Gambling Fallacies: Catalyst for, or the result of, problem gambling

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Gambling Fallacies

- Gambling specific versions of a subset of known cognitive errors that create erroneous beliefs about how gambling works
  - Hot hand
  - Monte-Carlo (a.k.a. the Gambler’s fallacy)
  - Belief in dispositional luck
  - Illusion of control
  - Insensitivity to sample size
  - Base rate neglect
Fallacies appear to increase coincident with gambling involvement.

Many researchers have asserted a causal role for gambling fallacies in the development and maintenance of problem gambling.
The evidence

- Goodie and Fortune (2013)
  - A “robust association” between gambling fallacies and problem gambling, supporting the presumed causal role of gambling fallacies in the development of problem gambling
  - Supports the dominant treatment orientation for problem gambling, which focuses on correcting these erroneous thoughts
Problems with the evidence

- Cross sectional nature of the association

- Gambling fallacy instrumentation with content validity issues.
  - Insufficient coverage of the fallacies
  - Inclusion of items assessing:
    - general attitudes & motivations for gambling (e.g., gambling to improve mood)
    - non-fallacious biases (e.g., focusing on wins)
    - non-gambling related erroneous beliefs (e.g., belief in Astrology)
    - problem gambling behaviour (e.g., chasing losses)
The current study

To re-evaluate the relationship between gambling fallacies and problem gambling:

- in a longitudinal context
- using a non-confounded measure of gambling fallacies
Quinte Longitudinal Study data
- Collected between 2006 – 2011
- n = 4121
- Age 17+
- Roughly representative of the Canadian adult population
  - 26% of the sample over-selected for greater gambling involvement
- Assessed annually
- Retention rate of 93.9%
Measures

- **Gambling Fallacy Measure (GFM)** (Leonard, Williams & Vokey, 2015)
  - 10 item multiple choice instrument – higher scores indicate greater resistance to gambling fallacies
  - Good internal consistency & test-retest reliability
  - Good content, convergent, discriminant & external validity

- **Problem and Pathological Gambling Measure (PPGM)** (Williams & Volberg, 2014)
  - 14 item instrument with 5 Categories: Non-Gambler, Recreational Gambler, At-Risk Gambler, Problem Gambler, Pathological Gambler
  - Very good internal consistency and test-retest reliability
  - Excellent content, convergent, discriminant, predictive, and external validity
Measures

- **Number of Gambling Formats (past year)**
  - Aggregate measure (0-11)
    - Calculated based on past year participation in lottery tickets; instant win tickets; EGMs; casino table games; games of skill; sports betting; horse or dog racing; high risk stocks, option futures or day trading; internet gambling; and ‘any other’ forms of gambling

- **Gambling Expenditure (past year)**
  - Aggregate measure
    - Sum of reported expenditures on each type of gambling for a typical month * 12 months
Measures

- Frequency of Gambling (past year)
  - Aggregate measure (0-360)
  - Number of days in a typical month during the past year (capped at 30) * 12 months

- Biggest Win (past year)
  - Largest win on a single day

- Family history of problem gambling
  - Were any family members problem gamblers
    - Yes; No; Unsure

- Impulsivity (NEO-PI-R)
Analyses

- Cross-sectional
  - Distribution of GFM scores by gambling category in Assessment 1
  - Significance of GFM scores by gambling category for each assessment year

- Prospective Generalized Estimating Equation models
  - All variables predicting future gambling category (i.e., Non-Gambler, Recreational, At-Risk, Problem, Pathological)
  - All variables predicting future GFM scores
Distribution of GFM Scores by PPGM Category

Non-Gamblers
Recreational Gamblers
At-Risk Gamblers
Problem Gamblers
Pathological Gamblers
## GFM Scores by Assessment Year and Gambling Category

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Gambler M(SD)</th>
<th>Recreational Gambler M(SD)</th>
<th>At Risk Gambler M(SD)</th>
<th>Problem Gambler M(SD)</th>
<th>Pathological Gambler M(SD)</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.22 (1.31)</td>
<td>6.97 (1.40)</td>
<td>6.42 (1.79)</td>
<td>6.26 (1.76)</td>
<td>6.06 (2.08)</td>
<td>89.90**</td>
</tr>
<tr>
<td>2</td>
<td>7.49 (1.16)</td>
<td>7.20 (1.31)</td>
<td>6.69 (1.71)</td>
<td>6.34 (1.84)</td>
<td>6.02 (1.90)</td>
<td>95.70**</td>
</tr>
<tr>
<td>3</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>4</td>
<td>7.44 (1.27)</td>
<td>7.28 (1.30)</td>
<td>6.90 (1.56)</td>
<td>6.80 (1.69)</td>
<td>6.40 (2.15)</td>
<td>48.50**</td>
</tr>
<tr>
<td>5</td>
<td>7.57 (1.13)</td>
<td>7.37 (1.02)</td>
<td>7.00 (1.50)</td>
<td>6.33 (2.14)</td>
<td>6.26 (2.04)</td>
<td>68.10**</td>
</tr>
</tbody>
</table>

*Note: ** p < 0.01; na = not assessed*
GEE Predicting Future Gambling Category

** Impulsivity
** Big Win
** Family History
** # of Days
** Formats
** Fallacies
** Net Expenditure
Time

Wald Chi-square

Note: ** p < 0.01
GEE Predicting Future GFM Scores

Note: ** p < 0.01; * p < 0.05
Conclusions

- The strong associations between problem gambling and gambling fallacies asserted in previous literature are likely artificially inflated.

- Gambling Fallacies are common in the population – regardless of gambling category.

- Gambling Fallacies are a significant but relatively weak predictor of future gambling category.

- Gambling involvement (expenditure, big win) and problem gambling status also shape future development of gambling fallacies.

- Treatment and prevention of problem gambling should include – but not rely predominantly on – the correction of gambling fallacies.