Declaration of Financial Interests or Relationships

I have no financial interests or relationships to disclose regarding the subject matter of this presentation.

Data access

Research and Industry division unit (Université libre de Bruxelles)

Research Funding

Fonds de la Recherche Scientifique - FNRS FRESH

Open Science Research

Pre-registration

Assessing Chasing in Large-Scale Online Gambling Data: A Multifaceted Analysis of Between-Session Chasing

EXCESSIVE GAMBLING: PROMOTING AND PROTECTING HEALTH IN A DIGITALISED WORLD

5th International Multidisciplinary Symposium

Credits: YouTube: Guardian: Bright Lights: what one woman's 25-year gambling addiction really cost

"He [the gambler] sees himself getting in deeper and deeper; yet if he quits now, all this is irretrievably lost. The only way to get it back is to keep on playing."

(Devereux, 1949 pg. 729, quoted in Addiction by Design by Natasha Dow Schüll, Princeton University Press, 2012, notes to chapter 7)

Chasing

continuing/intensifying gambling following losses **(Loss-chasing)** or following wins **(Win-chasing)**

(Lesuire, 1979; Blaszczynski and Nower, 2002)

Recreational gambling

Problematic gambling

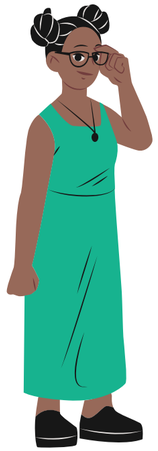
- Transition from **recreational gambling to problematic excessive** gambling (Zhang and Clark, 2020)
- Loss-chasing is **a key clinical symptom in the diagnosis** of gambling disorder (APA, 1994, 2013).
- The only clinical symptom **not borrowed from the substance abuse literature or shared** with substance use disorders (Genauck and Romanczuk-Seiferth, 2019; Banerjee et al., 2023).

Between-session Chasing

returning back another day/time to recoup losses

(Lesuire, 1979; Breen and Zuckerman, 1999; O'Connor and Dickerson, 2003)

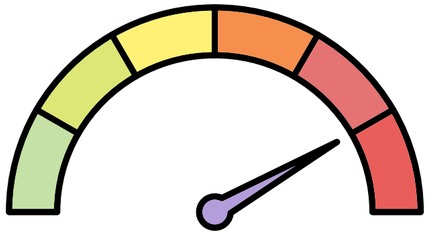
- Key operationalization used in the DSM - 5 for Gambling Disorder (GD) diagnosis (APA, 1994; 2013)
- Literature review indicates (Banerjee et al., 2023)



adults adolescents

(James et al., 2016; McBride et al., 2010; Goldstein et al., 2013; Kong et al., 2014)

Low High



across the entire continuum of problem gambling severity

(Toce-Gerstein et al., 2003)

highly endorsed as gambling involvement increases

(Carragher and McWilliams, 2011)

stable symptom of GD and triples the risk of developing more severe gambling problems after a year

(Sleczka and Romild, 2021)

Between-session Chasing

- assessed primarily via questionnaires (Banerjee et al., 2023)
  - between-session chasing items **misinterpreted** (Samuelson et al., 2019)
  - gambler's provide **biased responses to self-report questions** about their own gambling behavior (Braveman et al., 2014; Santos et al., 2025)

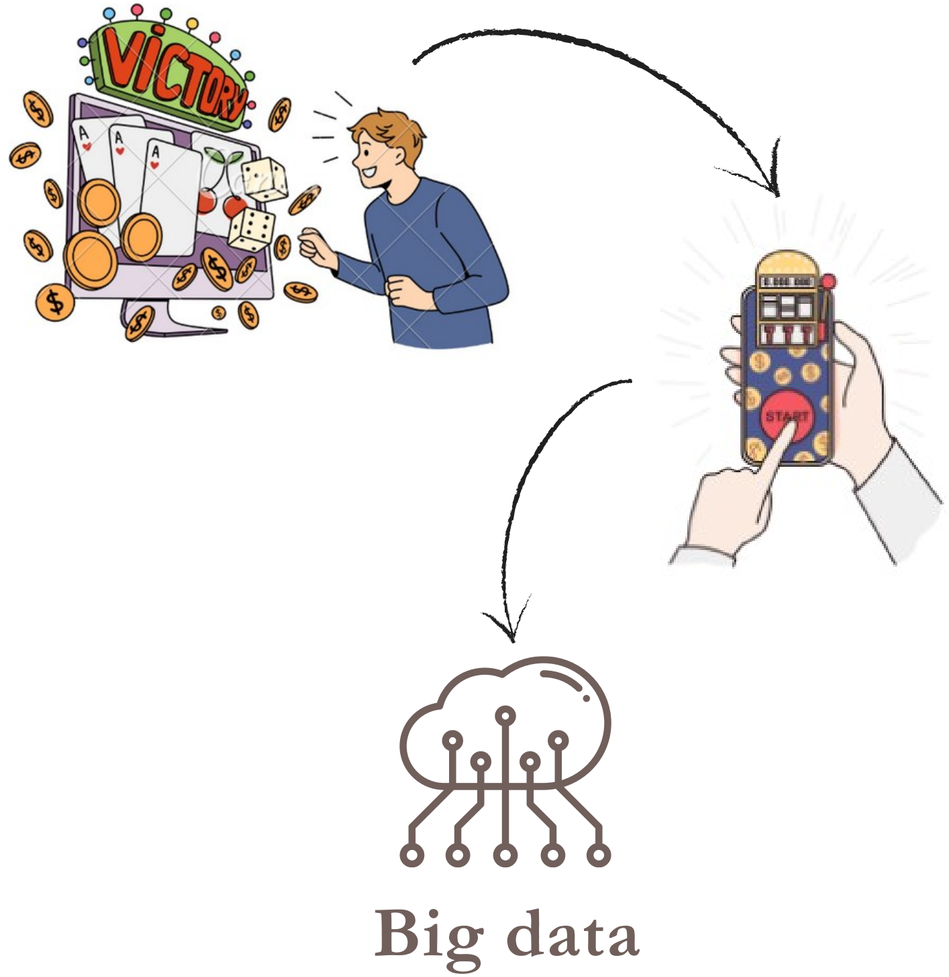
does not lend to lab-settings

(Breen and Zuckerman, 1999)

Between-session Chasing

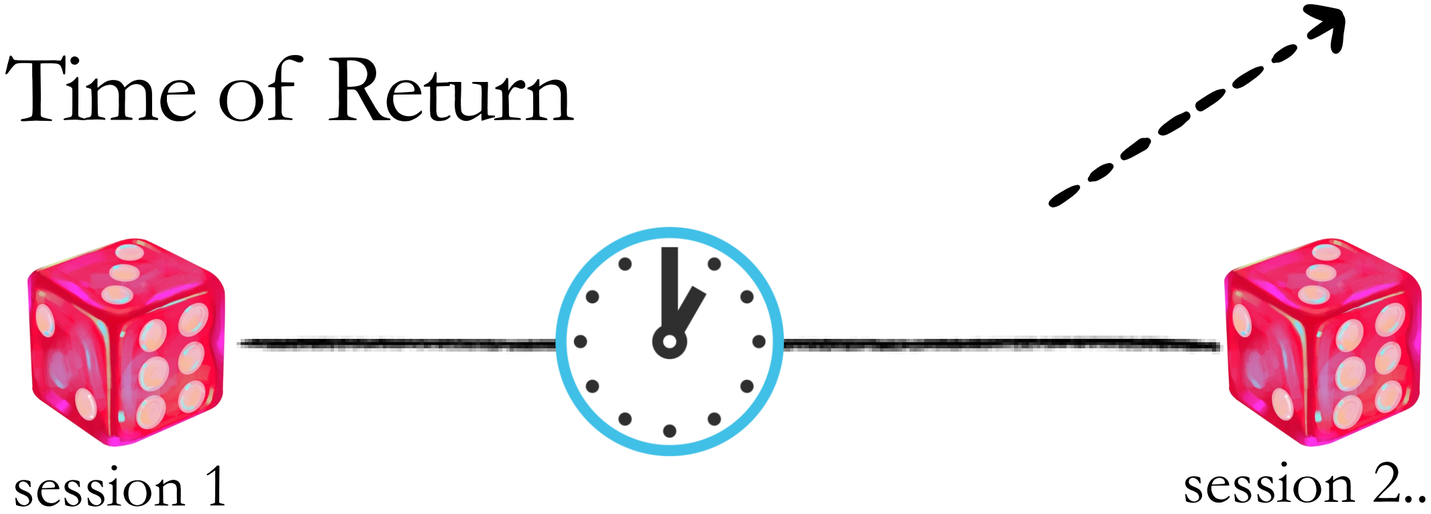
Field Studies

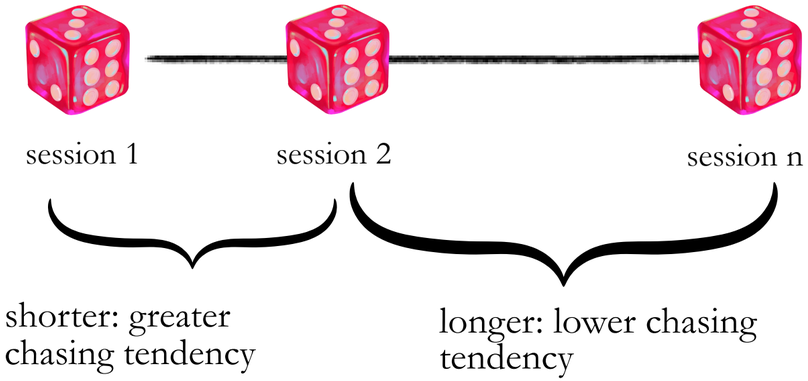
- large-scale datasets of player behavior
- collect play pattern datasets
  - wins
  - losses
  - stakes
  - number of bets placed
- assess gambling behavior – e.g., chasing behavior



Between-session Chasing
Field Studies

Time of Return





The time interval between the end of the prior session and the start of the next session.

Between-session Chasing

Field Studies

Time of Return

- Return faster to gamble in the next session following a winning session and delay following a losing session
- As the magnitude of losses (wins) increased gamblers delayed (accelerated) their return to gamble further
    - Aggregate profile is win-chasing
- Return times of high-frequency gamblers are less affected by prior session outcome as compared to low-frequency gamblers

(Forrest and McHale, 2016; Kainulainen, 2021; Zhang et al., 2024a)

Research Gaps

Limited Research
There is need of more research in field studies – add to this body of studies

Multifaceted Expression of Between-session chasing
Between-session chasing can be captured in the amount of Session Wagers and Session Duration (e.g., Auer and Griffiths, 2022; Parke and Parke, 2017)

Game-type can impact the expression of chasing
Chasing may differ across gambling products (e.g., Zhang et al., 2024a)

Current Study

Aims

Assess Between-session chasing in large-scale online gambling data

Multifaceted approach: Across 3 facets of Between-session chasing

Time of return
how fast the gamblers return to gamble

Session Wager
how much the gamblers wagered in the next session

Session Duration
how long the gamblers played in the next session

Prior Session Outcome
Loss vs. Wins

Outcome Magnitude
Loss vs. Win magnitude

Gambling Involvement
High vs. Low

Game product
Slots, Blackjack, Roulette and Dice game

Methods

Dataset overview

Products

 Dice Game

 Slots

 Blackjack

 Roulette

Data Retrieved

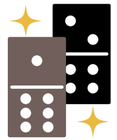
 **Data collected**
Nov 2019 - Aug - 2022

Total Sample = 11,673

 **High** n = 2403

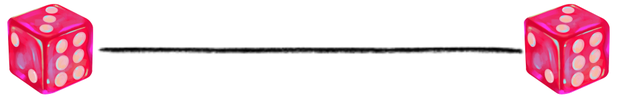
 **Low** n = 9270

Total number of Bets

 ≈ 170 million rounds

Computed Gambling Sessions

Time difference between two bets more than or equal to 30 mins (Zhang et al., 2024a)



≈ 900k sessions

Methods

Independent Variables:

Time of return

The time gap in hours between the previous and current session

Session Wager

The amount of total session wager placed in a session

Session Duration

The total number of rounds played in a session

Dependent Variables:

Prior Outcome: Win vs. Loss

Based on the Net Session outcome
Net outcome = Wins - Wagers

Outcome Magnitude: Prior session win and loss magnitude

Standardized net outcomes for losses/wins for each player

Involvement level: High vs. Low

High group: addiction score > = 3
Low group: addiction score < 3

Mixed effects regression model

Results

Time of return

Prior Outcome:

Gamblers **returned faster** if the prior session **ended in a win** as compared to a loss overall across products **(ß = -0.27, p-val <.001, CI 99% [-0.30 – -0.24]).**

Outcome Magnitude:

Overall gamblers **returned faster** to gamble **as the magnitude of prior outcome** wins and losses **increased** overall across products **(ß = -0.04, p-val <.001, CI 99% [-0.04 – -0.03])**

Involvement level:

High-involvement gamblers were **less sensitive to prior session outcome** as compared to low-involvement gamblers overall across products

(ß = 0.08 , p-val <.001, CI 99% [0.05 – 0.11])

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Results

Session Wager

Prior Outcome:

Gamblers **increased their session wager** following a **win** as compared to a loss overall across products **(ß = 0.13, p-val <.001, CI 99% [0.11 – 0.15]).**

Outcome Magnitude:

Overall **gamblers increased their session wager** as the **magnitude** of prior outcome outcome **increased** overall across products
(ß = 0.13, p-val <.001, CI 99% [0.12 – 0.14])

Involvement level:

High-involvement gamblers **increased session wagers** as the **magnitude** of prior session outcome increased as compared to low-involvement gamblers overall across products
(ß = 0.04, p-val <.001, CI 99% [0.02 – 0.05])

Pre-registration

Results

Session Duration

Prior Outcome:

Gamblers **played longer sessions** if the prior session ended in a **win** as compared to a loss overall across products **(ß = 0.07, p-val <.001, CI 99% [0.06 – 0.09]).**

Outcome Magnitude:

Overall gamblers **played longer sessions** as the **magnitude** of prior outcome wins and losses **increased** overall across products **(ß = 0.06, p-val <.001, CI 99% [0.05 – 0.07])**

Involvement level:

High-involvement gamblers **played longer sessions** as compared to low-involvement gamblers overall across products **(ß = 0.07, p-val <.001, CI 99% [0.03 – 0.11])**

Pre-registration

Summary

- Overall, the **findings report** that -

Prior Outcome

- gamblers **return faster, wager more and played longer** following a **prior winning** session as opposed to a losing session
  (e.g., Forrest and McHale, 2016; Kainulainen, 2021; Zhang et al., 2024a)
  - Wealth Effect and House Money Effect
    (e.g., Mehra, 2005; Salaghe et al., 2020; 2023; Thaler and Johnson, 1999)

Outcome Magnitude

- gamblers **return faster, wager more and played longer** following as the **magnitude of prior session outcome** increased
  - Break-even and House Money Effect (e.g., Smith, Lever and Kurtzman, 2009; Thaler and Johnson, 1999)
  - Higher magnitude outcomes are more salient events (e.g., Smith, Lever and Kurtzman, 2009)
  - Gambling escalation over time (e.g., Harris and Parke, 2016)

Involvement levels

- **return times** of high-involvement gamblers were less sensitive to prior session outcome than low-involvement gamblers
- increased session wagers as the magnitude of prior session outcome increased
- increased **session wagers** and played **longer sessions** as compared to low-involvement gamblers (e.g., Carragher and McWilliams, 2011; Forrest and McHale, 2016; Kainulainen, 2021)

Next Steps: Game products

- Conduct moderator analysis – assess the impact of game product

Pre-registration

Thank you for your attention!

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