

Childhood self-control and economic and health outcomes across life

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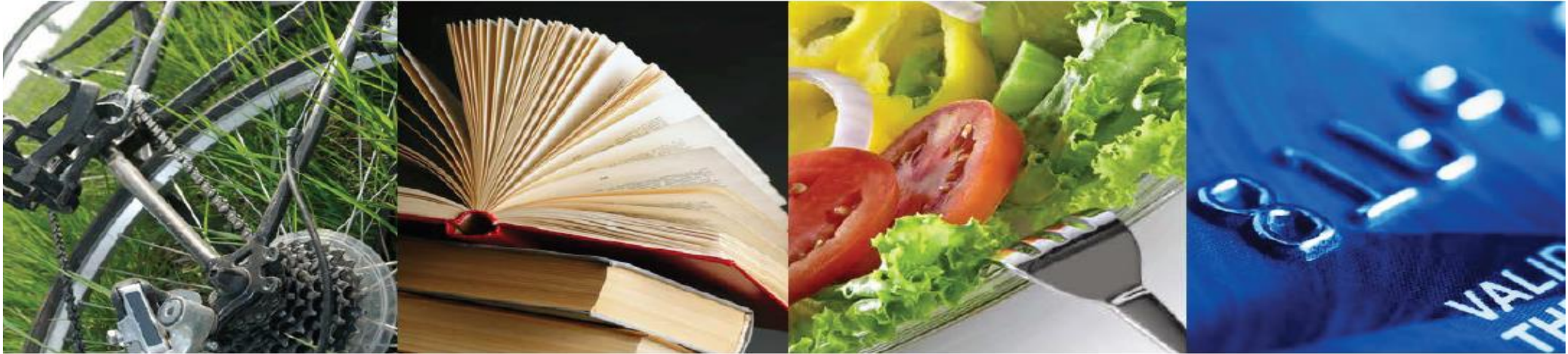
ESRI Seminar Series

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Overview



Background

Part 1: Lifespan outcomes of childhood self-control

Part 2: Self-control and intervention strategies

Conclusion

Why childhood
self-control?



Defining childhood self-control?

- Self-discipline: “*The capacity to begin tasks and follow through to completion despite boredom or distractions*” (NEO-PI-R)
- Self-control: The capacity to voluntarily regulate thoughts, feelings, and behaviour in the service of a valued long-term goal
- Also a range of disciplinary approaches (e.g. executive function, deficits in effortful control, use of resources over time; Daly et al., 2009; Nigg, 2017)



Why now?

- Cheap high calorie food
- Addictive substances
- Consumer goods
- Need for pension savings
- Gambling & social media
- Sustaining relationships



Forecasting Outcomes



Self-control and problematic behaviours and life outcomes in adulthood

Established (largely cross-sectional studies of students) association between high self-control and school performance, health behaviour, interpersonal, & well-being outcomes:

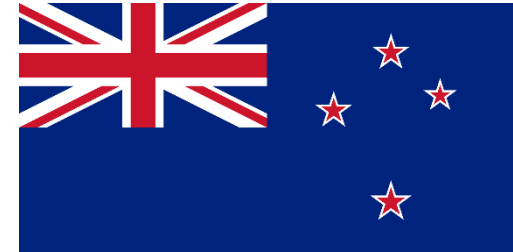
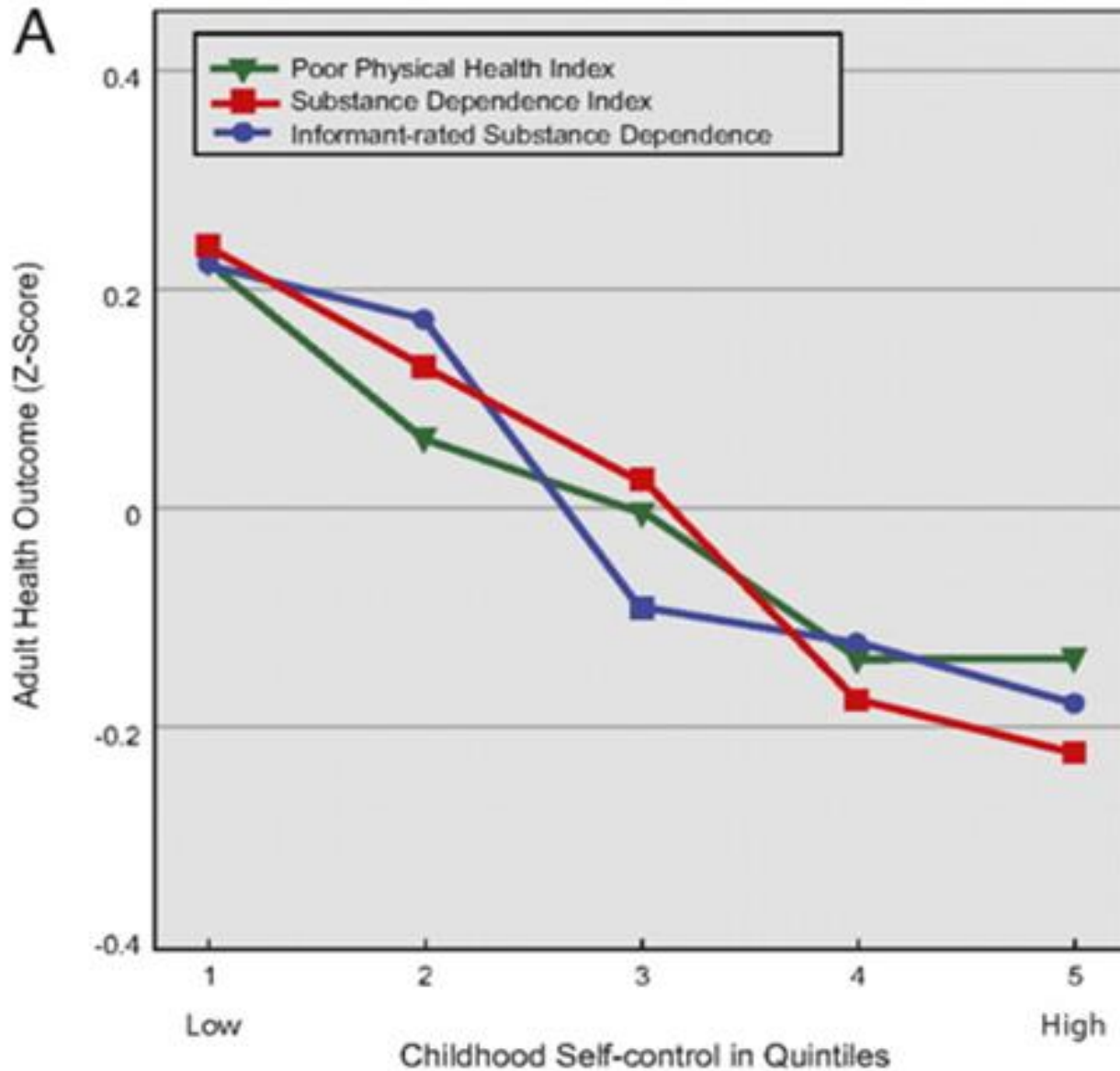
De Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviours. *Personality and Social Psychology Review*, 16, 76–99.

We seek to investigate in the population:

Childhood self-control → Adult behaviours/outcomes



Childhood self-control → Adult health



Moffitt, T. E. et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, 108(7), 2693-2698.

Current research

- Beyond early 30s
- Additional outcomes
- National samples
- Examine patterns of change
- Lifespan models including:
 - how social disadvantage & self-control may combine
 - pathways from self-control to later well-being & health





Data:
UK/US cohort studies

Life outcomes

Career-related

Employment

Education

Social mobility

Financial difficulties

Leadership

Retirement savings



Health

Smoking

Weight gain

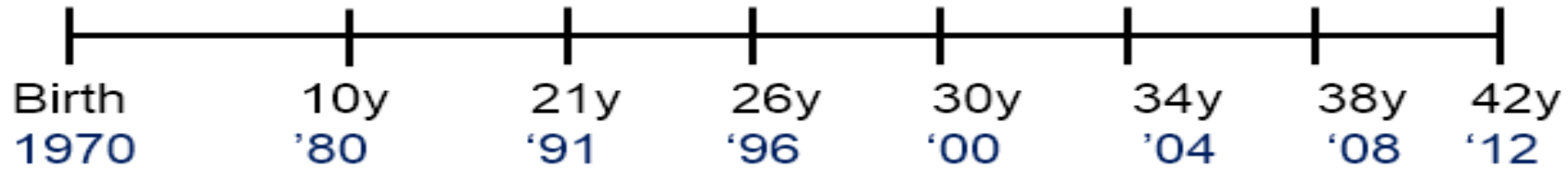
General health and well-being

Chronic conditions

Premature mortality

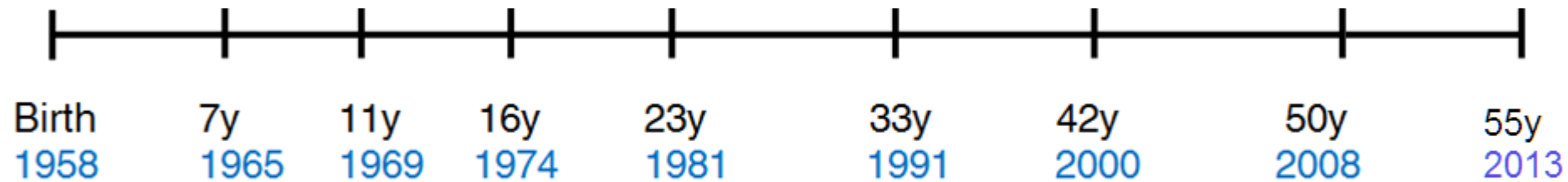
STUDY 1

UK Data Service



STUDY 2

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Self-control measures

BCS measure (age 10):

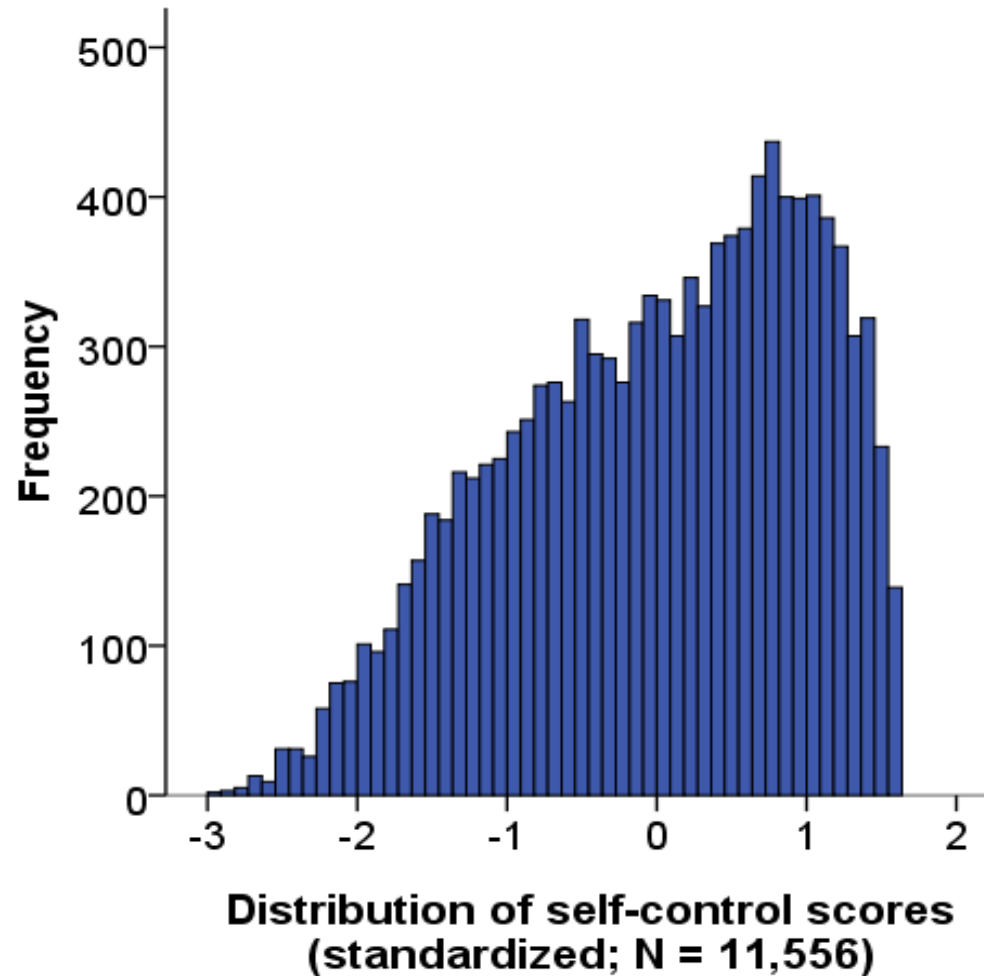
1. Child is daydreaming.
2. Cannot concentrate on particular task.
3. Becomes bored during class.
4. Shows perseverance.
5. Easily distracted.
6. Pays attention in class.
7. Forget on complex tasks.
8. Completes tasks.
9. Fails to finish tasks.

NCDS items (age 7/11):

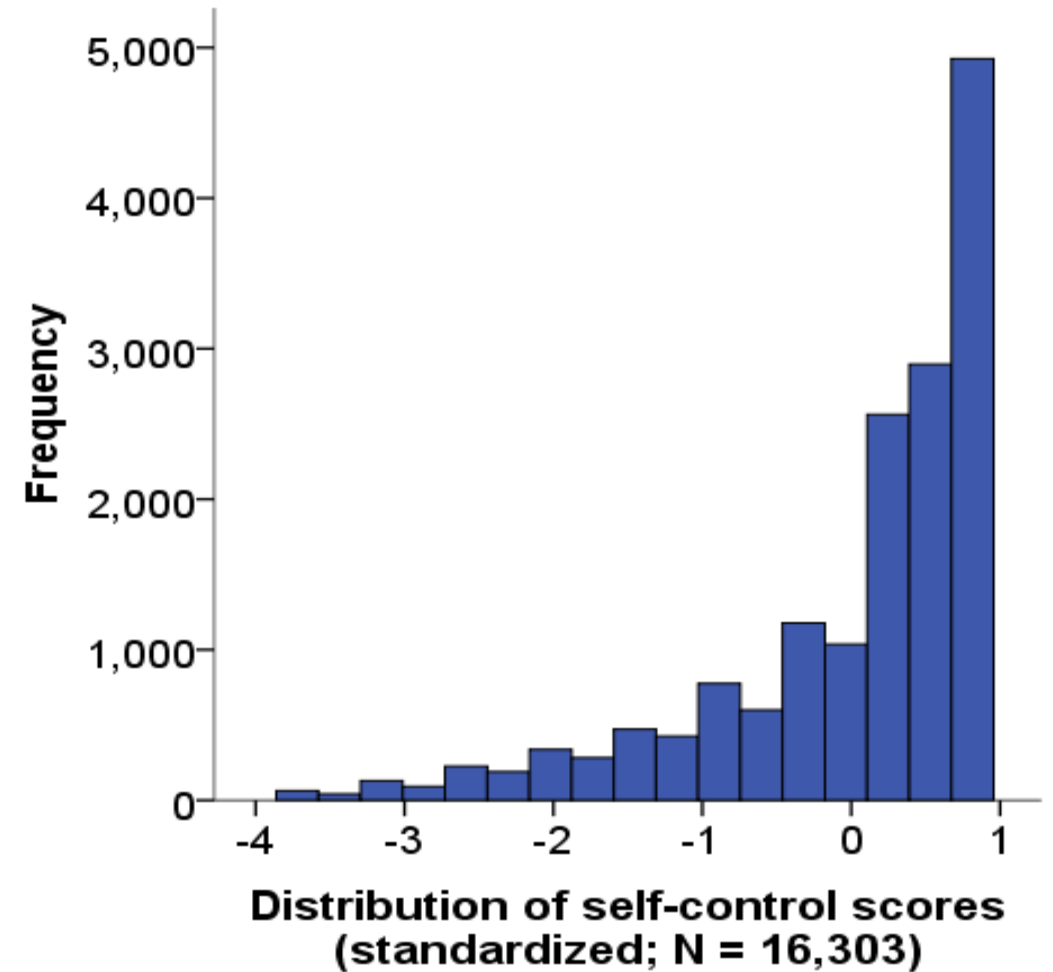
1. Constantly needs petty correction (classroom behaviour).
2. Too restless to remember for long (effect of correction).
3. Cannot attend or concentrate for long (cannot sit still when read to or during broadcasts, plays with things under desk) (attentiveness).
4. Does not know what to do with himself, can never stick at anything long (free activity).
5. Misbehaves when teacher is out of room (liking the limelight).....

Self-control measures

1970 British Cohort Study



1958 National Child Development Study

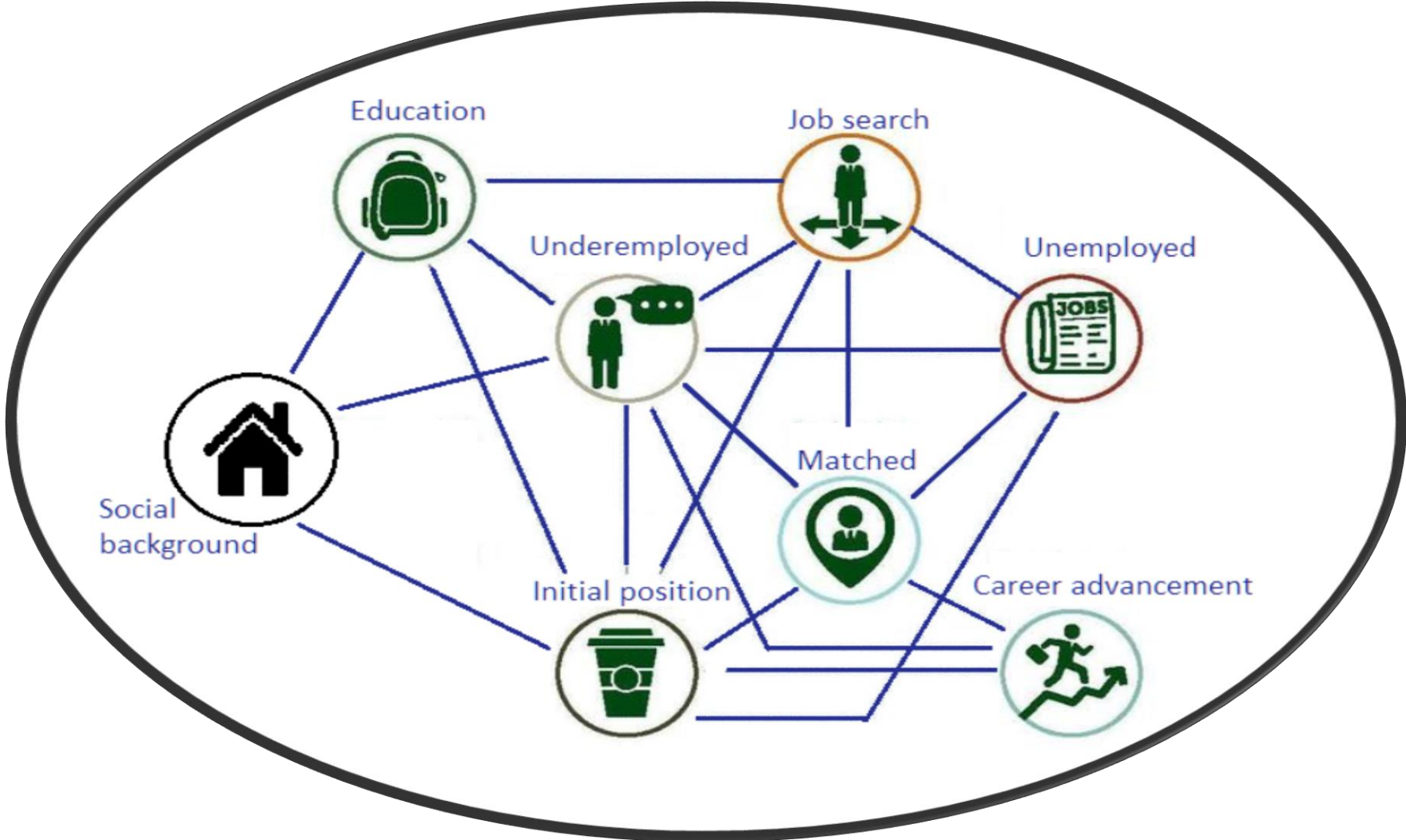


Measure validity

- 100 parents of children ages 5 through 12
- Cronbach's α in BCS = .88; NCDS = .87
- Convergence with contemporary measures:
 - BCS: Brief Self-Control Scale ($r = .75$) & Domain-Specific Impulsivity Scale ($r = .75$)
 - NCDS: BSCS: $r = .74$ and DSIS $r = .71$



Career success

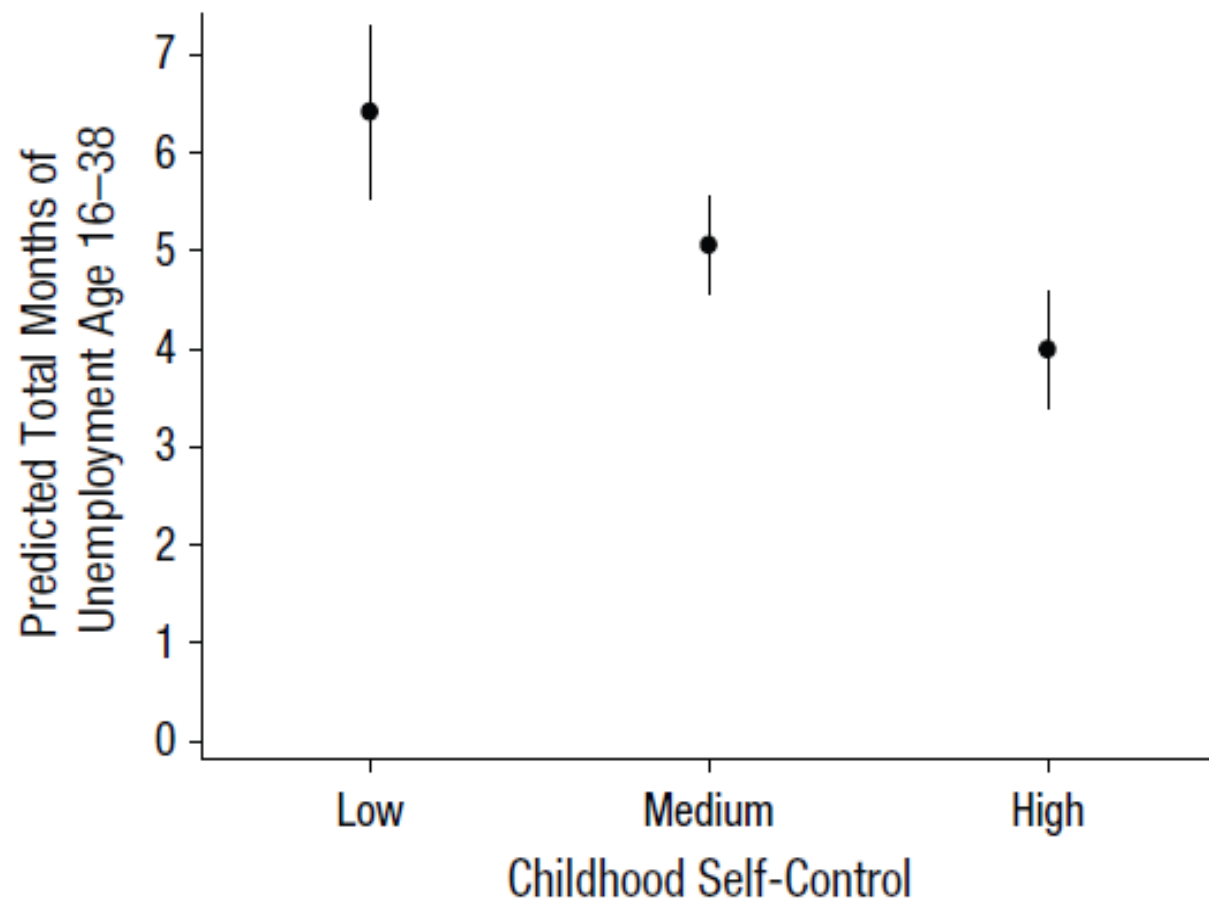
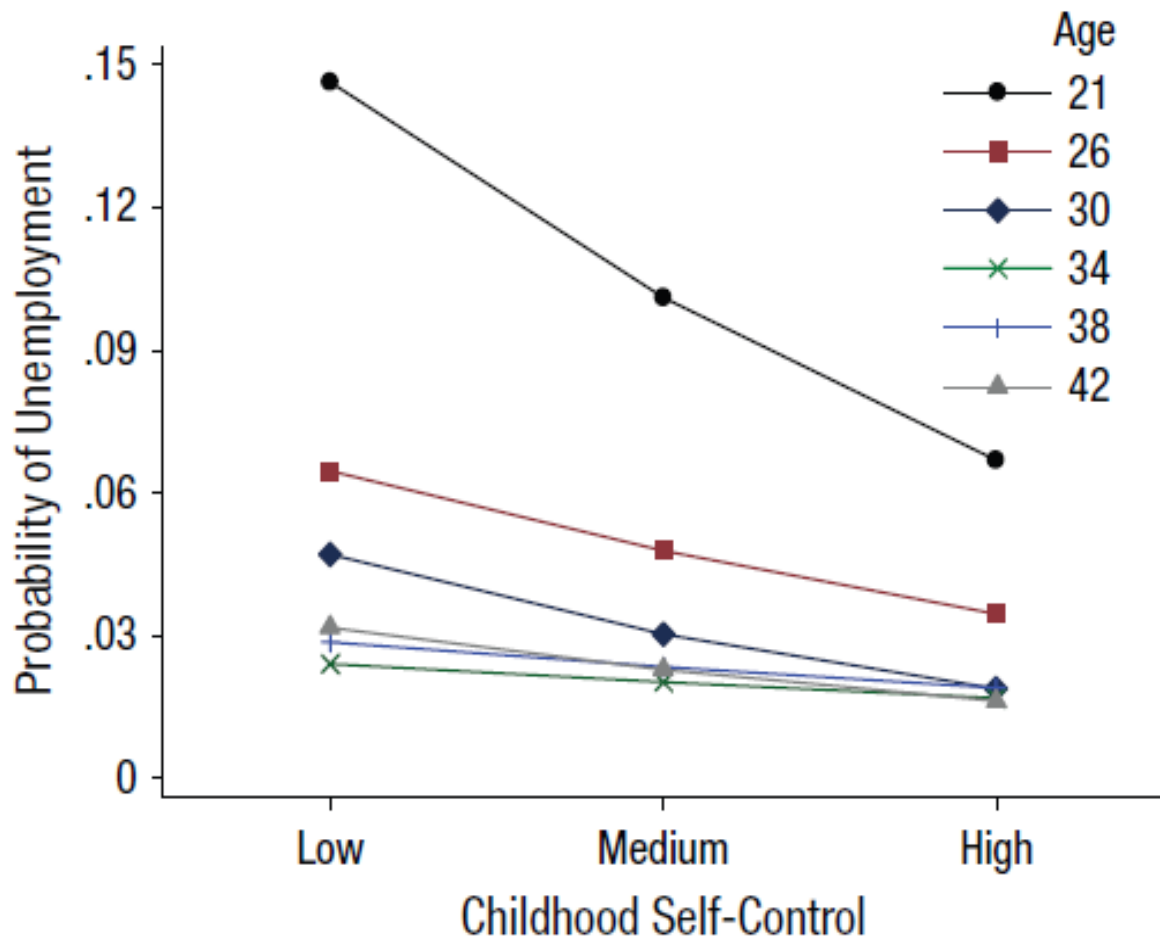


Unemployment

- Meet deadlines, follow rules/guidelines
- Avoid potential conflicts with customers /colleagues
- Resist conflicting activities (leisure, social media, socialising, sleep)
- Effective job search & interview prep.
- Selecting between the highly qualified

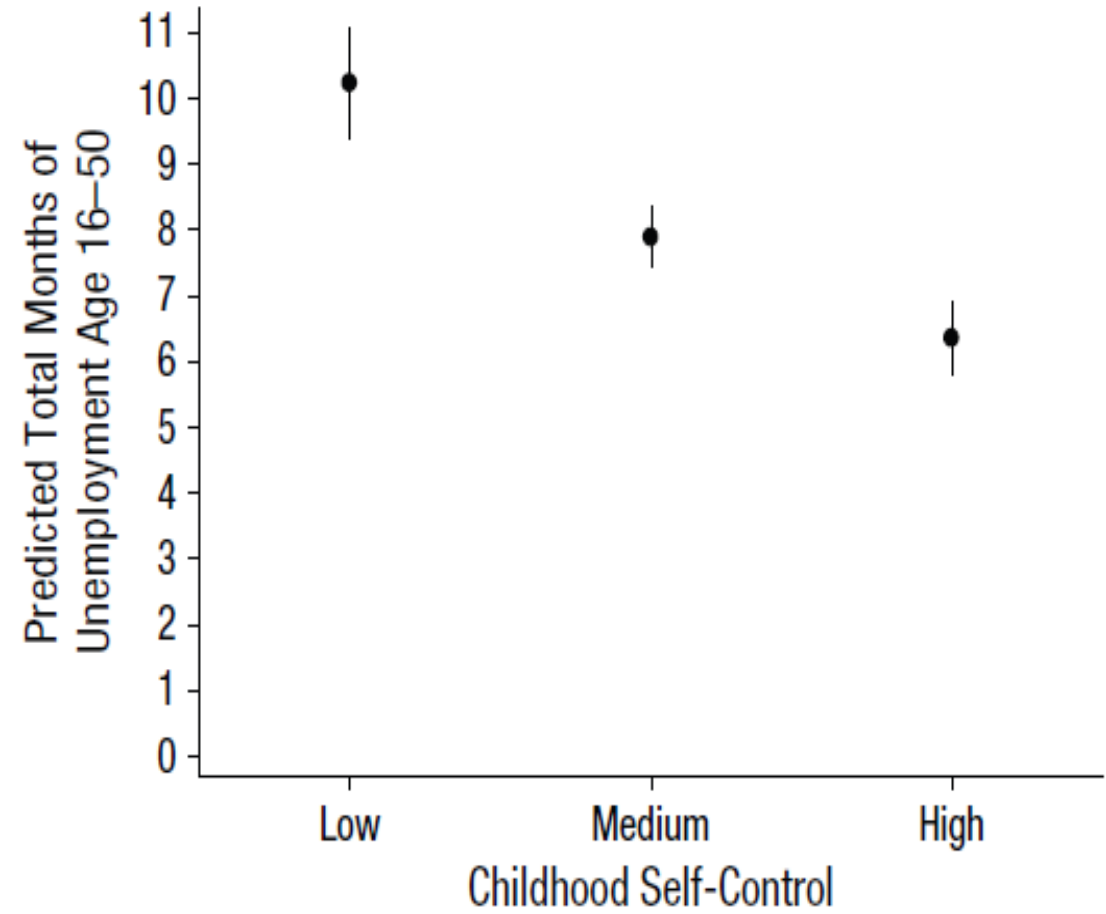
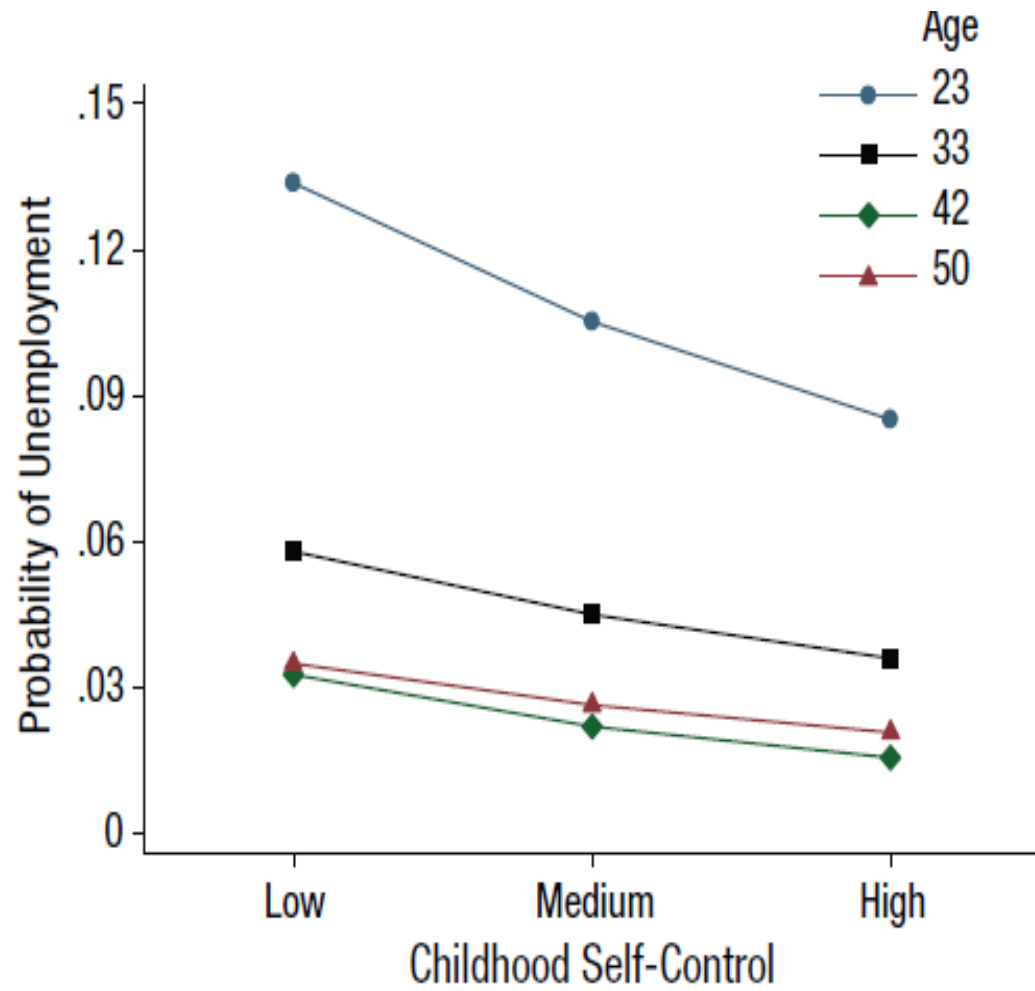


Unemployment: 1970 cohort



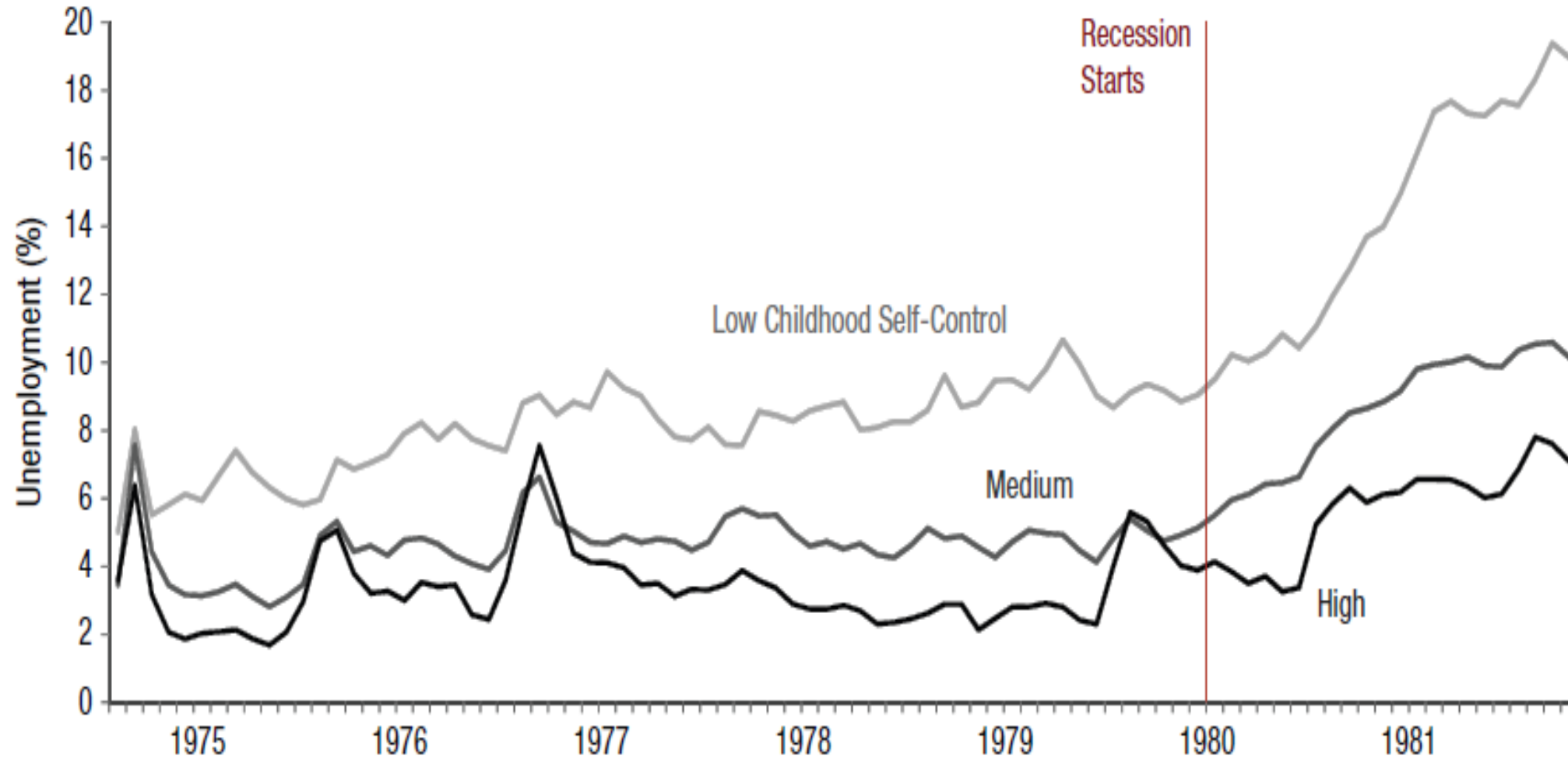
Note: models adjusted for gender, intelligence, and social class at birth.

Unemployment: 1958 cohort



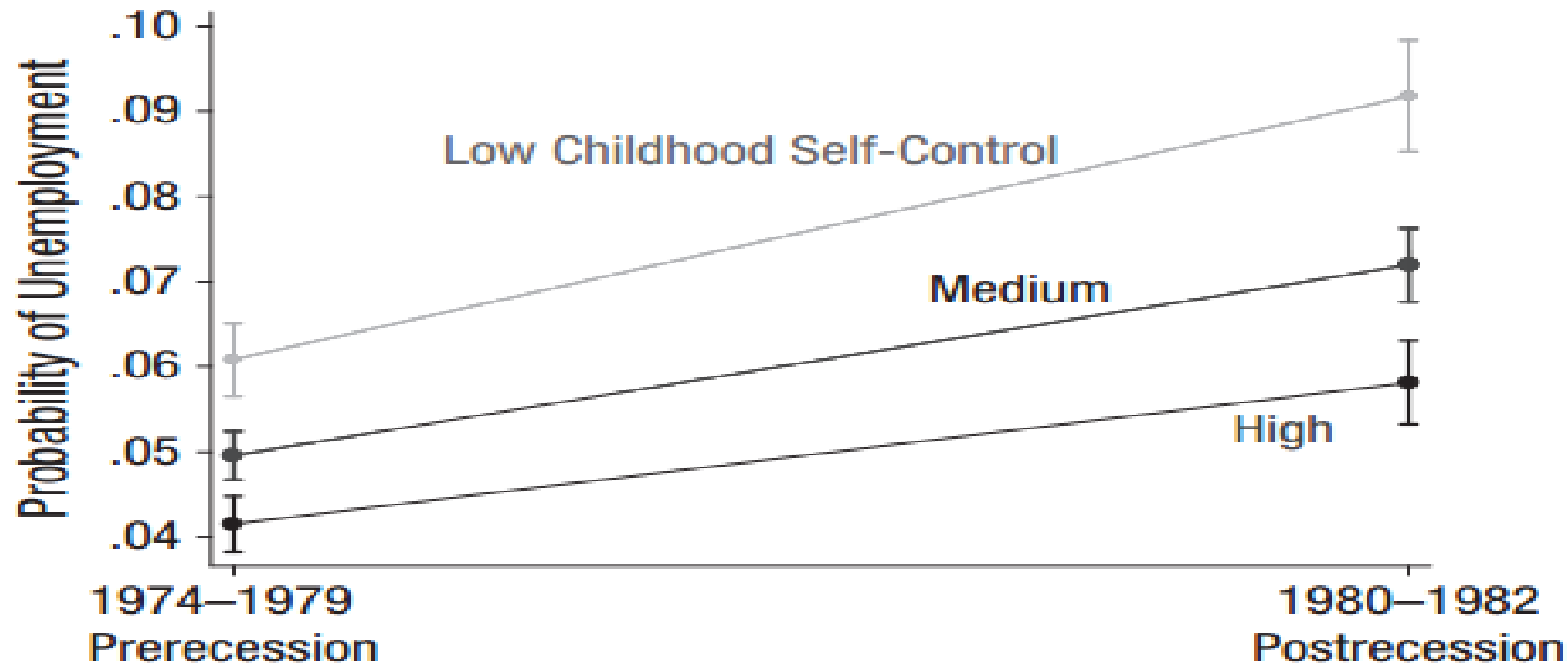
Note: models adjusted for gender, intelligence, and social class at birth.

1980 UK recession (1958 cohort)



Daly, M. et al. (2015). Childhood self-control and unemployment throughout the lifespan: evidence from two British cohort studies. *Psychological Science*, 26, 709 - 723.

Estimating the recession change



Self-control	Difference (postrecession – prerecession)	Difference in difference (relative to low self-control)
Low	0.031 (0.003)	—
Medium	0.022 (0.002)	0.009 (0.002)**
High	0.017 (0.003)	0.014 (0.003)**

Conscientiousness and unemployment

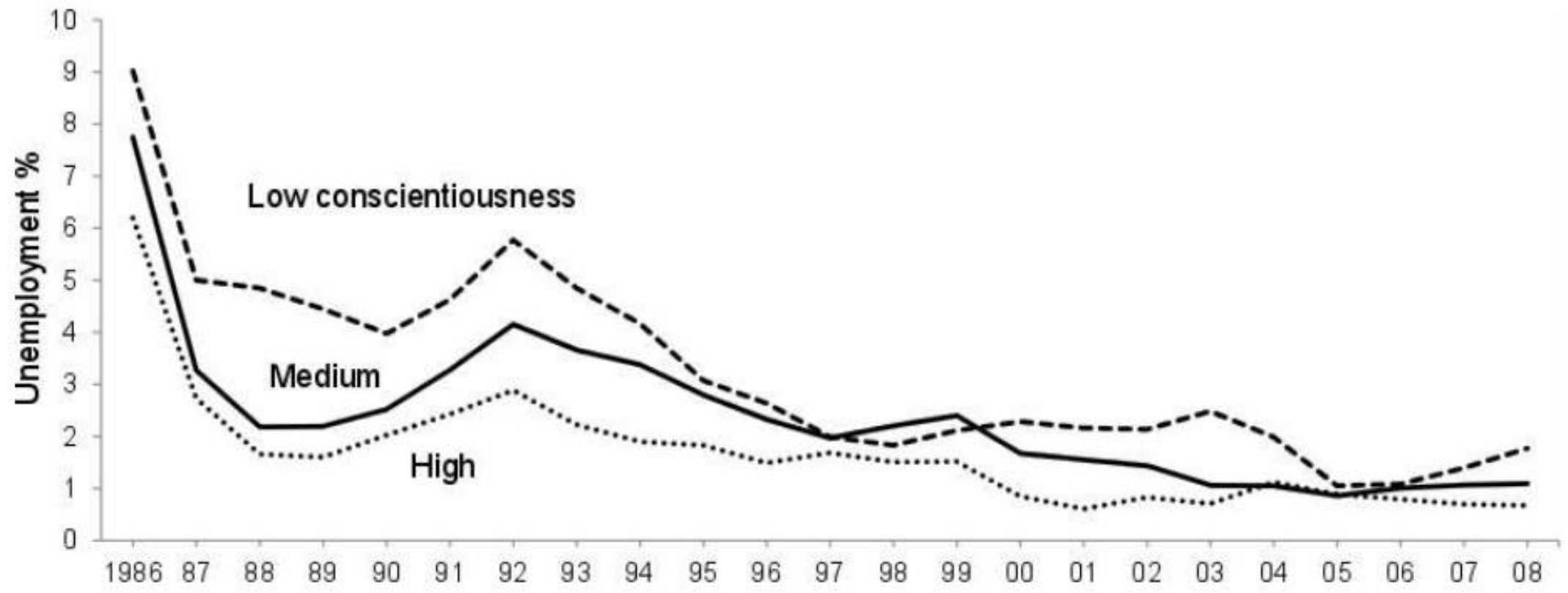


Figure 1. Unemployment over time by levels of adolescent conscientiousness (N = 4,206; Observations = 834,530).

Egan, M., Daly, M., Delaney, L., Boyce, C., & Wood, A. (2017). Pre-labor market conscientiousness predicts lower lifetime unemployment. *Journal of Applied Psychology*, 102, 700-709.

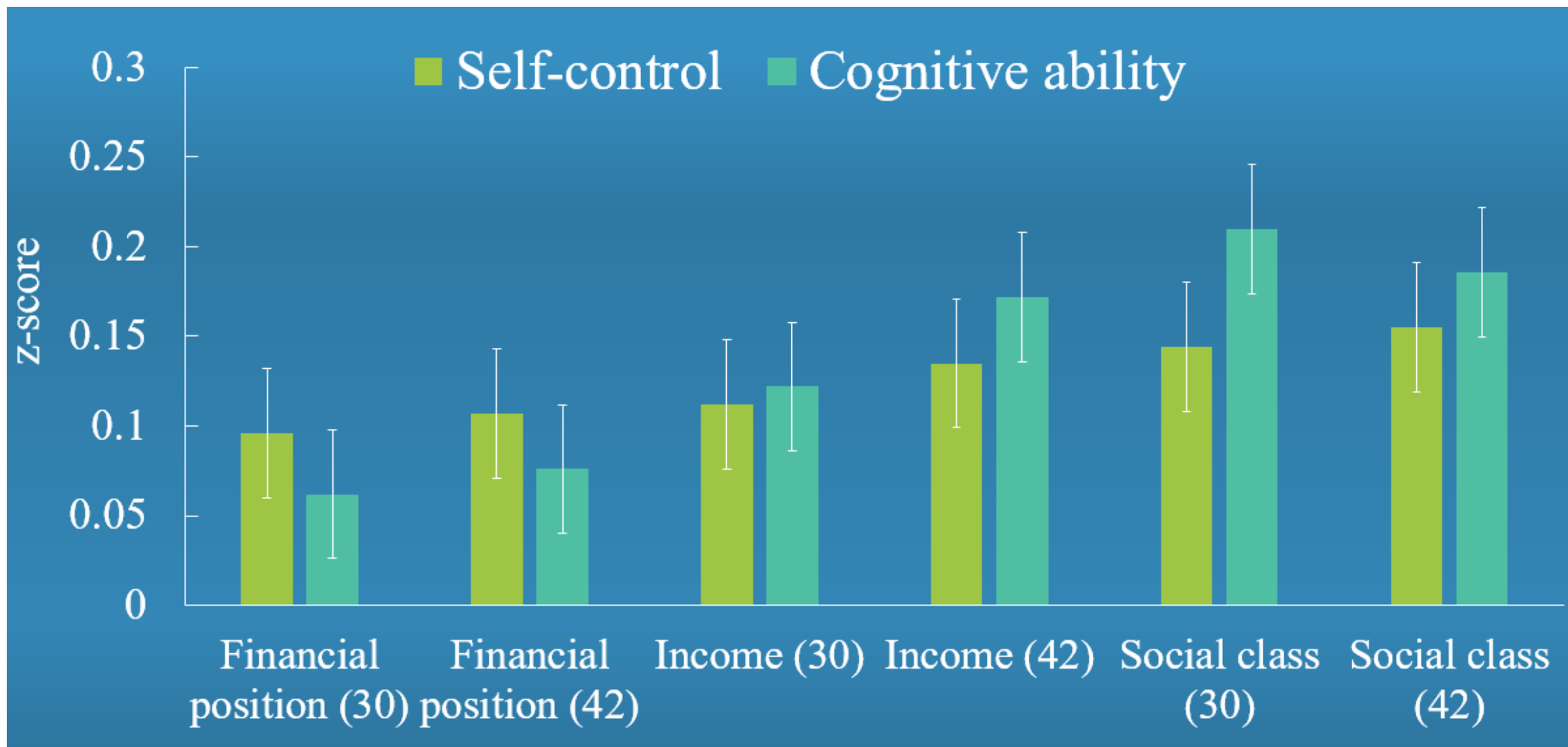
Social mobility in the UK & US

- Beyond early career outcomes
- Context of reduced social mobility (Blanden, Goodman, Gregg, Machin, 2005)
- Examine mobility changes within career



Graphic: <http://www.intoon.com/toons/2011/KeefeM20111027.jpg>

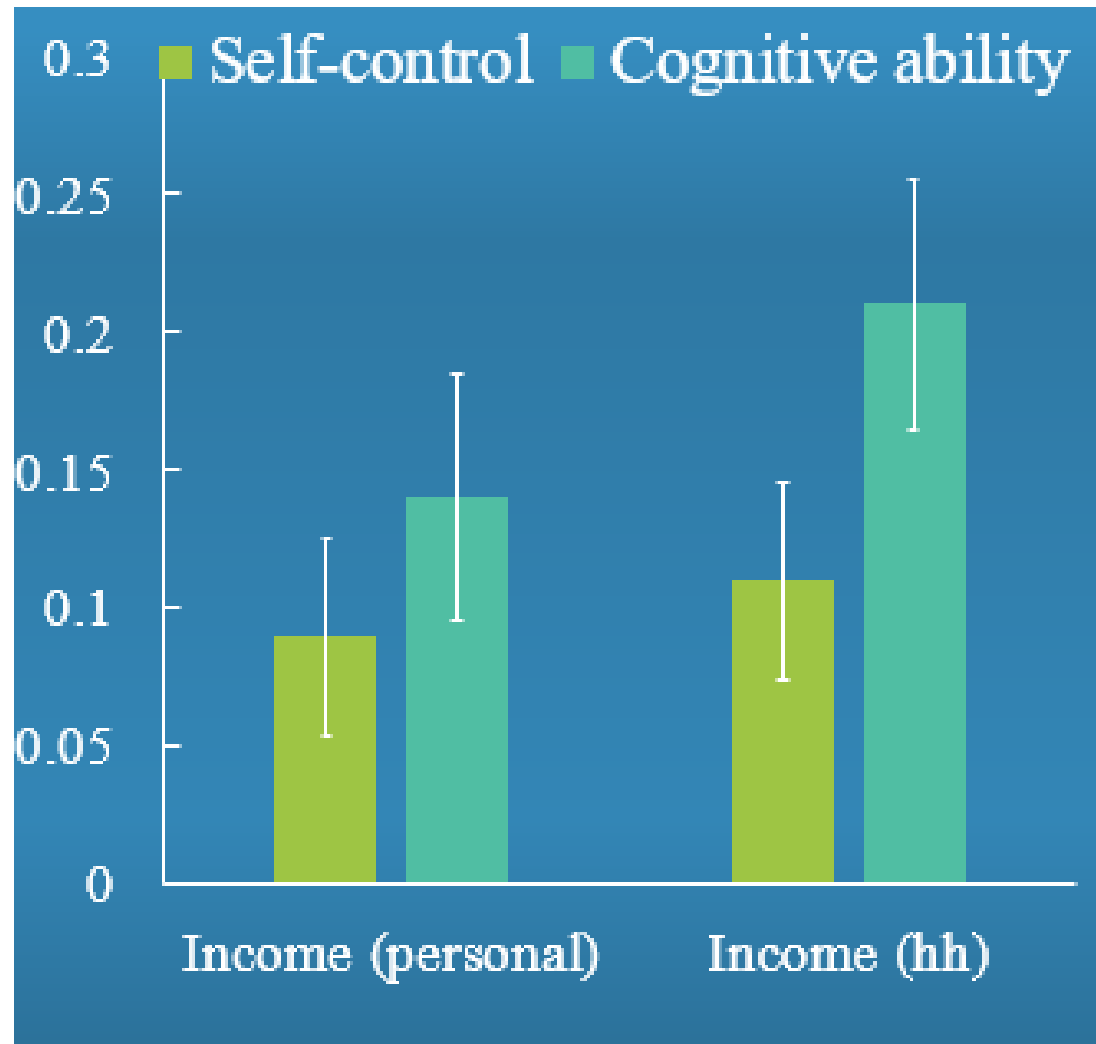
Socioeconomic measures (ages 30/42)



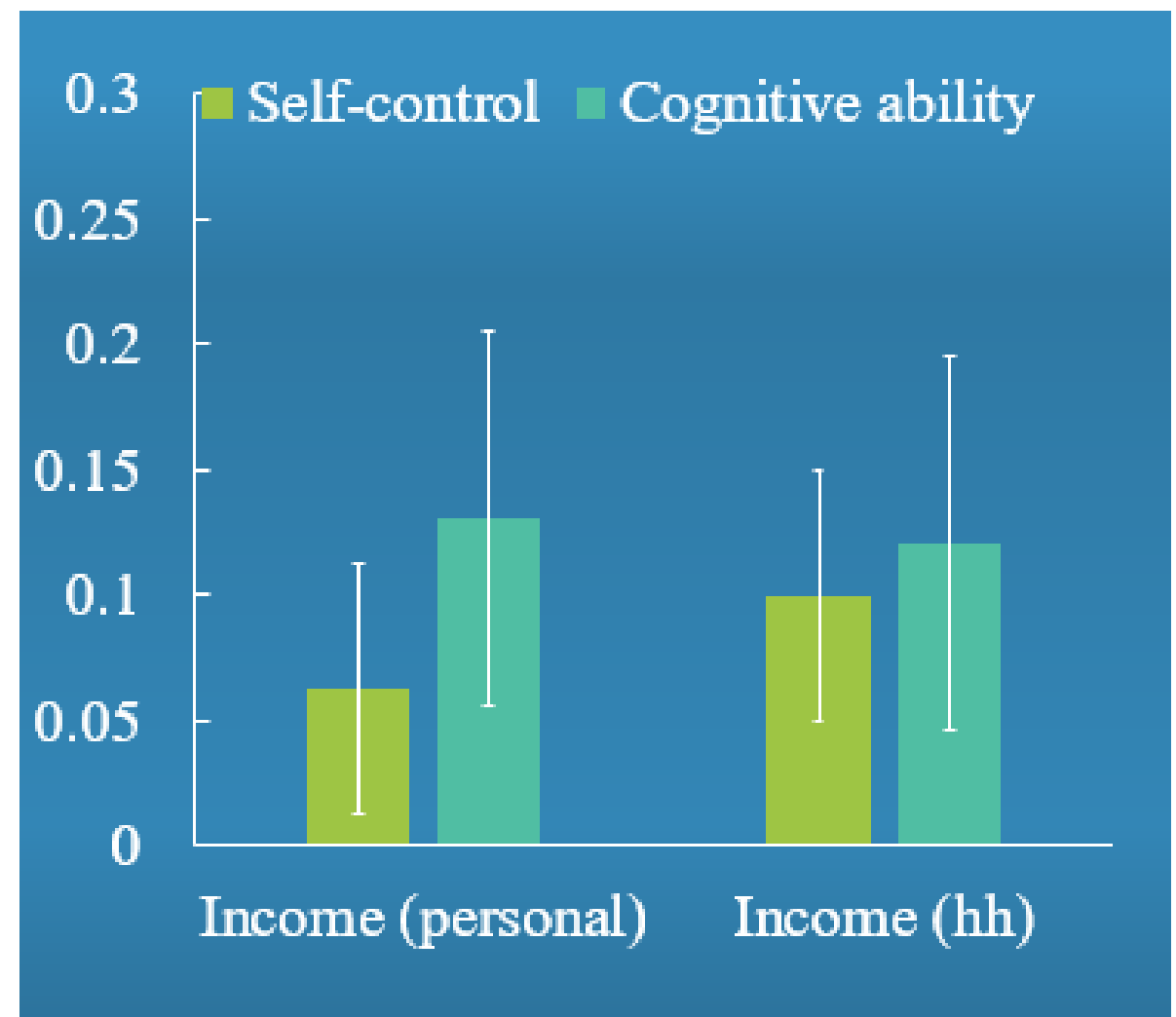
Note: models adjusted for gender, mental health, parental education, property ownership, and social class at birth.

Self-control & income: Add Health sibling models

z-score before and after inclusion of family FE (N = 2,611)

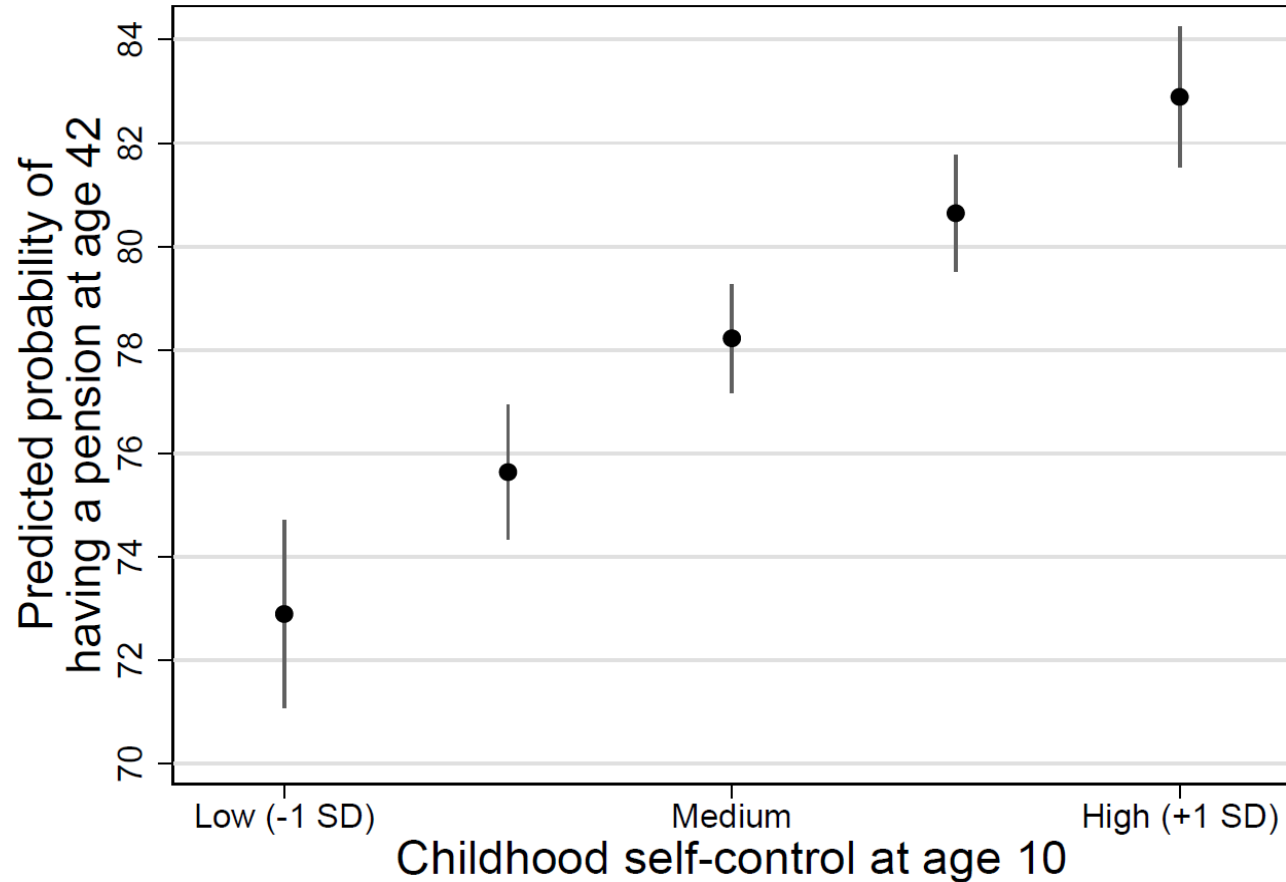


Adjusted for age, sex



Adjusted for age, sex, family FE

Childhood self-control → Pension



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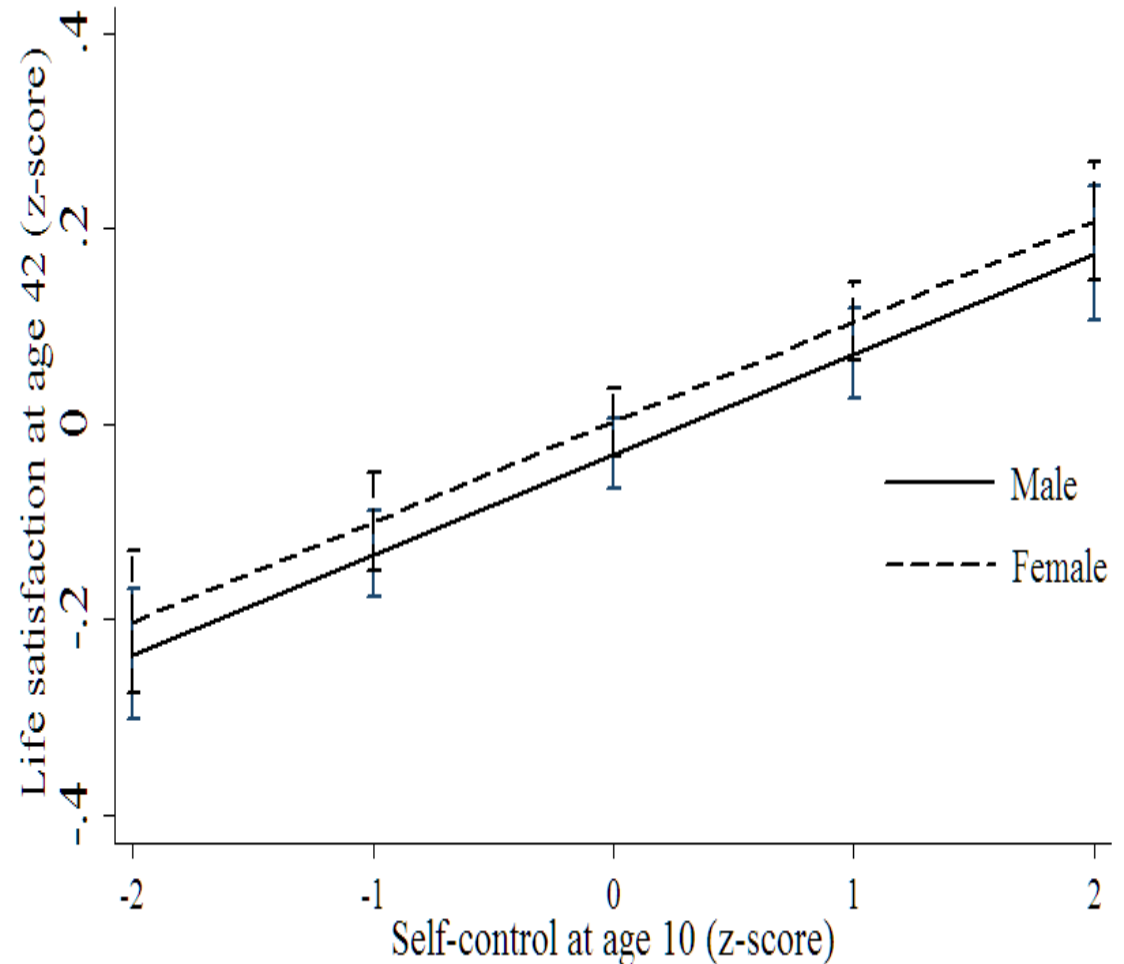


Adjusted for gender, intelligence, and social class at birth.

Lades, L.K., Egan, M., Delaney, L., & Daly, M. (2017). Childhood self-control and adult pension participation, In *Economics Letters*, 161, 102-104.

Self-control, economic success, & well-being

- Economic success factors (social class, income, housing tenure, education, unemployment) explain 60% of the association
- Pattern replicated in Add Health



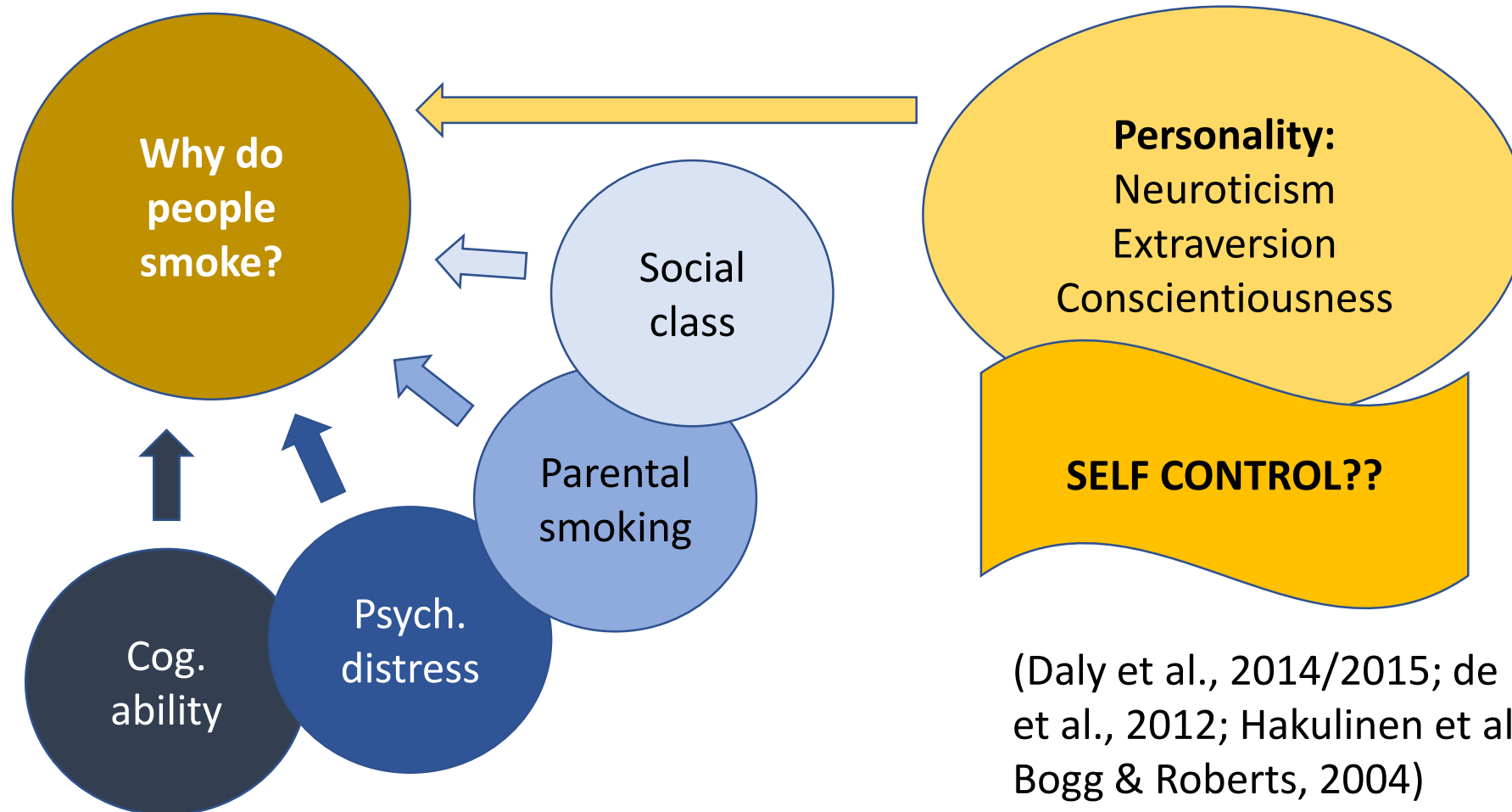
Note: models adjusted for gender, intelligence, & social disadvantage

Health outcomes

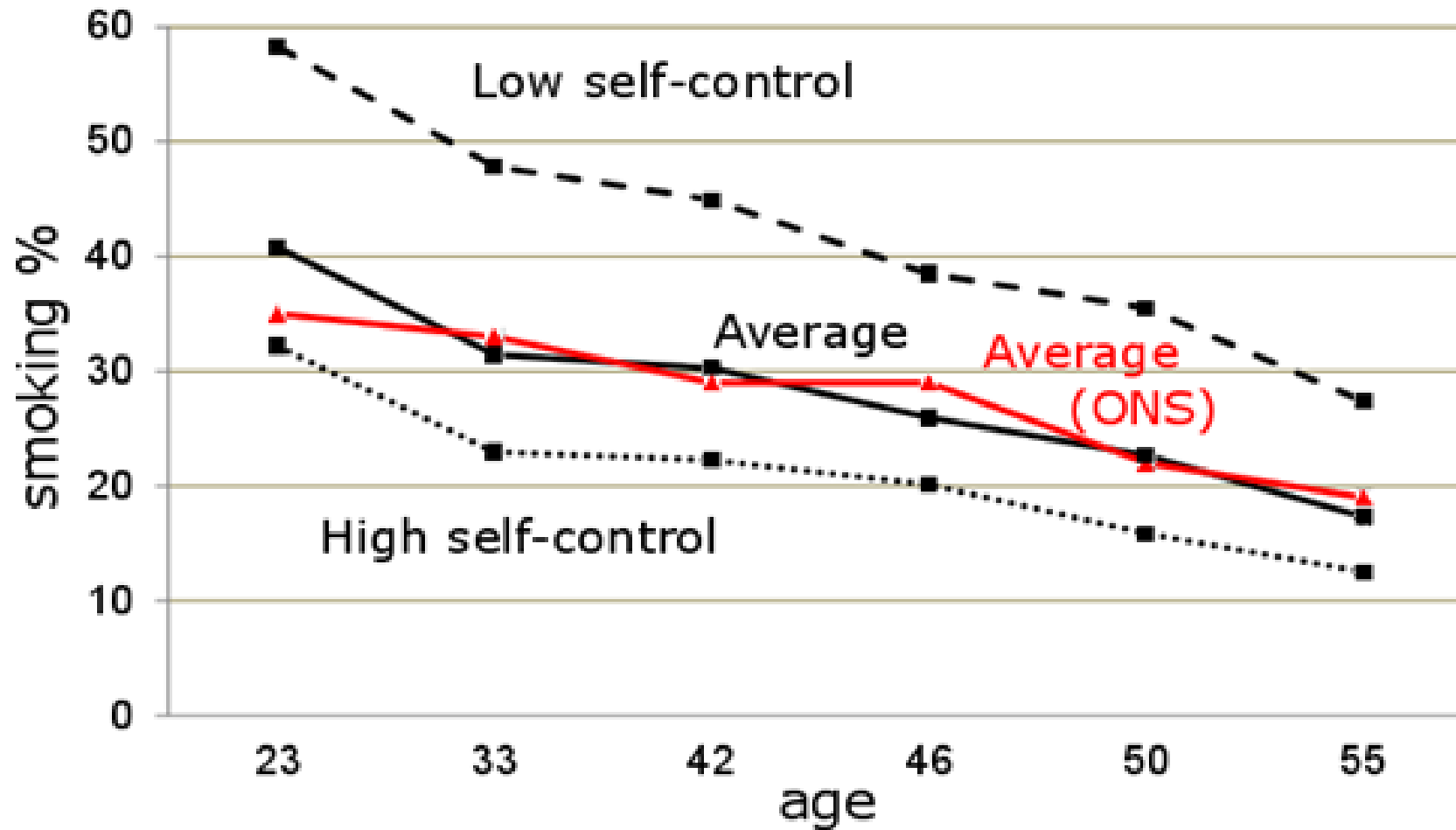


Smoking patterns

As the leading preventable cause of disease and death worldwide, identifying risk factors for smoking is key to its prevention/reduction

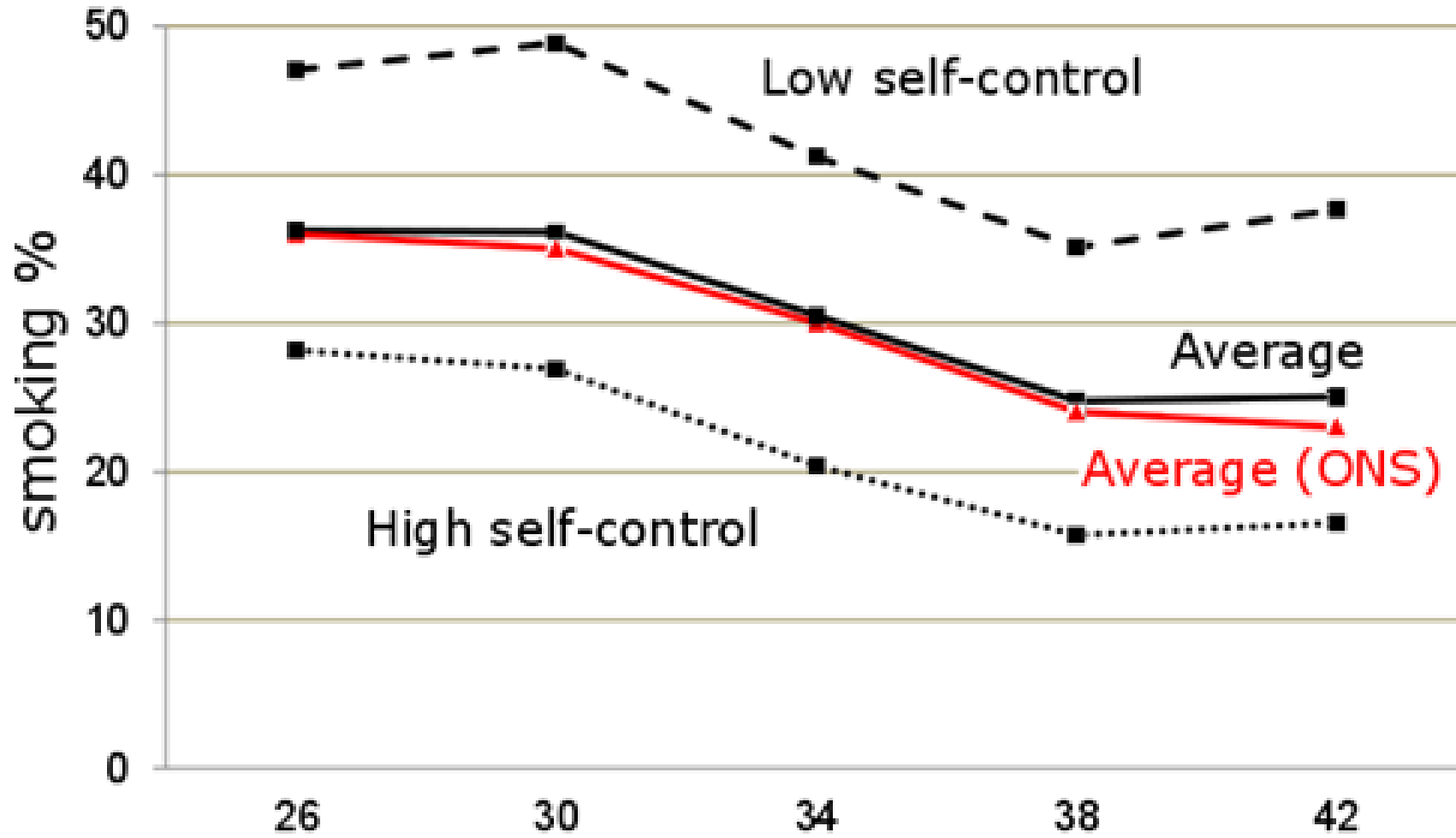


Smoking over time (NCDS, 1958)



From Daly, M. et al. (2016). Childhood self-control predicts smoking throughout life: Evidence from 21,000 cohort study participants. *Health Psychology*, 35, 1254-1263.

Smoking over time (BCS, 1970)



From Daly, M. et al. (2016). Childhood self-control predicts smoking throughout life: Evidence from 21,000 cohort study participants. *Health Psychology, 35*, 1254-1263.

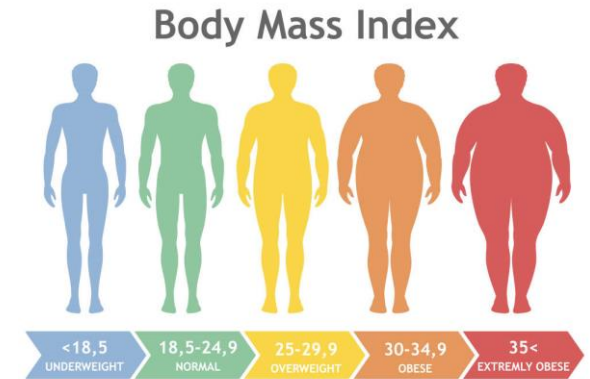
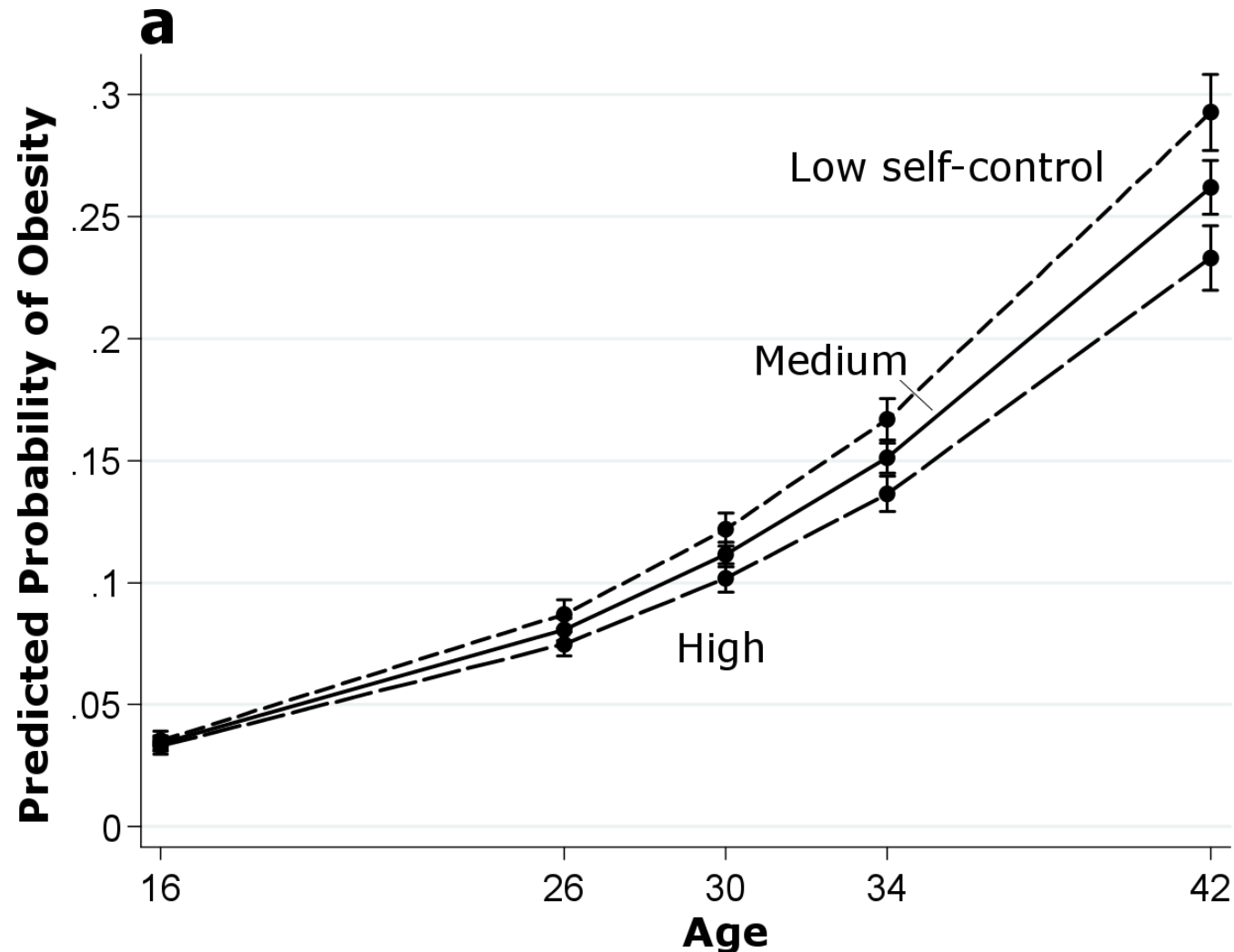
Smoking status & change models

Variables	BCS	NCDS
	Smoker	Smoker
Self-control	-6.9*** (.5)	-5.2*** (.4)
Cognitive ability	-.7 (.5)	-3.0*** (.4)
Psych. distress	-2.1*** (.5)	.5 (.4)
Female	-.5 (.9)	2.6*** (.7)
Age	-.9*** (.0)	-.6*** (.0)
Paternal smoking		
Father non-smoker	—	—
Father 1–10 cigs	4.2** (1.6)	4.5*** (1.2)
Father 11–20 cigs	7.5*** (1.3)	6.4*** (1.1)
Father 21+ cigs	10.8*** (1.7)	7.4*** (1.5)
Father pipes/cigar	—	2.8 (1.5)
Maternal smoking		
Mother non-smoker	—	—
Mother 1–10 cigs	4.1** (1.4)	2.6** (.9)
Mother 11–20 cigs	5.4*** (1.3)	3.3*** (1.0)
Mother 21+ cigs	10.2*** (2.5)	4.7** (1.8)
Mother pipes/cigar	—	11.0 (12.7)
Extended controls ^a	N	Y
<i>N</i>	8,526	12,605
Observations	30,888	54,775

Model	BCS		
	Initiation	Relapse	Cessation
Self-control	-1.5*** (.3)	-1.5* (.8)	.8 (.7)
Extended controls	N	N	N
<i>N</i>	3,749	2,361	3,153
Observations	10,560	4,471	6,849
NCDS			
	Initiation	Relapse	Cessation
Self-control	-.8** (.3)	-.2 (.4)	1.2* (.5)
Extended controls	Y	Y	Y
<i>N</i>	5,479	4,928	4,826
Observations	18,459	10,464	12,251

* $p < .05$. ** $p < .01$. *** $p < .001$.

Childhood self-control → Obesity



UK Data Service



Adjusted for gender, intelligence, social class at birth, & father, mother, child BMI

Daly, M., Egan, M., Quigley, J., & Delaney, L. (in preparation). Childhood self-control and weight gain across life.

Childhood self-control → Health outcomes

Predicts midlife (age 42 BCS, age 45-55 NCDS):

- Self-rated health
- Pain
- Psychological distress
- Chronic conditions
- Whether conditions are limiting
- Physiological dysregulation (NCDS)
- Death



Self-control and social disadvantage

(from Bridger & Daly, 2017)

- **Crowding:** Persons per room (age 5 BCS; age 7 NCDS)
- **Housing tenure:** Ranked from 'council rented' to 'owned outright'
- **Social class** at birth and early childhood (age 5 BCS; age 7 NCDS) based on classification of father's occupation using the Registrar General's Social Classes class scheme
- **Parental education:** Age mother left school/education and age father left school/education
- Cronbach's alpha = .8 in both the BCS and NCDS

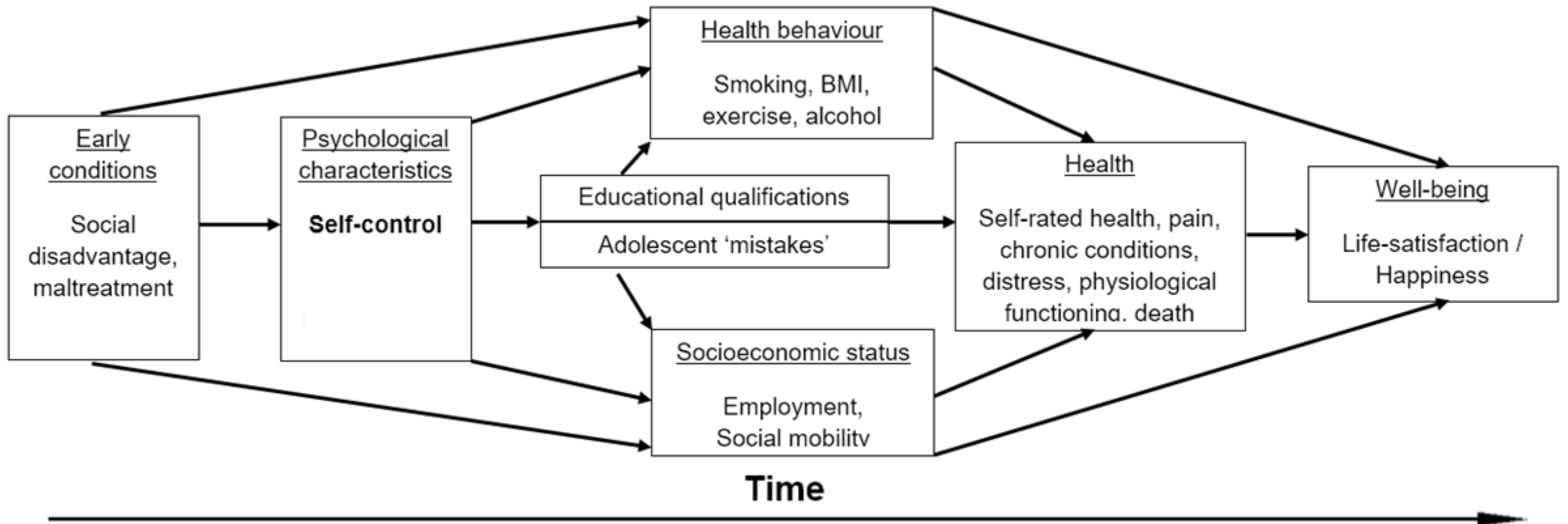
Childhood self-control → Health outcomes

Predictors	Self-rated health		Pain	Psych. distress		Physiol.
	BCS	NCDS	BCS	BCS	NCDS	NCDS
SES	106**	.141**	-.063**	-.048**	-.060**	-.162**
Self-control	.165**	.103**	-.099**	-.109**	-.098**	-.114**
<i>N</i>	6,604	7,789	6,605	5,815	9,050	7,496

Predictors	Chronic conditions		Illness is limiting		Death	
	BCS	NCDS	BCS	NCDS	BCS	NCDS
SES	.932*	.938**	.906*	.833**	.987	.857**
Self-control	.858**	.901**	.787**	.853**	.836**	.819**
<i>N</i>	6,579	8,471	1,897	2,786	10,873	15,914

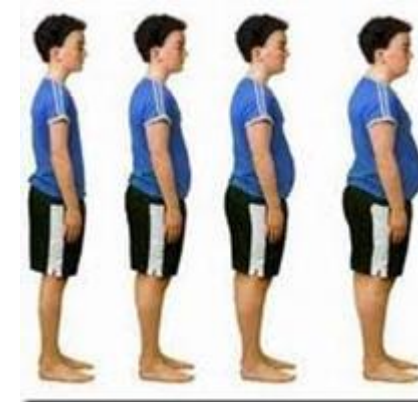
* $p < .05$. ** $p < .01$.

Channels linking early self-control to lifespan health and well-being

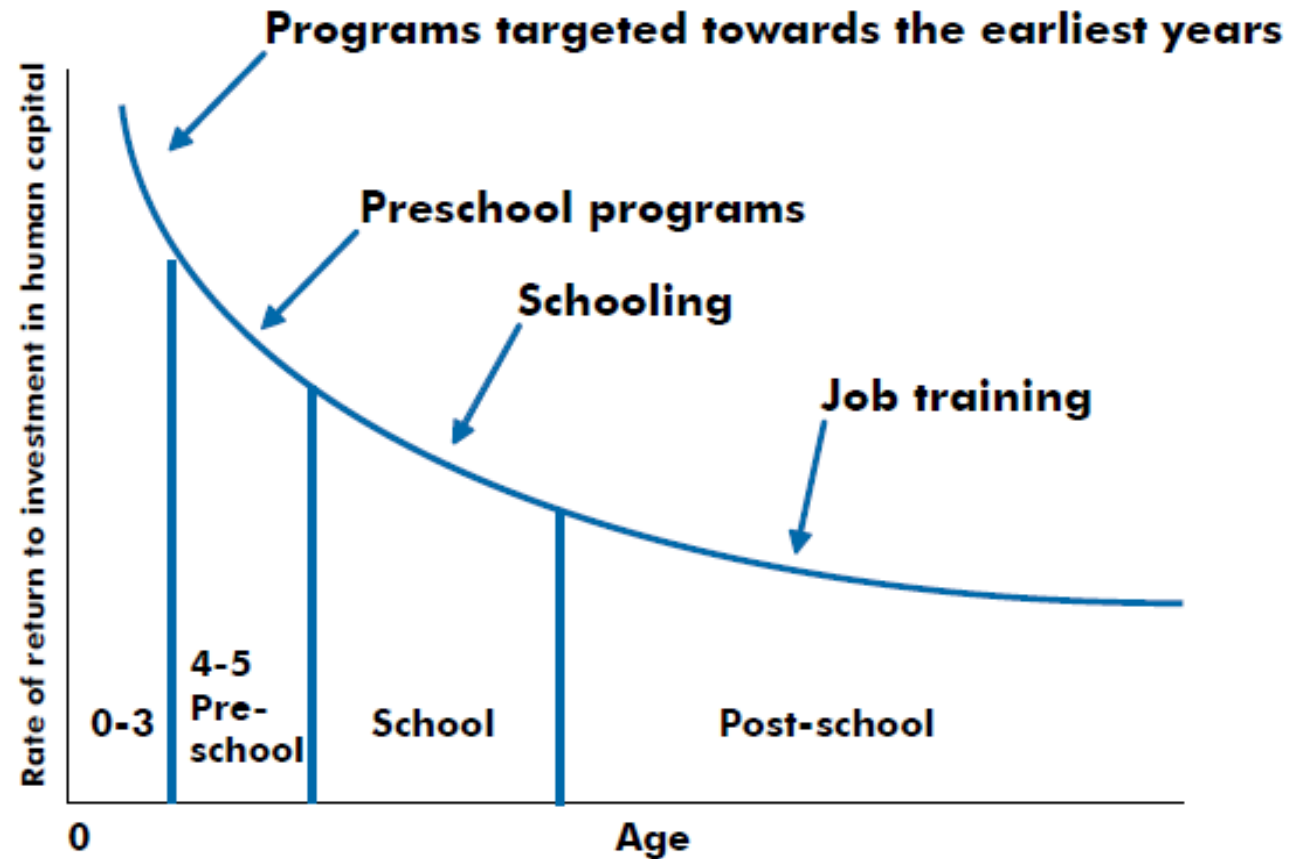


What factors explain the link between self-control and health outcomes?

Factor	% explained	Total	
		SES	Self-control
1	Smoking	11.50%	16.01%
2	BMI	12.80%	13.31%
3	Education	18.24%	13.86%
4	Income	15.06%	11.43%
5	Unemp.	3.86%	4.57%
6	Leader.	1.97%	0.69%
7	Total	63.33%	59.87%



Implications & directions



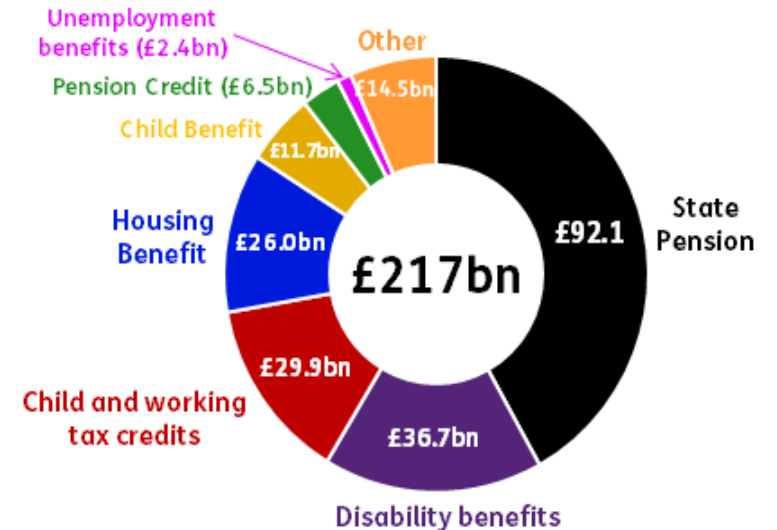
From: Heckman, J. (2008). The case for investing in disadvantaged young children. <https://heckmanequation.org/www/assets/2017/01/Heckman20Investing20in20Young20Children.pdf>

Government costs

- Self-control key part of ‘large economic burden’ (Caspi et al., 2016)
- Government: welfare, income support, housing, disability, pension, preventable disability and healthcare costs, costs of criminal activity
- Difficulties in estimating fiscal costs & benefits of intervention (e.g. Conti et al., 2017; Feinstein et al., 2017)

Benefits and Tax Credits

Spending on benefits (including the state pension) and tax credits, 2015/16



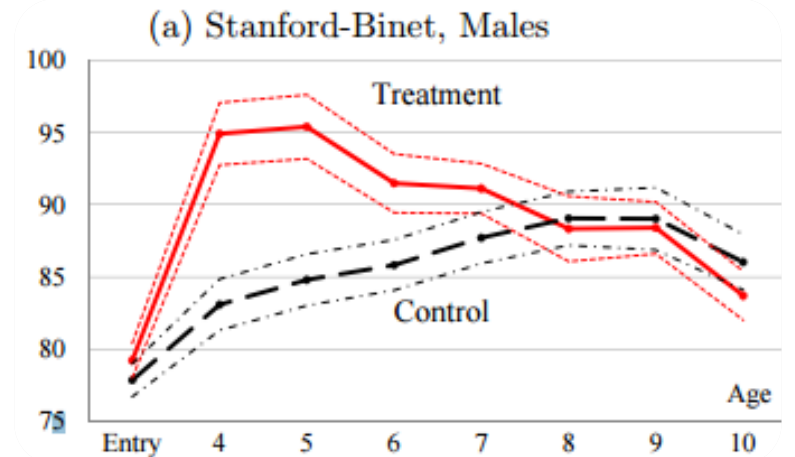
Source: Institute for Fiscal Studies Benefit and Tax Credits election briefing, Benefit expenditure and caseload tables 2015



From: <https://fullfact.org/economy/welfare-budget/>

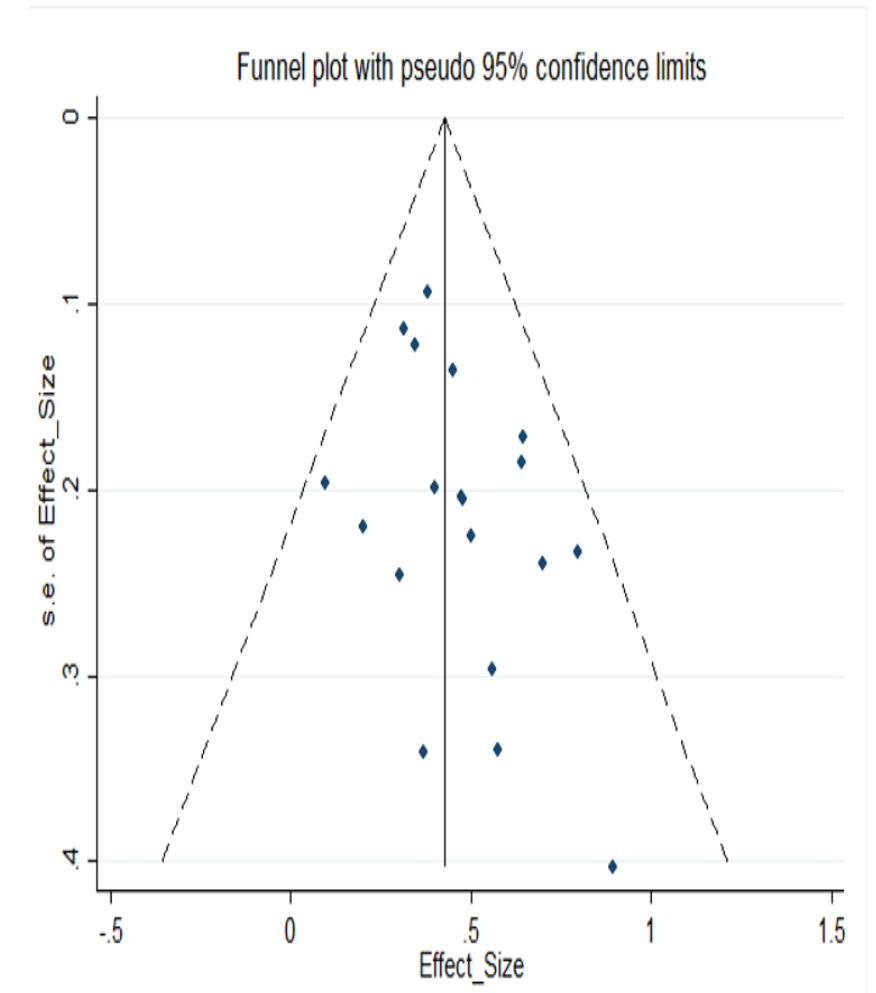
Early interventions

- Improved self-control may play a part in explaining why well-known early intervention programmes may be effective (e.g. PPP: Heckman et al., 2013; PPP/ABC: Conti et al., 2016)
- [*Tools of the Mind*](#) preschool programme which targets self-regulation (support: Barnett et al., 2008; Blair & Raver, 2014; Diamond et al., 2007; mixed evidence: Jacob & Parkinson, 2015)



Early interventions

- Pandey et al. (2018) curriculum-based instruction, physical activity or exercise, mindfulness and yoga, family-based interventions, and other social and personal skills-based training
- 14,000+ articles => 50 included in review
- 23,098 participants mostly under 10 years
- Overall pooled effect size of 0.42 (95%CI, 0.32-0.53) for performance measures



From Pandey, A., et al (2018). Effectiveness of universal self-regulation-based interventions in children and adolescents: a systematic review and meta-analysis. *JAMA Pediatrics*, doi:10.1001/jamapediatrics.2018.0232.

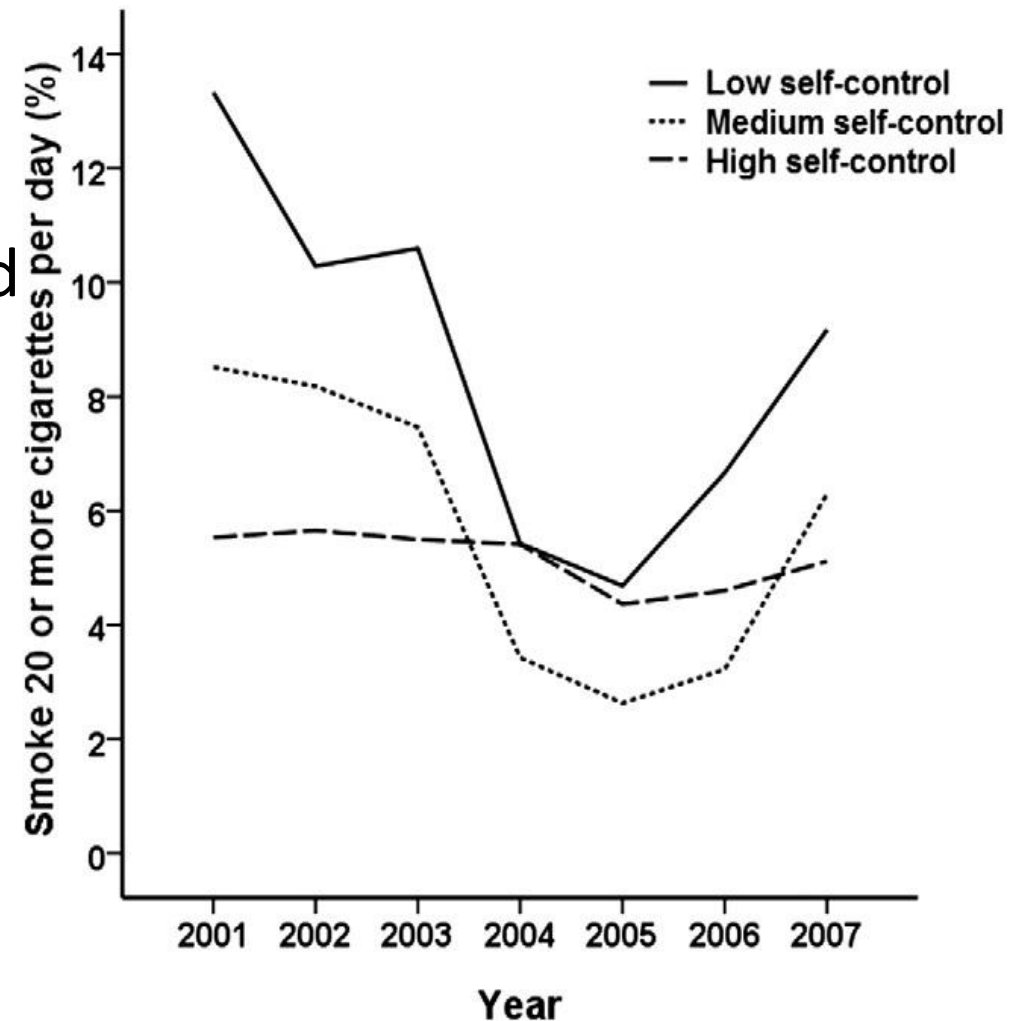
Early interventions

- Timing: Child & adolescent dual strategy (increase self-control, tackle life-altering decisions) (Piquero et al., 2016)
- General/specific: For particular behaviours: Who to target, when, and how? (e.g. smoking - low self-control adolescents; strategically tailored intervention)
- SES: Focusing intervention on disadvantaged neighbourhoods still likely to yield economic & health benefits



Later intervention

- Less self-controlled may be most responsive to changes in the immediate reward/cost of key behaviours
- Interventions requiring less effortful control and planning may be most effective in low self-control conditions: *incentives (including intrinsic rewards), defaults, commitment devices, checklists, implementation intentions, exploiting heuristics, changing opportunity and cues*



Conclusions

- Childhood self-control appears to be protective against a range of costly societal outcomes including unemployment, smoking, obesity, disability, & early mortality
- Positively predicts success: social mobility, higher income levels and savings
- More research needed on whether benefits may vary by social background
- Interventions and policies that *target childhood self-control* and/or *aim to prevent its adverse consequences* could produce long-run benefits for individuals, governments and society

Collaborators:

Prof. Roy Baumeister

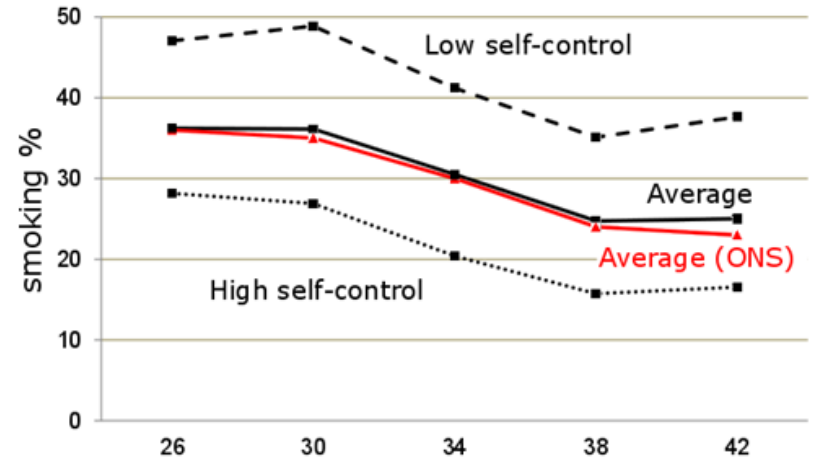
Prof. Liam Delaney

Dr. Mark Egan

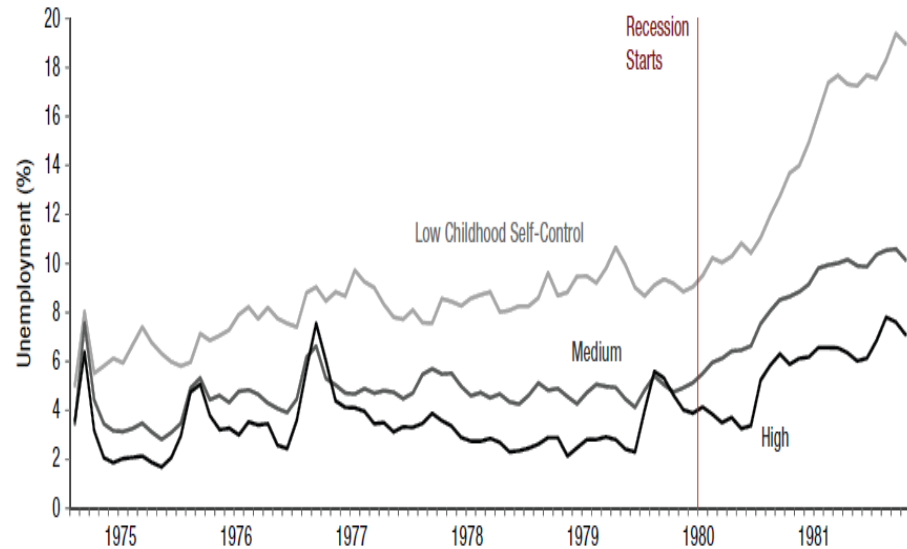
Dr. Leonhard Lades

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Thank you



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Publications

- Bridger, E.K., & Daly, M. (2017). Does cognitive ability buffer the link between childhood disadvantage and adult health? *Health Psychology, 36*, 966-976.
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- Daly, M., Delaney, L., Egan, M., & Baumeister, R. F. (2015). Childhood self-control and unemployment throughout the lifespan: evidence from two British cohort studies. *Psychological Science, 26*, 709 - 723.
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