

# THE ORIGINS OF HAPPINESS ONLINE APPENDICES

## CONTENTS

[Appendix 1](#): Descriptive statistics: Means, SDs and Correlations - e.g. Table D1

[Appendix 2](#): Full Tables (for all text tables and figures) - numbered as in text

[Appendix 3](#): Additional Tables and Figures – e.g. Table A1.1 etc.

[Appendix 4](#): Annexes

[Appendix 5](#): Survey details

[Appendix 6](#): Do files

Note: All numbers will be expanded to three decimal places. Every table will also be done separately for males and females.

# **APPENDIX 1**

## **DESCRIPTIVE STATISTICS**

**Table D1. Descriptive Statistics [BCS]**

Variables	Mean	SD	Min	Max
Life satisfaction	7.39	1.90	0	1
Income (ln)	9.55	0.74	6.23	12.4
Qualifications	3.31	1.57	1	6
Not unemployed	0.98	0.14	0	1
Non-criminality (Max - # arrests)	21.02	3.78	0	25
Partnered	0.53	0.50	0	1
Physical health (No.)	5.98	1.32	0	8
Emotional health	0.84	0.18	0	1
Intellectual performance (16)	0.78	0.41	0	1
Behaviour (16)	15.15	2.59	0	17
Emotional health (16)	0.79	0.12	0	1
Family income (ln)	4.03	0.53	2.36	5.51
Parents' education (age)	15.8	1.82	10	45.5
Father's unemployment	0.06	0.17	0	1
Mother's employment	0.42	0.32	0	1
Parental involvement	6.35	0.95	0	7
Family break-up	0.22	0.41	0	1
Mother's mental health	0.68	0.12	0	1
Number of siblings	1.73	1.22	0	12
Post-marital conception	0.92	0.27	0	1
Female	0.52	0.50	0	1
Ethnicity: white	0.98	0.15	0	1
Low birth weight	0.06	0.23	0	1

Notes: Information from BCS respondents at ages 34 and 42.

**Table D2. Descriptive Statistics [BHPS]**

Variables	Mean	SD	Min	Max
Life satisfaction	6.97	2.36	0	10
Income (ln)	6.42	1.22	0	10
Years of education	12.35	2.51	7	16
Employed full time	0.36	0.48	0	1
Employed part time	0.13	0.34	0	1
Self employed	0.07	0.25	0	1
Unemployed	0.04	0.21	0	1
Not in labour force	0.39	0.49	0	1
Single	0.22	0.41	0	1
Partnered	0.64	0.48	0	1
Separated	0.08	0.27	0	1
Widowed	0.06	0.25	0	1
Parent	0.34	0.47	0	1
Mental health problems	23.11	5.54	1	48
Physical health conditions	0.73	1.1	0	10
Female	0.55	0.50	0	1
Age	46.33	18.32	16	102

**Table D3. Descriptive Statistics [SOEP]**

Variables	Mean	SD	Min	Max
Life satisfaction	7.06	1.82	0	10
Income (ln)	7.14	0.74	0	11.78
Years of education	11.74	2.66	7	18
Employed full time	0.39	0.49	0	1
Employed part time	0.09	0.29	0	1
Self employed	0.06	0.25	0	1
Unemployed	0.05	0.22	0	1
Not in labour force	0.40	0.49	0	1
Single	0.23	0.42	0	1
Partnered	0.62	0.49	0	1
Separated	0.09	0.28	0	1
Widowed	0.06	0.24	0	1
Parent	0.39	0.49	0	1
Mental health problems	5.45	2.98	0	17
Physical health conditions	4.36	4.02	0	16
Female	0.52	0.50	0	1
Age	45.87	17.3	16	104

**Table D4. Descriptive Statistics [HILDA]**

Variables	Mean	SD	Min	Max
Life satisfaction	7.90	1.49	0	10
Income (ln)	7.51	0.88	0	11.36
Years of education	12.08	2.58	0	18.5
Employed full time	0.43	0.49	0	1
Employed part time	0.15	0.35	0	1
Self employed	0.07	0.25	0	1
Unemployed	0.05	0.21	0	1
Not in labour force	0.32	0.46	0	1
Single	0.23	0.42	0	1
Partnered	0.63	0.48	0	1
Separated	0.09	0.28	0	1
Widowed	0.05	0.22	0	1
Parent	0.66	0.47	0	1
Mental health problems	17.73	2.59	8	36
Physical health conditions	22.68	4.95	15	44
Female	0.53	0.50	0	1
Age	44.65	18.35	16	101

**Table D5. Descriptive Statistics [ALSPAC]**

Variables	Mean	SD	Min	Max
Emotional wellbeing (16)	25.02	4.61	0	34
Behavioural (16)	15.43	3.00	0	19
Intellectual performance (16)	315	96.26	0	540
Family income	5.11	0.57	3.19	6.61
Financial difficulties	0.12	0.21	0	1
Proportion of time mother worked in 1 <sup>st</sup> year	0.29	0.37	0	1
Proportion of time mother worked thereafter	0.62	0.37	0	1
Father's unemployment	0.07	0.14	0	1
Mother's mental health	22.82	4.27	0	30
Father's mental health	34.01	5.47	0	43
Involvement	0.00	1	-6.97	2.10
Aggression	0.00	1	-3.24	4.66
Family conflict	2.47	1.81	0	8
Parental separation	0.26	0.43	0	1
Parents' education (A-level equivalent)	0.39	0.41	0	1
Mother's age at birth	27.99	4.96	15	44
Parents' marital status at birth	0.74	0.44	0	1
Female child	0.47	0.50	0	1
Ethnicity: white	0.97	0.16	0	1
First born child	0.43	0.49	0	1
Number of siblings	1.05	1.10	0	18
Low birth weight	0.05	0.22	0	1
Premature baby	0.10	0.30	0	1

**Table D6. Correlation matrix [BCS]**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Life satisfaction	1.00											
(2) Income (ln)	0.05	1.00										
(3) Qualifications	0.06	0.26	1.00									
(4) Not unemployed	0.11	0.01	0.05	1.00								
(5) Non-criminality	0.01	0.28	-0.07	0.03	1.00							
(6) Partnered	0.22	-0.09	-0.03	0.10	0.07	1.00						
(7) Physical health (No.)	0.04	0.20	-0.07	-0.01	0.58	0.08	1.00					
(8) Emotional health	0.26	0.05	0.06	0.04	-0.11	0.07	0.05	1.00				
(9) Intellectual performance (16)	0.02	0.16	0.40	0.05	0.04	-0.01	-0.01	0.02	1.00			
(10) Behaviour (16)	0.04	0.02	0.14	0.07	0.02	-0.01	-0.00	0.10	0.13	1.00		
(11) Emotional health (16)	0.13	0.12	0.08	0.03	-0.02	0.04	0.05	0.30	0.06	0.38	1.00	
(12) Family income (ln)	0.03	0.17	0.23	0.06	-0.00	0.02	-0.00	0.07	0.16	0.11	0.09	1.00
(13) Parents' education (age)	0.01	0.14	0.27	0.02	0.00	0.01	-0.03	0.03	0.12	0.12	0.06	0.32
(14) Father's unemployment	-0.00	-0.06	-0.11	-0.05	-0.01	0.02	-0.01	-0.03	-0.12	-0.14	-0.08	-0.27
(15) Mother's employment	0.01	0.05	0.02	0.03	0.02	0.02	0.01	0.01	0.10	-0.01	0.00	0.15
(16) Parental involvement	0.02	0.05	0.09	0.04	0.02	0.02	0.02	0.03	0.06	0.03	0.06	0.22
(17) Family break-up	-0.04	-0.00	-0.06	-0.03	0.00	-0.04	-0.00	-0.02	-0.05	-0.09	-0.07	-0.11
(18) Mother's mental health	0.09	0.07	0.12	0.03	0.01	0.04	0.03	0.10	0.07	0.21	0.18	0.20
(19) Number of siblings	0.04	-0.06	-0.07	-0.03	-0.03	0.03	-0.00	0.04	-0.13	-0.04	-0.03	-0.28
(20) Post-marital conception	0.02	0.04	0.05	0.00	0.00	-0.03	-0.02	0.10	0.01	-0.01	0.05	0.09
(21) Female	0.03	-0.35	0.02	0.05	0.07	0.02	-0.00	-0.11	0.05	0.05	-0.15	-0.01
(22) Ethnicity: white	0.05	-0.04	0.00	0.01	0.01	0.04	0.04	0.03	0.01	0.06	0.07	-0.00
(23) Low birth weight	0.00	-0.01	0.00	-0.02	0.01	-0.00	-0.00	-0.01	-0.02	-0.01	-0.03	-0.04

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(13) Parents' education (age)	1.00										
(14) Father's unemployment	-0.11	1.00									
(15) Mother's employment	0.04	-0.08	1.00								
(16) Parental involvement	0.07	-0.11	0.09	1.00							
(17) Family break-up	-0.05	0.11	0.04	-0.09	1.00						
(18) Mother's mental health	0.14	-0.11	0.07	0.14	-0.11	1.00					
(19) Number of siblings	-0.06	0.16	-0.09	-0.18	-0.02	-0.11	1.00				
(20) Post-marital conception	0.04	-0.03	0.03	0.05	-0.08	0.00	0.10	1.00			
(21) Female	-0.01	-0.02	0.01	0.03	0.05	0.02	0.02	-0.04	1.00		
(22) Ethnicity: white	-0.01	0.01	-0.04	0.08	-0.04	0.04	-0.09	-0.02	0.01	1.00	
(23) Low birth weight	0.00	0.05	-0.07	-0.05	0.02	-0.01	-0.00	-0.02	0.01	-0.03	1.00

**Table D7. Correlation matrix [BHPS]**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Life satisfaction	1.00									
(2) Income (ln)	0.01	1.00								
(3) Years of education	0.02	0.05	1.00							
(4) Employed full time	0.01	0.12	0.22	1.00						
(5) Employed part time	0.01	0.02	0.04	-0.29	1.00					
(6) Self employed	0.01	0.03	0.05	-0.21	-0.11	1.00				
(7) Unemployed	-0.10	-0.05	-0.03	-0.16	-0.08	-0.06	1.00			
(8) Not in labour force	0.02	-0.13	-0.26	-0.61	-0.31	-0.22	-0.17	1.00		
(9) Single	-0.05	0.03	0.05	-0.01	-0.05	-0.06	0.13	0.03	1.00	
(10) Partnered	0.09	0.03	0.07	0.10	0.08	0.09	-0.10	-0.16	-0.70	1.00
(11) Separated	-0.11	-0.02	-0.03	-0.01	0.01	-0.01	0.02	0.00	-0.15	-0.39
(12) Widowed	0.02	-0.08	-0.17	-0.17	-0.07	-0.06	-0.05	0.26	-0.14	-0.35
(13) Parent	-0.03	-0.06	0.10	0.04	0.15	0.04	0.03	-0.18	-0.06	0.16
(14) Mental health problems	-0.51	-0.05	-0.04	-0.08	-0.01	-0.04	0.08	0.07	-0.01	-0.04
(15) Physical health conditions	-0.06	-0.35	-0.11	-0.15	-0.06	-0.05	-0.03	0.22	-0.09	-0.01
(16) Female	-0.00	-0.00	-0.02	-0.19	0.21	-0.13	-0.05	0.13	-0.04	-0.07
(17) Age	0.05	-0.02	-0.27	-0.27	-0.08	-0.00	-0.13	0.37	-0.48	0.16

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(11) Separated	1.00						
(12) Widowed	-0.08	1.00					
(13) Parent	-0.05	-0.16	1.00				
(14) Mental health problems	0.08	0.02	0.02	1.00			
(15) Physical health conditions	0.02	0.16	-0.13	0.14	1.00		
(16) Female	0.08	0.11	0.05	0.11	0.04	1.00	
(17) Age	0.10	0.39	-0.40	0.01	0.24	0.00	1.00

**Table D8. Correlation matrix [SOEP]**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Life satisfaction	1.00									
(2) Income (ln)	0.12	1.00								
(3) Years of education	0.09	0.32	1.00							
(4) Employed full time	0.05	0.09	0.06	1.00						
(5) Employed part time	0.04	0.03	0.06	-0.25	1.00					
(6) Self employed	0.02	0.08	0.10	-0.21	-0.08	1.00				
(7) Unemployed	-0.16	-0.12	-0.08	-0.19	-0.07	-0.06	1.00			
(8) Not in labour force	-0.01	-0.09	-0.12	-0.66	-0.26	-0.21	-0.19	1.00		
(9) Single	0.02	0.12	0.02	0.12	-0.07	-0.04	0.03	-0.07	1.00	
(10) Partnered	0.06	-0.06	0.03	-0.03	0.07	0.04	-0.04	-0.01	-0.70	1.00
(11) Separated	-0.09	-0.03	0.01	0.02	0.02	0.02	0.07	-0.07	-0.17	-0.39
(12) Widowed	-0.04	-0.07	-0.10	-0.17	-0.05	-0.03	-0.04	0.22	-0.14	-0.33
(13) Parent	0.05	-0.23	0.01	0.08	0.12	0.03	0.03	-0.18	-0.09	0.17
(14) Mental health problems	-0.50	-0.11	-0.10	-0.06	0.00	-0.03	0.07	0.04	-0.02	-0.05
(15) Physical health conditions	-0.37	-0.15	-0.20	-0.21	-0.05	-0.07	0.04	0.25	-0.22	0.08
(16) Female	-0.00	-0.06	-0.07	-0.25	0.23	-0.06	-0.01	0.15	-0.06	-0.05
(17) Age	-0.06	0.02	-0.03	-0.30	-0.06	0.01	-0.06	0.36	-0.54	0.26

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(11) Separated	1.00						
(12) Widowed	-0.08	1.00					
(13) Parent	-0.02	-0.16	1.00				
(14) Mental health problems	0.06	0.06	-0.01	1.00			
(15) Physical health conditions	0.04	0.19	-0.19	0.53	1.00		
(16) Female	0.06	0.14	0.02	0.12	0.09	1.00	
(17) Age	0.05	0.37	-0.41	0.04	0.42	0.02	1.00

**Table D9. Correlation matrix [HILDA]**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Life satisfaction	1.00									
(2) Income (ln)	0.03	1.00								
(3) Years of education	-0.03	0.37	1.00							
(4) Employed full time	-0.03	0.35	0.26	1.00						
(5) Employed part time	0.03	0.07	0.03	-0.36	1.00					
(6) Self employed	-0.00	-0.01	0.02	-0.23	-0.11	1.00				
(7) Unemployed	-0.07	-0.03	-0.04	-0.19	-0.09	-0.06	1.00			
(8) Not in labour force	0.04	-0.41	-0.31	-0.59	-0.28	-0.18	-0.15	1.00		
(9) Single	-0.05	0.16	-0.02	-0.01	0.13	-0.08	0.14	-0.11	1.00	
(10) Partnered	0.10	0.07	0.12	0.09	-0.07	0.09	-0.10	-0.05	-0.71	1.00
(11) Separated	-0.13	-0.16	-0.03	-0.01	-0.03	-0.01	-0.00	0.04	-0.17	-0.41
(12) Widowed	0.04	-0.25	-0.18	-0.17	-0.07	-0.04	-0.04	0.28	-0.13	-0.30
(13) Parent	0.01	-0.34	-0.10	-0.14	-0.07	0.07	-0.10	0.21	-0.63	0.40
(14) Mental health problems	-0.15	-0.11	-0.12	-0.13	-0.01	-0.04	0.09	0.13	0.10	-0.14
(15) Physical health conditions	-0.12	-0.31	-0.24	-0.27	-0.10	-0.04	-0.02	0.40	-0.13	-0.04
(16) Female	0.02	-0.06	-0.03	-0.21	0.18	-0.09	-0.01	0.14	-0.06	-0.04
(17) Age	0.07	-0.39	-0.19	-0.26	-0.18	0.03	-0.16	0.46	-0.50	0.18

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(11) Separated	1.00						
(12) Widowed	-0.07	1.00					
(13) Parent	0.16	0.14	1.00				
(14) Mental health problems	0.06	0.04	-0.06	1.00			
(15) Physical health conditions	0.09	0.23	0.18	0.21	1.00		
(16) Female	0.06	0.14	0.07	0.05	0.05	1.00	
(17) Age	0.14	0.38	0.55	-0.04	0.41	0.02	1.00

**Table D10: Correlation matrix [ALSPAC]**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Intellectual performance (16)	1.00							
(2) Behaviour (16)	0.37	1.00						
(3) Emotional wellbeing (16)	0.15	0.38	1.00					
(4) Family income	0.28	-0.07	0.05	1.00				
(5) Father's unemployment	-0.07	0.04	-0.05	0.02	1.00			
(6) Proportion of time mother worked in 1 <sup>st</sup> year	0.14	0.00	-0.01	0.33	0.02	1.00		
(7) Proportion of time mother worked thereafter	0.25	0.01	0.01	0.62	0.02	0.51	1.00	
(8) Involvement	0.11	-0.08	0.04	0.05	-0.01	0.03	0.04	1.00
(9) Aggression	-0.06	0.18	-0.07	-0.02	0.05	-0.00	-0.01	-0.13
(10) Family conflict	0.07	0.18	-0.12	0.39	0.13	0.19	0.30	-0.03
(11) Parental separation	-0.09	0.09	-0.07	0.18	0.07	0.06	0.11	-0.04
(12) Mother's mental health	0.20	-0.24	0.18	0.62	0.11	0.27	0.47	0.05
(13) Father's mental health	0.16	-0.09	0.08	0.37	0.06	0.21	0.28	0.05
(14) Parents' education	0.37	-0.11	0.05	0.37	-0.02	0.23	0.29	0.11
(15) Mother's age at birth	0.16	-0.05	0.02	0.38	0.07	0.24	0.29	0.02
(16) Parents' marital status at birth	0.22	-0.08	0.03	0.30	-0.00	0.19	0.27	0.03
(17) Female child	0.12	-0.07	-0.15	0.06	0.01	0.02	0.04	0.04
(18) Ethnicity: white	0.16	0.01	0.01	0.55	0.10	0.24	0.41	0.02
(19) First born child	0.13	0.00	0.03	0.16	0.01	0.14	0.10	0.21
(20) Number of siblings	0.02	-0.02	0.01	0.39	0.07	0.12	0.20	-0.11
(21) Low birth weight	-0.05	-0.03	0.01	-0.05	-0.00	-0.04	-0.06	-0.00
(22) Premature baby	-0.04	-0.01	0.00	-0.21	-0.05	-0.10	-0.17	-0.01

Variables	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(9) Aggression	1.00							
(10) Family conflict	0.13	1.00						
(11) Parental separation	0.04	0.22	1.00					
(12) Mother's mental health	-0.07	0.24	0.12	1.00				
(13) Father's mental health	-0.02	0.17	0.02	0.43	1.00			
(14) Parents' education	-0.09	0.15	-0.03	0.28	0.27	1.00		
(15) Mother's age at birth	-0.07	0.20	0.04	0.45	0.42	0.38	1.00	
(16) Parents' marital status at birth	-0.04	0.12	-0.10	0.30	0.37	0.29	0.41	1.00
(17) Female child	-0.06	0.03	0.03	0.07	0.04	0.03	0.07	0.02
(18) Ethnicity: white	-0.00	0.30	0.15	0.61	0.41	0.31	0.48	0.30
(19) First born child	0.09	0.08	0.06	0.17	0.20	0.15	0.07	-0.01
(20) Number of siblings	-0.05	0.23	0.11	0.35	0.25	0.15	0.35	0.24
(21) Low birth weight	0.02	-0.01	0.00	-0.04	0.00	-0.04	0.04	-0.03
(22) Premature baby	0.01	-0.10	-0.07	-0.27	-0.15	-0.11	-0.28	-0.06

Variables	(17)	(18)	(19)	(20)	(21)	(22)
(17) Female child	1.00					
(18) Ethnicity: white	0.06	1.00				
(19) First born child	0.03	0.17	1.00			
(20) Number of siblings	0.01	0.33	-0.19	1.00		
(21) Low birth weight	0.01	-0.06	0.06	-0.03	1.00	
(22) Premature baby	-0.12	-0.27	-0.05	-0.12	0.44	1.00

**APPENDIX 2**  
**FULL TABLES FOR ALL TEXT**  
**TABLES AND FIGURES**

**Full Table for Figure 1.1. How adult life-satisfaction at 34 and 42 is affected by adult outcomes at these ages [British Cohort Study] [Standardised coefficients]**

	Life satisfaction (0-10)
Income	<b>0.07 (.01)</b>
Qualifications	<b>0.02 (.01)</b>
Not unemployed	<b>0.08 (.01)</b>
Non-criminality	<b>0.06 (.02)</b>
Partnered	<b>0.17 (.01)</b>
Physical health	<b>0.06 (.01)</b>
Emotional health (lagged)	<b>0.18 (.01)</b>
Intellectual performance (16)	-0.00 (.01)
Behaviour (16)	0.01 (.01)
Emotional health (16)	<b>0.05 (.01)</b>
Family income	0.00 (.01)
Parents' education	0.00 (.01)
Father's unemployment	-0.01 (.01)
Mother's employment	-0.01 (.01)
Parental involvement	<b>0.02 (.01)</b>
Family break-up	<b>-0.01 (.01)</b>
Mother's mental health	<b>0.02 (.01)</b>
Number of siblings	-0.00 (.01)
Post-marital conception	0.01 (.01)
Female	<b>0.07 (.01)</b>
Ethnicity: white	<b>0.02 (.01)</b>
Low birth weight	-0.00 (.01)
Age dummy = 42	<b>-0.26 (.05)</b>
Observations	17,812
R <sup>2</sup>	0.147

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table for Figure 1.2. How adult life-satisfaction is affected by child outcomes at 16 [British Cohort Study] [Standardised coefficients]**

	Life satisfaction (0-10)
Qualifications	<b>0.07 (.01)</b>
Behaviour (16)	<b>0.03 (.01)</b>
Emotional health (16)	<b>0.09 (.01)</b>
Family income	0.01 (.01)
Parents' education	0.00 (.01)
Father's unemployment	<b>-0.03 (.01)</b>
Mother's employment	-0.00 (.01)
Parental involvement	<b>0.03 (.01)</b>
Family break-up	<b>-0.02 (.01)</b>
Mother's mental health	<b>0.04 (.01)</b>
Number of siblings	0.00 (.01)
Post-marital conception	0.01 (.01)
Female	<b>0.04 (.01)</b>
Ethnicity: white	<b>0.03 (.01)</b>
Low birth weight	-0.01 (.01)
Age dummy = 42	-0.01 (.01)
Observations	17,812
R <sup>2</sup>	0.035

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table for Figure 1.3. How adult life-satisfaction is affected by family background [British Cohort Study] [Standardised coefficients]**

	Life satisfaction (0-10)
Family income	<b>0.02 (.01)</b>
Parents' education	<b>0.02 (.01)</b>
Father's unemployment	<b>-0.03 (.01)</b>
Mother's employment	-0.01 (.01)
Parental involvement	<b>0.04 (.01)</b>
Family break-up	<b>-0.03 (.01)</b>
Mother's mental health	<b>0.06 (.01)</b>
Number of siblings	-0.00 (.01)
Post-marital conception	<b>0.02 (.01)</b>
Female	<b>0.04 (.01)</b>
Ethnicity: white	<b>0.03 (.01)</b>
Low birth weight	-0.01 (.01)
Age dummy = 42	<b>-0.02 (.01)</b>
Observations	17,812
R <sup>2</sup>	0.020

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table for Figure 1.4. How adult outcomes are affected by child outcomes.**  
**[British Cohort Study] [Standardised coefficients]**

	Income	Qualifications	Not-unemployed	Non-criminality	Partnered	Physical health	Emotional health
Intellectual performance (16)	<b>0.15</b> (.01)	<b>0.33</b> (.01)	<b>0.02</b> (.01)	<b>0.03</b> (.01)	0.01 (.01)	<b>-0.02</b> (.01)	<b>0.05</b> (.02)
Behaviour (16)	<b>0.02</b> (.01)	<b>0.06</b> (.01)	<b>0.03</b> (.01)	<b>0.03</b> (.01)	<b>0.03</b> (.01)	0.01 (.01)	<b>0.04</b> (.02)
Emotional health (16)	<b>0.03</b> (.01)	0.01 (.01)	0.00 (.01)	0.00 (.01)	<b>0.02</b> (.01)	<b>0.05</b> (.01)	<b>0.22</b> (.02)
Family income	<b>0.08</b> (.01)	<b>0.10</b> (.01)	<b>0.02</b> (.01)	0.00 (.01)	<b>0.02</b> (.01)	-0.00 (.01)	0.02 (.02)
Parents' education	<b>0.11</b> (.01)	<b>0.18</b> (.02)	0.00 (.01)	<b>0.02</b> (.01)	-0.00 (.01)	<b>-0.02</b> (.01)	<b>0.04</b> (.02)
Father's unemployment	<b>-0.02</b> (.01)	<b>-0.05</b> (.01)	<b>-0.03</b> (.01)	<b>-0.03</b> (.01)	<b>-0.02</b> (.01)	<b>-0.02</b> (.01)	<b>-0.07</b> (.02)
Mother's employment	0.00 (.01)	<b>-0.03</b> (.01)	<b>0.02</b> (.01)	0.00 (.01)	0.00 (.01)	0.01 (.01)	0.01 (.02)
Parental involvement	0.01 (.01)	<b>0.04</b> (.01)	0.01 (.01)	<b>0.02</b> (.01)	<b>0.02</b> (.01)	0.00 (.01)	0.02 (.02)
Family break-up	-0.00 (.01)	-0.02 (.01)	-0.00 (.01)	<b>-0.01</b> (.01)	<b>-0.03</b> (.01)	-0.00 (.01)	-0.01 (.02)
Mother's mental health	0.01 (.01)	<b>0.03</b> (.01)	0.01 (.01)	0.01 (.01)	-0.00 (.01)	<b>0.03</b> (.01)	<b>0.12</b> (.02)
Number of siblings	-0.01 (.01)	<b>-0.03</b> (.01)	0.01 (.01)	<b>-0.04</b> (.01)	<b>0.02</b> (.01)	<b>0.03</b> (.01)	0.02 (.02)
Post-marital conception	-0.00 (.01)	<b>0.02</b> (.01)	-0.00 (.01)	<b>0.02</b> (.01)	0.00 (.01)	-0.01 (.01)	0.01 (.02)
Female	<b>-0.45</b> (.01)	<b>0.02</b> (.01)	<b>0.04</b> (.01)	<b>0.13</b> (.01)	<b>0.07</b> (.01)	<b>-0.07</b> (.01)	<b>-0.17</b> (.02)
Ethnicity: white	<b>-0.02</b> (.01)	<b>-0.04</b> (.01)	-0.00 (.01)	-0.00 (.01)	0.01 (.01)	0.01 (.01)	-0.00 (.02)
Low birth weight	<b>-0.02</b> (.01)	-0.02 (.01)	-0.01 (.01)	<b>0.01</b> (.01)	<b>-0.02</b> (.01)	0.00 (.01)	-0.02 (.02)
Observations	12,378	17,802	17,167	8,869	17,803	17,806	8,869
R <sup>2</sup>	0.260	0.232	0.012	0.088	0.013	0.010	0.074

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table for Figure 1.5(a). How child outcomes are affected at 16 by family background**  
**[ALSPAC] [Standardised coefficients]**

	Emotional wellbeing	Behaviour	Intellectual performance
Family income	<b>0.07 (.02)</b>	<b>0.08 (.02)</b>	<b>0.14 (.01)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	-0.02 (.02)	-0.01 (.02)	<b>-0.02 (.01)</b>
Proportion of time mother worked thereafter	-0.01 (.02)	<b>-0.05 (.02)</b>	<b>0.04 (.01)</b>
Father's unemployment	-0.04 (.03)	-0.00 (.02)	<b>-0.03 (.01)</b>
Mother's mental health	<b>0.16 (.02)</b>	<b>0.17 (.02)</b>	<b>0.03 (.01)</b>
Father's mental health	<b>0.04 (.02)</b>	-0.00 (.02)	-0.00 (.01)
Involvement	<b>0.04 (.02)</b>	<b>0.05 (.02)</b>	<b>0.02 (.01)</b>
Aggression	<b>-0.03 (.02)</b>	<b>-0.12 (.02)</b>	-0.01 (.01)
Family conflict	<b>-0.04 (.02)</b>	<b>-0.14 (.02)</b>	-0.01 (.01)
Parental separation	0.00 (.02)	0.00 (.02)	<b>-0.03 (.01)</b>
Parents' education	-0.00 (.02)	<b>0.04 (.02)</b>	<b>0.17 (.01)</b>
Mother's age at birth	-0.02 (.02)	-0.01 (.02)	<b>0.08 (.01)</b>
Parents' marital status at birth	-0.02 (.02)	<b>0.04 (.02)</b>	<b>0.07 (.01)</b>
Female child	<b>-0.16 (.02)</b>	<b>0.07 (.02)</b>	<b>0.11 (.01)</b>
Ethnicity: white	-0.02 (.02)	-0.02 (.02)	<b>-0.02 (.01)</b>
First born child	-0.01 (.02)	-0.01 (.02)	<b>0.09 (.01)</b>
Number of siblings	0.02 (.02)	-0.01 (.02)	<b>-0.03 (.01)</b>
Low birth weight	0.03 (.02)	<b>0.05 (.02)</b>	<b>-0.02 (.01)</b>
Premature baby	-0.01 (.02)	0.02 (.03)	0.01 (.01)
Primary school fixed effects	Yes	Yes	Yes
Secondary school fixed effects	Yes	Yes	Yes
Observations	6,032	5,222	12,030
R <sup>2</sup>	0.160	0.209	0.410

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table for Figure 1.5(b). How child outcomes are affected at 16 by family and schooling [ALSPAC] [Standardised coefficients]**

	Emotional wellbeing	Behaviour	Intellectual performance
Observed family background	<b>0.27 (.01)</b>	<b>0.31 (.01)</b>	<b>0.34 (.01)</b>
Primary school	<b>0.26 (.01)</b>	<b>0.32 (.01)</b>	<b>0.21 (.01)</b>
Secondary school	<b>0.28 (.01)</b>	<b>0.31 (.01)</b>	<b>0.38 (.01)</b>
Observations	6,032	5,222	12,030
R <sup>2</sup>	0.158	0.207	0.406

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table 2.1. How adult life-satisfaction (0-10) is affected by adult outcomes  
[British Cohort Study] [Unstandardised coefficients]**

	Units	Cross-section	Panel
Income	Ln	<b>0.20 (.02)</b>	<b>0.13 (.04)</b>
Qualifications	SD (index)	<b>0.04 (.02)</b>	
Not unemployed	1,0	<b>0.89 (.13)</b>	<b>0.35 (.15)</b>
Non-criminality	Minus # arrests	<b>0.05 (.01)</b>	
Partnered	1,0	<b>0.69 (.03)</b>	<b>0.40 (.05)</b>
Physical health	No. of conditions	<b>0.11 (.01)</b>	0.03 (.02)
Emotional health (lagged)	SD (index)	<b>0.35 (.01)</b>	
Emotional health			<b>0.11 (.02)</b>
Intellectual performance (16)	1,0	-0.00 (.05)	
Behaviour (16)	SD (index)	0.01 (.02)	
Emotional health (16)	SD (index)	<b>0.09 (.02)</b>	
Family income	Ln	0.01 (.04)	
Parents' education	Age	0.00 (.01)	
Father's unemployment	# Waves	-0.15 (.10)	
Mother's employment	# Waves	-0.04 (.05)	
Parental involvement	SD (index)	<b>0.04 (.02)</b>	
Family break-up	1,0	-0.07 (.05)	
Mother's mental health	SD (index)	<b>0.03 (.02)</b>	
Number of siblings	No.	-0.00 (.01)	
Post-marital conception	1,0	0.06 (.06)	
Female	1,0	<b>0.26 (.03)</b>	
Ethnicity: white	1,0	<b>0.34 (.13)</b>	
Low birth weight	1,0	-0.01 (.07)	
Age dummy = 42	1,0	<b>-0.49 (.09)</b>	<b>-0.15 (.04)</b>
Observations		17,812	17812
R <sup>2</sup>		0.147	0.119

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Tables 2.2 and 2.3. How life satisfaction (0-10) is affected by log income**  
**[Household panel data] [Unstandardised coefficients]**

	Britain		Germany		Australia	
	Cross-section	Panel	Cross-section	Panel	Cross-section	Panel
Log own income	<b>0.16</b> (.01)	<b>0.04</b> (.01)	<b>0.26</b> (.01)	<b>0.08</b> (.01)	<b>0.16</b> (.01)	0.06 (.01)
Years of education	<b>0.03</b> (.00)		<b>0.05</b> (.00)		<b>-0.01</b> (.00)	
Self-employed	<b>0.06</b> (.03)	-0.04 (.03)	<b>-0.08</b> (.03)	-0.04 (.04)	0.01 (.03)	0.03 (.02)
Employed part time	0.03 (.02)	-0.01 (.02)	<b>-0.03</b> (.02)	<b>-0.11</b> (.02)	<b>0.08</b> (.02)	<b>0.01</b> (.01)
Unemployed	<b>-0.70</b> (.04)	<b>-0.46</b> (.04)	<b>-0.99</b> (.03)	<b>-0.71</b> (.03)	<b>-0.31</b> (.03)	<b>-0.18</b> (.02)
Not in labour force	<b>-0.29</b> (.02)	<b>-0.14</b> (.03)	<b>-0.10</b> (.02)	<b>-0.14</b> (.02)	<b>-0.04</b> (.02)	<b>-0.04</b> (.02)
Partnered	<b>0.57</b> (.02)	<b>0.26</b> (.04)	<b>0.32</b> (.02)	<b>0.16</b> (.03)	<b>0.40</b> (.02)	<b>0.24</b> (.02)
Separated	<b>-0.18</b> (.04)	<b>-0.15</b> (.06)	0.02 (.03)	0.02 (.04)	<b>-0.21</b> (.04)	<b>-0.26</b> (.04)
Widowed	0.07 (.08)	-0.04 (.12)	0.06 (.07)	<b>-0.31</b> (.14)	0.12 (.04)	<b>-0.22</b> (.12)
Parent	<b>0.03</b> (.02)	<b>0.06</b> (.02)	<b>0.16</b> (.02)	<b>0.08</b> (.02)	0.03 (.02)	0.03 (.02)
Physical health	<b>0.21</b> (0.01)	<b>0.13</b> (.01)	<b>0.21</b> (0.01)	<b>0.01</b> (.00)	<b>0.17</b> (0.01)	<b>0.01</b> (.00)
Emotional health (lagged)	<b>0.77</b> (0.01)	<b>0.09</b> (.01)	<b>0.47</b> (0.01)	<b>0.09</b> (.01)	<b>0.10</b> (0.01)	<b>0.09</b> (0.02)
Female	<b>0.24</b> (.02)		<b>0.18</b> (0.02)		<b>0.11</b> (.02)	<b>(.00)</b>
Age	<b>-0.12</b> (.01)	<b>-0.06</b> (.02)	<b>-0.07</b> (.01)	<b>-0.04</b> (.02)	<b>-0.12</b> (.01)	<b>-0.07</b> (.02)
Age <sup>2</sup>	<b>1.40</b> (.08)	<b>0.65</b> (.10)	<b>0.81</b> (.08)	<b>0.41</b> (.09)	<b>1.39</b> (.07)	<b>0.85</b> (.07)
Comparator income	<b>-0.15</b> (.07)	-0.10 (.06)	<b>-0.34</b> (.05)	-0.15 (.04)	<b>-0.13</b> (.06)	-0.03 (.04)
Comparator education	<b>-0.09</b> (.02)	-0.12 (.09)	<b>-0.05</b> (.01)	-0.07 (.05)	<b>-0.03</b> (.01)	0.03 (.03)
Comparator unemployment	<b>-1.33</b> (.56)	-0.59 (.54)	<b>-1.64</b> (.36)	<b>-1.02</b> (.32)	-0.38 (.42)	-0.21 (.33)
Comparator partnership	<b>0.38</b> (.06)	<b>0.14</b> (.06)	<b>-0.09</b> (.05)	-0.01 (.05)	<b>0.20</b> (.06)	<b>0.13</b> (.04)
Observations	155,333	169,057	140,821	148,238	118,979	121,040
R <sup>2</sup>	0.183	0.014	0.226	0.020	0.080	0.015

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 2.4. How life satisfaction (0-10) is affected by own income, comparator income, and own previous income [Household panel data] [Unstandardised coefficients] [Fixed-effects]**

	Britain	Germany	Australia
Log own income	<b>0.06 (.01)</b>	<b>0.19 (.01)</b>	<b>0.06 (.01)</b>
Log comparator income	-0.09 (.06)	<b>-0.12 (.04)</b>	0.01 (.04)
Log previous 3 years' income	-0.02 (.02)	<b>-0.08 (.01)</b>	-0.01 (.01)
Self-employed	-0.03 (.03)	<b>-0.07 (.02)</b>	0.03 (.02)
Employed part time	0.00 (.02)	<b>-0.12 (.01)</b>	0.01 (.01)
Unemployed	<b>-0.47 (.04)</b>	<b>-0.75 (.02)</b>	<b>-0.16 (.02)</b>
Not in labour force	<b>-0.09 (.03)</b>	<b>-0.17 (.01)</b>	<b>-0.04 (.02)</b>
Partnered	<b>0.08 (.02)</b>	<b>0.17 (.02)</b>	<b>0.25 (.02)</b>
Separated	<b>-0.11 (.06)</b>	0.01 (.02)	<b>-0.17 (.04)</b>
Widowed	-0.05 (.12)	<b>-0.22 (.06)</b>	-0.05 (.09)
Parent	<b>0.08 (.02)</b>	<b>0.06 (.01)</b>	<b>0.04 (.02)</b>
Age	<b>-0.10 (.02)</b>	<b>-0.05 (.00)</b>	<b>-0.07 (.02)</b>
Age-squared	<b>0.82 (.10)</b>	<b>0.37 (.04)</b>	<b>0.86 (.05)</b>
Year dummies	Yes	<b>Yes</b>	Yes
Region dummies	Yes	<b>Yes</b>	Yes
Observations	115,274	277,202	97,837
R <sup>2</sup>	0.017	0.072	0.050

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 3.1. How life satisfaction (0-10) is affected by qualifications [British Cohort Study] [Unstandardised coefficients]**

	Units	Cross-section	Cross-section
Income	Ln		<b>0.20 (.02)</b>
Qualifications	SD (index)	<b>0.18 (.02)</b>	<b>0.04 (.02)</b>
Not unemployed	1,0		<b>0.89 (.13)</b>
Non-criminality	Minus # arrests		<b>0.05 (.01)</b>
Partnered	1,0		<b>0.69 (.03)</b>
Physical health	No. of conditions		<b>0.11 (.01)</b>
Emotional health (lagged)	SD (index)		<b>0.35 (.01)</b>
Emotional health			
Intellectual performance (16)	1,0		-0.00 (.05)
Behaviour (16)	SD (index)		0.01 (.02)
Emotional health (16)	SD (index)		<b>0.09 (.02)</b>
Family income	Ln		0.01 (.04)
Parents' education	Age		0.00 (.01)
Father's unemployment	# Waves		-0.15 (.10)
Mother's employment	# Waves		-0.04 (.05)
Parental involvement	SD (index)		<b>0.04 (.02)</b>
Family break-up	1,0		-0.07 (.05)
Mother's mental health	SD (index)		<b>0.03 (.02)</b>
Number of siblings	No.		-0.00 (.01)
Post-marital conception	1,0		0.06 (.06)
Female	1,0	<b>0.13 (.03)</b>	<b>0.26 (.03)</b>
Ethnicity: white	1,0		<b>0.34 (.13)</b>
Low birth weight	1,0		-0.01 (.07)
Age dummy = 42	1,0	-0.01 (.02)	<b>-0.49 (.09)</b>
Observations		17,812	17,812
R <sup>2</sup>		0.013	0.147

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 3.3. How life satisfaction (0-10) is affected by years of education**  
**[Household panel data] [Unstandardised coefficients]**  
**[Pooled cross-section]**

	Britain Cross-section	Germany Cross-section	Australia Cross-section
Log own income	<b>0.16</b> (.01)	<b>0.26</b> (.01)	<b>0.16</b> (.01)
Years of education	<b>0.03</b> (.00)	<b>0.05</b> (.00)	<b>-0.01</b> (.00)
Self-employed	<b>0.06</b> (.03)	<b>-0.08</b> (.03)	0.01 (.03)
Employed part time	0.03 (.02)	<b>-0.03</b> (.02)	<b>0.08</b> (.02)
Unemployed	<b>-0.70</b> (.04)	<b>-0.99</b> (.03)	<b>-0.31</b> (.03)
Not in labour force	<b>-0.29</b> (.02)	<b>-0.10</b> (.02)	<b>-0.04</b> (.02)
Partnered	<b>0.57</b> (.02)	<b>0.32</b> (.02)	<b>0.40</b> (.02)
Separated	<b>-0.18</b> (.04)	0.02 (.03)	<b>-0.21</b> (.04)
Widowed	0.07 (.08)	0.06 (.07)	0.12 (.04)
Parent	<b>0.03</b> (.02)	<b>0.16</b> (.02)	0.03 (.02)
Physical health	<b>0.21</b> (0.01)	<b>0.21</b> (0.01)	<b>0.17</b> (0.01)
Emotional health (lagged)	<b>0.77</b> (0.01)	<b>0.47</b> (0.01)	<b>0.10</b> (0.01)
Female	<b>0.24</b> (.02)	<b>0.18</b> (0.02)	<b>0.11</b> (.02)
Age	<b>-0.12</b> (.01)	<b>-0.07</b> (.01)	<b>-0.12</b> (.01)
Age <sup>2</sup>	<b>1.40</b> (.08)	<b>0.81</b> (.08)	<b>1.39</b> (.07)
Comparator income	<b>-0.15</b> (.07)	<b>-0.34</b> (.05)	<b>-0.13</b> (.06)
Comparator education	<b>-0.09</b> (.02)	<b>-0.05</b> (.01)	<b>-0.03</b> (.01)
Comparator unemployment	<b>-1.33</b> (.56)	<b>-1.64</b> (.36)	-0.38 (.42)
Comparator partnership	<b>0.38</b> (.06)	<b>-0.09</b> (.05)	<b>0.20</b> (.06)
Observations	155,333	140,821	118,979
R <sup>2</sup>	0.183	0.226	0.080

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed). People aged 25-64.

**Full Table 4.1. How life satisfaction (0-10) is affected by labour force status – compared with full-time workers [British Cohort Study] [Unstandardised coefficients]**

	Units	Cross-section	Cross-section	Panel
Income	Ln		<b>0.24 (.03)</b>	<b>0.18 (.04)</b>
Qualifications	SD (index)		<b>0.03 (.02)</b>	
Unemployed	1,0	<b>-1.55 (.13)</b>	<b>-1.06 (.15)</b>	<b>-0.30 (.15)</b>
Part-time workers	1,0	-0.01 (.05)	0.05 (.05)	0.09 (.07)
Self-employed	1,0	<b>0.19 (.05)</b>	<b>0.25 (.09)</b>	<b>0.34 (.08)</b>
Out of labour force	1,0	-0.08 (.06)	-0.09 (.10)	<b>0.26 (.09)</b>
Non-criminality	Minus # arrests		<b>0.03 (.01)</b>	
Partnered	1,0		<b>0.65 (.03)</b>	<b>0.37 (.05)</b>
Physical health	No. of conditions		<b>0.10 (.01)</b>	0.03 (.02)
Emotional health (lagged)	SD (index)		<b>0.33 (.01)</b>	
Emotional health				<b>0.11 (.02)</b>
Intellectual performance (16)	1,0		-0.00 (.05)	
Behaviour (16)	SD (index)		0.00 (.05)	
Emotional health (16)	SD (index)		<b>0.09 (.02)</b>	
Family income	Ln		0.00 (.04)	
Parents' education	Age		0.00 (.01)	
Father's unemployment	# Waves		-0.11 (.09)	
Mother's employment	# Waves		-0.05 (.05)	
Parental involvement	SD (index)		<b>0.04 (.02)</b>	
Family break-up	1,0		-0.07 (.05)	
Mother's mental health	SD (index)		<b>0.04 (.02)</b>	
Number of siblings	No.		-0.00 (.01)	
Post-marital conception	1,0		0.06 (.06)	
Female	1,0	<b>0.16 (.04)</b>	<b>0.30 (.03)</b>	
Ethnicity: white	1,0		<b>0.33 (.13)</b>	
Low birth weight	1,0		0.01 (.07)	
Age dummy = 42	1,0	<b>-0.05 (.02)</b>	<b>-0.38 (.09)</b>	<b>-0.18 (.05)</b>
Observations		17,812	17,812	17,812
R <sup>2</sup>		0.049	0.162	0.114

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 4.2. How life satisfaction (0-10) is affected by labour force status – compared with full time workers [Household panel data] [Unstandardised coefficients]**

	Britain		Germany		Australia	
	Cross-section	Panel	Cross-section	Panel	Cross-section	Panel
Log own income	<b>0.16</b> (.01)	<b>0.04</b> (.01)	<b>0.26</b> (.01)	<b>0.08</b> (.01)	<b>0.16</b> (.01)	0.06 (.01)
Years of education	<b>0.03</b> (.00)		<b>0.05</b> (.00)		<b>-0.01</b> (.00)	
Self-employed	<b>0.06</b> (.03)	-0.04 (.03)	<b>-0.08</b> (.03)	-0.04 (.04)	0.01 (.03)	0.03 (.02)
Employed part time	0.03 (.02)	-0.01 (.02)	<b>-0.03</b> (.02)	<b>-0.11</b> (.02)	<b>0.08</b> (.02)	<b>0.01</b> (.01)
Unemployed	<b>-0.70</b> (.04)	<b>-0.46</b> (.04)	<b>-0.99</b> (.03)	<b>-0.71</b> (.03)	<b>-0.31</b> (.03)	<b>-0.18</b> (.02)
Not in labour force	<b>-0.29</b> (.02)	<b>-0.14</b> (.03)	<b>-0.10</b> (.02)	<b>-0.14</b> (.02)	<b>-0.04</b> (.02)	<b>-0.04</b> (.02)
Partnered	<b>0.57</b> (.02)	<b>0.26</b> (.04)	<b>0.32</b> (.02)	<b>0.16</b> (.03)	<b>0.40</b> (.02)	<b>0.24</b> (.02)
Separated	<b>-0.18</b> (.04)	<b>-0.15</b> (.06)	0.02 (.03)	0.02 (.04)	<b>-0.21</b> (.04)	<b>-0.26</b> (.04)
Widowed	0.07 (.08)	-0.04 (.12)	0.06 (.07)	<b>-0.31</b> (.14)	0.12 (.04)	<b>-0.22</b> (.12)
Parent	<b>0.03</b> (.02)	<b>0.06</b> (.02)	<b>0.16</b> (.02)	<b>0.08</b> (.02)	0.03 (.02)	0.03 (.02)
Physical health	<b>0.21</b> (0.01)	<b>0.13</b> (.01)	<b>0.21</b> (0.01)	<b>0.01</b> (.00)	<b>0.17</b> (0.01)	<b>0.01</b> (.00)
Emotional health (lagged)	<b>0.77</b> (0.01)	<b>0.09</b> (.01)	<b>0.47</b> (0.01)	<b>0.09</b> (.01)	<b>0.10</b> (0.01)	<b>0.09</b> (0.02)
Female	<b>0.24</b> (.02)		<b>0.18</b> (0.02)		<b>0.11</b> (.02)	<b>(.00)</b>
Age	<b>-0.12</b> (.01)	<b>-0.06</b> (.02)	<b>-0.07</b> (.01)	<b>-0.04</b> (.02)	<b>-0.12</b> (.01)	<b>-0.07</b> (.02)
Age <sup>2</sup>	<b>1.40</b> (.08)	<b>0.65</b> (.10)	<b>0.81</b> (.08)	<b>0.41</b> (.09)	<b>1.39</b> (.07)	<b>0.85</b> (.07)
Comparator income	<b>-0.15</b> (.07)	-0.10 (.06)	<b>-0.34</b> (.05)	-0.15 (.04)	<b>-0.13</b> (.06)	-0.03 (.04)
Comparator education	<b>-0.09</b> (.02)	-0.12 (.09)	<b>-0.05</b> (.01)	-0.07 (.05)	<b>-0.03</b> (.01)	0.03 (.03)
Comparator unemployment	<b>-1.33</b> (.56)	-0.59 (.54)	<b>-1.64</b> (.36)	<b>-1.02</b> (.32)	-0.38 (.42)	-0.21 (.33)
Comparator partnership	<b>0.38</b> (.06)	<b>0.14</b> (.06)	<b>-0.09</b> (.05)	-0.01 (.05)	<b>0.20</b> (.06)	<b>0.13</b> (.04)
Observations	155,333	169,057	140,821	148,238	118,979	121,040
R <sup>2</sup>	0.183	0.014	0.226	0.020	0.080	0.015

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed). People aged 25-64.

**Full Table for Figure 4.1. Adaptation to unemployment?**  
**[Household panel data] [Fixed-effects]**

	Britain		Germany		Australia	
	Men	Women	Men	Women	Men	Women
3-4 Years Hence	-0.08 (.08)	0.14 (.10)	<b>-0.10 (.04)</b>	<b>-0.09 (.05)</b>	0.06 (.05)	-0.04 (.07)
2-3 Years	<b>-0.16 (.09)</b>	-0.02 (.11)	<b>-0.10 (.04)</b>	-0.06 (.04)	<b>0.11 (.05)</b>	0.06 (.06)
1-2 years	<b>-0.19 (.09)</b>	0.01 (.10)	<b>-0.14 (.04)</b>	<b>-0.09 (.04)</b>	-0.02 (.06)	-0.00 (.06)
Within 1 year	-0.23 (.09)	-0.13 (.11)	<b>-0.30 (.04)</b>	<b>-0.22 (.04)</b>	0.05 (.06)	<b>-0.14 (.06)</b>
Unemp. 0-1 year	<b>-0.90 (.13)</b>	<b>-0.63 (.13)</b>	<b>-1.04 (.05)</b>	<b>-0.66 (.05)</b>	<b>-0.17 (.06)</b>	<b>-0.24 (.06)</b>
1-2 years	<b>-1.00 (.29)</b>	<b>-1.00 (.30)</b>	<b>-1.04 (.07)</b>	<b>-0.70 (.07)</b>	-0.25 (.15)	-0.09 (.12)
2-3 years	<b>-0.72 (.39)</b>	-0.40 (.40)	<b>-0.81 (.09)</b>	<b>-0.58 (.10)</b>	-0.32 (.31)	-0.08 (.28)
3-4 years	<b>-0.82 (.37)</b>	0.37 (.96)	<b>-0.97 (.13)</b>	<b>-0.66 (.12)</b>	-0.23 (.38)	-0.05 (.86)
4+ years	<b>-1.63 (.53)</b>	<b>-1.86 (.23)</b>	<b>-1.05 (.18)</b>	<b>-0.44 (.13)</b>	-0.56 (.50)	-1.84 (1.44)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,980	32,905	93,382	76,402	33,506	31,323
R <sup>2</sup>	0.002	0.015	0.029	0.029	0.050	0.004

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 4.3. How life-satisfaction (0-10) is affected by current and previous unemployment [Household panel data] [Pooled cross-section]**

	Britain	Germany	Australia
Current unemployment	<b>-0.74 (.07)</b>	<b>-0.82 (.03)</b>	<b>-0.37 (.04)</b>
Previous unemployment	<b>-0.44 (.13)</b>	<b>-0.73 (.05)</b>	<b>-0.53 (.10)</b>
Income	<b>0.20 (.02)</b>	<b>0.33 (.01)</b>	<b>0.19 (.02)</b>
Education	0.01 (.01)	<b>0.04 (.00)</b>	-0.00 (.01)
Self-employed	<b>0.08 (.05)</b>	<b>-0.15 (.03)</b>	0.03 (.03)
Employed part time	0.01 (.04)	<b>-0.06 (.02)</b>	<b>0.09 (.02)</b>
Not in labour force	<b>-0.64 (.05)</b>	<b>-0.25 (.02)</b>	<b>-0.19 (.04)</b>
Partnered	<b>0.62 (.05)</b>	<b>0.29 (.03)</b>	<b>0.40 (.03)</b>
Separated	<b>-0.32 (.07)</b>	<b>-0.11 (.04)</b>	<b>-0.20 (.05)</b>
Widowed	-0.12 (.14)	-0.07 (.08)	0.12 (.13)
Parent	<b>0.11 (.03)</b>	<b>0.25 (.02)</b>	<b>0.06 (.03)</b>
Age	<b>-0.15 (.01)</b>	<b>-0.10 (.01)</b>	<b>-0.11 (.01)</b>
Age-squared	<b>1.79 (.13)</b>	<b>0.98 (.07)</b>	<b>1.26 (.09)</b>
Female	<b>0.11 (.03)</b>	<b>0.10 (.02)</b>	<b>0.11 (.02)</b>
Year dummies	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Observations	72,125	190,911	61,367
R <sup>2</sup>	0.062	0.106	0.063

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table for Figure 4.2. Effect on life-satisfaction (0-10) of weekly hours of work – compared with 0-10 hours workers  
[Household panel data] [Pooled cross-section]**

	Britain	Germany	Australia
11-20 hours	-0.03 (.04)	-0.03 (.03)	<b>-0.06 (.02)</b>
21-30 hours	-0.06 (.04)	-0.01 (.03)	<b>b</b>
31-40 hours	<b>-0.08 (.03)</b>	<b>-0.04 (.03)</b>	<b>-0.14 (.02)</b>
41-50 hours	<b>-0.11 (.04)</b>	<b>-0.09 (.03)</b>	<b>-0.16 (.03)</b>
50+	<b>-0.12 (.05)</b>	<b>-0.25 (.08)</b>	<b>-0.28 (.03)</b>
Income	<b>0.34 (.02)</b>	<b>0.27 (.01)</b>	<b>0.19 (.01)</b>
Education	0.01 (.00)	<b>0.04 (.00)</b>	<b>-0.02 (.00)</b>
Partnered	<b>0.60 (.02)</b>	<b>0.30 (.02)</b>	<b>0.38 (.02)</b>
Separated	<b>-0.17 (.04)</b>	<b>-0.10 (.03)</b>	<b>-0.16 (.04)</b>
Widowed	0.01 (.08)	-0.01 (.06)	0.13 (.09)
Parent	<b>0.04 (.02)</b>	<b>0.13 (.01)</b>	0.01 (.02)
Age	<b>-0.10 (.00)</b>	<b>-0.06 (.00)</b>	<b>-0.09 (.00)</b>
Age-squared	<b>1.19 (.05)</b>	<b>0.61 (.04)</b>	<b>1.07 (.04)</b>
Female	0.03 (.02)	<b>-0.03 (.02)</b>	<b>0.03 (.02)</b>
Year dummies	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Observations	158,193	255,109	112,625
R <sup>2</sup>	0.033	0.053	0.052

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 4.8. How life satisfaction (0-10) is affected by various dimensions of workplace quality [European Social Survey]**

	Life satisfaction
Job has high autonomy	<b>0.27 (.03)</b>
Co-worker are supportive	<b>0.27 (.03)</b>
High time pressure	<b>-0.12 (.04)</b>
Job has high variety	<b>0.24 (.03)</b>
Job is dangerous	<b>-0.25 (.07)</b>
Job has long hours (>45)	<b>-0.09 (.03)</b>
Job interferes with family life	<b>-0.42 (.04)</b>
Household high income (>median)	<b>0.38 (.05)</b>
Good opportunities for promotion	<b>0.26 (.03)</b>
Job is secure	<b>0.22 (.03)</b>
Female	<b>0.08 (.03)</b>
Age	<b>-0.10 (.01)</b>
Age-squared	<b>0.00 (.00)</b>
Years of education	<b>0.02 (.01)</b>
Immigrant	<b>-0.26 (.05)</b>
Married	<b>0.60 (.04)</b>
Children	-0.04 (.03)
Country and wave fixed effects	Yes
2 Digit Industry fixed effects	Yes
2 Digit occupation fixed effects	Yes
Observation	71,383
R <sup>2</sup>	0.076

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 5.1. How life-satisfaction (0-10) is affected by family status – compared with single [British Cohort Study] [Ages 34 and 42] [Unstandardised coefficients]**

	Units	Cross-section	Cross-section	Panel
Income	Ln		<b>0.18 (.02)</b>	<b>0.13 (.04)</b>
Qualifications	SD (index)		<b>0.04 (.02)</b>	
Not unemployed	1,0		<b>0.80 (.12)</b>	<b>0.33 (.15)</b>
Non-criminality	Minus # arrests		<b>0.05 (.01)</b>	
Partnered	1,0	<b>0.99 (.04)</b>	<b>0.77 (.04)</b>	<b>0.34 (.06)</b>
Separated	1,0	-0.06 (.07)	-0.11 (.06)	-0.16 (.10)
Widowed	1,0	-0.44 (.32)	-0.44 (.33)	<b>-0.97 (.46)</b>
Having children	1,0	<b>0.22 (.04)</b>	<b>0.25 (.03)</b>	<b>0.30 (.06)</b>
Physical health	No. of conditions		<b>0.11 (.01)</b>	0.03 (.02)
Emotional health (lagged)	SD (index)		<b>0.34 (.01)</b>	
Emotional health				<b>0.11 (.02)</b>
Intellectual performance (16)	1,0		-0.01 (.05)	
Behaviour (16)	SD (index)		0.01 (.02)	
Emotional health (16)	SD (index)		<b>0.09 (.02)</b>	
Family income	Ln		0.01 (.04)	
Parents' education	Age		-0.00 (.01)	
Father's unemployment	# Waves		-0.14 (.10)	
Mother's employment	# Waves		-0.04 (.05)	
Parental involvement	SD (index)		<b>0.04 (.02)</b>	
Family break-up	1,0		-0.07 (.04)	
Mother's mental health	SD (index)		<b>0.04 (.02)</b>	
Number of siblings	No.		-0.00 (.01)	
Post-marital conception	1,0		0.06 (.06)	
Female	1,0		<b>0.25 (.03)</b>	
Ethnicity: white	1,0		<b>0.30 (.13)</b>	
Low birth weight	1,0		0.00 (.07)	
Age dummy = 42	1,0	<b>0.05 (.02)</b>	<b>-0.40 (.09)</b>	<b>-0.14 (.04)</b>
Observations		17,812	17,812	17,812
R <sup>2</sup>		0.076	0.165	0.132

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 5.2. How life-satisfaction (0-10) is affected by family status – compared with single [Household panel data] [Unstandardised coefficients]**

	Britain		Germany		Australia	
	Cross-section	Panel	Cross-section	Panel	Cross-section	Panel
Log own income	<b>0.17</b> (.01)	<b>0.05</b> (.01)	<b>0.32</b> (.01)	<b>0.12</b> (.01)	<b>0.15</b> (.01)	<b>0.06</b> (.01)
Years of education	<b>0.02</b> (.00)		<b>0.04</b> (.00)		<b>-0.02</b> (.00)	
Self-employed	<b>0.05</b> (.03)	-0.05 (.04)	<b>-0.10</b> (.03)	-0.04 (.04)	0.01 (.03)	0.01 (.02)
Employed part time	0.03 (.02)	0.00 (.03)	-0.03 (.02)	<b>-0.11</b> (.02)	<b>0.07</b> (.02)	0.02 (.02)
Unemployed	<b>-0.68</b> (.04)	<b>-0.41</b> (.04)	<b>-0.95</b> (.03)	<b>-0.69</b> (.03)	<b>-0.36</b> (.04)	<b>-0.21</b> (.03)
Not in labour force	<b>-0.33</b> (.03)	<b>-0.18</b> (.03)	<b>-0.11</b> (.02)	<b>-0.15</b> (.02)	<b>-0.05</b> (.03)	<b>-0.08</b> (.02)
Partnered	<b>0.59</b> (.03)	<b>0.28</b> (.05)	<b>0.29</b> (.03)	<b>0.14</b> (.03)	<b>0.47</b> (.03)	<b>0.30</b> (.03)
Separated	<b>-0.15</b> (.04)	<b>-0.12</b> (.07)	0.03 (.03)	0.01 (.04)	<b>-0.15</b> (.05)	<b>-0.21</b> (.04)
Widowed	0.11 (.08)	-0.02 (.12)	0.06 (.07)	<b>-0.31</b> (.14)	0.18 (.10)	-0.15 (.13)
Parent	0.03 (.02)	<b>0.07</b> (.03)	<b>0.23</b> (.02)	<b>0.11</b> (.02)	0.00 (.03)	-0.01 (.02)
Physical health	<b>0.22</b> (0.01)	<b>0.12</b> (.01)	<b>0.06</b> (0.00)	<b>0.01</b> (.00)	<b>0.05</b> (0.00)	<b>0.01</b> (.00)
Emotional health (lagged)	<b>0.76</b> (0.01)	<b>0.09</b> (.01)	<b>0.50</b> (0.01)	<b>0.09</b> (.01)	<b>0.09</b> (0.01)	<b>0.02</b> (.01)
Female	<b>0.26</b> (.02)		<b>0.18</b> (0.02)		<b>0.17</b> (.02)	
Age	<b>-0.12</b> (.01)	<b>-0.08</b> (.02)	<b>-0.11</b> (.01)	<b>-0.05</b> (.02)	<b>-0.11</b> (.01)	<b>-0.05</b> (.02)
Age <sup>2</sup>	<b>1.42</b> (.10)	<b>0.80</b> (.14)	<b>1.20</b> (.10)	<b>0.37</b> (.12)	<b>1.29</b> (.09)	<b>0.57</b> (.10)
Comparator income	<b>-0.18</b> (.07)	<b>-0.12</b> (.07)	<b>-0.28</b> (.05)	<b>-0.15</b> (.04)	<b>-0.10</b> (.06)	-0.07 (.04)
Comparator education	<b>-0.13</b> (.02)	-0.02 (.12)	<b>-0.03</b> (.01)	-0.07 (.06)	0.00 (.01)	0.02 (.04)
Comparator unemployment	<b>-2.00</b> (.76)	-0.37 (.75)	<b>-2.11</b> (.46)	<b>-1.61</b> (.42)	-0.73 (.62)	-0.39 (.50)
Comparator partnership	<b>0.68</b> (.12)	0.14 (.12)	<b>0.03</b> (.06)	0.00 (.06)	<b>0.18</b> (.11)	-0.00 (.08)
Observations	139,507	143,078	128,498	131,432	97,344	97,364
R <sup>2</sup>	0.191	0.015	0.236	0.020	0.088	0.016

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed). Age: 25+

**Full Table for Figure 5.2-5.6.****Adaptation to Partnership.**

	Britain		Germany		Australia	
	Men	Women	Men	Women	Men	Women
3-4 Years Hence	-0.126 (0.106)	-0.000 (0.106)	<b>0.154</b> <b>(0.042)</b>	0.050 (0.045)	0.071 (0.050)	0.027 (0.053)
2-3 Years	-0.063 (0.109)	0.104 (0.102)	<b>0.198</b> <b>(0.042)</b>	0.041 (0.044)	0.050 (0.053)	0.066 (0.051)
1-2 years	0.026 (0.108)	<b>0.283</b> <b>(0.105)</b>	<b>0.250</b> <b>(0.044)</b>	<b>0.122</b> <b>(0.044)</b>	0.074 (0.059)	0.089 (0.055)
Within 1 year	<b>0.234</b> <b>(0.103)</b>	<b>0.514</b> <b>(0.107)</b>	<b>0.344</b> <b>(0.045)</b>	<b>0.266</b> <b>(0.046)</b>	<b>0.193</b> <b>(0.059)</b>	<b>0.173</b> <b>(0.061)</b>
Partnered. 0-1 year	<b>0.399</b> <b>(0.125)</b>	<b>0.638</b> <b>(0.133)</b>	<b>0.463</b> <b>(0.052)</b>	<b>0.460</b> <b>(0.053)</b>	<b>0.247</b> <b>(0.072)</b>	<b>0.387</b> <b>(0.070)</b>
1-2 years	<b>0.305</b> <b>(0.130)</b>	<b>0.582</b> <b>(0.140)</b>	<b>0.306</b> <b>(0.056)</b>	<b>0.207</b> <b>(0.057)</b>	<b>0.310</b> <b>(0.079)</b>	<b>0.346</b> <b>(0.078)</b>
2-3 years	<b>0.299</b> <b>(0.140)</b>	<b>0.567</b> <b>(0.144)</b>	<b>0.165</b> <b>(0.060)</b>	<b>0.166</b> <b>(0.061)</b>	<b>0.294</b> <b>(0.087)</b>	<b>0.410</b> <b>(0.086)</b>
3-4 years	<b>0.256</b> <b>(0.146)</b>	<b>0.545</b> <b>(0.145)</b>	<b>0.229</b> <b>(0.063)</b>	<b>0.118</b> <b>(0.065)</b>	<b>0.243</b> <b>(0.096)</b>	<b>0.403</b> <b>(0.090)</b>
4+ years	<b>0.276</b> <b>(0.154)</b>	<b>0.460</b> <b>(0.152)</b>	<b>0.201</b> <b>(0.065)</b>	0.037 (0.051)	<b>0.243</b> <b>(0.064)</b>	<b>0.403</b> <b>(0.074)</b>
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,342	15,621	54,616	61,681	16,996	20,885
R <sup>2</sup>	0.034	0.014	0.010	0.033	0.050	0.020

Notes: Robust standard errors in parentheses. Bold: p&lt;10 (2-tailed).

### Adaptation to Separation

	Britain		Germany		Australia	
	Men	Women	Men	Women	Men	Women
3-4 Years Hence	<b>-0.312</b> <b>(0.130)</b>	<b>-0.199</b> <b>(0.111)</b>	-0.001 (0.057)	-0.018 (0.050)	<b>-0.154</b> <b>(0.081)</b>	-0.001 (0.070)
2-3 Years	<b>-0.387</b> <b>(0.118)</b>	<b>-0.460</b> <b>(0.110)</b>	<b>-0.157</b> <b>(0.056)</b>	<b>-0.121</b> <b>(0.052)</b>	<b>-0.178</b> <b>(0.068)</b>	-0.092 (0.072)
1-2 years	<b>-0.595</b> <b>(0.130)</b>	<b>-0.491</b> <b>(0.115)</b>	<b>-0.171</b> <b>(0.056)</b>	<b>-0.323</b> <b>(0.053)</b>	<b>-0.187</b> <b>(0.074)</b>	<b>-0.212</b> <b>(0.073)</b>
Within 1 year	<b>-0.824</b> <b>(0.143)</b>	<b>-0.819</b> <b>(0.119)</b>	<b>-0.421</b> <b>(0.062)</b>	<b>-0.550</b> <b>(0.060)</b>	<b>-0.390</b> <b>(0.078)</b>	<b>-0.584</b> <b>(0.081)</b>
Separated. 0-1 year	<b>-1.020</b> <b>(0.185)</b>	<b>-0.773</b> <b>(0.161)</b>	<b>-0.695</b> <b>(0.082)</b>	<b>-0.373</b> <b>(0.083)</b>	<b>-0.851</b> <b>(0.119)</b>	<b>-0.587</b> <b>(0.112)</b>
1-2 years	<b>-0.402</b> <b>(0.196)</b>	<b>-0.344</b> <b>(0.180)</b>	<b>-0.260</b> <b>(0.088)</b>	<b>-0.152</b> <b>(0.083)</b>	<b>-0.434</b> <b>(0.131)</b>	<b>-0.292</b> <b>(0.128)</b>
2-3 years	<b>-0.355</b> <b>(0.205)</b>	-0.148 (0.182)	<b>-0.211</b> <b>(0.096)</b>	0.046 (0.083)	<b>-0.349</b> <b>(0.144)</b>	-0.033 (0.125)
3-4 years	-0.089 (0.232)	-0.124 (0.206)	-0.089 (0.094)	-0.035 (0.090)	-0.251 (0.172)	0.040 (0.132)
4+ years	-0.011 (0.241)	-0.258 (0.195)	0.097 (0.087)	0.082 (0.081)	0.030 (0.158)	0.125 (0.125)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29,943	32,380	106,137	110,466	34,689	38,037
R <sup>2</sup>	0.005	0.029	0.045	0.043	0.039	0.007

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

### Adaptation to Parenthood

	Britain		Germany		Australia	
	Men	Women	Men	Women	Men	Women
3-4 Years Hence	<b>0.133</b> <b>(0.072)</b>	0.117 (0.073)	0.062 (0.040)	0.059 (0.041)	0.063 (0.051)	-0.016 (0.045)
2-3 Years	0.084 (0.073)	<b>0.155</b> <b>(0.073)</b>	<b>0.117</b> <b>(0.037)</b>	0.037 (0.038)	0.013 (0.053)	0.039 (0.047)
1-2 years	0.044 (0.077)	0.114 (0.075)	<b>0.120</b> <b>(0.036)</b>	<b>0.093</b> <b>(0.036)</b>	<b>0.108</b> <b>(0.049)</b>	<b>0.079</b> <b>(0.045)</b>
Within 1 year	<b>0.161</b> <b>(0.073)</b>	<b>0.307</b> <b>(0.072)</b>	<b>0.205</b> <b>(0.036)</b>	<b>0.283</b> <b>(0.035)</b>	<b>0.133</b> <b>(0.052)</b>	<b>0.277</b> <b>(0.047)</b>
Parent. 0-1 year	<b>0.214</b> <b>(0.079)</b>	<b>0.398</b> <b>(0.082)</b>	<b>0.208</b> <b>(0.040)</b>	<b>0.356</b> <b>(0.041)</b>	<b>0.178</b> <b>(0.058)</b>	<b>0.285</b> <b>(0.054)</b>
1-2 years	0.022 (0.085)	-0.005 (0.086)	0.049 (0.042)	<b>0.087</b> <b>(0.041)</b>	0.019 (0.062)	0.084 (0.058)
2-3 years	-0.107 (0.094)	-0.080 (0.089)	-0.013 (0.046)	-0.021 (0.044)	0.040 (0.072)	0.050 (0.067)
3-4 years	0.090 (0.092)	-0.078 (0.091)	0.048 (0.049)	0.020 (0.048)	-0.051 (0.088)	0.088 (0.080)
4+ years	-0.107 (0.076)	-0.009 (0.071)	0.015 (0.030)	0.043 (0.028)	-0.047 (0.061)	0.055 (0.052)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,781	17,099	55,531	58,809	20,059	22,555
R <sup>2</sup>	0.033	0.017	0.001	0.014	0.036	0.001

Notes: Robust standard errors in parentheses. Bold: p<10 (2-tailed).

**Full Table 6.1. What explains the proportion of the population who are in misery? (Cross-section) ( $\alpha$ -coefficients)**

	USA	Australia	Britain BCS	Britain BHPS
Income (log)	<b>0.05 (.00)</b>	<b>0.04 (.01)</b>	<b>0.01 (.00)</b>	<b>0.03 (.00)</b>
Years of education	<b>0.01 (.00)</b>	-0.00 (.00)	<b>-0.01 (.00)</b>	-0.00 (.00)
Unemployed	<b>0.07 (.00)</b>	<b>0.09 (.02)</b>	<b>0.06 (.03)</b>	<b>0.14 (.01)</b>
Partnered	<b>-0.04 (.00)</b>	<b>-0.06 (.01)</b>	<b>-0.06 (.01)</b>	<b>-0.07 (.00)</b>
Physical illness	<b>0.03 (.00)</b>	<b>0.09 (.01)*</b>	<b>0.02 (.00)</b>	<b>0.06 (.00)</b>
Mental illness	<b>0.10 (.00)</b>	<b>0.09 (.01)</b>	<b>0.15 (.01)</b>	<b>0.20 (.00)*</b>
Female	<b>-0.01 (.00)</b>	<b>-0.03 (.01)</b>	<b>-0.01 (.00)</b>	<b>-0.02 (.00)</b>
Age	<b>0.00 (.00)</b>	<b>0.01 (.00)</b>	0.09 (.12)	<b>0.02 (.00)</b>
Age <sup>2</sup>	<b>-0.03 (.00)</b>	<b>-0.17 (.03)</b>	--	<b>-0.19 (.01)</b>
Observations	268,300	16,001	17,812	139,507
R <sup>2</sup>	0.082	0.106	0.080	0.120

Notes: Controls for year and region dummies. Columns 2 and 4 also control for comparison income, education, unemployment and partnership (see Full Table 2.1 for a full list of controls). Column 3 controls for criminality, child outcomes at 16 and family background (see Full Table 2.2 for a full list of controls). Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed). \* Lagged one year.

**Full Table 6.2. How adult misery is predicted by adult outcomes? (Cross-section)  
( $\beta$ -coefficients)**

	USA	Australia	Britain BCS	Britain BHPS
Income (log)	<b>-0.12 (.00)</b>	<b>-0.09 (.02)</b>	<b>-0.05 (.01)</b>	<b>-0.07 (.01)</b>
Years of education	<b>0.04 (.01)</b>	-0.00 (.01)	<b>-0.02 (.01)</b>	-0.01 (.00)
Unemployed	<b>0.06 (.00)</b>	<b>0.06 (.01)</b>	<b>0.03 (.02)</b>	<b>0.07 (.00)</b>
Partnered	<b>-0.19 (.01)</b>	<b>-0.10 (.02)</b>	<b>-0.11 (.01)</b>	<b>-0.08 (.00)</b>
Physical illness	<b>0.05 (.00)</b>	<b>0.16 (.01)*</b>	<b>0.05 (.01)</b>	<b>0.09 (.00)</b>
Mental illness	<b>0.19 (.00)</b>	<b>0.14 (.01)</b>	<b>0.09 (.01)</b>	<b>0.26 (.00)*</b>
Female	<b>-0.06 (.00)</b>	<b>-0.06 (.01)</b>	<b>-0.06 (.02)</b>	<b>-0.04 (.01)</b>
Age	<b>0.02 (.00)</b>	<b>0.89 (.14)</b>	0.39 (.44)	<b>0.70 (.06)</b>
Age <sup>2</sup>	<b>-0.16 (.01)</b>	<b>-1.13 (.17)</b>	--	<b>-0.85 (.07)</b>
Observations	268,300	16,001	17,812	139,507
R <sup>2</sup>	0.085	0.110	0.082	0.139

Notes: Controls for year and region dummies. Columns 2 and 4 also control for comparison income, education, unemployment and partnership (see Full Table 2.1 for a full list of controls). Column 3 controls for criminality, child outcomes at 16 and family background (see Full Table 2.2 for a full list of controls). Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed). \* Lagged one year.

**Full Table 6.3. How adult life-satisfaction is predicted by adult outcomes  
(Cross-section) ( $\beta$ -coefficients)**

	USA	Australia	Britain BCS	Britain BHPS
Income (log)	<b>0.16 (.00)</b>	<b>0.09 (.01)</b>	<b>0.08 (.01)</b>	<b>0.09 (.01)</b>
Years of education	<b>0.02 (.01)</b>	<b>-0.03 (.01)</b>	<b>0.03 (.01)</b>	<b>0.02 (.00)</b>
Unemployed	<b>-0.05 (.00)</b>	<b>-0.04 (.01)</b>	<b>-0.03 (.01)</b>	<b>-0.05 (.00)</b>
Partnered	<b>0.34 (.01)</b>	<b>0.14 (.01)</b>	<b>0.21 (.01)</b>	<b>0.11 (.00)</b>
Physical illness	<b>-0.05 (.00)</b>	<b>-0.17 (.01)*</b>	<b>-0.06 (.01)</b>	<b>-0.11 (.00)</b>
Mental illness	<b>-0.21 (.00)</b>	<b>-0.18 (.01)</b>	<b>-0.11 (.01)</b>	<b>-0.32 (.00)*</b>
Female	<b>0.08 (.00)</b>	<b>0.08 (.01)</b>	<b>0.11 (.02)</b>	<b>0.05 (.00)</b>
Age	<b>-0.01 (.00)</b>	<b>-1.03 (.14)</b>	<b>-0.92 (.41)</b>	<b>-0.86 (.06)</b>
Age <sup>2</sup>	<b>0.13 (.01)</b>	<b>1.40 (.17)</b>	--	<b>1.06 (.07)</b>
Observations	268,300	16,001	17,812	139,507
R <sup>2</sup>	0.146	0.139	0.153	0.190

Notes: Controls for year and region dummies. Columns 2 and 4 also control for comparison income, education, unemployment and partnership (see Full Table 2.1 for a full list of controls). Column 3 controls for criminality, child outcomes at 16 and family background (see Full Table 2.2 for a full list of controls). Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed). \* Lagged one year.

**Full Table 6.4. How adult life-satisfaction is affected by emotional and physical health of self and others**  
**(Household panel data) (Cross-section) (Unstandardised coefficients)**

	Britain (BHPS)	Australia	Germany
Mental illness			
Own	<b>-0.14 (.00)*</b>	<b>-0.52 (.04)</b>	<b>-0.14 (.00)*</b>
Partners	<b>-0.03 (.00)*</b>	<b>-0.02 (.01)</b>	<b>-0.04 (.00)*</b>
Physical illness			
Own	<b>-0.19 (.01)</b>	<b>-0.05 (.00)*</b>	<b>-0.06 (.00)*</b>
Partners	-0.02 (.01)	<b>-0.02 (.00)*</b>	<b>-0.04 (.00)*</b>
Income (log)	<b>0.12 (.01)</b>	<b>0.10 (.02)</b>	<b>0.27 (.02)</b>
Years of education	<b>0.01 (.00)</b>	<b>-0.02 (.01)</b>	<b>0.03 (.00)</b>
Unemployed	<b>-0.61 (.06)</b>	<b>-0.41 (.10)</b>	<b>-0.85 (.05)</b>
Partnered	0.24 (.38)	0.72 (1.30)	<b>0.15 (.04)</b>
Parent	<b>-0.07 (.02)</b>	-0.05 (.04)	<b>0.13 (.02)</b>
Female	<b>0.22 (.02)</b>	<b>0.13 (.03)</b>	<b>0.13 (.02)</b>
Age	<b>-0.05 (.00)</b>	<b>-0.03 (.01)</b>	<b>-0.05 (.00)</b>
Age <sup>2</sup>	<b>0.66 (.04)</b>	<b>0.52 (.06)</b>	<b>0.50 (.04)</b>
Observations	129,002	15,127	64,516
R <sup>2</sup>	0.162	0.111	0.232

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed). \* Lagged one year.

**Full Table 6.5. Adaptation to disability**

	Britain	Germany	Australia
3-4 Years Hence	<b>-0.213</b> <b>(0.093)</b>	<b>-0.136</b> <b>(0.030)</b>	-0.021 (0.029)
2-3 Years	<b>-0.261</b> <b>(0.089)</b>	<b>-0.162</b> <b>(0.030)</b>	<b>-0.063</b> <b>(0.031)</b>
1-2 years	<b>-0.417</b> <b>(0.087)</b>	<b>-0.286</b> <b>(0.031)</b>	<b>-0.120</b> <b>(0.030)</b>
Within 1 year	<b>-0.649</b> <b>(0.092)</b>	<b>-0.500</b> <b>(0.033)</b>	<b>-0.218</b> <b>(0.032)</b>
Partnered. 0-1 year	<b>-1.286</b> <b>(0.111)</b>	<b>-0.568</b> <b>(0.040)</b>	<b>-0.406</b> <b>(0.040)</b>
1-2 years	<b>-1.463</b> <b>(0.152)</b>	<b>-0.479</b> <b>(0.046)</b>	<b>-0.404</b> <b>(0.067)</b>
2-3 years	<b>-1.390</b> <b>(0.180)</b>	<b>-0.409</b> <b>(0.052)</b>	<b>-0.384</b> <b>(0.106)</b>
3-4 years	<b>-0.966</b> <b>(0.201)</b>	<b>-0.445</b> <b>(0.058)</b>	<b>-0.353</b> <b>(0.135)</b>
4+ years	<b>-0.740</b> <b>(0.141)</b>	<b>-0.378</b> <b>(0.054)</b>	<b>-0.518</b> <b>(0.133)</b>
Other controls	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes
Observations	107,158	275,022	94,355
R <sup>2</sup>	0.008	0.041	0.051

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Tables 7.1, 7.2, and 7.4**

**See Annex 7.1.**

**Full Table 7.3. How the number of arrests is affected by qualifications, childhood outcomes at 10 and family background (British Cohort Study)**

	Units	The number of arrests by age 30		
Qualifications	SD (index)	<b>-0.11 (.01)</b>	<b>-0.14 (.02)</b>	
Intellectual performance (age 16)	SD (index)	<b>-0.05 (.02)</b>		
Good behaviour (age 16)	SD (index)	<b>-0.14 (.02)</b>	<b>-0.14 (.02)</b>	<b>-0.15 (.02)</b>
Emotional health (age 16)	SD (index)	-0.01 (.01)	-0.01 (.01)	-0.01 (.01)
Family characteristics	SD (index)	<b>-0.23 (.05)</b>	<b>-0.23 (.05)</b>	<b>-0.27 (.04)</b>
Female	1,0	<b>-0.77 (.03)</b>	<b>-0.77 (.03)</b>	<b>-0.77 (.03)</b>
Ethnicity: white	1,0	-0.06 (.12)	-0.06 (.12)	-0.06 (.12)
Observations		10,250	10,250	10,250
R <sup>2</sup>		0.098	0.097	0.093

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table 10.1 Child's emotional wellbeing (standardised) at 16 [ALSPAC]**

<b>Child Age 16</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.07 (.02)</b>	<b>0.12 (.04)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	-0.02 (.02)	-0.04 (.04)
Proportion of time mother worked thereafter	Fraction of waves	-0.01 (.02)	-0.03 (.06)
Father's unemployment	Fraction of waves	-0.04 (.03)	-0.29 (.18)
Mother's mental health	SD (index)	<b>0.16 (.02)</b>	<b>0.16 (.02)</b>
Father's mental health	SD (index)	<b>0.04 (.02)</b>	<b>0.04 (.02)</b>
Involvement	SD (index)	<b>0.04 (.02)</b>	<b>0.04 (.02)</b>
Aggression	SD (index)	<b>-0.03 (.02)</b>	<b>-0.03 (.02)</b>
Family conflict	SD (index)	<b>-0.04 (.02)</b>	<b>-0.04 (.02)</b>
Parental separation	1,0	0.00 (.02)	0.01 (.04)
Parents' education	0-1	-0.00 (.02)	-0.00 (.02)
Mother's age at birth	Years	-0.02 (.02)	-0.00 (.00)
Parents' marital status at birth	1,0	-0.02 (.02)	-0.03 (.04)
Female child	1,0	<b>-0.16 (.02)</b>	<b>-0.32 (.03)</b>
Ethnicity: white	1,0	-0.02 (.02)	-0.11 (.11)
First born child	1,0	-0.01 (.02)	-0.01 (.03)
Number of siblings	Number	0.02 (.02)	0.02 (.02)
Low birth weight	1,0	0.03 (.02)	0.12 (.08)
Premature baby	1,0	-0.01 (.02)	-0.02 (.08)
Primary school fixed effects	SD (index)	<b>0.26 (.01)</b>	<b>0.26 (.01)</b>
Secondary school fixed effects	SD (index)	<b>0.28 (.01)</b>	<b>0.28 (.01)</b>
Observations		6032	6032
R <sup>2</sup>		0.160	0.160

Notes: Robust standard errors in parentheses. Emotional wellbeing: standardised self- and mother-reported SMFQ at age 16. Bold:  $p < 0.10$  (2-tailed).

**Full Table 10.1 (cont). Child's emotional wellbeing (standardised) at 11  
[ALSPAC]**

<b>Child Age 11</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.04 (.02)</b>	<b>0.06 (.03)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	<b>-0.03 (.01)</b>	<b>-0.09 (.04)</b>
Proportion of time mother worked thereafter	Fraction of waves	-0.01 (.01)	-0.02 (.04)
Father's unemployment	Fraction of waves	<b>-0.04 (.02)</b>	<b>-0.23 (.12)</b>
Mother's mental health	SD (index)	<b>0.18 (.02)</b>	<b>0.18 (.02)</b>
Father's mental health	SD (index)	<b>0.04 (.02)</b>	<b>0.04 (.01)</b>
Involvement	SD (index)	0.02 (.01)	0.02 (.01)
Aggression	SD (index)	<b>-0.04 (.01)</b>	<b>-0.04 (.01)</b>
Family conflict	SD (index)	<b>-0.04 (.01)</b>	<b>-0.04 (.01)</b>
Parental separation	1,0	-0.01 (.01)	-0.03 (.03)
Parents' education	0-1	-0.00 (.01)	-0.00 (.03)
Mother's age at birth	Years	0.01 (.02)	0.00 (.00)
Parents' marital status at birth	1,0	<b>0.04 (.02)</b>	<b>0.09 (.04)</b>
Female child	1,0	<b>-0.05 (.01)</b>	<b>-0.11 (.02)</b>
Ethnicity: white	1,0	0.00 (.02)	0.01 (.11)
First born child	1,0	-0.02 (.01)	-0.04 (.03)
Number of siblings	Number	-0.02 (.02)	-0.01 (.01)
Low birth weight	1,0	<b>-0.02 (.02)</b>	<b>-0.08 (.07)</b>
Premature baby	1,0	<b>0.03 (.02)</b>	<b>0.10 (.06)</b>
Primary school fixed effects	SD (index)	<b>0.25 (.01)</b>	<b>0.25 (.01)</b>
Observations		7572	7572
R <sup>2</sup>		0.164	0.164

Notes: Robust standard errors in parentheses. Emotional wellbeing: standardised self- and mother-reported SMFQ at age 11. Bold: p<10 (2-tailed).

**Full Table 10.1 (cont). Child's emotional wellbeing (standardised) at 5  
[ALSPAC]**

<b>Child Age 5</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.10 (.01)</b>	<b>0.16 (.02)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	-0.01 (.01)	-0.04 (.03)
Proportion of time mother worked thereafter	Fraction of waves	<b>0.03 (.01)</b>	<b>0.07 (.03)</b>
Father's unemployment	Fraction of waves	-0.01 (.01)	-0.03 (.07)
Mother's mental health	SD (index)	<b>0.22 (.01)</b>	<b>0.22 (.01)</b>
Father's mental health	SD (index)	<b>0.05 (.01)</b>	<b>0.05 (.01)</b>
Involvement	SD (index)	<b>0.09 (.01)</b>	<b>0.09 (.01)</b>
Aggression	SD (index)	<b>-0.05 (.01)</b>	<b>-0.05 (.01)</b>
Family conflict	SD (index)	-0.02 (.01)	-0.02 (.01)
Parental separation	1,0	0.01 (.01)	0.04 (.03)
Parents' education	0-1	0.01 (.01)	0.03 (.03)
Mother's age at birth	Years	0.00 (.01)	0.00 (.00)
Parents' marital status at birth	1,0	-0.01 (.01)	-0.03 (.03)
Female child	1,0	<b>0.03 (.01)</b>	<b>0.05 (.02)</b>
Ethnicity: white	1,0	0.00 (.01)	0.02 (.08)
First born child	1,0	<b>-0.09 (.01)</b>	<b>-0.18 (.03)</b>
Number of siblings	Number	-0.02 (.01)	-0.02 (.01)
Low birth weight	1,0	-0.00 (.01)	-0.00 (.06)
Premature baby	1,0	0.01 (.02)	0.03 (.05)
Primary school fixed effects	SD (index)	<b>0.23 (.01)</b>	<b>0.23 (.01)</b>
Observations		8989	8989
R <sup>2</sup>		0.092	0.092

Notes: Robust standard errors in parentheses. Emotional wellbeing: standardised mother-reported SDQ internalising at age 5. Bold: p<10 (2-tailed).

**Full Table 10.2 (cont). Child's behaviour (standardised) at 16 [ALSPAC]**

<b>Child Age 16</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.08 (.02)</b>	<b>0.13 (.04)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	-0.01 (.02)	-0.01 (.05)
Proportion of time mother worked thereafter	Fraction of waves	<b>-0.05 (.02)</b>	<b>-0.14 (.06)</b>
Father's unemployment	Fraction of waves	-0.00 (.02)	-0.01 (.16)
Mother's mental health	SD (index)	<b>0.17 (.02)</b>	<b>0.17 (.02)</b>
Father's mental health	SD (index)	-0.00 (.02)	-0.01 (.02)
Involvement	SD (index)	<b>0.05 (.02)</b>	<b>0.05 (.02)</b>
Aggression	SD (index)	<b>-0.12 (.02)</b>	<b>-0.12 (.02)</b>
Family conflict	SD (index)	<b>-0.14 (.02)</b>	<b>-0.14 (.02)</b>
Parental separation	1,0	0.00 (.02)	0.00 (.04)
Parents' education	0-1	<b>0.04 (.02)</b>	<b>0.09 (.04)</b>
Mother's age at birth	Years	-0.01 (.02)	-0.00 (.00)
Parents' marital status at birth	1,0	<b>0.04 (.02)</b>	<b>0.09 (.05)</b>
Female child	1,0	<b>0.07 (.02)</b>	<b>0.14 (.03)</b>
Ethnicity: white	1,0	-0.02 (.02)	-0.10 (.12)
First born child	1,0	-0.01 (.02)	-0.03 (.04)
Number of siblings	Number	-0.01 (.02)	-0.01 (.02)
Low birth weight	1,0	<b>0.05 (.02)</b>	<b>0.20 (.10)</b>
Premature baby	1,0	0.02 (.03)	0.05 (.09)
Primary school fixed effects	SD (index)	<b>0.32 (.01)</b>	<b>0.32 (.01)</b>
Secondary school fixed effects	SD (index)	<b>0.31 (.01)</b>	<b>0.31 (.01)</b>
Observations		5,222	5,222
R <sup>2</sup>		0.209	0.209

Notes: Robust standard errors in parentheses. Behaviour: standardised mother-reported SDQ externalising at ages 16, 11 and 5. Bold: p<10 (2-tailed).

**Full Table 10.2 (cont). Child's behaviour (standardised) at 11 [ALSPAC]**

<b>Child Age 11</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.06 (.02)</b>	<b>0.10 (.03)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	0.01 (.02)	0.03 (.04)
Proportion of time mother worked thereafter	Fraction of waves	<b>-0.04 (.02)</b>	<b>-0.11 (.04)</b>
Father's unemployment	Fraction of waves	0.00 (.02)	0.02 (.12)
Mother's mental health	SD (index)	<b>0.17 (.02)</b>	<b>0.17 (.02)</b>
Father's mental health	SD (index)	0.01 (.02)	0.01 (.02)
Involvement	SD (index)	<b>0.10 (.02)</b>	<b>0.10 (.02)</b>
Aggression	SD (index)	<b>-0.15 (.01)</b>	<b>-0.15 (.01)</b>
Family conflict	SD (index)	<b>-0.10 (.02)</b>	<b>-0.10 (.02)</b>
Parental separation	1,0	-0.01 (.02)	-0.02 (.04)
Parents' education	0-1	<b>0.06 (.01)</b>	<b>0.15 (.03)</b>
Mother's age at birth	Years	0.02 (.02)	0.00 (.04)
Parents' marital status at birth	1,0	0.02 (.02)	0.04 (.04)
Female child	1,0	<b>0.15 (.01)</b>	<b>0.31 (.02)</b>
Ethnicity: white	1,0	0.01 (.02)	0.07 (.10)
First born child	1,0	-0.02 (.02)	-0.04 (.03)
Number of siblings	Number	<b>-0.06 (.02)</b>	<b>-0.06 (.02)</b>
Low birth weight	1,0	0.02 (.02)	0.10 (.07)
Premature baby	1,0	-0.02 (.02)	-0.08 (.07)
Primary school fixed effects	SD (index)	<b>0.26 (.01)</b>	<b>0.26 (.01)</b>
Observations		6677	6677
R <sup>2</sup>		0.200	0.200

Notes: Robust standard errors in parentheses. Behaviour: standardised mother-reported SDQ externalising at ages 16, 11 and 5. Bold: p<10 (2-tailed).

**Full Table 10.3. Child's behaviour (standardised) at 5 [ALSPAC]**

<b>Child Age 5</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	0.02 (.01)	<b>0.03 (.02)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	-0.00 (.01)	0.00 (.03)
Proportion of time mother worked thereafter	Fraction of waves	0.01 (.01)	0.01 (.03)
Father's unemployment	Fraction of waves	-0.01 (.01)	-0.04 (.06)
Mother's mental health	SD (index)	<b>0.18 (.01)</b>	<b>0.18 (.01)</b>
Father's mental health	SD (index)	<b>0.02 (.01)</b>	<b>0.02 (.01)</b>
Involvement	SD (index)	<b>0.12 (.01)</b>	<b>0.12 (.01)</b>
Aggression	SD (index)	<b>-0.20 (.01)</b>	<b>-0.20 (.01)</b>
Family conflict	SD (index)	<b>-0.04 (.01)</b>	<b>-0.04 (.01)</b>
Parental separation	1,0	<b>-0.02 (.01)</b>	<b>-0.06 (.03)</b>
Parents' education	0-1	<b>0.08 (.01)</b>	<b>0.20 (.03)</b>
Mother's age at birth	Years	<b>0.06 (.01)</b>	<b>0.01 (.00)</b>
Parents' marital status at birth	1,0	<b>0.03 (.01)</b>	<b>0.07 (.03)</b>
Female child	1,0	<b>0.09 (.01)</b>	<b>0.19 (.02)</b>
Ethnicity: white	1,0	-0.01 (.01)	-0.03 (.08)
First born child	1,0	<b>0.03 (.01)</b>	0.07 (.02)
Number of siblings	Number	0.01 (.01)	0.01 (.01)
Low birth weight	1,0	-0.01 (.01)	-0.06 (.06)
Premature baby	1,0	-0.01 (.02)	-0.04 (.05)
Primary school fixed effects	SD (index)	<b>0.22 (.01)</b>	<b>0.22 (.01)</b>
Observations		8989	8989
R <sup>2</sup>		0.168	0.168

Notes: Robust standard errors in parentheses. Behaviour: standardised mother-reported SDQ externalising at ages 16, 11 and 5. Bold: p<10 (2-tailed).

**Full Table 10.3 (cont). Child's intellectual performance (standardised) at 16**  
**[ALSPAC]**

<b>Child Age 16</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.14 (.01)</b>	<b>0.24 (.02)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	<b>-0.02 (.01)</b>	<b>-0.06 (.02)</b>
Proportion of time mother worked thereafter	Fraction of waves	<b>0.04 (.01)</b>	<b>0.11 (.03)</b>
Father's unemployment	Fraction of waves	<b>-0.03 (.01)</b>	<b>-0.23 (.06)</b>
Mother's mental health	SD (index)	<b>0.03 (.01)</b>	<b>0.03 (.01)</b>
Father's mental health	SD (index)	-0.00 (.01)	-0.00 (.01)
Involvement	SD (index)	<b>0.02 (.01)</b>	<b>0.02 (.01)</b>
Aggression	SD (index)	-0.01 (.01)	-0.01 (.01)
Family conflict	SD (index)	-0.01 (.01)	-0.01 (.01)
Parental separation	1,0	<b>-0.03 (.01)</b>	<b>-0.07 (.02)</b>
Parents' education	0-1	<b>0.17 (.01)</b>	<b>0.41 (.02)</b>
Mother's age at birth	Years	<b>0.08 (.01)</b>	<b>0.02 (.00)</b>
Parents' marital status at birth	1,0	<b>0.07 (.01)</b>	<b>0.15 (.02)</b>
Female child	1,0	<b>0.11 (.01)</b>	<b>0.22 (.02)</b>
Ethnicity: white	1,0	<b>-0.02 (.01)</b>	<b>-0.12 (.05)</b>
First born child	1,0	<b>0.09 (.01)</b>	<b>0.18 (.02)</b>
Number of siblings	Number	<b>-0.03 (.01)</b>	<b>-0.03 (.01)</b>
Low birth weight	1,0	<b>-0.02 (.01)</b>	<b>-0.07 (.04)</b>
Premature baby	1,0	0.01 (.01)	0.04 (.04)
Primary school fixed effects	SD (index)	<b>0.21 (.01)</b>	<b>0.21 (.01)</b>
Secondary school fixed effects	SD (index)	<b>0.38 (.01)</b>	<b>0.38 (.01)</b>
Observations		12,030	12,030
R <sup>2</sup>		0.410	0.410

Notes: Robust standard errors in parentheses. Intellectual: standardised GCSE points at age 16. Bold: p<10 (2-tailed).

**Full Table 10.3 (cont). Child's intellectual performance (standardised) at 11  
[ALSPAC]**

<b>Child Age 11</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.14 (.01)</b>	<b>0.24 (.02)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	<b>-0.03 (.01)</b>	<b>-0.05 (.03)</b>
Proportion of time mother worked thereafter	Fraction of waves	<b>0.03 (.01)</b>	<b>0.08 (.03)</b>
Father's unemployment	Fraction of waves	<b>-0.02 (.01)</b>	<b>-0.15 (.06)</b>
Mother's mental health	SD (index)	<b>0.03 (.01)</b>	<b>0.03 (.01)</b>
Father's mental health	SD (index)	-0.01 (.01)	-0.01 (.01)
Involvement	SD (index)	<b>0.02 (.01)</b>	<b>0.02 (.01)</b>
Aggression	SD (index)	<b>-0.03 (.01)</b>	<b>-0.03 (.01)</b>
Family conflict	SD (index)	0.01 (.01)	0.01 (.01)
Parental separation	1,0	-0.01 (.01)	-0.03 (.02)
Parents' education	0-1	<b>0.21 (.01)</b>	<b>0.51 (.02)</b>
Mother's age at birth	Years	<b>0.08 (.01)</b>	<b>0.02 (.00)</b>
Parents' marital status at birth	1,0	<b>0.03 (.01)</b>	<b>0.07 (.02)</b>
Female child	1,0	<b>0.04 (.01)</b>	<b>0.08 (.02)</b>
Ethnicity: white	1,0	-0.01 (.01)	-0.06 (.06)
First born child	1,0	<b>0.08 (.01)</b>	<b>0.16 (.02)</b>
Number of siblings	Number	<b>-0.03 (.01)</b>	<b>-0.03 (.01)</b>
Low birth weight	1,0	<b>-0.03 (.01)</b>	<b>-0.15 (.05)</b>
Premature baby	1,0	-0.01 (.01)	-0.02 (.04)
Primary school fixed effects	SD (index)	<b>0.34 (.01)</b>	<b>0.34 (.01)</b>
Observations		12,395	12,395
R <sup>2</sup>		0.290	0.290

Notes: Robust standard errors in parentheses. Intellectual: standardised Key stage 2 points at age 11.

Bold: p<10 (2-tailed).

**Full Table 10.3 (cont). Child's intellectual performance (standardised) at 5  
[ALSPAC]**

<b>Child Age 5</b>	Units	RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.21 (.02)</b>	<b>0.13 (.01)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	-0.00 (.03)	-0.01 (.01)
Proportion of time mother worked thereafter	Fraction of waves	<b>0.08 (.03)</b>	<b>0.04 (.01)</b>
Father's unemployment	Fraction of waves	-0.01 (.05)	-0.00 (0.01)
Mother's mental health	SD (index)	<b>0.07 (.01)</b>	<b>0.04 (.01)</b>
Father's mental health	SD (index)	<b>0.00 (.03)</b>	0.00 (.01)
Involvement	SD (index)	<b>0.07 (.01)</b>	<b>0.07 (.01)</b>
Aggression	SD (index)	0.00 (.01)	0.00 (.00)
Family conflict	SD (index)	0.01 (.01)	0.01 (.01)
Parental separation	1,0	-0.02 (.03)	-0.01 (.01)
Parents' education	0-1	<b>0.39 (.03)</b>	<b>0.16 (.01)</b>
Mother's age at birth	Years	<b>0.02 (.00)</b>	<b>0.08 (.01)</b>
Parents' marital status at birth	1,0	<b>0.07 (.02)</b>	<b>0.04 (.01)</b>
Female child	1,0	<b>0.31 (.02)</b>	<b>0.15 (.01)</b>
Ethnicity: white	1,0	<b>0.21 (.07)</b>	<b>0.04 (.01)</b>
First born child	1,0	<b>0.11 (.02)</b>	<b>0.06 (.01)</b>
Number of siblings	Number	<b>-0.05 (.01)</b>	<b>-0.06 (.01)</b>
Low birth weight	1,0	<b>-0.24 (.05)</b>	<b>-0.05 (.01)</b>
Premature baby	1,0	-0.01 (.05)	-0.00 (.01)
Primary school fixed effects	SD (index)	<b>0.34 (.01)</b>	<b>0.34 (.01)</b>
Observations		9836	9836
R <sup>2</sup>		0.251	0.251

Notes: Robust standard errors in parentheses. Standardised local school entry assessments at age 5.

Bold: p<10 (2-tailed).

**Full Tables 11.1 – 11.3, 12.1 – 12.3, 13.1 – 13.3**

**See Full Tables 10.1-10.3**

**Full Table 14.1. How child outcomes (standardised) are affected at 16 by secondary school attended [ALSPAC] [ $\beta$ -coefficients]**

	Emotional	Behavioural	Intellectual
Secondary school	<b>0.26 (.01)</b>	<b>0.21 (.01)</b>	<b>0.29 (.01)</b>
Family	<b>0.20 (.01)</b>	<b>0.14 (.01)</b>	<b>0.24 (.01)</b>
Lagged dependent variable (at age 11)	<b>0.30 (.02)</b>	<b>0.57 (.02)</b>	<b>0.52 (.01)</b>
Observations	6032	5222	12030
R <sup>2</sup>	0.19	0.37	0.60

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table 14.2. How child outcomes (standardised) at 16 are affected by secondary school measured characteristics?  
[ALSPAC] [ $\beta$ -coefficients]**

	Emotional	Behavioural	Intellectual
School size	-0.02 (.02)	-0.02 (.02)	<b>0.03(.01)</b>
Class size	0.00 (.02)	-0.00 (.02)	0.01 (.01)
% Free school meals	0.01 (.02)	-0.03 (.03)	<b>-0.03 (.01)</b>
% English not first language	0.01 (.02)	<b>0.04 (.02)</b>	0.01 (.01)
Family	<b>0.21 (.01)</b>	<b>0.15 (.01)</b>	<b>0.27 (.01)</b>
Lagged dependent variable (at age 11)	<b>0.30 (.02)</b>	<b>0.57 (.02)</b>	<b>0.53 (.01)</b>
Observations	6032	5222	12030
R <sup>2</sup>	0.14	0.34	0.55

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table 14.3. How child outcomes (standardised) are affected by primary school attended  
[ALSPAC] [ $\beta$ -coefficients]**

	Emotional	Behavioural	Intellectual
<b>At age 11</b>			
Primary school	<b>0.24 (.01)</b>	<b>0.19 (.01)</b>	<b>0.27 (.01)</b>
Family	<b>0.30 (.01)</b>	<b>0.20 (.01)</b>	<b>0.34 (.01)</b>
Lagged dependent variable (at age 7)	<b>0.21 (.01)</b>	<b>0.61 (.01)</b>	<b>0.46 (.01)</b>
Observations	7572	6677	12395
R <sup>2</sup>	0.21	0.46	0.39
<b>At age 8</b>			
Primary school	<b>0.19 (.01)</b>	<b>0.20 (.01)</b>	<b>0.30 (.01)</b>
Family	<b>0.28 (.01)</b>	<b>0.25 (.01)</b>	<b>0.25 (.01)</b>
Lagged dependent variable (at age 5)	<b>0.35 (.01)</b>	<b>0.48 (.12)</b>	<b>0.40 (.01)</b>
Observations	7226	7225	5333
R <sup>2</sup>	0.28	0.41	0.30

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table 14.4. How child outcomes (standardised) are affected by primary school measured characteristics?  
[ALSPAC] [ $\beta$ -coefficients]**

<b>Outcomes at age 11</b>	Emotional	Behavioural	Intellectual
School size	<b>-0.06 (.02)</b>	<b>0.06 (.02)</b>	<b>-0.14 (.01)</b>
Class size	<b>0.04 (.02)</b>	-0.01 (.02)	<b>0.05 (.01)</b>
% Free school meal	-0.02 (.03)	<b>0.12 (.03)</b>	<b>-0.11 (.01)</b>
% English not first language	0.04 (.03)	0.02 (.02)	-0.02 (.01)
% SEN statemented	<b>0.09 (.02)</b>	0.03 (.02)	<b>-0.05 (.02)</b>
% Home concerns	0.00 (.02)	<b>0.03 (.02)</b>	-0.02 (.01)
Teacher dummies	<b>0.31 (.03)</b>	<b>0.29 (.03)</b>	<b>0.33 (.01)</b>
Lagged dependent variable at age (7)	<b>0.21 (.01)</b>	<b>0.62 (.01)</b>	<b>0.46 (.01)</b>
Observations	7572	6677	12395
R <sup>2</sup>	0.19	0.45	0.38

<b>Outcomes at age 8</b>	Emotional	Behavioural	Intellectual
School size	<b>-0.03 (.02)</b>	0.01 (.01)	0.01 (.02)
Class size	<b>0.04 (.02)</b>	-0.02 (.02)	<b>0.04 (.02)</b>
% Free school meal	0.01 (.02)	-0.02 (.02)	-0.01 (.02)
% English not first language	<b>-0.05 (.02)</b>	<b>-0.03 (.02)</b>	0.01 (.02)
% SEN statemented	<b>0.05 (.01)</b>	<b>-0.06 (.01)</b>	-0.03 (.02)
% Home concerns	<b>-0.06 (.02)</b>	0.01 (.01)	<b>0.05 (.02)</b>
Teacher dummies	<b>0.38 (.01)</b>	<b>0.34 (.01)</b>	<b>0.43 (.01)</b>
Lagged dependent variable at age (5)	<b>0.36 (.01)</b>	<b>0.50 (.01)</b>	<b>0.39 (.01)</b>
Observations	7226	7225	5333
R <sup>2</sup>	0.30	0.42	0.33

Notes: Robust standard errors in parentheses. Bold:  $p < 10$  (2-tailed).

**Full Table 16.1. What explains the variation of life-satisfaction and of misery among adults [BHPS] [Cross-section] [Standardised coefficients]**

	Britain	
	Life Satisfaction	Misery
Log own income	<b>0.09</b> <b>(.01)</b>	<b>-0.07</b> <b>(.01)</b>
Years of education	<b>0.02</b> <b>(.00)</b>	<b>-0.01</b> <b>(.00)</b>
Self-employed	<b>0.01</b> <b>(.00)</b>	0.00 (.00)
Employed part time	0.00 (.00)	0.00 (.00)
Unemployed	<b>-0.05</b> <b>(.00)</b>	<b>0.07</b> <b>(.00)</b>
Not in labour force	<b>-0.07</b> <b>(.01)</b>	<b>0.11</b> <b>(.01)</b>
Partnered	<b>0.11</b> <b>(.00)</b>	<b>-0.08</b> <b>(.01)</b>
Separated	<b>-0.02</b> <b>(.00)</b>	<b>0.02</b> <b>(.01)</b>
Widowed	0.01 (.01)	<b>-0.02</b> <b>(.01)</b>
Parent	0.01 (.00)	<b>-0.02</b> <b>(.00)</b>
Physical health	<b>0.10</b> <b>(0.00)</b>	<b>-0.09</b> <b>(.01)</b>
Emotional health (lagged)	<b>0.32</b> <b>(0.00)</b>	<b>-0.26</b> <b>(.00)</b>
Female	<b>0.05</b> <b>(.00)</b>	<b>-0.04</b> <b>(.01)</b>
Age	<b>-0.86</b> <b>(.06)</b>	<b>0.70</b> <b>(.06)</b>
Age <sup>2</sup>	<b>1.06</b> <b>(.07)</b>	<b>-0.86</b> <b>(.07)</b>
Comparator income	<b>-0.08</b> <b>(.00)</b>	0.05 (.03)
Comparator education	<b>-0.05</b> <b>(.01)</b>	<b>0.03</b> <b>(.01)</b>
Comparator unemployment	<b>-0.02</b> <b>(.01)</b>	<b>0.02</b> <b>(.01)</b>
Comparator partnership	<b>0.04</b> <b>(.01)</b>	<b>-0.04</b> <b>(.01)</b>
Observations	139,507	139,507
R <sup>2</sup>	0.191	0.139

**Full Table 16.2. How adult life satisfaction (0-10) is affected by current circumstances [BHPS] [Cross-section] [Unstandardised coefficients]**

	Britain Cross-section
Log own income	<b>0.17</b> <b>(.01)</b>
Years of education	<b>0.02</b> <b>(.00)</b>
Self-employed	<b>0.05</b> <b>(.03)</b>
Employed part time	0.03 (.02)
Unemployed	<b>-0.68</b> <b>(.04)</b>
Not in labour force	<b>-0.33</b> <b>(.03)</b>
Partnered	<b>0.59</b> <b>(.03)</b>
Separated	<b>-0.15</b> <b>(.04)</b>
Widowed	0.11 (.08)
Parent	0.03 (.02)
Physical health	<b>0.22</b> <b>(0.01)</b>
Emotional health (lagged)	<b>0.76</b> <b>(0.01)</b>
Female	<b>0.26</b> <b>(.02)</b>
Age	<b>-0.12</b> <b>(.01)</b>
Age <sup>2</sup>	<b>1.42</b> <b>(.10)</b>
Comparator income	<b>-0.18</b> <b>(.07)</b>
Comparator education	<b>-0.13</b> <b>(.02)</b>
Comparator unemployment	<b>-2.00</b> <b>(.76)</b>
Comparator partnership	<b>0.68</b> <b>(.12)</b>
Observations	139,507
R <sup>2</sup>	0.191

Notes: Robust standard errors in parentheses. Age 25+

**Full Table 16.3. How adult life satisfaction (0-10) and behaviour are predicted by child outcomes at 16 [British Cohort Study] [Cross-section] [Unstandardised coefficients]**

	Life satisfaction (0-10)	Number of arrests before 34
Qualifications	<b>0.12 (.02)</b>	<b>-0.24 (.02)</b>
Behaviour (16)	<b>0.06 (.02)</b>	<b>-0.07 (.02)</b>
Emotional health (16)	<b>0.18 (.02)</b>	-0.01 (.01)
Family income	0.05 (.04)	0.02 (.05)
Parents' education	0.00 (.01)	-0.00 (.01)
Father's unemployment	<b>-0.31 (.01)</b>	<b>0.46 (.18)</b>
Mother's employment	-0.02 (.05)	-0.01 (.05)
Parental involvement	<b>0.06 (.02)</b>	-0.04 (.02)
Family break-up	<b>-0.11 (.05)</b>	<b>0.11 (.06)</b>
Mother's mental health	<b>0.07 (.02)</b>	0.02 (.02)
Number of siblings	0.01 (.02)	<b>0.09 (.02)</b>
Post-marital conception	0.08 (.06)	<b>0.21 (.08)</b>
Female	<b>0.15 (.03)</b>	<b>0.72 (.03)</b>
Ethnicity: white	<b>0.39 (.14)</b>	0.05 (.14)
Low birth weight	-0.06 (.08)	<b>0.18 (.07)</b>
Observations	17,812	8869
R <sup>2</sup>	0.035	0.097

# **APPENDIX 3**

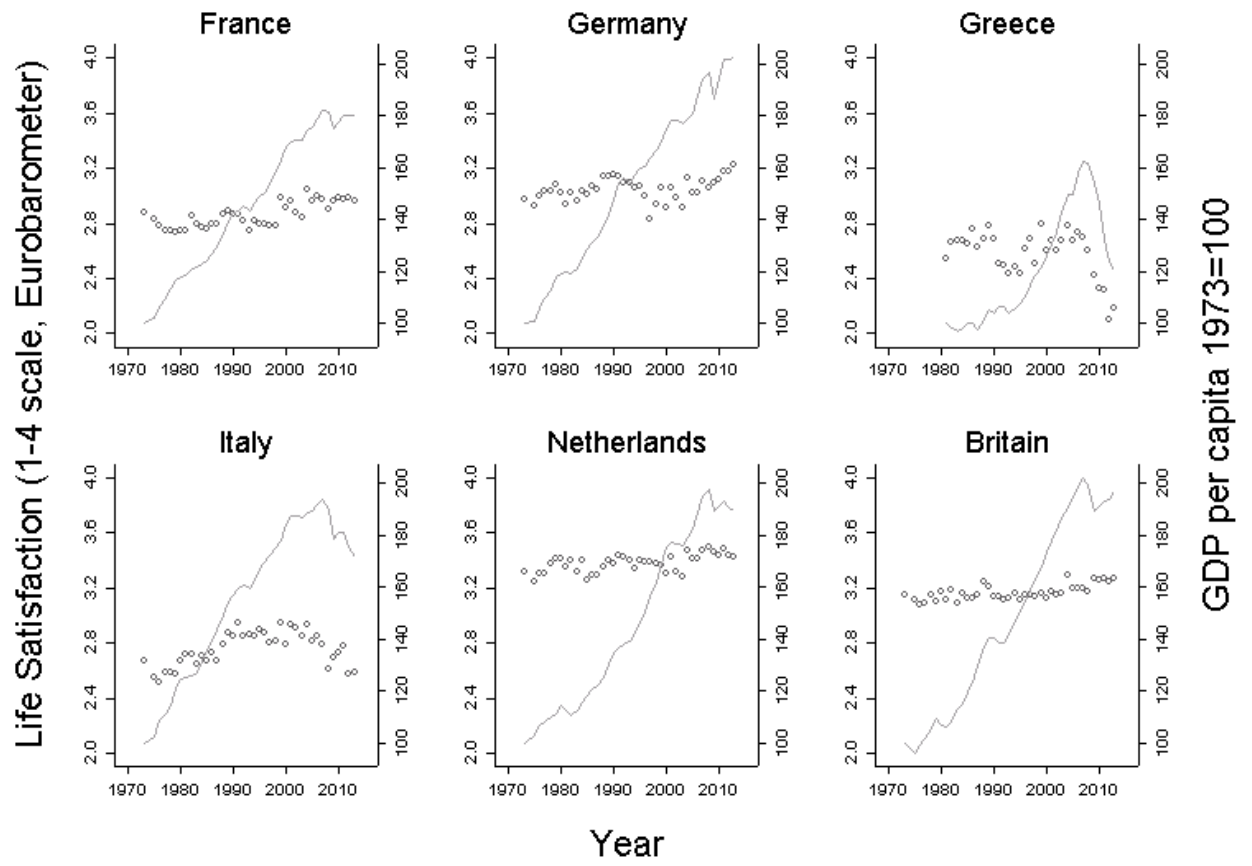
## **ADDITIONAL TABLES AND FIGURES**

**Additional Table A2.1. How adult life-satisfaction (0-10) is affected by log income: 30-45 year olds [Household panel data]**

	Cross-section	Panel
Britain	<b>0.24 (.02)</b>	<b>0.08 (.02)</b>
Germany	<b>0.37 (.02)</b>	<b>0.19 (.03)</b>
Australia	<b>0.18 (.02)</b>	<b>0.09 (.02)</b>

Notes: Robust standard errors in parentheses. Controls for years of education, employment status, partnered, having children, physical and emotional health, comparison income, education, unemployment and partnership, age, age-squared, gender, year and region fixed effects. Bold:  $p < .10$  (2-tailed).

**Additional Figure A2.1. Income and wellbeing over time: Eurobarometer**



**Additional Table A2.2. How adult life-satisfaction (0-10) is affected by comparators' income, education, unemployment and partnership**  
**[Household panel data] [Pooled cross-section]**

	Britain		Germany		Australia	
Log own income	<b>0.16</b> (.01)	<b>0.22</b> (.06)	<b>0.26</b> (.01)	<b>0.68</b> (.33)	<b>0.16</b> (.01)	<b>-0.87</b> (.16)
Years of education	<b>0.03</b> (.00)	<b>-0.15</b> (.07)	<b>0.05</b> (.00)	0.07 (.05)	<b>-0.01</b> (.00)	<b>-0.13</b> (.05)
Self-employed	<b>0.06</b> (.03)	<b>0.06</b> (.03)	<b>-0.08</b> (.03)	<b>-0.08</b> (.03)	0.01 (.03)	0.00 (.03)
Employed part time	0.03 (.02)	<b>0.02</b> (.02)	<b>-0.03</b> (.02)	-0.03 (.02)	<b>0.08</b> (.02)	<b>0.07</b> (.02)
Unemployed	<b>-0.70</b> (.04)	<b>-0.73</b> (.09)	<b>-0.99</b> (.03)	<b>-0.93</b> (.07)	<b>-0.31</b> (.03)	<b>-0.48</b> (.11)
Not in labour force	<b>-0.29</b> (.02)	<b>-0.29</b> (.02)	<b>-0.10</b> (.02)	<b>-0.10</b> (.02)	<b>-0.04</b> (.02)	<b>-0.05</b> (.02)
Partnered	<b>0.57</b> (.02)	<b>0.45</b> (.05)	<b>0.32</b> (.02)	<b>0.27</b> (.05)	<b>0.40</b> (.02)	<b>0.17</b> (.05)
Separated	<b>-0.18</b> (.04)	<b>-0.16</b> (.04)	0.02 (.03)	0.03 (.03)	<b>-0.21</b> (.04)	<b>-0.16</b> (.05)
Widowed	0.07 (.08)	0.10 (.08)	0.06 (.07)	0.07 (.07)	0.12 (.04)	0.16 (.05)
Parent	<b>0.03</b> (.02)	<b>0.03</b> (.02)	<b>0.16</b> (.02)	<b>0.16</b> (.02)	0.03 (.02)	0.02 (.02)
Physical health	<b>0.21</b> (0.01)	<b>0.21</b> (0.01)	<b>0.21</b> (0.01)	<b>0.21</b> (0.01)	<b>0.17</b> (0.01)	<b>0.17</b> (0.01)
Emotional health (lagged)	<b>0.77</b> (0.01)	<b>0.77</b> (0.01)	<b>0.47</b> (0.01)	<b>0.47</b> (0.01)	<b>0.10</b> (0.01)	<b>0.10</b> (0.01)
Female	<b>0.24</b> (.02)	<b>0.24</b> (.02)	<b>0.18</b> (0.02)	<b>0.18</b> (.02)	<b>0.11</b> (.02)	<b>0.12</b> (.02)
Age	<b>-0.12</b> (.01)	<b>-0.12</b> (.01)	<b>-0.07</b> (.01)	<b>-0.07</b> (.01)	<b>-0.12</b> (.01)	<b>-0.11</b> (.01)
Age <sup>2</sup>	<b>1.40</b> (.08)	<b>1.35</b> (.08)	<b>0.81</b> (.08)	<b>0.81</b> (.08)	<b>1.39</b> (.07)	<b>1.31</b> (.07)
Comparator income	<b>-0.15</b> (.07)	-0.12 (.08)	<b>-0.34</b> (.05)	0.08 (.33)	<b>-0.13</b> (.06)	<b>-1.10</b> (.17)
Comparator education	<b>-0.09</b> (.02)	<b>-0.26</b> (.07)	<b>-0.05</b> (.01)	<b>-0.02</b> (.05)	<b>-0.03</b> (.01)	<b>-0.14</b> (.05)
Comparator unemployment	<b>-1.33</b> (.56)	<b>-1.38</b> (.56)	<b>-1.64</b> (.36)	<b>-1.58</b> (.36)	-0.38 (.42)	-0.37 (.42)
Comparator partnership	<b>0.38</b> (.06)	<b>0.23</b> (.09)	<b>-0.09</b> (.05)	<b>-0.12</b> (.06)	<b>0.20</b> (.06)	-0.10 (.09)
Own income*Comparator income		-0.01 (.01)		-0.06 (.04)		<b>0.13</b> (.02)
Own income*Comparator education		<b>0.01</b> (.01)		-0.00 (.00)		<b>0.01</b> (.00)
Own unemployment*Comparator unemployment		0.38 (1.36)		-0.67 (.75)		2.85 (1.74)
Own partnership*Comparator partnership		<b>0.19</b> (.08)		0.08 (.08)		<b>0.40</b> (.09)
Observations	155,333	155,333	140,821	402,948	118,979	118,979
R <sup>2</sup>	0.183	0.183	0.226	0.099	0.080	0.082

Notes: Robust standard errors in parentheses. Bold: p<.10 (2-tailed).

**Additional Table A2.3. How log income is determined**  
**[British Cohort Study] [Unstandardised coefficients] [Pooled cross-section]**

	Units	Log income		
Qualifications	SD (index)			<b>0.17 (.01)</b>
Intellectual performance (16)	1,0	<b>0.30 (.02)</b>		<b>0.14 (.02)</b>
Behaviour (16)	SD (index)	0.01 (.01)		0.01 (.01)
Emotional health (16)	SD (index)	<b>0.02 (.01)</b>		<b>0.02 (.01)</b>
Family income	Ln	<b>0.12 (.02)</b>	<b>0.14 (.02)</b>	<b>0.09 (.02)</b>
Parents' education	Age	<b>0.04 (.00)</b>	<b>0.05 (.00)</b>	<b>0.03 (.01)</b>
Father's unemployment	Fraction of waves	<b>-0.08 (.04)</b>	<b>-0.10(.04)</b>	-0.05 (.04)
Mother's employment	Fraction of waves	0.01 (.02)	-0.00 (.02)	0.02 (.02)
Parental involvement	SD (index)	0.01 (.01)	0.01 (.01)	0.00 (.01)
Family break-up	1,0	-0.00 (.02)	-0.02 (.02)	-0.00 (.02)
Mother's mental health	SD (index)	0.01 (.01)	<b>0.01 (.01)</b>	0.00 (.01)
Number of siblings	Number	-0.01 (.01)	<b>-0.01 (.01)</b>	-0.00 (.01)
Post-marital conception	1,0	-0.00 (.02)	0.01 (.02)	-0.02 (.02)
Female	1,0	<b>-0.62 (.01)</b>	<b>-0.62 (.01)</b>	<b>-0.63 (.01)</b>
Ethnicity: white	1,0	<b>-0.12 (.05)</b>	<b>-0.13 (.05)</b>	-0.05 (.05)
Low birth weight	1,0	<b>-0.07 (.03)</b>	<b>-0.08 (.03)</b>	<b>-0.06 (.03)</b>
Observations		12,378	12,378	12,378
R <sup>2</sup>		0.260	0.239	0.307

Notes: Robust standard errors in parentheses. Bold: p<.10 (2-tailed).

**Additional Table A3.1. How highest qualification (standardised) is affected by childhood outcomes and family background? [British Cohort Study]**

	Units	RH variables unstandardised	
Intellectual performance (16)	1,0	<b>0.94 (.03)</b>	
Behaviour (16)	SD (index)	<b>0.06 (.01)</b>	
Emotional health (16)	SD (index)	0.01 (.01)	
Family income	Ln	<b>0.21 (.03)</b>	<b>0.25 (.03)</b>
Parents' education	Age	<b>0.10 (.01)</b>	<b>0.12 (.01)</b>
Father's unemployment	Fraction of waves	<b>-0.29 (.06)</b>	<b>-0.34 (.07)</b>
Mother's employment	Fraction of waves	<b>-0.08 (.04)</b>	<b>-0.11 (.04)</b>
Parental involvement	SD (index)	<b>0.04 (.01)</b>	<b>0.05 (.01)</b>
Family break-up	1,0	-0.05 (.03)	<b>-0.10 (.03)</b>
Mother's mental health	SD (index)	<b>0.03 (.01)</b>	<b>0.05 (.01)</b>
Number of siblings	Number	<b>-0.03 (.01)</b>	<b>-0.04 (.01)</b>
Post-marital conception	1,0	0.08 (.04)	<b>0.12 (.04)</b>
Female	1,0	<b>0.04 (.02)</b>	<b>0.07 (.02)</b>
Ethnicity: white	1,0	<b>-0.33 (.08)</b>	<b>-0.37 (.09)</b>
Low birth weight	1,0	-0.07 (.05)	<b>-0.12 (.05)</b>
Observations		8943	8943
R <sup>2</sup>		0.231	0.160

Notes: Robust standard errors in parentheses. Highest qualification is measured at age 42. Bold: p<10 (2-tailed).

**Additional Table A4.1. How life-satisfaction (0-10) is affected by labour force status – compared with full-time workers : 30-45 year olds  
[Household panel data]**

	Britain	Germany	Australia
Pooled cross-section			
Unemployed	<b>-0.73 (.06)</b>	<b>-0.99 (.05)</b>	<b>-0.34 (.06)</b>
Part-time workers	<b>0.05 (.03)</b>	<b>-0.07 (.03)</b>	<b>0.07 (.03)</b>
Self-employed	<b>0.08 (.04)</b>	<b>-0.09 (.04)</b>	0.03 (.04)
Out of labour force	<b>-0.36 (.04)</b>	<b>-0.10 (.03)</b>	-0.05 (0.4)
Fixed effects			
Unemployed	<b>-0.36 (.07)</b>	<b>-0.68 (.04)</b>	<b>-0.24 (.04)</b>
Part-time workers	-0.01 (.04)	<b>-0.11 (.03)</b>	0.02 (.02)
Self-employed	-0.05 (.05)	-0.01 (.05)	0.04 (.04)
Out of labour force	<b>-0.21 (.05)</b>	<b>-0.13 (.03)</b>	<b>-0.09 (.03)</b>

Notes: Robust standard errors in parentheses. Controls for income, years of education, marital status, having children, physical and emotional health, comparison income, education, unemployment and partnership, age, age-squared, gender, year and region dummies. Bold:  $p < 0.10$  (2-tailed).

**Additional Table A5.1. How life satisfaction is affected by parenthood  
[British Cohort Study]**

	Effect of having one or more children
Holding nothing else constant	<b>0.22 (.04)</b>
Holding everything constant	<b>0.25 (.03)</b>
Fixed effects	<b>0.30 (.06)</b>

Notes: Robust standard errors in parentheses. In row (1), controls for marital status, gender, and age. In row (2) controls for income, qualifications, not unemployed, non-criminality, marital status, physical health, mental health, child outcomes at 16, family background, age dummy (42), gender, ethnicity, low birth weight. In Row (3), controls for income, not unemployed, marital status, physical health and mental health. Bold:  $p < 10$  (2-tailed).

**Additional Table A5.2. How life satisfaction is affected by family status and parenthood 30-45 years old.****[Household panel data]**

	Britain	Germany	Australia
Pooled cross-section			
Partnered	<b>0.62 (.04)</b>	<b>0.32 (.03)</b>	<b>0.50 (.04)</b>
Separated	-0.06 (.05)	0.01 (.04)	<b>-0.15 (.06)</b>
Widowed	0.08 (.16)	<b>0.34 (.15)</b>	-0.16 (.32)
Parenthood	<b>0.07 (.03)</b>	<b>0.27 (.03)</b>	0.04 (.03)
Panel			
Partnered	<b>0.25 (.07)</b>	<b>0.14 (.04)</b>	<b>0.33 (.04)</b>
Separated	<b>-0.22 (.10)</b>	-0.04 (.06)	<b>-0.20 (.06)</b>
Widowed	-0.06 (.21)	0.00 (.27)	<b>-0.76 (.27)</b>
Parenthood	0.04 (.04)	<b>0.13 (.03)</b>	-0.00 (.03)

Notes: Robust standard errors in parentheses. Controls for income, years of education, employment status, physical and emotional health, comparison income, education, unemployment and partnership, age, age-squared, gender, year and region dummies. Bold:  $p < 10$  (2-tailed).

**Additional Table A6.1. Percentage of those in misery having each characteristic**

	<b>% of unhappy people having the characteristic</b>	<b>% of total population having the characteristics shown</b>
<b>USA (BRFSS)</b>		
In poverty (bottom 20%)	<b>51</b>	<b>20</b>
Unemployed	<b>13</b>	<b>4</b>
Physical health conditions (bottom 20%)	<b>20</b>	<b>20</b>
Ever diagnosed with depression or anxiety	<b>61</b>	<b>22</b>
<b>Australia (HILDA)</b>		
In poverty (bottom 20%)	<b>31</b>	<b>20</b>
Unemployed	<b>7</b>	<b>3</b>
Physical health symptoms lagged (bottom 20%)	<b>39</b>	<b>20</b>
Ever diagnosed with depression or anxiety	<b>51</b>	<b>21</b>
<b>Britain (BCS)</b>		
In poverty (bottom 20%)	<b>22</b>	<b>20</b>
Unemployed	<b>9</b>	<b>3</b>
Physical health conditions (bottom 20%)	<b>18</b>	<b>20</b>
Emotional health symptoms lagged (bottom 20%)	<b>31</b>	<b>20</b>
Has seen a doctor for emotional health problems in last year	<b>20</b>	<b>14</b>
<b>Britain (BHPS)</b>		
In poverty (bottom 20%)	<b>14</b>	<b>20</b>
Unemployed	<b>8</b>	<b>3</b>
Physical health conditions bottom 20%)	<b>21</b>	<b>20</b>
Emotional health symptoms lagged (bottom 20%)	<b>45</b>	<b>20</b>

**Additional Table A6.2. How adult misery is predicted by adult outcomes  
(Panel analysis) [ $\beta$ -coefficients]**

	<b>Australia</b>	<b>Britain BHPS</b>
Income (log)	-0.030 (.028)	<b>-0.030 (.009)</b>
Unemployed	<b>0.047 (.015)</b>	<b>0.046 (.004)</b>
Physical illness	0.027 (.021)*	<b>0.052 (.006)</b>
Mental illness	<b>0.072 (.021)</b>	<b>0.034 (.004)*</b>

Notes: Robust standard errors are in parentheses. Control for marital status, having children, comparison income, education, unemployment and partnership, age, age-squared, region and year dummies. Fixed-effects regressions using information from HILDA and BHPS respondents at age 25+ \*Lagged for one year. Bold:  $p < .10$  (2-tailed).

**Additional Table A6.3. How adult life-satisfaction is predicted by adult outcomes  
(Panel analysis) [ $\beta$ -coefficients]**

	<b>Australia</b>	<b>Britain BHPS</b>
Income (log)	<b>0.040 (.020)</b>	<b>0.029 (.008)</b>
Unemployed	<b>-0.060 (.011)</b>	<b>-0.034 (.004)</b>
Physical illness	<b>-0.029 (.016)*</b>	<b>-0.060 (.005)</b>
Mental illness	<b>-0.087 (.016)</b>	<b>-0.040 (.003)*</b>

Notes: Robust standard errors are in parentheses. Control for marital status, having children, comparison income, education, unemployment and partnership, age, age-squared, region and year dummies. Fixed-effects regressions using information from HILDA and BHPS respondents at age 25+ \*Lagged for one year. Bold:  $p < .10$  (2-tailed).

**Table A9.1. Characteristics of the ELSA participants included in the cross-sectional analysis**

<b>Variable</b>	<b>Unit</b>	<b>Mean</b>	<b>Std Dev</b>
Life-satisfaction	index 1-7	5.38	1.38
Age	years	68.40	8.51
Female	1,0	0.55	0.50
Ethnicity (non-white vs white)	1,0	0.02	0.14
Education low	1,0	0.29	0.46
Education medium	1,0	0.37	0.48
Education high	1,0	0.34	0.47
Wealth (decile)	decile	6.18	2.69
Income (decile)	decile	5.75	2.77
Employment: employed	1,0	0.24	0.43
Employment: retired	1,0	0.67	0.47
Employment: Unemployed/Sick/Homemaker	1,0	0.08	0.27
Marital status: married	1,0	0.69	0.46
Marital status: never married	1,0	0.06	0.23
Marital status: divorced	1,0	0.11	0.31
Marital status: widowed	1,0	0.14	0.35
Cultural engagement	frequency 0-5	1.45	1.07
Organisational involvement	number of memberships (0-8)	1.58	1.42
Social network	number of people	7.09	4.08
Short-form UCLA loneliness scale	index (1-3)	1.37	0.50
Positive support	1-4	3.18	0.51
Chronic lung disease	1,0	0.05	0.21
Cancer	1,0	0.06	0.23
Arthritis	1,0	0.38	0.49
Diabetes	1,0	0.01	0.12
Stroke	1,0	0.01	0.09
CHD	1,0	0.01	0.11
Limiting long standing illness	1,0	0.33	0.47
ADL difficulties	number of difficulties (0-6)	0.28	0.80
Hearing	rating scale 0-4	2.37	1.09
Eyesight	rating scale 0-4	2.54	0.91
Sleep quality	rating scale 0-3	2.00	0.74
Impaired mobility	number of impairments (0-10)	1.77	2.42
Urinary incontinence	1,0	0.15	0.36
Chronic pain	1,0	0.41	0.49
Sense of control W5	index (1-6)	2.88	1.35
Cognitive function score W5	index	31.13	5.93
Depressive symptom CESD W5	index (0-8)	1.27	1.77

**Table A9.2. What affects changes in life-satisfaction (0-10) over an 8 year interval: by age (ELSA) (Unstandardised coefficients (s.e.))**

	<b>52-64</b>	<b>65+</b>
Age in 2004	0.006 (0.005)	-0.002 (0.005)
Female	-0.01 (0.04)	-0.01 (0.05)
Ethnicity (non-white vs white)	-0.18 (0.16)	-0.34 (0.21)
Education: medium vs low	0.03 (0.05)	0.07 (0.05)
Education: high vs low	-0.04 (0.05)	0.01 (0.06)
Change in income 2004-2012	0.001 (0.007)	-0.01 (0.01)
Change in employment 2004-2012 (ref=stable)		
Employed -> Not employed	0.03 (0.04)	-0.08 (0.11)
Not employed -> Employed	0.18 (0.15)	0.8 (0.55)
Change in marital status 2004-2012 (ref=stable)		
Married -> Divorced/Widowed	0.11 (0.09)	0.1 (0.08)
Non married -> Married	0.14 (0.12)	0.31 (0.32)
Change in cultural engagement \$	<b>0.05 (0.02)</b>	0.03 (0.03)
Change in organisational involvement \$	0.02 (0.01)	0.03 (0.02)
Change in social network \$	0.003 (0.005)	0.005 (0.005)
Change in loneliness \$	<b>0.51 (0.04)</b>	<b>0.36 (0.05)</b>
Change in positive support	<b>0.2 (0.04)</b>	<b>0.13 (0.05)</b>
New chronic lung disease	-0.06 (0.08)	-0.07 (0.11)
New cancer	-0.08 (0.08)	-0.08 (0.09)
New arthritis	<b>-0.1 (0.05)</b>	-0.02 (0.07)
New diabetes	-0.25 (0.17)	0.26 (0.22)
New stroke	-0.43 (0.28)	0.02 (0.2)
New CHD	-0.23 (0.22)	-0.22 (0.14)
Change in limiting long standing illness (ref=stable)		
New long standing illness	-0.09 (0.05)	<b>-0.11 (0.06)</b>
No longer report long standing illness	<b>0.17 (0.07)</b>	-0.02 (0.08)
Change in ADL \$	0.03 (0.03)	0.04 (0.03)
Change in hearing \$	<b>0.03 (0.02)</b>	-0.02 (0.02)
Change in eyesight \$	<b>0.05 (0.02)</b>	<b>0.06 (0.02)</b>
Change in impaired mobility \$	0.005 (0.013)	0.02 (0.01)
Change in pain \$	0.04 (0.04)	-0.07 (0.04)
Change in sense of control \$	<b>0.03 (0.01)</b>	0.001 (0.015)
Cognitive function score W5 \$	0.003 (0.004)	-0.01 (0)
Change in depressive symptom CESD W5 \$	<b>0.03 (0.01)</b>	<b>0.03 (0.01)</b>
N	<b>1979</b>	<b>1251</b>
Adjusted R2	0.13	0.08

**Table A9.3. What affects changes in life-satisfaction (0-10) over an 8 year interval: by gender (ELSA) (Unstandardised coefficients (s.e.))**

	<b>Males</b>	<b>Females</b>
Age in 2004	-0.001 (0.003)	-0.002 (0.003)
Ethnicity (non-white vs white)	-0.29 (0.17)	-0.16 (0.2)
Education: medium vs low	0.09 (0.06)	0.03 (0.05)
Education: high vs low	0.05 (0.06)	-0.06 (0.05)
Change in income 2004-2012	-0.01 (0.01)	0.002 (0.007)
Change in employment 2004-2012 (ref=stable)		
Employed -> Not employed	0.04 (0.05)	0.01 (0.05)
Not employed -> Employed	0.14 (0.23)	0.26 (0.19)
Change in marital status 2004-2012 (ref=stable)		
Married -> Divorced/Widowed	0.19 (0.11)	0.08 (0.07)
Non married -> Married	0.05 (0.19)	0.22 (0.14)
Change in cultural engagement \$	0.04 (0.03)	0.05 (0.02)
Change in organisational involvement \$	0.04 (0.02)	0.01 (0.02)
Change in social network \$	0 (0.005)	0.009 (0.005)
Change in loneliness \$	0.41 (0.05)	0.47 (0.04)
Change in positive support	0.16 (0.04)	0.16 (0.04)
New chronic lung disease	-0.05 (0.09)	-0.09 (0.09)
New cancer	-0.06 (0.08)	-0.08 (0.09)
New arthritis	-0.05 (0.06)	-0.08 (0.06)
New diabetes	-0.24 (0.18)	0.2 (0.2)
New stroke	-0.24 (0.22)	0.04 (0.25)
New CHD	-0.18 (0.17)	-0.28 (0.16)
Change in limiting long standing illness (ref=stable)		
New long standing illness	-0.12 (0.06)	-0.08 (0.06)
No longer report long standing illness	0.05 (0.08)	0.12 (0.07)
Change in ADL \$	0.04 (0.03)	0.03 (0.03)
Change in hearing \$	0.03 (0.02)	0 (0.02)
Change in eyesight \$	0.05 (0.02)	0.06 (0.02)
Change in impaired mobilities \$	0.02 (0.01)	0.01 (0.01)
Change in pain \$	0.03 (0.04)	-0.02 (0.04)
Change in sense of control \$	0.02 (0.01)	0.01 (0.01)
Cognitive function score W5 \$	0.001 (0.004)	-0.001 (0.004)
Change in depressive symptom CESD W5 \$	0.03 (0.01)	0.04 (0.01)
N	1464	1766
Adjusted R2	0.10	0.13

**Additional Table A10.1. Child's emotional wellbeing (standardised) at 16**  
**[ALSPAC] [Gender differences]**

Child Age 16	Units	Boys	Girls
		RH variables standardised	RH variables unstandardised
Family income	Log	<b>0.12 (.05)</b>	<b>0.12 (.06)</b>
Proportion of time mother worked in 1 <sup>st</sup> year	Fraction of year	0.01 (.06)	-0.08 (.07)
Proportion of time mother worked thereafter	Fraction of waves	-0.06 (.07)	-0.01 (.09)
Father's unemployment	Fraction of waves	-0.29 (.24)	-0.37 (.27)
Mother's mental health	SD (index)	<b>0.12 (.03)</b>	<b>0.20 (.03)</b>
Father's mental health	SD (index)	<b>0.06 (.02)</b>	0.04 (.03)
Involvement	SD (index)	0.03 (.02)	0.07 (.03)
Aggression	SD (index)	-0.03 (.02)	-0.03 (.03)
Family conflict	SD (index)	<b>-0.06 (.03)</b>	-0.03 (.03)
Parental separation	1,0	0.04 (.05)	0.01 (.06)
Parents' education	0-1	0.03 (.05)	-0.04 (.06)
Mother's age at birth	Years	-0.01 (.01)	0.00 (.01)
Parents' marital status at birth	1,0	0.01 (.06)	-0.06 (.06)
Ethnicity: white	1,0	-0.03 (.16)	-0.06 (.16)
First born child	1,0	-0.01 (.04)	-0.02 (.06)
Number of siblings	Number	0.02 (.02)	0.02 (.03)
Low birth weight	1,0	0.15 (.10)	0.08 (.13)
Premature baby	1,0	-0.06 (.08)	0.02 (.14)
Primary school fixed effects		Yes	Yes
Secondary school fixed effects		Yes	Yes
Observations		2778	3254
R <sup>2</sup>		0.196	0.180

Notes: Robust standard errors in parentheses. Emotional wellbeing: standardised self- and mother-reported SMFQ at age 16. Bold: p<10 (2-tailed).

**Additional Table A10.2: Decompositions of the gross effect of family income  
(standardised) on child's outcomes at 16 [ALSPAC]**

Income (log)	Emotional (Standardised)	Behavioural (Standardised)	Intellectual (Standardised)
Gross effect	<b>0.10</b>	<b>0.11</b>	<b>0.22</b>
- Economic	<b>-0.00</b>	<b>+0.01</b>	<b>-0.02</b>
- Psycho-social	<b>-0.04</b>	<b>-0.05</b>	<b>-0.02</b>
- School	<b>+0.01</b>	<b>+0.01</b>	<b>-0.04</b>
= Net effect	<b>0.07</b>	<b>0.08</b>	<b>0.14</b>

Notes: Gross effect controls for parents' education at birth, mother's age at birth, parental marital status at birth, child's gender, ethnicity, birth order, number of siblings, birth weight, born prematurely and age in months at testing. Economic includes father's unemployment and mother's work. Psycho-social includes parenting involvement, parenting strictness, parental separation, family conflict, mother's mental health and father's mental health. School includes primary and secondary school fixed effects.

The net effect reported in Tables 10.1, 10.2, and 10.3 is the gross effect minus the role of other economic, psycho-social and school factors correlated with family income (see Appendix 4).

**Additional Table A11.1: Decomposition of the gross effect of father's unemployment (0-1) on child outcomes at 16 [ALSPAC]**

Father's unemployment	Emotional (Standardised)	Behavioural (Standardised)	Intellectual (Standardised)
Gross effect	<b>-0.07</b>	<b>-0.05</b>	<b>-0.06</b>
- Economic	<b>+0.01</b>	<b>-0.01</b>	<b>+0.01</b>
- Psycho-social	<b>+0.03</b>	<b>+0.05</b>	<b>+0.01</b>
- School	<b>-0.01</b>	<b>+0.01</b>	<b>+0.01</b>
= Net effect	<b>-0.04</b>	<b>-0.01</b>	<b>-0.03</b>

Notes: The net effect reported in Table 11.4 is the gross effect minus the role of other economic, psycho-social and school factors correlated with father's unemployment. See Table A.11.1 for a full description.

**Additional Table A12.1: Decomposition of the gross effect of parents on child's intellectual development at age 16 (standardised) [ALSPAC]**

Intellectual	Father's			
	Mother's Mental Health (Standardised)	Mental Health (Standardised)	Involvement (Standardised)	Aggression (Standardised)
Gross effect	<b>0.07</b>	<b>0.03</b>	<b>0.05</b>	<b>-0.02</b>
- Economic	<b>-0.02</b>	<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>
- Psycho-social	<b>-0.01</b>	<b>-0.01</b>	<b>-0.01</b>	<b>0.01</b>
- School	<b>-0.01</b>	<b>-0.01</b>	<b>-0.02</b>	<b>0.00</b>
= Net effect	<b>0.03</b>	0.00	<b>0.02</b>	-0.01

Notes: The net effect reported in Table 12.3 is the gross effect minus the role of other economic, psycho-social and school factors correlated with parents. Gross effect controls for parents' education at birth, mother's age at birth, parental marital status at birth, child's gender, ethnicity, birth order, number of siblings, birth weight, born prematurely and age in months at testing. Economic includes family income, proportion of time mother worked in 1<sup>st</sup> year, proportion of time mother worked thereafter (up to age shown) and father's unemployment. Psycho-social includes parenting involvement, parenting strictness, parental separation, family conflict, mother's mental health and father's mental health. School includes primary and secondary school fixed effects.

**Additional Table A14.1. How child outcomes (standardised) at 11 are affected by primary school teacher characteristics and practices? (ALSPAC) ( $\beta$ -coefficients)**

	Emotional	Behavioural	Intellectual
Teacher characteristics:			
Female	<b>-0.03 (0.01)</b>	0.02 (.01)	-0.01 (.01)
Experience	0.01 (.01)	0.01 (.01)	0.01 (.01)
Emotional health	0.00 (.02)	0.02 (.02)	<b>0.05 (.01)</b>
Self-esteem	-0.02 (.02)	0.00 (.02)	<b>0.06 (.01)</b>
Confidence	0.01 (.02)	0.01 (.01)	<b>0.03 (.01)</b>
Teaching practices:			
Amount of homework	-0.00 (.01)	-0.00 (.01)	<b>0.04 (.01)</b>
Develop children's capacity to think	0.01 (.02)	-0.01 (.01)	0.02 (.01)
Help children to be considerate to others	0.00 (.02)	0.01 (.01)	<b>0.03 (.01)</b>
Absence of noise in the classroom	0.00 (.01)	0.01 (.01)	0.01 (.01)

Notes: Robust standard errors in parentheses Controls for family income, proportion of time mother worked in the 1<sup>st</sup> year, proportion of time mother worked thereafter, father's unemployment, mother's mental health, father's mental health, involvement, aggression, family conflict, parental separation, parents' education, mother's age at birth, parents' marital status at birth, female child, ethnicity, first born child, number of siblings, low birth weight, premature baby, SEN statement, free school meal eligibility, English not first language, lagged dependent variable (at 8) and primary school dummies. Bold:  $p < .10$  (2-tailed).

# APPENDIX 4

## ANNEXES

- 1.1 [Interpreting the statistics](#)
- 2.1 [Income and wellbeing. Selected estimates](#)
- 3.1 [Education and wellbeing. Selected estimates](#)
- 3.2 [Decomposition analysis](#)
- 4.1 [Unemployment and wellbeing. Selected estimates](#)
- 5.1 [Family and wellbeing. Selected estimates](#)
- 6.1 [Data on health of body and mind](#)
- 7.1 [Crime and childhood \(by Stephen J. Machin\)](#)
- 9.1 [Definitions of variables in ELSA](#)
- 10.1 [Financial difficulties](#)
- 15.1 [Cost-effectiveness analysis in terms of happiness](#)

## Annex 1.1. Interpreting the statistics

### $\alpha$ coefficients

Suppose life-satisfaction ( $S$ ) depends linearly on a vector of  $X_i$  variables according to

$$S = \sum_i a_i X_i + e \quad (1)$$

If  $S$  is measured in absolute units (0-10) and each  $X_i$  is measured in its natural units, we call the coefficients  $\alpha_i$  **unstandardised coefficients**. For actual cost-effectiveness analysis they are the most informative numbers – they measure the quantitative effect of  $X_i$  on  $S$ .

### $\beta$ coefficients

However we may also wish to ask a prior question: How important is  $X_i$  in explaining the variance of  $S$ . For this purpose the **standardised coefficients**  $\beta_i$  are more interesting. Thus (1) can be rewritten

$$\frac{S}{\sigma_s} = \sum_i \left( a_i \frac{\sigma_i}{\sigma_s} \right) \frac{X_i}{\sigma_i} + \frac{e}{\sigma_s}$$

or

$$\frac{S}{\sigma_s} = \sum_i \beta_i \frac{X_i}{\sigma_i} + \frac{e}{\sigma_s} \quad (2)$$

where

$$\beta_i = \alpha_i \frac{\sigma_i}{\sigma_s}$$

If we take the variance of both sides, we find

$$1 = \sum_i \sum_j \beta_i \beta_j r_{ij} + \frac{\sum e^2}{\sigma_s^2}$$

or

$$R^2 \equiv 1 - \frac{\sum e^2}{\sigma_s^2} = \sum_i \beta_i^2 + 2 \sum_i \sum_j \beta_i \beta_j r_{ij} \quad (i \neq j)$$

The  $R^2$  is the sum of the  $\beta_i$  coefficients squared plus a part reflecting the covariance of the explanatory variables. So  **$\beta_i^2$  measures the share of the variance of  $S$  explained by the independent variation of  $X_i$ .**

These are the main measures we use in this book -  $\alpha_i$  and  $\beta_i$ . With the  $\beta_i$ , both left and right hand variables are standardised so these statistics are otherwise known as partial correlation coefficients or standardised regression coefficients. With the  $\alpha_i$  all variables are unstandardised. In Part I the left-hand variable (life-satisfaction) is usually also unstandardised since our aim is to familiarise readers with its units. In Part II the left-hand variable (emotional health) is standardised, since it has no natural units. But we also use variants where only the LH variable is standardised. These give an 'effect size' for any binary RH variable.<sup>1</sup>

## Odds-ratios

The reader will find no odds-ratios in this book, and may therefore be surprised at the small size of most effects. The reason is that policymakers should be interested in the absolute size of an effect (rather than its size relative to a counterfactual).

We can illustrate this with an example based on our actual data. This example will also explain why the reader must get used to much smaller numbers than typical odds-ratios. The following table breaks down 5.660 members of our sample into 4 proportions according to whether they are:

- i. from broken families at age 16 (Yes/No)
- ii. have behavioural problems at age 16 (Yes/No)

**Proportion of the sample in each category**

		Broken family		Total
		Yes	No	
Behavioural problems	Yes	0.016	0.031	0.047
	No	0.241	0.712	0.953
	Total	0.257	0.743	1.000

As the table shows, the proportion of people who have behavioural problems are:

0.066 if your family is broken (0.016/0.241)

0.043 if your family is not broken (0.032/0.760)

So a broken family raises the probability of having behavioural problems by 2.3 percentage points (0.066-0.043). This is the type of number reported in our book. It is an effect to which we can then attach a value.

The odds-ratio is the ration between two odds. The numerator is the odds of the behavioural problem, if you have a broken family (0.066/(1- 0.066)). The denominator is the odds of behavioural problems, if you do not have a broken family (0.043/(1- 0.043)). Thus the odds ratio is

$$\frac{0.066/0.933}{0.043/0.956} = 156\%$$

<sup>1</sup> An effect size of 0.10 shifts an individual, initially at the mean, upwards by 4 percentile points.

This is a large number. But it is an unhelpful number because it is measured as a ratio to the counterfactual rather than as a difference.

Given the high odds ratios reported in much of the literature, the reader may also be surprised by the low correlation between family break-up and behavioural problems, which in this example is 0.04.

Another reason why our numbers are smaller than many readers are used to is that we try to hold constant more other variables, in order to get a policy-relevant measure of what difference it would make to change the variable in question.

**Annex 2.1. Income and wellbeing. Selected estimates**

	<b>AUTHOR</b>	<b>RESEARCH DESIGN</b>	<b>OUTCOME MEASURE</b>	<b>INCOME MEASURE</b>	<b>CONTROLS</b>	<b>DATA</b>	<b>ENDO-GENEITY</b>	<b>COEFFICIENT</b>	<b>BETA COEFFICIENT</b>
Individual Evidence	<b>Kahneman and Deaton (2010)</b>	Within-country regression of wellbeing on high-income dummy	Cantril ladder	High income = 1 if monthly income is at least \$4,000	Age, gender, marital status, health (behaviour), religion, education, children, day of the week	Gallup-Healthways Well-Being Index		0.64	
Individual Evidence	<b>Pischke (2011)</b>	Within-country regressions of wellbeing on logarithm of income	Happiness, life satisfaction	ln family income	Age, ethnicity, education, year of the interview	General Social Survey (GSS), European Social Survey (ESS), German Socio-Economic Panel (GSOEP)	Instrumental variable regressions using industry wage differentials as instruments	(1) GSS: [0.11;0.28], (2) ESS: [0.06;0.24], (3) GSOEP: [0.13;0.78]	(1) GSS: [;], (2) ESS: [;], (3) GSOEP: [;]
Individual Evidence	<b>Stevenson and Wolfers (2008)</b>	Within-country regressions of wellbeing on logarithm of income	Happiness (GSS), life satisfaction	ln family income	(1) No controls, (2) with gender, quartic in age, and the interaction of these variables	General Social Survey (GSS), Gallup World Poll, World Values Survey, Pew Survey		(1) without controls [0.25;0.45], (2) with controls [0.15;0.35]	(1) without controls [0.10;0.18], (2) with controls [0.06;0.14]
Social Comparisons	<b>Luttmer (2005)</b>	Within-country regressions of happiness on logarithm of income + relative income	Happiness	ln family income, ln PUMA earnings	Basic demographics, PUMA (Public Use Microdata Areas) characteristics, wave dummies, state dummies, sample: married or cohabiting people	National Survey of Families and Households	Instrumental variable regressions using industry*occupation earnings	(1) Own income OLS: 0.12, (2) own income IV: 0.36, (3) ln PUMA earnings: [-0.30;-0.24] (4) Individual FE: ln HH income 0.05 (n.s.) and ln	(1) Own income OLS: 0.06, (2) own income IV: 0.18, (3) ln PUMA earnings: [-0.08;-0.06] (4) Individual FE: ln HH income 0.03 (n.s.) and ln

							PUMA earnings -0.37	PUMA earnings -0.07
Social Comparison s	<b>Ferrer-i- Carbonell (2005)</b>	Within-country regressions of life satisfaction on logarithm of income + relative income	Life satisfaction	ln family income, ln reference income in education, age, and region cell	Age, gender, education, children, work status, marital status, wave dummies, region dummies	German Socio- Economic Panel	Ordered probit individual random effects: own income 0.25, reference income [-0.25;-0.20]	Ordered probit individual random effects: own income 0.10, reference income [-0.04;-0.03]
Social Comparison s	<b>Layard et al. (2010)</b>	Within-country regressions of wellbeing on the logarithm of income + relative income	Happiness, life satisfaction	ln real household income, ln reference income = average real household income in year for observations matched by gender, age, and education	Gender, quadratic in age and education, marital and work status, and state dummies	General Social Survey (GSS), German Socio- Economic Panel (GSOEP)	(1) GSS: own income 0.33, ref income -0.49, (2) GSOEP: own income 0.53, ref income -0.65, (3) GSOEP, FE: own income 0.33, ref income -0.30	(1) GSS: own income 0.13, ref income -0.09, (2) GSOEP: own income 0.21, ref income -0.13, (3) GSOEP, FE: own income 0.13, ref income -0.06
Country- Level Income: Cross- Section	<b>Deaton (2008)</b>	Cross-country regressions of average life satisfaction on logarithm of per capita GDP	Life satisfaction	ln GDP per capita in 2003 measured in 2000 Int. USD from Penn World Table	No controls	2006 Gallup World Poll	0.83	0.25
Country- Level Income: Cross- Section	<b>Stevenson and Wolfers (2008)</b>	Cross-country regressions of average life satisfaction on the logarithm of per capita GDP	Normalised life satisfaction across surveys using ordered probit regressions	ln GDP per capita measured at purchasing power parity (World Bank's World Development Indicators, Penn World Table)	No controls	Gallup, World Values Survey (WVS), Pew Survey, Eurobarometer	(1) Gallup, WVS, Pew Survey: [0.35;0.45], (2) Eurobarometer: [0.74;0.77]	(1) Gallup, WVS, Pew Survey: [0.10; 0.13], (2) Eurobarometer: [0.22;0.23]
Country- Level Income: Long-Term Growth	<b>Stevenson and Wolfers (2008)</b>	Panel regressions of life satisfaction on GDP per capita	Life satisfaction	ln real GDP per capita	No controls, micro/macro data estimates with country fixed effects	World Values Survey (WVS), Eurobarometer	(1) WVS: 0.3, (2) Eurobarometer: 0.20	(1) WVS: 0.09, (2) Eurobarometer: 0.06

Notes: The coefficients have been rounded.

**This literature review has been done by Sarah Flèche and Christian Krekel.**

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**Annex 3.1. Education and wellbeing. Selected estimates**

	<b>AUTHOR</b>	<b>TYPE</b>	<b>OUTCOME MEASURE</b>	<b>MEASURE EDUCATION</b>	<b>CONTROLS</b>	<b>DATA SET</b>	<b>ENDOGENEITY</b>	<b>COEFFICIENT</b>	<b>BETA COEFFICIENT</b>
Education – main variable of interest	<b>Oreopoulos (2007)</b>	IV estimation of returns to compulsory schooling on pecuniary and non-pecuniary outcomes including life-satisfaction	(i) self-reported life satisfaction 4-point scale (ii) self-reported happiness 3-point scale	average educational attainment for particular region, year and birth cohort.	basic controls (interacted with survey year)	UK data from General Household Survey from 1983-1998 combined with Northern Ireland Continuous Household Survey from 1985-1998. As well as Eurobarometer Surveys	compulsory schooling law IV estimation	(i) OLS estimate: 0.073 (std. 0.0093) IV estimate: 0.059 (std.0.0073) (ii) OLS estimate: 0.044 (std. 0.013) IV estimate: 0.0667 (std. 0.0093)	
Education – main variable of interest	<b>Oreopoulos and Salvanes (2011)</b>	review of literature on the benefits of schooling + IV estimation with compulsory schooling law on pecuniary and non-pecuniary outcomes including life-satisfaction	self-reported life satisfaction (4-point scale)	years of schooling	basic controls + income	1973–98 Eurobarometer data, sample constrained to 25-65 year olds from UK	compulsory schooling law IV estimation	(i) IV estimate without income control: 0.048 (std. 0.010) (ii) IV estimate with income control: 0.035 (std. 0.012)	

Education – main variable of interest	<b>Powdthavee et al. (2015)</b>	evidence of direct and indirect effects of schooling on subjective wellbeing within a simultaneous equation model (SEM) with individual fixed effects	overall life satisfaction (on 10-point scale)	years of education	basic controls + income	HILDA, restricted to 22-65 year olds	structural SEM model with individual fixed effects	single equation OLS -0.034 (std. 0.002) / SEM model total indirect effects 0.049 (std. 0.001)	single equation OLS -0.05 / SEM model total indirect effects 0.08
Education – main variable of interest	<b>Powdthavee et al. (2013)</b>	evidence of direct and indirect effects of schooling on subjective wellbeing within IV estimation framework	(i) overall life satisfaction (on 10-point scale) (ii) mental health (measured by MH-5 which is part of the SF36 Health Survey on 6-point scale) (iii) financial satisfaction (10-point scale)	years of education	basic controls + income (endogenous) + income (exogenous)	HILDA, restricted to 22-65 year olds	compulsory schooling law + windfall income data IV estimation	(i) IV education direct effect (without IV income): men not significant / women -1.00 (std. 0.053)  IV education indirect effect (through IV income): men 0.045 (std. 0.019) / women not significant	(i) IV education direct effect (without IV income): men not significant / women -1.6 (ii) IV education indirect effect (through IV income): men 0.07 / women not significant
Education – main variable of interest	<b>Chevalier and Feinstein (2006)</b>	fixed effects, IV and quantile estimation of education on adult mental health.	(i) mental health O-level and above (malaise score by Rutter, 1970) (ii) depression (dummy if >8)	highest educational qualification	basic controls + financial difficulties childhood + school characteristics + work	NCDS (British National Child Development Survey)	fixed effects estimation + IV estimation (using teacher expectations about benefits of further education & proxy	(i) IV estimate: for men -0.063 (std. 0.055)/ for women -0.154 (std. 0.066)	(i) IV estimate: for men -0.05 / for women -0.11

		on malaise score)		characteristics adult + family characteristics adult		for child discount rate measured by smoking dummy) + Quantile Regression			
Education – main variable of interest	<b>Banks and Mazzonna (2012)</b>	IV estimation of returns to compulsory schooling on cognitive abilities in older age (including quality of life)	quality of life index (CASP-19)	years of schooling	basic controls	ELSA (English Longitudinal Survey on Ageing)	compulsory schooling law RDD estimation	not significant	not significant
Education – control variable	<b>Easterlin (2001)</b>	discussion paper on how changes in material aspirations likely explain lack of relationship between income and happiness over the life cycle. Education mediates the absence of relationship as higher education means higher future income.	(i) happiness (1-4)	high education vs. low education dummy		GSS + tables borrowed from several reference articles		no coefficient estimates	no coefficient estimates
Education – control variable	<b>Blanchflower and Oswald (2004)</b>	ordered logit estimations (with time trends) of determinants of happiness in the United States and Great Britain	(i) life satisfaction (very satisfied, fairly satisfied, not very satisfied, or not at all satisfied)	years of education	basic controls + income	(i) GSS (USA) (ii) Eurobarometer (UK)	ordered logit regressions with time trends	(i) ordered logit no income control: 0.0482 (t-stat 13.03) / ordered logit with income control: 0.0346 (t-stat	

			(ii) happiness (very happy, pretty happy, or not too happy)					8.41) (ii) no education variable	
Education – control variable	<b>Ferrer-i- Carbonell (2005)</b>	panel estimation of SWB with individual random effects and controls. Shows the importance of comparison income for SWB testing various measures of comparison income.	life satisfaction (0-10)	years of education	basic controls + income and reference income	GSOEP	ordered probit regressions with individual random effects	ordered probit all Germany from 0.078 (t-ratio 0.675) to 0.112 (t- ratio 0.971) depending on specification of reference income	
Education – control variable	<b>Clark and Oswald (1996)</b>	effect of age on job satisfaction (U-shape) with controls	(i) job satisfaction (1 - 7) (ii) psychological functioning GHQ-12	education dummies (Low, medium, high)	80 controls including income and work values	BHPS, wave 1991		(i) ordered probit with all controls: high education dymmy -0.33 (std. 0.05) (ii) ordered probit: education dymmy not significant	(i) ordered probit with all controls: high education dymmy -0.1 (ii) ordered probit: education dymmy not significant
Education – control variable	<b>Flouri and Buchanan (2004)</b>	examine the role of parenting in later subjective well-being (SWB).	Life satisfaction, psychological functioning (measured with the GHQ-12), and absence of psychological distress	education dummies (educational attainments by age 20: 1-3)	basic controls (no income) + mental health + parental economic and mental background	NCDS (British National Child Development Study)		not significant	not significant

	(measured with the Malaise Inventory)
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Notes: The coefficients have been rounded.

**This literature review has been done by Clement Bellet and Nele Warrinnier.**

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### Annex 3.2. Decomposition analysis

Suppose

$$H = \hat{a}_1 X_1 + \sum_{i=2}^N \hat{a}_i X_i \quad (1)$$

and also

$$H = \hat{b}_1 X_1 \quad (2)$$

Combining these equations and differentiating by  $X_1$  gives

$$\hat{b}_1 - \hat{a}_1 = \sum_{i=2}^N \hat{a}_i \frac{\partial X_i}{\partial X_1} \quad (3)$$

where  $\frac{\partial X_i}{\partial X_1}$  is the gross relation.

The interpretation of this decomposition requires judgement. If an  $X_i$  follows  $X_1$  in time, then the relation  $\frac{\partial X_i}{\partial X_1}$  is a maximal estimate of the causal effect of  $X_1$  on  $X_i$ . It thus represents the maximal role of  $X_i$  in mediating a true effect of  $X_1$  on  $H$ .

If on the other hand  $X_1$  and  $X_i$  are contemporaneous or even more if  $X_i$  precedes  $X_1$ , then that part of the decomposition represents purely the effect of removing confounding correlational relationships.

For reference, the standardized version of equation (3) is

$$r_{1H} - \beta_1 = \sum_{i=2}^N \beta_i r_{iH} \quad (4)$$

where  $r$  represents the correlation coefficient.

**Annex 4.1. Unemployment and wellbeing. Selected estimates**

	<b>AUTHOR</b>	<b>TYPE</b>	<b>MEASURE OF INTEREST</b>	<b>OUTCOME MEASURE</b>	<b>DATA SET</b>	<b>COEFFICIENT</b>
Labour force status and Life Satisfaction	<b>Kassenböhrer and Haisken-DeNew (2009)</b>	Plant Closures	Unemployed (reference category: employed)	Life satisfaction (0-10)	SOEP	Men in West Germany: -1.09 (OLS), -0.72 (FE). Women in West Germany: -0.49 (OLS), -0.23 (FE)
Labour force status and Life Satisfaction	<b>Clark and Oswald (1994)</b>	OLS + Individual FE	Unemployed, self-employed (reference category: employed)	GHQ-12	BHPS	Unemployed: -0.53; Self-employed: -0.113
Labour force status and Life Satisfaction	<b>Di Tella et al. (2001)</b>	OLS with country fixed effects	Micro: Unemployed, self employed; Macro: Unemployment rate	Life-satisfaction (1-4)	Euro-barometer	Micro analysis: Unemployed = -1.1, Self-employed = 0.133; Macro analysis : Coefficient for unemployment ==> -2.8 (1 percentage point increase in UE rate is equal to a decrease of 0.028 in LS)
Social comparisons	<b>Clark (2003)</b>	OLS + Individual FE	Interaction effect between own and region unemployment	GHQ-12	BHPS	Positive coefficient associated to "regional unemp. Rate * respondent unemployed"

Social comparisons	<b>Card et al (2012)</b>	Field Experiment	Randomized treatment: email on the existence of peer salary info website	Job Satisfaction	Field Experiment across the UC campuses	Detrimental impact of relative income (especially for workers in the lowest pay quartile)
Adaptation	<b>Clark and Georgellis (2013)</b>	Individual Fixed Effects	Lags and Leads of Unemployment	Life Satisfaction (1-7)	BHPS	Lasting effects of Unemployment
Adaptation	<b>Clark et al (2008)</b>	Individual Fixed Effects	Lags and Leads of Unemployment	Life Satisfaction (0-10)	SOEP	Lasting effects of Unemployment
Job Quality	<b>Helliwell and Huang (2010)</b>	Ordered Probit	Job Characteristics	Life Satisfaction (1-10)	GSS and ESC	Workplace trust, job variety, skilled work among key drivers of LS
Job Quality	<b>Clark (2001)</b>	OLS	Job Satisfaction + Characteristics	Job Quits	BHPS	Elements of jobs that predict quits: job security and pay most important, followed by use of initiative, the work itself, and hours of work

Notes: The coefficients have been rounded.

**This literature review has been done by Anthony Lepinteur and George Ward.**

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**Annex 5.1. Family and wellbeing. Selected estimates**

	<b>AUTHOR</b>	<b>RESEARCH DESIGN</b>	<b>OUTCOME MEASURE</b>	<b>FAMILY MEASURE</b>	<b>CONTROLS</b>	<b>DATA</b>	<b>ENDO-GENEITY</b>	<b>COEFFICIENT</b>	<b>BETA COEFFICIENT</b>
Within-Country Analysis	<b>Anusic et al. (2014)</b>	Non-linear models with and without normative trends (through comparison group of people who did not experience the life event)	0/10 life satisfaction	Dummy for becoming married, dummy for becoming widowed, dummy for childbirth	Gender, age, education, and household income	Swiss Household Panel (SHP) from 2000 to 2013		Marriage: 0.29 [0.52], widowhood: -1.35 [-1.16], children: 0.36 [0.44], model with comparison group in brackets	
Within-Country Analysis	<b>Baetschmann et al. (2016)</b>	Several, including fixed-effects regressions, regressions on lagged life satisfaction and trends, and matching	0/10 life satisfaction	Dummy for childbirth	Basic controls, including relationship, education, household size, working hours, and household income	German Socio-Economic Panel (GSOEP) from 1984 to 2009	Partly dealt with by using fixed effects	0.56 under matching, 0.52 under regressions on lagged life satisfaction and trends, and 0.56 under fixed-effects regressions, all for women	
Within-Country Analysis	<b>Clark et al. (2008)</b>	Fixed-effects regressions (including annual leads and lags)	0/10 life satisfaction	Dummy for marriage, dummy for widowhood, dummy for childbirth	Age, marital status, health, education, employment, household income, number of children, and dummy for German national	German Socio-Economic Panel (GSOEP) from 1984 to 2003	Accounted for partly by fixed effects, leads, and lags	Marriage: 0.32 for men and 0.20 for women, widowhood: -0.14 for men and -0.53 for women, childbirth: 0.10 for men and 0.20 for women, all in year after event	

Within-Country Analysis	<b>Stutzer and Frey (2006)</b>	Fixed-effects regressions, pooled OLS regressions	0/10 life satisfaction	Dummy for being married, dummy for living with children	Basic controls, including age, employment, place of residence, and nationality	German Socio-Economic Panel (GSOEP) from 1984 to 2000	Accounted for partly by fixed effects	Marriage: 0.31 for fixed-effects and 0.30 for pooled OLS regressions, living with children: 0.02 for fixed-effects and 0.07 for pooled OLS regressions
Within-Country Analysis	<b>Frijters et al. (2011)</b>	Fixed-effects regressions (including quarterly leads and lags)	0/10 life satisfaction	Dummy for marriage, dummy for death of spouse/child (not-differentiable), dummy for childbirth	Basic controls, including gender and education	Household, Income and Labour Dynamics in Australia (HILDA) Survey from 2001 to 2006	Accounted for partly by fixed effects, leads, and lags	Marriage: 0.43, death of spouse/child: -0.57, childbirth: 0.24, all in quarter after event
Within-Country Analysis	<b>Lucas et al. (2003)</b>	Hierarchical linear modelling	0/10 life satisfaction	Dummy for marriage, dummy for widowhood	Basic controls, including gender and age	German Socio-Economic Panel (GSOEP) from 1984 to 2003		Marriage: 0.23, widowhood: -0.86
Within-Country Analysis	<b>Myrskylä and Margolis (2014)</b>	Fixed-effects regressions (including lags of various lengths before and after the event)	0/10 life satisfaction (GSOEP), 1/4 happiness and 1/7 life satisfaction (BHPS)	Dummy for childbirth	Basic controls, including age, health, education, labour force status, and income	German Socio-Economic Panel (GSOEP) from 1984 to 2009, British Household Panel Study (BHPS) from 1991 to 2008	Accounted for partly by fixed effects, leads, and lags	0.32 (within one year) for life satisfaction in Germany, 0.39 for life satisfaction and 0.47 for happiness (within one year) in Britain

Mixed	<b>Cetre et al. (2016)</b>	OLS regressions, with country and year fixed effects for cross-country regressions	0/10 Cantril ladder (GWP), 0/10 life satisfaction (ESS), 0/10 happiness and 0/10 life satisfaction (GSOEP)	Dummy for living with children under 15 (GWP), dummy for living with children and dummy for having children (ESS), dummy for having children (GSOEP)	Gender, age, marital status, education, employment, household income, religion, and year and country dummies (where applicable)	Gallup World Poll (GWP) from 2009 to 2013, European Social Survey (ESS) from 2002 to 2012, German Socio-Economic Panel (GSOEP) from 1984 to 2012	GWP: -0.03, ESS: 0.02 and 0.08 for life satisfaction and having children and living with children, respectively (0.13 and 0.02 for happiness), GSOEP: -0.07 for having children	
Mixed	<b>Deaton and Stone (2014)</b>	Weighted linear regressions for US and 161 countries	0/10 Cantril ladder, 1,0 happiness yesterday	Dummy for living with children	Gender, age, marital status, ethnicity, health (behaviour), education, income, household size, religiosity, and state of residence	Gallup Healthways Well-Being Index (GHWBI) for US from 2008 to 2012, Gallup's World Poll (GWP) for 161 countries since 2006	US: -0.05 for Cantril ladder and 0.02 for happiness yesterday, 161 countries: -0.01 for Cantril ladder and 0.02 for happiness	
Cross-Country Analysis	<b>Aassve et al. (2012)</b>	Ordered logit models (with country and year fixed effects)	0/10 happiness	Dummy for having (at least one) child	Basic controls, including age, partnership, employment, and years of education	European Social Survey (ESS) for 22 countries in 2002, 2004, and 2006	0.074 for men and 0.042 for women	
Cross-Country Analysis	<b>Alesina et al. (2004)</b>	Ordered logit models (with country and year fixed effects)	0/3 happiness	Dummy for being married, dummy for number of children (here: 1)	Basic controls, including gender, age, marital status, ethnicity,	General Social Survey (GSS) from 1972 to 1997, Eurobarometer	Accounted for partly by fixed effects	Marriage: 0.62 (GSS), 0.28 (Eurobarometer), having children: -0.18 (GSS), -0.03 (Eurobarometer)

					education, employment, income, dummy for household head, number of siblings, and macro controls	from 1975 to 1992	
Cross-Country Analysis	<b>Margolis and Myrskylä (2010)</b>	Linear regressions (with country and year fixed effects)	0/4 happiness	Dummy for having a child	Basic controls, including gender, age, marital status, socio-economic status, and income	World Values Survey (WVS) from 1981 to 2005	-0.032
Cross-Country Analysis	<b>Stanca (2012)</b>	OLS regressions, cross-country (with country and year fixed effects)	0/10 life satisfaction, 0/4 happiness	Dummy for being widowed, dummy for having children	Basic controls, including gender, marital status, educational, and employment	World Values Survey (WVS) for 94 countries	Widowhood: -0.41 for life satisfaction and -0.07 for happiness, having children: -0.86 for life satisfaction and -0.02 for happiness

Notes: The coefficients have been rounded.

**This literature review has been done by Christian Krekel.**

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## Annex 6.1. Data on health of body and mind

### A. Data sources

<b>Britain</b>	<p><b>British Cohort Study (BCS)</b></p> <p>British cohort data which began in 1970. The children are followed over time and interviewed at ages 5, 16, 26, 30, 34 and 42. A life satisfaction question has been included in the study from age 26.</p> <p>At age 42, respondents were asked whether they have seen a doctor for emotional health issues in last year. From ages 26, 30 to 34, mental health is also measured using malaise scores.</p> <p>From age 34 to age 42, they were asked whether they have any physical health problems.</p>
<b>Britain</b>	<p><b>British Household Panel Survey (BHPS)</b></p> <p>Household-based panel study which began in 1991. The panel members are followed over time and interviewed every year. A life satisfaction question has been included in the study from 1996.</p> <p>From 1996 to 2008, it also collects information on mental health using the GHQ-12 questionnaire.</p>
<b>Australia</b>	<p><b>Household Income and Labour Dynamics in Australia (HILDA) Survey</b></p> <p>Household-based panel study which began in 2001. The panel members are followed over time and interviewed every year. Life-satisfaction is measured throughout.</p> <p>In 2007 and 2009, respondents were asked whether they have ever been diagnosed with depression or anxiety.</p> <p>In 2009, they were also asked whether they take prescription medication for depression or anxiety or whether they have been seen during the last 12 months by a mental health professional.</p> <p>From 2001 to 2010, the SF-36 questionnaire is included.</p>
<b>USA (BRFSS)</b>	<p><b>Behavioral Risk Factor Surveillance System (BRFSS)</b></p> <p>Cross-sectional survey which includes a life-satisfaction question since 2005.</p> <p>There are several measures of mental health in the BRFSS:  Ever diagnosed with depression or anxiety: 2006; 2008; 2010; 2013  Receiving mental health treatment: 2007; 2009  Days mental health not good this month: 2005-2010; 2013</p>
<b>Germany</b>	<p><b>German Socio Economic Panel (GSOEP)</b></p> <p>Household-based panel study which began in 1984. The panel members are followed over time and interviewed every year. Mental and physical health are measured using the SF-12 questionnaire in 2002; 2004; 2006 and 2008. Life-satisfaction is measured throughout.</p>

**B. Definitions of Variables**

<b>Life Satisfaction</b>	
Britain (BCS)	How dissatisfied or satisfied are you about the way your life has turned out so far? 0-10
Britain (BHPS)	How dissatisfied or satisfied are you with your life overall? 1-7
Australia	All things considered, how satisfied are you with your life? Pick a number between 0 and 10 to indicate how satisfied you are.
USA (BRFSS)	In general, how satisfied are you with your life? 1-4
Germany	How satisfied are you with your life, all things considered? 0-10
<b>Mental health measures</b>	
<b>(1) Diagnosis</b>	
Britain (BCS)	Have you seen a doctor or specialist for emotional health issues in last year? (Yes/No)
Australia	Have you ever been told by a doctor or nurse that you have any long term health conditions listed below? eg. Depression/Anxiety. (Yes/No)
USA (BRFSS)	Yes to either or both of the following: <ul style="list-style-type: none"> <li>• Have you ever been told you have an anxiety disorder? (Yes/No)</li> <li>• And/or have you ever been told you had a depressive disorder? (Yes/No)</li> </ul>
<b>(2) Treatment</b>	
Australia	Yes to either or both of the following: <ul style="list-style-type: none"> <li>• Takes prescription medication for depression or anxiety. (Yes/No)</li> <li>• Seen during last 12 months a mental health professional (Yes/No)</li> </ul>
USA (BRFSS)	Are you now taking medicine or receiving treatment from a doctor or other health professional for any type of mental health condition or emotional problem? (Yes/No)
<b>(3) Self-reported symptomatology</b>	
Britain (BCS)	<p><b>How You feel</b> Number of Yes answers.</p> <p>These questions are concerned with how you are feeling generally. Please answer by ticking either the “Yes” or “No” box for each one. It is important that you try to answer All the questions.</p> <ul style="list-style-type: none"> <li>• Do you often have backhache?</li> <li>• Do you feel tired most of the time?</li> <li>• Do you often have bad headaches?</li> <li>• Do you often get worried about things?</li> <li>• Do you usually have great difficulty in falling or staying asleep?</li> <li>• Do you usually wake unnecessarily early in the morning?</li> <li>• Do you wear yourself out worrying about your health?</li> <li>• Do you often get into a violent rage?</li> <li>• Do people often annoy and irritate you?</li> <li>• Have you at times had twitching of the face, head or shoulders?</li> <li>• Do you often suddenly become scared for no good reason?</li> <li>• Are you scared to be alone when there are no friends near you?</li> <li>• Are you easily upset or irritated?</li> <li>• Are you frightened of going out alone or of meeting people?</li> <li>• Are you constantly keyed up and jittery?</li> <li>• Do you suffer from an upset stomach?</li> <li>• Is your appetite poor?</li> <li>• Does every little thing get on your nerves and wear you out?</li> <li>• Does your heart often race like mad?</li> <li>• Do you often have bad pains in your eyes?</li> <li>• Are you troubled with rheumatism or fribositis?</li> <li>• Have you ever had a nervous breakdown?</li> </ul>

Britain (BHPS)	<p><b>General Health Questionnaire-12</b> Number of Yes answers.</p> <p>Here are some questions regarding the way you have been feeling over the last few weeks. For each question please tick the box next to the answer that best describes the way you have felt.</p> <ul style="list-style-type: none"> <li>• Have you recently been able to concentrate on whatever you are doing? (Yes/No)</li> <li>• Have you recently lost much sleep over worry? (Yes/No)</li> <li>• Have you recently felt that you were playing a useful part in things? (Yes/No)</li> <li>• Have you recently felt capable of making decisions about things? (Yes/No)</li> <li>• Have you recently felt constantly under strain? (Yes/No)</li> <li>• Have you recently felt you could not overcome your difficulties? (Yes/No)</li> <li>• Have you recently been able to enjoy your normal day-to-day activities? (Yes/No)</li> <li>• Have you recently been able to face up to problems? (Yes/No)</li> <li>• Have you recently been losing confidence in yourself? (Yes/No)</li> <li>• Have you recently been thinking of yourself as a worthless person? (Yes/No)</li> <li>• Have you recently been feeling reasonably happy, all things considered? (Yes/No)</li> </ul>
Australia	<p><b>SF-36 questionnaire</b></p> <p><b>Mental health:</b> These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please file the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks:</p> <ul style="list-style-type: none"> <li>• Have you been a nervous person? (1-5)</li> <li>• Have you felt so down in the dumps that nothing could cheer you up? (1-5)</li> <li>• Have you felt calm and peaceful? (1-5)</li> <li>• Have you felt down? (1-5)</li> <li>• Have you been a happy person? (1-5)</li> </ul> <p><b>Emotional factors affecting role:</b> During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?</p> <ul style="list-style-type: none"> <li>• Cut down the amount of time you spent on work or other activities (1-3)</li> <li>• Accomplished less than you would like (1-3)</li> <li>• Did not do work or other activities as carefully as usual (1-3)</li> </ul> <p>To calculate our self-reported mental health measure, we first create the “mental health” and the “emotional factors affecting role” indicators that are total score from the above questions, each of them rescaled from 1 to 5. Then, we compute the total score of these two new variables to obtain the self-reported mental health measure.</p>
Germany	<p><b>SF-12 questionnaire</b></p> <p>Please think about the last four weeks. How often did it occur within this period of time:</p> <p><b>Mental health:</b></p> <ul style="list-style-type: none"> <li>• That you felt run-down and melancholy? (1-5)</li> </ul>

	<ul style="list-style-type: none"> <li>• That you felt relaxed and well-balanced? (1-5)</li> </ul> <p><b>Emotional factors affecting role:</b></p> <ul style="list-style-type: none"> <li>• That due to mental health or emotional health problems: <ul style="list-style-type: none"> <li>○ You achieved less than you wanted to at work or in everyday tasks? (1-3)</li> <li>○ You carried out your work or everyday tasks less thoroughly than usual? (1-3)</li> </ul> </li> </ul> <p>To calculate our self-reported mental health measure, we first create the “mental health” and the “emotional factors affecting role” indicators that are total score from the above questions, each of them rescaled from 1 to 5. Then, we compute the total score of these two new variables to obtain the self-reported mental health measure.</p>
<b>Physical health measures</b>	
<b>(1) Number of physical health problems</b>	
Britain (BCS)	<p>Number of Yes answers.</p> <p>Since your prior interview, have you had any of the health problems listed on this card? Please include any health problems that had already started before that date.</p> <ul style="list-style-type: none"> <li>• Problems with eyesight including wearing glasses or contact lenses (Yes/No)</li> <li>• Asthma or wheezy bronchitis (Yes/No)</li> <li>• Hayfever or persistent sneezing/runny nose (Yes/No)</li> <li>• Diabetes (Yes/No)</li> <li>• Convulsion, fit, epileptic seizure (Yes/No)</li> <li>• Recurrent backhache, prolapsed disc, sciatica or other back problem (Yes/No)</li> <li>• Cancer or leukaemia (Yes/No)</li> <li>• Problems with hearing (Yes/No)</li> <li>• High blood pressure (Yes/No)</li> <li>• Migraine (Yes/No)</li> <li>• Eczema or other skin problems (Yes/No)</li> <li>• Chronic fatigue syndrome (ME) (Yes/No)</li> <li>• Problems with stomach, bowels or gall bladder (Yes/No)</li> <li>• Problems with bladder or kidneys (Yes/No)</li> <li>• Persistent cough/bringing up phlegm (Yes/No)</li> <li>• Liver disease including viral hepatitis B or C (Yes/No)</li> <li>• Arthritis (Yes/No)</li> </ul>
Britain (BHPS)	<p>Number of Yes answers.</p> <p>Do you have any of the health problems or disabilities listed on this card? Exclude temporary conditions.</p> <ul style="list-style-type: none"> <li>• Problems or disability connected with: arms, legs, hands, feet, back, or neck (including arthritis and rheumatism) (Yes/No)</li> <li>• Difficult in seeing (other than needing glasses to read normal size print) (Yes/No)</li> <li>• Difficulty in hearing (Yes/No)</li> <li>• Skin conditions/allergies (Yes/No)</li> <li>• Chest/breathing problems, asthma, bronchitis (Yes/No)</li> <li>• Heart/blood pressure or blood circulation problems (Yes/No)</li> <li>• Stomach/liver/kidneys or digestive problems (Yes/No)</li> <li>• Diabetes (Yes/No)</li> <li>• Epilepsy (Yes/No)</li> </ul>

	<ul style="list-style-type: none"> <li>• Migraine or frequent headaches (Yes/No)</li> <li>• Cancer (Yes/No)</li> <li>• Stroke (Yes/No)</li> </ul>
USA (BRFSS)	<p>Number of Yes answers.</p> <p>Have you ever been told by a doctor, nurse or other health professional, that you had:</p> <ul style="list-style-type: none"> <li>• Diabetes (Yes/No)</li> <li>• Heart attack (Yes/No)</li> <li>• Angina or coronary heart disease (Yes/No)</li> <li>• Stroke (Yes/No)</li> <li>• Asthma (Yes/No)</li> <li>• Arthritis (Yes/No)</li> <li>• Cataracts (Yes/No)</li> <li>• Glaucoma (Yes/No)</li> <li>• Macular degeneration (Yes/No)</li> <li>• Prostate cancer (Yes/No)</li> </ul>
<b>(2) Self-reported symptomatology</b>	
Australia	<p><b>SF-36 questionnaire</b></p> <p><b>Physical functioning</b> The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?</p> <ul style="list-style-type: none"> <li>• Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports (1-3)</li> <li>• Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf (1-3)</li> <li>• Lifting or carrying groceries (1-3)</li> <li>• Climbing several flights of stairs (1-3)</li> <li>• Climbing one flight of stairs (1-3)</li> <li>• Bending, kneeling, or stooping (1-3)</li> <li>• Walking more than one kilometre (1-3)</li> <li>• Walking half a kilometre (1-3)</li> <li>• Walking 100 metres (1-3)</li> <li>• Bathing or dressing yourself (1-3)</li> </ul> <p><b>Physical factors affecting role</b> During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?</p> <ul style="list-style-type: none"> <li>• Cut down the amount of time you spent on work or other activities (1-5)</li> <li>• Accomplished less than you would like (1-5)</li> <li>• Were limited in the kind of work or other activities (1-5)</li> <li>• Had difficulties performing the work or other activities (1-5)</li> </ul> <p><b>Bodily pain</b></p> <ul style="list-style-type: none"> <li>• How much bodily pain have you had during the past 4 weeks? (1-5)</li> <li>• During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? (1-5)</li> </ul> <p>To calculate our self-reported physical health measure, we first create the “physical functioning”, the “bodily pain” and the “physical factors affecting role” indicators that are total score from the above questions, each of them rescaled from 1 to 5. Then, we compute the total score of</p>

	these three new variables to obtain the self-reported physical health measure.
Germany	<p><b>SF-12 questionnaire</b></p> <p><b>Physical functioning</b></p> <ul style="list-style-type: none"> <li>• When you ascend stairs, i.e. go up several floors on foot: Does your state of health affect you greatly, slightly or not at all? (1-3)</li> <li>• And what about having to cope with other tiring everyday tasks, i.e. when one has to lift something heavy or when one requires agility: Does your state of health affect you greatly, slightly or not at all ? (1-3)</li> </ul> <p><b>Physical factors affecting role</b></p> <p>Please think about the last four weeks. How often did it occur within this period of time,</p> <ul style="list-style-type: none"> <li>• That due to physical health problems <ul style="list-style-type: none"> <li>○ You achieved less than you wanted to at work or in everyday tasks? (1-5)</li> <li>○ You were limited in some form at work or in everyday tasks? (1-5)</li> </ul> </li> </ul> <p><b>Bodily pain</b></p> <ul style="list-style-type: none"> <li>• That you had strong physical pains? (1-5)</li> </ul> <p>To calculate our self-reported physical health measure, we first create the “physical functioning”, the “bodily pain” and the “physical factors affecting role” indicators that are total score from the above questions, each of them rescaled from 1 to 5. Then, we compute the total score of these three new variables to obtain the self-reported physical health measure.</p>

## **Annex 7.1. Crime and childhood**

**By Stephen J. Machin**

Incomplete preliminary first draft

## **Crime and Childhood**

**Stephen Machin\***

July 2016

\* *Department of Economics, University College London and Centre for Economic Performance, London School of Economics*

## 1. Introduction

Navigating the childhood years brings a wide and diverse array of experiences to individuals, some of which play a role in shaping life as an adult. A very pertinent, and policy relevant, research question is whether study of longitudinal data that follows individuals from the childhood years to adulthood is able to pin down which childhood factors shape adult behaviour. This is especially relevant in the area of crime where many commentators have posited that childhood experiences can lead individuals to a life of crime.

In this Chapter I study the empirical connections between adult crime and childhood factors, looking at crime and measures of behaviour attributes in the childhood years. The analysis studies crime and childhood behaviour in America and Britain. Remarkably similar results, in terms of qualitative direction and magnitudes, emerge from this analysis. A key correlate of participation in crime in both countries is whether an individual engages in negative externalising behaviour (i.e. behaves in a way that negatively affects others via conduct disorder) as a child.

Negative externalising behaviours also impact on education and again the connections are very similar across the two countries. I therefore also consider the connections between crime and education, building upon what is a growing research area in economics where the causal impact of education on subsequent crime is identified. This reveals that a policy lever that does result in crime reduction, albeit typically as an unintended consequence, is education policy that improves education acquisition for individuals in the lower part of the education distribution.

The Chapter is structured as follows. In the next section, I revisit the earlier results of the book by replicating the empirical models that were presented there. I use this as the starting point of my own empirical work on crime and childhood behaviour, based on longitudinal data for America and Britain, which is presented in section 3. In section 4, I show analogous results

for education as an outcome, and discuss the crime and education results in the context of other work on the crime reducing effects of education. Section 6 then concludes by offering a discussion of the effects of crime on wellbeing for individuals and society.

## 2. Recap

So as to ensure the starting point for the Chapter is the same as the earlier discussion of the book, I begin by replicating the regression from Chapter 1, before moving forward to the cross-country comparisons in section 3.

Table 1 uses data from the British Cohort Study of 1970 (BCS), a longitudinal survey of all individuals born in a week of April 1970, to consider the relationship between crime and childhood behaviour. The dependent variable is measured at age 30 (i.e. in the year 2000) and is a binary indicator of whether an individual has been arrested by that age. The independent variables I consider are:

- i) Age 16 measures of behaviour. These are an index of externalising behavioural problems/conduct disorder, an index of internalising behavioural problems, an index of emotional health.
- ii) Age 10 measures of behaviour. These are the same index of externalising behavioural problems/conduct disorder and of internalising behavioural problems, an index of cognitive skill (based on reading and maths).
- iii) Child and family factors as control variables. These are whether the cohort member is male, whether the cohort member is non-white, mother's age, mother's education and whether the cohort member's father was living with them.

Definitions of these variables are given in the Data Appendix. The indexes of externalising and internalising behavioural problems are taken from the 19-item Rutter scale questions administered in the age 10 and 16 surveys (10 of the 19 are defined as externalising,

and the other 9 as internalising behavioural problems). The emotional health index comes from the age 16 survey and is based on 22 items on the cohort member's health where they were asked if various health problems happened to them most of the time, some of the time, or rarely/never. It is scored as a positive index, having higher values for not having health problems that were asked about. The cognitive skills index is based upon the age 10 maths and reading tests administered to the survey participants. All of the indexes are standardised to have a mean of zero and a unit standard deviation, enabling comparison of their relative magnitudes in the reported results.

Marginal effects from probit models of the likelihood of being arrested by age 30 are presented in Table 1.<sup>1</sup> The Table shows three specifications that vary in terms of whether they include age 10 or 16 behaviour measures and whether or not the emotional health index is included. Specification (1) includes age 16 behaviour measures and the emotional health index so as to replicate the earlier results of the book. The first thing to note is that the estimates show a strong connection between externalising behaviour problems at age 16 and the probability of arrest. A one standard deviation higher value of the externalising behaviour index is associated with a 4.9 percentage point higher arrest rate. Compared to the mean arrest percentage of 14.7, this corresponds to a 33 percent higher probability of arrest. The other indexes do not attract as high coefficients, but all three are negative and statistically significant showing lower arrest probabilities for individuals with internalising problems, and better emotional health and cognitive skills.

Specification (2) of Table 1 replaces the age 16 behavioural indexes with the age 10 measures. It is evident that the estimates are very similar. The reason for considering this specification is that the later analysis will focus upon age 10 measures of behavioural problems.

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<sup>1</sup> Similar results emerged if the probability of being found guilty in court was used instead of arrest as the dependent variable. Some of these results are reported later and discussed in section 3.

This is to ensure the British and American analyses are comparable. The other feature required to make them comparable is considered in specification (3), where the emotional health index is excluded. This is because an analogous measure cannot be defined for the US analysis that will follow in the next section. It is evident, however, that the exclusion of the index does not alter the results by much. The strongest effect – at 0.046 of a standard deviation corresponding to a 28 percent higher arrest probability ( $= [0.046/0.166] \times 100$ ) – is for the externalising behaviour index.

The results of this section therefore replicate and corroborate that presented in the earlier part of the book. Thus in the next section I build further upon this to probe empirical connections between crime and childhood in comparable statistical models based on American and British data.

### 3. Crime and Childhood Behaviour in America and Britain

In this section, I present comparable estimates of the relationship between adult crime outcomes and childhood behaviour based upon American and British longitudinal data that follows individuals from their childhood years into adulthood. I first present the American results, then the British ones.

#### *Crime and Childhood Behaviour in the US*

The National Longitudinal Survey of Youth 1979 (NLSY79) is a nationally representative sample of individuals who were born in the years 1957 to 1964. This survey was conducted annually from 1979 to 1994 and has been conducted biennially since 1994. The children of NLSY79 mothers are also surveyed in the NLSY79 Child and Young Adult cohort (CNLSY) and is these data which permit the empirical analysis of crime and childhood in the US.

The CNLSY data began in 1986 when 5,255 children were reported on by 2,922 interviewed NLSY79 mothers. In 1994, the first Young Adult survey year, 6,109 children under

age 15 and 980 young adults were reported on by 3,464 mothers.<sup>2</sup> By 2012 of the 7,892 children reported by the 3,190 mothers interviewed in 2012 (the most up to date public release), 515 children and 5,808 young adults were interviewed.

The structure of these data mean that, even though the children are of different ages in different years, I am able to put together a cohort of individuals born in a given year which matches data on crime by a given age to childhood behaviour variables.<sup>3</sup> Table 2 shows the structure of this data. For individuals born between 1975 and 1988 I am able to structure the sample so I can study whether individuals were ever convicted by age 24/25 and to this I can match the behavioural problems index contained in the data at age 10/11.<sup>4</sup> Table 2 shows the sample structure that does this.

In Table 3, I begin the empirical analysis of the CNLSY showing estimates of marginal effects from probit models of the likelihood of being convicted by age 24/25. The first column shows the marginal effect associated with the behavioural problems index at age 10/11 to be 0.065, as compared to the mean of the dependent variable of 0.219, thus corresponding to a 30 percent higher probability of conviction. Adding the cognitive skill index, in column (2), which is significantly negatively associated with crime lowers the estimate from 0.065 to 0.058. Further adding control variables for demographic characteristics (gender, race and year of birth dummies) in column (3) brings the estimate down to 0.043, and it falls a little more to 0.040, while remaining strongly significant in statistical terms, on addition of mother variables (mother's age, education and whether the father lives with the mother and cohort member) in column (4). In this specification a one standard deviation higher value of the behavioural problems index raises the probability of conviction by 20 percent ( $= [0.043 / 0.219] \times 100$ ).

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<sup>2</sup> The NLSY79 Young Adult survey includes respondents age 15 and older who are the biological children of female NLSY79 respondents. These NLSY79 Young Adult respondents continue to be interviewed biennially even after they move out of their parents' homes.

<sup>3</sup> See Agan (2011) who also uses these data to study crime and behaviour problems, using data up to the 2008 survey.

<sup>4</sup> The reason why I have to look at 24/25 and 10/11 is the biennial survey structure.

Because of having data on multiple children from the same mother, column (5) presents estimates that compare cohort members within families. A strong finding emerges. Even within families a sibling who has a one standard deviation higher value for the behavioural problems index has a 0.040, or 18 percent, higher conviction rate. Interestingly, the previous strong crime reducing effect from higher cognitive skills now goes away, suggesting much of this to reflect a common family effect. But this is not true of behavioural problems which can result in crime differing for individuals from the same family background.

In Table 4, the behavioural problems are broken down into externalising and internalising components. The precise definitions are given in Appendix Table A1. When separate effects are estimated for externalising and internalising behaviour, a striking pattern emerges. It is externalising behaviour problems that are strongly connected to crime and, in the initial model without controls in column (1), internalising behaviour problems are actually negatively associated. The marginal effect for the externalising index of 0.094 is sizable and amounts to a 43 percent higher conviction probability. Adding controls in the same way as for Table 3 lowers this effect, and in column (4) it is still sizable but a little smaller at a 28 percent higher conviction probability. By the time the control variables have been added, the estimated internalising behaviour effect loses statistical significance. In fact, in the final specification, the fixed effects model reported in column (5), it becomes completely insignificant like the cognitive skills variable. However, the externalising problems variable remains significant and sizable at 0.053 for a one standard deviation higher level, corresponding to a 24 percent higher conviction probability.

Thus the estimates show there to be a strong crime increasing effect from externalising problems from the childhood years. This is in line with Agan's (2011) findings using a different approach with the CNLSY data and with the Heckman et al (2013) analysis of the long run impacts of the Perry Pre-School Program whose main benefits come from crime reduction for

the males in the program who, because of treatment by the program, had lower levels of externalising problems in childhood as compared to the control group.

Rather than the externalising versus internalising break down I have studied so far, the CNLSY behavioural problems index is also broken down in the survey into six sub-indexes related to the following behaviours: antisocial; anxiety/depression; headstrongness; hyperactivity; dependency; peer conflict/social withdrawal. To further probe the findings, Table 5 shows what happens when this breakdown is entered into the statistical models. It becomes evident that antisocial behaviour is most important of these, and this is a clear component of the externalising or conduct disorder problems in childhood that lead to higher crime incidence as a young adult.

One additional observation of the results to date is that they pool together birth cohorts from 1975 through to 1988 who reach the age of 24/25 in the calendar years 2000 to 2012. In the 2000s crime fell in the US (especially in some of the larger cities) and so it is informative to check whether the results hold across cohorts. Figure 1 shows estimates where the models were estimated separately for four cohorts. In all of them the pattern of significantly higher crime associated with higher values of the externalising problems index is observed.

The final set of CNLSY results on crime and childhood are reported in Table 6. This reports estimates from redoing the mother fixed effects analysis for male siblings only. The reason for doing so is obvious, namely that most crime is done by young men. The results stay intact when this is done, showing a sizable externalizing behaviour effect on criminality when comparing male siblings within the same family.

#### *Crime and Childhood Behaviour in Great Britain*

The British data that permits study of crime and childhood behaviour was already discussed in the recap section presented earlier. Here I use the BCS data to present empirical models that match the US CNLSY analysis. This begins in Table 7 which shows marginal

effects from probit models considering the probability of arrest by age 30 and the Rutter behaviour index available in the BCS. As with the US results a higher level of behavioural problems at age 10 is strongly connected a higher arrest probability. The raw effect from the model with no other independent variables in column (1) is of a 0.038 for a one standard deviation higher Rutter index, corresponding to a 23 percent higher arrest rate ( $= [0.038/0.166] \times 100$ ). On addition of the cognitive skill index and the control variables, in columns (2) through (4), the same pattern as with the US analysis of the overall behavioural problems index (in Table) emerges as the estimated coefficient falls in magnitude but remains strongly significant. In the column (4) specification a one standard deviation higher Rutter index is connected to a 0.020, or 12 percent, higher probability of arrest by age 30.

Separating out externalising and internalising components (definitions are described in the Data Appendix) produces a strong pattern, and one that is very much in line with the US results. As is shown in Table 8, there is a strong positive estimated marginal effect of 0.080 for a one standard deviation higher externalising index score, corresponding to a 48 percent higher arrest probability. The internalising behaviour marginal effect is negative and significant, but much smaller in magnitude. Moving across the columns of the Table as more variables are sequentially added moderates the size of the crime increases connected to externalising behaviour in childhood, but it remains significant at 0.046 in column (4), with a percent arrest probability increase of 29 percent ( $= [0.046/0.167] \times 100$ ).

The BCS data also has information on whether an individual was found guilty in court by age 30. This matches more closely to the US convictions measure. Results using this measure are therefore reported in Table 9. A very similar pattern emerges, with the column (4) marginal effect of 0.034 corresponding to a 27 percent higher probability of being found guilty in court ( $= [0.034/0.125] \times 100$ ).

Thus the British analysis uncovers a strikingly similar pattern of results to those shown earlier for the United States. In both cases in longitudinal data following individuals from childhood to adulthood, there is strong evidence of significantly higher crime incidence as adults being connected to externalising behaviours exhibited by individuals at age 10.

#### 4. Education and Crime in Britain and America

The results discussed so far have isolated a strong empirical connection between having externalising behavioural problems in childhood and subsequent participation in crime. It is also natural to ask whether these problems impact on education as there is a well-established connection between education and crime, and one may think that if such a connection exists then education policy may have a role to play in offsetting crime. This is discussed in this section of the paper, by first demonstrating that there is indeed a connection between externalising childhood behaviours and educational outcomes and second by considering education policies and crime in the light of this.

##### *Education and Childhood Behaviour*

Table 10 shows estimates of the relationship between education outcomes and the childhood behaviour indexes in the US CNLSY data. The Table shows two specifications where the dependent variable is now whether or not the CNLSY cohort member is a high school dropout who does not graduate from high school. The first specification is analogous to the crime models from before with the full set of controls. The second is the within family model that includes mother fixed effects.

In both cases there is a strong positive relationship between not graduating high school and age 10/11 externalising behavioural problems. The estimated marginal effect is 0.030 in column (1) and 0.055 in column (2). These correspond to a sizable probability of being a high school dropout, in the range of 22 percent for column (1) ( $= [0.030/0.138] \times 100$ ) to 40 percent

for column (2) ( $= [0.055/0.138] \times 100$ ). Thus the likelihood of being a high school dropout is strongly connected to age 10/11 externalising problems. It is also, as we know from existing literature (e.g. Lochner and Moretti, 2004; Anderson, 2014) strongly connected to participating in crime.

Education outcomes and childhood behaviour in the British Cohort Study data are considered in Table 11. I cannot consider the mother fixed effects models as in the US analysis as we only have a single cohort member in the data. Therefore, the Table presents estimates for two different education variables, the first being marginal effects from a probit model of leaving school with low or poor qualifications and the second coefficients from a regression where the dependent variable is the age the BCS cohort member left full time continuous education. The results are strong and very consistent with the US findings as they show individuals with higher values of the externalising behaviour problems index at age 10 are much more likely to have poor levels of qualification attainment and leave schooling at an earlier age.

### *Crime and Education Policy*

The findings for both countries are highly consistent with one another in that they show individuals with externalising behaviour problems are more likely to do badly in education and are more likely to turn to crime. It is therefore useful to consider education policies that have been shown to reduce crime in existing research in this context.

A recurrent finding in recent economics of crime research is that more education reduces crime where causality from education to crime has been established by studying increases in the compulsory school leaving age (Lochner and Moretti, 2004; Machin et al., 2011; Bell et al., 2016a). In this research, crime reduction is viewed as an unintended consequence of education policies that raise the leaving or dropout age since they were not

designed with crime reduction in mind, but nonetheless seem to induce sizeable economic benefits from crime reduction.

The finding of crime reduction benefits from increases in the compulsory school leaving age is informative in the context of individuals with externalising problem behaviour doing worse in education and in subsequently turning to crime.

**[to be completed]**

## 5. Crime and Wellbeing<sup>5</sup>

This Chapter concludes with some remarks on crime and wellbeing. The ultimate reason for studying crime is because of its effects on human wellbeing. These include effects on the individual criminal and effects on everybody else. These are considered in turn.

### *Effects on the criminal*

The book has already discussed the effect on the criminal, and shown that a one standard deviation difference in the number of times arrested by age 34 is associated with a 0.06 standard deviation difference in life-satisfaction at age 34 – or 0.12 points on a scale 0-10. We do not suggest that this is a directly causal statement. It shows essentially how people who get involved in crime become more isolated or worse treated, and thus become more miserable.

### *Effects on others*

The second problem with crime is the distress it causes to others. In this book so far we have focussed solely on how each individual is affected by their own experience and not at all on how they affect the experience of others. This is a major shortcoming of much of the empirical literature on wellbeing, because in the end the wellbeing of the population depends hugely on how people behave towards each other – not in terms of providing income, education, jobs or healthcare, but in their day to day behaviour. Are they kind, considerate,

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<sup>5</sup> This section was written by Richard Layard.

encouraging, supportive, loving or, in contrast, rough, bullying, oppressive and in the extreme case criminal in the way they behave? Do we feel that in general other people are on our side or against us?

So we need to modify our original graph to include another key set of influences. This is illustrated in simplified form in Figure X. As this shows, interventions designed to improve an individual's adult behaviour derive much of their value from the benefits they confer on others (rather than on the individual concerned) i.e. through channel A rather than channel B.

To put numerical values on this influence is not easy and at this stage we can do no more than give an illustrative example – hopefully, this will become a major area of research. We take our example from an important study of the effect of the local crime rate upon local life-satisfaction.<sup>6</sup> This was based on the British Household Panel Study and included a measure of the quarterly crime rate in the individual's local Police Force Area. It found that individual mental health (0-10) fell by .14 points for each unit increase in the log of the local crime rate. This implies that, cumulated over the whole local population, each crime reduces life-satisfaction (0-10) by roughly 1 point-year.<sup>7</sup>

It would be interesting to compare this external effect with the 'effect' on the individual concerned which we mentioned earlier. This is not easy, for in that other case we measured the effects of a person's **cumulated** crime upon life-satisfaction at a point in time. But, to look at orders of magnitude, our data show that each arrest between 16 and 34 reduces life-satisfaction (0-10) at 34 by 0.04 points.<sup>8</sup> Thus, supposing the effects of an arrest last 20 years, each arrest

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<sup>6</sup> Dustmann and Fasani (2016). There have been many efforts to put money values on the effects of crime; for a survey, see Soares (2010).

<sup>7</sup> From their Table 3 Column (1),  $GHQ = .14 \log\left(\frac{C}{P}\right) + etc.$  Thus  $\Delta GHQ = \frac{.14}{C/P} \frac{1}{P} \Delta C$  where C is the number of crimes and P is the population. Using average annual rates for C/P of 0.09, this gives  $P \cdot \Delta GHQ \simeq 1.5 \Delta C$ . (To convert a change in GHQ (0-10) to one in life-satisfaction (LS) we note from Mukuria et al. (2014) that when GHQ is measured 0-10,  $\frac{\partial LS}{\partial GHQ} = -0.21(3.6) = -0.75$ . So  $P \Delta LS = -0.75 P \cdot \Delta GHQ \simeq -1.1 \Delta C$ .) Note that since Table 3 use panel data with a fixed effect, any effect of crime on house prices (which is spread over many years) is largely removed.

<sup>8</sup> The SD of arrests is 2.8. Interestingly adding a quadratic term in arrests adds no explanatory power.

reduces cumulated life-satisfaction by roughly 0.8 point-years.<sup>9</sup> Since crimes exceed arrests in the ratio 3.6:1, each crime reduces life-satisfaction by 0.2 point-years. This is much less than the effect of crime upon the rest of the population. It serves to illustrate why the measured impacts of a policy need to include not only the wellbeing of those directly affected but also their behaviour towards those not directly affected.

This completes our analysis of crime, but it leads on directly to the wider issue of how social institutions affect the wellbeing of nations.

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<sup>9</sup> The ratio of 3.6/1 is for 2006/7 from Crime Survey for England and Wales and Arrests Collection, Home Office.

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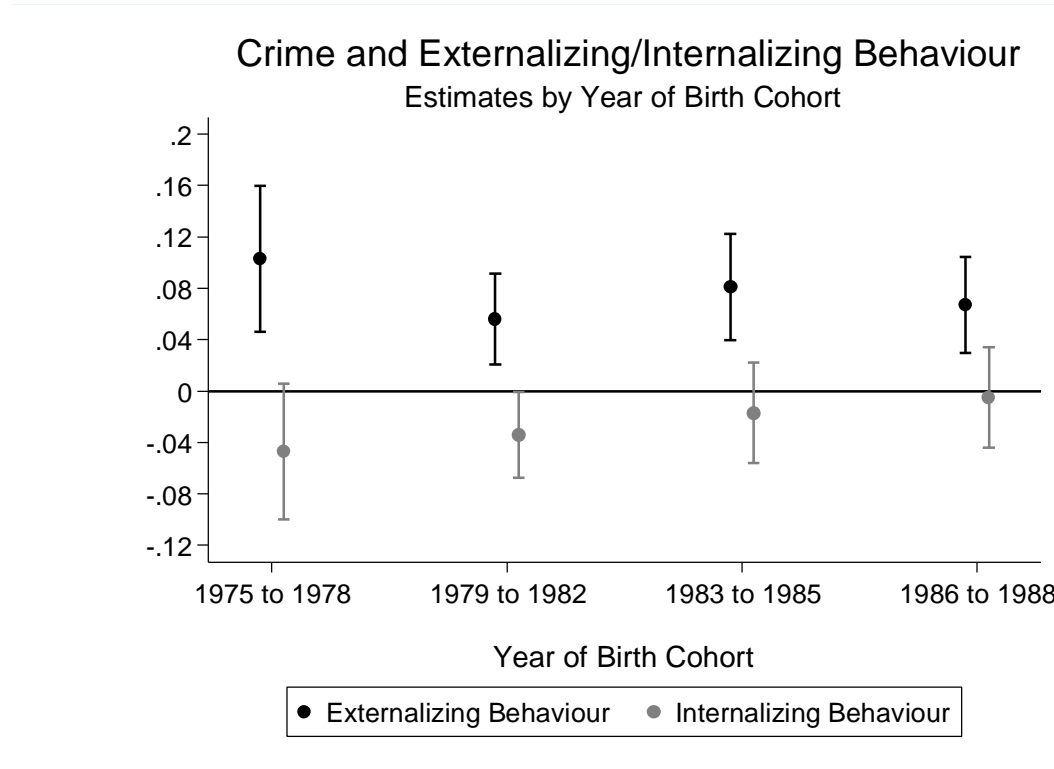
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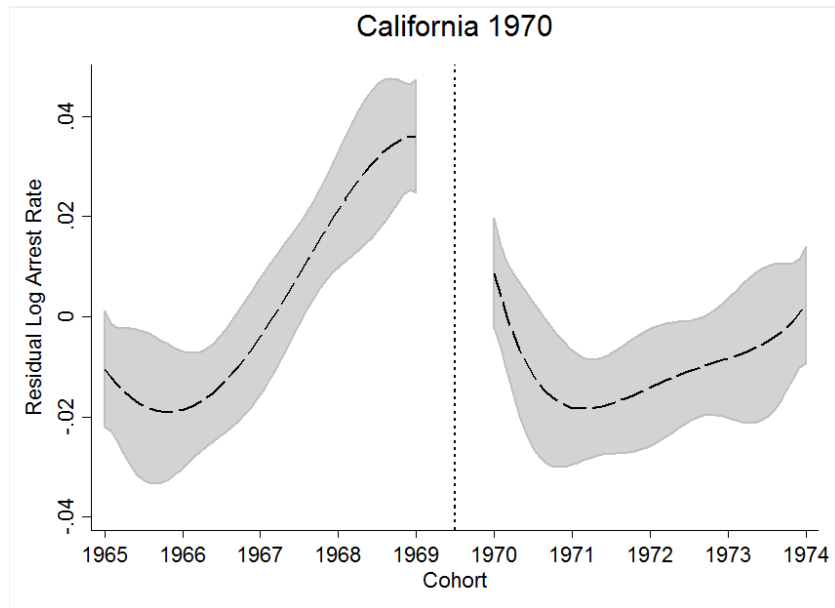
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**Figure 1: Variations Across Birth Cohorts**



**Figure 2:**  
**Examples of Discontinuities in Crime Around**  
**Changes in Compulsory School Leaving Age**

California Reform, 1970



England and Wales Reform, 1973

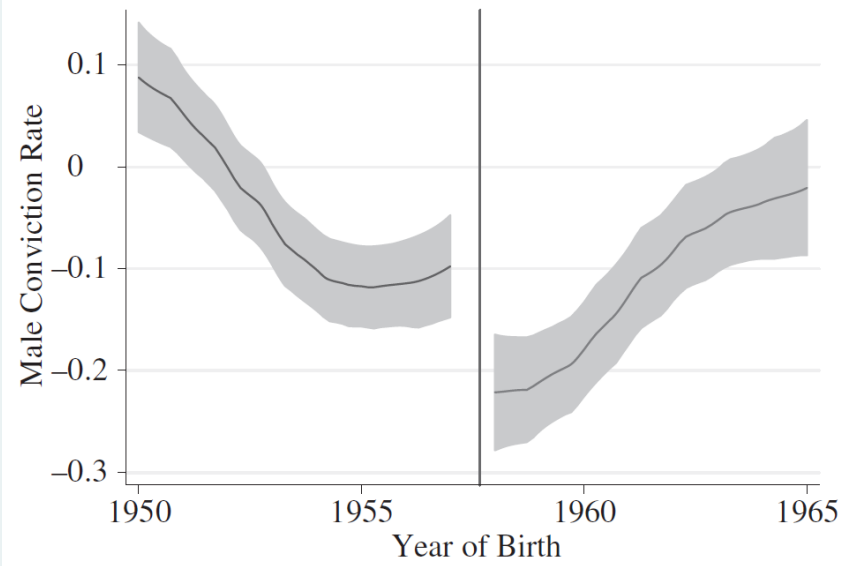
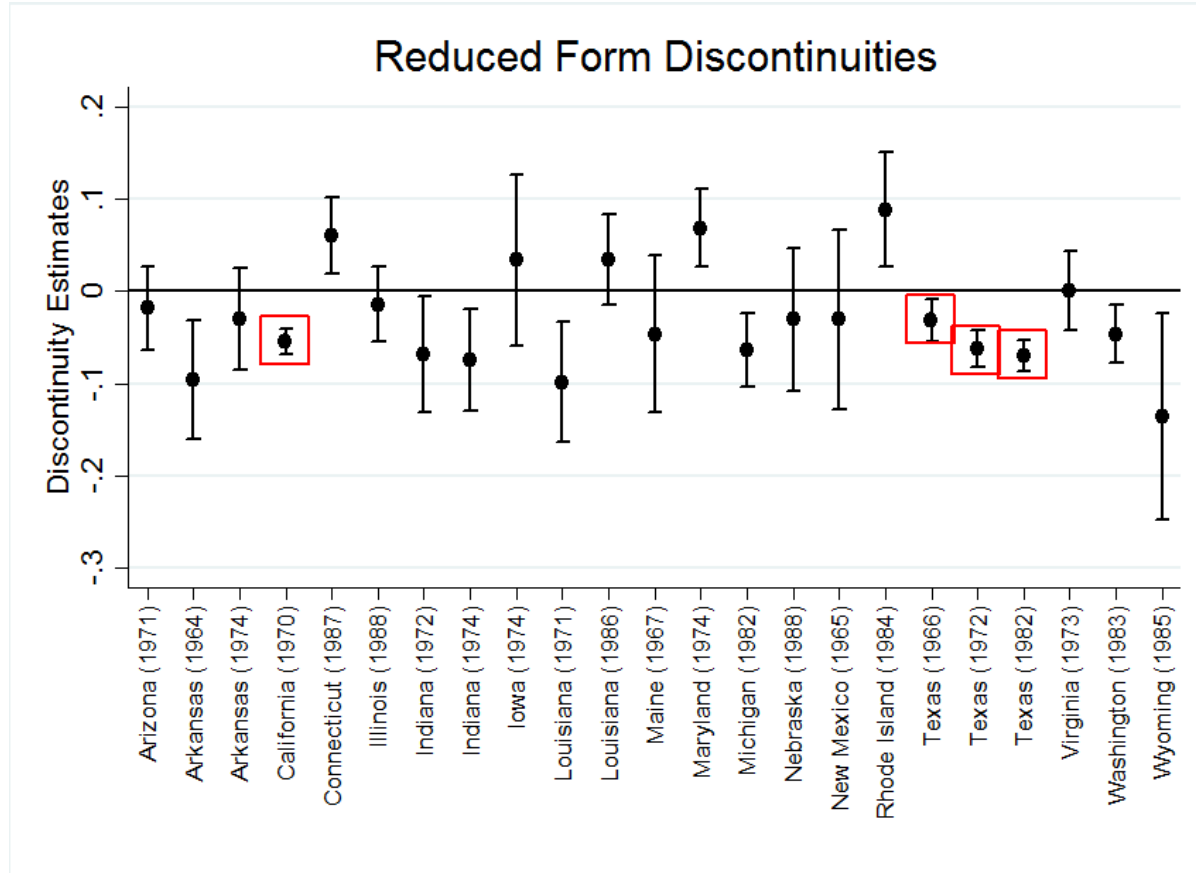
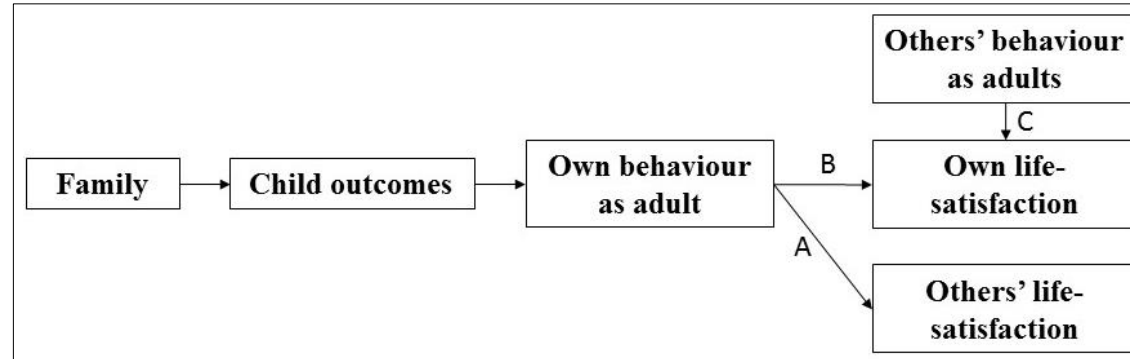


Figure 3: Crime Reduced Form Discontinuities For US States



**Figure 4: How individual experience affects self and others**



**Table 1: BCS Arrest Equations, Recap and Replication**

	Pr[Ever Arrested By Age 30]		
	(1)	(2)	(3)
	X = 16	X = 10	X = 10
Externalizing Behaviour Index, Age X	0.049 (0.005)	0.044 (0.005)	0.046 (0.005)
Internalizing Behaviour Index, Age X	-0.016 (0.005)	-0.023 (0.005)	-0.024 (0.005)
Cognitive Index, Age 10	-0.019 (0.005)	-0.018 (0.006)	-0.026 (0.005)
Emotional Index, Age 16	-0.020 (0.006)	-0.020 (0.005)	
Male	0.201 (0.010)	0.214 (0.009)	0.220 (0.008)
Non-White	0.006 (0.020)	-0.018 (0.022)	-0.019 (0.022)
Mother Education > No Qualifications	-0.038 (0.010)	-0.036 (0.009)	-0.039 (0.009)
Mother Age	-0.001 (0.001)	-0.002 (0.001)	-0.002 (0.001)
Live With Mother and Father	-0.033 (0.015)	-0.060 (0.014 )	-0.065 (0.014)
Sample Size	4740	7298	7298

Notes: Marginal effects from probit estimates. Standard errors in parentheses.

**Table 2: Whether Convicted by Age 24/25 - Sample Structure, CNLSY**

Birth Cohort	All		Two Year Birth Cohorts					
	1975-88	1975-76	1977-78	1979-80	1981-82	1983-84	1985-86	1987-88
Age 10/11 BPI Survey Year	1986-98	1986	1988	1990	1992	1994	1996	1998
Age 24/25 Crime Survey Year	2000-12	2000	2002	2004	2006	2008	2010	2012
Proportion Ever Convicted	0.22	0.20	0.24	0.25	0.22	0.22	0.23	0.18
Sample Size	4301	255	466	593	762	773	780	672

Notes: Proportion ever convicted weighted by young adult weights. Unweighted sample size.

**Table 3: Whether Convicted by Age 24/25 – Baseline Behavioural Problems Index Results, CNLSY**

	Pr[Ever Convicted By Age 24/25]				
	(1)	(2)	(3)	(4)	(5)
Behavioural Problems Index, Age 10/11	0.065 (0.008)	0.058 (0.009)	0.050 (0.009)	0.043 (0.009)	0.040 (0.019)
Cognitive Index, Age 10/11		-0.037 (0.010)	-0.047 (0.010)	-0.032 (0.011)	0.001 (0.027)
Controls	No	No	Yes	Yes	Yes
Mother Controls	No	No	No	Yes	No
Mother Fixed Effects	No	No	No	No	Yes
Sample Size	4301	4301	4301	4301	4301

Notes: Marginal effects from probit estimates. Weighted using young adult survey weights. Standard errors in parentheses.

**Table 4: Whether Convicted by Age 24/25 – Internalizing and Externalizing Behaviour Results, CNLSY**

	Pr[Ever Convicted By Age 24/25]				
	(1)	(2)	(3)	(4)	(5)
Externalizing Behaviour Index, Age 10/11	0.094 (0.013)	0.088 (0.013)	0.067 (0.013)	0.062 (0.013)	0.053 (0.025)
Internalizing Behaviour Index, Age 10/11	-0.035 (0.012)	-0.036 (0.012)	-0.021 (0.012)	-0.024 (0.013)	-0.017 (0.022)
Cognitive Index, Age 10/11		-0.036 (0.010)	-0.046 (0.010)	-0.030 (0.011)	0.007 (0.027)
Controls	No	No	Yes	Yes	Yes
Mother Controls	No	No	No	Yes	No
Mother Fixed Effects	No	No	No	No	Yes
Sample Size	4301	4301	4301	4301	4301

Notes: Marginal effects from probit estimates. Weighted using young adult survey weights. Standard errors in parentheses.

**Table 5: Whether Convicted by Age 24/25 – Detailed Behaviour Results, CNLSY**

	Pr[Ever Convicted By Age 24/25]				
	(1)	(2)	(3)	(4)	(5)
Antisocial Behaviour Index, Age 10/11	0.072 (0.011)	0.068 (0.011)	0.058 (0.012)	0.049 (0.012)	0.042 (0.020)
Anxiousness/Depression Behaviour Index, Age 10/11	-0.014 (0.011)	-0.012 (0.011)	-0.009 (0.011)	-0.008 (0.011)	-0.019 (0.020)
Headstrongness Behaviour Index, Age 10/11	0.014 (0.012)	0.016 (0.012)	0.019 (0.012)	0.022 (0.012)	0.020 (0.023)
Hyperactivity Behaviour Index, Age 10/11	0.018 (0.011)	0.011 (0.011)	-0.005 (0.011)	-0.005 (0.011)	0.000 (0.022)
Dependency Behaviour Index, Age 10/11	0.003 (0.010)	0.001 (0.010)	0.015 (0.010)	0.010 (0.010)	0.008 (0.019)
Peer Conflict/Social Withdrawal Behaviour Index, Age 10/11	-0.009 (0.011)	-0.008 (0.011)	-0.009 (0.011)	-0.010 (0.011)	0.003 (0.021)
Cognitive Index, Age 10/11		-0.029 (0.010)	-0.044 (0.011)	-0.030 (0.011)	0.003 (0.027)
Controls	No	No	Yes	Yes	Yes
Mother Controls	No	No	No	Yes	No
Mother Fixed Effects	No	No	No	No	Yes
Sample Size	4217	4217	4217	4217	4217

Notes: Marginal effects from probit estimates. Weighted using young adult survey weights. Standard errors in parentheses.

**Table 6: Sibling Differences, Male Only Families**

	Pr[Ever Convicted By Age 24/25], Male Sibling Differences		
	(1)	(2)	(3)
Behavioural Problems Index, Age 10/11	0.046 (0.024)	0.054 (0.026)	
Externalizing Behaviour Index, Age 10/11			0.068 (0.032)
Internalizing Behaviour Index, Age 10/11			-0.011 (0.035)
Cognitive Index, Age 10/11		-0.026 (0.033)	-0.009 (0.033)
Controls	Yes	Yes	Yes
Mother Fixed Effects	Yes	Yes	Yes
Sample Size	2136	2136	2136

Notes: Marginal effects from probit estimates. Weighted using young adult survey weights. Standard errors in parentheses.

**Table 7: Whether Arrested by Aged 30 (in 2000 Wave) – Baseline Rutter Index Results, BCS**

	Pr[Ever Arrested By Age 30]			
	(1)	(2)	(3)	(4)
Rutter Behaviour Index, Age 10	0.038 (0.004)	0.031 (0.004)	0.023 (0.004)	0.020 (0.004)
Cognitive Index, Age 10		-0.039 (0.005)	-0.038 (0.005)	-0.030 (0.005)
Controls	No	No	Yes	Yes
Mother Controls	No	No	No	Yes
Sample Size	7298	7298	7298	7298

Notes: Marginal effects from probit estimates. Standard errors in parentheses.

**Table 8: Whether Arrested by Aged 30 (in 2000 Wave) –Rutter Internalizing and Externalizing Behaviour Results, BCS**

	Pr[Ever Arrested By Age 30]			
	(1)	(2)	(3)	(4)
Rutter Externalizing Behaviour Index, Age 10	0.080 (0.004)	0.074 (0.005)	0.049 (0.005)	0.046 (0.005)
Rutter Internalizing Behaviour Index, Age 10	-0.040 (0.005)	-0.040 (0.005)	-0.024 (0.005)	-0.024 (0.005)
Cognitive Index, Age 10		-0.031 (0.005)	-0.033 (0.005)	-0.025 (0.005)
Controls	No	No	Yes	Yes
Mother Controls	No	No	No	Yes
Sample Size	7298	7298	7298	7298

Notes: Marginal effects from probit estimates. Standard errors in parentheses.

**Table 9: Whether Found Guilty in Court by Aged 30 (in 2000 Wave) –Rutter Internalizing and Externalizing Behaviour Results, BCS**

	Pr[Been Found Guilty in Court By Age 30]			
	(1)	(2)	(3)	(4)
Rutter Externalizing Behaviour Index, Age 10	0.062 (0.004)	0.057 (0.004)	0.037 (0.004)	0.034 (0.004)
Rutter Internalizing Behaviour Index, Age 10	-0.036 (0.004)	-0.037 (0.004)	-0.023 (0.004)	-0.023 (0.004)
Cognitive Index, Age 10		-0.017 (0.004)	-0.017 (0.004)	-0.012 (0.004)
Controls	No	No	Yes	Yes
Mother Controls	No	No	No	Yes
Sample Size	7244	7244	7244	7244

Notes: Marginal effects from probit estimates. Standard errors in parentheses.

**Table 10: Education Outcomes, CNLSY**

	Pr[High School Dropout]	
	(1)	(2)
Externalizing Behaviour Index, Age 10/11	0.030 (0.008)	0.055 (0.027)
Internalizing Behaviour Index, Age 10/11	-0.009 (0.007)	-0.038 (0.025)
Cognitive Index, Age 10/11	0.059 (0.009)	0.009 (0.033)
Controls	Yes	Yes
Mother Controls	Yes	No
Mother Fixed Effects	No	Yes
Sample Size	2502	2502

Notes: Marginal effects from probit estimates. Estimates weighted using young adult survey weights. Standard errors in parentheses.

**Table 11: Education Outcomes, BCS**

	Low or Poor Qualifications	Age Left Full Time Continuous Education
	(1)	(2)
Rutter Externalizing Behaviour Index, Age 10	0.044 (0.006)	-0.193 (0.030)
Rutter Internalizing Behaviour Index, Age 10	-0.015 (0.006)	0.085 (0.028)
Cognitive Index, Age 10	-0.150 (0.006)	0.861 (0.030)
Controls	Yes	Yes
Mother Controls	Yes	Yes
Sample Size	7351	7172

Notes: For column (1) marginal effects from probit estimates. Standard errors in parentheses.

**Table 12: Correlates of Crime Reduced Forms**

	Estimate of Crime Reduced Form, From Discontinuity Analysis					
	(1)	(2)	(3)	(4)	(5)	(6)
Percent black	-0.004 (0.001)					-0.003 (0.001)
Percent in employment		0.002 (0.001)				-0.007 (0.006)
Police per capita/1000			0.012 (0.014)			-0.005 (0.004)
Pupil/teacher ratio				0.013 (0.006)		0.022 (0.007)
Log(Teacher Salary)					-0.031 (0.037)	-0.020 (0.076)

Notes: From Bell, Costa and Machin (2016b). Standard errors in parentheses. Sample size is 762 counties for the 23 state discontinuity samples.

## Appendix

### Components of Behavioural Problems Index, CNLSY

Component	Internalizing	Externalizing
Child has sudden change in mood or feeling		✓
Child complains no one loves him/her	✓	
Child is rather headstrong, tense and nervous		✓
Child cheats or tells lies		✓
Child is too fearful or anxious	✓	✓
Child argues too much		✓
Child has difficulty concentrating	✓	
Child is easily confused		✓
Child bullies or is cruel/mean to		✓
Child is disobedient at home		✓
Child has trouble getting along with other children		✓
Child is impulsive or acts without thinking		✓
Child feels worthless or inferior	✓	
Child is not liked by other children		✓
Child has trouble getting mind off certain thoughts		✓
Child is restless, overly active, cannot sit still		✓
Child is sullen, stubborn or irritable		✓
Child has strong temper and loses it easily		✓
Child is unhappy, sad or depressed	✓	✓
Child is withdrawn, does not get involved with others	✓	
Child breaks own, or another's, things deliberately		✓
Child clings to adults	✓	
Child cries too much	✓	
Child demands a lot of attention	✓	
Child is too dependent on others	✓	

## **Components of Rutter Behavioural Problems Index, BCS**

**[to be added]**

## 9.1. Definitions of variables in ELSA

### Base model

*Age* (continuous)

*Sex*

*Ethnicity*: White European, non-White

*Education*: Highest educational attainment, 3 categories. Classified as high (e.g. university degree or higher), intermediate (e.g. ordinary or advanced-level secondary school examinations or equivalent) and low (completed no more than compulsory schooling).

*Employment*: Paid employment or not in paid employment

*Total non-pension wealth*: Total non-pension wealth, reported at the family level, defined as the sum of net financial wealth, net physical wealth and net housing wealth. To form wealth deciles, all ELSA sample members are ordered according to the value of their total (non-pension) family wealth and divide the sample into ten equal sized groups.

### Physical health

*Health conditions*: Respondents were asked whether a doctor had ever told them that they suffered from any of the following conditions: coronary heart disease (angina or myocardial infarction), diabetes, cancer, respiratory illness (asthma or pulmonary disease), arthritis, stroke, and depression.

*Limiting longstanding illness*: Respondents were asked whether they suffered from any illness or disability that affected them for over a long period of time and if so whether the illness limited their activities.

*Self-rated general health*: Respondents were asked to rate their health as excellent, very good, good, fair or poor. Note: this variable is measured at wave 5 for cross-sectional analysis and the change between wave 2 and wave 5 was used for longitudinal analysis

### Mental wellbeing

Note: all these variables are measured at wave 5 for cross-sectional analysis and the change between wave 2 and wave 5 was used for longitudinal analysis

*Cognitive function*: Aggregate of performance on five measures: immediate and delayed memory (word-list learning), verbal fluency (word-finding task), attention and processing speed (letter cancellation task).

*Sense of control*: Respondents were asked to answer on a 6-point scale how much they agreed to the following affirmation "I feel that what happens in life is often determined by factors beyond my control".

*Depressive symptoms*: Center of Epidemiologic Studies Depression Scale, 8 item version

Note: all these variables were measured at wave 5 for cross-sectional analysis and the change between wave 2 and wave 5 was used for longitudinal analysis

### Functional capability

*Mobility*: Number of impairment in 10 mobility items (e.g. walking 100 yards, climbing one flight of stairs without resting)

*Activities of Daily Living*: Respondents were asked to report whether they had any difficulty with one or more activities of daily living (dressing, walking across a room, bathing or showering, eating, getting out of bed, using toilet).

*Hearing difficulties*: Respondents were asked to rate their hearing as excellent, very good, good, fair or poor.

*Sight difficulties*: Respondents were asked to rate their eyesight as excellent, very good, good, fair or poor.

*Sleep quality*: Respondents were asked to rate their sleep quality as excellent, very good, good, fair or poor.

*Urinary incontinence* Yes, no

*Chronic pain*: Whether often troubled with pain yes, no.

### **Social relations and engagement**

*Marriage*: 4 categories. Married, never married, divorced, widowed.

*Organisational involvement*: Membership of 8 types of organisation and club (e.g. resident group, social club, church)

*Loneliness*: Short-form UCLA loneliness scale

*Social network*: Number of friends, relatives and children that the person is close to

*Positive support*: Ratings of support from spouse, children, relatives and friends (3 items per category)

*Organisational involvement*: Participation in organisations such as social clubs, religious groups, residents groups

*Cultural engagement*: Frequency of going to the cinema, an art gallery or museum, theatre, concert or opera

## 10.1. Financial difficulties

In many years' mothers were asked 'Has the family had major financial problems in the last year?' When we add to our standard equation for emotional wellbeing a variable to report the proportion of replies over the relevant period which were positive, the coefficients were as follows.

### How child's emotional wellbeing (standardised) is affected by financial difficulties (ALSPAC)

Child Age	Financial difficulties (standardised)	Financial difficulties (unstandardised)
Effect on standardised wellbeing at		
16	<b>-0.04 (.02)</b>	<b>-0.19 (.11)</b>
11	<b>-0.08 (.02)</b>	<b>-0.35 (.09)</b>
5	-0.01 (.01)	-0.04 (.05)

Source: Appendix 2. Table A.10.1.

Notes: Robust standard errors in parentheses. For additional controls see Table 10.1. Emotional wellbeing: Standardised self- and mother-reported SMFQ at ages 16 and 11; standardised mother-reported SDQ internalising at age 5. Financial difficulties: proportion of time family had major financial problems in the last year. Bold:  $p < .10$  (2-tailed).

This shows that financial difficulties are an important influence on the emotional wellbeing of teenage children. Since financial difficulties are not strongly correlated with family income ( $r = -0.2$ ) the implications for economic policy are unclear, though there are clear implications for educational policy

By contrast, there was no clear pattern of effects of financial difficulties on children's behaviour or intellectual performance.

## 15.1. Cost-effectiveness analysis in terms of happiness

This Appendix spells out more formally and in more detail the argument in Chapter 15, as it applies to governments. The discussion in the first few pages focusses on the situation where everything happens within one interval of time.

### The conceptual objective

The government's aim is, we assume, to maximise the happiness of the population (initially considered as the sum of each individual's happiness,  $H_i$ ). This has to be done subject to the usual constraints of endowments, technology and tastes, working their way through the market mechanism. In addition total public expenditure is assumed fixed. To affect things, the government has three main types of policy instrument.

- (i) The first is programmes involving **public expenditure**. We include in these not only public services but also transfer payments, in order to highlight the choice between giving people money and providing services which help people to help themselves. There is thus an array of possible programmes ( $P$ ). Each programme  $P_j$  involves an expenditure  $E_j$ . Not all possible programmes can be activated, since there is a public expenditure constraint,  $\bar{E}$  (assumed given):

$$\sum_j E_j \leq \bar{E} \quad (1)$$

- (ii) The second type of policy is **tax policy**, which determines the way in which public expenditure is financed. Again there is an array of different possible taxes ( $S$ ). Each tax  $S_k$  will yield its own tax-take  $T_k$  and altogether these tax receipts must finance the total of public expenditure:

$$\sum_k T_k \geq \bar{E} \quad (2)$$

- (iii) Finally there are **regulations**, where public revenue and expenditure are not the main issue. There is an array of possible regulations ( $R$ ) from which the government has to choose which ones to switch on.

(Clearly many actual policies are mixtures of these three forms, but this poses no substantive problem.)

So we can think of the happiness ( $H_i$ ) of individual  $i$  as being determined by which expenditure programmes, taxes and regulations are switched on:

$$H_i = H_i(P, S, R) \quad (i=1, \dots, n) \quad (3)$$

The government's job then is to choose  $P$ ,  $S$  and  $R$  to maximise  $\sum H_i$  subject to constraints (1), (2) and (3).

This task, if correctly undertaken, would throw up a shadow price of public expenditure (in units of happiness) corresponding to constraint (1). This price (call it  $p_E$ ) would measure the gain in happiness per dollar of expenditure resulting from the marginal public expenditure programme. It would also throw up a shadow price of tax receipts (in units of happiness) corresponding to constraint (2). This price (call it  $p_T$ ) would measure the loss of happiness per dollar of tax receipts resulting from the most damaging tax that squeezed through.

One would hope that these two shadow prices were the same. If the shadow price of expenditure were higher than that of taxes, it would suggest that  $\bar{E}$  should be higher. But issues of this kind must be left to the politicians. So we shall assume that  $p_E = p_T = p$ .

### Decentralisation

Maximizing  $\sum H_i$  subject to (1) – (3) describes the outcome we would like to achieve. But the same result can be achieved not through one single massive optimisation, but through a decentralised process whereby each possible programme, tax or regulation is looked at on its own.<sup>1</sup> For each possible change, we start from the existing configuration of policy and ask whether the change will be for the better. The answer is Yes if

$$\sum \Delta H_i - p(\Delta E - \Delta T) > 0 \quad (4)$$

By trial and error we should soon find a value for  $p$  which allowed the right number of expenditure programmes to pass the test. **Equation (4) provides the basic rule for all cost-effectiveness analysis where happiness is the criterion.**

- (i) For **public expenditure** programmes it says that the net gain in human happiness must exceed the net cost to the government times the shadow price of government funds. Perhaps more intuitively, it can also be written

$$\frac{\sum \Delta H_i}{\Delta E - \Delta T} > p \quad (5)$$

In other words the welfare gain per dollar of net public expenditure cost must exceed some crucial value  $p$ . This approach is called “cost-effectiveness analysis”, since the calculations of costs and effects are in different units (in this case costs being measured in dollars and effects in units of happiness).

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<sup>1</sup> This needs modifying if there are some very large projects or projects that are mutually exclusive but differ in public expenditure cost.

- (ii) For **taxation**, the following is perhaps the most intuitive formulation:

$$-\frac{\sum \Delta H_i}{\Delta T} < p \quad (6)$$

The loss of welfare per dollar of taxes raised must be below some critical level.

- (iii) For **regulation** there are often few expenditure or tax implications and the rule reduces to: Do if

$$\sum \Delta H_i > 0 \quad (7)$$

In measuring the changes in happiness it is important to include not only the benefits (like food safety) but also the disbenefits like reduced liberty or increased enforcement costs.

### Distribution of happiness

Many people argue that it is more important to raise the happiness of people for whom it is low than of those for whom it is already high. One approach here uses the veil of ignorance as the basis for ethical theory. The person making the ethical judgment is asked to rank states of the world without knowing which participant he will be. In such a situation he would probably prefer a state of the world with less inequality of happiness, even if this involved some fall in average happiness.<sup>2</sup> This has led economists such as Atkinson and Stiglitz to propose a social welfare function where social welfare ( $W$ ) is represented by<sup>3</sup>

$$W = \frac{1}{\alpha} \sum_i (H_i^\alpha - 1) \quad (\alpha < 1) \quad (8)$$

(This involves abandoning cardinality in favour of a ratio scale: the origin of  $H_i$  can no longer be varied at will.)

Now the change in social welfare resulting from a policy change becomes not  $\sum \Delta H_i$  but

$$\Delta W = \sum_i H_i^{\alpha-1} \cdot \Delta H_i \quad (9)$$

This adds no real difficulty to the approach except for the choice of  $\alpha$ , which is essentially a matter of ethical judgement or political preference. An alternative approach is simply to break down net benefits according to the levels of happiness of those affected – leaving the overall evaluation to the readers.

<sup>2</sup> This does not contradict “expected utility theory”. See Layard (2011), pp 312-3.

<sup>3</sup> Atkinson and Stiglitz (1980).

**Discount rates**

We have so far considered only one period. But almost all policies have multi-period effects. The government's objective is then to maximise the discounted sum of happiness-years, subject to expenditure and tax constraints in each period. In the absence of distributional weights this would lead to a multi-period decision criterion, analogous to (4) but expanded to

$$\sum_t \sum_i \Delta H_{it} (1 - \delta)^t - \sum_t p_t (\Delta E_t - \Delta T_t) > 0 \quad (10)$$

For  $\delta$  it seems reasonable to use a pure time preference rate of 1.5%, or possibly less. For  $p_t$ , which is the price of future government funds in units of today's happiness-years, it also seems reasonable to assume that  $p_t = p_0 (1 - \delta)^t$ .

**Length of life**

The analysis so far takes person-years as given. If we follow standard practice and take births as exogenous, we shall simply add an extra, discounted,  $\Delta H_i$  for each additional year which comes about through increased life expectancy.

**Measuring  $\Delta H_i$** 

So much for the framework. The much greater problem is measuring of  $\Delta H_i$  resulting from a policy change. The ideal approach would be a randomised controlled trial (RCT) but this is often not feasible. And it only gives data for as many years as the trial is continued. This is where life-course models can help. But this depends on the model being truly causal. To derive more causal models will require a lot more work. This has got to be one of the main tasks of social science in the years to come.

**Measuring  $(\Delta E - \Delta T)$** 

An equally important task is to get better measurements of the net change in public expenditure as a result of a policy. The immediate cost is usually fairly clear, but the subsequent impact through additional costs and cost savings is much less so. There have been many notable cases of over-claiming in this field. For example, early work on the Perry Pre-School Program showed that programme participants later received both more education and higher earnings than the control group. The higher earnings were credited to the programme without deducting the cost of the extra education.

To trace the year-by-year impact of a policy on the individual's use of public services is an absolutely critical need. Life-course models will help in this, as will experimental designs (as for example where a new mental health programme is introduced for some groups and the subsequent savings on physical healthcare are evaluated against control groups).

**Relation to traditional cost-effectiveness analysis**

Traditional cost-effectiveness can of course continue to be used in some areas where revealed preference provides good evidence. But this raises two questions.

- (1) How can non-pecuniary factors (such as X) be valued in money units? The best available approach is as follows. If we have a happiness equation in which both X and log income (log Y) appear, such as

$$H_i = a X_i + b \log Y_i + \text{etc} \quad (11)$$

it follows that the equivalent variation for a change in  $X_i$  is

$$\Delta Y_i = \frac{a}{b} Y_i (\Delta X_i) \quad (12)$$

- (2) If some policies are evaluated in units of happiness and others in money, how do we compare policies in those two different categories? The problem here is that there is a wide range of estimates of the marginal utility of money at any particular income level (though not of the ratios between the marginal utility at different income levels). So in practice it may be necessary to have two separate pots of money – one for policies evaluated in money units and one for policies evaluated in units of happiness.

**Conclusion**

Present methods of cost-effectiveness analysis give little guide to the cost-effectiveness of much of public policy. The only way forward is through direct measurement of happiness and causal models of how it is determined. This is still in its infancy. But, even existing knowledge indicates the need for major new priorities. And, as knowledge accumulates, the evaluation of specific projects in terms of happiness outcomes will become increasingly feasible. We urge Finance Ministries to take a lead in making this happen, as they have done with traditional cost-effectiveness analysis.

Atkinson, A.B. and Stiglitz, J.E. (1980). *Lectures on Public Economics*, Maidenhead: McGraw-Hill.  
Layard, R. (2011). *Happiness: Lessons from a new science*, London: Penguin.

## **APPENDIX 5. SURVEY DETAILS**

- 1. British Cohort Study data (BCS)**
- 2. British Household Panel Survey (BHPS)**
- 3. German Socio-Economic Panel (SOEP)**
- 4. Household, Income and Labour Dynamics in Australia (HILDA)**
- 5. Behavioral Risk Factor Surveillance System (BRFSS)**
- 6. Avon Longitudinal Study of Parents and Children (ALSPAC)**

# 1 British Cohort Study

## 1. Data

### a. The BCS sample

The sample used in Tables 1,2,3 and 5 is based on the British Cohort Study (BCS). The 1970 BCS follows the lives of more than 17,000 people born in England, Scotland and Wales in a single week of 1970. Over the course of cohort member lives, the BCS70 has collected information on health, physical, educational and social development, and economic circumstances among other factors. Since the birth survey in 1970, there have been eight “sweeps” of all cohort members at ages 5, 10, 16, 26, 30, 34, 38 and 42. At each sweep, different sources and methods were used to gather information on the cohort members. In the birth survey, the midwife present at the birth completed a questionnaire and supplementary information was obtained from clinical records. As the cohort members got older, the tools and information gathered changed. Health Visitors interviewed the parents, teachers completed questionnaires, medical examinations were carried out, and cohort members themselves participated in educational assessments.<sup>5</sup> The original BCS70 cohort contained 52 per cent boys; over two thirds of mothers of the cohort children were between 20 and 30 years old at the birth; nearly 60 per cent of the cohort children’s mothers and 55 per cent of fathers left school at age 15. Seventy per cent of the cohort child families had up to two children and 92 per cent of the parents were married.

### b. Attrition and non-response

Studies of non-response in longitudinal studies have revealed that it most often has systematic elements and is not random. Ketende et al. (2010)<sup>6</sup> have carried out analysis of attrition in the BCS70 sample. Response rates vary between 61 per cent and 95 per cent across waves. Therefore, each regression is performed on all survey members for whom we have a non-missing value of the left-hand variable. Where the respondent has no information available for the right-hand variable, we include a variable-specific dummy to register the fact (the so-called Missing Indicator method). In our prior analysis of the British Cohort Study, we have also used as an alternative the Multiple Imputation method and the main results are very similar regardless of whether missing indicators or multiple imputation is used (Layard et al., 2014).

## 2. Variables

Table S1 shows the variables used for the in the main text. Table S2 gives fuller detail of exact questions used in the surveys.

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<sup>5</sup> The BCS website contains details of all the data (<http://www.cls.ioe.ac.uk/page.aspx?&sitesectionid=795&sitesectiontitle=Welcome+to+the+1970+British+Cohort+Study>)

<sup>6</sup> Centre for Longitudinal Studies Working Paper

**Table S1: BCS Variables**

<b>Variable</b>	<b>Measured at Age (year)</b>	<b>Question(s)</b>	<b>Scale</b>	<b>Reported By</b>
<b>Life satisfaction</b>	42	How dissatisfied or satisfied are you about the way your life as turned out so far?	Responses reported on a 0-10 scale.	self
<b>Adult outcomes</b>				
<b>Income</b>	34,42	Equivalised household weekly income	£2012, log	self
<b>Qualifications</b>	34,42	Highest level of education achieved	6 categories (No qual; CSE; O-level; A-level; Degree; Higher degree).	self
<b>Not unemployed</b>	34,42	Currently not unemployed	Dummy variable 0-1	self
<b>Non-criminality</b>	30,34	How many times has respondent been formally cautioned at the police station? How many times has respondent been found guilty by a criminal court?	Total (reversed) score used.	self
<b>Partnered</b>	34,42	Currently married or cohabiting	Dummy variable 0-1	self
<b>Having children</b>	34,42	Whether cohort member has any of own kids in the household	Dummy variable 0-1	self
<b>Physical health conditions</b>	34,42	Number of physical health conditions	Each condition recoded on 0-1 scale. Total points score of 11 questions (See Table A2 for details of questions)	self
<b>Emotional health</b>	30,34	Malaise score	Each response recoded on 0-1 scale. Total points score of 24 questions. (See Table A2 for details of questions).	self
<b>Child outcomes</b>				
<b>Academic Achievement</b>	16	Has at least an O-level (NVQ2)	Dummy variable 0-1	Mother
<b>Behaviour</b>	16	17 questions on behavioural and hyperactivity problems	Each response recoded on 0-1 scale. Total score used. (See Table A2 for details of questions)	Mother

<b>Emotional Health</b>	16	22 questions answered by the child and 8 questions answered by the mother on emotional problems	Each response recoded on 0-1 scale. Total score used. (See Table A2 for details of questions)	Mother+child
<b>Family</b>				
<b>Parents' Education</b>	pre-birth	Age parents left full time education	Average score used.	Mother
<b>Family Income</b>	10	Equivalised family weekly income	£1986, log	Mother
<b>Involvement</b>	10	Frequency family goes for a walk together; go for outling together; have meal together; go for holidays together; go shopping together; chat for at least 5 minutes; go to restaurant together	Each activity recoded on a 0-1 scale (sometimes or often; rarely). Total score used.	Mother
<b>Mother Mental Health</b>	5,10	Malaise score	Each response recoded on 0-1 scale. Total points score of 24 questions. (See Table A2 for details of questions)	Mother
<b>Family Break up</b>	0,5,10,16	Both natural parents live in household at 16	Reverse scale (1,0)	Mother
<b>Mother work</b>	0,5,10,16	Currently employed	# of waves answered yes (/4)	Mother
<b>Father Unemployment</b>	0,5,10,16	Currently unemployed	# of waves answered yes (/4)	Mother

**Table S2 : BCS Variables – Exact wording**

<b>Malaise score (26,34)</b>
<p><i>How You feel. Please answer these questions by ticking either the Yes or the No box for each one</i></p> <p>Do you often have backache?            Do you feel tired most of the time?            Do you often feel miserable or depressed?            Do you often have bad headaches?            Do you often get worried about things?            Do you usually have great difficulty in falling or staying asleep?            Do you usually wake unnecessarily early in the morning?            Do you wear yourself out worrying about your health?            Do you often get into a violent rage?            Do people often annoy and irritate you?            Have you at times had twitching of the face, head or shoulders?            Do you often suddenly become scared for no good reason?            Are you scared to be alone when there are no friends near you?            Are you easily upset or irritated?            Are you frightened of going out alone or of meeting people?            Are you constantly keyed up and jittery?            Do you suffer from indigestion?            Do you suffer from an upset stomach?            Is your appetite poor?            Does every little thing get on your nerves and wear you out?            Does your heart often race like mad?            Do you often have bad pains in your eyes?            Are you troubled with rheumatism or fibrositis?            Have you ever had a nervous breakdown?</p>
<b>Behaviour Scale (16)</b>
<p><i>Are the following statements about the child “Does not apply”, “Applies somewhat” or “Certainly applies”?</i></p> <p>Is very restless            Is squirmy/fidgety            Often destroy belongings            Frequently fights with others            Is not much liked by others            Sometimes takes others things            Is often disobedient            Cannot settle to do things            Often tells lies            Bullies others            Is in inattentive/easily distracted            Hums or makes odd noises</p>

Requests must be met immediately  
 Shows restless behaviour  
 Is impulsive/excitable  
 Interferes with others activity  
 Given to rhythmic tapping/kicking

### Emotional Scale (16)

*Are the following statements about the child "Does not apply", "Applies somewhat" or "Certainly applies"?*

Often worried, worries about many things  
 Tends to do things on his own - rather solitary  
 Irritable. Is quick to "fly off the handle"  
 Often appears miserable, unhappy, tearful or distressed  
 Tends to be fearful or afraid of new things or new situations  
 Is fussy of over particular  
 Is sullen or sulky  
 Cries for little cause

*Feeling healthy. Please tell us whether you have each of these problems most of the time, some of the time, rarely or never.*

Do you have backache?  
 Do you feel tired?  
 Do you feel miserable or depressed?  
 Do you have headaches?  
 Do things worry you?  
 Do you have great difficulty sleeping?  
 Do you wake unnecessarily early in the morning?  
 Do you wear yourself out worrying about your health?  
 Do you ever get in a violent rage?  
 Do people annoy and irritate you?  
 Have you at times a twitching of the face, hand or shoulders?  
 Do you often suddenly become scared for no good reason?  
 Are you scared if alone?  
 Are you easily upset or irritated?  
 Are you frightened of going out alone or of meeting people?  
 Are you constantly keyed up and jittery?  
 Do you suffer from indigestion?  
 Do you suffer from an upset stomach?  
 Is your appetite poor?  
 Does every little thing get on your nerves and wear you out?  
 Does your heart often race like mad?  
 Do you often have bad pains in your eyes?

**Mother Mental Health (5,10)**

*Please tick all the symptoms that apply.*

- Do you often have backache?
- Do you feel tired most of the time?
- Do you often feel miserable or depressed?
- Do you often have bad headaches?
- Do you often get worried about things?
- Do you usually have great difficulty in falling or staying asleep?
- Do you usually wake unnecessarily early in the morning?
- Do you wear yourself out worrying about your health?
- Do you often get into a violent rage?
- Do people often annoy and irritate you?
- Have you at times had twitching of the face, head or shoulders?
- Do you often suddenly become scared for no good reason?
- Are you scared to be alone when there are no friends near you?
- Are you easily upset or irritated?
- Are you frightened of going out alone or of meeting people?
- Are you constantly keyed up and jittery?
- Do you suffer from indigestion?
- Do you suffer from an upset stomach?
- Is your appetite poor?
- Does every little thing get on your nerves and wear you out?
- Does your heart often race like mad?
- Do you often have bad pains in your eyes?
- Are you troubled with rheumatism or fibrositis?
- Have you ever had a nervous breakdown?

**Physical health conditions (34, 42)**

*Health problems since last interview:*

- Asthma/wheezy cough
- Hayfever
- Eczema
- Diabetes
- Int-convulsion/fit/epileptic
- Backache
- Cancer, Leukemia
- Problems with hearing
- Problems with eyesight
- High blood pressure
- Migraine

## 2-4 BHPS, SOEP, HILDA

	<b>BHPS</b>	<b>SOEP</b>	<b>HILDA</b>
<b>Life Satisfaction</b>	"How dissatisfied or satisfied are you with" (1-7 scale; rescaled to 0-10)	"How satisfied are you with your life, all things considered?" 0-10 Scale "completely dissatisfied" to 10 "completely satisfied")	'All things considered, how satisfied are you with your life?' 0-10 Scale
<b>Household Income</b>	Monthly Net HH Income (£2010, equivalised)	Monthly Net HH Income (€2010, equivalised)	Monthly Net HH Income (\$2010, equivalised)
<b>Gender</b>	Female=1	Female=1	Female=1
<b>Age</b>	Years old at survey	Years old at survey	Years old at survey
<b>Children</b>	Number of children residing in household	Number of children residing in household	Number of children residing in household
<b>Marital Status</b>	Single (responded "Single"); Partnered (responded "Married", "Remarried", "Live as Married"); Separated (responded "Divorced", "Separated"); Widowed (responded "Widowed")	Single (responded "Single"); Partnered (responded "Married/Live as Married"); Separated (responded "Divorced", "Separated"); Widowed (responded "Widowed")	Single (responded "Single"); Partnered (responded "Married", "Live as Married"); Separated (responded "Divorced", "Separated"); Widowed (responded "Widowed")
<b>Education</b>	Years of Education (derived from school leaving age and/or FE leaving age)	Years of education	Years of education
<b>Employment</b>	FT Employed (>29 hours a week in employment); FT Employed (<30 hours a week in employment); Self-Employed; Unemployed; Not in labour force	FT Employed (>29 hours a week in employment); FT Employed (<30 hours a week in employment); Self-Employed; Unemployed; Not in labour force	FT Employed (>29 hours a week in employment); FT Employed (<30 hours a week in employment); Self-Employed; Unemployed; Not in labour force
<b>Physical health</b>	See Annex 6.1		
<b>Mental health</b>	See Annex 6.1		

## 5 ALSPAC

### 1. Data

#### a. The ALSPAC sample

The sample used in Table 5 is based on the Avon Longitudinal Study of Parents and Children (ALSPAC). This is a near-census English cohort study, which is primarily designed to investigate environmental, genetic, and socio-economic influences on health and development over the life-course. The study recruited over 14,000 pregnant women residing in the Avon area of the UK with expected delivery dates between April 1, 1991, and December 31, 1992. This corresponds to circa 70% of the eligible pregnancies in the area (which comprises the city of Bristol and surrounding towns, villages and farming communities). The sample is broadly representative of the national population of mothers with children less than 12 months old, although higher socio-economic status groups as well as people of white ethnicity are over-represented compared to the national population taken as a whole.<sup>7</sup> The study contains various measures of the family environment as well as indicators of the development of child wellbeing and skills over time, along with rich information on the parents' characteristics and backgrounds. Our data is drawn from a mixture of postal questionnaires and tests collected in a clinical setting, as well as from linked administrative data on educational performance in national tests.<sup>8</sup>

#### b. Attrition and non-response

As is the case with many large cohort and panel datasets, there are problems of attrition and non-response. It is likely that attrition is non-random, and depends on respondent characteristics. Following other research in the life-course literature,<sup>9</sup> (e.g. Campbell *et al.*, 2014), we try to mitigate against biases based on this attrition using inverse-probability weighting in regressions where the outcome is based on survey responses. Attrition is much less of an issue when we consider cognitive outcomes, as these are measured by test scores matched from administrative data.

We estimate logit regressions for the probability of dropping out of the sample by age 16. The independent variables in this attrition equation are a vector of pre-birth characteristics,  $z_{i0}$ , including mother's education, mothers' age at the child's birth, child gender and ethnicity, whether the mother was married, whether she worked at any point during her pregnancy, and her mental health during pregnancy.<sup>10</sup> We use the outcomes from the logit attrition regression to calculate inverse-probability weights: these give more weight to observed individuals who have similar characteristics to those who are more likely to attrit from the study.

Each regression is performed on all survey members for whom we have a non-missing value of the left-hand explanatory variable. For input variables (which are typically measured at multiple time points during childhood) our strategy is to retain as much information and as much of the sample as possible by taking the average of all of the non-missing information available for each respondent. Where the respondent has no information available at all, we include a variable-

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<sup>7</sup> Boyd *et al.* (2013).

<sup>8</sup> The ALSPAC study website contains details of all the data, and is available through a searchable data dictionary (<http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary/>).

<sup>9</sup> e.g. Campbell *et al.* (2014).

<sup>10</sup> As such, this methodology relies on selection on observables, and sees attrition as ignorable non-response, conditional on the pre-natal characteristics  $z_{i0}$  (see Fitzgerald *et al.* (1998); Wooldridge (2002)).

specific dummy to register the fact (the so-called Missing Indicator method). In our prior analysis of the British Cohort Study, we have also used as an alternative the Multiple Imputation method and the main results are very similar regardless of whether missing indicators or multiple imputation is used.<sup>11</sup>

## 2. Variables

Table S3 shows of the variables used for the analysis underlying chapters 10, 11, 12 and 13 in the main text. Table S4 gives fuller detail of exact questions used in the survey.

## References

- Boyd, A., Macleod, J., Henderson, J., Molloy, L., Ring, S., Golding, J. and Ness, A. (2013). 'Cohort profile: The "Children of the 90s"-The index offspring of the Avon longitudinal study of parents and children', *International Journal of Epidemiology*, 42, pp. 111-127.
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- Fitzgerald, J., Gottschalk, P. and Moffitt, R. (1998). 'An Analysis of Sample Attrition in Panel Data: The Michigan Panel Study of Income Dynamics', *Journal of Human Resources*, 33(251-299).
- Layard, R., Clark, A.E., Cornaglia, F., Powdthavee, N. and Vernoit, J. (2014). 'What predicts a successful life? A life-course model of well-being', *The Economic Journal*, 124(F720-738).
- Wooldridge, J.M. (2002). 'Inverse probability weighted M-estimators for sample selection, attrition, and stratification', *Portuguese Economic Journal*, 1, pp. 117-139.

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<sup>11</sup> Layard et al. (2014).

**Table S3. ALSPAC Variables**

<b>Variable</b>	<b>Measured at Child Age (months)</b>	<b>Question(s)</b>	<b>Scale</b>	<b>Reported By</b>
<b>Inputs</b>				
<b>Income</b>	33, 47, 85, 97, 134		£2008, log.	Mother*
<b>Financial Probs</b>	2, 8, 21, 33, 47, 61, 73, 97, 110, 122, 134	Major financial problem in past year	# of waves answered yes (/11).	Mother
<b>Parent Educ</b>	Pre-birth	Highest level of education achieved (avg. M+F)	A-Level achieved (1,0).	Mother
<b>Father Unemp</b>	2, 8, 21, 33, 47, 61, 73, 97, 110, 122, 134	Partner lost job in past year	# of waves answered yes (/11).	Mother
<b>Mother Work</b>	8, 21, 33, 47, 61, 73, 97, 110, 122, 134	Currently in work	# of waves answered yes (/10).	Mother
<b>Involvement</b>	6, 18, 42, 57, 69, 81	Frequency mother has conversations with the child; sings to child; reads to child; draws/paints with child; helps with homework; helps prepare for school	Each activity reported on a 1-5 scale (never, <less than once a week, once a week, 2-5 a week, every day). Total score used.	Mother
<b>Aggression</b>	18, 42, 57, 78	Frequency mother i) shouts at, and ii) smacks/slaps child when has child has a tantrum	Each tantrum response is coded on a 0-2 scale (never, sometime, often). Total score used (/4).	Mother
<b>Family Conflict</b>	21, 33, 73, 110, 145	In past 3 months have you and your partner argued frequently (>3 times)? Either you or your partner been irritable with the other? Not spoken to the other for a long period of time? Walked out on the other? Shouted at the other? Hit/slapped the other? Thrown something in anger?	Total index of yes/no answers (/8).	Mother
<b>Mother M Health</b>	2, 8, 21, 33, 61, 73, 97, 134	Edinburgh Post-Natal Depression Scale (EPDS)	See Table A6. Reverse coded.	Mother
<b>Father M Health</b>	2, 8, 21	Crown-Crip Experiential Index (CCEI)	See Table A6. Reverse coded.	Father

<b><u>Outcomes</u></b>				
<b>Academic Achievement</b>	Age 16	58 points for an A*, 52 for an A, 46 for a B, etc... to 16 for a G grade in GCSE	Total points score of best 8 GCSEs.	External (National Pupil Database)
	Age 11	Key Stage 2	Average point score on Maths, English and Science	External (National Pupil Database)
	Age 5	School entry assessment	Average on Maths, Reading, Writing and Languages	Local data
<b>Behaviour</b>	All ages	Strengths and Difficulties Questionnaire (SDQ)	Externalising Behaviour Scale Reverse coded.	Mother
<b>Emotional Health</b>	Ages 16 + 11	Short Moods and Feelings Questionnaire (SMFQ)	Total score of mother+child reported	Mother+Child
	Age 5	Strengths and Difficulties Questionnaire (SDQ)	Total score, mother-reported	Mother

\*"Mother refers to the main carer, which is the natural mother in the majority of cases. "Father" refers to the mother's partner.

**Table S4 ALSPAC Variables – Exact wording**

<b>Strengths and Difficulties Questionnaire (SDQ)</b>
<b>Internalising Behaviour Scale</b>
<i>Are the following statements about the child “Not True”, “Somewhat True” or “Certainly True”?</i>
Often complains of headaches, stomach-aches or sickness
Many worries, often seems worried
Often unhappy, down-hearted or tearful
Nervous or clingy in new situations, easily loses confidence
Many fears, easily scared
Rather solitary, tends to play alone
Has at least one good friend
Generally liked by other children
Picked on or bullied by other children
Gets on better with adults than with other children
<b>Externalising Behaviour Scale (Conduct and Hyperactivity scales)</b>
<i>Are the following statements about the child “Not True”, “Somewhat True” or “Certainly True”?</i>
Generally obedient, usually does what adults request
Often has temper tantrums or hot tempers
Often fights with other children or bullies them
Often lies or cheats
Steals from home, school or elsewhere
Restless, overactive, cannot stay still for long
Constantly fidgeting or squirming
Easily distracted, concentration wanders
Thinks things out before acting
Sees tasks through to the end, good attention span
<b>Short Mood and Feelings Questionnaire (SMFQ)</b>
<i>Are the following statements about you / the child “True”, “Sometimes True” or “Not at all”?</i>
I felt miserable or unhappy
I didn't enjoy anything at all
I felt so tired I just sat around and did nothing
I was very restless
I felt I was no good anymore
I cried a lot
I found it hard to think properly or concentrate
I hate myself
I was a bad person
I felt lonely
I thought nobody really loved me
I thought I could never be as good as other kids
I did everything wrong

**Edinburgh Post-Natal Depression Scale (EPDS)**

*Please check the answer that comes closest to how you have felt in the past 7 days*

- I have been able to laugh and see the funny side of things.
- I have looked forward with enjoyment to things.
- I have blamed myself unnecessarily when things went wrong.
- I have been anxious or worried for no good reason.
- I have felt scared or panicky for no very good reason.
- Things have been getting on top of me.
- I have been so unhappy that I have had difficulty sleeping.
- I have felt sad or miserable.
- I have been so unhappy that I have been crying.
- The thought of harming myself has occurred to me.

# **APPENDIX 6:**

## **Do files**

**[To come]**