Longitudinal Studies of Gambling: Methods, Findings and Planning for the Future

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Using Big Data to Study Development & Social Change

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Utility of Longitudinal Cohort Designs

- Cross-sectional studies permit estimation of number of people who experience gambling problems & identification of factors associated with these problems

- Leaves uncertain the question of temporal sequence of associations between gambling problems & associated factors

- Identified cases include people with recently developed as well as long-term problems
  - Circumstances under which problems arose in the past could well be different from those associated with current problems
  - Recovery could require different intervention strategies

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Utility of Longitudinal Cohort Designs

- Allows you to understand how problem gambling develops (risk and protective factors) and how problem gamblers recover
  - retrospective self-reports are unreliable
  - correlates of problem gambling tell you nothing about whether they caused PG, developed coincident with PG, or are a result of PG

- Allows you to understand the natural course and stability of problem gambling

- Allows you to determine the incidence of problem gambling

Utility of Longitudinal Cohort Designs

- Cohort studies are needed
  - To generate reliable estimates of the incidence (onset) of problems
  - Determine temporal sequence and changes in gambling/problem gambling
  - Identify risk & protective factors for initial onset and other changes over time inc. remission & relapse/recurrence

- This information is highly relevant to the identification of high-risk groups before problems develop & design of preventative interventions

Growing number of longitudinal cohort studies conducted internationally

Study Population	Waves	Jurisdiction	Researchers
Children	2	Canada	Pagani, Derevensky & Japel, 2009
Adolescents & parents	2	Canada	Dane et al, 2008
Adolescents	6	United States	Barnes et al
Adolescents	6	Montreal	Vitaro et al

Young adults

Study Population	Waves	Jurisdiction	Researchers
Young adults	2	Canada ADHD study	Breyer et al, 2009
Young adults	2	Dunedin cohort	Slutske et al, 2005
Young adults	3	Minnesota	Winters et al, 2002, 2005
Young adults	4	Australia	Delfabbro, Winefield & Anderson, 2009
College – young adult	4	Midwest US	Slutske, Jackson & Sher, 2003
College – young adult	4	Midwest US (1 gambling item)	Goudriaan et al, 2009
Young adults	6	Australia health study	Hayatbakhsh et al, 2006

Special populations

Study Population	Waves	Jurisdiction	Researchers
Regular EGM players	6 (6 months)	Australia	Dickerson, Haw & Shepherd, 2003
At-risk & help-seeking gamblers	6 (12 months)	Canada	Wiebe et al, 2009
Scratchcard players	2	Netherlands	DeFuentes-Merillas et al, 2004
Regular VLT players	2	Nova Scotia	Schrans, Schellinck & Walsh, 2000
Casino employees	3	United States	Shaffer & Hall, 2002

Adult studies

Study Population	Waves	Jurisdiction	Researchers
Adults	2	Ontario	Wiebe et al, 2003a, 2003b
Adults	2	New Zealand	Abbott, Williams & Volberg, 2004
Older low-income adults	3	United States (1 gambling item)	Vander Bilt et al, 2004

Adult studies

Study Population	Waves	Jurisdiction	Researchers
Adults	3	Quebec	Kairouz et al (analysis underway)
Adults	4	Alberta LLLP	el-Guebaly et al (analysis underway)
Adults	5	Ontario QERI	Williams et al (analysis underway)
Adults	4	Victoria	Billi et al (analysis underway)
Adults	6	Sweden	Romild et al (data collection & analysis underway)

Methodological advances

- Recent studies have included much larger samples
  - Representative of population at baseline
  - Significant resources dedicated to minimizing bias due to attrition

- Recent studies have longer duration
  - More fine-grained picture of transitions
  - Better sense of scope/scale of PG status changes

- Qualitative/in-depth input increasingly incorporated

Methodological advances

- Recent studies have included more sophisticated analytic approaches
  - Logistic regression
  - Multivariate analyses of variance
  - Hierarchical linear modeling
  - Individual & group trajectory analysis
  - Structural equation modeling w/latent variables
  - Latent class analysis & latent transitions btw classes
  - Survival analysis

- Missing data addressed via weighting & imputation

- Attrition analysis & group classification are elements of the best studies

Key findings

- **Differentiating between proximal & distal factors**
  - Recent gambling behavior/symptoms are better predictors of same behavior in subsequent years than more distant measures

- **Most gambling problems tend to resolve over time**

- **Different groups of gamblers characterized by different trajectories towards problem gambling**
  - Different predictors for at-risk & problem gambling
  - Involvement in clusters of different gambling activities associated w/different levels of risk

Risk factors predicting PG development across two cohort studies

- Gambling in the past year on EGMs, casino table games, Internet
- Betting weekly on horse/dog races

- Poor health (physical, mental)
- Smoking
- Risky drinking habits

- Difficulties at work
- Changes in working conditions
- Loss of a close relative
- Changes in personal/HH finances

Swedish National Institute for Public Health, 2012; Victoria Department of Justice, 2011

Some implications for policy & practice

- Some PGs are 'new' while others are 'relapsing'
  - Important when designing treatments
  - Relapsers may have more acute problems, other physical/mental disorders
  - New PGs may be more responsive to brief interventions, less intensive treatments

- Larger % of population has experienced difficulties than prevalence rates suggest
  - 'Natural selection' will be high in this group in wake of gambling introductions, expansions
  - Policy, regulatory safeguards needed to minimize 'natural selection'
  - Prevention, intervention safeguards needed to support PGs in remission or recovery & prevent development of new PGs

Value of a new longitudinal cohort study

- Ability to apply lessons learned from other studies to create even better methodology
  - ➢ Greater oversampling to identify prevalence & incidence more accurately
  - ➢ Use of techniques to obtain highest possible retention rate

- Ability to provide greater focus on under-investigated areas of other studies
  - ➢ More than 5 assessment periods (i.e., 7 or more)
  - ➢ Finer-grained chronology (e.g., subsample with twice yearly assessments)
  - ➢ More detailed focus on the etiological factors implicated in the other studies

Considerations

Consideration #1

➢ Do we want to just determine incidence, stability, and tentative predictors of PG **OR** do we want to also develop a comprehensive etiological model?

➢ Etiological model much more scientifically ground-breaking and useful from a prevention/treatment standpoint, however this would mean:

   ➢ Supplement baseline sample with large number of high-risk individuals (perhaps using multimodal sampling methods)

   ➢ Assess all participants with comprehensive assessment battery

Considerations

Consideration #2

➢ How big should our sample be?

➢ Incidence of PG could be captured just by following 1,000 baseline participants

➢ Incidence and stability of PG could be captured by following 3,000 baseline participants

➢ Incidence, stability and etiology of PG could be captured by following 2,000 randomly selected baseline participants + 3,000 high risk individuals = 5,000

Considerations

Consideration #3

➤ How frequently should the cohort be assessed?

➤ Do we want the usual 1-2 year interval or develop a finer-grained chronology?

➤ The latter would be more scientifically ground-breaking
  ➤ However, too logistically difficult to assess entire sample more than once a year
  ➤ Could assess a subsample (500 – 1,000) of high-risk individuals twice yearly

Considerations

Consideration #4

➤ How long do we want the study to continue?

➤ The longer the better. While some people become PGs within a few years of gambling onset, others report that it took many years. A study of 5 years duration will only reliably identify the etiology for the subset of people who become PGs within a 4 year time period.

➤ 7 – 10 assessment periods would be a significant improvement over the 4 – 5 assessment periods used in the existing studies

Lessons learned

- Success at conducting a large-scale longitudinal cohort study is not due to a few critical things, <u>but a thousand little things and the ongoing ability to quickly identify and rectify the many issues that continually arise</u>