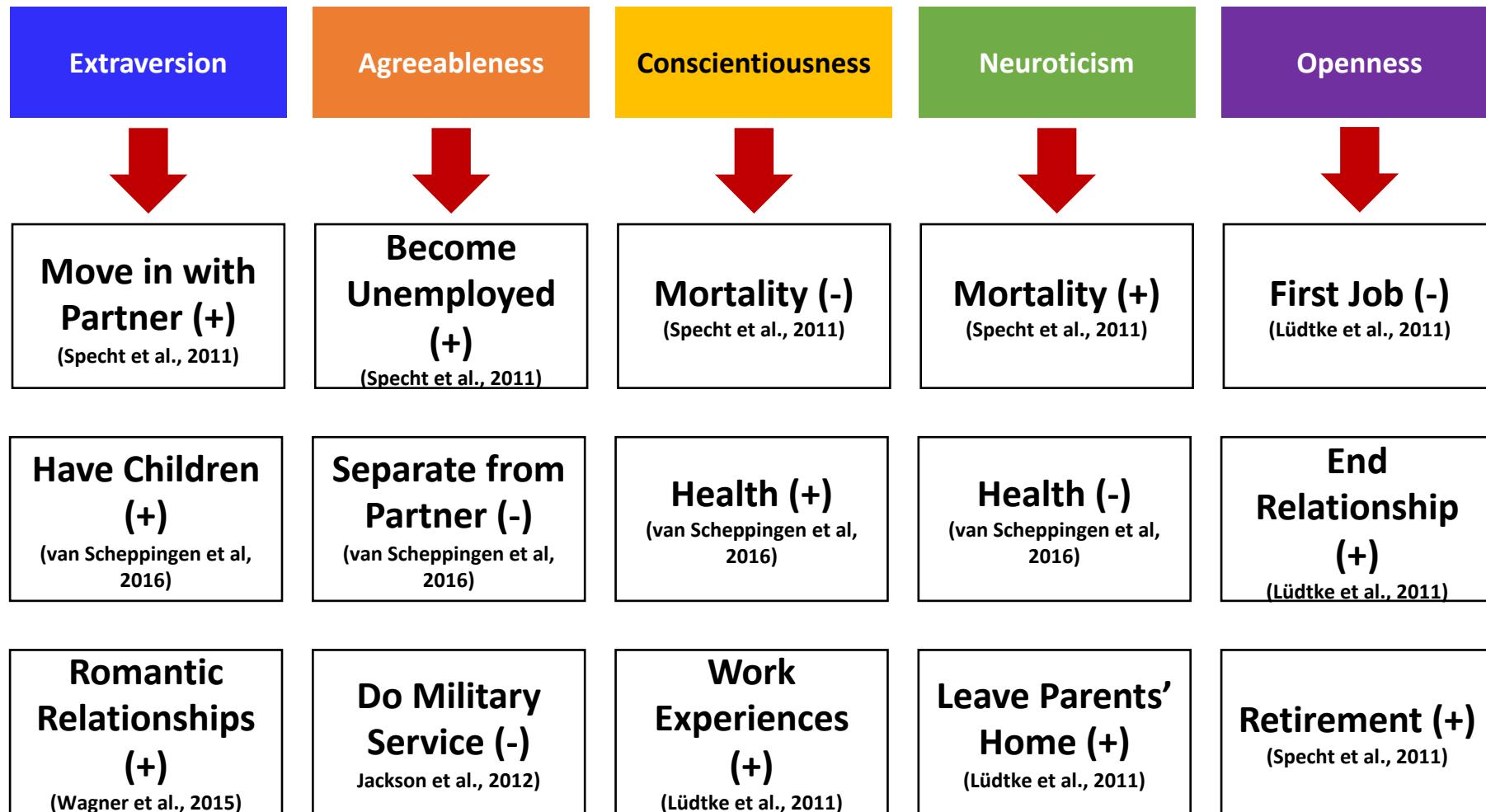


A Mega-Analysis of Personality Predictions: Robustness and Boundary Conditions

Emorie D Beck

November 19, 2020

Selection



Selection

Extra-version	Agreeableness	Conscientiousness	Neuroticism	Openness	Self-Esteem	Optimism	Life Satisfaction	Positive Affect	Negative Affect	Locus of Control	Social Support	IQ	Depression
													
Move in with Partner (+) (Specht et al., 2011)	Become Unemployed (+) (Specht et al., 2011)	Mortality (-) (Specht et al., 2011)	Mortality (+) (Specht et al., 2011)	First Job (-) (Lüdtke et al., 2011)	Criminal Behavior (-) (Trzesniewski et al., 2006)	Heart Problems (-) (Tindle et al., 2009)	Mortality (-) (Lyra et al., 2006)	Inflammatory markers (-) (Specht et al., 2011)	Post-traumatic Stress (+) (Weems et al., 2007)	Survival after Transplant (+) (Burker et al., 2005)	Mortality (-) (Brown et al., 2003)	Longevity (+) (Gottfredson & Deary, 2004)	Heart Failure (+) (Johnson et al., 2012)
Have Children (+) (van Scheppingen et al, 2016)	Separate Partner (-) (van Scheppingen et al, 2016)	Health (+) (van Scheppingen et al, 2016)	Health (-) (van Scheppingen et al, 2016)	End Relationship (+) (Lüdtke et al., 2011)	Smoking (-) (Trzesniewski et al., 2006)	Marital wellbeing (+) (Neff & Geers, 2013)	Divorce (-) (Stutzer & Frey, 2006)	Physical Activity (+) (Audrain et al., 2001)	Common Cold (+) (Cohen et al., 1993)	Social Mobility (+) (von Stumm et al, 2009)	Inflammation (-) (Hughes et al., 2014)	Smoking (-) (Gottfredson, 2004)	Mortality (+) (Sullivan et al., 2012)
Romantic Relationships (+) (Wagner et al., 2015)	Do Military Service (-) (Jackson et al., 2012)	Work Experiences (+) (Lüdtke et al., 2011)	Leave Parents' Home (+) (Lüdtke et al., 2011)	Retirement (+) (Specht et al., 2011)	Heart Problems (-) (Trzesniewski et al., 2006)	Completing College (-) (Solberg Ness et al., 2009)	Student Engagement(+) (Heffner & Antaramian, 2015)	Smoking (-) (Pettit et al., 2001)	Blood pressure (+) (Ewart & Kolodner, 1994)	School Achievement (+) (Tesiny et al., 1980)	Delinquency (-) (Kort-Butler, 2010)	Obesity (-) (Gottfredson, 2004)	Smoking (+) (Japuntich et al., 2007)

Limitations of Personality Prediction

Cross-Sectional (Reverse Causality)	Third Variables (Selection Bias)	Arbitrary Covariate Inclusion	Unclear Boundary Conditions	Single Studies
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Limitations of Personality Prediction

Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

Arbitrary Covariate
Inclusion

Unclear Boundary
Conditions

Single Studies

Personality



T1



Outcomes

Limitations of Personality Prediction

Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

Arbitrary Covariate
Inclusion

Unclear Boundary
Conditions

Single Studies

Personality



T1

T2



Outcomes

Limitations of Personality Prediction

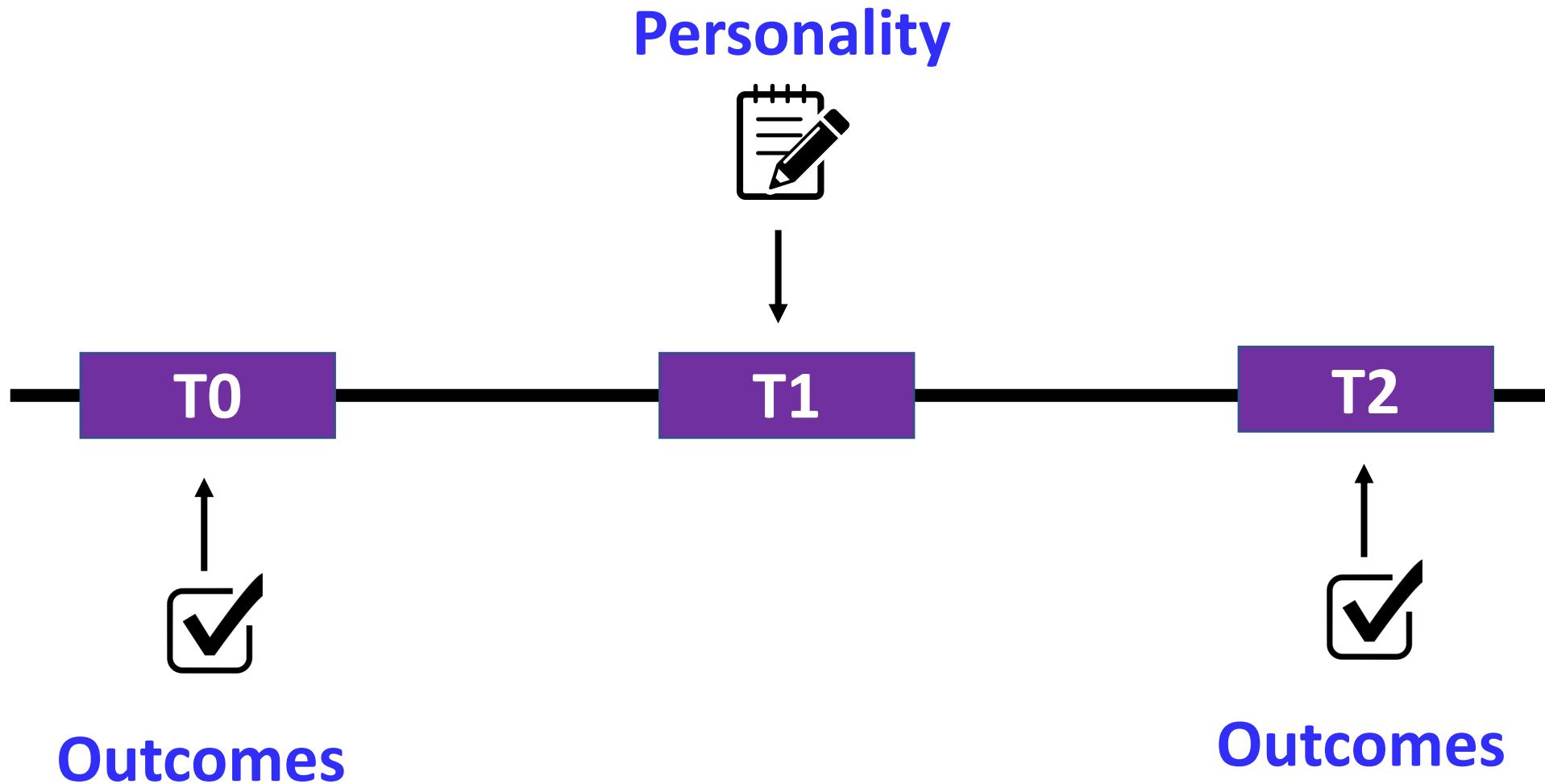
Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

Arbitrary Covariate
Inclusion

Unclear Boundary
Conditions

Single Studies



Limitations of Personality Prediction

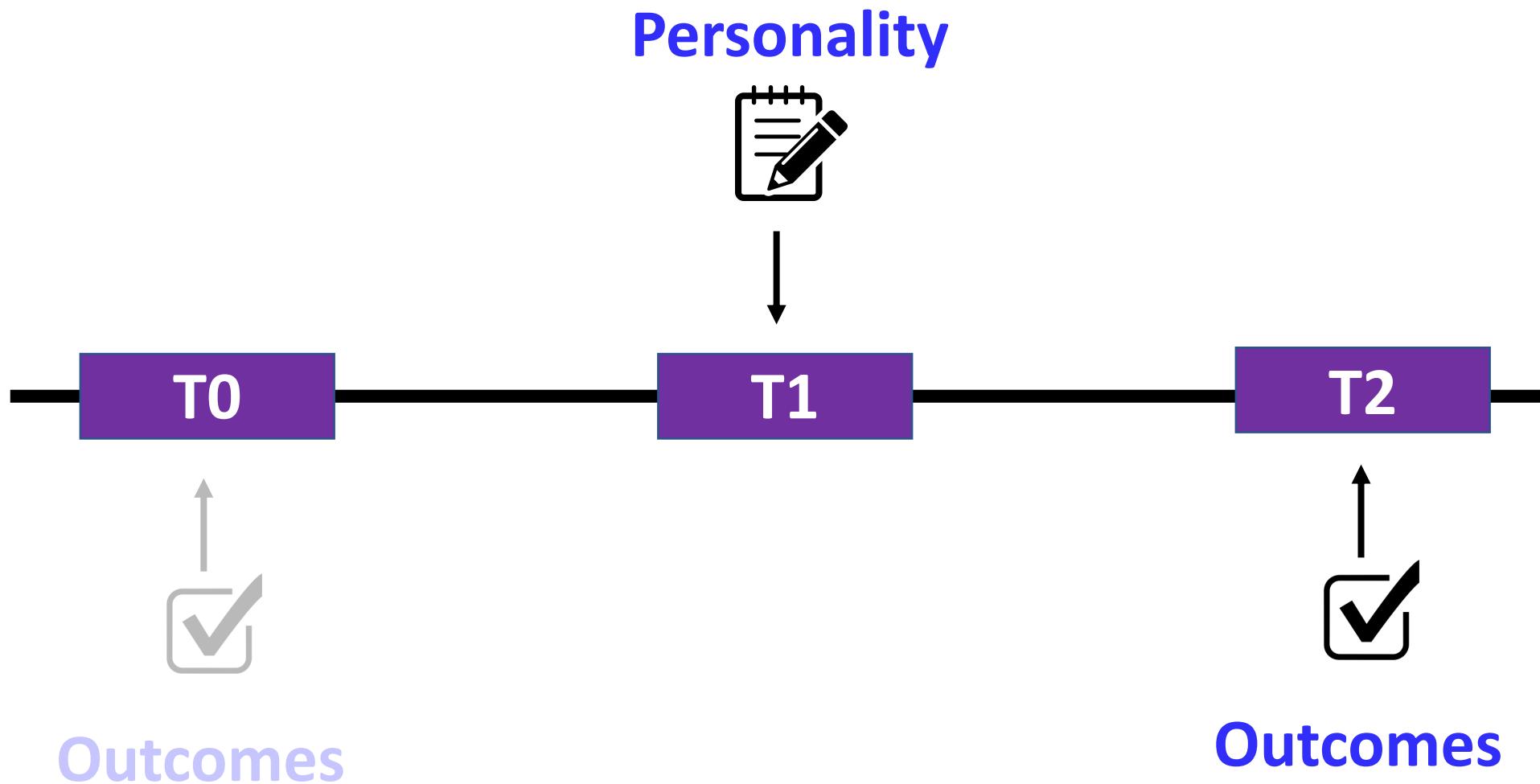
Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

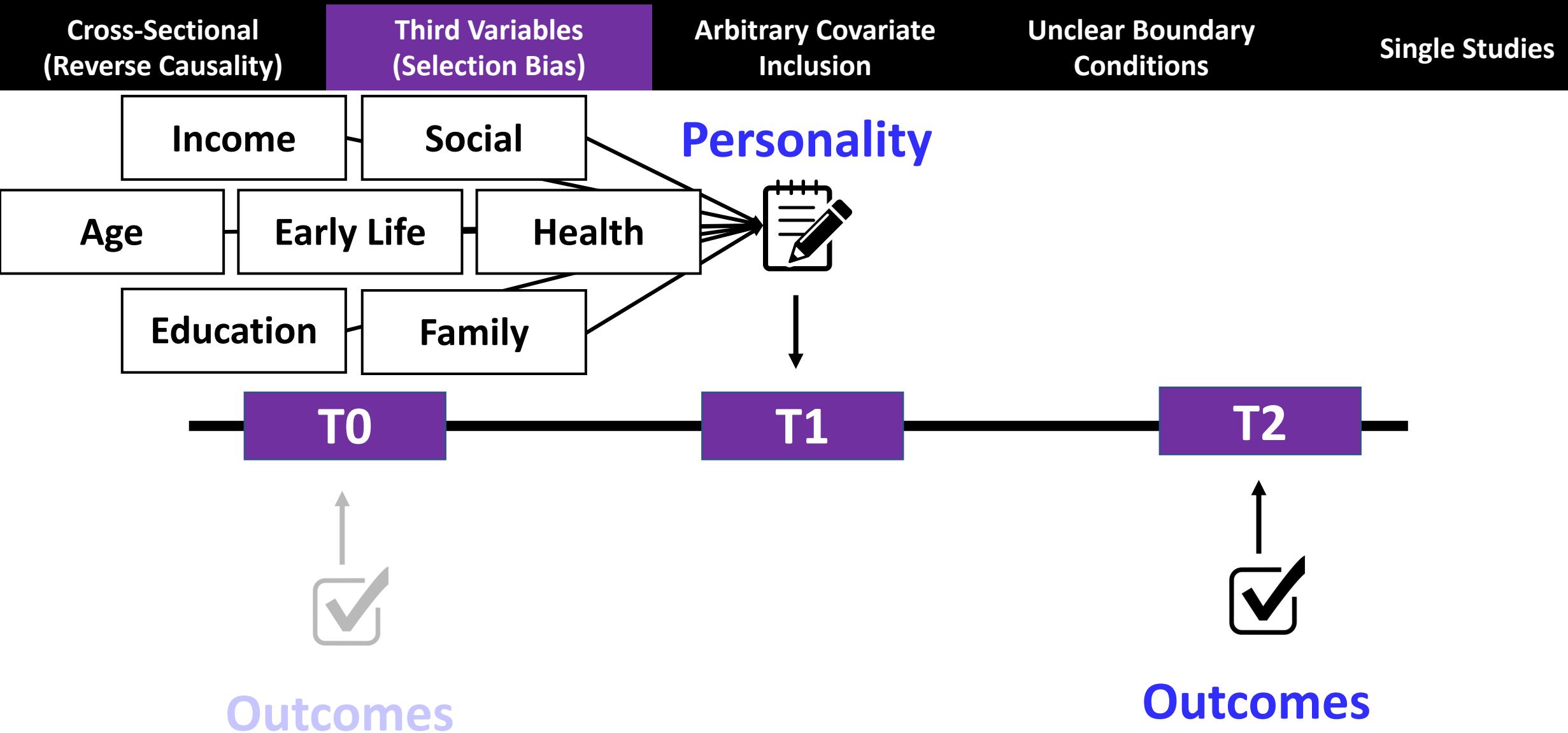
Arbitrary Covariate
Inclusion

Unclear Boundary
Conditions

Single Studies



Limitations of Personality Prediction



Limitations of Personality Prediction

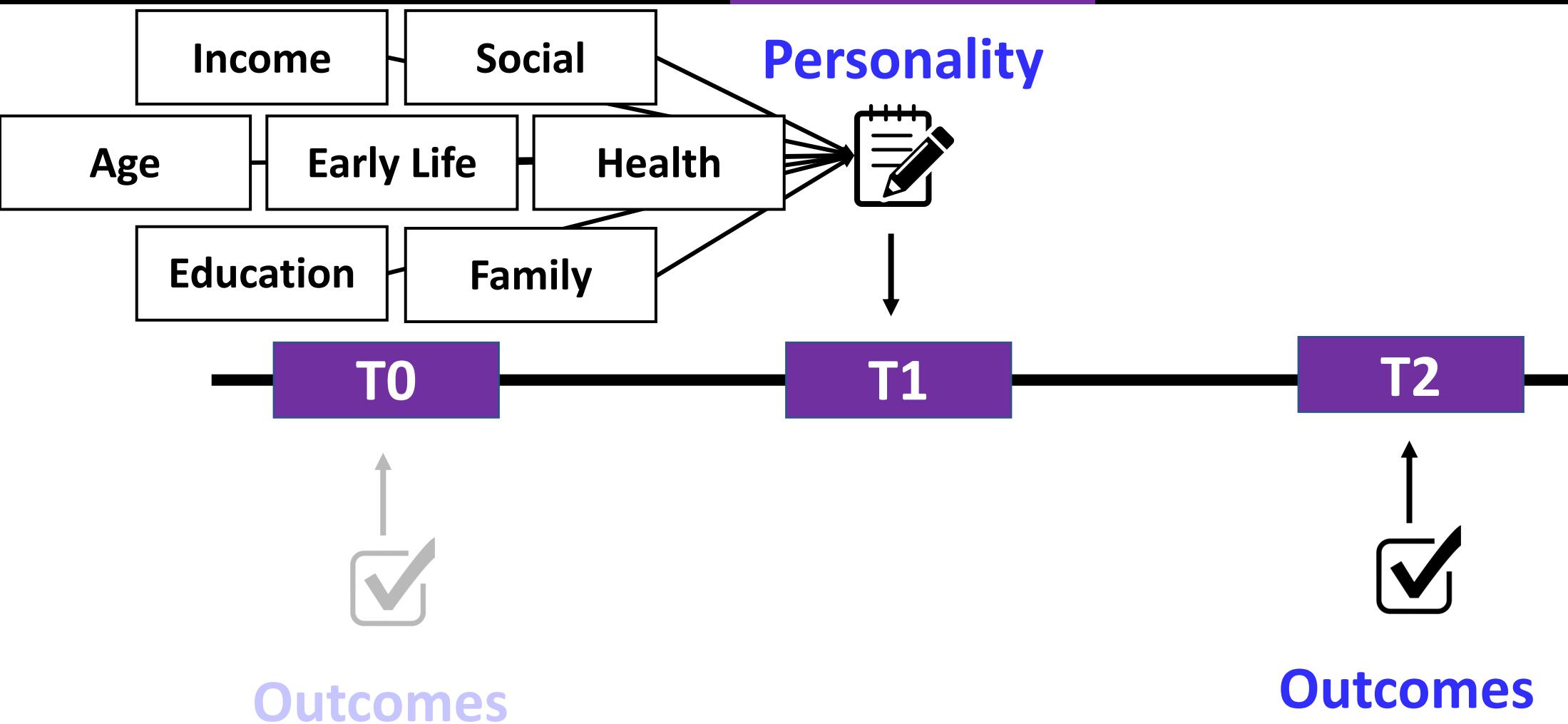
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Limitations of Personality Prediction

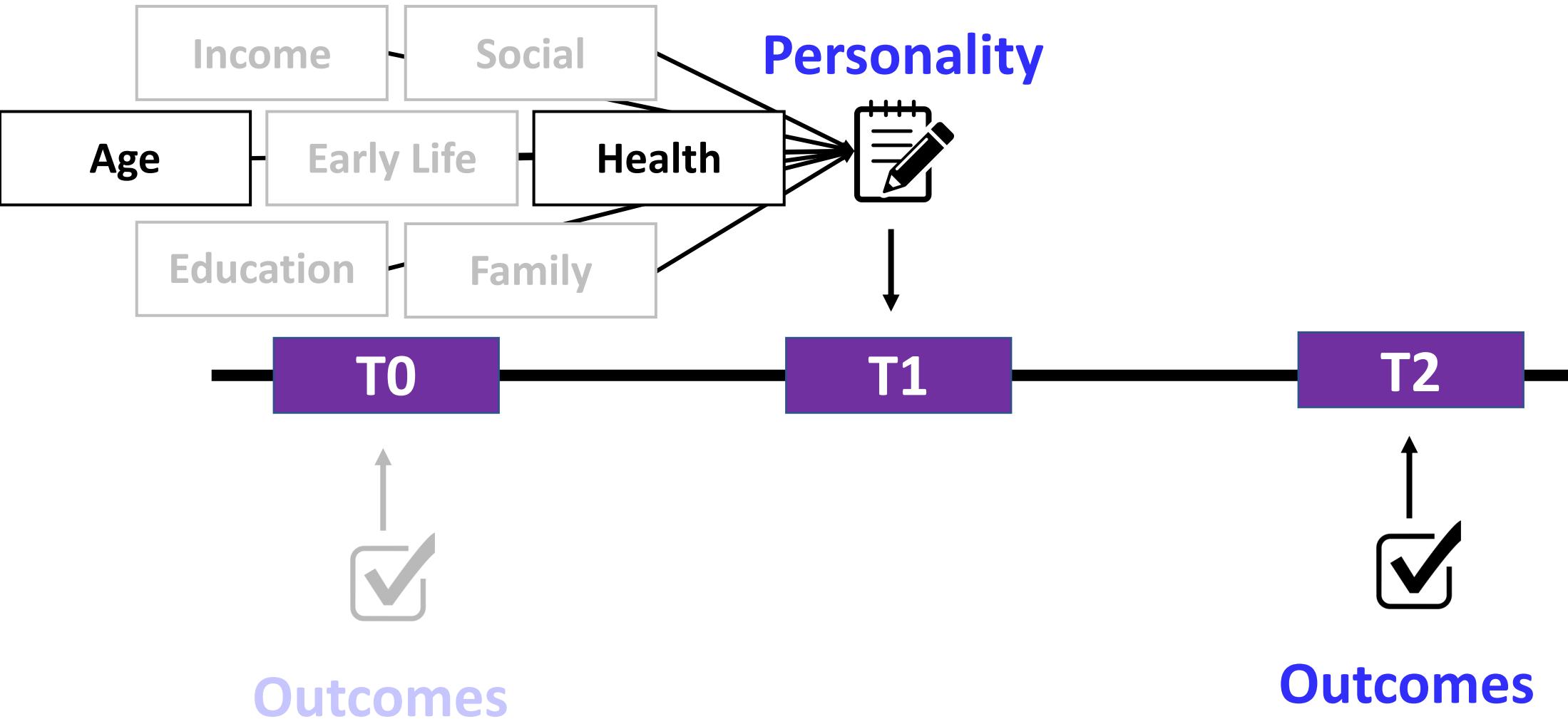
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Limitations of Personality Prediction

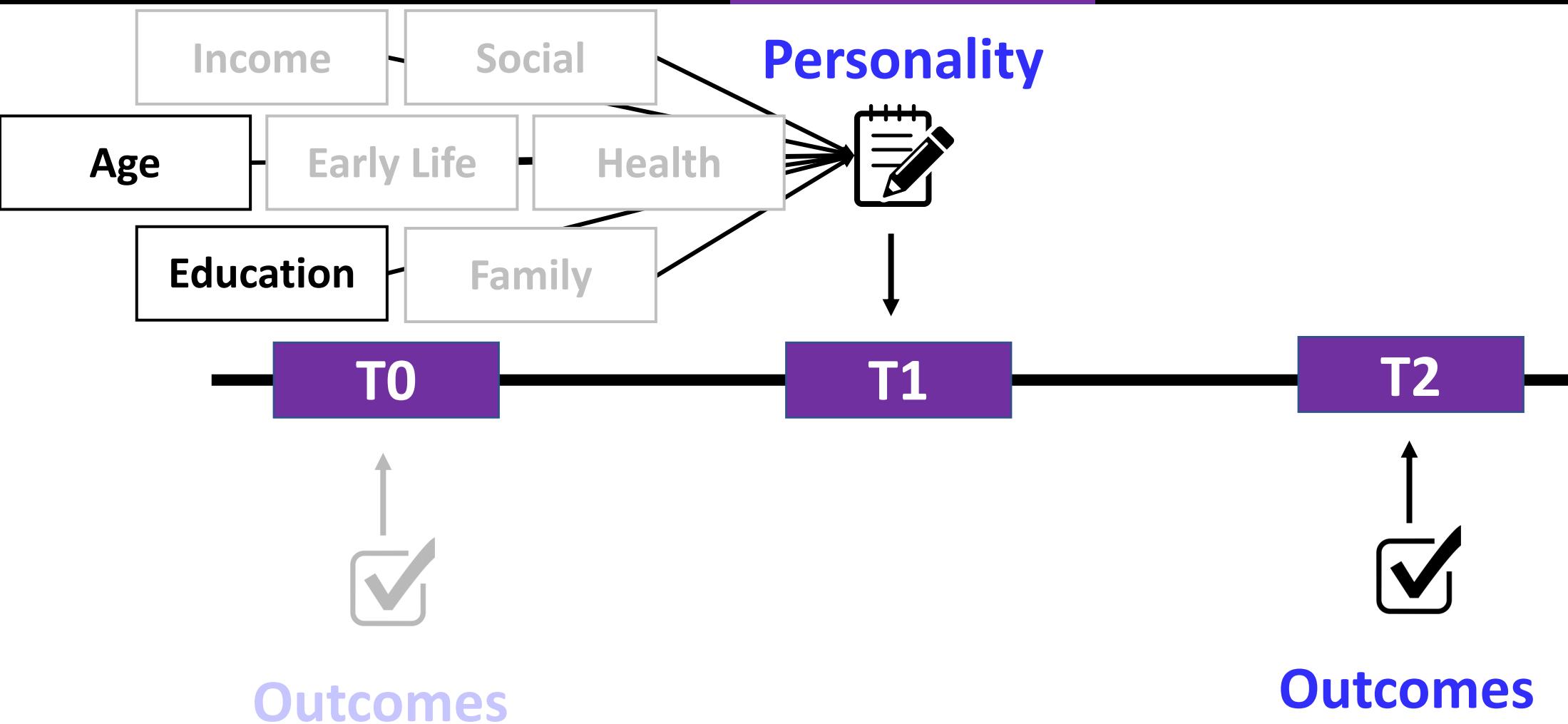
Cross-Sectional
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Limitations of Personality Prediction

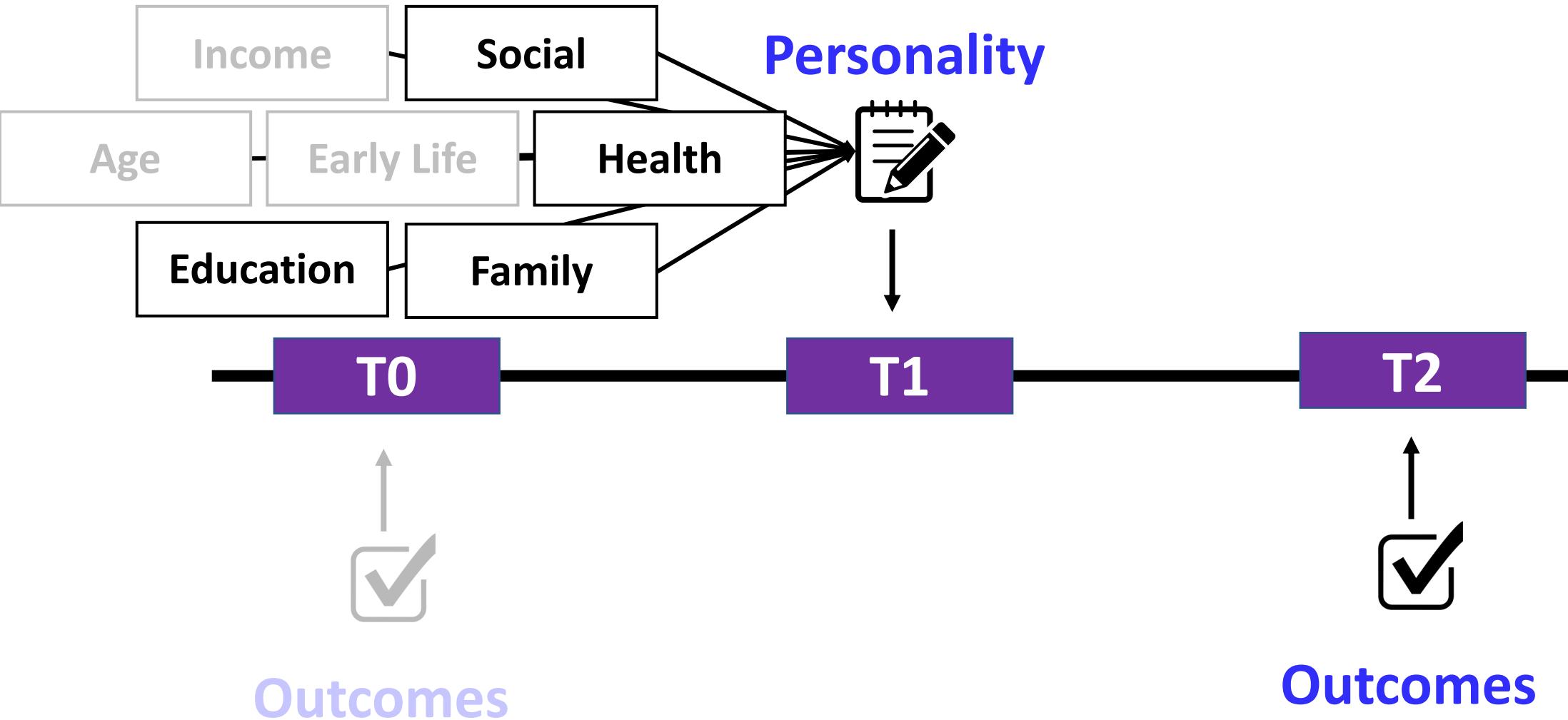
Cross-Sectional
(Reverse Causality)

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Limitations of Personality Prediction

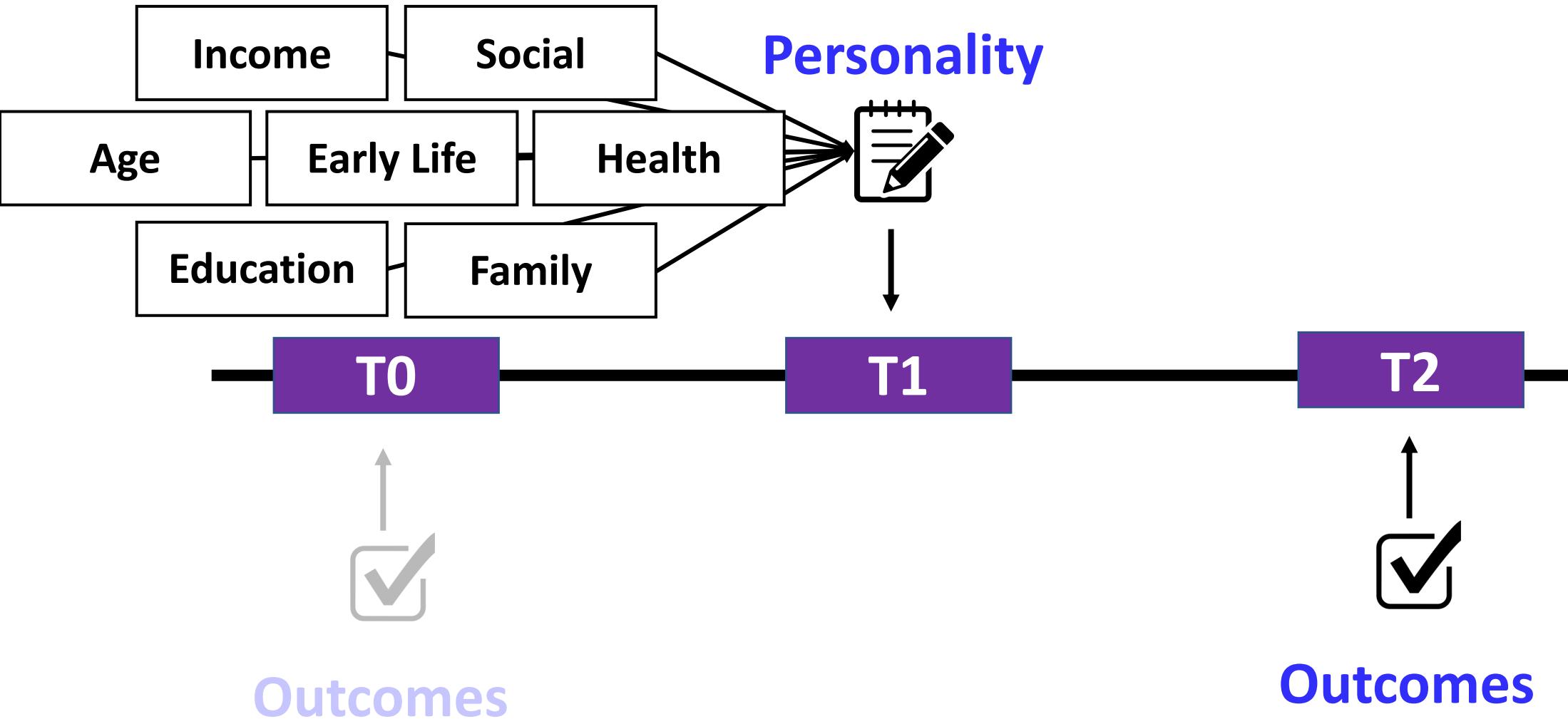
Cross-Sectional
(Reverse Causality)

Third Variables
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Limitations of Personality Prediction

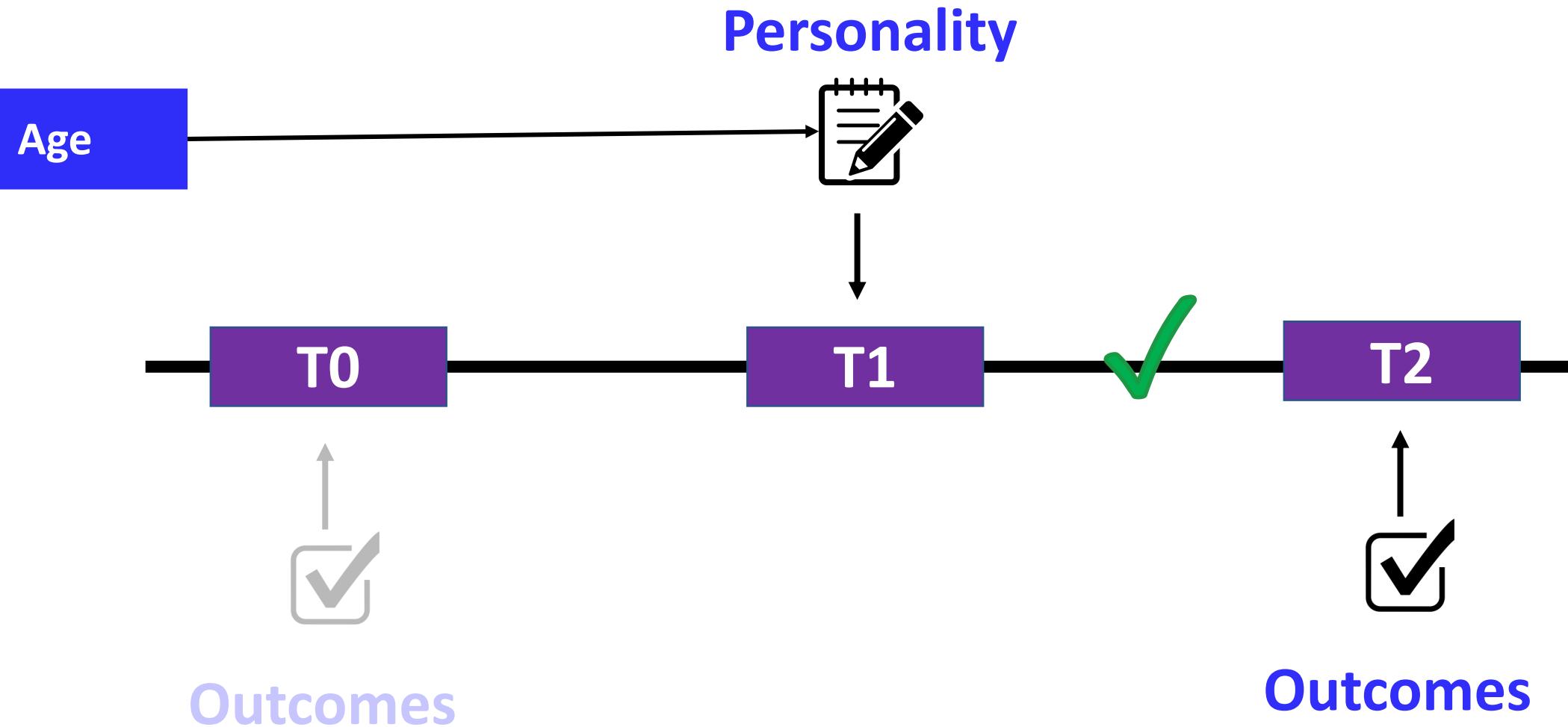
Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

Arbitrary Covariate
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Limitations of Personality Prediction

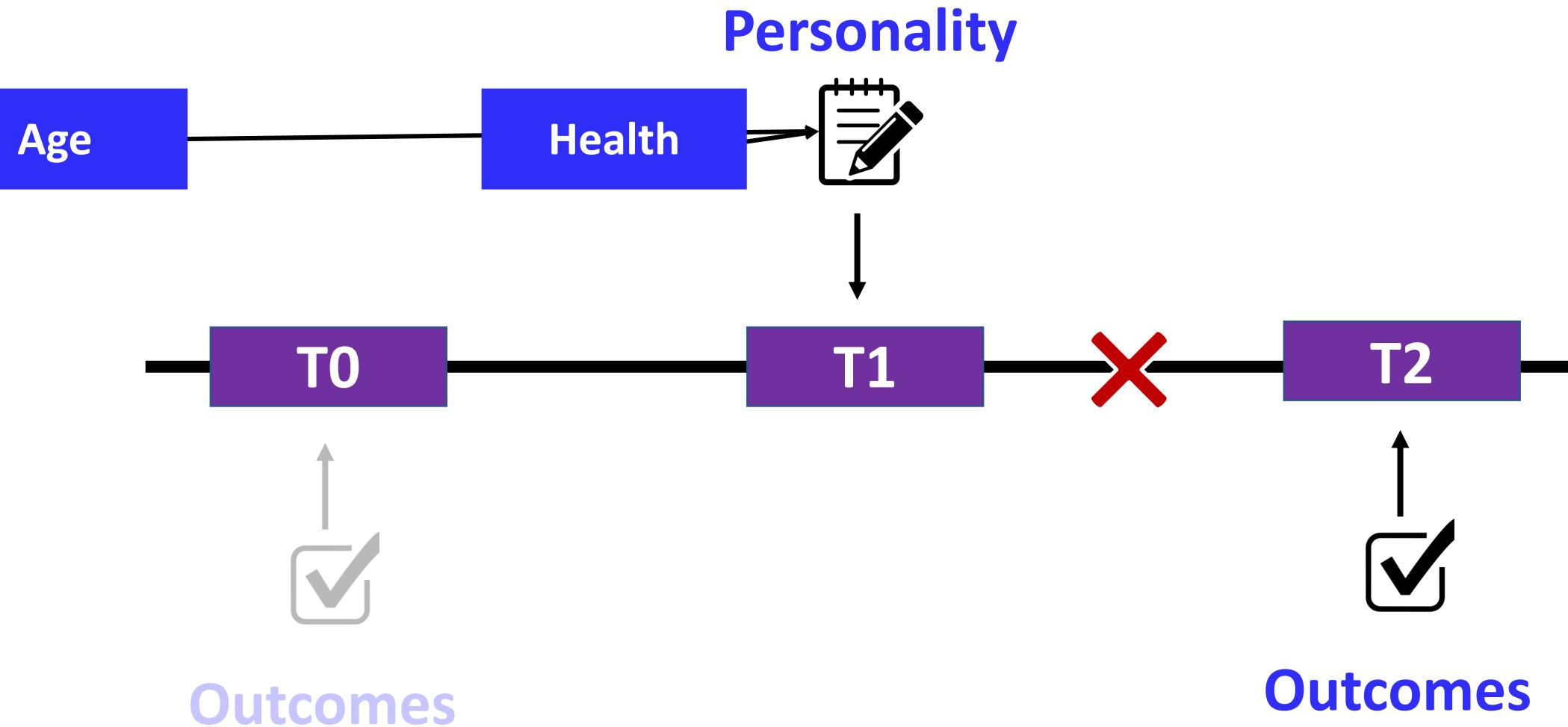
Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

Arbitrary Covariate
Inclusion

Unclear Boundary
Conditions

Single Studies



Limitations of Personality Prediction

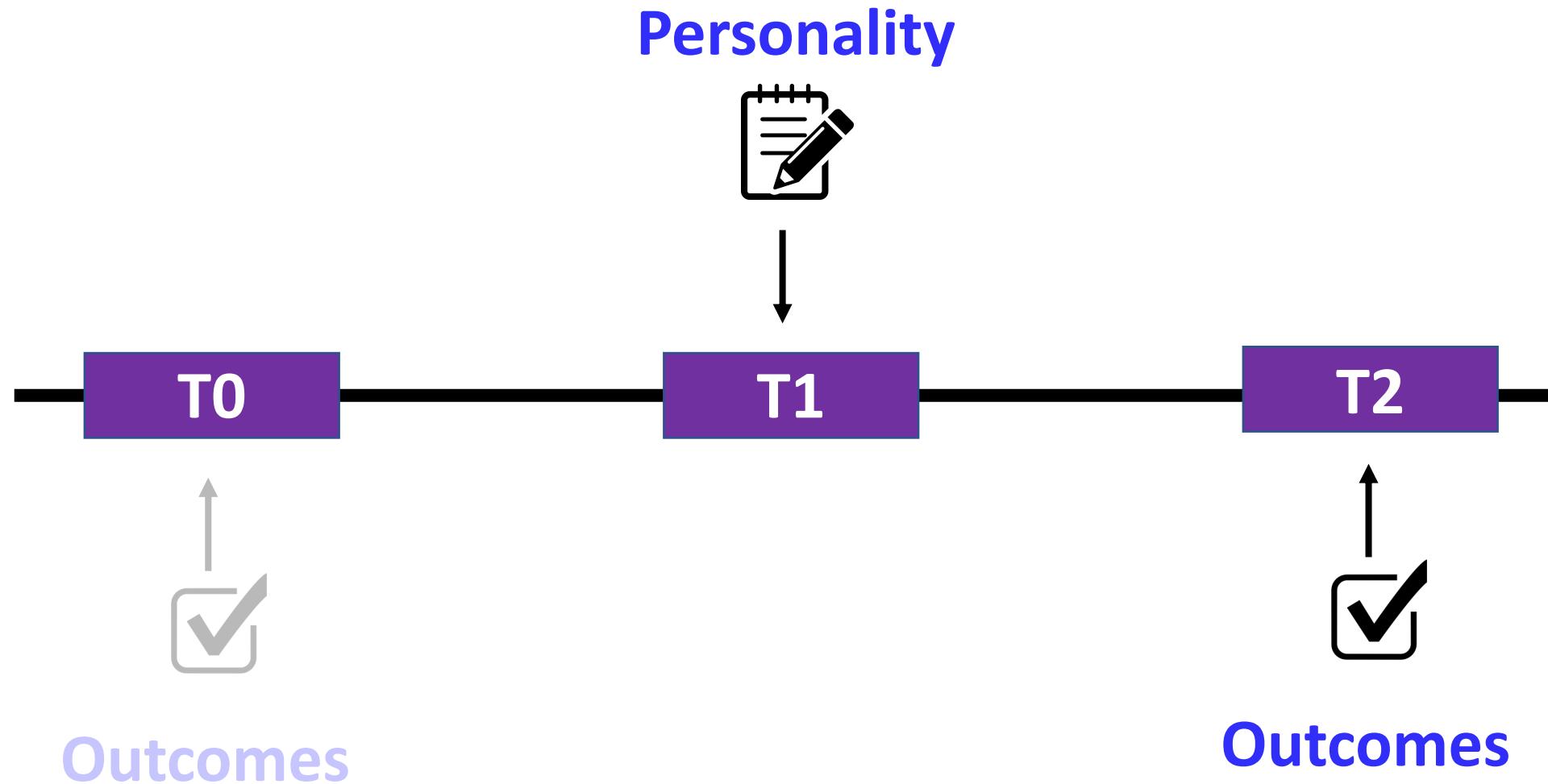
Cross-Sectional
(Reverse Causality)

Third Variables
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Arbitrary Covariate
Inclusion

Unclear Boundary
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Single Studies



Limitations of Personality Prediction

Cross-Sectional
(Reverse Causality)

Third Variables
(Selection Bias)

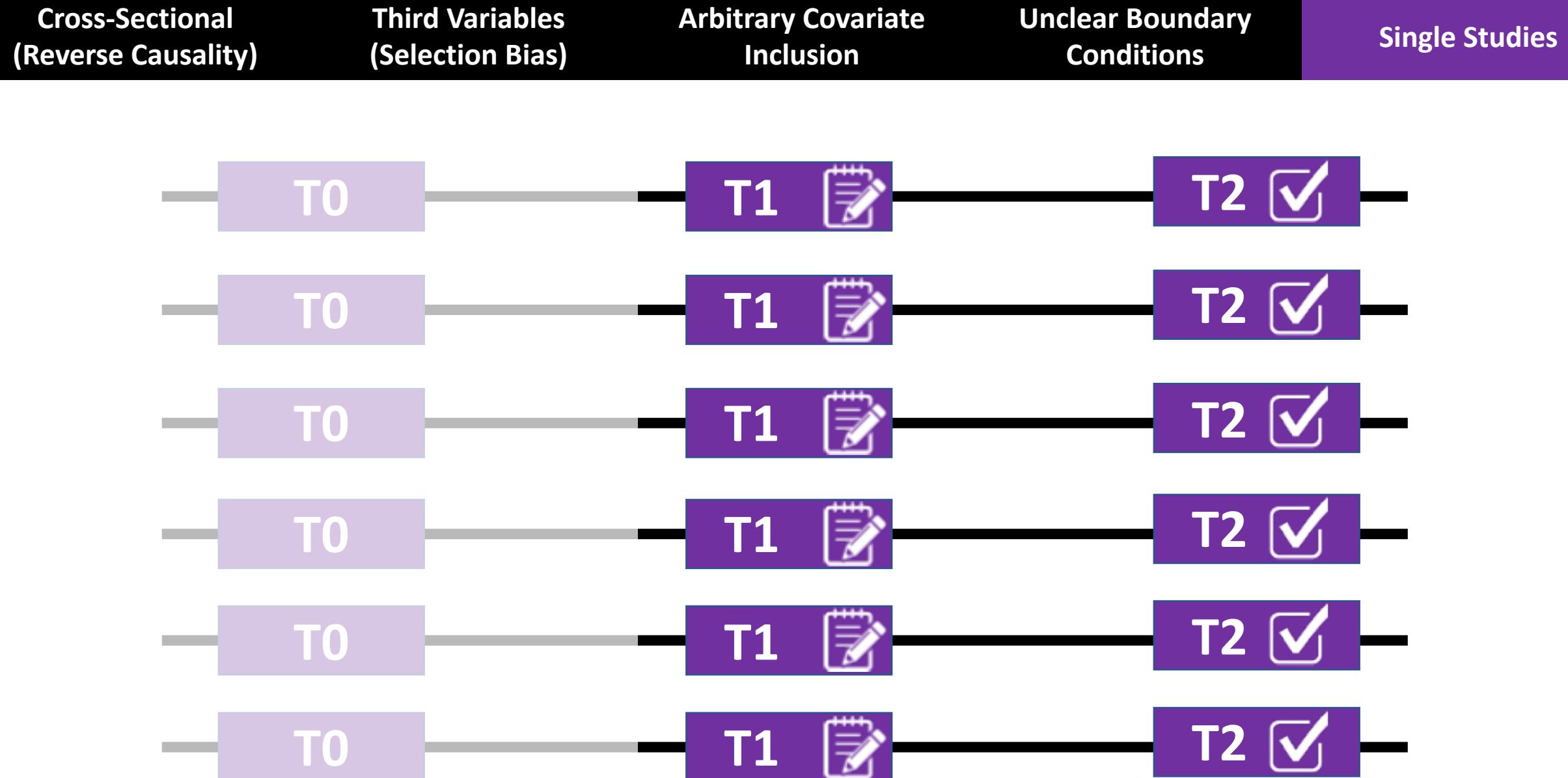
Arbitrary Covariate
Inclusion

Unclear Boundary
Conditions

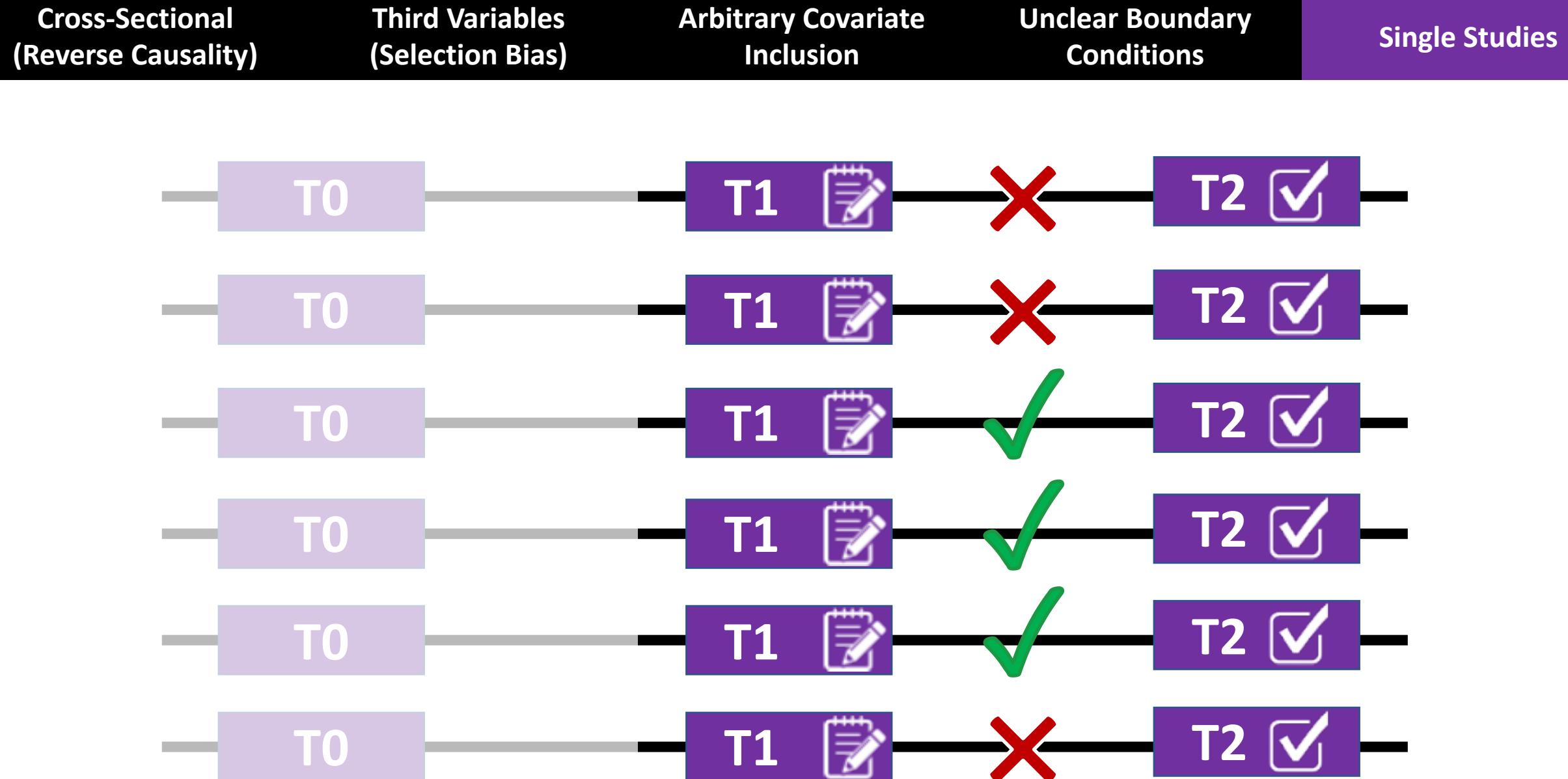
Single Studies



Limitations of Personality Prediction



Limitations of Personality Prediction



Limitations of Personality Prediction

Problem	Longitudinal Design	Propensity Score Matching	Specification Curve Analysis	Mega-Analysis
Cross-Sectional (Reverse Causality)				
Third Variables (Selection Bias)				
Arbitrary Covariate Inclusion				
Unclear Boundary Conditions				
Single Studies				

Limitations of Personality Prediction

Problem	Longitudinal Design	Propensity Score Matching	Specification Curve Analysis	Mega-Analysis
Cross-Sectional (Reverse Causality)	✓	✓		
Third Variables (Selection Bias)	✓	✓	✓	
Arbitrary Covariate Inclusion		✓	✓	
Unclear Boundary Conditions		✓	✓	✓
Single Studies				✓

The Current Study

How robust are personality-outcome associations...

1. Longitudinally?
2. Across studies?
3. Controlling for selection bias?
4. Across moderators?
5. Across covariates?

14 Predictors

14 Outcomes

8 Moderators

10 Studies

2 Methods

14 Predictors

14 Outcomes

8 Moderators

10 Studies

Extraversion

Agreeableness

Conscientiousness

Neuroticism

Openness to Experience

Self-Esteem

Optimism / Pessimism

Satisfaction with Life

Positive Affect

Negative Affect

Locus of Control

Social Support

IQ / Cognitive Ability

Depression

2 Methods

14 Predictors**14 Outcomes****8 Moderators****10 Studies**

Extraversion

Mortality

Agreeableness

Major Health Event

Conscientiousness

Mental Health Event

Neuroticism

Childbirth

Openness to Experience

Move in with a Partner

Self-Esteem

Marriage

Optimism / Pessimism

Divorce

Satisfaction with Life

Child Moves Out

Positive Affect

Higher Education

Negative Affect

First Job

Locus of Control

Unemployment

Social Support

Retirement

IQ / Cognitive Ability

Volunteering

Depression

Criminal Behavior

Health

Social

Work/Edu

Civic

2 Methods

14 Predictors	14 Outcomes	8 Moderators	10 Studies
Extraversion	Mortality	Age	
Agreeableness	Major Health Event	Gender	
Conscientiousness	Mental Health Event	Race	
Neuroticism	Childbirth	Parental Education (SES)	
Openness to Experience	Move in with a Partner	Par. Occ. Prestige (SES)	
Self-Esteem	Marriage	Gross Wages (SES)	
Optimism / Pessimism	Divorce	Reliability	
Satisfaction with Life	Child Moves Out	Prediction Interval	
Positive Affect	Higher Education	2 Methods	
Negative Affect	First Job		
Locus of Control	Unemployment		
Social Support	Retirement		
IQ / Cognitive Ability	Volunteering		
Depression	Criminal Behavior		

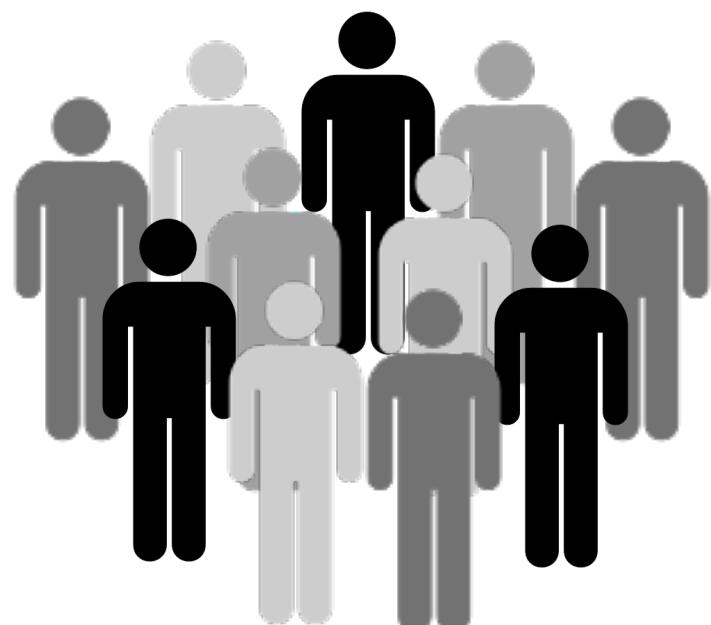
14 Predictors	14 Outcomes	8 Moderators	10 Studies
Extraversion	Mortality	Age	Add Health
Agreeableness	Major Health Event	Gender	BHPS (and US)
Conscientiousness	Mental Health Event	Race	GSOEP
Neuroticism	Childbirth	Parental Education (SES)	HILDA
Openness to Experience	Move in with a Partner	Par. Occ. Prestige (SES)	HRS
Self-Esteem	Marriage	Gross Wages (SES)	LISS
Optimism / Pessimism	Divorce	Reliability	MIDUS
Satisfaction with Life	Child Moves Out	Prediction Interval	NLSY
Positive Affect	Higher Education	2 Methods	SHP WLS (G&S)
Negative Affect	First Job		
Locus of Control	Unemployment		
Social Support	Retirement		
IQ / Cognitive Ability	Volunteering		
Depression	Criminal Behavior		

14 Predictors	14 Outcomes	8 Moderators	10 Studies
Extraversion	Mortality	Age	Add Health
Agreeableness	Major Health Event	Gender	BHPS (and US)
Conscientiousness	Mental Health Event	Race	GSOEP
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Openness to Experience	Move in with a Partner	Par. Occ. Prestige (SES)	HRS
Self-Esteem	Marriage	Gross Wages (SES)	LISS
Optimism / Pessimism	Divorce	Reliability	MIDUS
Satisfaction with Life	Child Moves Out	Prediction Interval	NLSY
Positive Affect	Higher Education	2 Methods	SHP WLS (G&S)
Negative Affect	First Job		
Locus of Control	Unemployment		
Social Support	Retirement		
IQ / Cognitive Ability	Volunteering	Propensity Score Matching	
Depression	Criminal Behavior	Specification Curve Analysis	

No Event

Event

Propensity Score Matching



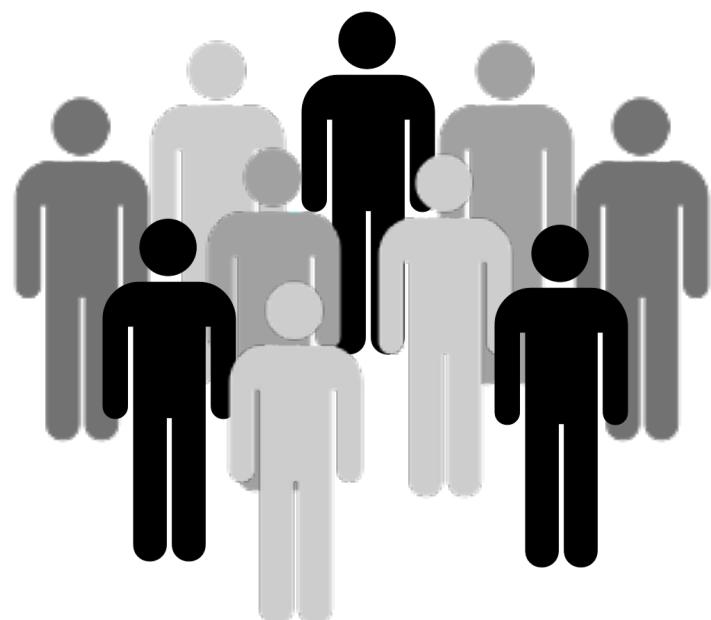
(Thoemmes & Kim, 2011)

No Event

Event



PS = .2



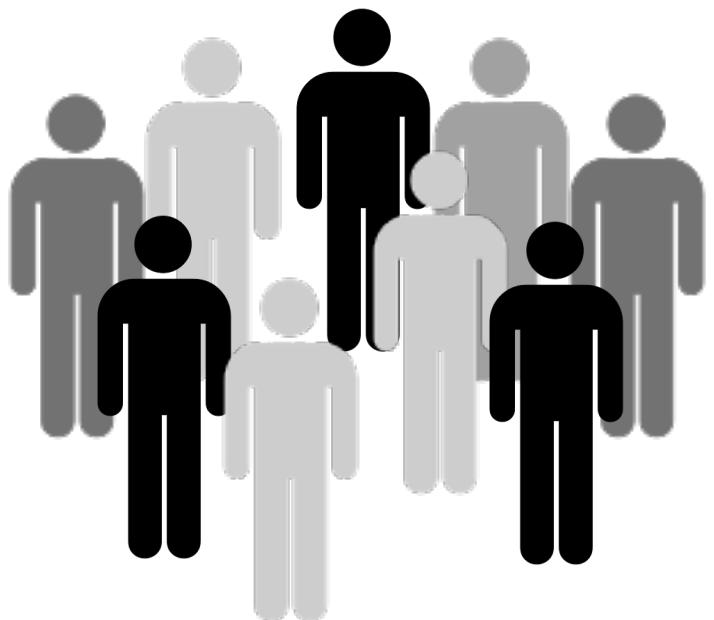
(Thoemmes & Kim, 2011)



PS = .2



No Event



PS = .6



Event



(Thoemmes & Kim, 2011)



PS = .2



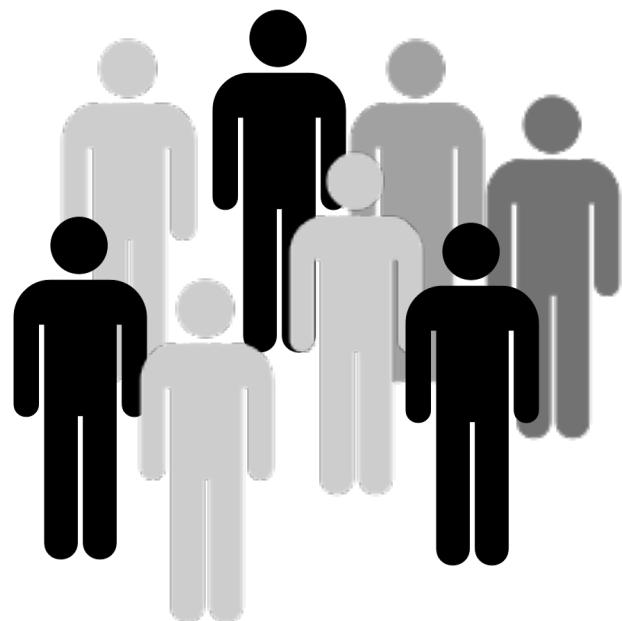
PS = .6

No Event

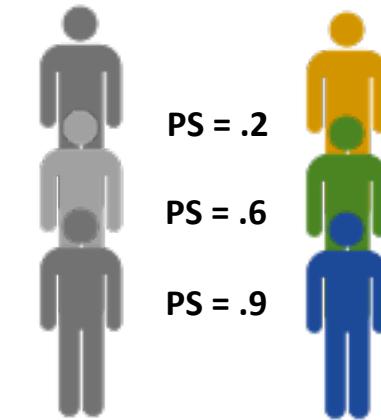
Event



PS = .9

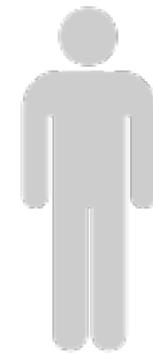


(Thoemmes & Kim, 2011)

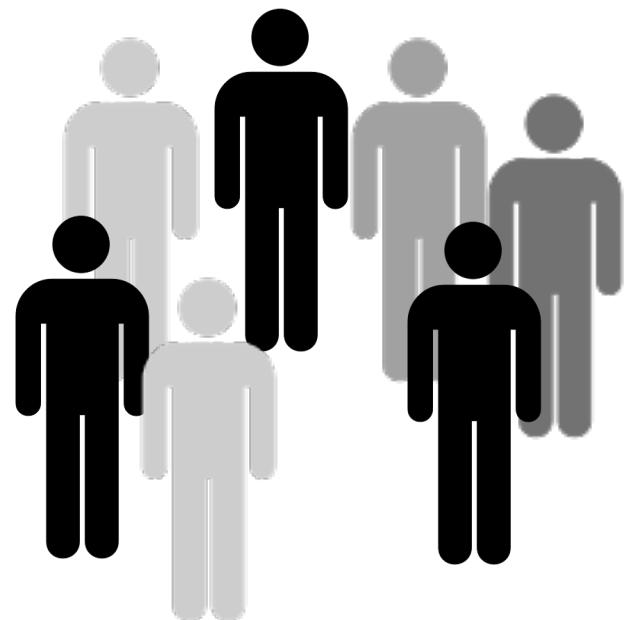


No Event

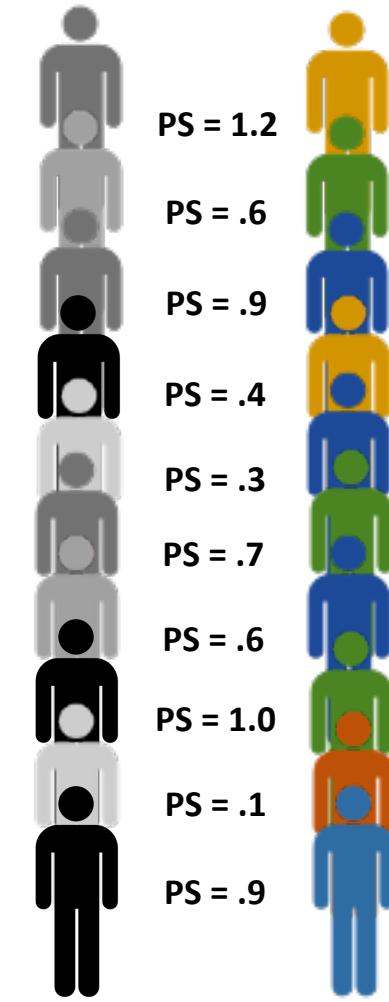
Event



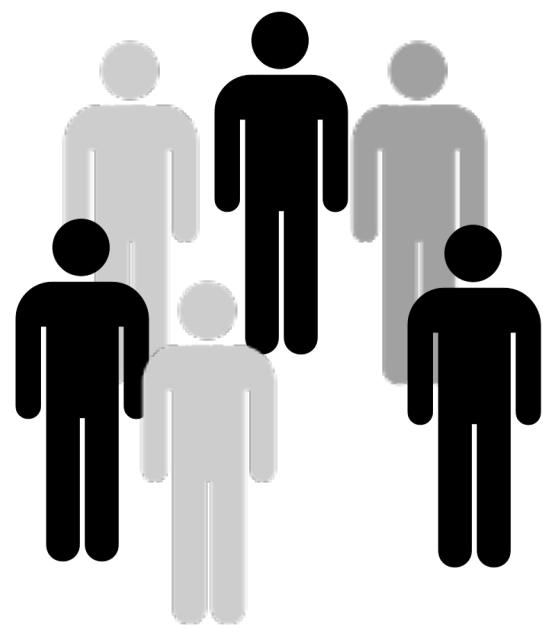
PS = .3



(Thoemmes & Kim, 2011)



No Event



Event



Propensity Score Matching

Year of Birth	Physical Functioning	Unemployment Benefit
Gender	Life Satisfaction	Number of Siblings
Household ID	Satisfaction with Family	Married
Father Alive	Satisfaction with Income	Number of Children
Mother Alive	Satisfaction with School	Employment
Race	Neighborhood Quality	Height (in meters)
Ethnicity	Healthcare	Weight (in kg)
Gross Wages	Urban/Rural	Education
Welfare	Disability	Exercise
Household size	Father Education	Drinks Alcohol
Self-Rated Physical Health	Mother Education	Does Drugs
Body Mass Index (BMI)	Mother Age at Birth	Smokes
Loneliness	Doctor Visits	Physical Activity

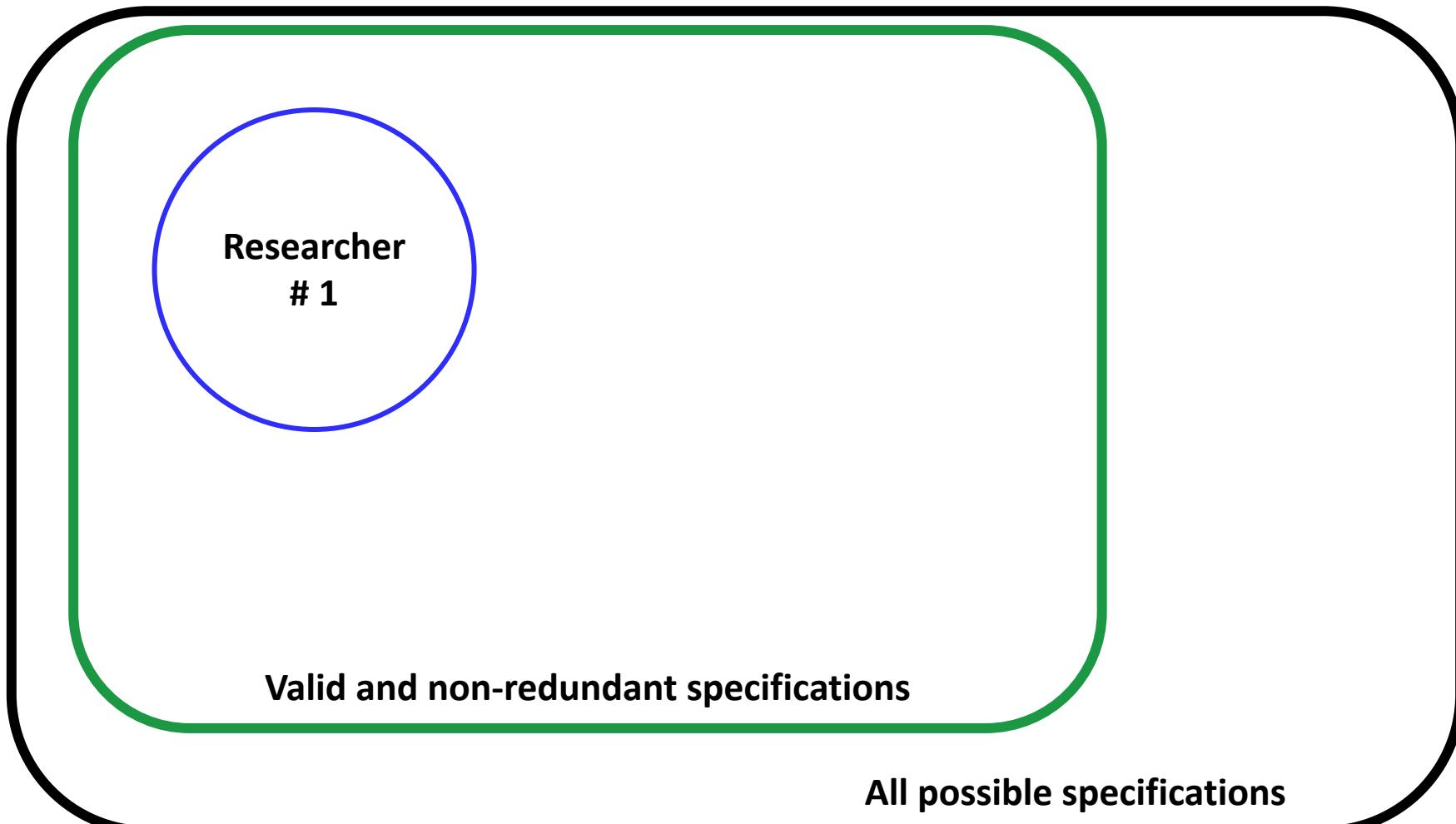
Specification Curve Analysis

All possible specifications

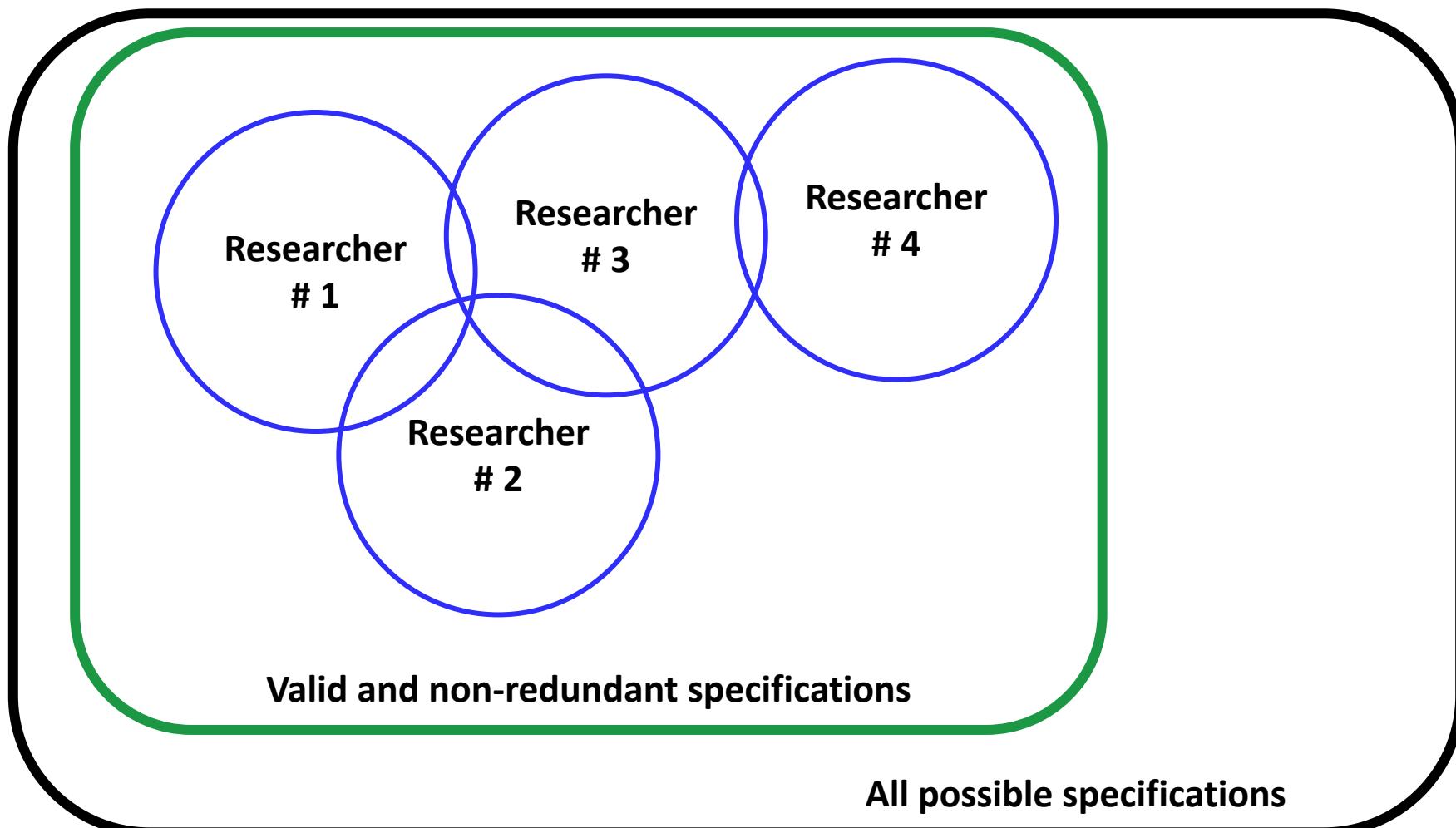
Specification Curve Analysis



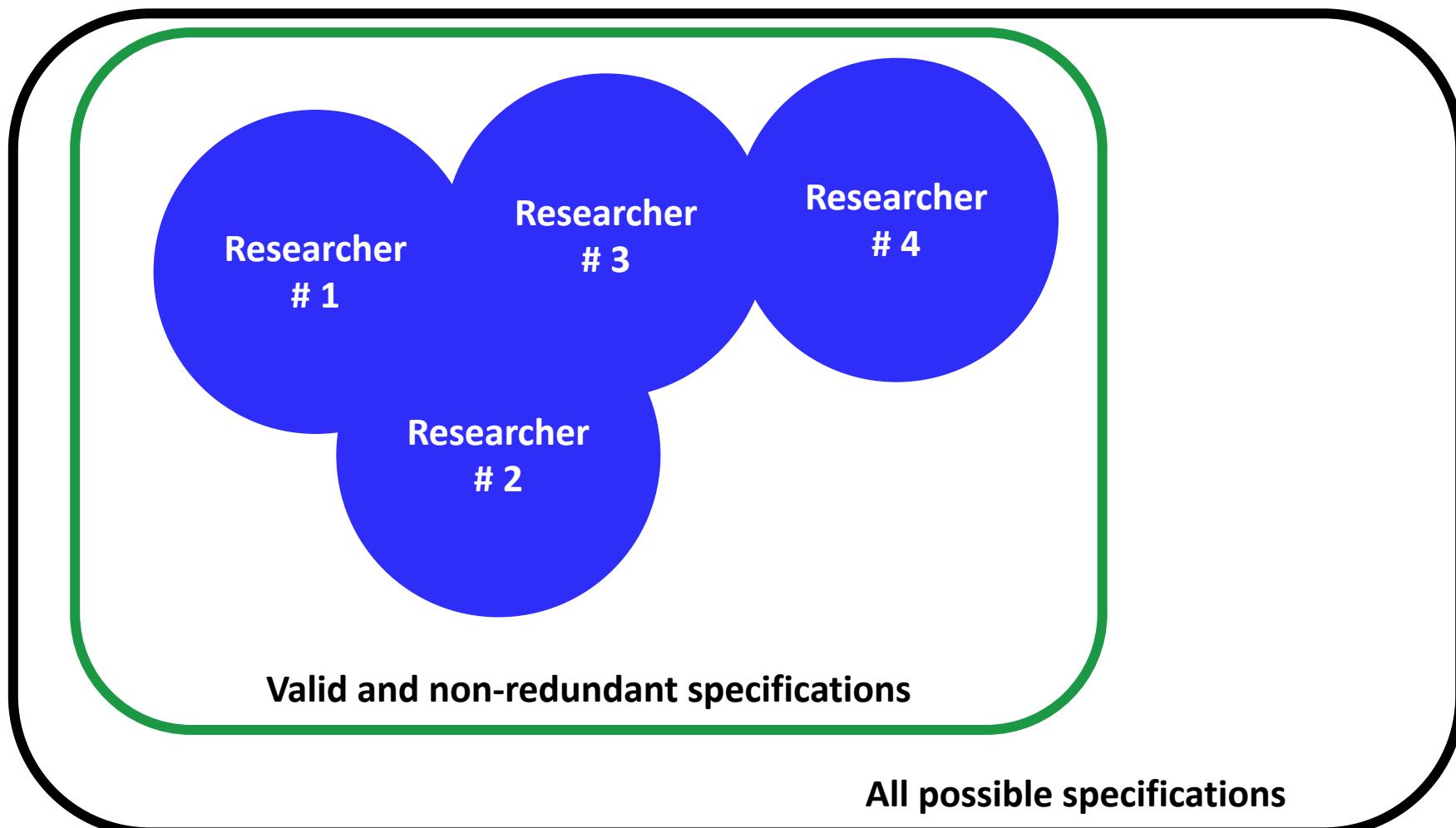
Specification Curve Analysis



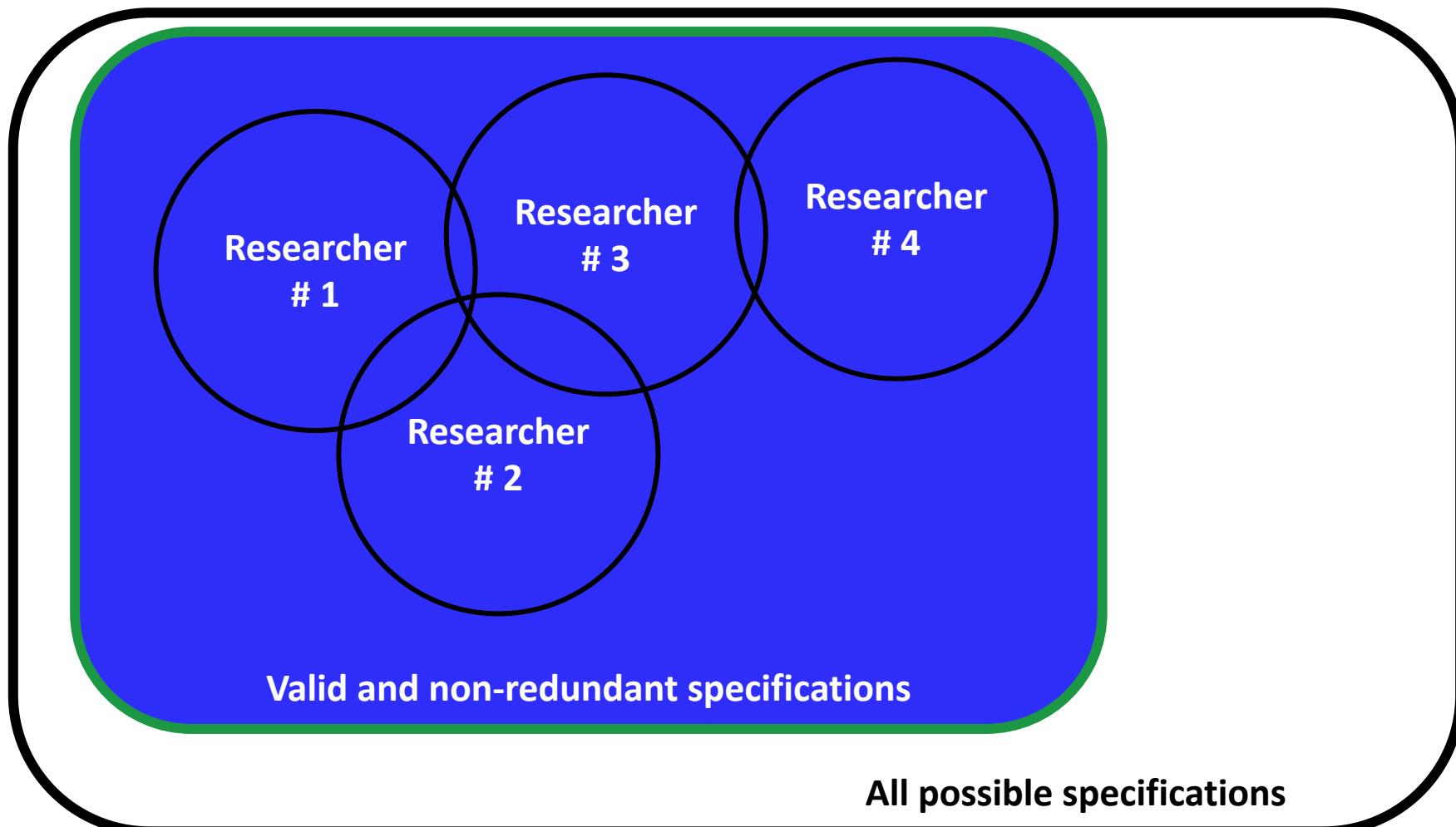
Specification Curve Analysis



Specification Curve Analysis



Specification Curve Analysis



Specification Curve Analysis

Age	Gender	Health	SES
1 Covariate	2 Covariates	3 Covariates	4 Covariates
1. Age	5. Age + Gender	11. Age + Gender + Health	15. Age + Gender + Health + SES
2. Gender	6. Age + Health	12. Age + Gender + SES	
3. Health	7. Age + SES	13. Age + SES + Health	0 Covariates
4. SES	8. Gender + Health	14. Gender + Health + SES	16.
	9. Gender + SES		
	10. Health + SES		
Total Specifications = $2^{\# \text{ of terms}}$			

1. Age

2. Gender

3. Health

4. SES

7. Age + SES

5. Age + Gender

8. Gender + Health

6. Age + Health

9. Gender + SES

10. Health + SES

11. Age + Gender + Health

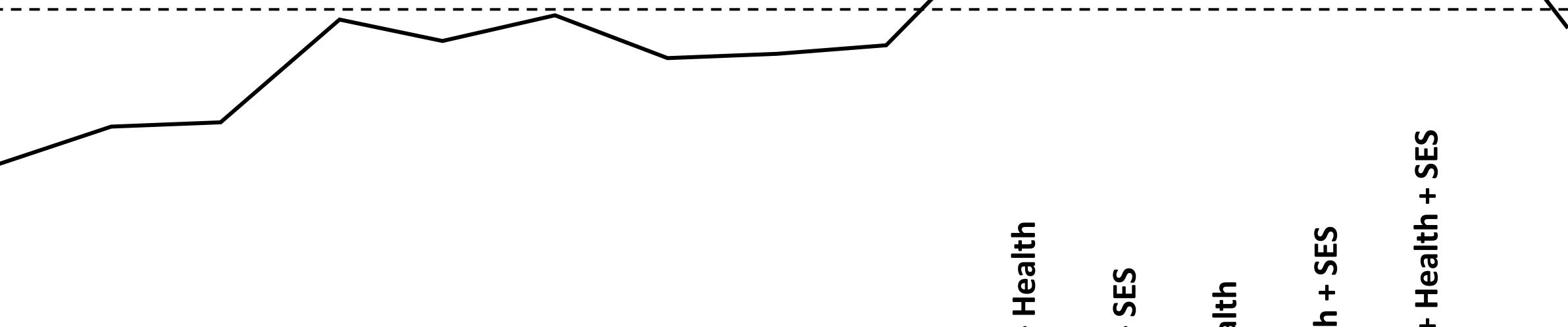
12. Age + Gender + SES

13. Age + SES + Health

14. Gender + Health + SES

15. Age + Gender + Health + SES

16.



But does this pattern
differ from chance?

-
1. Age
2. Gender
3. Health
4. SES
7. Age + SES
5. Age + Gender
8. Gender + Health
6. Age + Health
9. Gender + SES
10. Health + SES
11. Age + Gender + Health
12. Age + Gender + SES
13. Age + SES + Health
14. Gender + Health + SES
15. Age + Gender + Health + SES
- 16.

Specification Curve Analysis

ID	Personality	Outcome	Age	Gender	Health	SES
1	9	1	42	0	3	0
2	7	0	26	0	3	1
3	4	1	57	1	4	1
4	2	1	40	1	2	2
5	5	1	36	0	1	1
6	6	0	44	1	4	1
7	8	0	60	1	5	0
8	9	0	21	0	2	0
9	9	0	35	0	3	1
10	1	1	52	1	3	1

Specification Curve Analysis

ID	Personality	Outcome	Age	Gender	Health	SES
1	1	1	42	0	3	0
2	9	0	26	0	3	1
3	6	1	57	1	4	1
4	2	1	40	1	2	2
5	3	1	36	0	1	1
6	4	0	44	1	4	1
7	8	0	60	1	5	0
8	4	0	21	0	2	0
9	3	0	35	0	3	1
10	0	1	52	1	3	1

x 500 permutations

Simonsohn, Simmons & Nelson, 2015

1. Age

2. Gender

3. Health

4. SES

7. Age + SES

5. Age + Gender

8. Gender + Health

6. Age + Health

9. Gender + SES

10. Health + SES

11. Age + Gender + Health

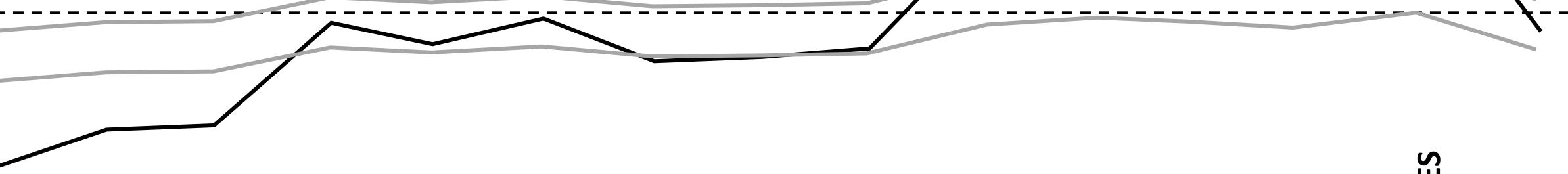
12. Age + Gender + SES

13. Age + SES + Health

14. Gender + Health + SES

15. Age + Gender + Health + SES

16.



Specification Curve Analysis

(1) the median overall point estimate within each specification curve

(2) the number of specifications that are of the dominant sign

(3) the number of specifications with the dominant sign that are also significant

Specification Curve Analysis

Table 3
Specification Curve Analysis Specifications for Each Outcome

Measure	S	T	Mortality	Health Event	Mental Health Event	Childbirth	Move in with Partner	Mariage	Divorce	Child Moves Out	Higher Ed	First Job	Unemployed	Retire	Volunteer	Criminal Behavior
Age	C	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Parent Occ. Prestige	C	P	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Parental Education	B	P	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gross Wages	C	P	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Education	N	P	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gender	B	P	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Race	N	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Disease	B	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Self-Rated Health	B	C	X	X	X	X	X	X	X					X	X	
Smoking	C	P	X	X	X	X	X	X	X							X
Alcohol Consumption	C	C	X	X	X		X	X	X				X			
Exercise	C	C	X	X	X	X	X	X	X				X	X		
BMI	C	C	X	X	X	X								X		X
Marital Status	N	C	X	X	X	X				X	X		X	X		X
Number of Children	C	C							X	X	X			X		X
Parental Divorce	C	C				X	X	X	X		X	X				X
Functional Limitations	N	C	X	X	X	X		X					X	X		
Religion	B	C	X		X	X	X	X	X	X	X	X				X

Note: Column S indicates whether variables are continuous (C), binary (B), or nominal (N), while column T indicates concurrent (C) or prior (P) measurement to personality.

Results

R Shiny Web Application: <https://emoriebeck.shinyapps.io/selection>
All Code & Results: <https://github.com/emoriebeck/selection>

Results

Propensity Score Matching

R Shiny Web Application: <https://emoriebeck.shinyapps.io/selection>
All Code & Results: <https://github.com/emoriebeck/selection>

emoriebeck.shinyapps.io/selection

[https://github.com/emoriebeck/selection/
tree/master/results/psm/bal_plots](https://github.com/emoriebeck/selection/tree/master/results/psm/bal_plots)

Propensity Score Matching

Dataset

Wisconsin Longitudinal Study (WLS)

German Socioeconomic Panel (GSOEP)

Longitudinal Internet Studies for the Social Sciences (LISS)

National Longitudinal Study of Youth (NLSY)

Household, Income, and Labor Dynamics in Australia (HILDA)

Midlife in the US Study (MIDUS)

British House Panel Study (BHPS)

Adolescent to Adult Health (Ad Health)

Health and Retirement Study (HRS)

Swiss Household Panel Study (SHP)

$$\text{Level 1: } \logit(P_{ij}) = \beta_{0j} + \beta_{1j} * X_{ij} + \varepsilon_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j},$$

$$\begin{bmatrix} \tau_{00}^2 & \tau_{01} \\ \tau_{10} & \tau_{11}^2 \end{bmatrix}$$

Study-specific personality-outcome associations

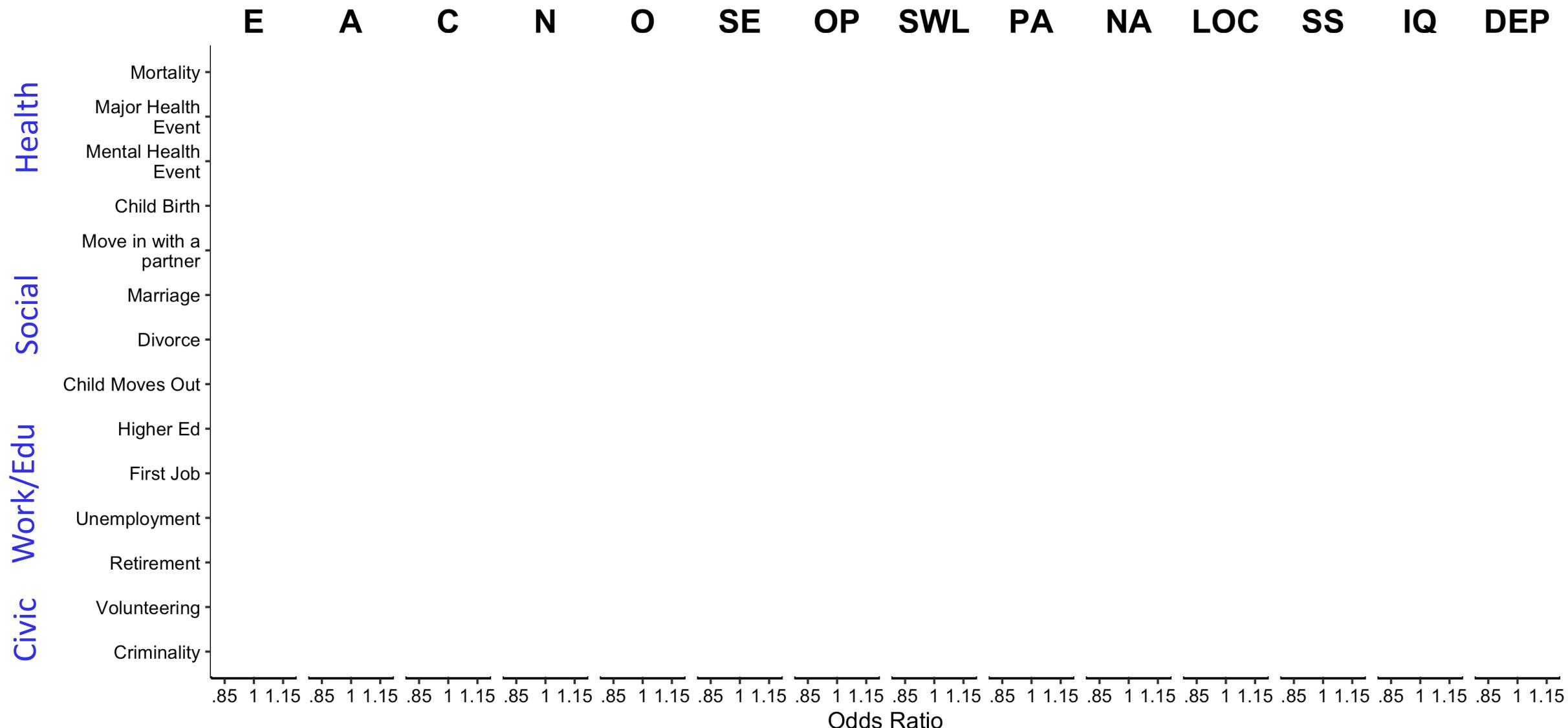
Average personality-outcome association

Study-specific deviations

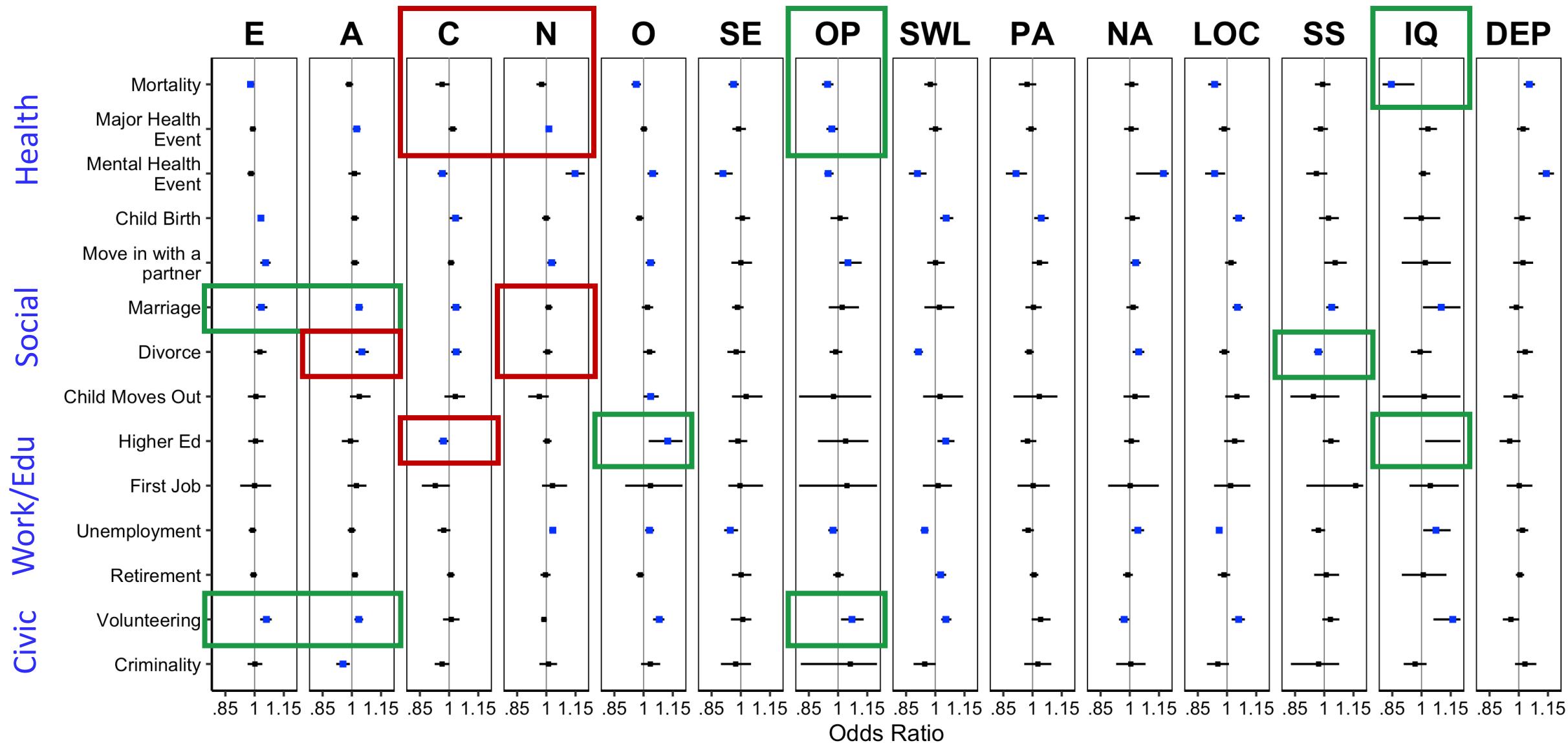
Variance in personality-outcome associations

Mega-Analytic Estimates (γ_{10}): 32.65% robust after matching

Mega-Analytic Estimates (γ_{10}): 32.65% robust after matching

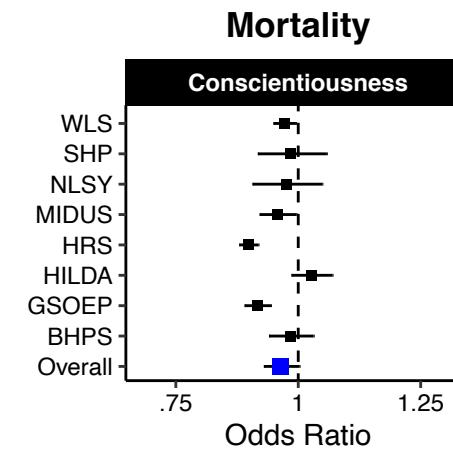


Mega-Analytic Estimates (γ_{10}): 32.65% robust after matching



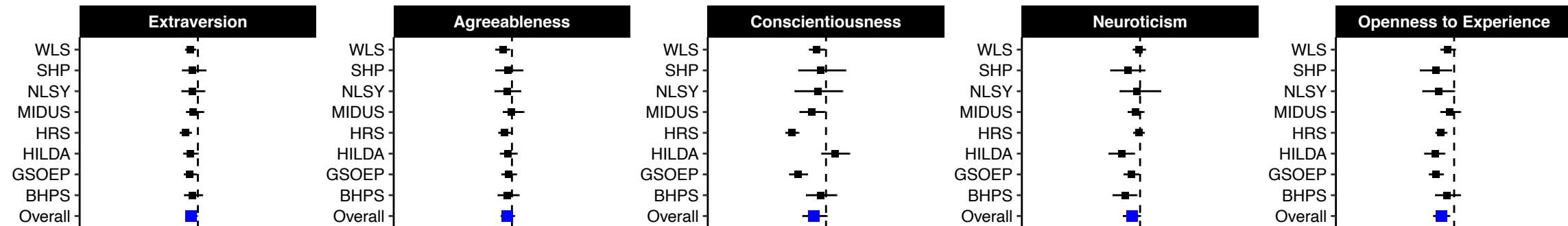
Study-Specific Estimates (β_{1J})

Study-Specific Estimates (β_{1j})

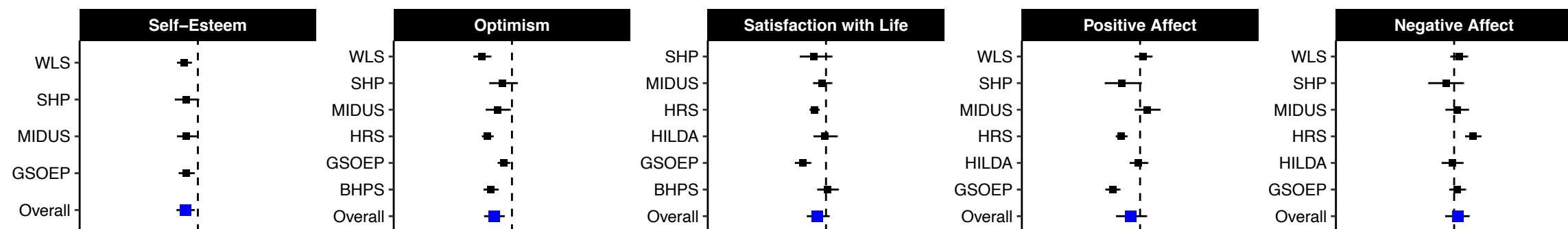


Study-Specific Estimates (β_{1j})

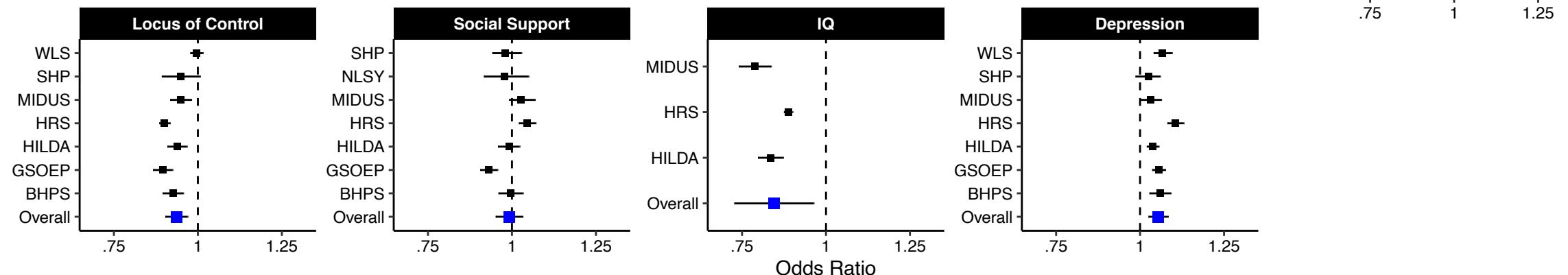
Mortality



Self-Esteem



Locus of Control



...too many results to parse through in a short amount of time

Top/Bottom
Moderators

Most/Least
Moderated Traits

Most/Least
Moderated Outcomes

...too many results to parse through in a short amount of time

Top/Bottom Moderators

6.70% significant overall

1. Parental Education: 11.20%*
2. Age: 10.20%
3. Gender: 9.80%
- ...
6. Race: 3.57%**
7. Reliability: 1.02%

Most/Least Moderated Traits

14/14 moderated

1. Social Support: 12.50%
2. Conscientiousness, Openness: 10.70%
- ...
13. IQ: 3.57%
14. Optimism: 2.68%

Most/Least Moderated Outcomes

11/14 moderated

1. Unemployment: 13.4%
2. Move in with a Partner: 10.7%
- ...
11. Education: 3.57%
14. Child Moves Out, First Job, Criminal Behavior: 0%

*high school or below versus either 2/4-year college, 8.16%; degree or beyond 4 years of college, 4.08%

**white versus Black, 3.06%; white versus other, .51%

Results

Specification Curve Analysis

R Shiny Web Application: <https://emoriebeck.shinyapps.io/selection>
All Code & Results: <https://github.com/emoriebeck/selection>

Inference Test Robustness

Very Robust $3/3 < .0167$

Somewhat Robust $2/3 < .0167$

Not Robust $0-1/3 < .0167$

Inference Test Robustness

Very Robust $3/3 < .0167$ 102/196
(52.04%)

Somewhat Robust $2/3 < .0167$ 44/196
(22.44%)

Not Robust $0-1/3 < .0167$ 50/196
(25.51%)

Observed Curve Robustness

Not Robust

Robust

Differential, No clear pattern

Differential, Clear pattern

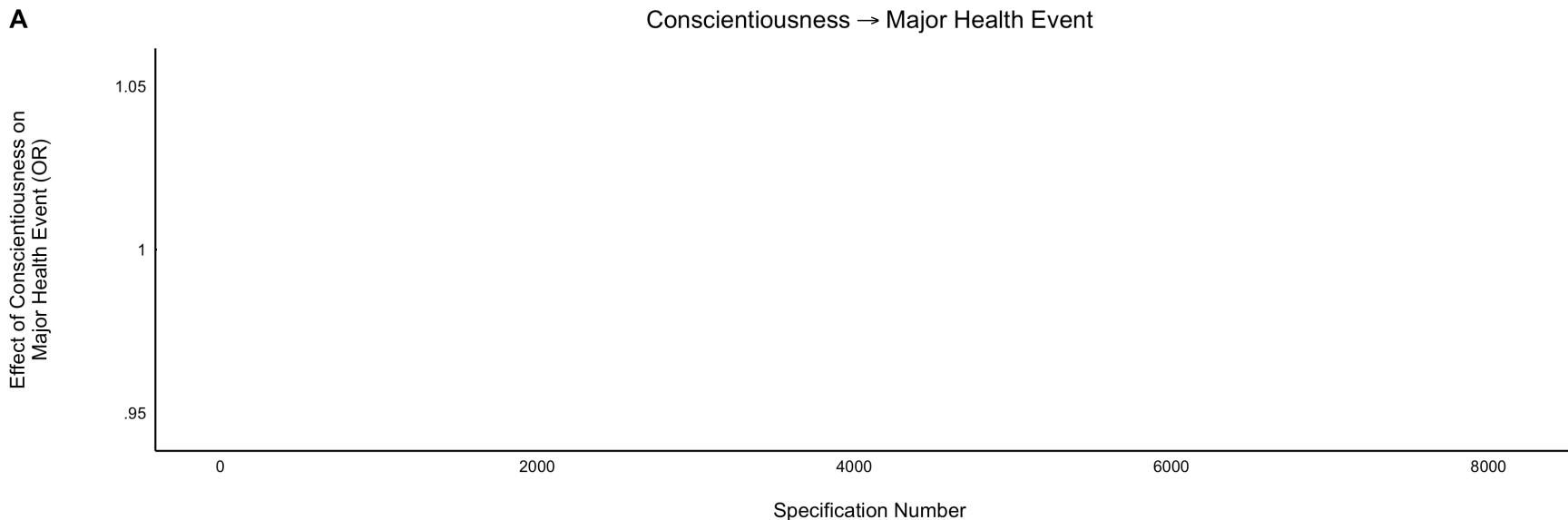
Observed Curve Robustness

Not Robust	60/196 (30.61%)
Robust	18/196 (9.18%)
Differential, No clear pattern	16/196 (8.16%)
Differential, Clear pattern	102/196 (52.04%)

Not Robust

60/196 (30.61%)

A



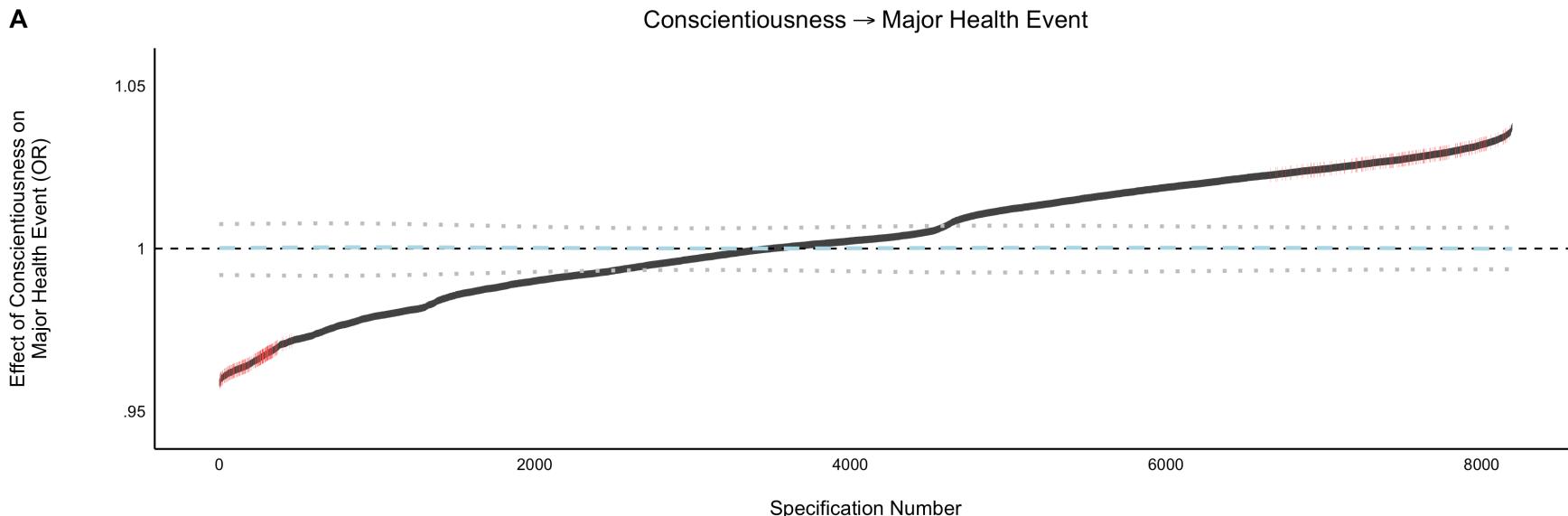
B

Variables	SRhealth
	smokes1
	race2
	race1
	PhysFunc1
	parOccPrstg
	parEdu3
	parEdu2
	p_value
	married1
	grsWages
	gender1
	exercise
	education2
	education1
	BMI
	alcohol1
	age

Not Robust

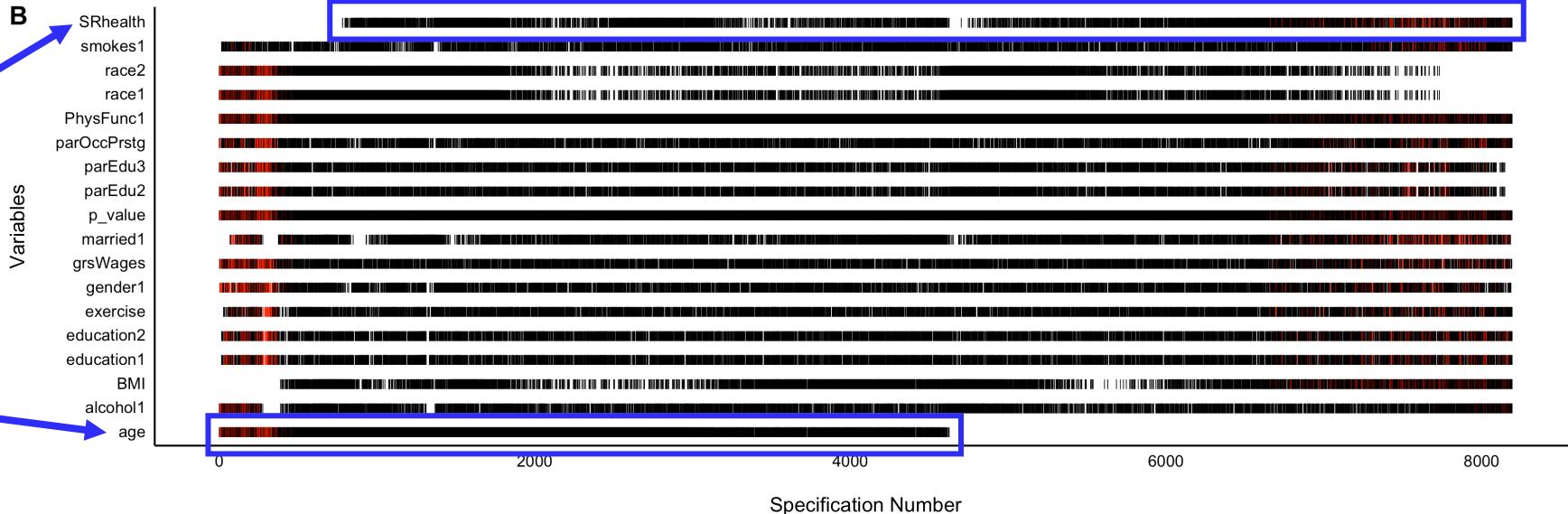
60/196 (30.61%)

A

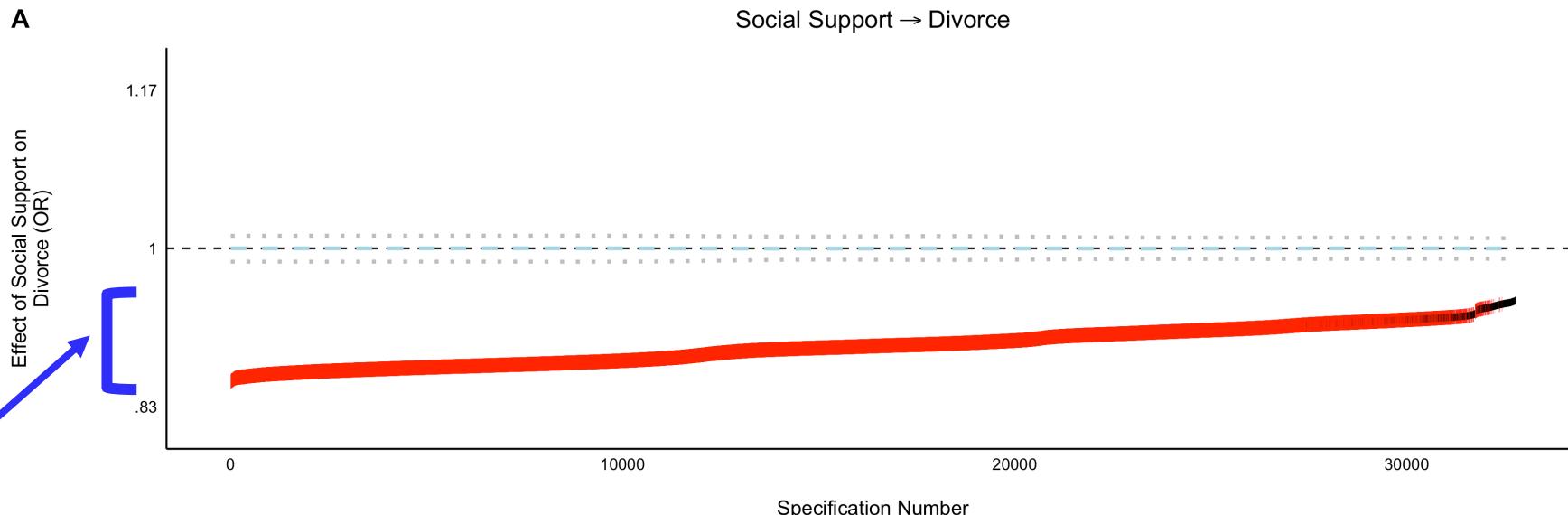


Self-rated health attenuates the relationship

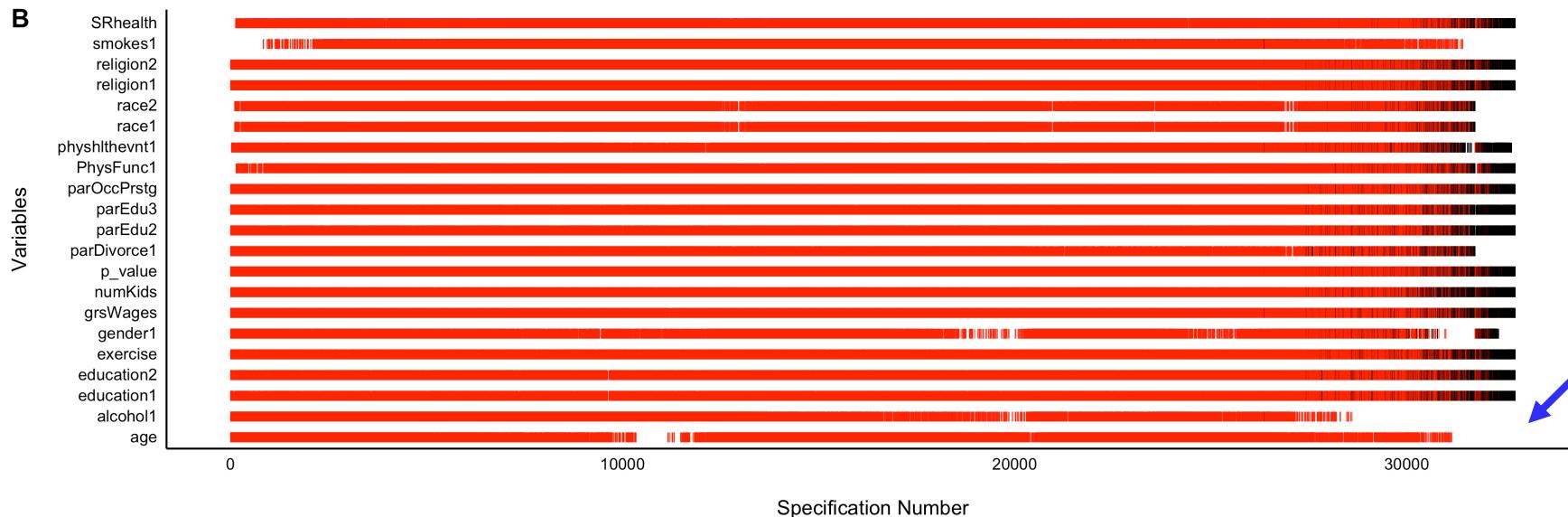
B



Age impacts the direction of the relationship

Robust**18/196 (9.18%)****A**

Not a lot of effect size change

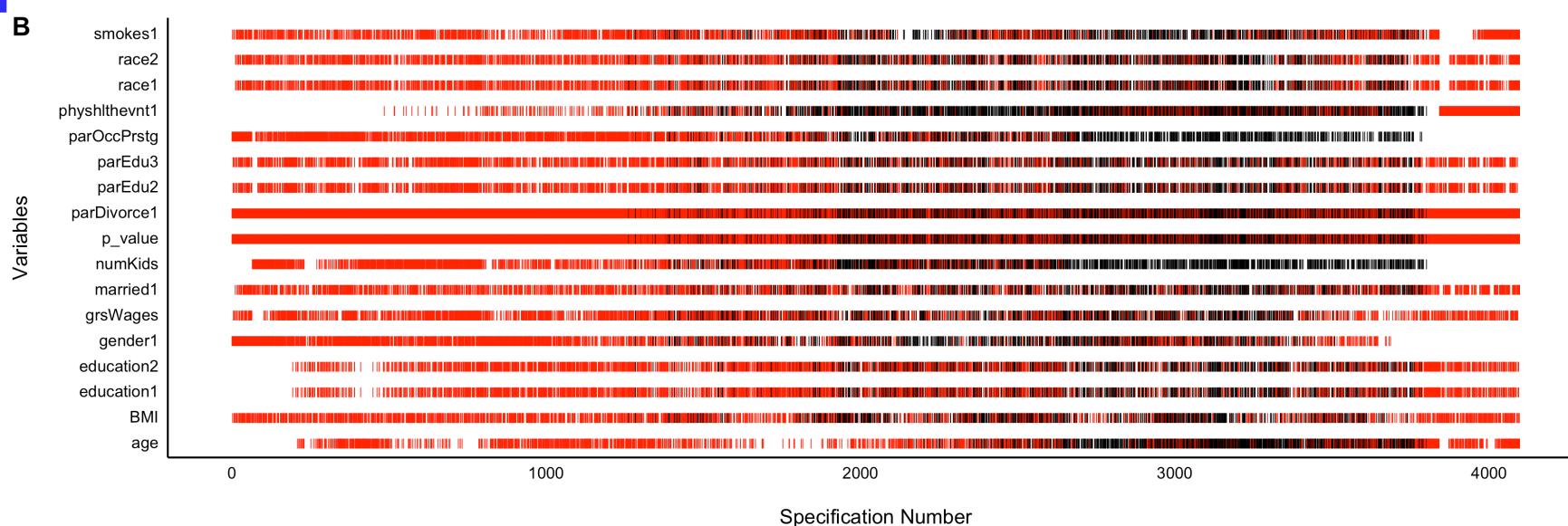
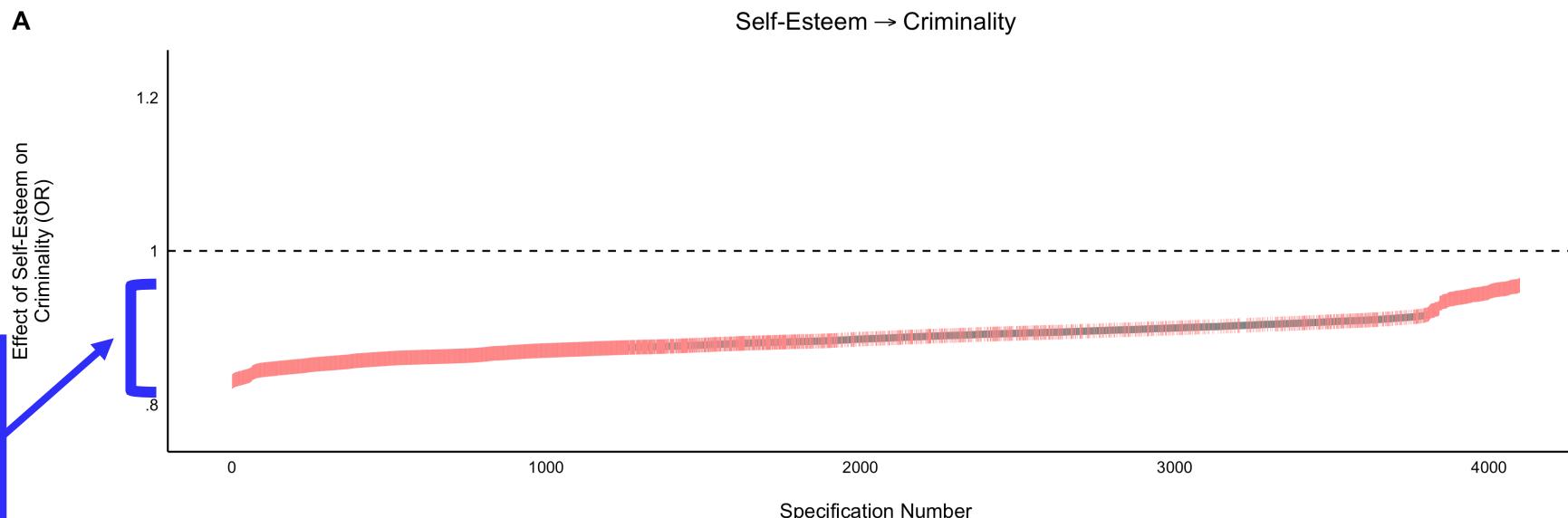
B

Only specifications including age and alcohol are significant

Differential, No clear pattern

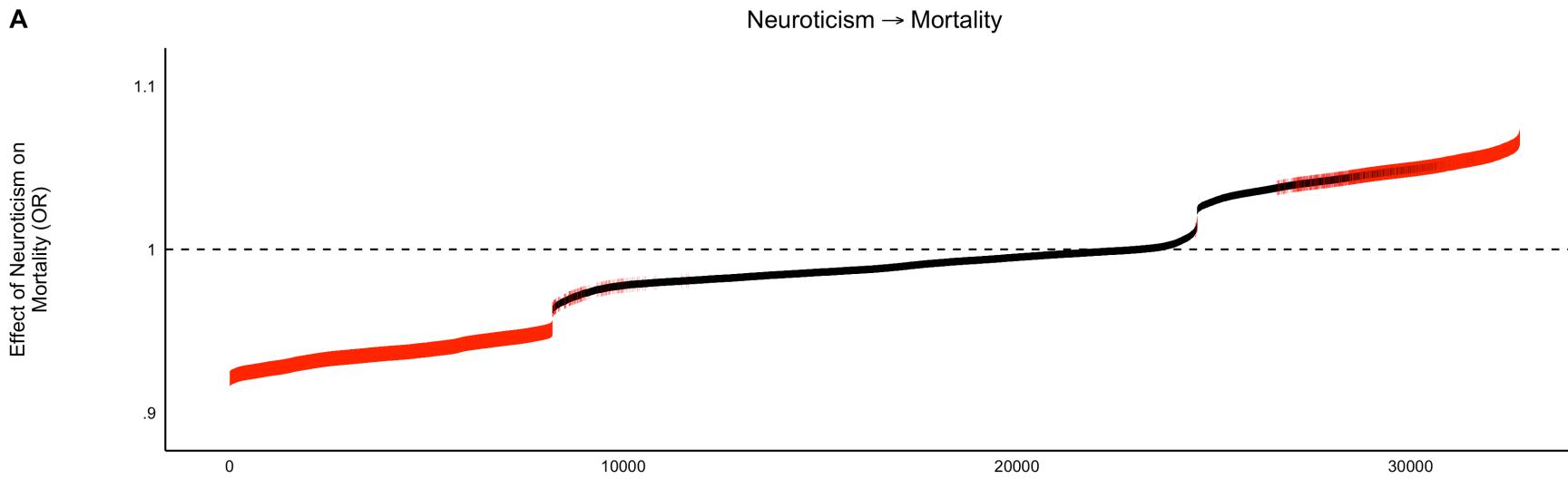
16/196 (8.16%)

Not a lot of effect size change

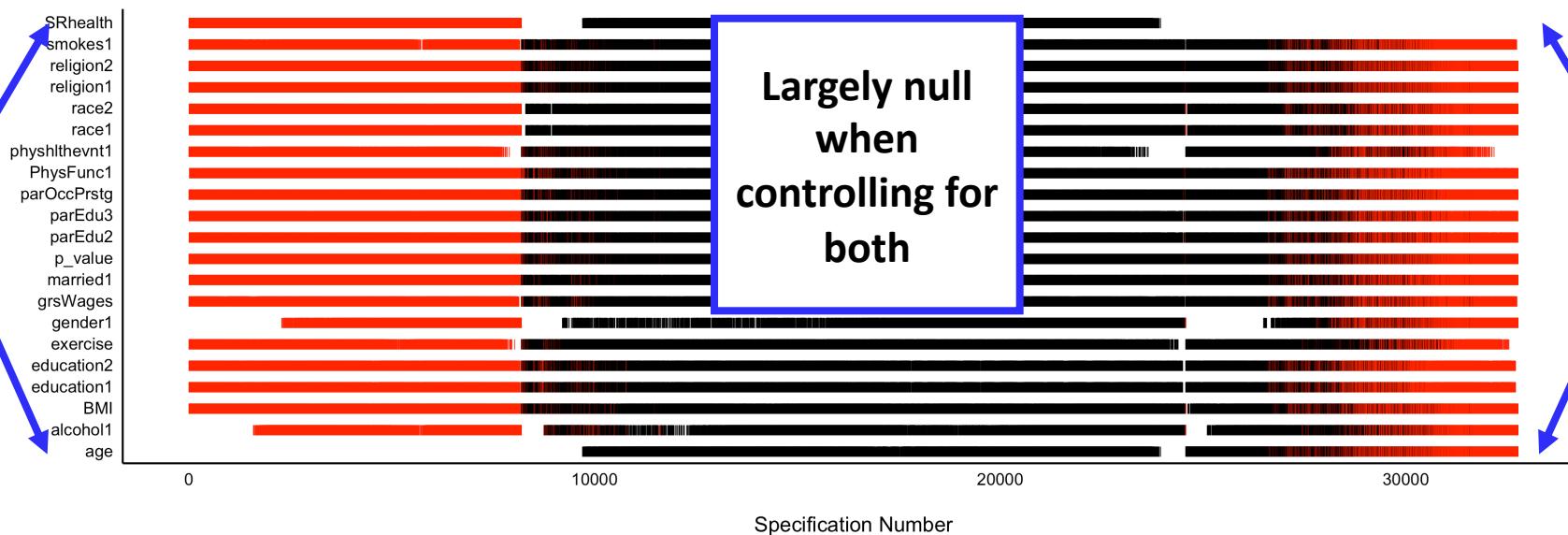


Differential, Clear pattern

102/196 (52.04%)

A

Significant and negative with self-rated health but not age

B

Somewhat Significant and positive with age but not self-rated health

Observed Curve Robustness

Not Robust	60/196 (30.61%)
Robust	18/196 (9.18%)
Differential, No clear pattern	16/196 (8.16%)
Differential, Clear pattern	102/196 (52.04%)

For all specification curve plots, a several sentence summary of each plot, and a list of key variables in each plot, see the Specification Curve Panel of the R Shiny Web Application:

R Shiny Web Application:

<https://emoriebeck.shinyapps.io/selection>

Discussion

Personality prediction is quite robust.

**32.65% of unmoderated associations
robust after matching**

**Proportionally fewer moderators of
personality-outcome associations (6.70%)**

**52.04% of associations very robust across
specifications**

**61.22% of observed associations robust
across all specifications**

Summary

Key Variables

Future Directions

Summary

Key Variables

Future Directions

R Shiny Web Application:
[https://emoriebeck.shinyapps.io/
 selection](https://emoriebeck.shinyapps.io/selection)

“Key Variables” Tab

Table 9
 Significant Moderators of Propensity Score Matched Models and Critical Covariates of Specification Curve Analyses

Outcome	Method	E	A	C	N	O	SE	OP	SWL	PA	NA	LOC	SS	IQ	DEP		
Mortality	PSM	age gender parOccPrstg	gender	gender		predInt			age	predInt			reliability				
	SCA	age SRhealth age SRhealth gender	age SRhealth gender	age SRhealth gender	age SRhealth gender alcohol physhlthevt	age SRhealth age	SRhealth	age SRhealth gender	age SRhealth alcohol	age SRhealth gender	age SRhealth alcohol	age SRhealth gender	SRhealth age	age SRhealth age	age SRhealth		
Major Health Event	PSM	parEdu		age					age				parOccPrstg	age grsWages parOccPrstg	parEdu		
	SCA	SRhealth age		age race SRhealth BMI	age SRhealth	SRhealth age	age SRhealth	age race SRhealth	race	race age	age race SRhealth	SRhealth age	race age alcohol	age parOccPrstg parEdu	age parOccPrstg parEdu		
Mental Health Event	PSM		parOccPrstg predInt		race		parOccPrstg	age	age					gender grsWages education exercise age	gender grsWages race		
	SCA	SRhealth gender age alcohol	SRhealth gender1	age SRhealth gender1 alcohol	SRhealth age	SRhealth age	SRhealth age exercise		race	SRhealth race physhlthevt PhysFunc1	race parOccPrstg	parOccPrstg race	race				
Childbirth	PSM	parEdu	age predInt	gender parEdu	gender	parEdu							parOccPrstg predInt	parEdu			
	SCA	race parDivorce	age parOccPrstg	age parDivorce married smoking	race parOccPrstg	race parDivorce	parOccPrstg	age physhlthevt	SRhealth race physFunc1 age smokes	age race parDivorce	age grsWages age	smokes physhlthevt exercise	race parDivorce	parOccPrstg exercise	exercise physhlthevt parOccPrstg		
Move in with a partner	PSM			age parOccPrstg		gender	age parOccPrstg			gender			predInt race		gender predInt		
	SCA	age	age alcohol	age alcohol race	age alcohol	age alcohol race	grsWages age	age smokes grsWages	alcohol	age parOccPrstg parOccPrstg	age parOccPrstg	age parOccPrstg	age alcohol race	age parOccPrstg exercise	age parOccPrstg parOccPrstg		
Marriage	PSM	age	age	gender	age grsWages parEdu					parOccPrstg parEdu							
	SCA	age alcohol	age	age alcohol race parOccPrstg	age	age race parDivorce	age parDivorce	age parDivorce alcohol age	parOccPrstg race parOccPrstg age	age parOccPrstg parOccPrstg	age parOccPrstg	age parOccPrstg	age alcohol smokes	exercise parEdu	physhlthevt age		
Divorce	PSM	grsWages		age parEdu	parEdu										race		
	SCA	age SRhealth	grsWages gender	age SRhealth	age	SRhealth age	grsWages alcohol smokes	SRhealth alcohol			age parDivorce	age alcohol	age parEdu gender race smokes alcohol	age parDivorce race physhlthevt exercise			
Child Moves Out	PSM SCA	age	age	race age	race grsWages	race	race age	race	race age numKids grsWages	race numKids	race age numKids grsWages	race age grsWages married	race age education	race age numKids parEdu grsWages	race age		
Higher Ed	PSM			gender						gender predInt							
	SCA	age	age gender parOccPrstg numKids	age married numKids parOccPrstg	age	age	age physhlthevt parOccPrstg numKids	age parOccPrstg	age parOccPrstg parOccPrstg numKids	age parOccPrstg parOccPrstg gender	age parOccPrstg parOccPrstg numKids	age parOccPrstg parOccPrstg gender	age parOccPrstg parOccPrstg numKids	numKids parOccPrstg physhlthevt age			
First Job	PSM SCA	race parDivorce	age	age race parDivorce	age	race age parDivorce	age	race parDivorce age parOccPrstg parOccPrstg	race parOccPrstg age parOccPrstg	parEdu	age parOccPrstg	age parOccPrstg	physhlthevt age race parDivorce	age parOccPrstg			
Unemployment	PSM	grsWages		age	gender parEdu	age parEdu	parEdu			parEdu	parOccPrstg			reliability	age gender parEdu		
	SCA	age married		age married	age alcohol	age			age alcohol	age	age parOccPrstg		age parOccPrstg	age age	age parOccPrstg married		
Retirement	PSM	age grsWages	parEdu	parEdu		gender grsWages	age parEdu	age married grsWages	SRhealth	age SRhealth grsWages physhlthevt grsWages	age SRhealth grsWages physhlthevt grsWages	age SRhealth grsWages physhlthevt grsWages	age physhlthevt age SRhealth	age SRhealth age physhlthevt grsWages			
	SCA	age grsWages		age SRhealth grsWages	age SRhealth physhlthevt grsWages	age parEdu	age parEdu	age married numKids physhlthevt grsWages		parEdu predInt	predInt		parEdu predInt	age SRhealth	age physhlthevt grsWages		
Volunteering	PSM					grsWages		parEdu			grsWages predInt						
	SCA	age	SRhealth age	SRhealth parOccPrstg age	age SRhealth	age parOccPrstg	age SRhealth	age education gender exercise	SRhealth exercise	SRhealth parOccPrstg	age SRhealth parOccPrstg	age SRhealth parOccPrstg	grsWages predInt	age SRhealth parOccPrstg age grsWages	age physhlthevt parOccPrstg age grsWages		
Criminality	PSM SCA	gender race	age gender	gender	race age	age gender	marriage age gender	physhlthevt race gender parOccPrstg numKids		smokes married grsWages	parOccPrstg parOccPrstg numKids	parOccPrstg numKids smokes gender	physhlthevt race gender parOccPrstg married	age smokes parOccPrstg	physhlthevt gender age		

PSM = Propensity Score Matched Models. SCA = Specification Curve Analyses. All variables indicate either significant moderators of personality-outcome associations in the propensity score matched study or critical covariates (in terms of direction, magnitude, and significance) in the specification curve analyses.

Narrower outcomes (e.g., break health events down into specific causes)

The other half of reverse causality (i.e. socialization effects)

Coupling PSM and SCA with models to address more process-related questions

Personality prediction is quite robust.

Across:

- **Studies**
- **Personality Characteristics**
- **Outcomes**
- **Moderators**
- **Covariates**

As well as:

- **Decades**
- **Countries**

Propensity score matching and specification curve analyses are powerful tools for pushing personality research forward

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HRS

LISS

MIDUS

NLSY

SHP

WLS (G&S)

Analytic Tools

WUSTL Center for High
Performance Computing