Childhood adversity and mental health:

Insights into causality, measurement, and individual risk

Jessie Baldwin

Sir Henry Wellcome Postdoctoral Fellow

j.baldwin@ucl.ac.uk

@jessiebaldwin

Childhood adversity & mental health

Childhood adversity

Mental health

Childhood adversity & mental health

Childhood adversity

Causal?

Mental health

Childhood adversity & mental health

Childhood adversity

Measurement of adversity?

Mental health

Childhood adversity & mental health

Childhood adversity

Individual prediction?

Mental health

Childhood adversity & mental health

1. Causality
2. Measurement
3. Individual prediction

Childhood adversity & mental health

1. **Causality**
2. Measurement
3. Individual prediction

Child maltreatment & mental health

Maltreatment

Mental health

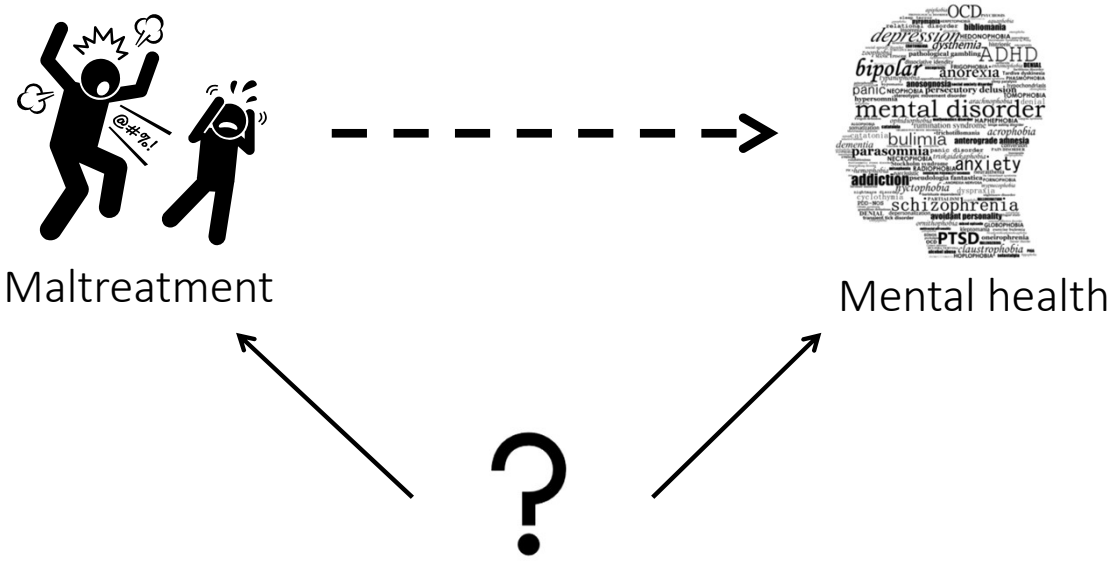
Child maltreatment & mental health

Maltreatment

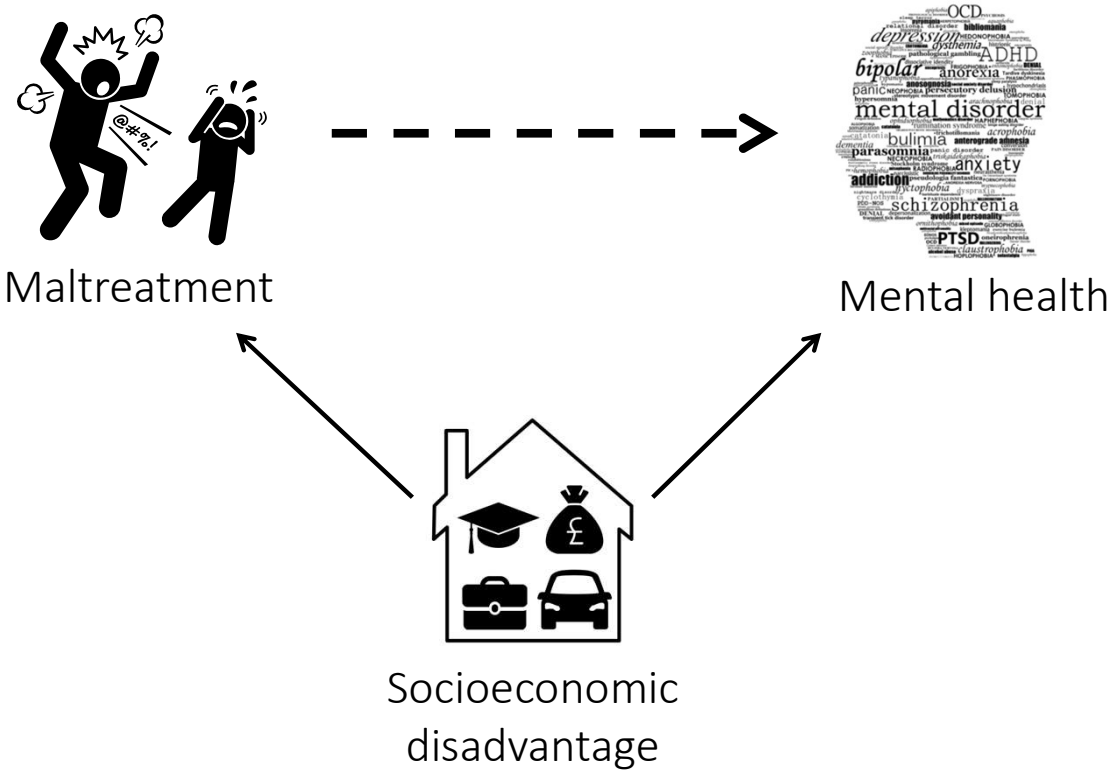
causal?

Mental health

Child maltreatment & mental health

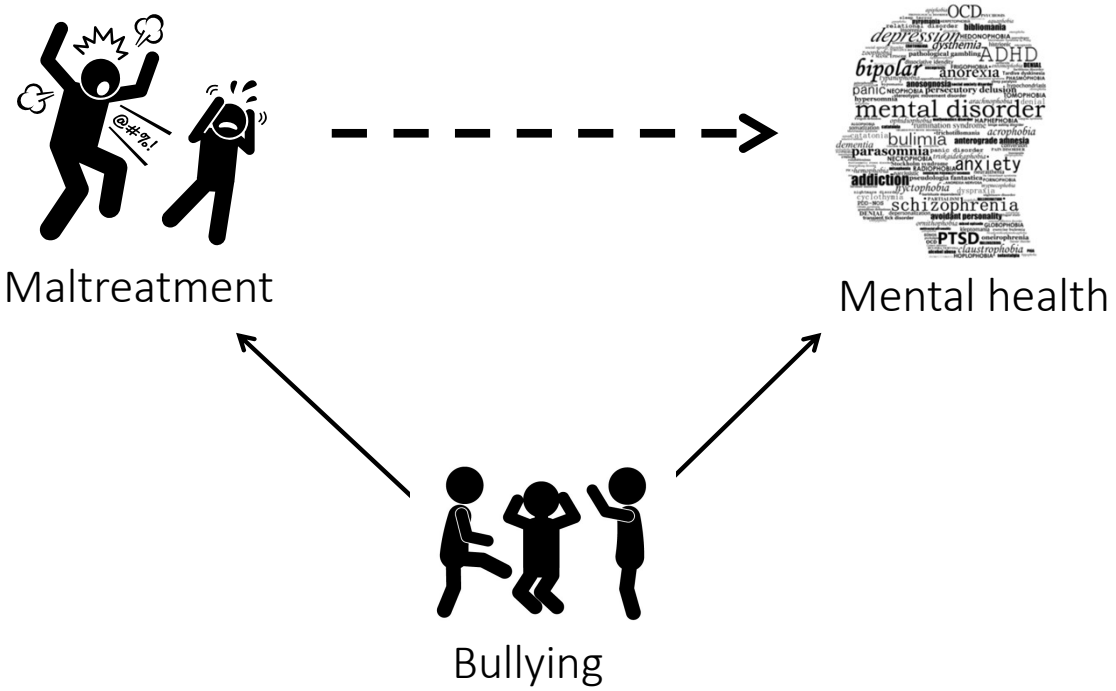


Child maltreatment & mental health



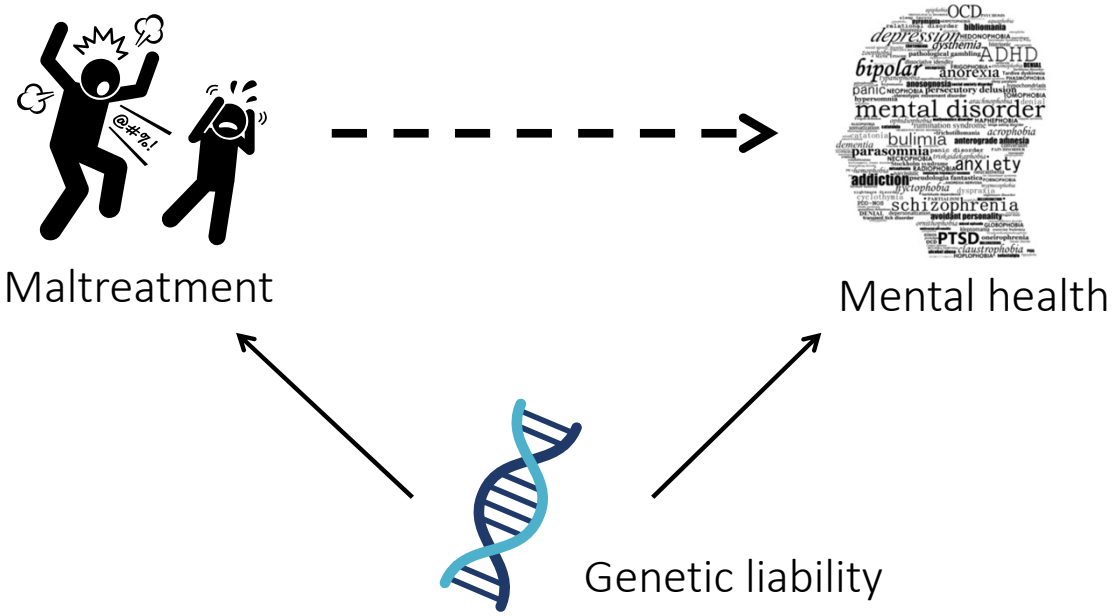
Sidebotham et al. (2001)

Child maltreatment & mental health



Baldwin et al. (2016)

Child maltreatment & mental health



Baldwin et al. (2022); Sallis et al. (2020)

Estimating causal effects of maltreatment on mental health

- Randomised Control Trials
  - The “gold standard” but not ethical or feasible

- Classical epidemiological methods (e.g., multiple regression) in observational studies
  1. Cannot control for unmeasured confounding (e.g., genetic influences)
  2. Relies on confounders being accurately measured

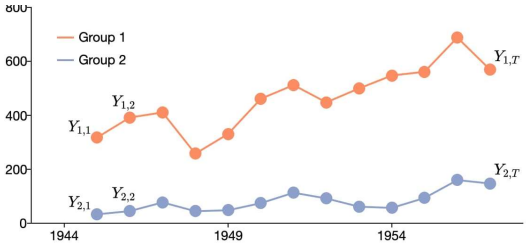
Quasi-experimental methods

1. Family-based designs

- Twin or sibling differences, Children of Twins design, and adoption studies
- Capitalise on varying genetic and environmental similarities between family members to account for familial confounding

2. Panel data designs

- Fixed-effects design, random intercept cross-lagged models
- Leverage longitudinal data to test whether within-individual changes in maltreatment exposure predict within-individual changes in mental health
- Accounts for time-invariant confounding



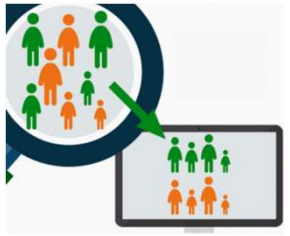
Quasi-experimental methods

3. Natural experiments

- Examine the effects of maltreatment that is caused by wider social or political processes, & is unrelated to individual/family risk factors
- E.g. English & Romanian Adoptee Study

4. Propensity score methods

- Propensity score matching, inverse probability weighting
- Mimic randomisation by removing confounding due to measured pre-existing differences between maltreated & non-maltreated individuals



Study aims

1. Meta-analyse the relationship between child maltreatment and mental health problems in **quasi-experimental studies**

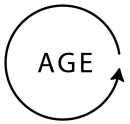
2. Test whether the relationship between child maltreatment and mental health problems differs depending on the level of adjustment for confounding (no adjustment vs quasi-experimental adjustment)

Search results

k = 34

N = 54,646

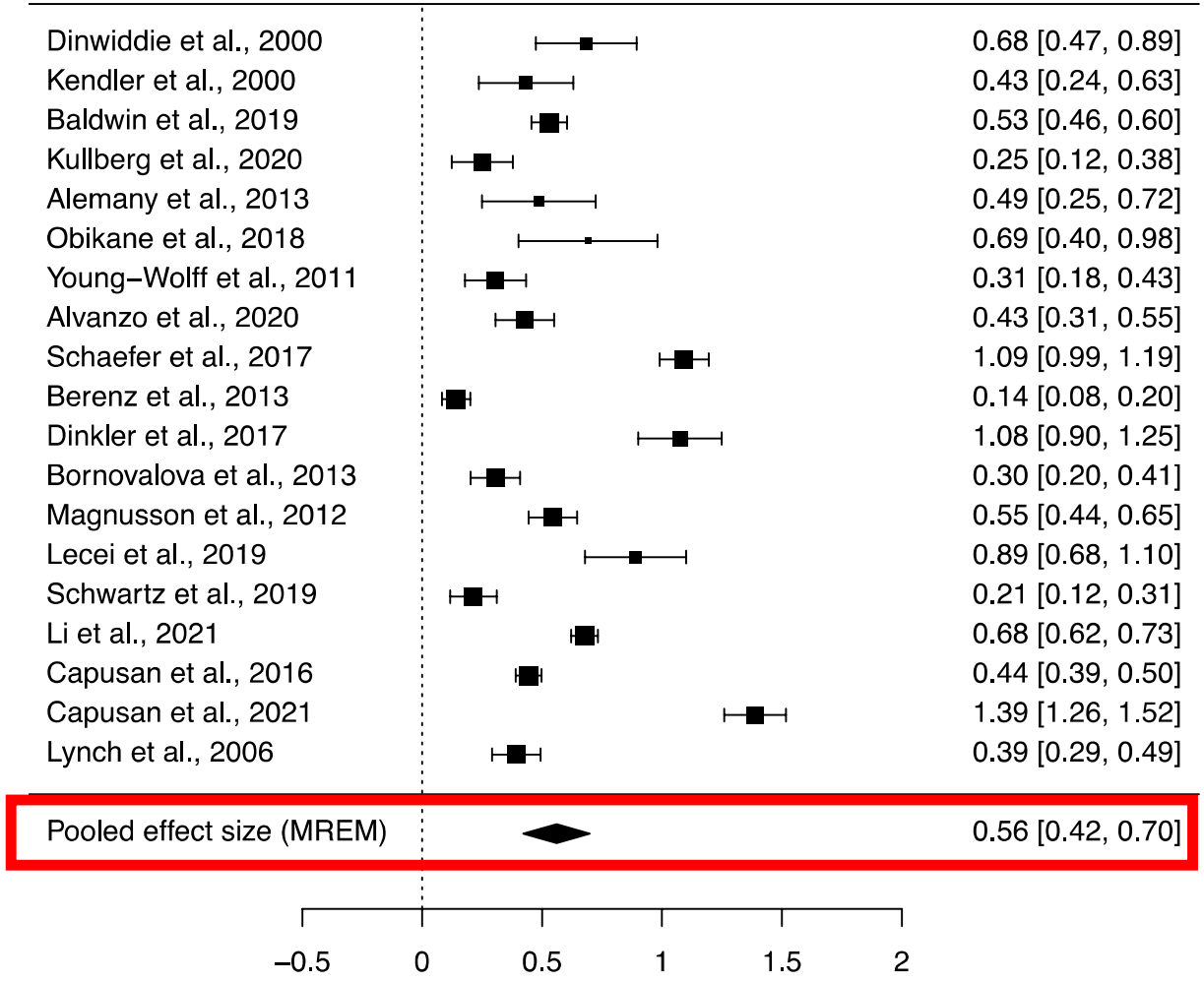
56%



29 years

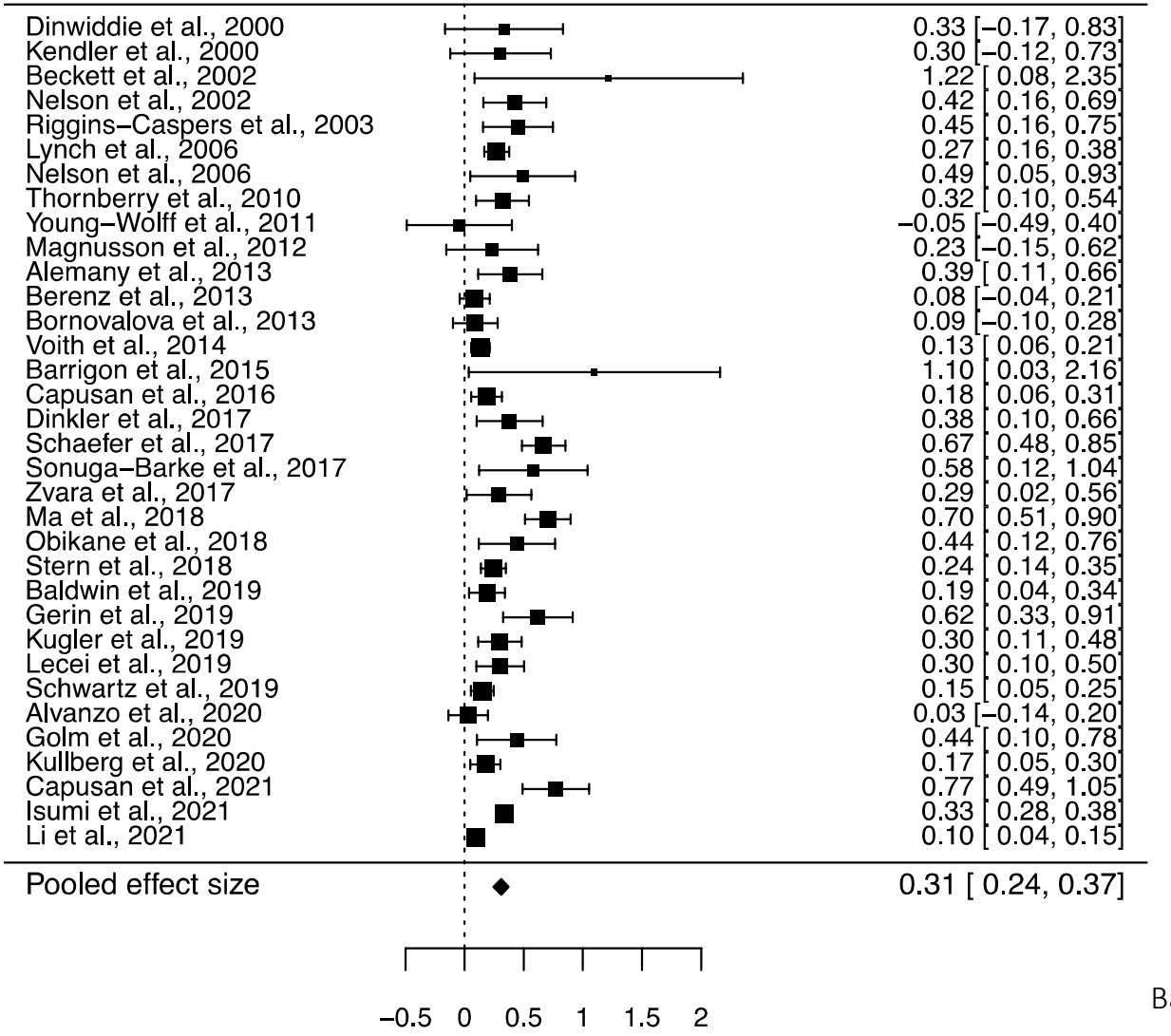
156 QE-adjusted;
103 unadjusted

What is the unadjusted association between child maltreatment and mental health problems?

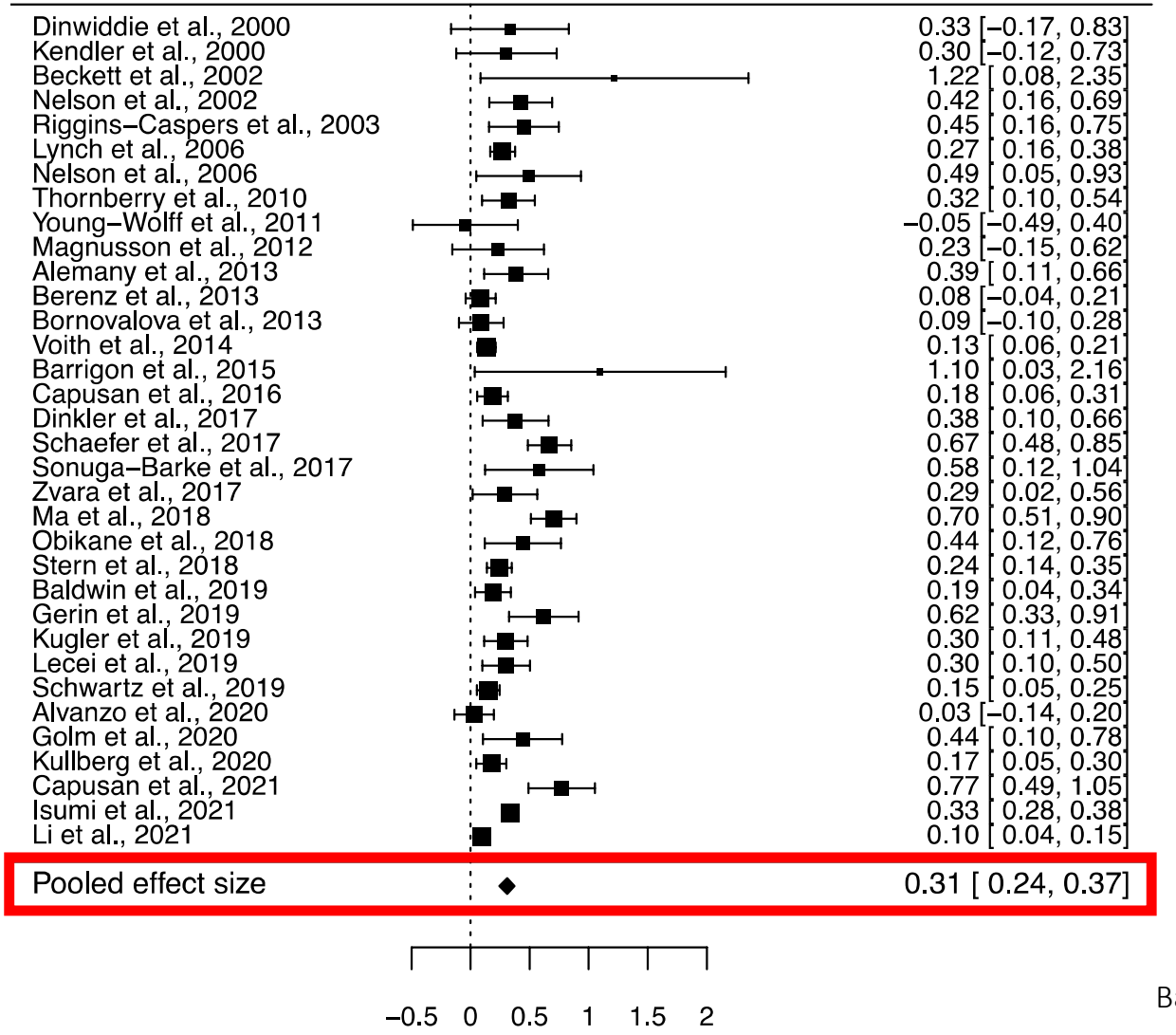


Baldwin et al. (2023), *Am J Psych*

What is the adjusted association between child maltreatment and mental health problems in quasi-experimental studies?



Baldwin et al. (2023), *Am J Psych*



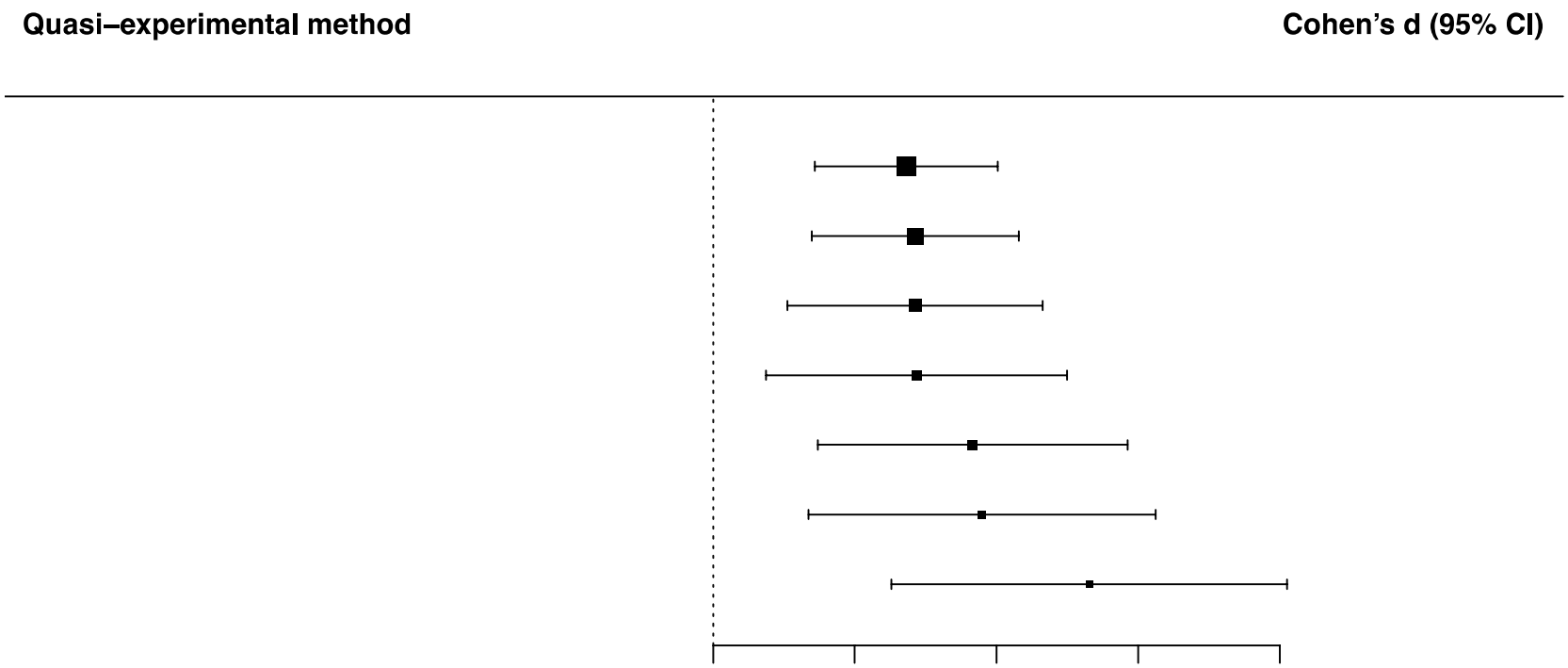
45% smaller effect size than in unadjusted analyses (d=0.56, p-value for difference = 0.004)

Baldwin et al. (2023), *Am J Psych*

Type of quasi-experimental method

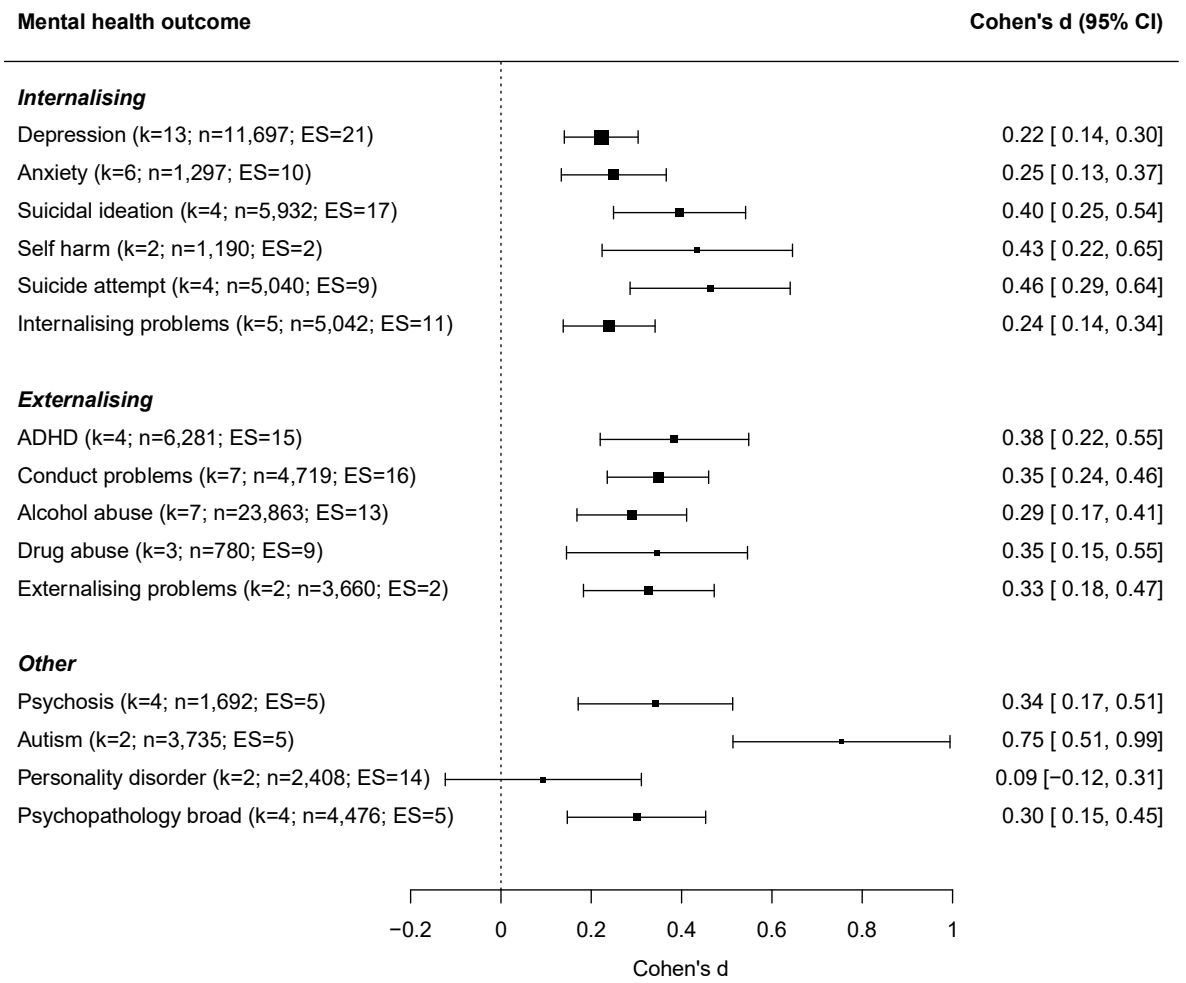
Quasi–experimental method

Type of quasi-experimental method



p-value = 0.75

Type of mental health outcome



p-value = 0.07

Discussion

Meta-analysis of 34 quasi-experimental studies (54,646 individuals)

Causality

- Child maltreatment had a small relationship with mental health problems in quasi-experimental studies
- Findings consistent across multiple quasi-experimental designs
- Evidence consistent with small causal effect, which could have far-reaching consequences

Confounding

- Association between child maltreatment and mental health in quasi-experimental adjusted models was 45% smaller than in unadjusted models
- Large part of the relationship between maltreatment and mental health is confounded by pre-existing risk factors for psychopathology

Implications

Prevention

- Primary prevention of maltreatment should prevent a proportion of cases of mental health problems in the population
- Secondary prevention - holistic clinical approach to address maltreatment experience & wider risk factors for mental illness

Future research

- Highlights value of using quasi-experimental designs to estimate causal effects in observational data
- Future quasi-experimental research could examine causal effects of child maltreatment on physical health outcomes, or causal effects of other forms of childhood adversity

Childhood adversity & mental health

1. Causality

2. **Measurement**

3. Individual prediction

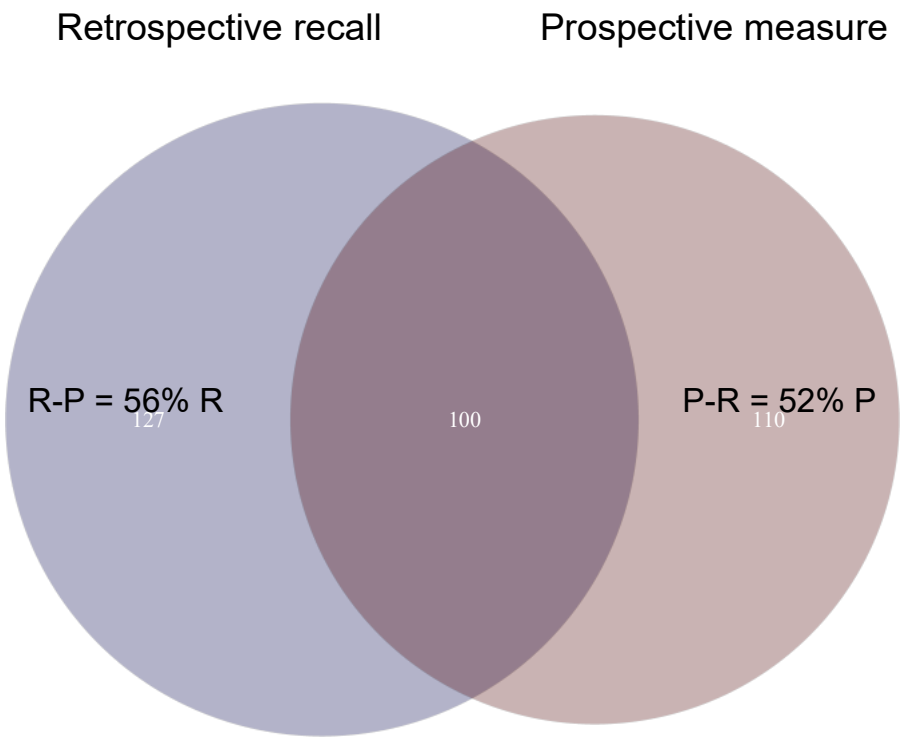
Childhood adversity & mental health

Childhood adversity

Measurement of childhood adversity?

Mental health

Measurement of childhood adversity



Retrospective self-reports of childhood maltreatment showed **poor agreement** with prospective measures (**kappa=0.19**)

Baldwin et al. (2019), *JAMA Psych*

Measurement of childhood adversity and mental health

nature human behaviour

ARTICLES

https://doi.org/10.1038/s41562-020-0880-3

Check for updates

Objective and subjective experiences of child maltreatment and their relationships with psychopathology

Andrea Danese [1,2,3] ✉ and Cathy Spatz Widom [4,5] ✉

Development and Psychopathology **29** (2017), 1823–1837

doi:10.1017/S0954579417001420

In the eye of the beholder: Perceptions of neighborhood adversity and psychotic experiences in adolescence

JOANNE B. NEWBURY,[a] LOUISE ARSENEAULT,[a] AVSHALOM CASPI,[a,b] TERRIE E. MOFFITT,[a,b] CANDICE L. ODGERS,[b] JESSIE R. BALDWIN,[a] HELENA M. S. ZAVOS,[a] AND HELEN L. FISHER[a]
[a]*King's College London; and* [b]*Duke University*

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ELSEVIER

Peer and self-reports of victimization and bullying: Their differential association with internalizing problems and social adjustment ☆

Thijs Bouman [a,*], Matty van der Meulen [b], Frits A. Goossens [c], Tjeert Olthof [d], Marjolijn M. Vermande [e], Elisabeth A. Aleva [f]

Research aims


Emma Francis

Systematically summarise the literature to examine:

1. Whether subjective self-reports of childhood adversity are associated with mental health problems, independent of more objective measures.

2. Whether objective measures of childhood adversity are associated with mental health problems, independent of subjective measures.

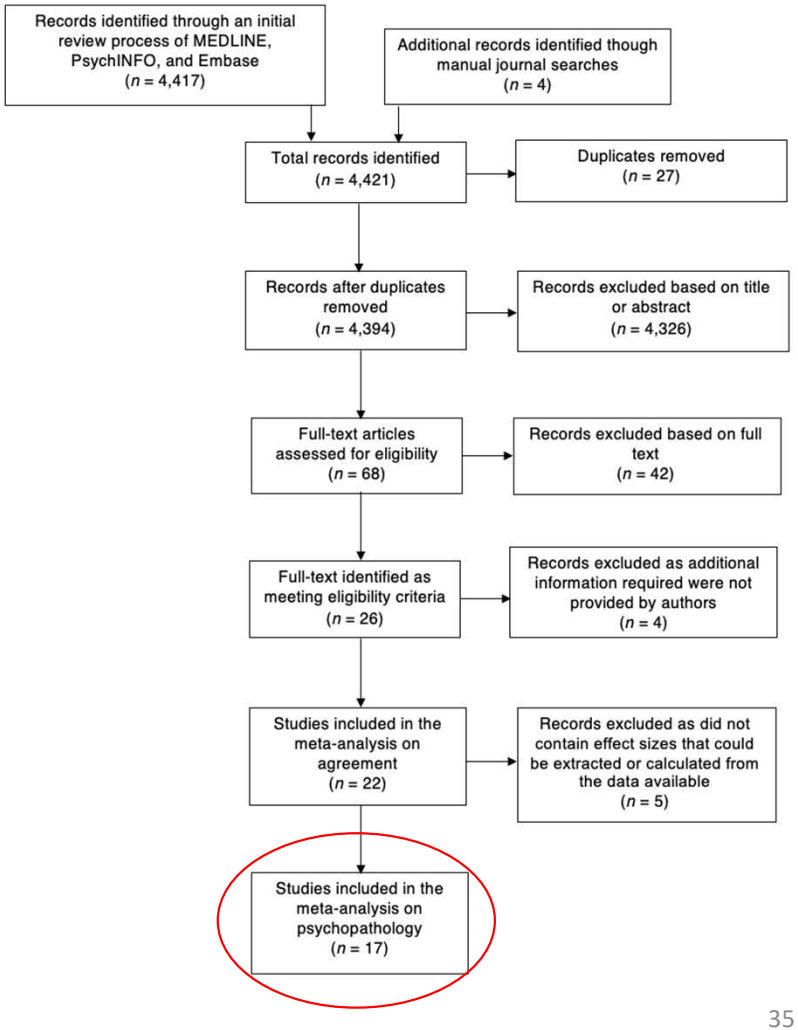
Methods

- Pre-registered systematic review and meta-analysis
- Inclusion criteria:
  - Objective measures of child adversity = official records or reports from multiple informants unrelated to the target individual
  - Subjective measures of child adversity = self-reports
  - Examine associations with mental health problems
- Searched in Embase, Medline, and PsycInfo

Results

17 studies identified (N=14,789):
15 independent cohorts
54% female

Maltreatment (k=6; 188 effect sizes)
Bullying (k=9; 90 effect sizes)
Neighbourhood adversity (k=2; 4 effect sizes)

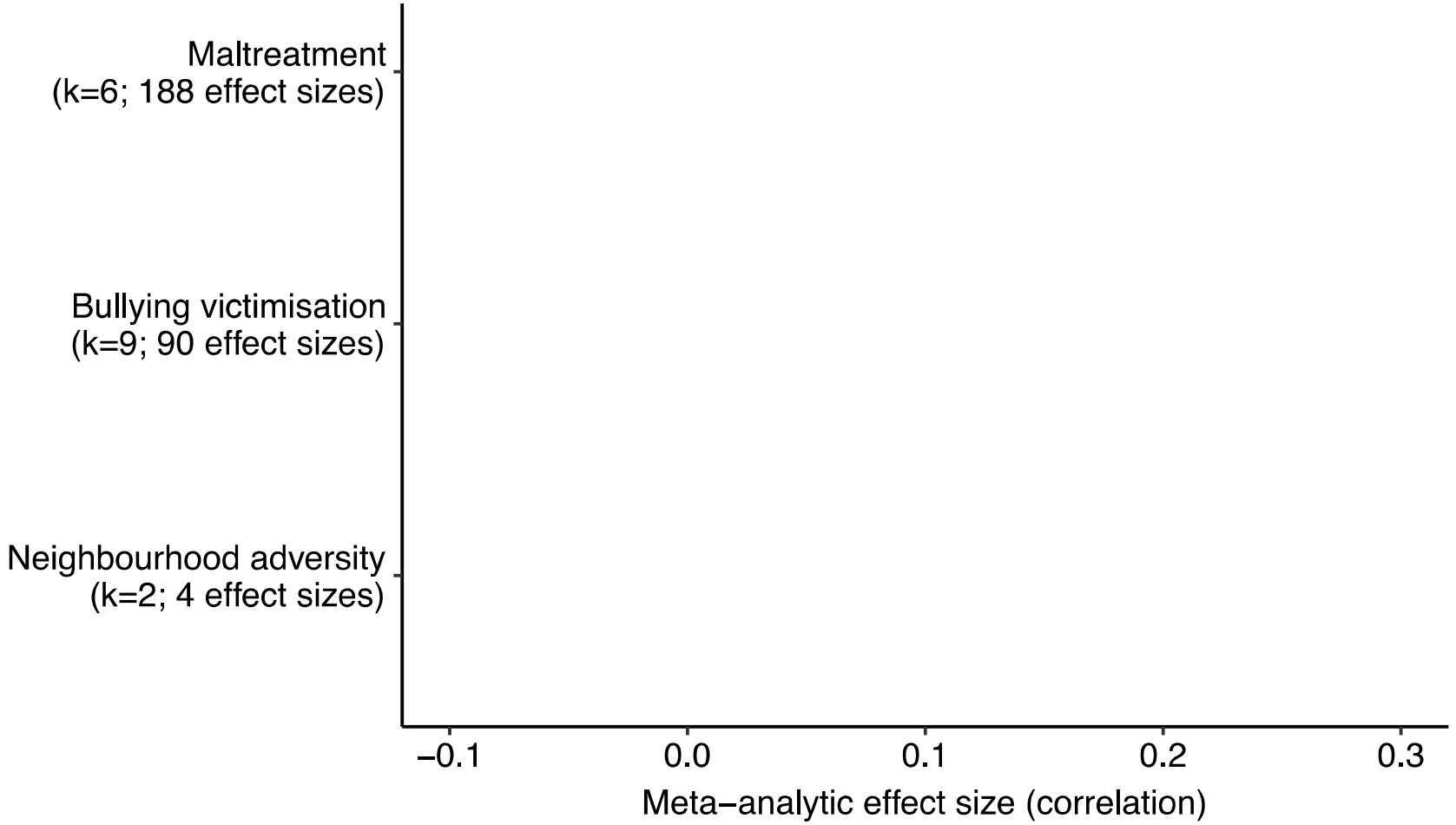


PRISMA Flow Diagram Depicting Selection of Studies

Are subjective measures of childhood adversity associated with mental health problems, independent of more objective measures?

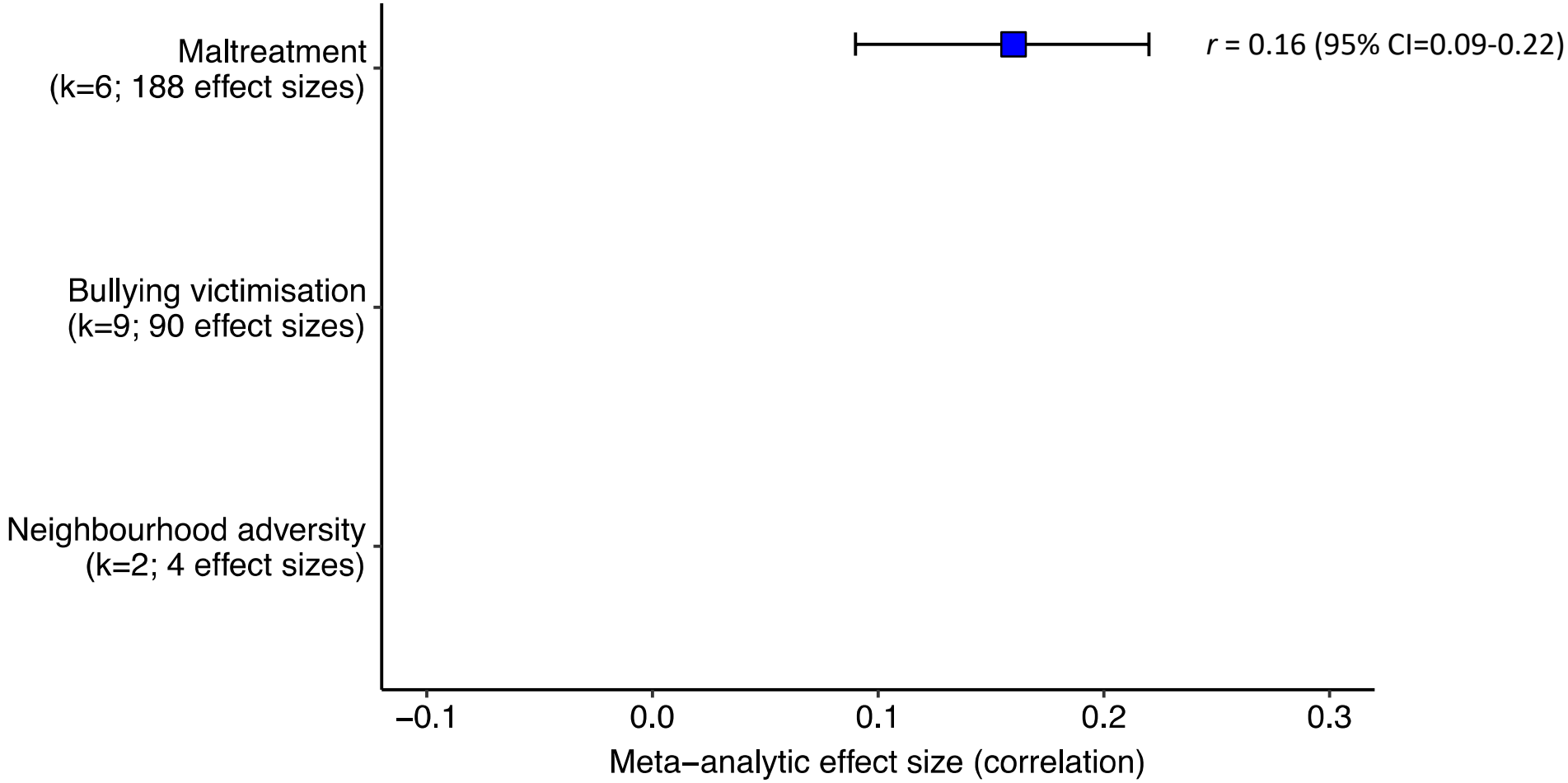
Subjective measures of child adversity & mental health

Independent of objective measures



Subjective measures of child adversity & mental health

Independent of objective measures



Subjective measures of child adversity & mental health

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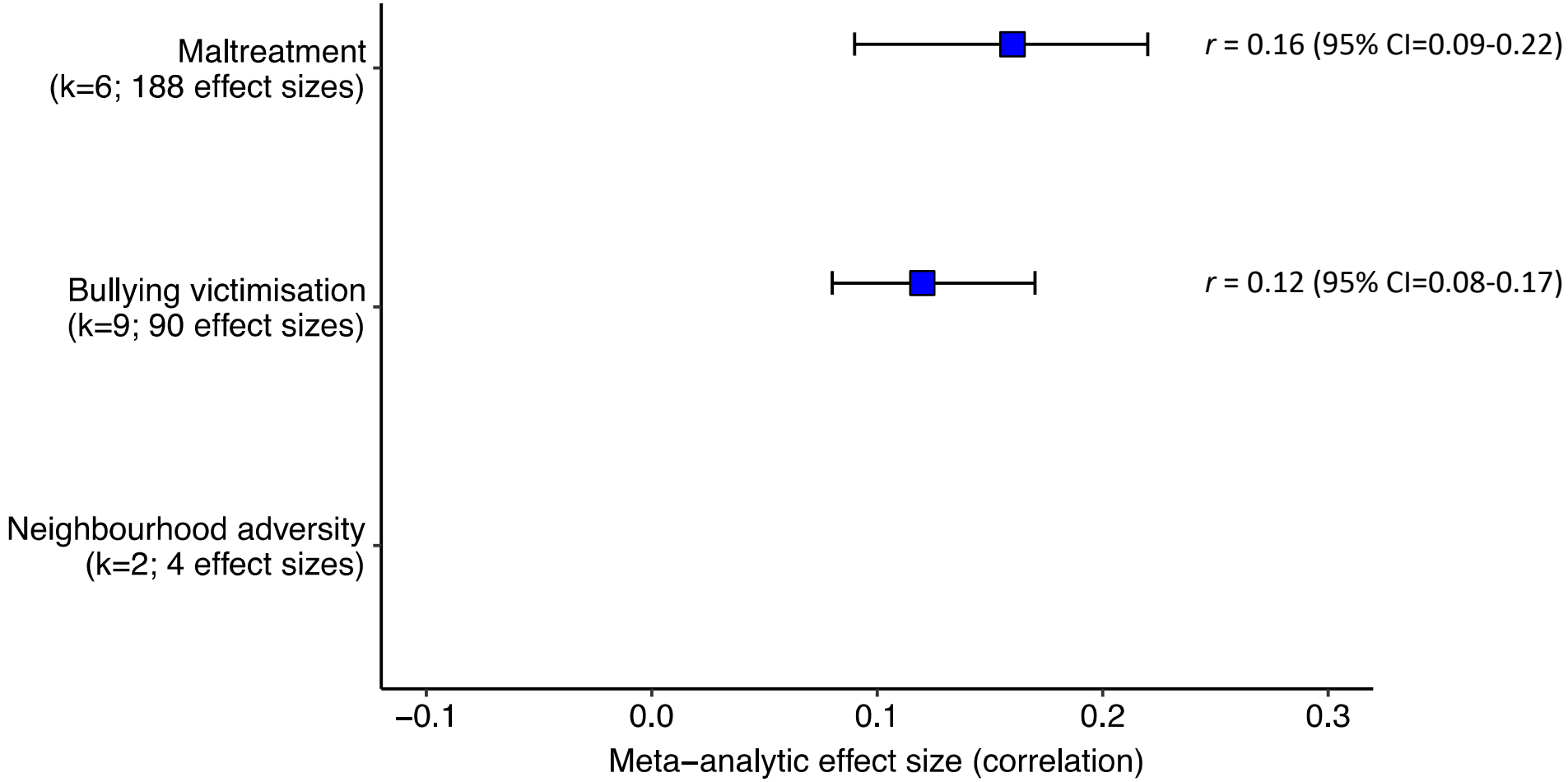
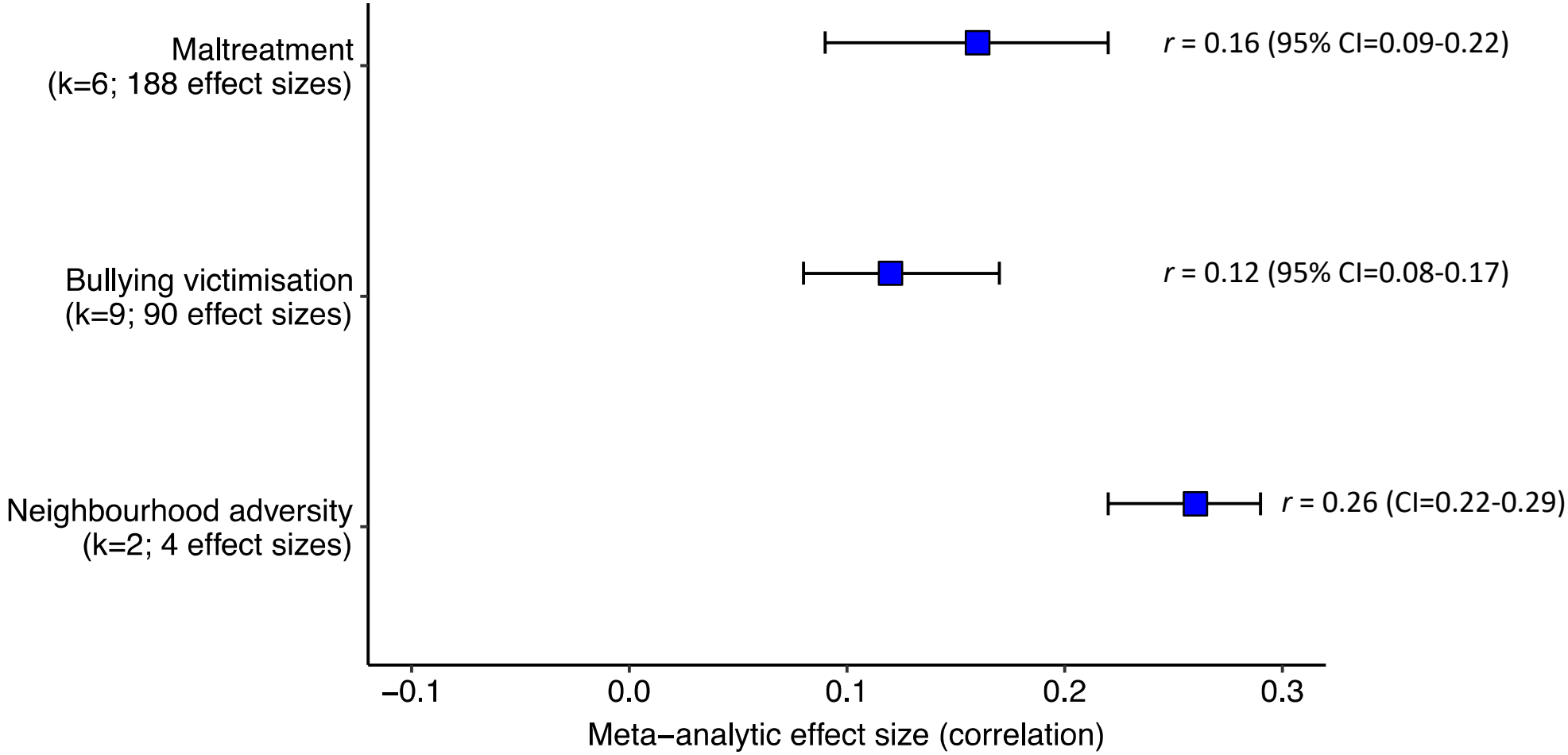


Subjective measures of child adversity & mental health

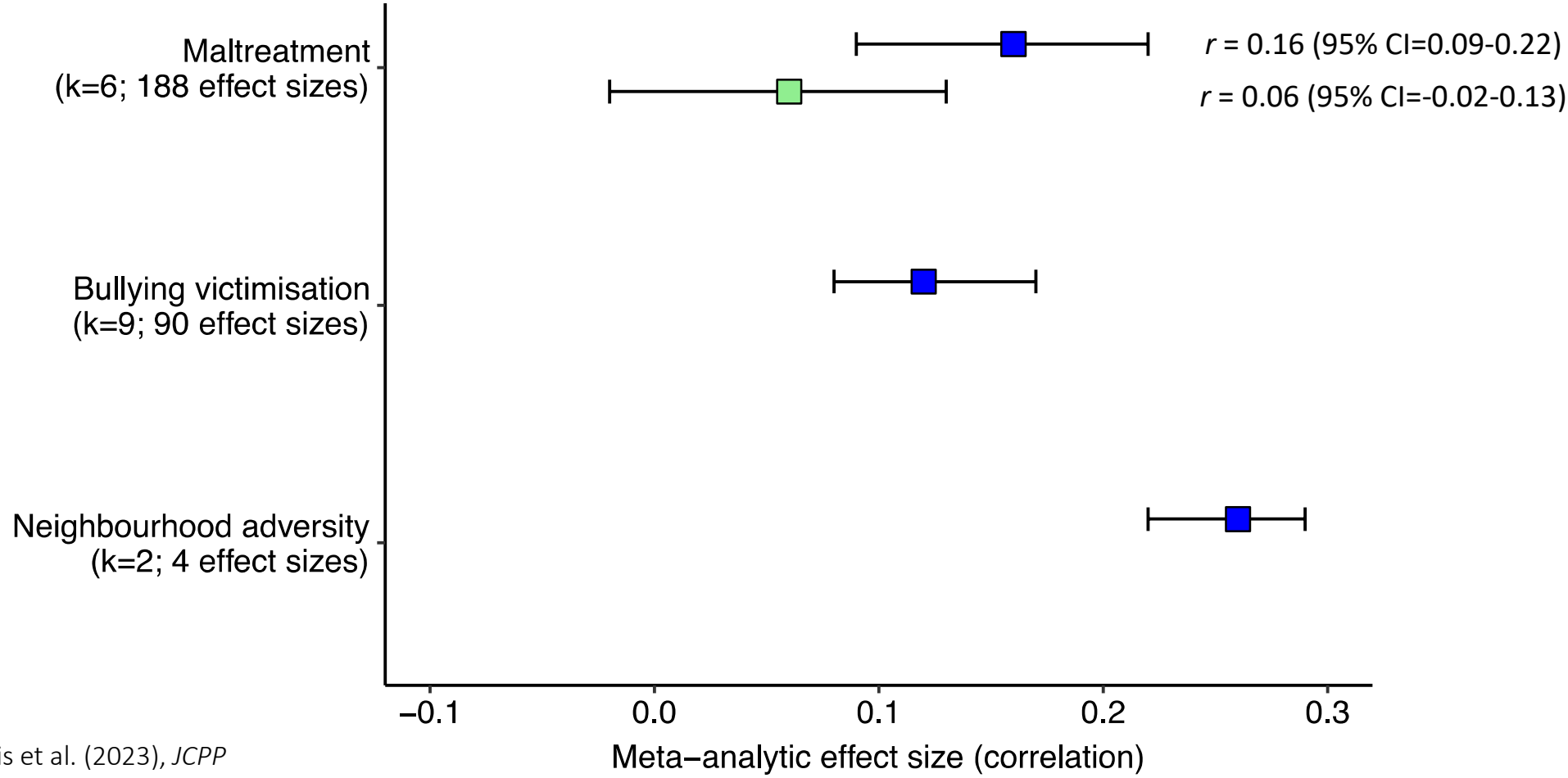
Independent of objective measures



Are objective measures of childhood adversity associated with mental health problems, independent of subjective measures?

Objective measures of child adversity & mental health

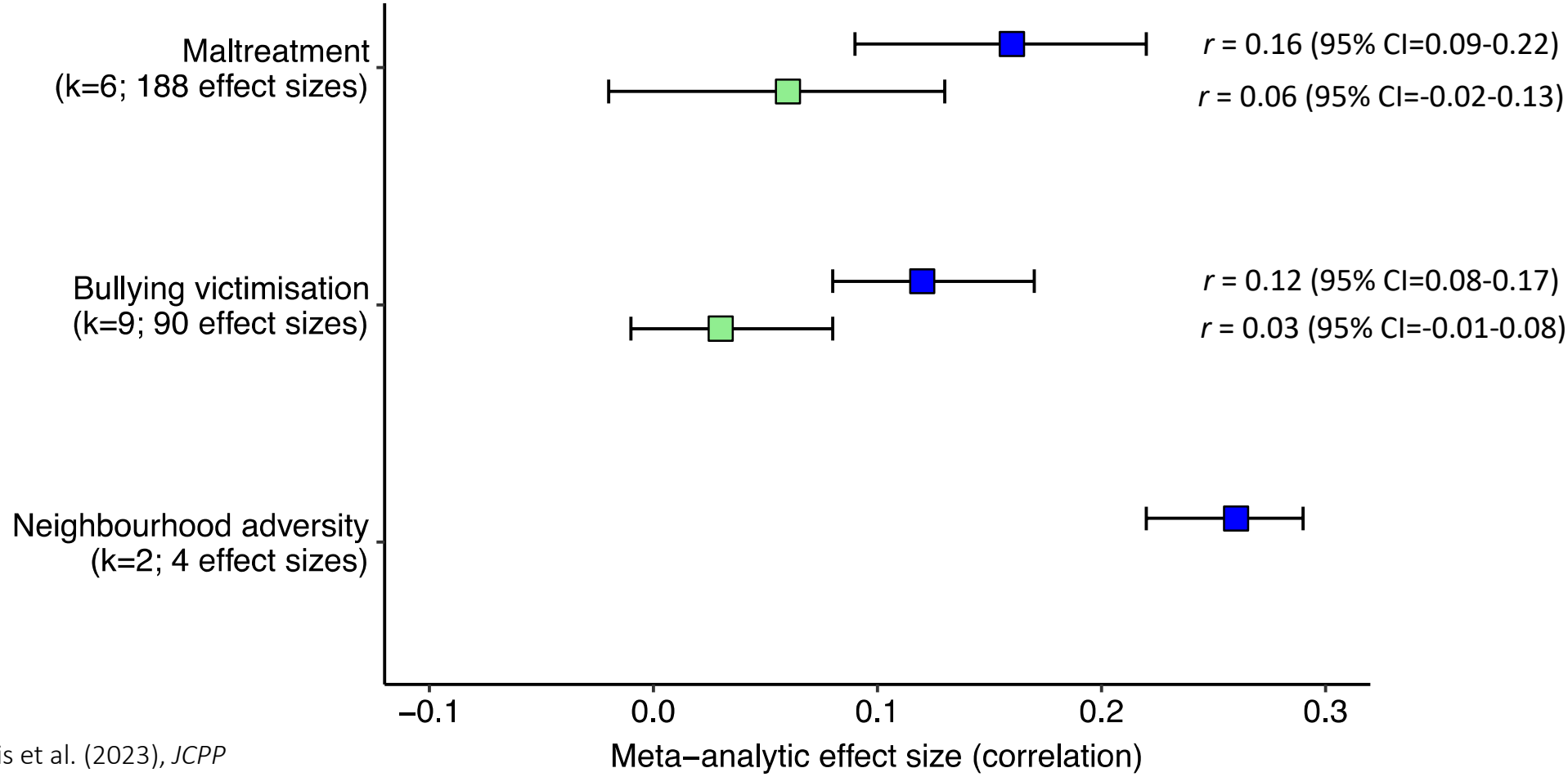
Independent of subjective measures



Francis et al. (2023), *JCPP*

Objective measures of child adversity & mental health

Independent of subjective measures



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Objective measures of child adversity & mental health

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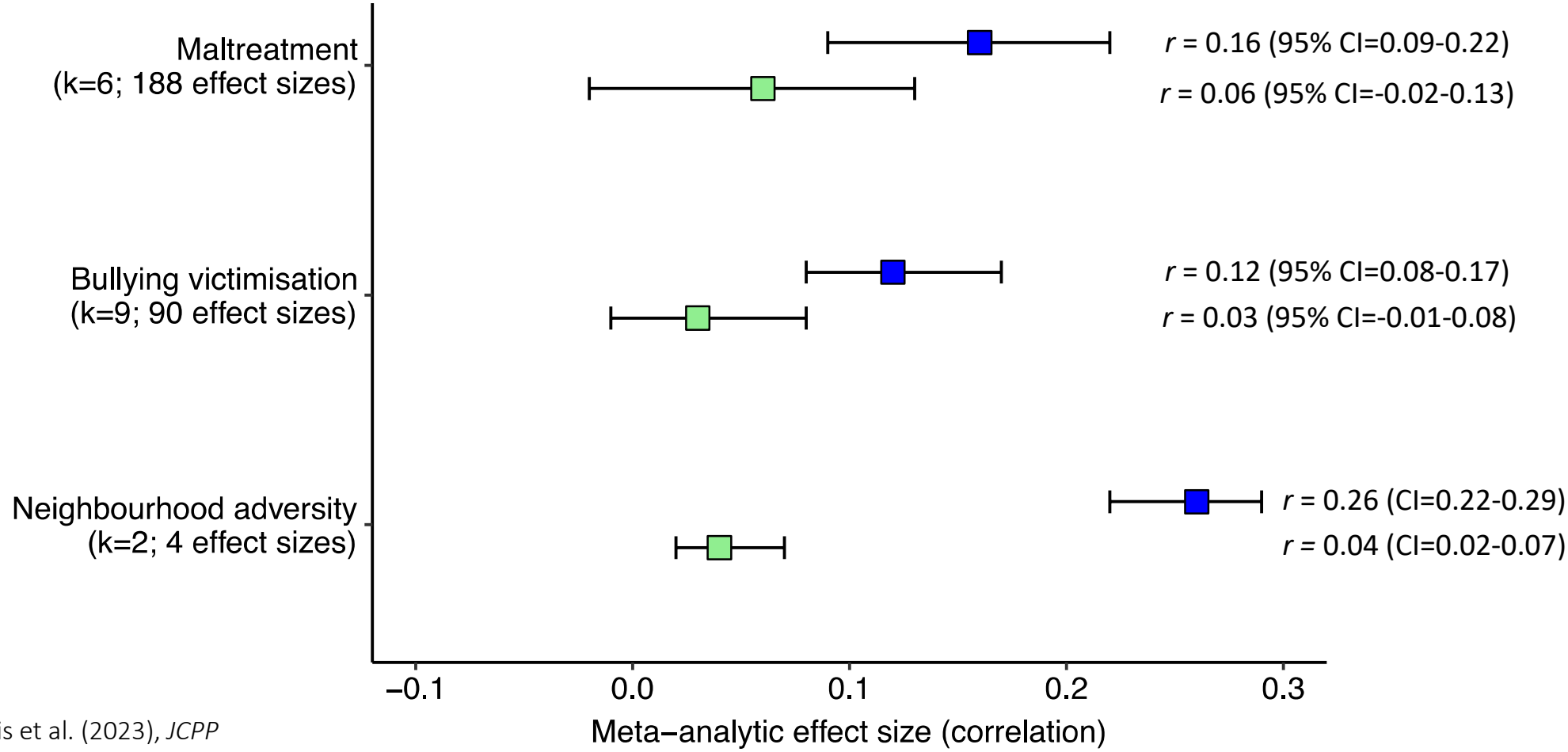


Francis et al. (2023), *JCPP*

Discussion

- Subjective measures of childhood adversity were associated with psychopathology, independent of corresponding objective measures.

- Objective measures of childhood adversity had null or very small associations with psychopathology, independent of subjective measures.

- Subjective reports of childhood adversity may be more strongly associated with psychopathology than objective measures due to:
  - Perceptions / memories of childhood adversity mediating the effects of objective experiences on mental health
  - Bias in self-reports (e.g., recall bias, shared method variance) or confounding

Childhood adversity & mental health

1. Causality
2. Measurement
3. **Individual prediction**

Adverse childhood experiences & mental health

ACEs

Individual prediction?

Mental health

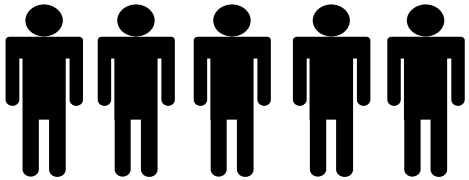
Screening for adverse childhood experiences

- Aims to identify at-risk children and adults who may benefit from healthcare interventions
- $160 million initiative in California
- US pediatric primary care clinics
- UK NHS screening in adults

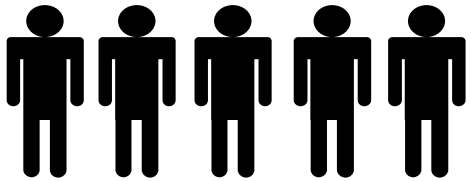
Group differences in childhood adversity & mental health

Group differences in childhood adversity & mental health

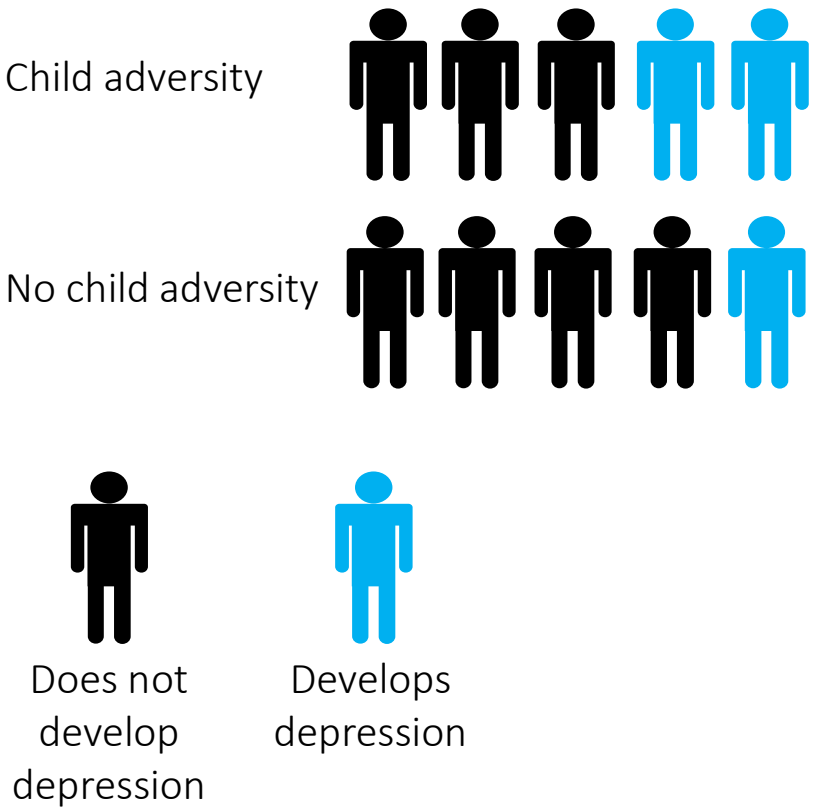
Child adversity



No child adversity



Group differences in childhood adversity & mental health



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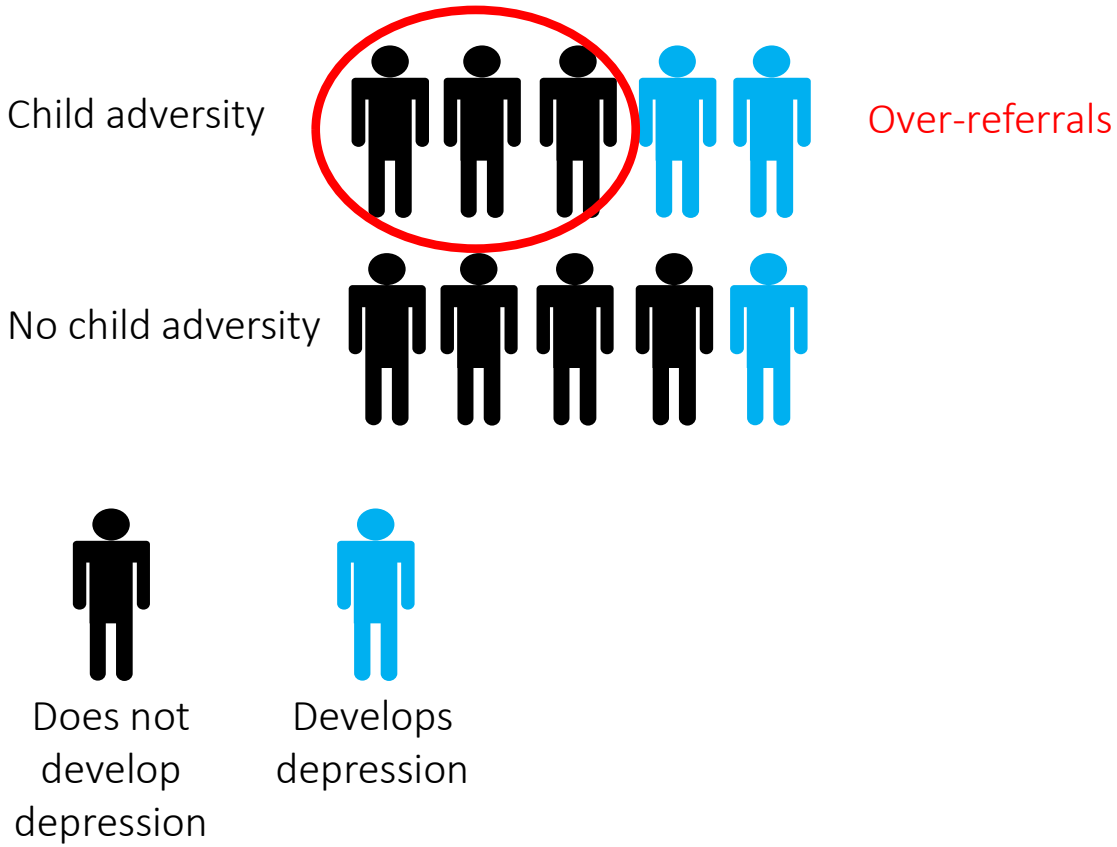
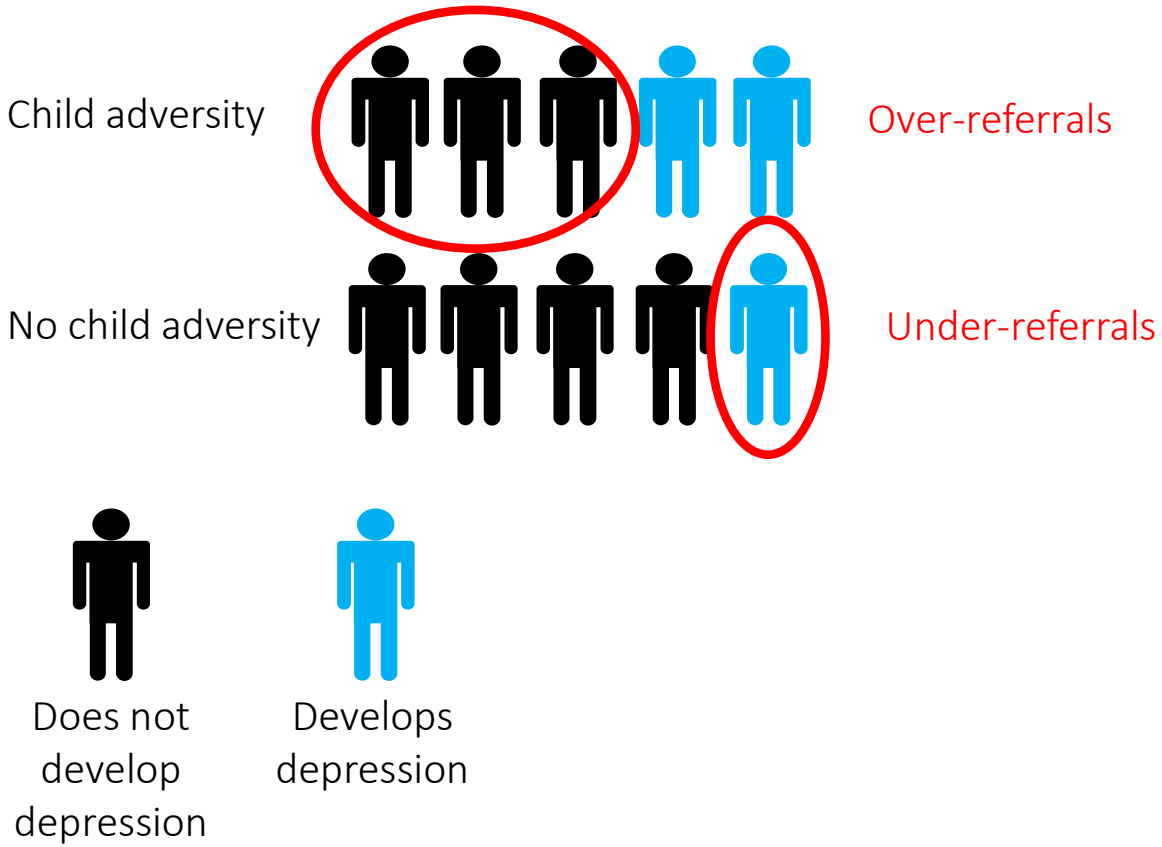


Group differences in childhood adversity & mental health

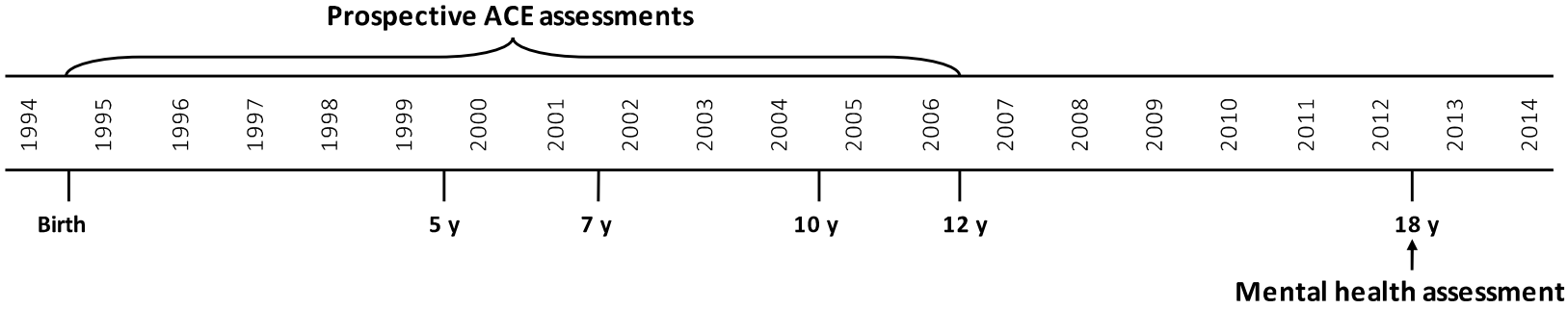


Research questions

1. Can adverse childhood experiences (ACEs) predict later mental health problems at the individual level?

2. Does the predictive accuracy of ACE scores vary according to the type of mental health problem?

E-Risk Study
(N=2,232; 93% participation at age 18)



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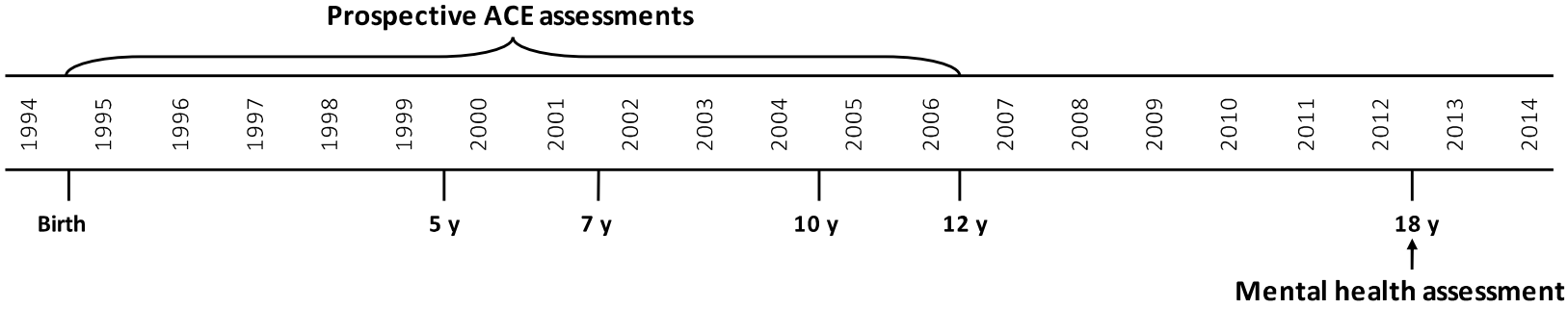
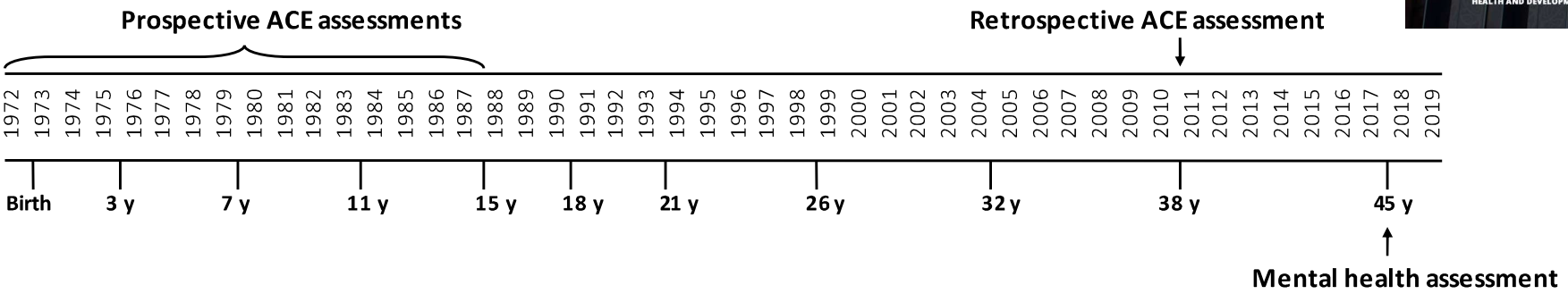
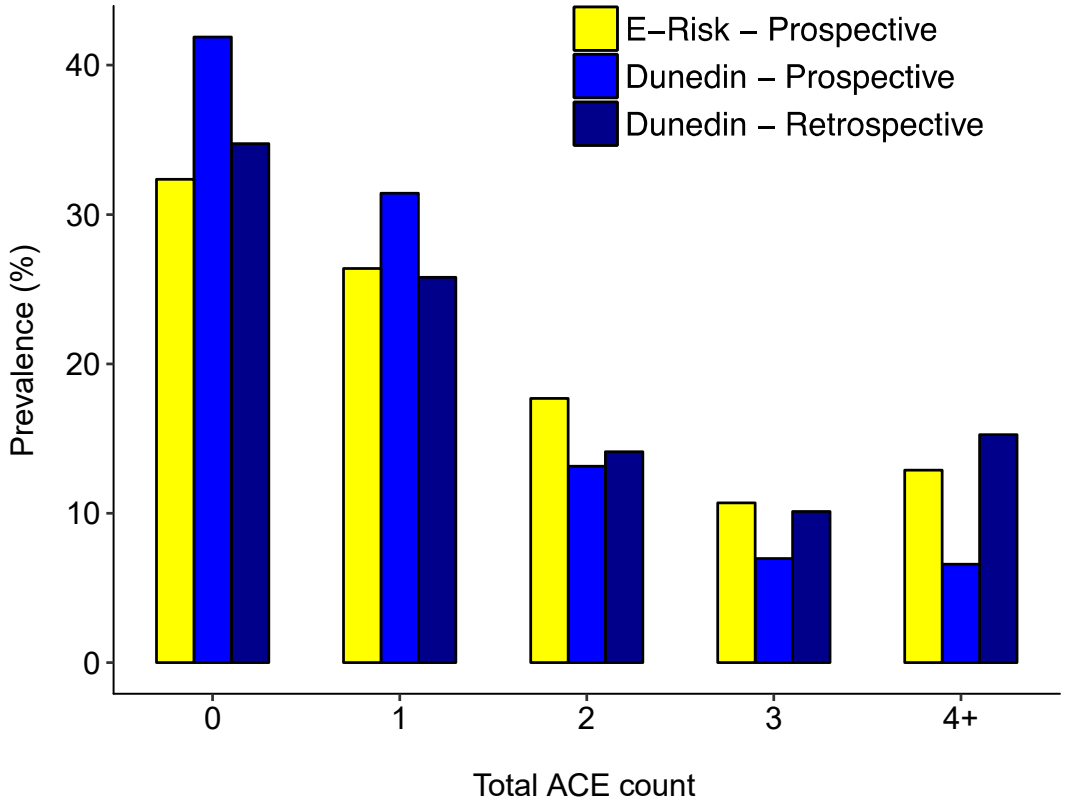


Dunedin Study
(N=1,037; 94% participation at age 45)



ACE scores

- Physical abuse
- Sexual abuse
- Emotional abuse and neglect
- Physical neglect
- Domestic violence
- Parental antisocial behaviour
- Family substance abuse
- Family mental health problems
- Parental separation or divorce

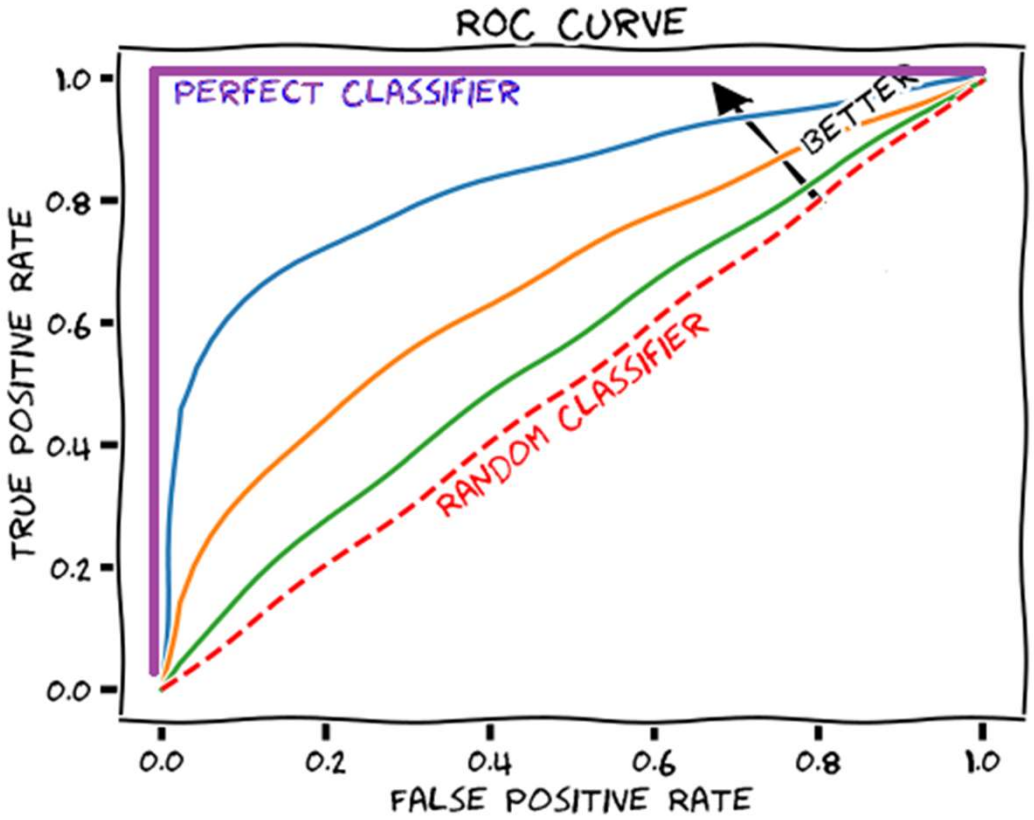


Mental health outcomes

- Depression
- Anxiety
- Self-harm
- Conduct disorder
- ADHD
- Alcohol dependence
- Drug dependence
- Any mental health problem

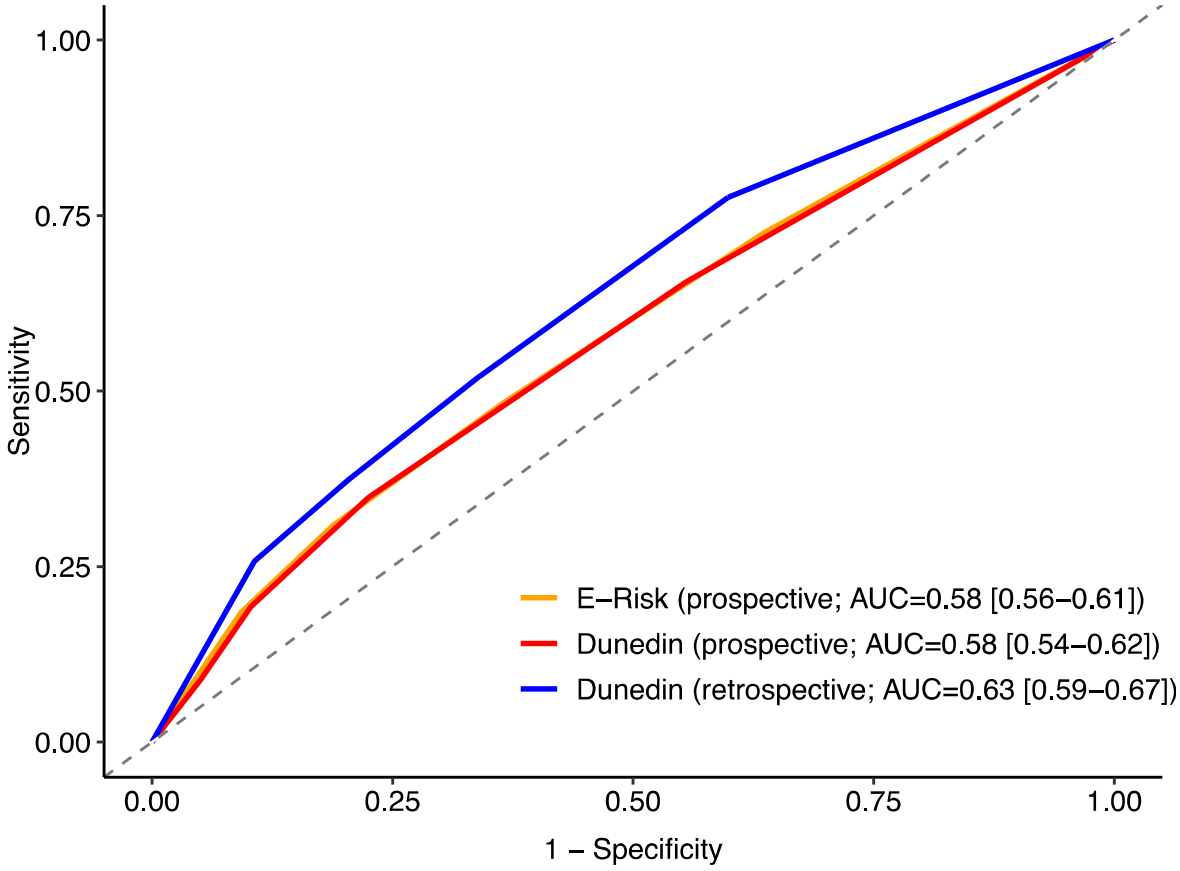
Can ACE scores identify individuals at risk of later mental health problems?

ROC curve analyses



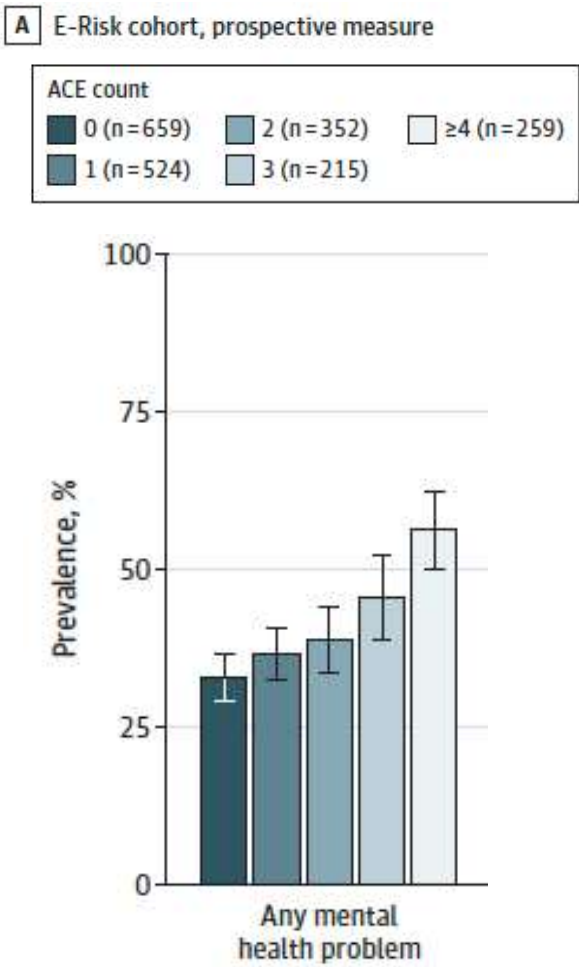
AUC	Prediction
0.5-0.6	Very poor
0.6-0.7	Poor
0.7-0.8	Fair
0.8-0.9	Good
0.9-1	Excellent

Individual prediction of any mental health problem

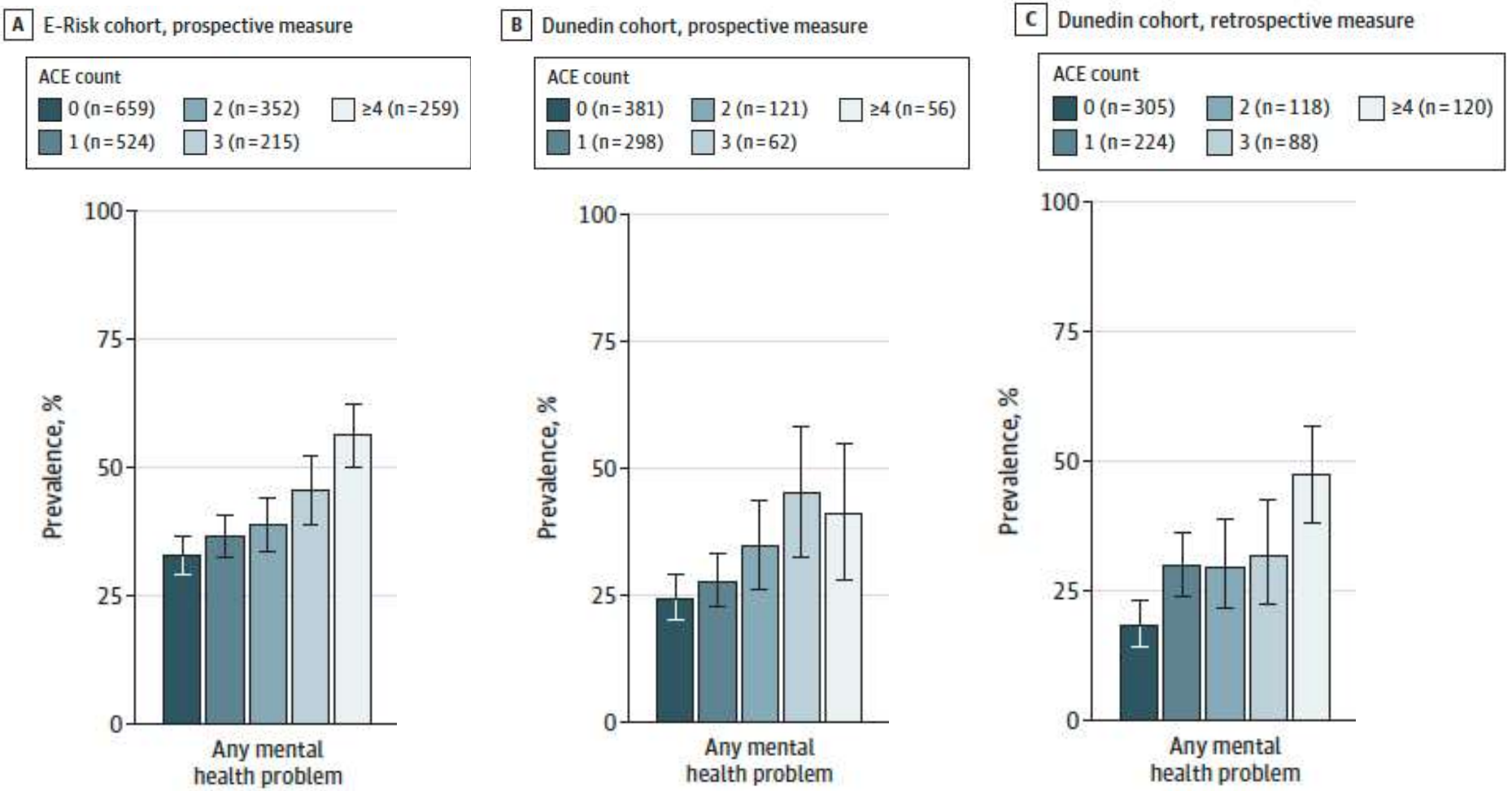


Baldwin et al. (2021), *JAMA Pediatr*

Prevalence of any mental health problem by ACE score



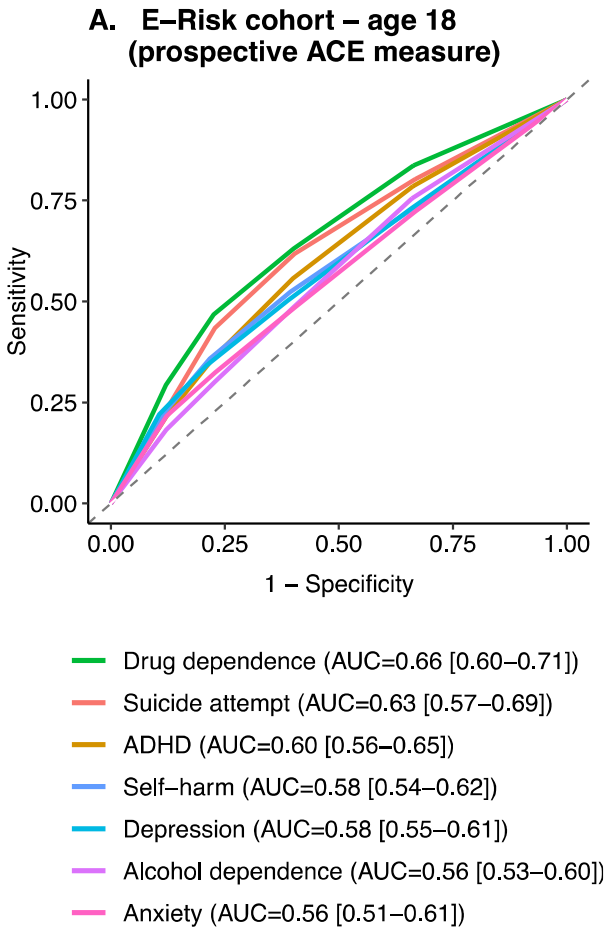
Prevalence of any mental health problem by ACE score



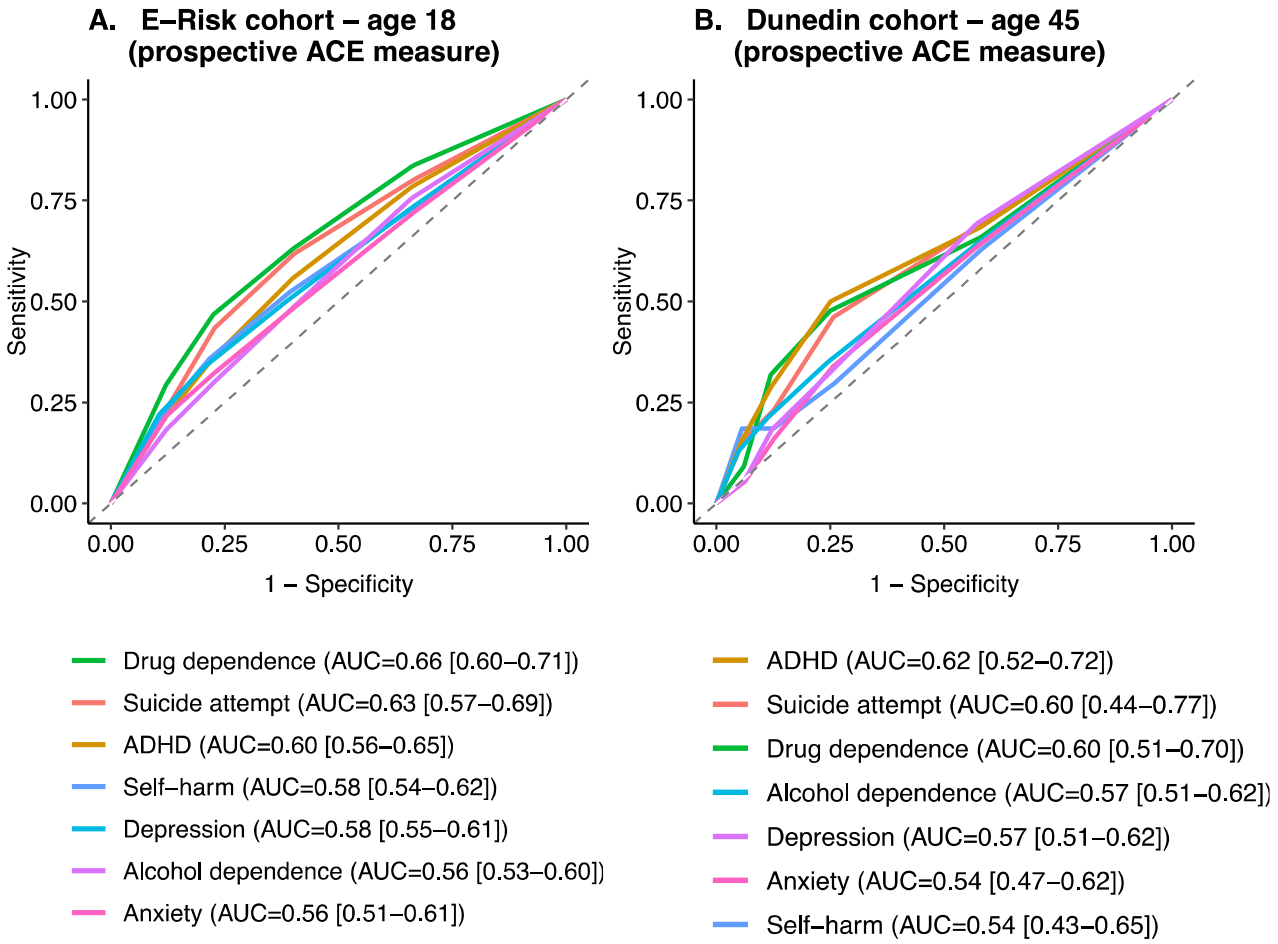
Does the predictive accuracy of ACE scores vary across mental health problems?

Individual prediction of specific mental health outcomes

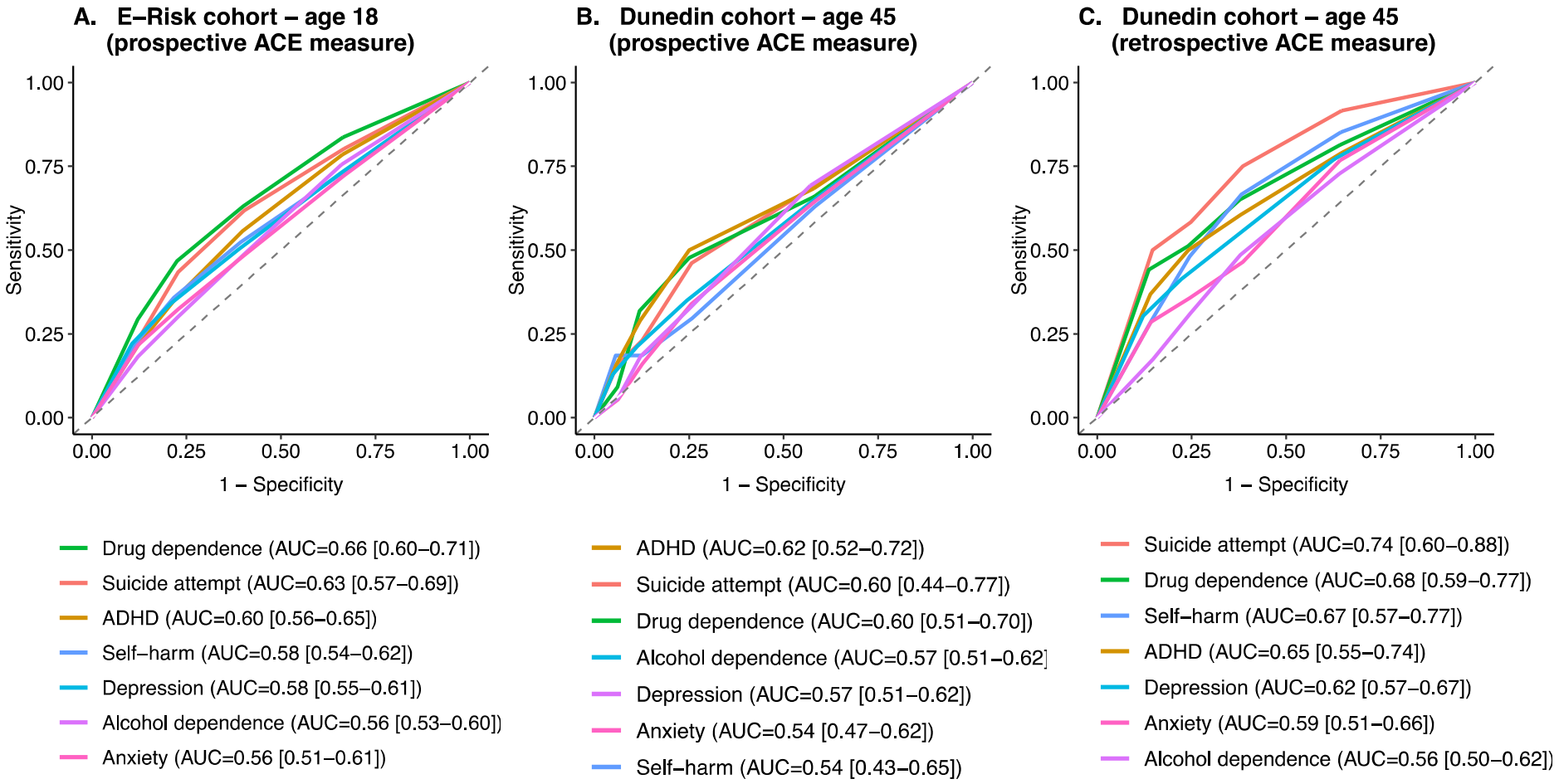
Individual prediction of specific mental health outcomes



Individual prediction of specific mental health outcomes



Individual prediction of specific mental health outcomes



Summary

- ACE scores have poor accuracy in predicting an individual's risk of later mental health problems
  - ❖ Prediction poor for "any" mental health problem & specific outcomes
- Many individuals with high ACE scores will not develop poor mental health outcomes
- Many individuals with low ACE scores will develop poor mental health outcomes
- Targeting interventions based on ACE screening is unlikely to be effective in preventing poor mental health
  - ❖ Over-referrals and under-referrals likely
- Future research needed to understand whether ACE scores can be used alongside other clinically available information to effectively identify individuals at-risk of mental health problems

Takeaway messages

1. Causality
   - ❖ Childhood maltreatment has small causal effects on mental health
   - ❖ Part of the overall risk for mental health problems is due to wider psychiatric risk factors
2. Measurement
   - ❖ Subjective measures of childhood adversity show stronger associations with mental health problems than more objective measures
3. Individual prediction
   - ❖ ACE scores have poor accuracy in identifying individuals at risk of later mental health problems

Acknowledgments

CMAP Lab

Jean-Baptiste Pingault

Emma Francis

Andrea Danese

j.baldwin@ucl.ac.uk

@jessiebaldwin