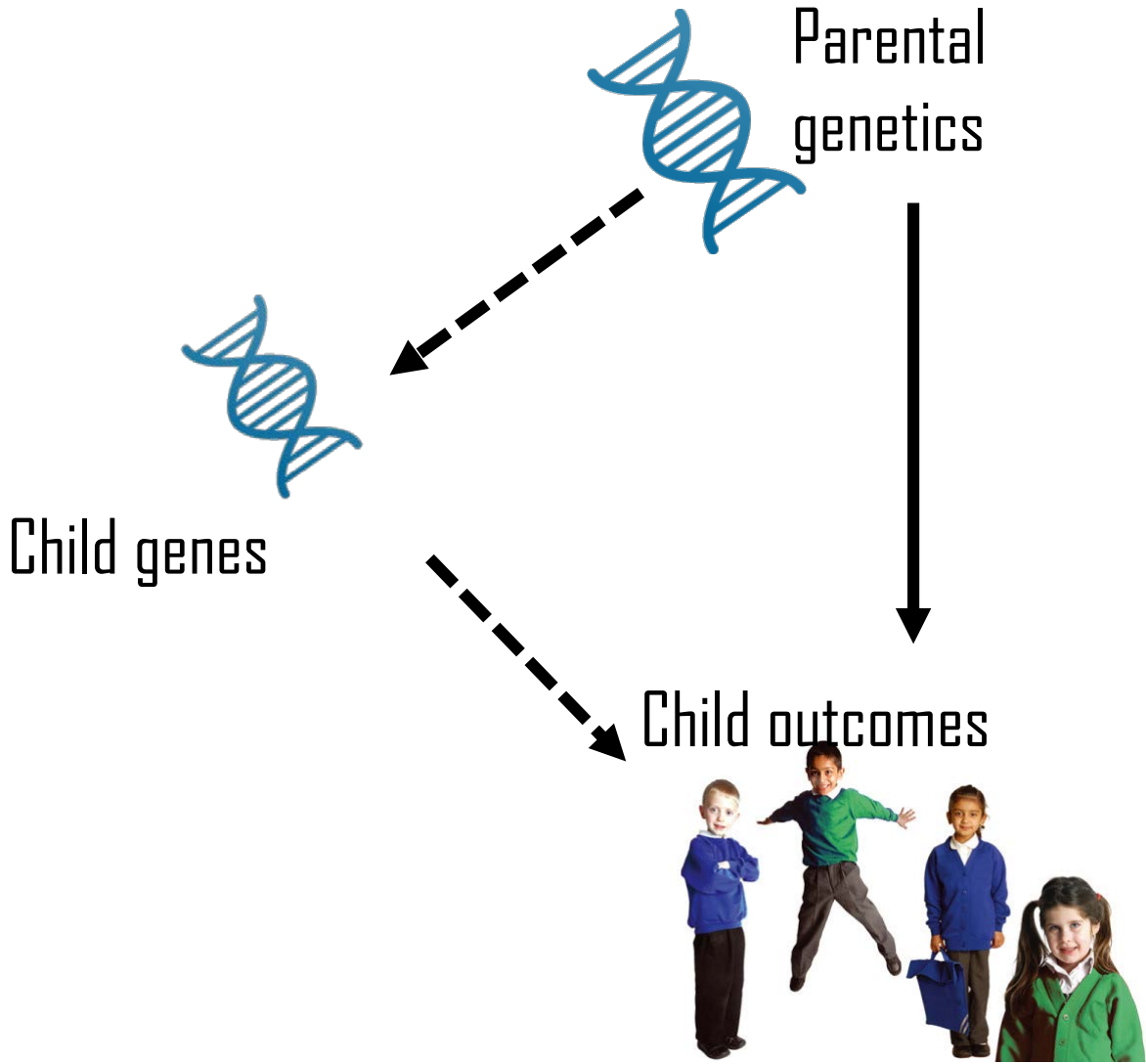# Prenatal Environment Mediates the Association Between Maternal Genetics and Child Development

EMMA ARMSTRONG-CARTER, SAM TREJO, LIAM HILL, KIRSTY CROSSLEY, DAN MASON & BEN DOMINGUE
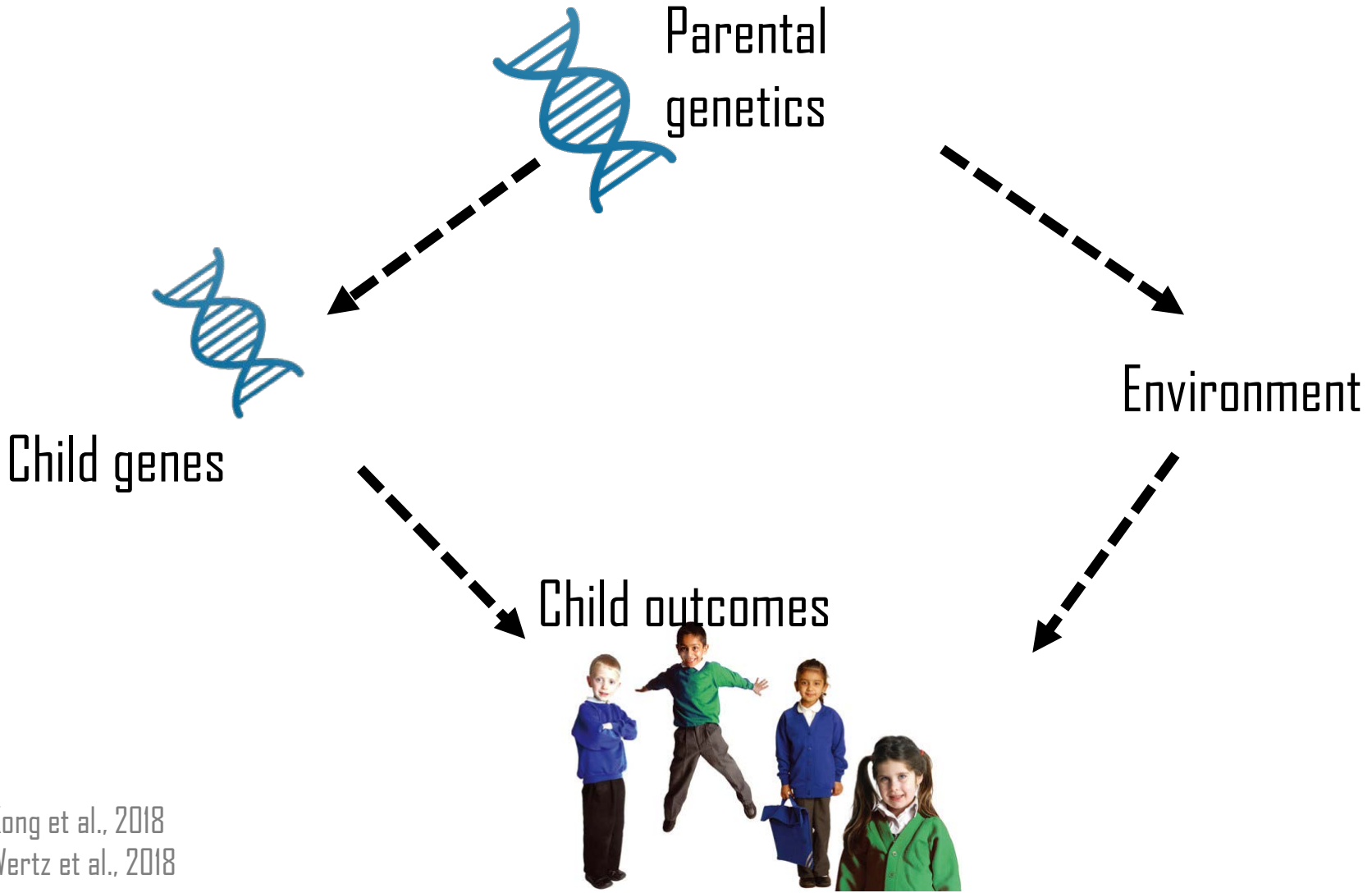
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Framework

Parental genetics

Child genes

Child outcomes

Framework: Genetic nurture

Parental genetics

Child genes

Environment

Child outcomes

Kong et al., 2018
Wertz et al., 2018

Framework: Genetic nurture

Parental genetics

Child genes

Early home

Child outcomes
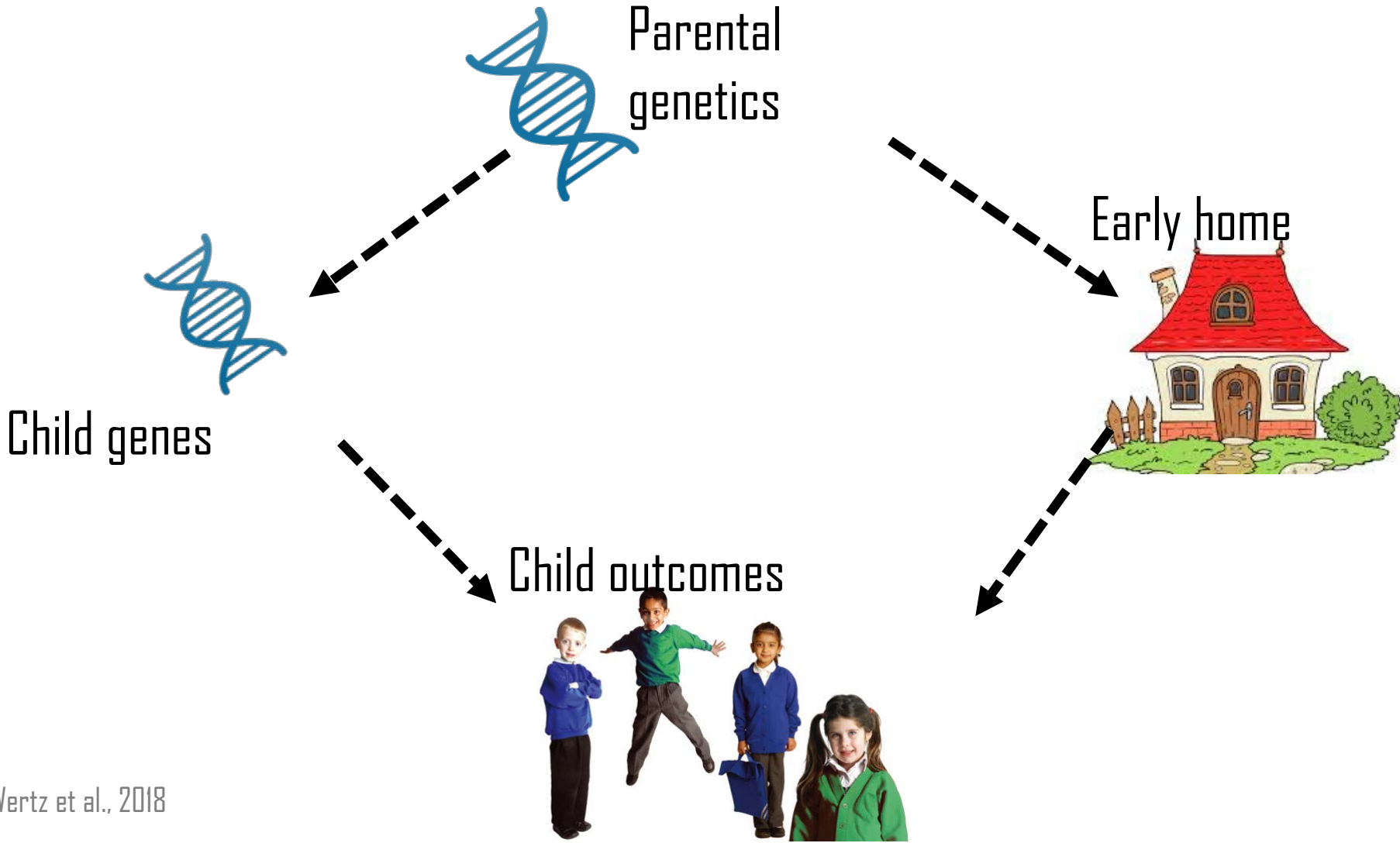
Wertz et al., 2018
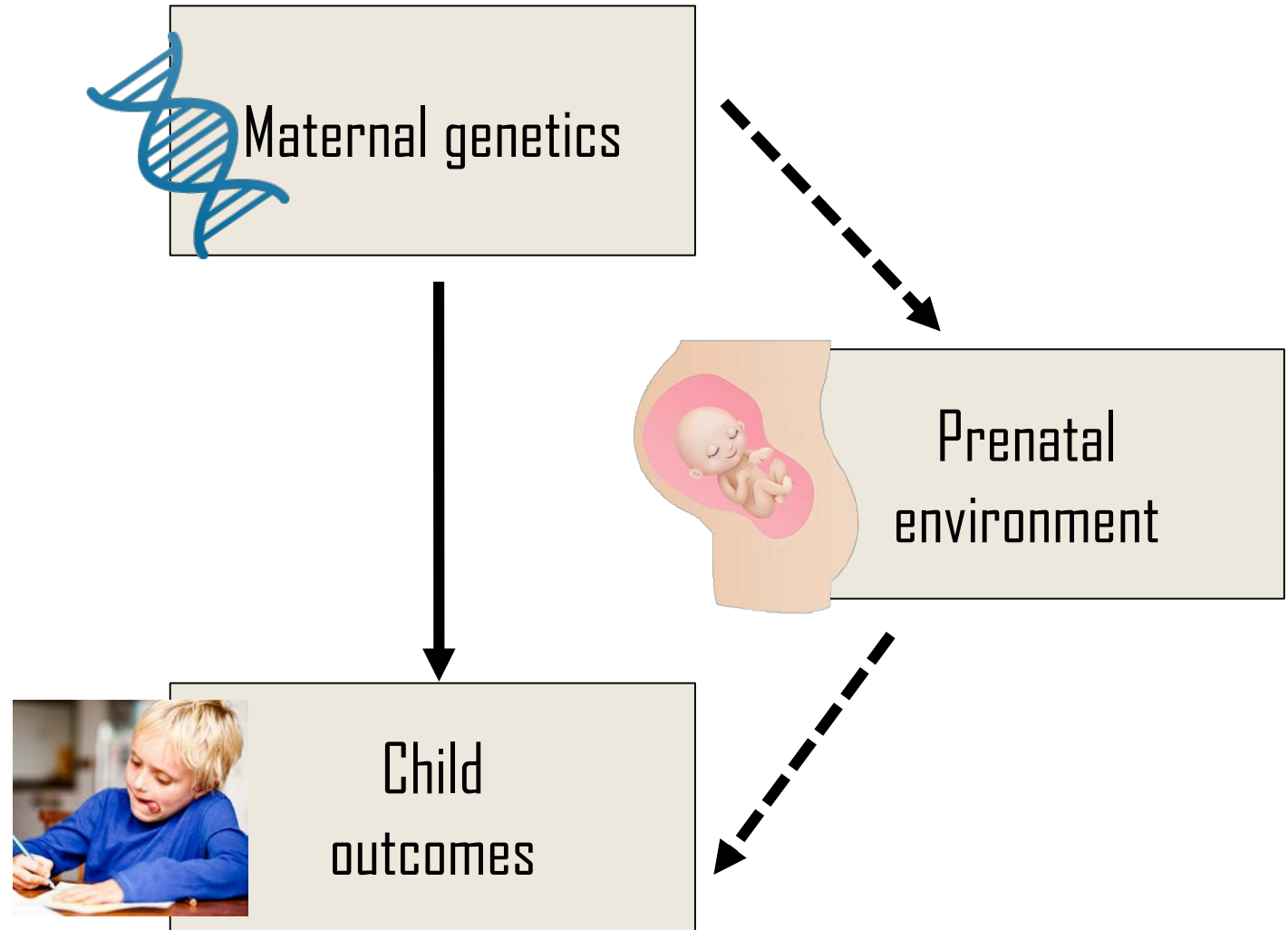
Framework: Genetic nurture
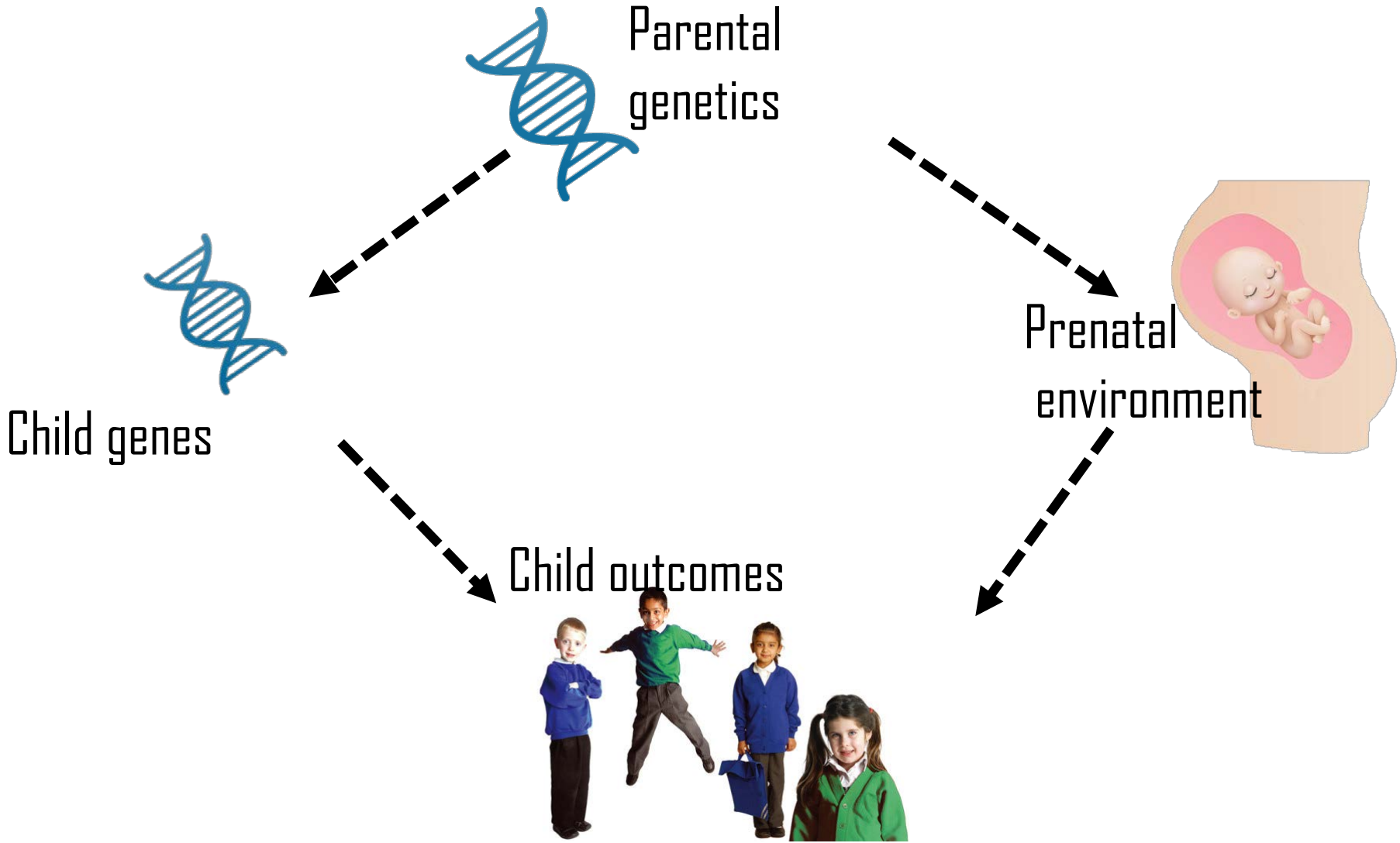
Research Question

Are maternal genetics associated with children's early development via prenatal environmental pathways?

Mediation framework

Data: Born in Bradford birth cohort

Child age

28 weeks gestation	Birth	4-7 yrs.

Maternal report:

Prenatal health & socio-economics

Maternal PGS for EA

Direct assessment:

Child birth characteristics

Child PGS for EA

Teacher observation:
Child development

Direct assessment:
Child academics
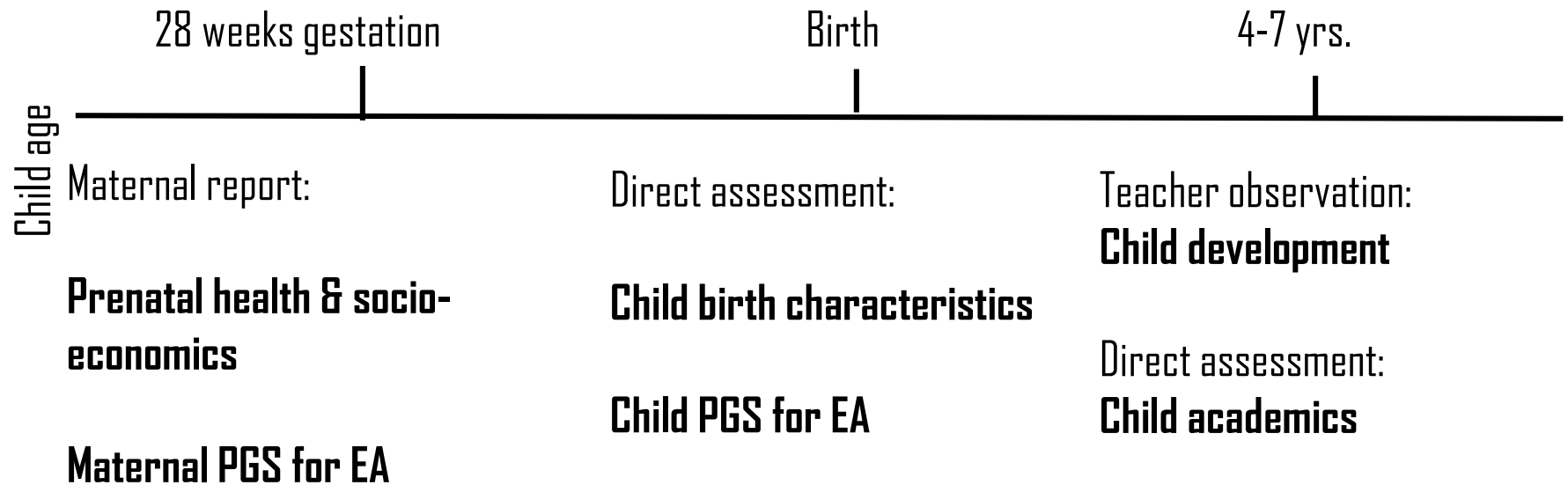
N = 2,007
Controlled for child PGS

Mediation Results

	% total effect of child outcome	
	Development	**Academics**
Governmental Benefits	9.72	11.66
Neighborhood Deprivation	5.24	4.44
Indirect smoke Exposure	5.00	3.13
Employment	2.00	5.28
Cigarette Use	1.46	3.94
Caffeine Use	1.90	-
Vitamin Use	-	-
Alcohol Use	-	-
Drug Use	-	-
Single	-	-
BMI	-	-
Physical Health	-	-
Maternity Leave	-	-
Stress	-	-
Sleep Problems	-	-
Financial Difficulty	-	-
Child APGAR Score	-	-
Child Gestational Age	-	-
Child Small for gestational age	-	-
Child Large for gestational age	-	-
Child Birthweight (g)	-	-
	27.91	31.27

B	ci	p	B	CI	p
.03	0.02-0.05	.00	.04	0.02-0.05	.00

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B	c_i	p	B	CI	p
.03	0.02-0.05	.00	.04	0.02-0.05	.00

Approx. 30% mediated prenatally
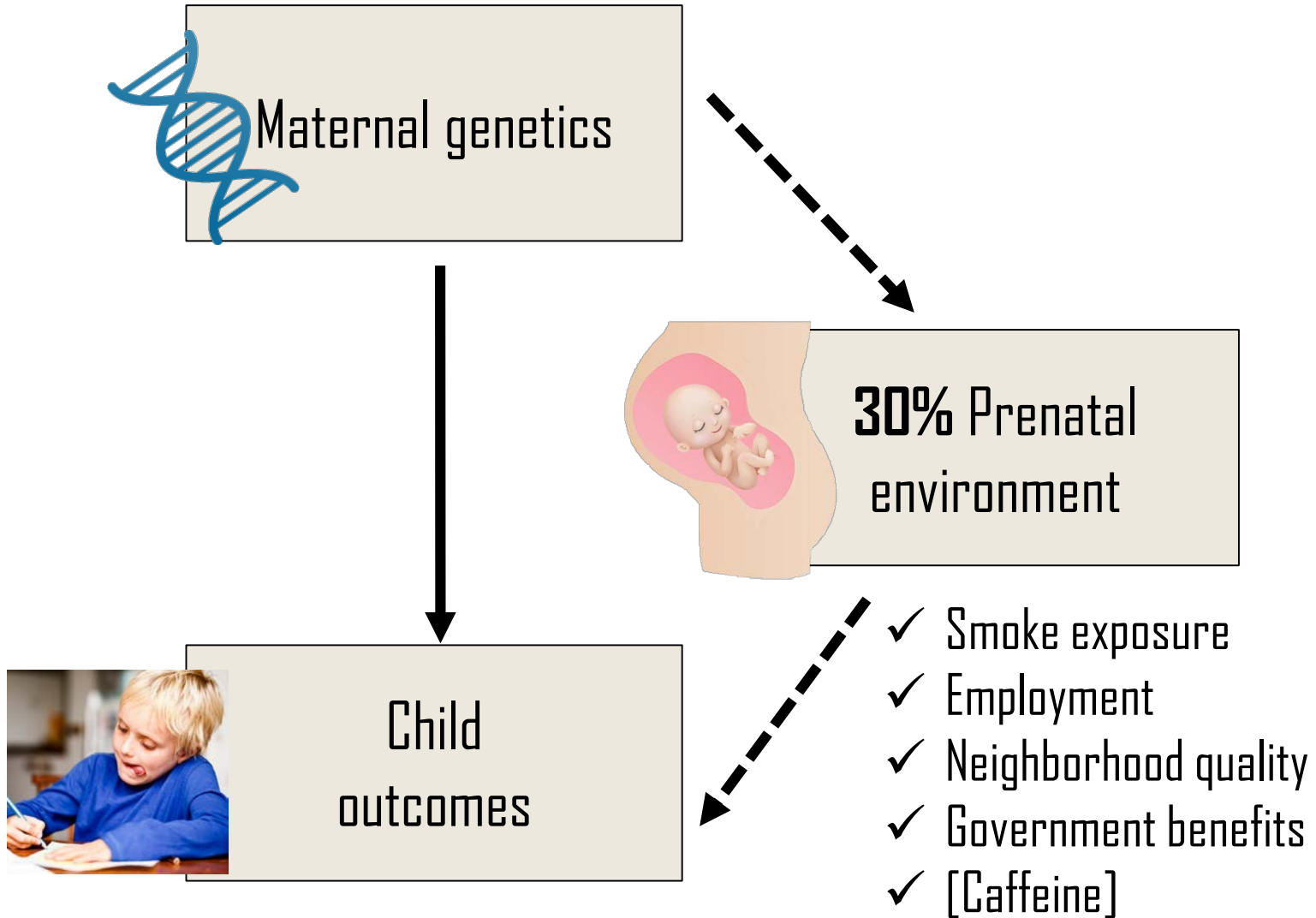
Implications

- Consistent with hypothesized genetic nurture

- Prenatal environment may be a pathway through which parental genes indirectly relate to child outcomes

- In particular, early child <u>development</u>

- Helps characterize potential influences on early childhood & downstream outcomes

Kong et al., 2018; Wertz et al., 2018; Jaffee & Price, 2007

Stanford University

THANK YOU!

Dr. Ben
Domingue, Ph.D

Sam Trejo