

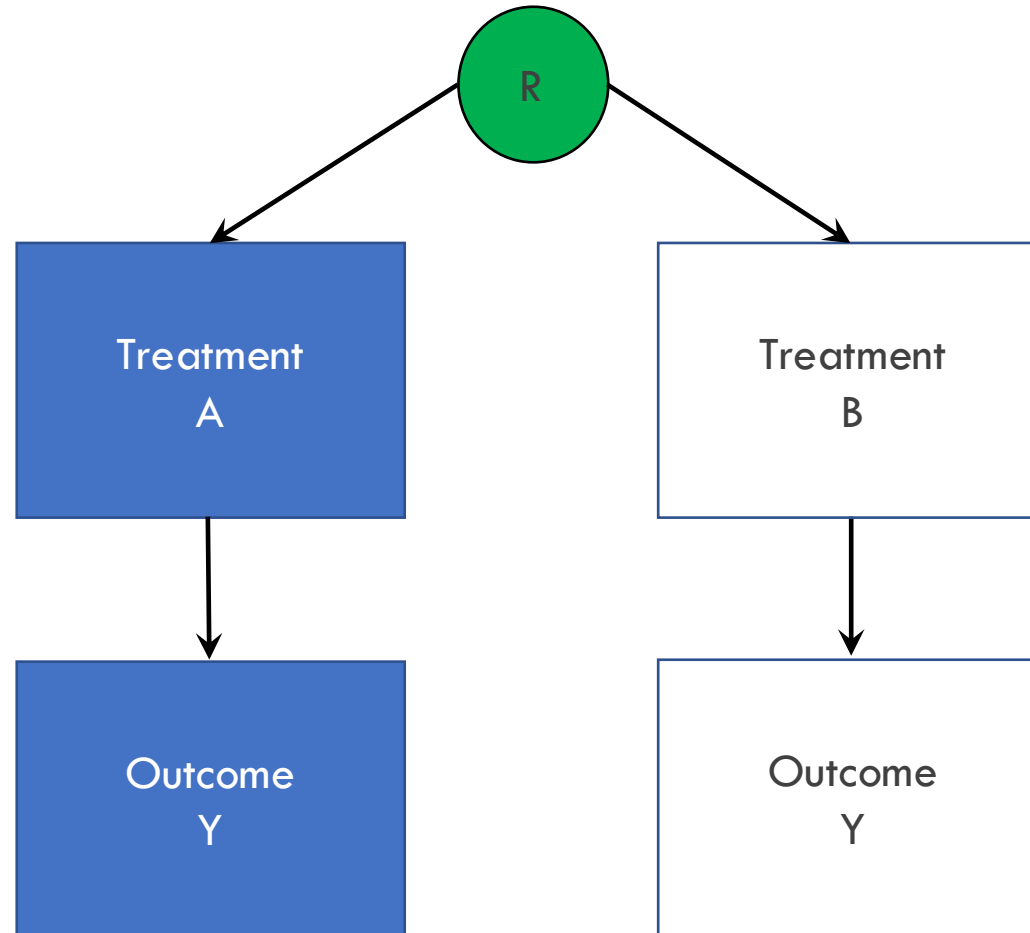
Contamination and Its Impact on Causal Estimates in Observational Research with Psychological Outcomes

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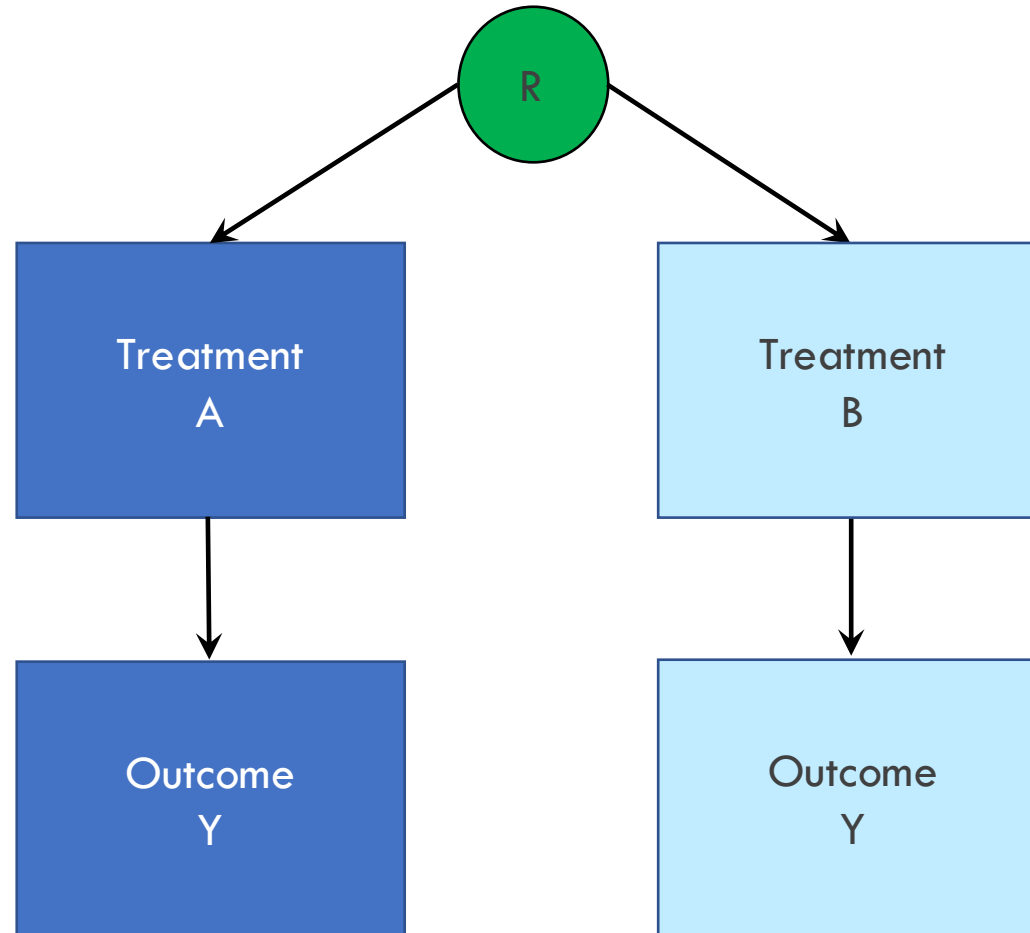
What is Contamination?

Randomized controlled trial



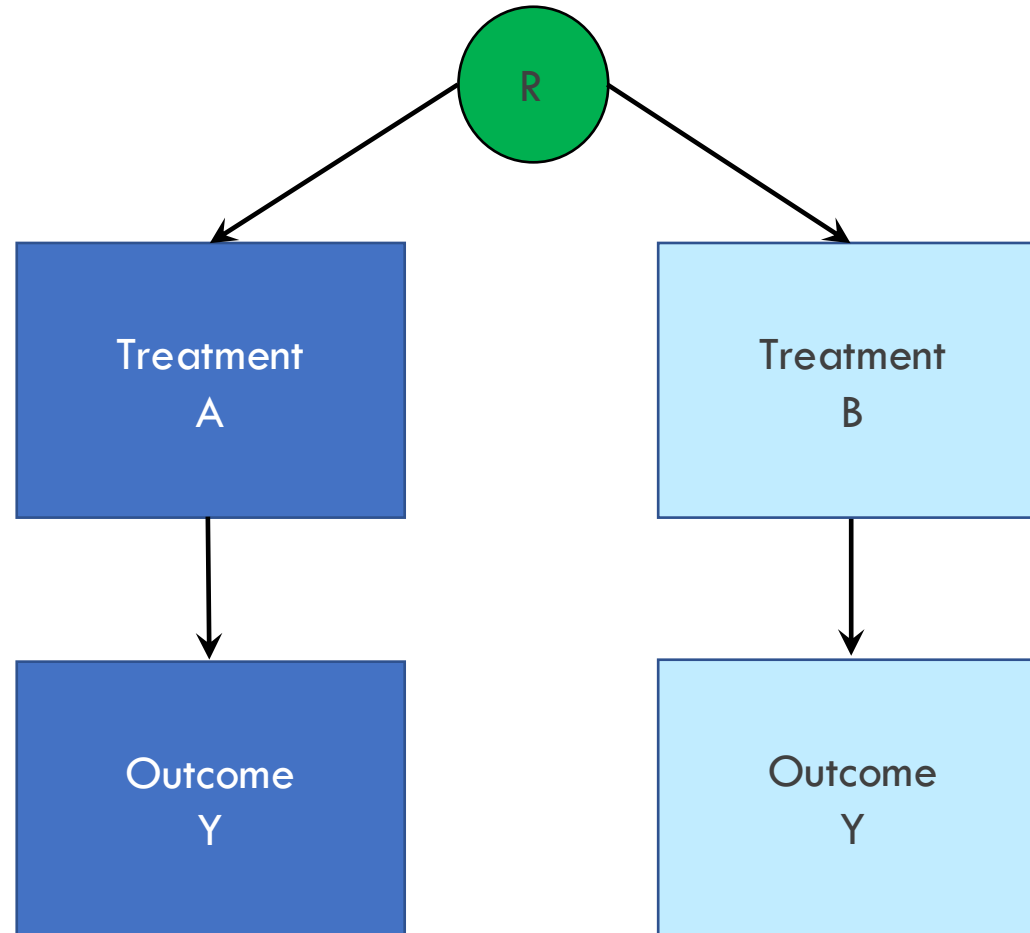
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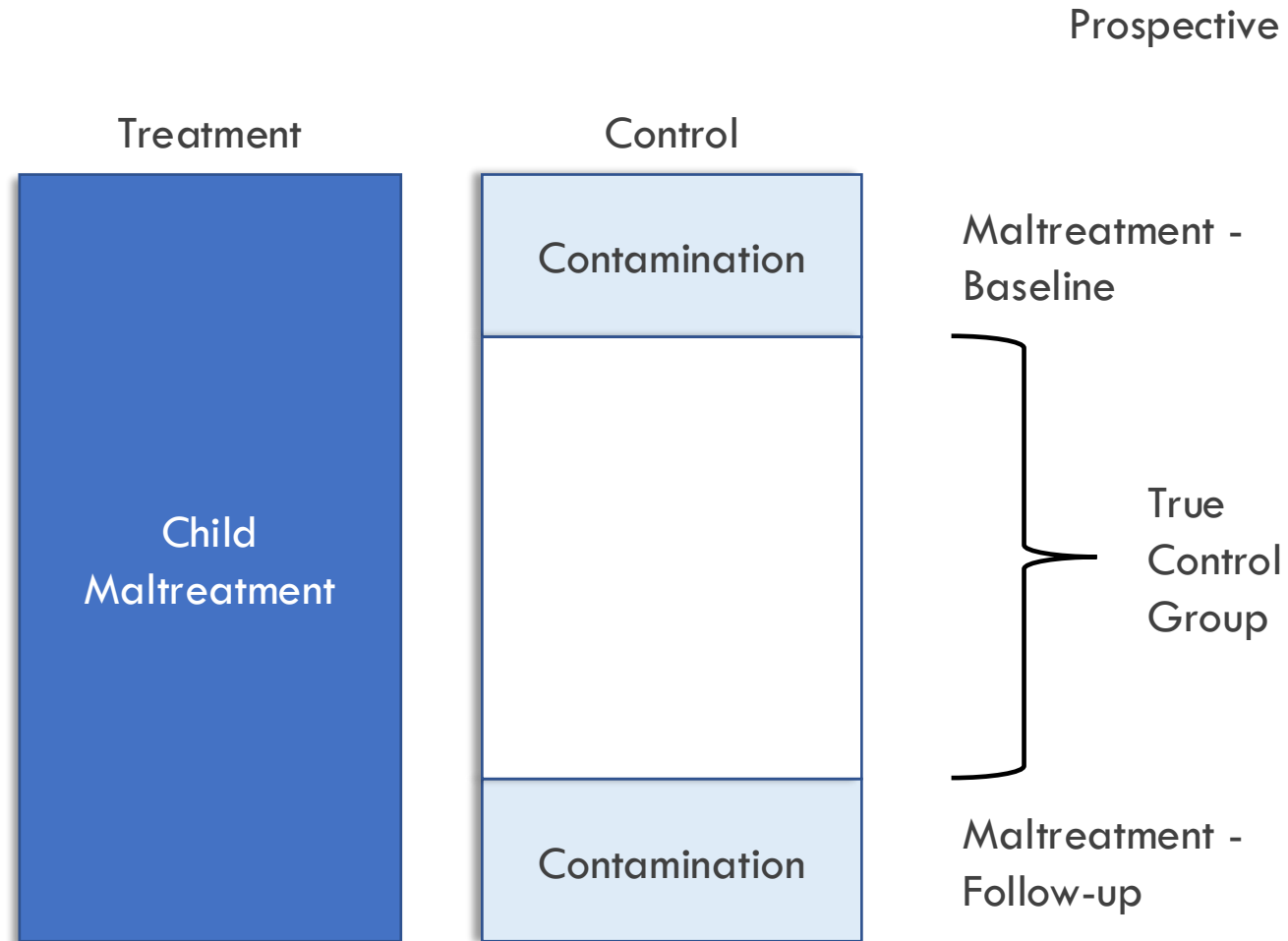
Impact:

Loss of statistical power

Increased probability of Type II errors

Bias in effect size estimates

What is Contamination?



Prevalence of Contamination

Widom's Longitudinal Cohort:	45%
Rochester Youth Development Study:	18%
Female Adolescent Development Study:	45%
Scott's Longitudinal Cohort:	15%
LONGSCAN:	65%

Prospectively Ascertained Child Maltreatment and Its Association With *DSM-IV* Mental Disorders in Young Adults

Kate M. Scott, PhD, MA Appl(Clin Psych); Don R. Smith, MA; Pete M. Ellis, PhD, BMBCh

Table 6. *DSM-IV* Disorder Groups Among Young Adults With Child Protection Agency History Compared With Those Without^a

DSM-IV Mental Disorder Group	Child Protection Agency Group		Comparison Group Including Retrospectively Reported Childhood Maltreatment ^b		Comparison Group			
					Including Retrospectively Reported Childhood Maltreatment ^b		Excluding Retrospectively Reported Childhood Maltreatment ^b	
	No. (%)	SE	No. (%)	SE	Unadjusted OR (95% CI)	Adjusted OR (95% CI) ^c	Unadjusted OR (95% CI)	Adjusted OR (95% CI) ^c
12-Month Disorders								
Any mood disorder	44 (20.94)	3.80	227 (11.90)	1.10	1.96 (1.19-3.23) ^d	1.86 (1.12-3.08) ^d	2.47 (1.47-4.13) ^d	2.38 (1.37-4.14) ^d
Any anxiety disorder	80 (35.74)	5.02	345 (17.92)	1.26	2.55 (1.62-4.00) ^d	2.41 (1.47-3.97) ^d	2.96 (1.87-4.69) ^d	2.92 (1.73-4.91) ^d
Any substance use disorder	38 (16.98)	3.13	186 (8.70)	0.88	2.15 (1.32-3.49) ^d	1.71 (1.01-2.88) ^d	2.55 (1.55-4.21) ^d	2.29 (1.31-4.01) ^d
Any disorder	103 (50.54)	5.03	540 (29.02)	1.81	2.55 (1.62-4.00) ^d	2.32 (1.39-3.85) ^d	2.96 (1.87-4.69) ^d	2.83 (1.68-4.80) ^d
Any 2 disorders	28 (12.13)	3.13	130 (6.11)	0.68	2.12 (1.15-3.92) ^d	1.40 (0.72-2.73) ^d	2.54 (1.35-4.76) ^d	1.55 (0.75-3.21) ^d
Any ≥3 disorders	28 (13.27)	3.03	110 (5.44)	0.68	2.66 (1.49-4.75) ^d	2.67 (1.47-4.87) ^d	3.71 (2.00-6.89) ^d	4.47 (2.29-8.75) ^d
Lifetime Disorders								
Any mood disorder	75 (32.91)	3.95	399 (20.23)	1.25	1.93 (1.31-2.85) ^d	1.80 (1.21-2.68) ^d	2.50 (1.67-3.74) ^d	2.31 (1.52-3.50) ^d
Any anxiety disorder	99 (43.72)	5.22	498 (25.47)	1.46	2.27 (1.47-3.52) ^d	2.04 (1.24-3.33) ^d	2.84 (1.82-4.44) ^d	2.68 (1.61-4.46) ^d
Any substance use disorder	93 (39.68)	4.32	389 (18.15)	1.12	2.97 (2.02-4.37) ^d	2.38 (1.55-3.65) ^d	3.73 (2.51-5.55) ^d	3.11 (1.97-4.91) ^d
Any disorder	136 (64.66)	5.99	795 (43.83)	2.05	2.34 (1.37-4.01) ^d	2.12 (1.20-3.75) ^d	2.91 (1.69-5.00) ^d	2.80 (1.58-4.97) ^d
Any 2 disorders	36 (17.68)	4.04	214 (10.43)	0.88	1.84 (1.05-3.25) ^d	1.30 (0.67-2.53) ^d	2.28 (1.28-4.04) ^d	1.54 (0.77-3.08) ^d
Any ≥3 disorders	67 (28.77)	4.13	247 (11.35)	0.94	3.16 (2.03-4.90) ^d	2.86 (1.79-4.56) ^d	4.19 (2.64-6.66) ^d	3.80 (2.29-6.33) ^d

Increase in Effect Size Magnitude:

Past Year Disorder - 22%

Lifetime Disorder - 32%

Contamination in the Prospective Study of Child Maltreatment and Female Adolescent Health

Chad E. Shenk,^{1,2} PhD, Jennie G. Noll,¹ PhD, James L. Peugh,^{3,4} PhD, Amanda M. Griffin,¹ MS, and Heather E. Bensman,³ PsyD

Table III. The Relative Risk of Child Maltreatment on Female Adolescent Health

Outcome	No control of contamination-baseline model (N = 498)		Contamination controlled-multimethod strategy (N = 394)	
	RR	95% CI	RR	95% CI
Teenage births				
Unadjusted	1.80**	1.17–2.78	2.89**	1.47–5.66
Adjusted ^a	1.66*	1.06–2.61	2.21*	1.06–4.63
Obesity				
Unadjusted	1.16	0.88–1.52	1.51*	1.04–2.21
Adjusted ^b	1.16	0.90–1.50	1.47*	1.03–2.08
Major depression				
Unadjusted	1.59	0.99–2.57	4.04**	1.64–9.97
Adjusted ^b	1.28	0.79–2.08	2.95*	1.22–7.16
Past-month cigarette use				
Unadjusted	2.01***	1.51–2.66	2.64***	1.74–3.99
Adjusted ^b	1.36*	1.06–1.74	1.68**	1.21–2.35

Increase in Effect Size Magnitude:


Teenage Births - 33%

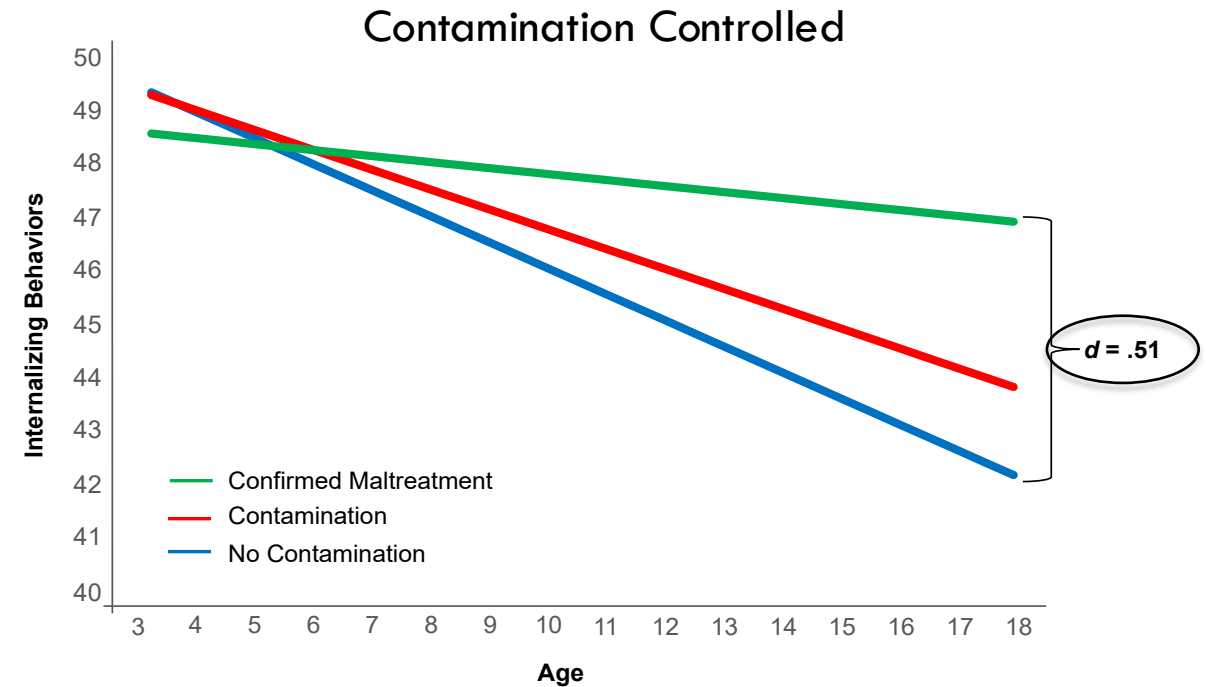
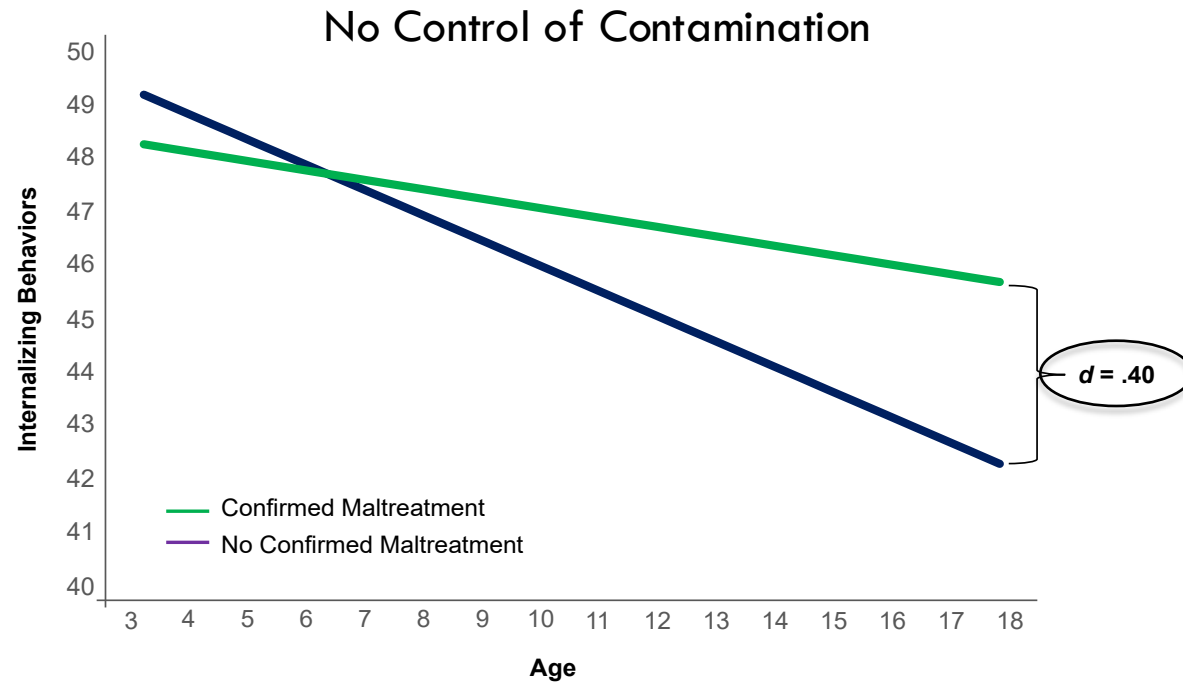
Obesity - 27%

Major Depression - 130%

Cigarette Use - 24%

Controlling contamination in child maltreatment research: Impact on effect size estimates for child behavior problems measured throughout childhood and adolescence

Chad E. Shenk^{1,2} , Joseph R. Rausch^{3,4}, Kenneth A. Shores⁵, Elizabeth K. Allen¹ and Anneke E. Olson¹



Increase in Effect Size Magnitude:

Internalizing behaviors - 28%; Externalizing behaviors - 53%

Current Grant Funded Projects

Longitudinal Studies of Child Abuse and Neglect (N=1354)

- Contamination = self-reported maltreatment
- Synthetic control methods

National Survey of Child and Adolescent Well-Being (N=5872)

- Contamination = caregiver reported maltreatment
- Propensity score matching

Causal effects of maltreatment after controlling contamination



Bringing it all home...

Contamination:

Is a feature, not a bug, in longitudinal observational research

- Particularly child maltreatment research

Truncates the significance and magnitude of causal estimates

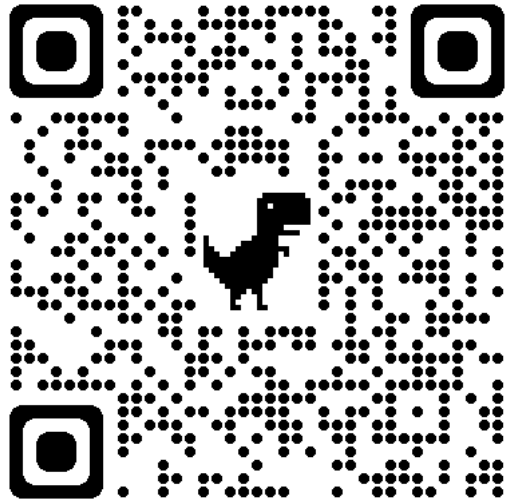
Repeated, dual measurement strategies can reduce bias

Thank you!

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