). None of the LD statistics were greater than 10, attesting the unidimensionality of the scale.

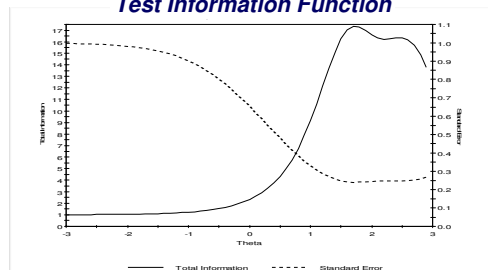
## Item selection and calibration with IRT (IRTPRO software)

We tested the fit of the unidimensional two parameter model ( $a$ = discrimination,  $b$  = severity). Seven items were eliminated given a significant  $S-\chi^2$  value ( $p < .001$ ). Then, we performed the IRT calibration with the remaining 26 items. For each criterion we selected the item with the higher discrimination value ( $a > 2$ ) (Table 1). Finally, we performed a new calibration with the remaining 9 items (Table 2).

Table 2. *Item factor loadings ( $\lambda$ ), discrimination ( $a$ ) and category threshold ( $b$ ) estimates with standard errors.*

Item	DSM-V	$\lambda$	$a$	$b_1$	$b_2$
1	Tolerance	.67	3.50 (0.34)	1.66 (0.10)	2.83 (0.22)
2	Withdrawal	.69	2.98 (0.29)	1.55 (0.09)	2.35 (0.18)
3	Loss of Control	.63	3.02 (0.38)	1.72 (0.11)	2.52 (0.18)
4	Pre-occupation	.52	1.89 (0.19)	1.35 (0.10)	2.21 (0.17)
5	Escape	.68	2.29 (0.25)	1.62 (0.11)	3.02 (0.24)
6	Chasing	.53	1.66 (0.16)	0.82 (0.07)	2.80 (0.21)
7	Lying	.58	2.53 (0.30)	1.56 (0.10)	2.56 (0.19)
8	Risk/lose relationships/opportunities	.68	3.19 (0.38)	1.65 (0.10)	2.65 (0.17)
9	Bailout	.70	1.84 (0.19)	1.52 (0.11)	2.87 (0.24)

## Test Information Function



The 9-item GBSA scale accurately measures from mild to high gambling severity levels.

## Validity

Table 3. *Validity measures*

	SOGS-RA	Cognitive distortions about gambling	Gambling Behaviour Frequency
GBSA	.55**	.65**	.44**

\*\* $p < .001$

Correlations of the Gambling Behavior Scale for adolescents (GBSA) score with a DSM-III-R measure of pathological gambling in adolescents (SOGS-RA) and gambling related constructs were high and in the expected direction.

## Discussion & Conclusion

The GBSA is an efficient tool to assess the DSM-V Gambling Disorder criteria in adolescents.

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