Rational & Introduction

Gambling addiction is strongly associated with mental disorders: Amongst others, major depression, anxiety disorders, and personality disorders show high comorbidity rates with pathological gambling. However, there is very little empirical evidence on how exactly the interaction of pathological gambling and mental disorders affects gamblers’ risk behavior.

As a behavioral addiction, pathological gambling is characterized by repetitive maladaptive patterns of behavior connected to low impulse control irrespective of potentially devastating long-term outcomes (Hökendahl, 2001; Bickel et al. 2014, Grant & Chamberlain 2014).

Among others, major depression, anxiety disorders, ADHD, and personality disorders show disproportionally high comorbidity rates with pathological gambling (Wittchen et al. 2002). EARLINT applied large-scale epidemiological studies to define explicit questions. EARLINT applied large-scale epidemiological studies to define explicit questions. To what extent does pathological gambling and mental disorder lead to an exacerbation of behavioral biases and result in extreme and inconsistent delay and probability discounting behavior (Klein-Flügge et al. 2015).

Gambling addicts are more likely to exhibit systematic deviances from rational goal-oriented and consistent behavior (Redish 2010, Meyer et al. 2011, Braun et al. 2014). Studies on decision making under risk using experimental lab-based measures such as the Iowa Gambling Task or the Wisconsin Card Sorting Test found significant dissimilarities in economic choice behavior amongst addicts in general – not only in gambling addicts – compared with healthy control groups (Bellevig & Potenza 2010, Bickel & Yi 2010, Redish 2010, Li 2011). It is, therefore, likely that pathological gambling and mental disorder may accentuate biases even to the behavior of gamblers. However, the exact interactive effect of pathological gambling and mental disorders is currently understudied.

Research objective

Based on an original sample of N=379 pathological gamblers gathered with the Pathological Gambling and Epidemiology (PAGE) database, we scrutinize the delay and probability discounting behaviors of pathological gamblers with and without mental disorders.

Material: The PAGE Study

The emphasis of this paper is based on the data of the “Pathological Gambling and Epidemiology” (PAGE) research program initiated by the German federal states. The data was collected by an interdisciplinary research group (EARLINT) at the University Hospital of Lübeck and the University of Greifswald. The PAGE database provides rich epidemiological data on the prevalence of pathological gambling among the German population (Meyer et al. 2015).

The sample was selected randomly through a dual sampling setup with guided telephone interviews for the general population and yielded N=15,023 test subjects (aged 14 to 64), as well as N=594 subjects through depth-in-one-on-one clinical interviews with high-risk respondents recruited directly at gambling locations and in qualitative pharmacological treatment programs. EARLINT assembled large parts of Wittchen and Pfänder’s standardized Composite International Diagnostic Interview (CIDI-X) codebook (Meyer et al. 2015, Wittchen & Pfänder 2005), which allowed for aggregation into parametric rating scale values with high test-retest reliability (α=0.49–0.83) and high evidential validity (α=0.39–0.82) (Essau et al. 1999, Stirruch et al., 2003, Wittchen & Pfänder 2005).

Individual gambling behavior and gambling problems were classified by the criteria established in the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV). The DSM-IV criteria were standardized by translation into algorithmic item scale items. Sociodemographic measures were adapted from Abrams et al. (2000). In order to inhibit distortion effects due to cross-loadings, gamblers with substance-based comorbidities were excluded from this study. The data was collected pseudonymously in order to inhibit response distortion through social desirability.

Method

Probability discounting questionnaire (Madden et al. 2009)

\[ V = \frac{A}{1 + A\theta} \]

Delay discounting questionnaire (Kirby et al. 1999)

\[ V = \frac{A}{1 + k + D} \]

Results

The results of the Wolin and on -2015 test (Mann-Whitney) tests indicate that, in this sample, there is only statistically reliable differences in the discounting behavior of pathological gamblers with and without mental disorders when large rewards are compared with small rewards (p<0.001, v=−2.338). Pathological gamblers with mental disorders discount large probabilistic rewards more steeply than pathological gamblers without mental disorders. There are no statistically reliable differences for delayed rewards, irrespective of the magnitude of delayed reward. Table 1 displays the mean estimated results of the probability (\( P\text{Prob} \)) and \( n_s \) of the delay discounting parameters by magnitude of reward (\( R\text{Prob} \), \( k\text{Prob} \)) and \( n_s \) for pathological gamblers with and without a history of mental disorders.

However, as shown in table 2, different mental disorders affect discounting behavior very dissimilarly:

<table>
<thead>
<tr>
<th>Mental Disorder</th>
<th>( \text{Delay discounting} )</th>
<th>( \text{Probability discounting} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major depression</td>
<td>( -0.32 ) (s.e. 0.09)</td>
<td>( -0.51 ) (s.e. 0.12)</td>
</tr>
<tr>
<td>Anxiety disorders</td>
<td>( -0.27 ) (s.e. 0.10)</td>
<td>( -0.45 ) (s.e. 0.13)</td>
</tr>
<tr>
<td>Personality disorders</td>
<td>( -0.24 ) (s.e. 0.11)</td>
<td>( -0.41 ) (s.e. 0.14)</td>
</tr>
<tr>
<td>Alcohol disorders</td>
<td>( -0.21 ) (s.e. 0.12)</td>
<td>( -0.37 ) (s.e. 0.15)</td>
</tr>
<tr>
<td>Gambling disorders</td>
<td>( -0.18 ) (s.e. 0.13)</td>
<td>( -0.33 ) (s.e. 0.16)</td>
</tr>
</tbody>
</table>

Discussion & further directions

Our study is evidence on how mental health problems have the potential to seriously confound goal-oriented discounting behavior, posing a profound threat to the success of both programs for the prevention and for the treatment of pathological gambling behavior if these effects are not taken into account. However, the findings need further scrutinizing especially with regards to multiple:

1. The origin of the magnitude bias in probability discounting.
2. The effect of individual factors as predictors of discounting behavior, e.g. risk propensity, impulsiveness, & socio-demographic factors, as well as
3. Interaction effects due to potential multi-morbidity.
4. How well do these findings correspond to real-life risk behavior of pathological gamblers – especially with a focus on treatment success, (gambling) consumption, and relapse?
5. Future studies might want to research the long-term interaction effects of substance-abuse, pathological gambling, and mental disorder using larger sample sizes.
6. Deviant probability discounting behavior: Cause or Consequence of gambling addiction and what are the neuroeconomic correlates?

This research is work in progress.

For further information

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Literatur cited


