

What can predict problematic pornography use best? Findings from a machine learning study across 70+ samples

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Background

• **Pornography use is prevalent as 70 to 94%** of people have viewed it in their lifetime¹

• Pornography viewing is not problematic in most cases, but it **can become problematic for 1 to 10% of people**¹

• **Problematic pornography use (PPU)** is defined as persistent, repetitive, uncontrollable pornography use resulting in significant distress and functional impairment²

• **Research on PPU has proliferated in the past 25 years**, resulting in 124 studies on PPU¹

• **Knowledge** on risk and protective factors for PPU is **limited**, given methodological and conceptual **shortcomings**:

- **Simplistic** methodological designs and statistical methods
- Relatively **small** and **homogenous** samples
- Lack of **quality** and **unified** measurement
- Lack of **theoretical models** and integration
- Lack of **large-scale, collaborative** studies

• A **large-scale, collectivistic approach with innovative state-of-the-art methods** would provide³:

- Greater **statistical power**
- A **higher number of measurable constructs**
- Greater **generalizability**
- A list of **crucial constructs** that may predict PPU

Aim of the present study: Identifying the most robust predictors of PPU with machine learning

Method

Procedure and Participants:

- 98 researchers and labs contacted (2020–2021)
- 74 eligible datasets received – see detailed eligibility criteria: osf.io/jqkzr
 - 64 cross-sectional datasets
 - 10 longitudinal datasets
- Datasets from 17 countries
- $N = 100,000+$ (current cross-sectional $N = 82,135$)

Statistical Analysis

- Cross-sectional datasets used in the current presentation
- Random Forest models on each dataset (R “randomForest” package, variable selection: “VSURF” package)
- PPU score is the outcome in each model
- All measures available in each dataset (i.e., all sociodemographic questions, all scales) as predictors of PPU – see exclusion criteria: osf.io/jqkzr

Results

Characteristics' of datasets

Studies' characteristics:

- Unpublished ($k = 32$) vs. published ($k = 24$)

Samples' characteristics:

- Community ($k = 50$) vs. treatment-seeking samples ($k = 6$)
- Adolescents ($k = 1$) vs. Adults ($k = 53$) + Young adults (16–29 years) ($k = 2$)

Scales used (some studies used multiple scales):

- Cyber Pornography Use Inventory - long or short versions (CPUI; CPUI-9; CPUI-4)⁴⁻⁶ ($k = 28$)
- Problematic Pornography Consumption Scale - long or short versions (PPCS; PPCS-6; PPCS-6-A)⁷⁻⁹ ($k = 22$)
- Brief Pornography Screen (BPS)¹⁰ ($k = 13$)
- Problematic Pornography Use Scale (PPUS)¹¹ ($k = 8$)
- Compulsive Pornography Consumption Scale (CPCS)¹² ($k = 1$)

Top 10 predictors of problematic pornography use

Variance explained by the models:

- **Range** of explained variance in the models: 8 to 78%
- **Average** variance explained: 42%

Variables (measured at least in 10 datasets)	In database (n)	Is predictor (n)	Percent (%)
Pornography use frequency	53	49	92.45
Sexual shame	13	11	84.62
Moral incongruence	31	26	83.87
Externalization of blame	11	7	63.64
Guilt proneness	13	8	61.54
Duration of pornography use (each occasion)	36	22	61.11
Anxiety	20	12	60.00
Depression	19	11	57.90
Self-perceived addiction to pornography	11	6	54.55
Loneliness	15	8	53.33

Conclusions and Implications

• Further support for the **Moral Incongruence Model of Problematic Pornography Use**¹³

• Importance of **negative emotions/mood disorders**



• **Coping is not included** in the new Compulsive Sexual Behavior Disorder (parent category of PPU in the International Classification of Diseases, ICD-11)² **diagnostic guidelines** (vs. proposed Hypersexual Disorder)¹⁴ → **Should be?**

• **Better understanding** of the factors underlying PPU → **refinement of theoretical conceptualizations** of the development and maintenance of PPU^{1, 15}

• **Strongest predictors** of PPU identified → development of **more efficient prevention and intervention** programs^{1, 15}

• Empirical evidence about the **relative importance** of PPU predictors → guidelines for **future research** (e.g., potentially reducing the **cost** of future studies as we know which variables or characteristics might be necessary/unnecessary for data collection)

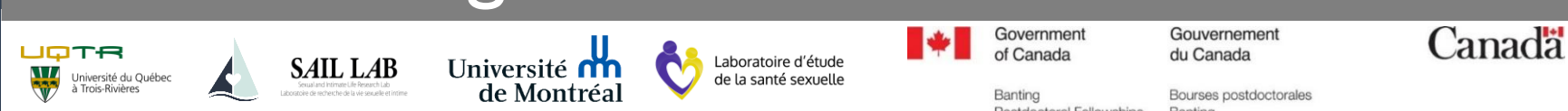
• **Methodological blueprint** for future **machine learning studies** and **large-scale collaborations** in the field of CSBD and sex research

• **Future directions:** Identifying the most robust predictors of **change in PPU over time** with machine learning

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