Gambling in youths: A new scale to measure pathological gambling behavior

Maria Anna Donati, Francesca Chiesi, & Caterina Primi

UNIVERSITY OF FLORENCE

European Association for the Study of Gambling
Gambling in adolescence

- A large number of adolescents are involved in gambling activities (e.g., Scholes-Balog et al., 2014).
- Between 60 and 99% of young people aged 12–20 years gambled over the past year (Splevins et al., 2010).
- Despite boys gambled more than girls, female adolescent gamblers are increasing (Bastiani et al., 2010).
Youth gambling problems

- A high proportion of young people gamble excessively, developing a wide array of psychological, social, and economic problems (e.g., see Ariyabuddhiphongs, 2013).
  - Problem gambling among adolescents is four or five times higher than among adults (e.g., Olason & Gretarsson, 2009).

- Gambling as a central public health issue of prevention research and practice (see Blinn-Pike et al., 2010).
Much attention has been paid to the issue of measurement (for reviews, see Derevensky & Gupta, 2004; 2006; Stinchfield, 2010).

The 3 most commonly used instruments are:

- **South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA)** (Winters et al., 1993);
- **DSM-IV-Juvenile (DSM-IV-J)** and its revision, **DSM-IV-Multiple Response-Juvenile (DSM-IV-MR-J)** (Fisher, 1992; 2000);
- **Massachusetts Adolescent Gambling Screen (MAGS)** (Shaffer et al., 1994).
Limitations in the measurement

- Adaptation from adult instruments, with minor changes in the wording of some items (Chiesi et al., 2013);
- Dichotomous response format (or it becomes dichotomous in the scoring procedure), while a Likert-type format offers more advantages psychometrically (Muñiz et al., 2005);
- No evidence for equivalence among male/female (Derevensky & Gupta, 2004) and younger/older respondents;
- No screens based on the new DSM-5.
Gambling Disorder in DSM-5

From DSM-IV to DSM-5

- From Pathological Gambling to Disordered Gambling;
- From Impulse-Control Disorders not elsewhere classified to Substance-Related and Addictive Disorders;
- From ten to nine criteria: One criterion (to commit illegal acts) has been eliminated;
- From five to four criteria for diagnosis: lower threshold;
- Different forms of the disorder are specified (mild, moderate, severe);
- Specified time period: symptoms must be present during a 12 month time period.
Aim

- To develop a new brief scale to assess pathological gambling among adolescents (Gambling Behavior Scale for Adolescents, GBSA) referring to the DSM-5:
  - Adapting the criteria to adolescent lives
  - Using a multiple-response format
  - Applying Item Response Theory (IRT)
    - Testing the equivalence for male/female and younger/older respondents
  - Providing validity evidence.
Item Response Theory (IRT)

- IRT aims to show the probabilistic relationship between pattern responses, latent characteristics of respondents, and item properties.

- Advantages of IRT:
  - **Fit** of the measurement model
  - **Parameter estimates of items** that define their ability to discriminate and to measure different levels of the *latent trait* ($\theta$)
  - **Precision** of the test at different levels of $\theta$ (Reliability)
  - **Differential Item Functioning (DIF)** across different groups.
Method

Participants

- **1723** adolescents attending middle and high school (56% males, mean age=15.64 years, $SD=1.79$, 11-23 years):
  - **265** (15%) middle school (II year);
  - **1458** (85%) high school (23% I year; 30% II year; 19% III year; 28% IV year).
### Method

#### Measures
- This version was obtained starting from a preliminary set of 45 items tested in pilot studies at both qualitative and quantitative levels.

<table>
<thead>
<tr>
<th>DSM-5 Criteria</th>
<th>Step 0: 45 items</th>
<th>Step 1: 33 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Loss of Control</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Preoccupation</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Escape</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Chasing</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Lying</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Risk/lose relationships/opportunities</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Bailout</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>
Method

Measures

• Questionnaire on gambling behavior in the last 12 months (activities and relative frequency);

• **South Oaks Gambling Screen – Revised for Adolescents (SOGS-RA)** (Winters et al., 1993; Italian version: Colasante et al., 2013)

• **Illusion of Control (GRCS-IC)** (Raylu & Oei, 2004; Italian version: Donati et al., 2014)

• **Gambling Attitude Scale (GAS)** (Delfabbro & Thrupp, 2003; Italian version: Primi et al., 2013)
Results – Preliminary Analysis

- Analyses were conducted with adolescents who gambled
  - $N=1187$ (69%) (59% males, mean age=15.66 years, $SD=1.71$).
- Since item response distributions were strongly skewed, we converted the 5-point scale into a 3-point scale (never = 1, rarely/sometimes = 2, often/very often = 3).
- The 33 item-version resulted to be unidimensional.
The fit of the unidimensional two parameter model was tested:

- Seven items were eliminated since they did not fit to the model.

We performed the IRT calibration with the remaining 26 items:

- For each criterion we selected the best functioning items relying on IRT discrimination parameters.

<table>
<thead>
<tr>
<th>DSM-5 Criteria</th>
<th>Step 1: 33 items</th>
<th>Step 2: 26 items</th>
<th>Step 3: 9 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Loss of Control</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Preoccupation</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Escape</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Chasing</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lying</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Risk/lose relationships/opportunities</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Bailout</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
## Factor loadings and item parameters

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

- The TIF shows the precision of the test at different levels of the latent trait.
Differential Item Functioning (DIF) across gender and age

- An item is considered to exhibit DIF if respondents of two different groups who have equal levels of the trait do not have the same probability of responding affirmatively to that item.

- Comparing male and female gamblers and younger and older gamblers (based on the median age of around 16 years old), no items exhibited DIF with respect to:
  - Discrimination parameters \((a)\)
  - Severity parameters \((b)\)
# Validity

<table>
<thead>
<tr>
<th></th>
<th>GBSA-total score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gambling Frequency</strong></td>
<td>.44***</td>
</tr>
<tr>
<td><strong>Gambling Versatility</strong></td>
<td>.33***</td>
</tr>
<tr>
<td><strong>Illusion of Control</strong></td>
<td>.48***</td>
</tr>
<tr>
<td><strong>Perception of gambling profitability</strong></td>
<td>.30***</td>
</tr>
<tr>
<td><strong>Problem gambling</strong></td>
<td>.55***</td>
</tr>
</tbody>
</table>

*** p < .001
• Referring to the DSM-5 definition of GD and using the IRT approach, this scale seems to be a reliable and valid brief tool to accurately measure medium and high levels of gambling problems among adolescents.

➢ It could be especially useful to identify severe levels of gambling problems in adolescents, regardless of their gender and age.
Conclusion

• The GBSA is likely to be a useful screening and diagnostic instrument for gambling research and practice with adolescents.

• Future research is needed to:
  • Test its psychometric properties with adolescents who are in treatment for their gambling problems (clinical samples).
  • Develop new IRT-based cut-offs.
  • Conduct cross-cultural studies.


Acknowledgments

Thank you!

mariaanna.donati@unifi.it