The Stability of Addiction

Lessons from Gambling Studies of Populations & People

Division on Addictions
Cambridge Health Alliance, Harvard Medical School
Professional & Conventional Wisdom about the Stability of Gambling

- **Diagnostic and Statistical Manual version IV**
  - “the essential feature of Pathological Gambling is persistent and recurrent maladaptive gambling behavior...”

- **National Council on Problem Gambling**
  - “a progressive addiction characterized by increasing preoccupation with gambling, a need to bet more money more frequently, restlessness or irritability when attempting to stop, ‘chasing’ losses, and loss of control...”

- **Gamblers Anonymous**
  - “we are convinced that gamblers of our type are in the grip of a progressive illness. Over any considerable period of time we get worse, never better...”
How do Researchers “Know” Stability?

- Population level activity over time
- Diagnostic classification constancy
- Symptom pattern reliability
Population Level Stability
Gambling Exposure & Instability in Population Level Gambling

- New venues
  - e.g., new casinos
- New availabilities
  - e.g., racinos
- New events
  - e.g., World Cup
- New media
  - e.g., Internet gambling
Exposure Evidence: People, Places, Points, and Problems

Exposure is:
- Essential to the development of problems
- Related to the development of problems in predictable ways
- Not the same for all people
  - Casino employees
- Not the same for all places
  - Nevada
- Not the same for all time points
  - Proximal versus distal assessments
- Not linearly related to problems
  - Adaptation

LaPlante & Shaffer (in press)
Understanding Adaptation

Following initial increases in adverse reactions to new environmental events, individuals in a population become resistant to those events.

Potential sources of adaptation include:

- Social learning
- Waning novelty effects
- Increases in harmful consequences
- Interventions
- New interests
Typical Course of Infection

- Exposure leads to a rapid increase of infection
  - Viruses target the most vulnerable

- Rates slow
  - People who are not yet infected are more resistant

- Decline evident
  - People recover, incidence rate declines
Enrollments by Time

LaBrie et al. (2007)
Rates of Disorder by Time

Prevalence of Gambling Problems

Prevalence of Probable Pathological Gamblers
Prevalence of At-risk Problem Gamblers

Population Trends in Internet Gambling

- Goal: Document population level online sport gambling behavior patterns for the full longitudinal cohort and extreme 1% of subgroup of subscribers
- Sample: 46,339 consecutive subscribers to the *bwin* Interactive Entertainment, AG online gambling service
- Timeframe: 18 months of actual gambling behavior of *bwin* consecutive subscribers
- Games: Fixed Odds & Live Action sport betting

LaPlante, Schumann et al. (in press)
Full Sample: Monthly Bets

- **BETS fixed odds**
- **BETS live action**

Graph showing the monthly bets over 18 months with the sum of bets ranging from 0 to 1,600,000.00.
Full Sample: Daily Bets

[Graph showing the sum of bets (full sample) over days for BETS fixed odds and BETS live action.]
Extreme Fixed Odds Bettors: Daily Bets

Days

Sum of Bets (1% FO-B)

Days

BETS fixed odds

BETS live action
Findings

- This population of gamblers adapted to the new subscription service rapidly, as evidenced by quickly developing declines in population participation, number of bets, and size of stakes.

- Among subgroups of heavily involved bettors, adaptation was generally slower or not apparent.
  - Involved bettors often maintained or escalated the high level of betting they engaged in during the days following subscription.
Summary:
Population Level Stability

- Longitudinal examinations of populations have not indicated population-level stability of gambling behavior.
- Instability often reflects short term worsening followed by longer term improvements.
- Population segments might not contribute equally to exposure and adaptation patterns.
  - Some segments might worsen more easily and not adapt as efficiently.
Individual Level Stability
Retrospective Evidence: Substance Use

- Robins, Davis, and Goodwin which found high rates of spontaneous remission from heroin addiction among Vietnam Veterans upon their return to the United States.

- Using information from the National Epidemiological Survey of Alcohol and Related Conditions (NESARC), Dawson, Grant, et al. found that only 25% of people who met criteria for prior to past year (PPY) alcohol dependence met criteria for current alcohol dependence.
Retrospective Evidence: Gambling

- **Slutske et al. 2006**
  - Among individuals who reported a lifetime history of gambling disorder, between 36% and 39% did not experience gambling problems during the past year.

- **Sartor et al. 2007**
  - Among participants who reported two or more gambling phases (N=183):
    - 48.6% no change in symptoms
    - 14.8% only decreases in symptoms
    - 13.7% only increases in symptoms
    - 23.0% both increases and decreases in symptoms
Academic Debate

- Slutske (2006) attributed results to natural recovery among pathological gamblers.

- Afifi et al. argued “although some pathological gamblers are able to overcome their gambling problems, it is important to emphasize that the majority of individuals with a lifetime diagnosis of pathological gambling continue to experience some level of gambling-related problems in the past year.”

- Slutske responded, non-recovered individuals “could have had a variety of courses of gambling problems...”
“Firm conclusions regarding chronicity and persistence will ultimately require the use of longitudinal prospective data.”
Longitudinal Evidence: Alcohol

- The 3-year course of alcohol disorders as classified by DSM-IV showed considerably variability
  - 81% of baseline abusers were in remission one year later and 85% three years later
  - Alcohol dependence remission rates also were high: 67% at year 1 and 74% at year 3
  - 82% of those followed remained in remission at year 3, 14% relapsed to dependence and 4% relapsed to abuse

Benefits of Longitudinal Studies

- Real time assessment of phenomena of interest
- Better tests of progressive hypotheses
  - Persistence
  - Selective-Stability
  - Progression
Persistence Assumption

- Individuals cannot recover from disordered gambling
  - Once present, disordered gambling (i.e., Level 3, gambling problems that reach a clinical threshold) would be relatively inflexible and almost never absent; that is, we would not observe evidence of systematic reductions (i.e., above and beyond those associated with chance) in disordered gambling once it is evident
Selective-Stability Assumption

- Individuals who have more severe problems are less likely to improve than those who have less severe problems
  - Individuals who have numerous problems (i.e., Level 3 gamblers) would be less likely to experience a reduction in classification status (i.e., moving to Level 2, subclinical gambling problems) than those individuals who have fewer problems (i.e., Level 2 problem gamblers moving to Level 0/1 status, that is, not gambling or gambling without problems)
Progression Assumption

- Individuals who have some gambling problems are more likely to worsen than individuals who do not have gambling problems.
  - Individuals who have some problems (i.e., Level 2) would be more likely later to report an increased level of disorder (i.e., to Level 3) compared to those without problems initially (i.e., Level 0/1 increasing to Level 2 or 3).
Methodology

- Literature review
- Inclusion criteria
  - Pertained to gambling
  - Reported empirical data
  - Reported longitudinal data at individual level
  - Measured gambling problems at multiple time points
- Exclusion criteria
  - Treatment samples
  - Duplicate findings

- Included studies:
  - Shaffer & Hall, 2002
  - Winters et al., 2002
  - Slutske et al., 2003
  - Abbott et al., 2004
  - DeFuentes et al., 2004

LaPlante, Nelson, et al. (in press)
We defined the following classification configurations to describe four primary gambling courses:

- 1) Improving = decreased number of gambling problems sufficient to reduce the classification level from baseline with no period of increase;
- 2) Worsening = increased number of gambling problems sufficient to increase the classification level from baseline with no period of reduction;
- 3) Stable = consistent classification level of gambling problems across all time points;
- 4) Variable = fluctuation of gambling problems sufficient to vary without a consistent direction the classification level of disorder across time points.
Results: The Persistence Assumption among Level 3 Gamblers

Improvement anticipated by chance
Actual Improvement
Results: The Persistence Assumption among Level 2 Gamblers

Improvement anticipated by chance  Actual Improvement
Results: The Selective-Stability Assumption

- Winters et al.
- Abbott et al.
- Shaffer & Hall
- DeFuentes et al.

Improvement

- Level 2
- Level 3
Results: The Progression Assumption

Winters et al.
Abbott et al.
Shaffer & Hall
Slutske et al.

Level 0/1
Level 2

Worsening
0%
5%
10%
15%
20%
25%

*
Results: The Progression Assumption among Level 2 Gamblers

- Worsening anticipated by chance
- Actual Worsening
Historically, gambling and other addictions have been considered intractable and progressive.

- Longitudinal studies do not support this contention:
  - Higher than anticipated rates of improvement
  - Lower than anticipated rates of worsening
  - Weaker than anticipated tendency for progression
Caveats

- Improvement is not a certainty
  - Stability & worsening rates not negligible

- White knuckled recovery
  - Symptom suppression

- Addiction hopping
  - Addiction as syndrome

- Individual differences
  - Cumulative findings might not represent individual experiences
Intra-Individual Level Stability
Current Study

■ Purpose
  – Examination of intra-individual symptom variability

■ Design
  – Analyzed data from NESARC (Grant et al., 2004) about lifetime, prior to past year (PPY) and past year (PY) gambling problem symptoms

■ Sample
  – 11,153 NESARC respondents who reported gambling 5+ times within a year

■ Instrument
  – AUDADIS: 15 items assessing the 10 DSM-IV criteria for PG; for each item, participants report whether the symptom occurred ever, prior to the past year (PPY), and in the past year (PY)
Current Study

Analyses

- How many and which symptoms participants endorse in a prior to past year (PPY) and past year (PY) timeframe
- Stability of each symptom from a PPY to a PY timeframe
### NESARC: Gambling Problem Symptom Assessment

<table>
<thead>
<tr>
<th>DSM-IV Criteria for Pathological Gambling</th>
<th>Corresponding AUDADIS Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)</td>
<td>Ever spend a lot of time gambling, planning your bets, or studying the odds</td>
</tr>
<tr>
<td>Need to gamble with increasing amounts of money in order to achieve the desired excitement</td>
<td>Ever spend a lot of time thinking about ways to get money together so you could gamble</td>
</tr>
<tr>
<td>Have repeated unsuccessful efforts to control, cut back, or stop gambling</td>
<td>Ever spend a lot of time thinking about the times when you won or lost</td>
</tr>
<tr>
<td>Are restless or irritable when attempting to cut down or stop gambling</td>
<td>Ever find that you had to increase the amount of money you would gamble to keep it exciting</td>
</tr>
<tr>
<td>Gamble as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)</td>
<td>Ever more than once try to quit or cut down on your gambling, but found you couldn’t do it</td>
</tr>
<tr>
<td></td>
<td>Ever find that you became restless, irritable, or anxious when trying to quit or cut down on your gambling</td>
</tr>
<tr>
<td></td>
<td>Ever gamble to get out of a bad mood – like feeling nervous, sad, or down</td>
</tr>
<tr>
<td></td>
<td>Ever gamble to forget your problems</td>
</tr>
</tbody>
</table>
### NESARC: Gambling Problem Symptom Assessment

<table>
<thead>
<tr>
<th>DSM-IV Criteria for Pathological Gambling</th>
<th>Corresponding AUDADIS Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>After losing money gambling, often return another day in order to get even (&quot;chasing&quot; one's losses)</td>
<td>Ever find you had to gamble again as soon as possible after losing in order to win back your losses</td>
</tr>
<tr>
<td>Lie to family members, therapist, or others to conceal the extent of involvement with gambling</td>
<td>Ever find you had to gamble again as soon as possible after winning in order to win more</td>
</tr>
<tr>
<td>Have committed illegal acts, such as forgery, fraud, theft, or embezzlement, in order to finance gambling</td>
<td>Ever try to keep you family or friends from knowing how much you gambled</td>
</tr>
<tr>
<td>Have jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling</td>
<td>Ever raise gambling money by writing a bad check, signing someone else’s name to a check, stealing, cashing someone else’s check, or in some other illegal way</td>
</tr>
<tr>
<td>Rely on others to provide money to relieve a desperate financial situation caused by gambling</td>
<td>Ever have job or school trouble because of your gambling – like missing too much work, being demoted at work, losing your job, or dropping out of school</td>
</tr>
<tr>
<td></td>
<td>Ever break up or come close to breaking up with anyone who was important to you because of your gambling</td>
</tr>
<tr>
<td></td>
<td>Ever have such financial trouble as a result of your gambling that you had to get help with living expenses from family, friends, or welfare</td>
</tr>
</tbody>
</table>
## Analysis 1: Symptom Stability at Varying #s of PPY Symptoms

<table>
<thead>
<tr>
<th># of PY Symptoms</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>98%</td>
<td>58%</td>
<td>40%</td>
<td>42%</td>
<td>50%</td>
<td>43%</td>
<td>41%</td>
<td>38%</td>
<td>53%</td>
<td>38%</td>
<td>60%</td>
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<td>1</td>
<td>2%</td>
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<td>2</td>
<td>&lt;1%</td>
<td>2%</td>
<td>38%</td>
<td>11%</td>
<td>6%</td>
<td>8%</td>
<td>7%</td>
<td>6%</td>
<td>5%</td>
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<td>3</td>
<td>&lt;1%</td>
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<td>4</td>
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<td>2%</td>
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<td>11%</td>
<td>7%</td>
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<td>15%</td>
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<td>13%</td>
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<td>20%</td>
</tr>
</tbody>
</table>

*Note. PPY = prior to past year; PY = past year. Percents refer to percent of participants with X PPY symptoms who fall into the given PY or same symptom category.*
## Analysis 1:
### Symptom Stability at Varying #s of PPY Symptoms

<table>
<thead>
<tr>
<th># of Symptoms Endorsed PPY (N = 11,153)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>% w/ 100% same symps</td>
<td>98%</td>
<td>36%</td>
<td>36%</td>
<td>31%</td>
<td>27%</td>
<td>14%</td>
<td>25%</td>
<td>31%</td>
<td>21%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>% w/ 75-99% same symps</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>8%</td>
<td>11%</td>
<td>7%</td>
<td>9%</td>
<td>21%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>% w/ 50-74% same symps</td>
<td>0%</td>
<td>2%</td>
<td>21%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
<td>3%</td>
<td>0%</td>
<td>13%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>% w/ 25-49% same symps</td>
<td>0%</td>
<td>1%</td>
<td>2%</td>
<td>13%</td>
<td>3%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>% w/ 1-24% same symps</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>12%</td>
<td>7%</td>
<td>9%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>% w/ 0% same symps</td>
<td>2%</td>
<td>61%</td>
<td>41%</td>
<td>43%</td>
<td>50%</td>
<td>43%</td>
<td>41%</td>
<td>38%</td>
<td>53%</td>
<td>38%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Note. PPY = prior to past year; PY = past year. % same symptoms = number of PPY/PY overlapping symptoms / # of symptoms endorsed lifetime. Percents refer to percent of participants with X PPY symptoms who fall into the given same symptom category.
Analysis 1: Summary

- Respondents who report 0 symptoms PPY are highly likely to report 0 symptoms PY
- Stability decreases with severity
- Less than 40% of the sample endorsed 100% same symptoms from PPY to PY
- 40-60% of participants who endorse at least 1 PPY symptom do not endorse any of the same symptoms from PPY to PY
**Analysis 2: Symptom Stability by Symptom**

<table>
<thead>
<tr>
<th></th>
<th>PPYS1</th>
<th>PPYS2</th>
<th>PPYS3</th>
<th>PPYS4</th>
<th>PPYS5</th>
<th>PPYS6</th>
<th>PPYS7</th>
<th>PPYS8</th>
<th>PPYS9</th>
<th>PPYS10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PY S1</strong> (Preoccupation)</td>
<td>47%</td>
<td>31%</td>
<td>31%</td>
<td>43%</td>
<td>29%</td>
<td>33%</td>
<td>38%</td>
<td>35%</td>
<td>38%</td>
<td>36%</td>
</tr>
<tr>
<td><strong>PY S2</strong> (Tolerance)</td>
<td>16%</td>
<td><strong>43%</strong></td>
<td>23%</td>
<td>31%</td>
<td>17%</td>
<td>20%</td>
<td>25%</td>
<td>27%</td>
<td>26%</td>
<td>19%</td>
</tr>
<tr>
<td><strong>PY S3</strong> (Failed Quit Attempts)</td>
<td>7%</td>
<td>11%</td>
<td><strong>43%</strong></td>
<td>31%</td>
<td>12%</td>
<td>10%</td>
<td>17%</td>
<td>19%</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td><strong>PY S4</strong> (Withdrawal)</td>
<td>4%</td>
<td>7%</td>
<td>13%</td>
<td><strong>37%</strong></td>
<td>6%</td>
<td>6%</td>
<td>11%</td>
<td>19%</td>
<td>13%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>PY S5</strong> (Gambled to Escape)</td>
<td>13%</td>
<td>18%</td>
<td>23%</td>
<td>31%</td>
<td><strong>53%</strong></td>
<td>16%</td>
<td>22%</td>
<td>30%</td>
<td>27%</td>
<td>20%</td>
</tr>
</tbody>
</table>

*Note. PPY = prior to past year; PY = past year; S=symptom. Percents refer to percent of participants with a specific PPY symptom who endorse a given PY symptom.*
## Analysis 2: Symptom Stability by Symptom

### Stability of Each Symptom from PPY to PY (N = 11,153)

<table>
<thead>
<tr>
<th></th>
<th>PPY S1</th>
<th>PPY S2</th>
<th>PPY S3</th>
<th>PPY S4</th>
<th>PPY S5</th>
<th>PPY S6</th>
<th>PPY S7</th>
<th>PPY S8</th>
<th>PPY S9</th>
<th>PPY S10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PY S6</strong> (Chased)</td>
<td>16%</td>
<td>21%</td>
<td>25%</td>
<td>36%</td>
<td>19%</td>
<td><strong>39%</strong></td>
<td>26%</td>
<td>22%</td>
<td>24%</td>
<td>23%</td>
</tr>
<tr>
<td><strong>PY S7</strong> (Lied to Others)</td>
<td>9%</td>
<td>12%</td>
<td>20%</td>
<td>31%</td>
<td>13%</td>
<td>12%</td>
<td><strong>41%</strong></td>
<td>22%</td>
<td>21%</td>
<td>23%</td>
</tr>
<tr>
<td><strong>PY S8</strong> (Illegal Acts)</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>5%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td><strong>16%</strong></td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>PY S9</strong> (Jeoprdz Work/Relations)</td>
<td>2%</td>
<td>3%</td>
<td>6%</td>
<td>10%</td>
<td>4%</td>
<td>3%</td>
<td>6%</td>
<td>11%</td>
<td><strong>20%</strong></td>
<td>8%</td>
</tr>
<tr>
<td><strong>PY S10</strong> (Others to Relieve Debt)</td>
<td>3%</td>
<td>4%</td>
<td>7%</td>
<td>13%</td>
<td>4%</td>
<td>4%</td>
<td>8%</td>
<td>16%</td>
<td>11%</td>
<td><strong>21%</strong></td>
</tr>
</tbody>
</table>

*Note. PPY = prior to past year; PY = past year; S=symptom. Percents refer to percent of participants with a specific PPY symptom who endorse a given PY symptom.*
Analysis 2: Summary

- Committing illegal acts, jeopardizing work/relationships, and relying on others to relieve debt were not stable symptoms.
- Escape and preoccupation were the most stable symptoms; escape was less prevalent overall than preoccupation.
Implications

- Implications for clinicians
- Implications for DSM-V
- Implications for researchers