Case-Control Studies Can Identify Prospective Risk Factors For Sexual Offending

R. Karl Hanson, Moderator

Symposium at the Annual Convention of the Canadian Psychological Association, June 23, 2024

Ottawa, Ontario Canada

Presentations in Symposium

Andrew J. R. Harris, offenderrisk.com

- **The Dynamic Predictors Project: A Case-Control Study of Sexual Recidivism Risk Factors**

R. Karl Hanson, Carleton University and SAARNA

Julie Blais, Dalhousie University

- **Case-Control Studies Can Identify Prospective Risk Factors For Sexual Recidivism: Case-Control Versus Prospective Designs**

Kelly M. Babchishin, Carleton University

- **An Example of Case-Control Designs to Elucidate Risk Factors for the Onset of Offending**

Case-Control v. Prospective Cohort Designs

Common features

- Dichotomous outcome (e.g., diagnosis, recidivism)
- Predictor and control variables

Case-control

- Index cases selected *because* they have the outcome
- Comparison cases "matched" to index cases on control variables
- Researchers determine the number of index and comparison cases
- No follow-up

Prospective cohort

- No cases have outcome at time of assessment
- Researchers determine the size of cohort, but not the proportion of index cases
- Patience, patience, patience . . . .

Prospective provides stronger conclusions than case-control designs

- Temporal order is unambiguous
- In case-control studies, matching on one variable can systematically mismatch cases on other variables

“To put it most extremely, the so-called ex post facto “experiment” is fundamentally defective for many, perhaps most, of the theoretically significant purposes to which it has been put.”

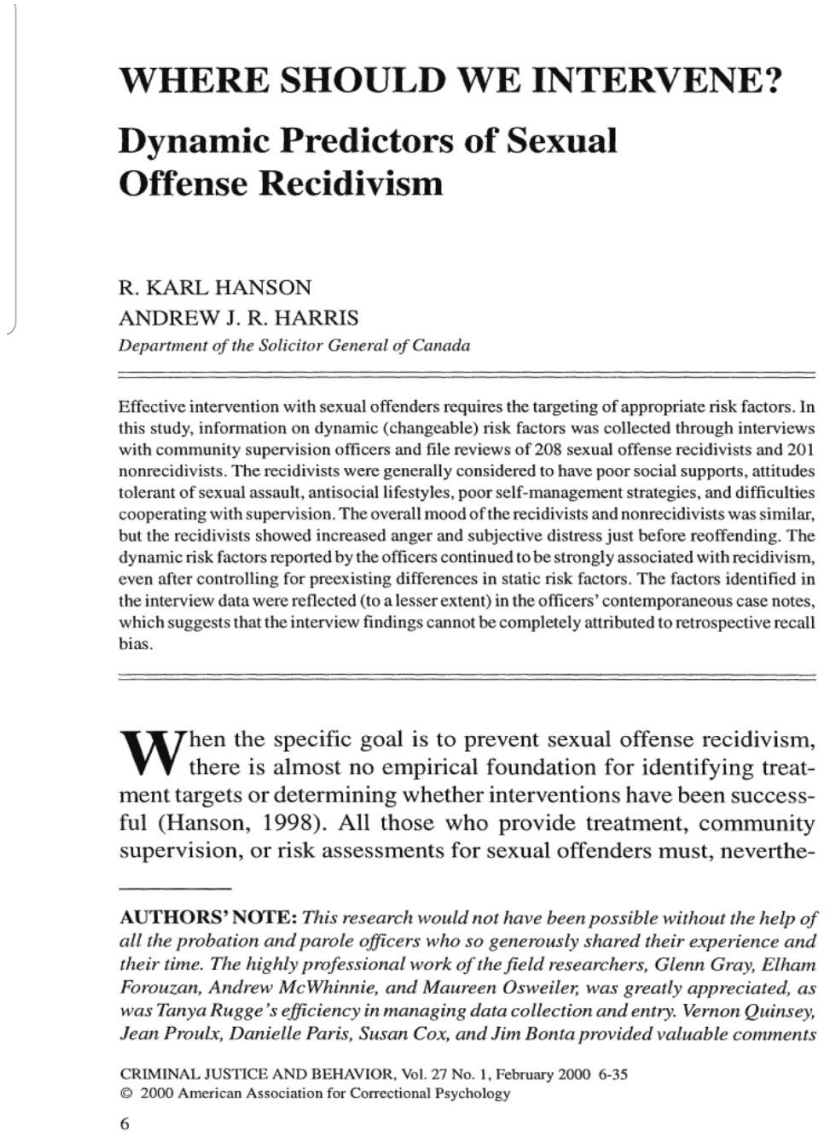
Paul Meehl (1970, p. 374)

Hanson & Harris (1998, 2000)

Cited in Google Scholar
1,318 times
37 times in 2023

Conceptual basis for STABLE-2007 and ACUTE-2007 Sexual Recidivism Risk Tools

How reliable are its findings?



WHERE SHOULD WE INTERVENE?

Dynamic Predictors of Sexual Offense Recidivism

R. KARL HANSON
ANDREW J. R. HARRIS
Department of the Solicitor General of Canada

Effective intervention with sexual offenders requires the targeting of appropriate risk factors. In this study, information on dynamic (changeable) risk factors was collected through interviews with community supervision officers and file reviews of 208 sexual offense recidivists and 201 nonrecidivists. The recidivists were generally considered to have poor social supports, attitudes tolerant of sexual assault, antisocial lifestyles, poor self-management strategies, and difficulties cooperating with supervision. The overall mood of the recidivists and nonrecidivists was similar, but the recidivists showed increased anger and subjective distress just before reoffending. The dynamic risk factors reported by the officers continued to be strongly associated with recidivism, even after controlling for preexisting differences in static risk factors. The factors identified in the interview data were reflected (to a lesser extent) in the officers' contemporaneous case notes, which suggests that the interview findings cannot be completely attributed to retrospective recall bias.

When the specific goal is to prevent sexual offense recidivism, there is almost no empirical foundation for identifying treatment targets or determining whether interventions have been successful (Hanson, 1998). All those who provide treatment, community supervision, or risk assessments for sexual offenders must, neverthe-

AUTHORS' NOTE: *This research would not have been possible without the help of all the probation and parole officers who so generously shared their experience and their time. The highly professional work of the field researchers, Glenn Gray, Elham Forouzan, Andrew McWhinnie, and Maureen Osweiler, was greatly appreciated, as was Tanya Rugge's efficiency in managing data collection and entry. Vernon Quinsey, Jean Proulx, Danielle Paris, Susan Cox, and Jim Bonta provided valuable comments*

CRIMINAL JUSTICE AND BEHAVIOR, Vol. 27 No. 1, February 2000 6-35

What did we do?

Compared the results of the case-control and prospective cohort designs *using the same sample*.

What did we expect?

The prospective study to favour sex crime specific variables compared to the case-control study because we matched on sex crime specific variables in the case-control design.

Andrew J. R. Harris, offenderrisk.com

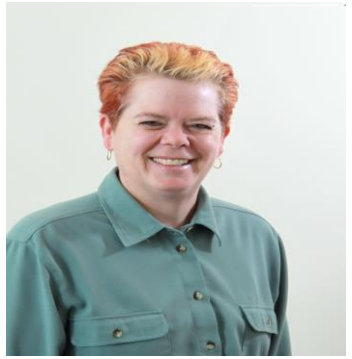
- **The Dynamic Predictors Project: A Case-control Study of Sexual Recidivism Risk Factors**

Dynamic Predictors Project

Glenn Gray Andrew Harris R. Karl Hanson Andrew McWhinnie
Elham Forousan Maureen Osweiler

Tanya Rugge

Susan Cox



Danielle Paris

WHERE SHOULD WE INTERVENE?

Dynamic Predictors of Sexual Offense Recidivism

R. KARL HANSON
ANDREW J. R. HARRIS
Department of the Solicitor General of Canada

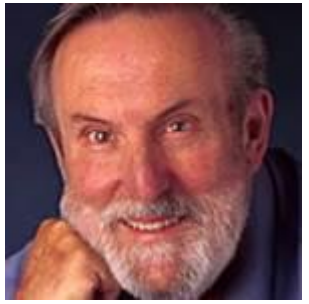
Effective intervention with sexual offenders requires the targeting of appropriate risk factors. In this study, information on dynamic (changeable) risk factors was collected through interviews with community supervision officers and file reviews of 208 sexual offense recidivists and 201 nonrecidivists. The recidivists were generally considered to have poor social supports, attitudes tolerant of sexual assault, antisocial lifestyles, poor self-management strategies, and difficulties cooperating with supervision. The overall mood of the recidivists and nonrecidivists was similar, but the recidivists showed increased anger and subjective distress just before reoffending. The dynamic risk factors reported by the officers continued to be strongly associated with recidivism, even after controlling for preexisting differences in static risk factors. The factors identified in the interview data were reflected (to a lesser extent) in the officers' contemporaneous case notes, which suggests that the interview findings cannot be completely attributed to retrospective recall bias.

When the specific goal is to prevent sexual offense recidivism, there is almost no empirical foundation for identifying treatment targets or determining whether interventions have been successful (Hanson, 1998). All those who provide treatment, community supervision, or risk assessments for sexual offenders must, neverthe-

AUTHORS' NOTE: *This research would not have been possible without the help of all the probation and parole officers who so generously shared their experience and their time. The highly professional work of the field researchers, Glenn Gray, Elham Forouzan, Andrew McWhinnie, and Maureen Osweiler, was greatly appreciated, as was Tanya Rugge's efficiency in managing data collection and entry. Vernon Quinsey, Jean Proulx, Danielle Paris, Susan Cox, and Jim Bonta provided valuable comments*

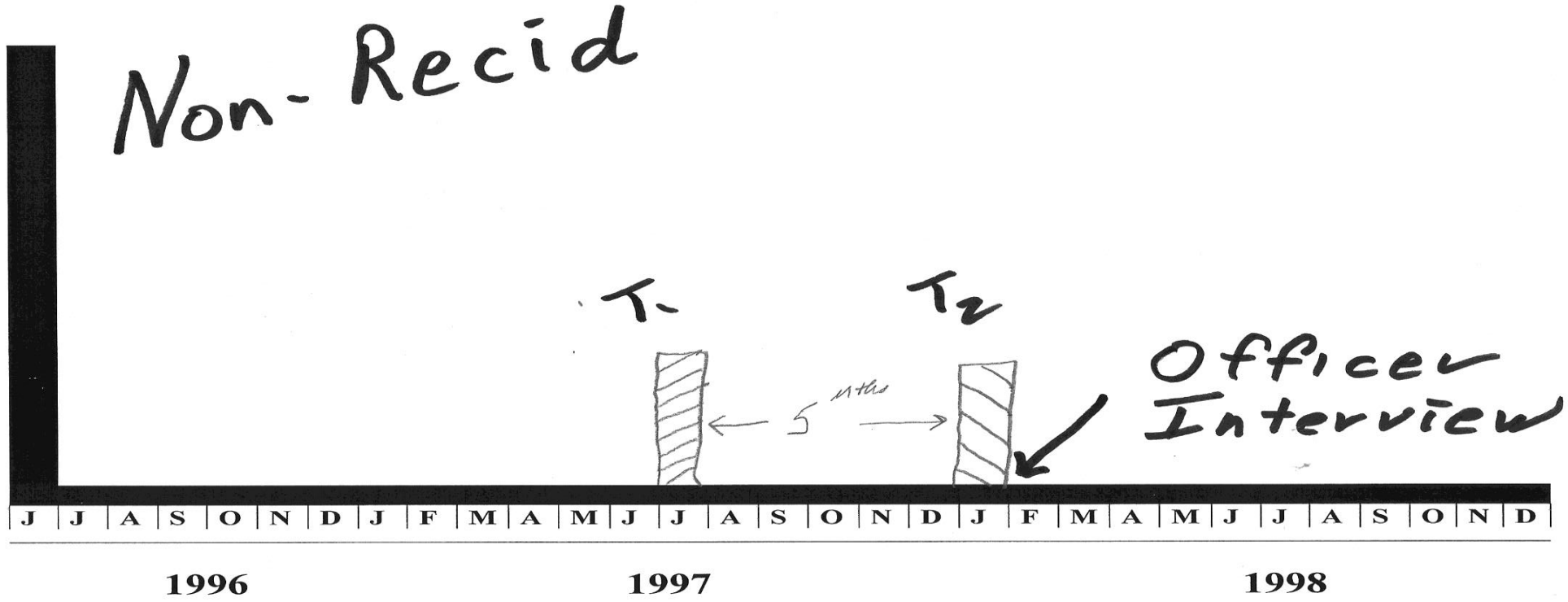
CRIMINAL JUSTICE AND BEHAVIOR, Vol. 27 No. 1, February 2000 6-35

Getting Good Data



1. LITERATURE REVIEW: Work of Don Andrews (1994) & Hanson & Bussière
2. STAKEHOLDER CONSULTATIONS: Supervision officers, Researchers, Corr. Mgrs.
3. TEAM SELECTION: Country wide advertising, Resume reviews, In person interviews
4. TEAM TRAINING: Week-long, mock interviews, scoring practice
5. TEAM COHESION: "Decision Log" shared 'that day,' Teleconferences, Proj. Mgr. Visits
6. GROUNDING MEMORY AND THE GRAPHIC TIMELINE
7. FILE CODING: Colour-coded booklets
8. OFFICER INTERVIEW CODING: 133 Questions
9. CONTEMPORANIOUS CONTACT NOTE CODING: Same 133 Questions

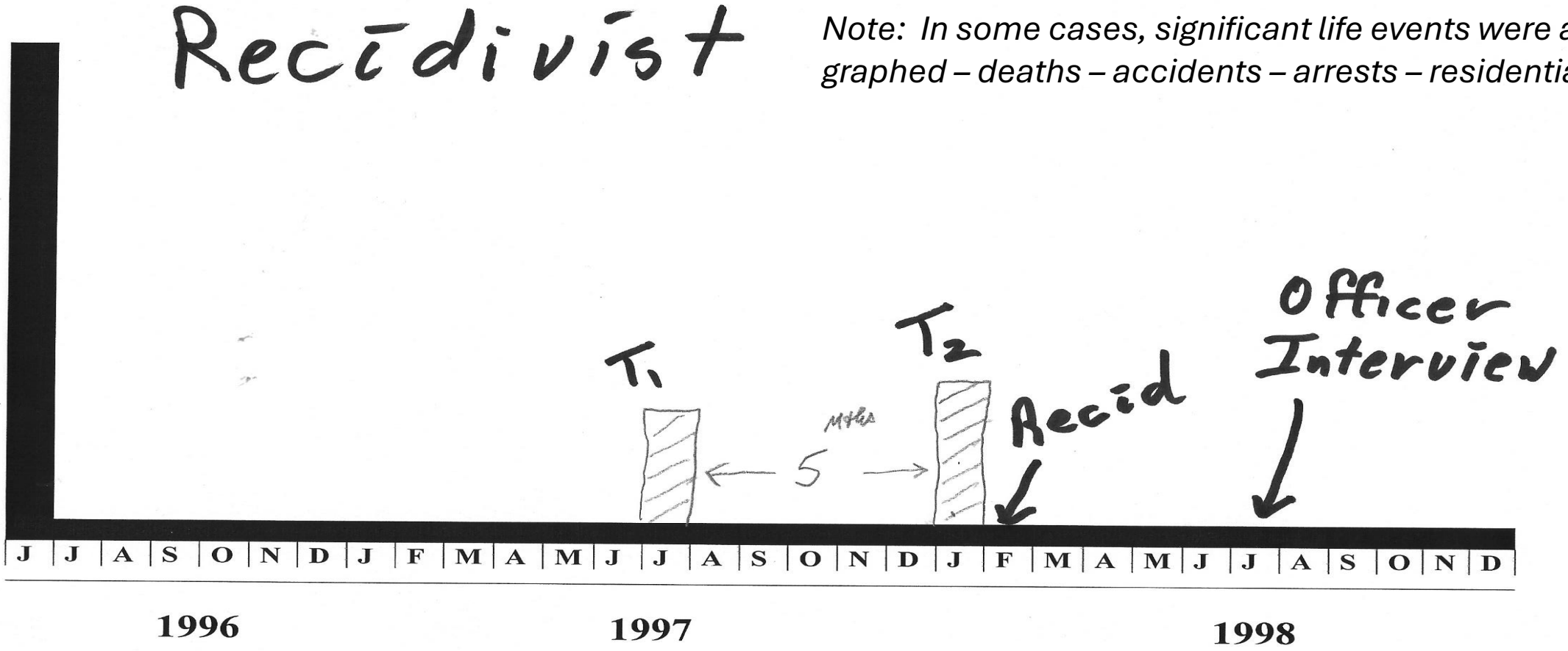
Attempts to ‘anchor’ timeline



Time Graph:

Date: _____ **Officer Name:** _____ **Case Identifier:** _____

Attempts to ‘anchor’ timeline



Note: In some cases, significant life events were also graphed – deaths – accidents – arrests – residential moves

Time Graph:

Date: _____ **Officer Name:**_____ **Case Identifier:** _____

SUBNUM

DYNAMIC PREDICTORS OF SEXUAL REOFFENSE PROJECT 1997

DEPARTMENT OF THE SOLICITOR GENERAL CANADA

340 LAURIER AVENUE WEST

SIR WILFRID LAURIER BUILDING

11 th. FLOOR

OTTAWA, ONTARIO CANADA K1A 0P8

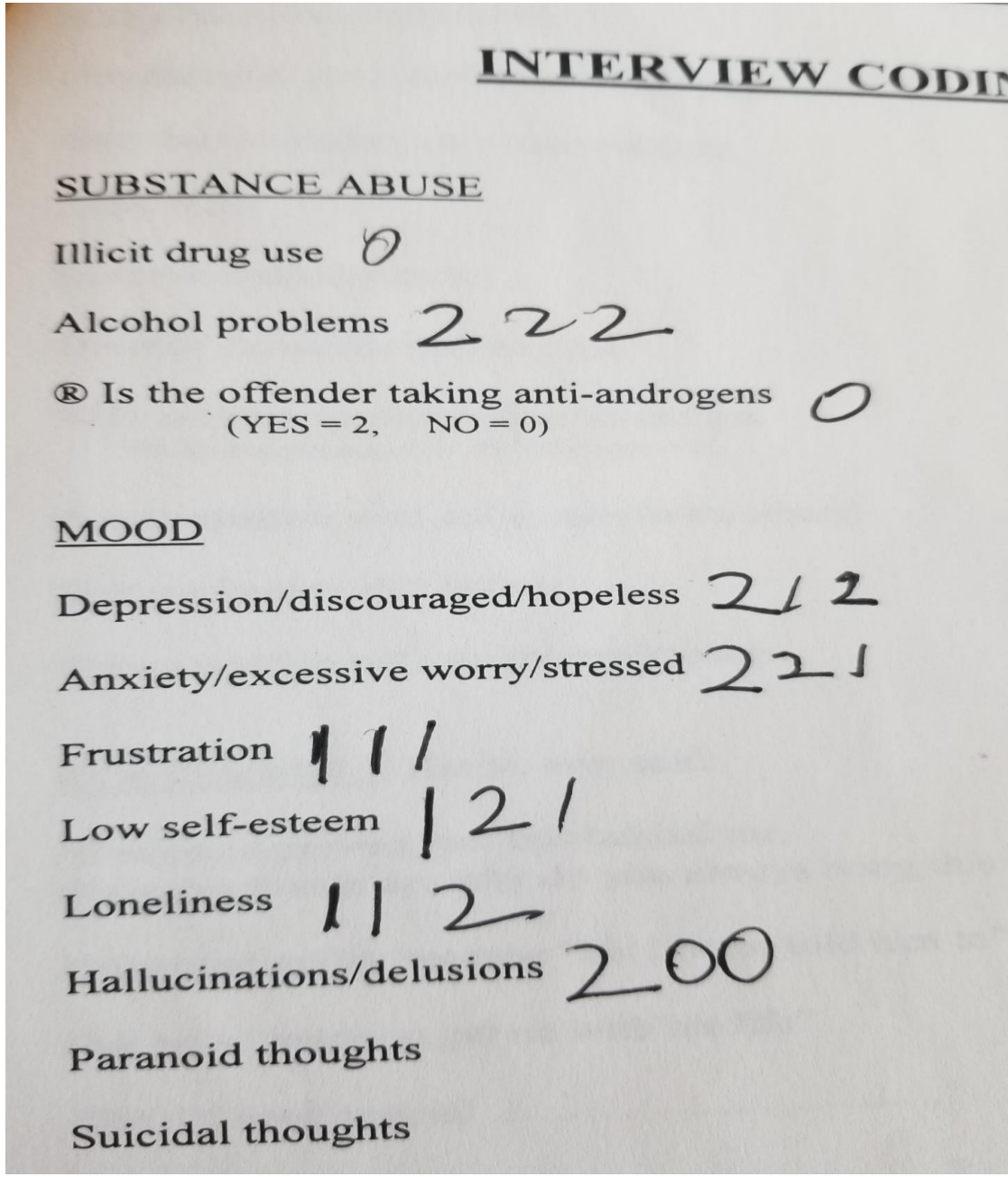
for information please contact: Andrew J. R. Harris (613) 991-2033
Project Manager

Dr. R. Karl Hanson (613) 991-2840
Project Director

Interview Coding

AREAS QUESTIONED	*Examples*
Substance Abuse (3)	
Mood (12)	*Depressed/Suicidal*
Social (13)	*Isolation/Conflicts*
Employment (4)	
Attitude/Presentation (12)	*Tolerant of sex crimes*
Life Stress (9)	*Health/Media Attn.*
Risk Reports Received (2)	
Sexual Risk Factors (9)	*Excessive masturbation*
Statements #1 (7)	*"You always bring this up"*
Statements #2 (13)	short skirts = asking -> trouble
Victim Access (6)	
Appearance (2)	
Lifestyle (7)	*Chaotic/Unstable*
Does he have a problem with (4)	*Restless/Hyperactive*
Does this guy . . . (2)	*Acknowledge his sex problems*
Cooperation with Supervision (28)	*Lies/Contradictions/No Show*

Total: 133 Q's



INTERVIEW CODI

SUBSTANCE ABUSE

Illicit drug use 0

Alcohol problems 2 2 2

® Is the offender taking anti-androgens 0
(YES = 2, NO = 0)

MOOD

Depression/discouraged/hopeless 2 1 2

Anxiety/excessive worry/stressed 2 2 1

Frustration 1 1 1

Low self-esteem 1 2 1

Loneliness 1 1 2

Hallucinations/delusions 2 0 0

Paranoid thoughts

Suicidal thoughts

2017 Follow-up

Seung C. Lee & Andrew Brankley at Public Safety Canada

Original Case-control study (1997)	208 Sexual Recidivists	201 Non-recidivists
Revised Case-control assignment (2017)	180 Sexual Recidivists	227 Non-recidivists
20 Year Prospective Follow-up Study	57 Sexual Recidivists	156 Non-recidivists

RCMP FPS Records in 2017

- N = 27: Reclassification of recidivists to non-recidivists (mostly pseudo-recidivism)
- N = 2: Did not meet sampling frame (e.g., nonsexual recidivism)
- N = 14: No FPS record in 2017

Survival end date

- N = 1: Deported
- N = 18: Death confirmed by FPS with median death date = 2010

2017 Follow-up

Google name search

- 7 additional results:
  - 5 sex contact offences, 1 non-contact, 1 sex-related supervision violation.

Average Follow-up Time

- 20.6 years (median = 20.7 years, *SD* = 4.1)
- Excluded time incarcerated for nonsexual offences (street time)

SEXUAL RECIDIVISM (N = 57)

- 45 based on new charges
- 12 cases on sex-related community violations
- 15 recidivistic cases involved non-contact offences (Exhibitionism, CSEM, Voyeurism)

R. Karl Hanson, Carleton University and SAARNA

Julie Blais, Dalhousie University

- **Case-control Studies Can Identify Prospective Risk Factors For Sexual Recidivism: Case-control Versus Prospective Designs**

Recidivism: Sexually motivated crime or violation of community supervision with sex crime intent

Case-control (in 1997)

- 180 recidivists
- 227 non-recidivists

Prospective (since 1997)

- 57 recidivists
- 156 non-recidivists

Static Predictors - 50 Variables

- Age
- Predominant victim type (women, boys, girls) *
- Sex crime history (ever offended against . . .)
- Sexual deviance (ever diagnosed, number of paraphilias)
- Adverse childhood experiences
- General criminal record (violent, nonviolent)
- Low IQ
- Psychopathy
- Actuarial risk tools
  - SIR
  - VRAG
  - RRASOR *

* Primary matching variables

Stable Predictors - 32 Variables

- Employment
- Substance use
- Mood/anger
- Significant social influences
- Attitudes
- Victim access
- Lifestyle
- Cooperation with treatment/supervision

Sex Crime Specific - 28 Variables

- Predominant victim type *
- Deviant sexual preference
- Lifestyle congruent with sexual deviance
- RRASOR *
- Association with sex offenders
- Sex crime supportive attitudes
- Sexual preoccupation

* Primary matching variables

General Crime Predictors – 34 Variables

- Age
- Never married
- Adverse childhood experiences
- Violent and nonviolent criminal history
- Psychopathy
- SIR
- VRAG
- Unemployed
- Substance use
- Negative social influences
- Antisocial lifestyle
- Lack of cooperation with supervision

Analysis

Difference in effect sizes

- AUCs for ordinal/interval variables
- Odds Ratios for dichotomous variables

95% confidence intervals using the standard error of the difference:

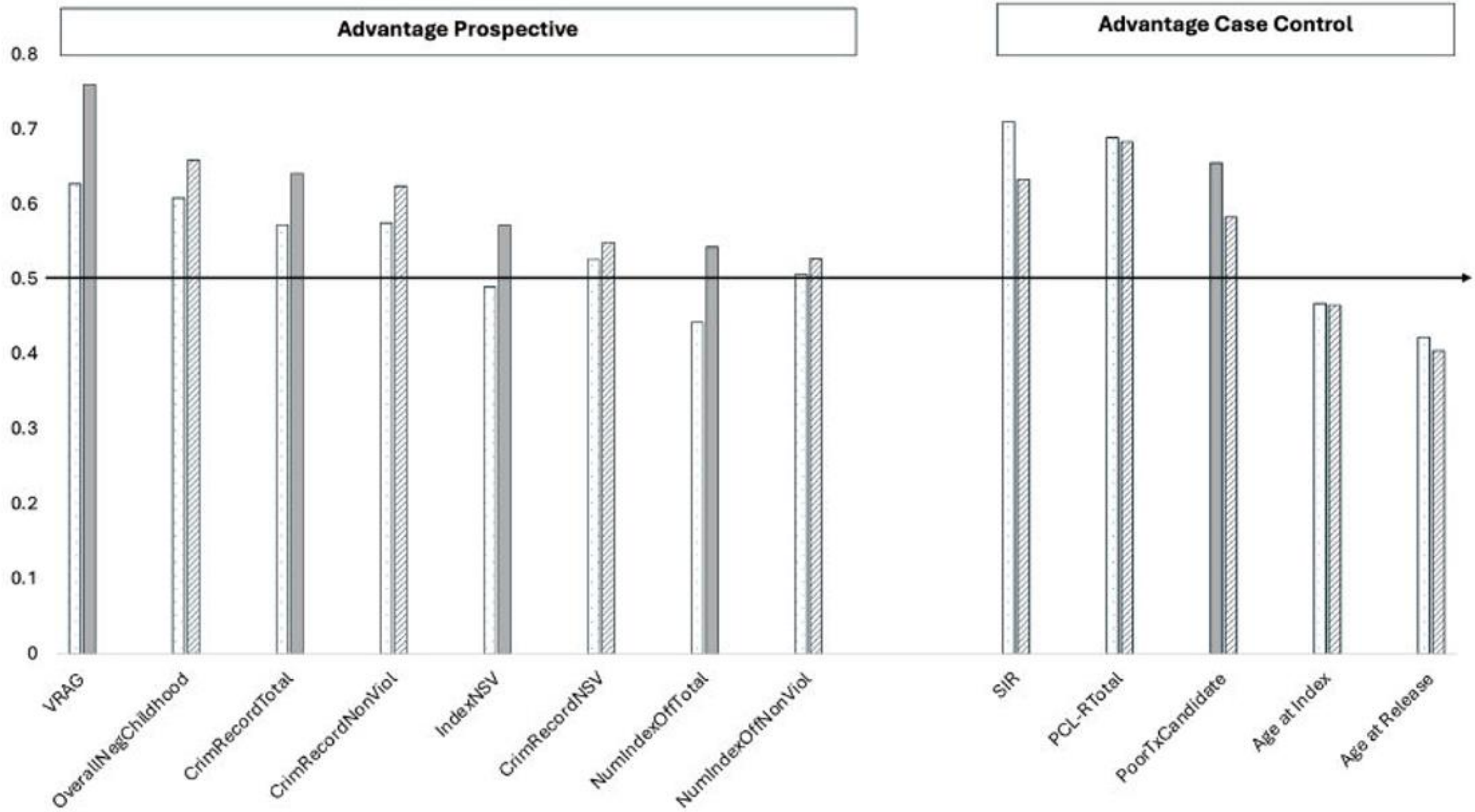
$$\sigma_{a-b}^2 = \sigma_a^2 + \sigma_b^2 - 2r\sigma_a\sigma_b$$

r = .70 for AUCs; *r* = .55 for logits

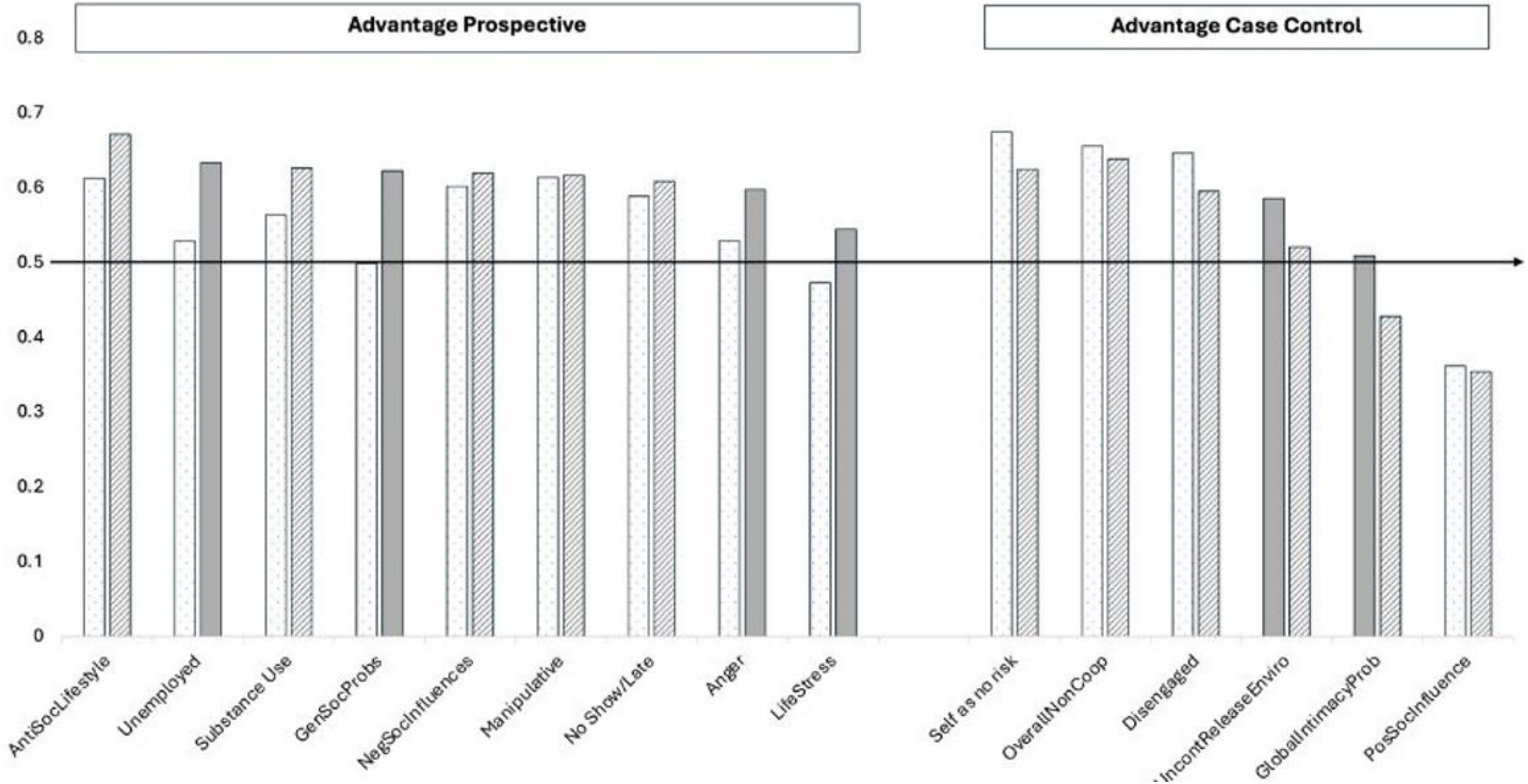
Results

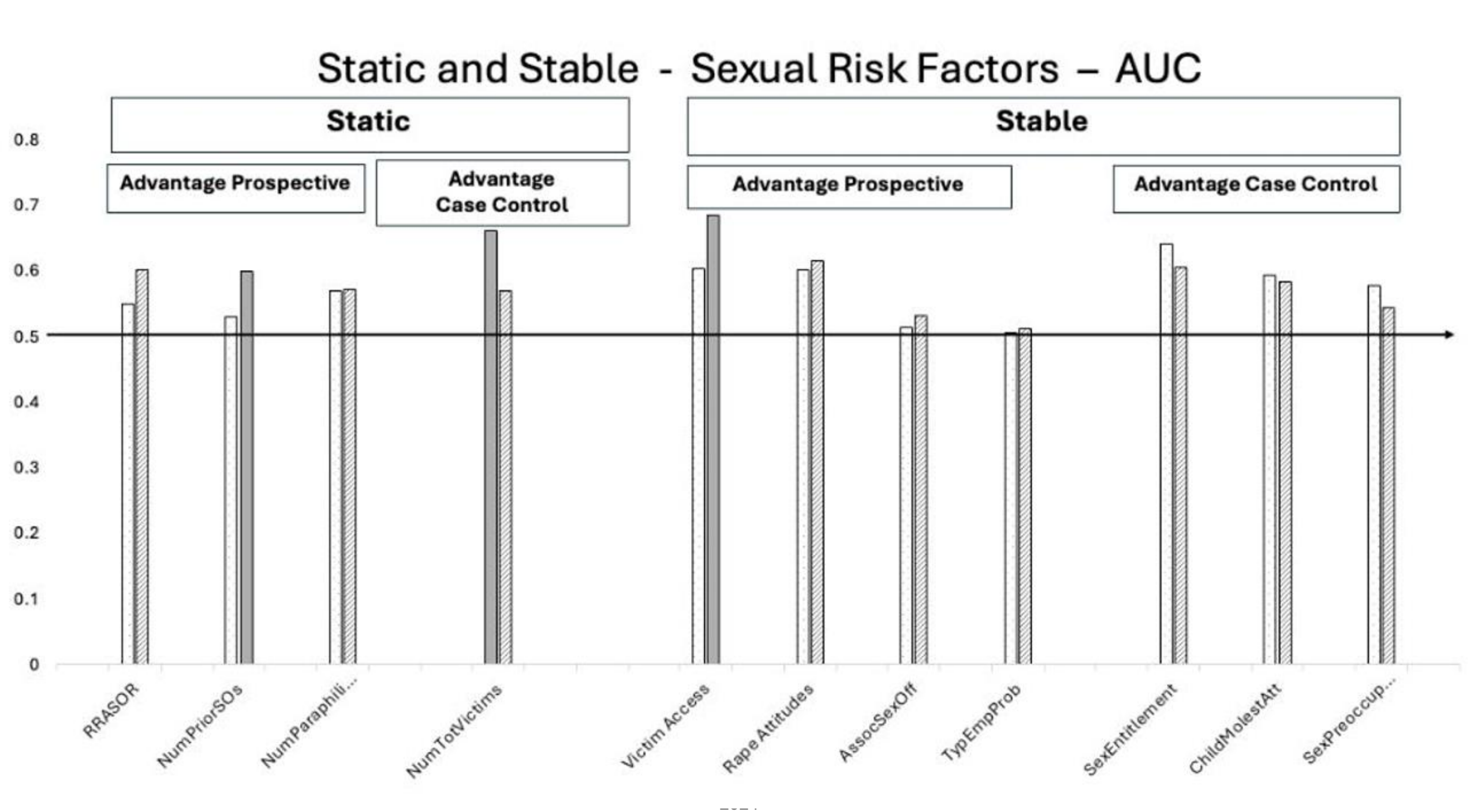
		Favours Case Control	Favours Prospective
Overall		32	50
	significant	10	17
Static variables		20	30
	significant	6	9
Dynamic		11	21
	significant	4	8
Sex crime specific		14	14
	significant	4	3
General risk factors		13	21
	significant	4	7

Static General Risk Factors – AUC

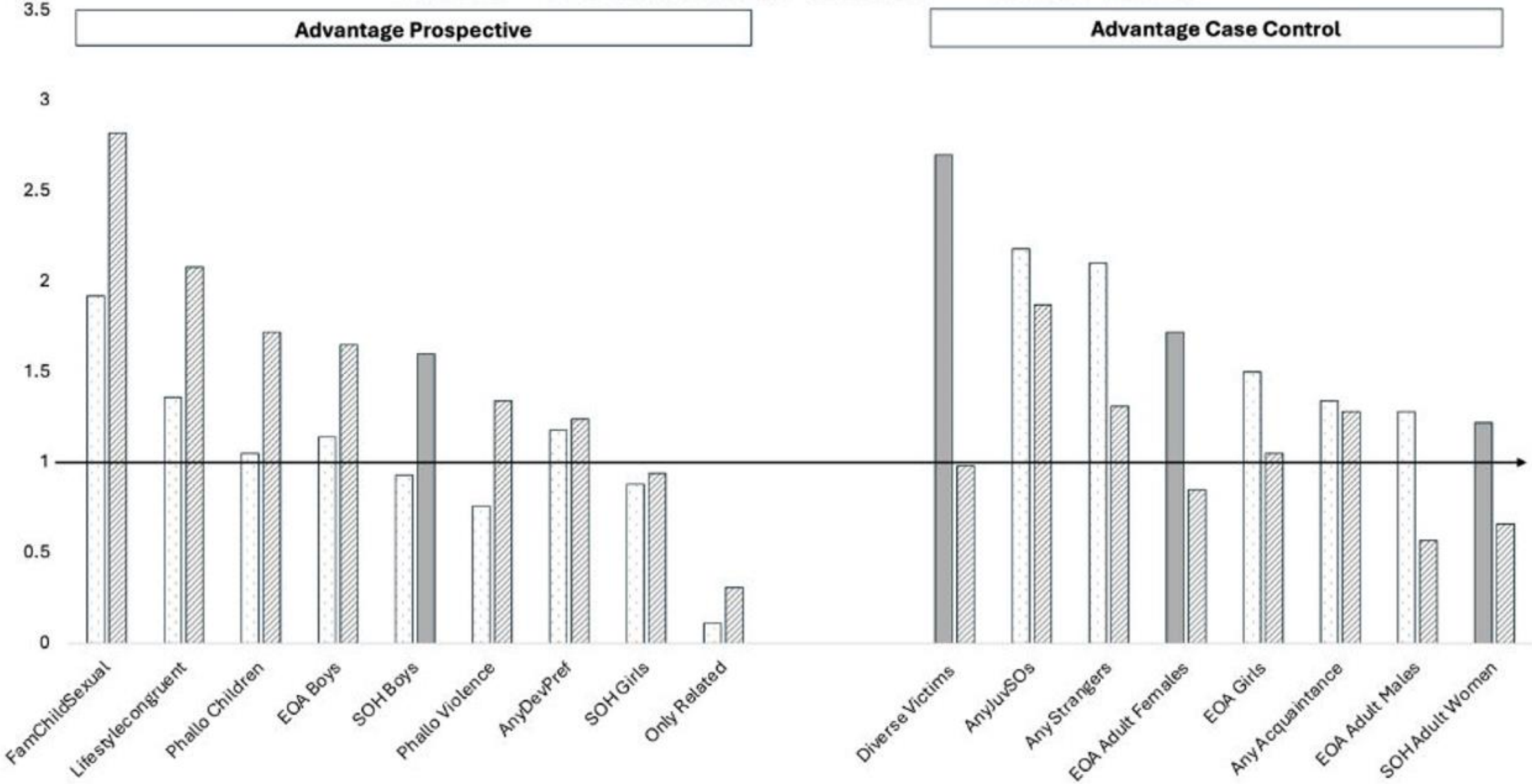


STABLE - General Risk Factors – AUC

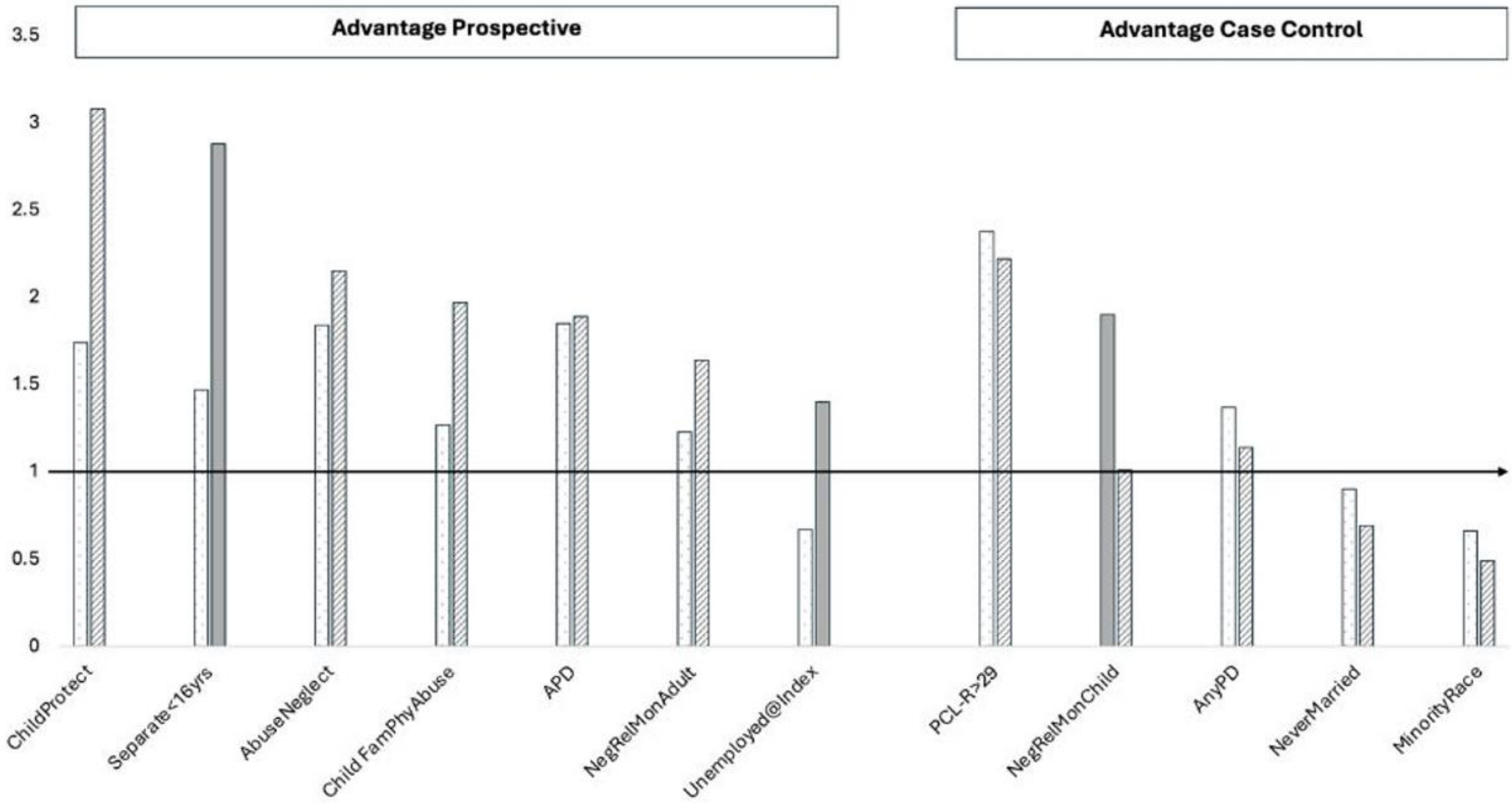



Static and Stable - Sexual Risk Factors – AUC
Static
Stable
Advantage Prospective
Advantage Case Control
Advantage Prospective
Advantage Case Control
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
RRASOR
NumPriorSOs
NumParaphili...
NumTotVictims
Victim Access
Rape Attitudes
AssocSexOff
TypEmpProb
SexEntitlement
ChildMolestAtt
SexPreoccup...

Static - Sexual Risk Factors – Odds Ratio



Static General Risk Factors – Odds Ratio



Conclusions

- Case-control and prospective cohort designs can provide similar information on risk factors for sexual recidivism;
- It is hard to anticipate the effects of matching on specific factors in case-control studies;
- The sexual recidivism risk and protective factors identified through both designs are largely consistent with the broader literature on sexual recidivism risk.

Researchers can and should use case-control studies for low frequency outcomes related to crime and violence

An Example of Case-Control Designs to Elucidate Risk Factors for the Onset of Offending

Kelly M. Babchishin

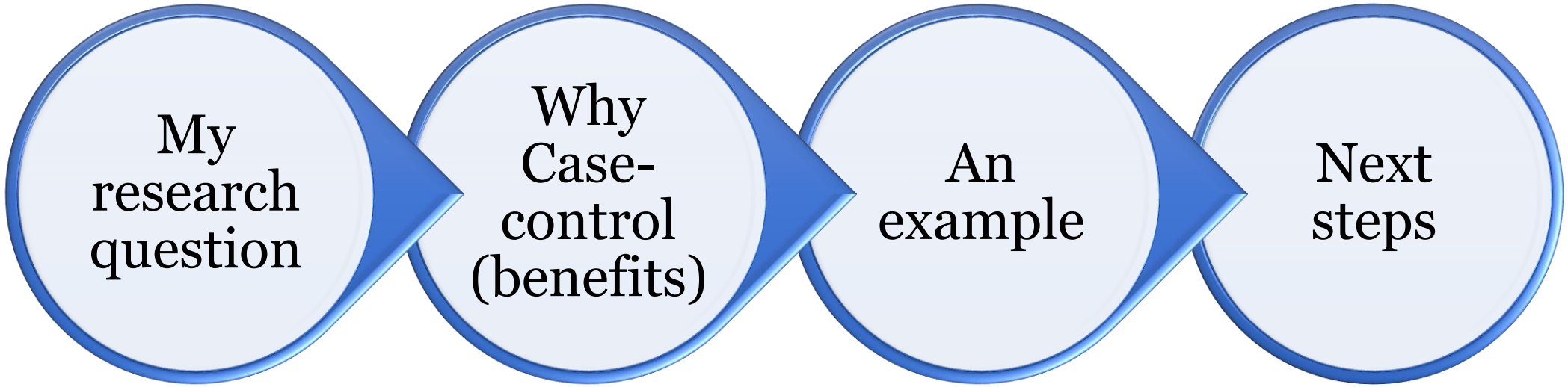
Kelly.Babchishin@carleton.ca

SEXUALLY HARMFUL BEHAVIOURS Research Lab

CPA, Ottawa, ON, June 23, 2024

Carleton University

Today's talk


My research question
Why Case-control (benefits)
An example
Next steps

Research Question

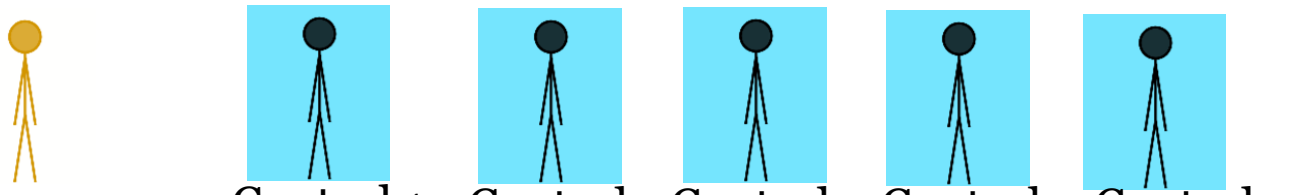
- Does psychiatric diagnoses and neurological diagnoses predict the onset of sexual offending?
  - Account for comorbidity

Data

- Swedish registry data
  - Crime info
    - National Crime Register
    - Criminal Suspect Register
  - Diagnoses
    - National Patient Register (outpatient consultations, general practitioners, hospitals)
    - ICD

Method

- Each case (sex offence) matched with 5 controls

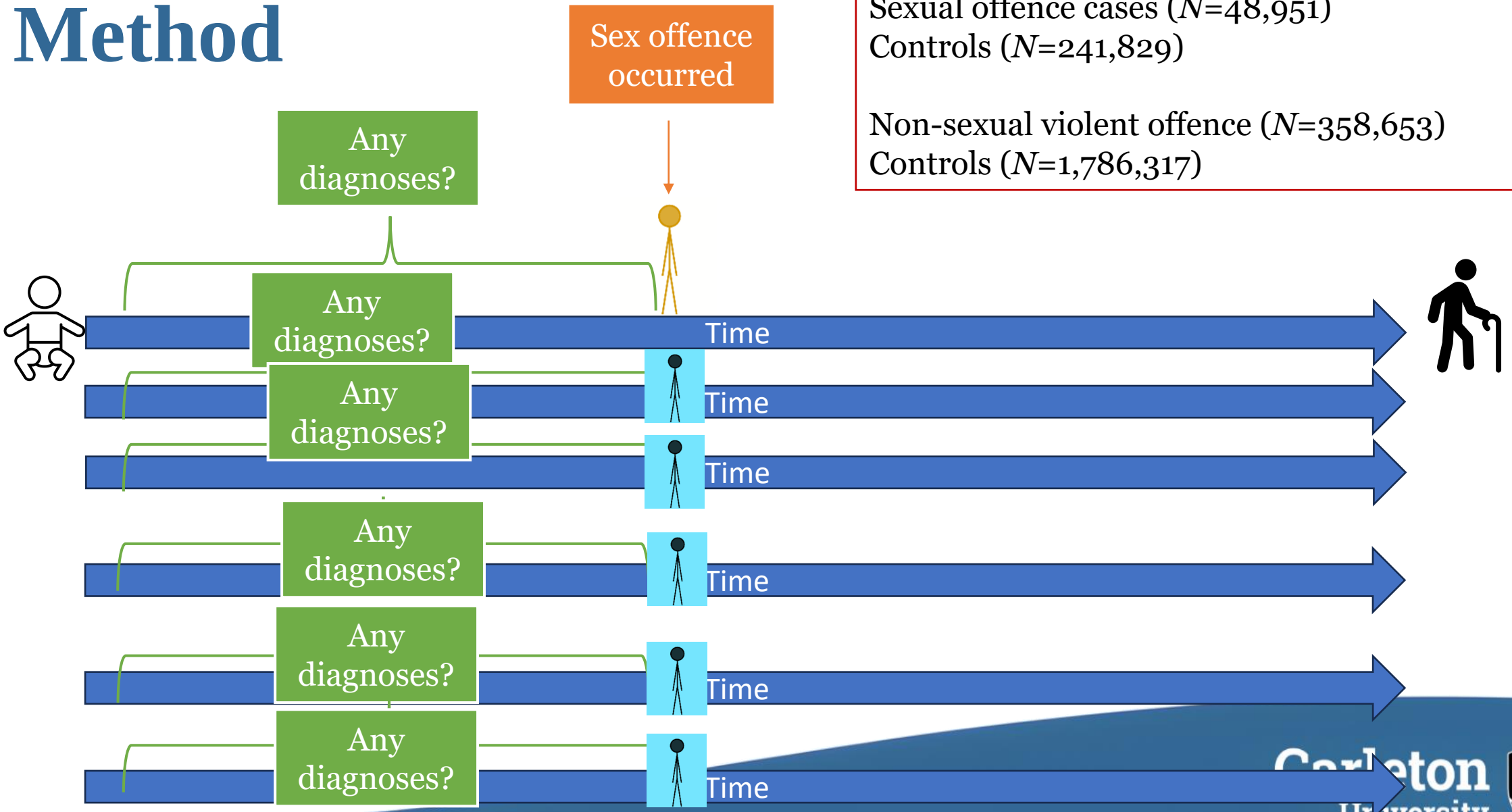


Not convicted for a sex offence
AND
are matched on sex, birth year, year of immigration (when applicable), and county of birth in Sweden.

Method

Sexual offence cases (*N*=48,951)
Controls (*N*=241,829)

Non-sexual violent offence (*N*=358,653)
Controls (*N*=1,786,317)



Measure

- ICD diagnoses

Any severe mental disorder
Affective disorder
Personality disorder
Psychotic disorder
Any substance use-related disorder
Alcohol use disorder
Drug use disorder
Any self-harm or suicide attempt
Any neurological disorder
Concussion
Epilepsy
Traumatic brain injury

Nested case-control design

- Why?
  - Helpful for rare outcomes
  - Better assessment of ‘causality’
  - No recall bias, and temporal order is confirmed (based on registry data)
  - Ability to adjust for confounders
  - Why 5?
    - More statistical power

- But also: there is multiple ways to answer a research question, this study used one of multiple possible methods

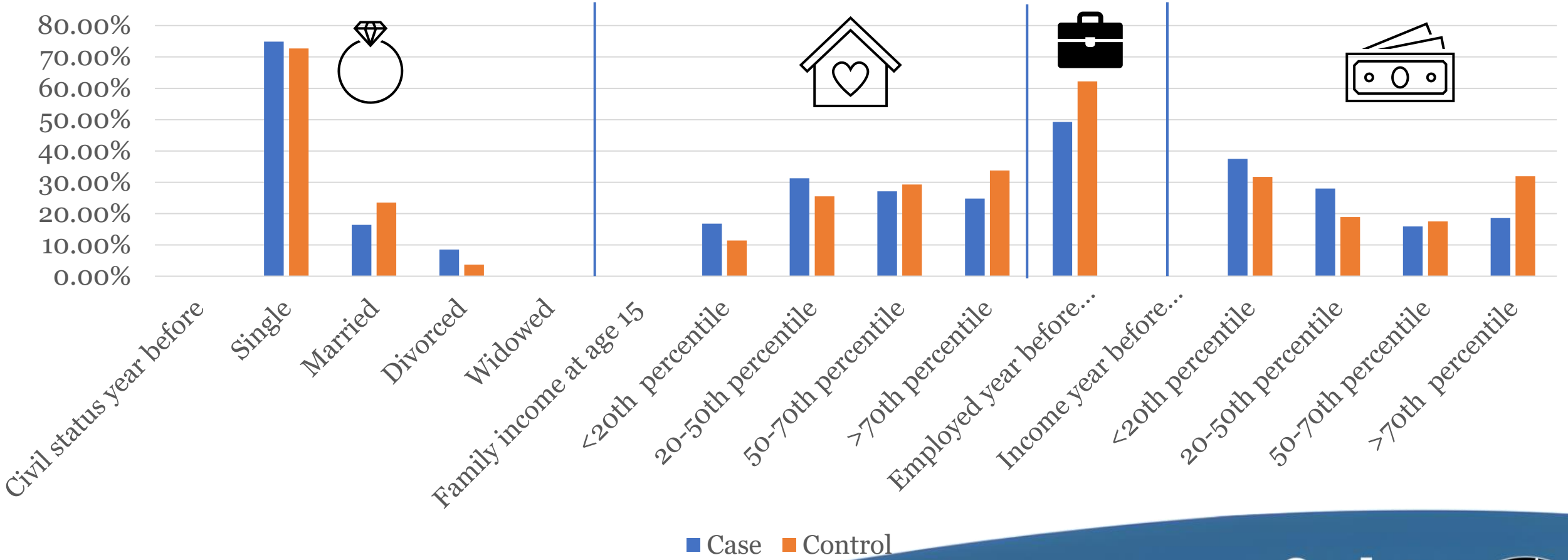
Matching- Proof of concept

- Groups has same birth year, immigration status, and age at index

	Case (SO)	Controls
Birth year	1975 (SD=10·7)	1975 (SD=10·6)
Born abroad	34·6% (16,946)	34·8% (84,136)
Age at index offence, yrs	28·6 (SD=9·7)	28·6 (SD=9·7)

- Groups differ on civil status, family income, employment, and income year before the offence

Matching



Carleton University

Does psychiatric and neurological diagnoses predict the onset of sexual offending?

- How: by comparing those with a sex offence vs. those without a sex offence on psychiatric diagnoses using a case control design
- Conditional logistic regression
  - Odds ratio: odds of being identified a sex offence case vs. a control case
- Sensitivity analyses: rerun this but for nonsexual violent offence

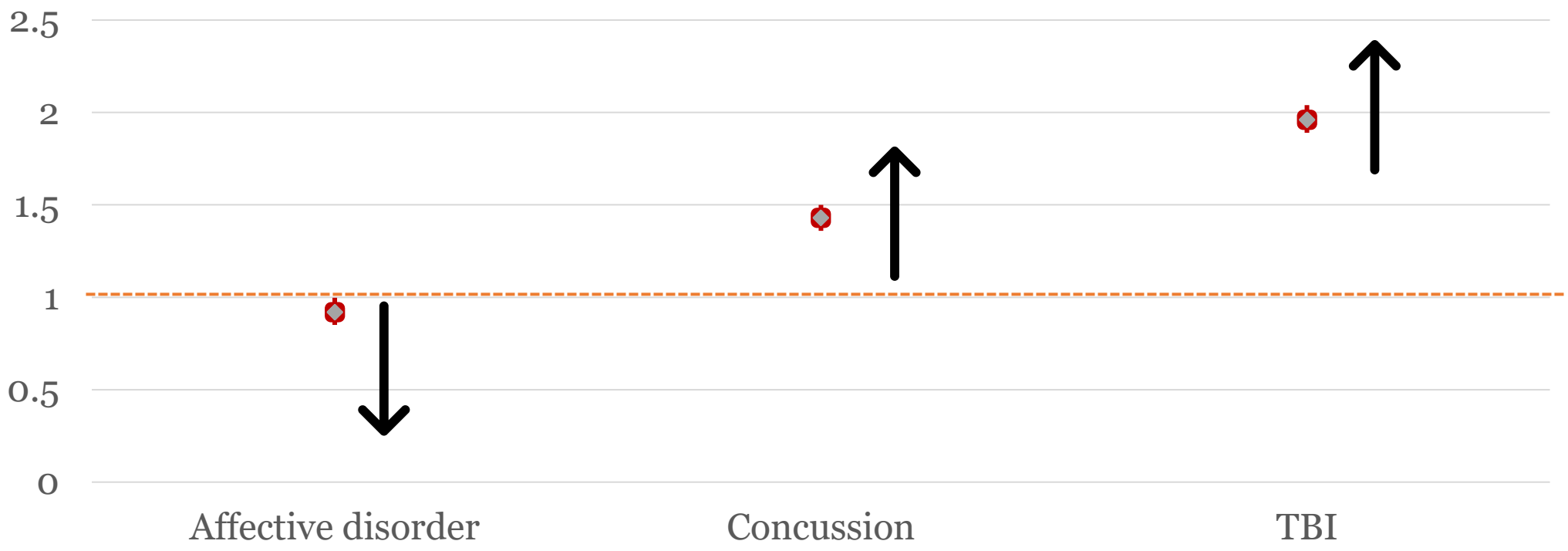
Findings

- All diagnoses significant (+) predictors of the onset of sexual and violent offending

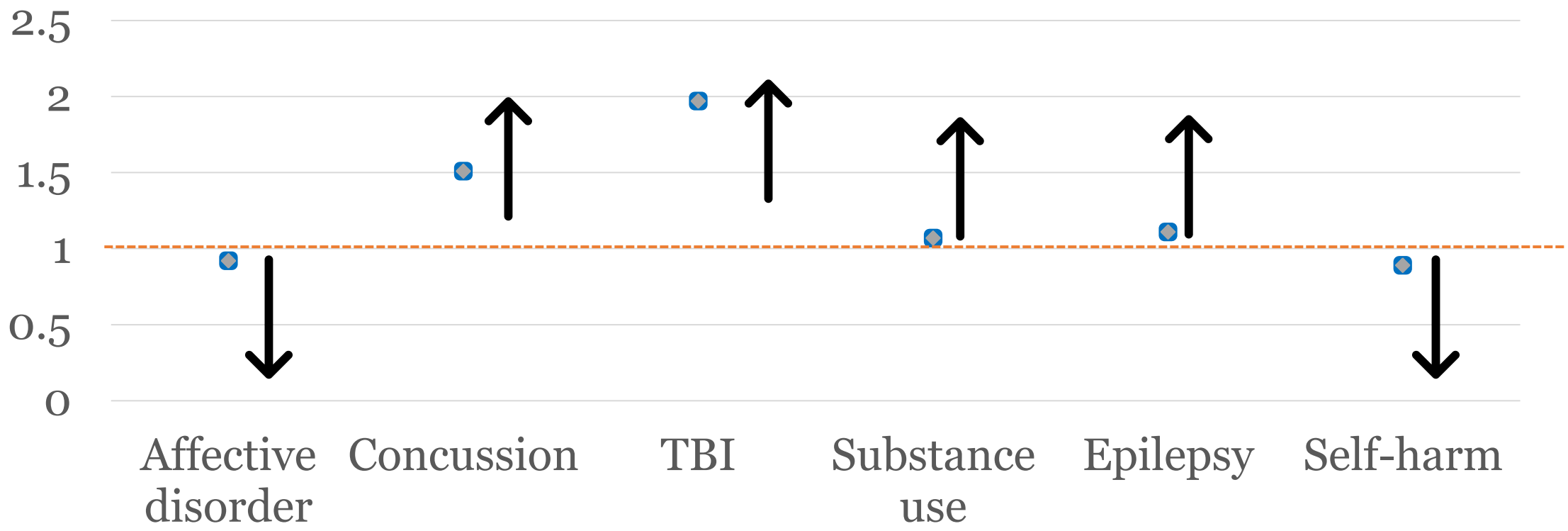
- Which ones are unique predictors?

Any psychiatric disorder
Any severe mental disorder
Affective disorder
Personality disorder
Psychotic disorder
Any substance use-related disorder
Alcohol use disorder
Drug use disorder
Any self-harm or suicide attempt
Any neurological disorder
Concussion
Epilepsy
Traumatic brain injury

Sex offending



Violent offending



Summary of Findings

- Affective disorders associated with a reduction in sexual and nonsexual offences, after accounting for other diagnoses
- Neurological disorders are most predictive of offending
- ORs are not large

Summary of Findings

- Personality disorder did not survive!
  - Why?
    - Only available at the category level (do not have info at the cluster level)
      - Prevalence in Gen pop: Cluster A > Cluster C > Cluster B
    - Impulsivity may the driving force, accounted for by other diagnoses?

Limitations

- Registry data may be better than self-report, but not free of bias
- Registry data used not detailed
  - e.g., antisocial PD vs. others
- Only matched on year of birth, sex, and born abroad (vs. here), county of birth
  - Groups differ on other risk-relevant factors, e.g., employment
- Need new data pull for each outcome of interest

Take home message

Some psychiatric and **neurological disorders** may create a **vulnerability** towards offending, but there is likely the need of **another element** to push someone towards offending

- e.g., neurological disorder + hypersexuality

Next Steps

- What are these elements?
  - Combine risk factors with diagnoses
- Replication with other registries
  - Substance use OR was lower than the literature, but we:
    - Did not include substance use crime
    - Accounted for comorbid diagnoses
- Examine PD separately

Thank you.

Questions?

Carleton University