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ABSTRACT

The Causes and Consequences of Early-Adult Unemployment: Evidence from Cohort Data[*]

We here use the employment-history data from the British Cohort Study to calculate an individual's total experience of unemployment from the time they left school up to age 30. We show that this experience is negatively correlated with the life satisfaction that the individual reports at age 30, so that past unemployment scars. We also identify the childhood circumstances and family background that predict this adult unemployment experience. Educational achievement and good behaviour at age 16 both reduce adult unemployment experience, and emotional health at age 16 is a particularly strong predictor of unemployment experience for women. Both boys and girls reproduce on average their parents' unemployment, so that adult unemployment experience is transmitted between generations. We uncover evidence of a social-norm effect: children from less-advantaged backgrounds both experience more adult unemployment but are less affected by it in well-being.

JEL Classification:	J21, J63, I31
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1. Introduction

Is unemployment voluntary? This question is not only central to our understanding of societal well-being but also determines labour-market policy. A number of well-known articles have concluded that unemployment is likely involuntary, in the sense that it is associated with sharply lower subjective well-being in both cross-section and panel data (one example is Winkelmann and Winkelmann, 1998). The existing literature has also emphasised that unemployment scars: the well-being losses associated with a period of unemployment persist beyond the end of the unemployment spell (Clark *et al.*, 2001, and Knabe and Rätzel, 2011). As such only considering the contemporaneous effect of unemployment will underestimate its total effect.[1]

If we accept that unemployment is involuntary, then the understanding of its individual determinants becomes of policy interest. An extensive literature has already investigated the extent to which childhood characteristics such as cognitive and non-cognitive skills (Heckman *et al.*, 2006) and parental unemployment (Johnson and Reed, 1996) predict the probability of adult unemployment. To the best of our knowledge, Layard *et al.* (2014) was the first contribution to use a life-course model of well-being and birth-cohort data to consider simultaneously the predictive power of a large set of childhood characteristics on adult outcomes. While their analysis revealed a reasonably good fit for the estimation of outcomes such as educational achievement and emotional health at age 34, this performance was far worse when predicting adult unemployment measured at the same age. The adult labour-force status outcome in Layard *et al.* (2014) is "not being unemployed" at age 34. This is problematic as it neglects any scarring effect of past

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[1] We will also underestimate the societal effect if there are spillovers, in that an individual's unemployment reduces the well-being of those around them, either via altruism or because of others' fear of losing their own jobs. Regional or national unemployment is regularly found to be negatively correlated with subjective well-being: one well-known contribution here is Di Tella *et al.* (2001).

unemployment on well-being. As such, the prediction of unemployment at a given point in time does not suffice to explain adult well-being, and we instead would want to predict an individual's entire experience of unemployment on the labour market.

We here take advantage of long-run birth-cohort data to contribute to the literatures on both the causes and consequences of adult unemployment experience. The existing literature on the well-being scars of past unemployment has used only relatively recent individual labour-market outcomes (those over the past three years in Clark *et al*., 2001).[2] On the contrary, we here exploit information on the individual's entire labour-force history from the end of full-time education up to age 30 to produce an exhaustive measure of early-adulthood unemployment experience. We measure this latter as the percentage of months spent in unemployment out of the number of months that the individual has been active in the labour force. This unemployment-experience measure is then correlated with the individual's life satisfaction at age 30. The results are in line with those in the existing literature: past unemployment scars. However, we can here establish that this scarring effect comes not only from recent unemployment experiences, but rather from any past experience of unemployment, no matter how long ago.

We then turn to the determinants of this unemployment experience. As noted above, our measure of this latter goes far beyond a simple dummy for currently being unemployed, and so exhibits much more variation across individuals. The birth-cohort data we use here allows us to consider the role of a wide set of childhood characteristics and family background. For both men and women, better intellectual performance and behaviour at age 16 predict less unemployment experience as adults; for women, age 16 emotional health also plays a protective role.

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[2] An exception is Böckerman *et al*. (2019), who use Finnish survey data and match in register information on the number of unemployment months over the past ten years. They consider ten job-related well-being measures, and find estimated coefficients on past unemployment that are always negative, but only significant for two out of ten of their measures.

Family background is also shown to be important. In particular, growing up with a mother who worked translates into lower future unemployment experience; the same holds for mother's mental health during the respondent's childhood. While father's employment is important for both sexes, the effect is notably larger in size for men. There is thus significant intergenerational transmission of unemployment.

We do however find something of a social-norm effect: the effect of unemployment on adult well-being is lower for children from less-advantaged backgrounds.[3] This might reflect a greater adherence to an unemployment norm that acts as a buffer in terms of well-being but also translates into longer unemployment spells as adults.

The remainder of the paper is organised as follows. Section 2 reviews some of the literature on the causes and scarring effects of unemployment. Section 3 then presents the data and the empirical strategy, and the results appear in Section 4. Last, Section 5 concludes.

2. The Causes and Consequences of Unemployment Experience in a Life-Course Model of Well-Being

We here appeal to the life-course model of well-being that appeared in Layard *et al.* (2014) to investigate the causes and consequences of unemployment experience. This model postulates that adult life satisfaction is influenced proximally by other adult outcomes such as income or employment. It also assumes that adult life satisfaction is predicted by childhood characteristics and family background, with both direct effects and mediated effects via adult outcomes. Our objective here is to evaluate the extent to which early-adulthood unemployment experience affects adult life-satisfaction, and then how this unemployment experience is correlated with family

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[3] This intergenerational social norm of unemployment is of the same nature as the contemporaneous social norm of unemployment, where the comparison group is those in the labour market around you, as analysed in Clark (2003).

background and childhood characteristics. We review below the existing literature relating to these two questions.

a. Unemployment and well-being: direct, scarring and contextual effects

The negative well-being effect of contemporaneous unemployment has by now been demonstrated many times in the literature (Winkelmann and Winkelmann, 1998, Dolan *et al*., 2008, and Frey and Stutzer, 2010). The comparison of the estimated coefficients on unemployment and income often leads to the conclusion that the non-pecuniary losses from unemployment far exceed the pecuniary losses.

It has also been shown that past unemployment is correlated with current labour-market outcomes. Arulampalam (2001) uses British Household Panel Survey (BHPS) data to show that re-employment wages are negatively correlated with the number of months spent unemployed, and that it takes two years on average to move back to the pre-unemployment wage level. Gregg (2001) appeals to National Child Development Study (NCDS) data to conclude that long-term unemployment during young adulthood (between the ages of 16 and 23) translates into greater unemployment experience during adulthood (between the ages of 28 and 33). Nilsen and Reiso (2011) have more recently confirmed this broad conclusion in a sample of young Norwegian workers, using an identification strategy based on propensity-score matching: past unemployment negatively affects labour-market attachment via a greater risk of repeated unemployment or leaving the labour force entirely.

Unemployment also has scarring effects on well-being. Clark *et al*. (2001) use German Socio-Economic Panel (SOEP) data to conclude that unemployment experience over the past three years is associated with lower current life satisfaction, conditional on current unemployment status. Bell and Blanchflower (2011) analyse NCDS data and find that spells of youth unemployment have detrimental effects on current happiness, health and job satisfaction. This conclusion is confirmed

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using unemployment experience over the past five years in more recent SOEP data, as well as BHPS and Household, Income and Labour Dynamics in Australia (HILDA) data in Table 4.3 of Clark *et al*. (2018).

Last, Clark (2003) shows that the well-being effect of unemployment is lower for those with an unemployed partner or who live in higher-unemployment regions. He also shows that those whose well-being fell the most on entering unemployment leave unemployment faster, consistent with hysteresis in unemployment.

b. The childhood determinants of unemployment

Given its detrimental well-being effects, the identification of the individual determinants of unemployment is crucial. There is a considerable theoretical labour-economics literature on the determinants of unemployment and the length of individual unemployment spells. Job-search models predict that the duration of unemployment will fall with the job-arrival rate and rise with the individual's reservation wage, both of which reflect the worker's employment opportunities. These models do not however directly include any childhood determinants of future unemployment. Another strand of the literature has focussed on the determinants of long-term unemployment. The review in Machin and Manning (1999) concludes that this is likely affected by the average exit rate from unemployment and how this rate changes with unemployment duration, changes in unemployment inflows and the nature of duration dependence (whereby the longer the unemployment spell, the lower the unemployment-exit rate). While most of those are aggregate, duration dependence is rather an individual-level characteristic. The literature underlines the existence of two types of duration dependence: 'true' duration dependence and unobserved heterogeneity. According to Machin and Manning (1999), true duration dependence corresponds to situations where "*anyone entering unemployment but being unlucky and not finding a job would find their outflow rate declining*" (p. 3107). However, duration dependence may also

reflect unobserved individual heterogeneity. If two types of individuals become unemployed, 'low-types' with a low outflow rate and 'high-types' with a high outflow rate, then observed duration dependence may be driven purely by unobserved individual heterogeneity. Many contributions have attempted to disentangle 'true' duration dependence from unobserved heterogeneity by making assumptions about the functional form of the outflow rate and the distribution of unobserved heterogeneity. Differences in outflow rates across individuals, and therefore unemployment experience, may be partially determined by family background and childhood. There is an extensive economic literature demonstrating the importance of childhood cognitive and non-cognitive skills on labour-market outcomes. Among others, Heckman *et al*. (2006) used the National Longitudinal Survey of Youth 1979 (NLSY79) to show that better childhood cognitive and non-cognitive skills translate into a lower probability of being unemployed at age 30 (the gradient on non-cognitive skills is larger than that for cognitive skills). Apart from these skills, relatively little is known in the economic literature about how childhood characteristics and family background predict adulthood unemployment. This likely partly reflects the demands in terms of data, as we require information not only on childhood and family background, as in birth-cohort data, but also complete calendar information on labour-market status during adulthood. While the academic literature in economics on the childhood determinants of unemployment is limited, there have been notable contributions in sociology and psychology. Caspi *et al.* (1998) use a sample of 954 individuals from the Dunedin Multidisciplinary Health and Development Study to consider how different measures of human, social and personal capital at different ages in youth predict unemployment between the ages of 15 and 21. Kokko and Pulkkinen (2000) show that children who exhibit aggressive behaviour at age 8 are more likely to be long-term unemployed (defined as being unemployed for at least 48 months between the ages of 27 and 36), with this relationship being mediated by an index of school outcomes at age 14 (school success, interest in schoolwork,

punishments at school and truancy) and drinking problems at age 27. More recently, Daly *et al.* (2015) use British Cohort Study (BCS) data to show that childhood self-control and the number of months spent unemployed during adulthood are negatively correlated. Gregg and Machin (2000) consider NCDS birth-cohort data and estimate first the childhood determinants of juvenile delinquency and social disadvantage at age 16, and then correlate these measures with age-23 and 33 economic and social outcomes. Among others, they show that poor school attendance and living in a family in financial difficulties during childhood reduce the probability of being employed at age 33.

A part of the intergenerational-transmission literature has considered labour-market outcomes. Colombier and Masclet (2008) show for example that self-employment is transmitted across generations. Work using data on a number of developed countries, such as Johnson and Reed (1996), Corak *et al*. (2004) and Ekhaugen (2009), has found strong intergenerational correlation in the incidence of unemployment between parents and children.

We complement this existing work on the causes of unemployment in two ways. We first simultaneously take into account the influence of a variety of different dimensions of childhood and family background, rather than concentrating on the isolated effect of one or a small number of specific childhood characteristics; we are also able to control for a large set of possible confounding variables.

Second, we take advantage of the cohort nature of our dataset by constructing a measure of unemployment that picks up all of the time that the respondents have spent unemployed between the ages of leaving school and 30, rather than a simple dummy indicating whether the individual is unemployed at a certain given age. The following section describes our data and the way in which we construct our variables.

3. Data, Sample and Empirical Strategy

a. The British Cohort Study

Our empirical analysis uses data from the BCS, which follows the lives of more than 17,000 people born in England, Scotland and Wales in a single week in 1970. Over the course of cohort members' lives, the BCS70 collects information on individual health, physical, educational and social development and economic circumstances, as well as other variables. 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 methods were used to collect information on cohort members. At birth, the midwife who was present completed a questionnaire, and supplementary information was obtained from clinical records. At later sweeps, Health Visitors interviewed the parents, teachers completed questionnaires, medical examinations were carried out, and cohort members themselves participated in cognitive tests.[4] The original BCS70 cohort was 52 per cent male; over two-thirds of mothers of the cohort children were between 20 and 30 years old at the time of childbirth; nearly 60 per cent of the cohort children's mothers and 55 per cent of their fathers left school at age 15. Seventy per cent of respondents had at most two siblings at the age of 10, and 92 per cent of the parents were married.

The analysis of non-response in longitudinal studies has revealed that this often has systematic patterns and is thus not random. Ketende *et al.* (2010) analyse attrition in the BCS70 sample. The response rates vary between 61 per cent and 95 per cent across waves. Each regression we report here is carried out using all of the survey members who have non-missing values for the two

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[4] The BCS website contains details regarding all of the data:
http://www.cls.ioe.ac.uk/page.aspx?&sitesectionid=795&sitesectiontitle=Welcome+to+the+1970+British+Cohort+Study.

dependent variables (unemployment experience since leaving school and life satisfaction at age 30). Where the respondent has missing information for a right-hand side variable, we create a variable-specific dummy variable to flag this missing information (the so-called Missing Indicator method) and replace the missing value by the sample mean. In our prior analysis of BCS data, we also used the Multiple Imputation method as an alternative: the main results turned out to be very similar between missing indicators and multiple imputation (Layard *et al.*, 2014).

b. Sample and variables of interest

This paper focuses on respondents with non-missing values for our two dependent variables, yielding a sample of 4753 observations for men and 5026 observations for women. The complete descriptive statistics appear in Table 1.

- **Unemployment experience**

Respondents in the 5th sweep, at age 30, were asked to report their last ten episodes on the labour market.[5] The potential statuses they can report in each episode are full-time employed, part-time employed, full-time self-employed, part-time self-employed, unemployed seeking work, full-time education, government training scheme, temporarily sick/disabled, permanently sick/disabled, looking after home/family, wholly retired, and other. Our measure of unemployment experience at age 30 is defined as follows:[6]

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[5] Ten or fewer episodes take almost all respondents back to the time they left full-time education. The ten respondents who had over ten episodes, and for whom we cannot therefore calculate lifetime unemployment experience, are dropped from the analysis.

[6] The age-42 wave of the BCS also includes information on past labour-market experience, although collected in a different way from that at age 30. There is more attrition at age 42 than at age 30. As a check, we can reproduce all of our main results here using life satisfaction at age 42 and the past labour-market experience variable calculated at that age.

$$Unemp. Exp_{i_{30}} = \frac{Total\ Length\ of\ Unemployment_i}{Length\ of\ Active\ Life_i}$$

Here *Total Length of Unemployment$_i$* corresponds to the number of months spent unemployed after leaving full-time education, and *Length of Active Life$_i$* is the number of months full-time employed, part-time employed, full-time self-employed, part-time self-employed or unemployed over the same period.[7] Table 2 shows the descriptive statistics for unemployment experience at age 30. While only 3.14% of the total sample is currently unemployed at age 30 (corresponding to a current unemployment rate of 3.5%, as 88.6% are currently active in the labour market), almost one quarter of our sample of BCS respondents had already had at least one unemployment experience by age 30. For 8.5% of the sample, this unemployment covered under 5% of their active life, while this latter figure is 15% or more for 8.1% of the sample.

- **Life satisfaction**

Life satisfaction is a measure of well-being that has been extensively analysed in the literature. In the BCS at age 30 this comes from the following question: "*How dissatisfied or satisfied are you about the way your life has turned out so far?*". Respondents reply on a scale of 0 to 10, with 0 meaning "*Not satisfied at all*" and 10 "*Perfectly satisfied*". Figure 1 depicts the distribution of life satisfaction in the sample. Over half of respondents reply 7 or 8, with only few people choosing values under 4. The resulting skewed well-being distribution is common in the literature.

- **Childhood characteristics and Family background**

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[7] Over 50% of the sample left full-time education at the earliest-possible age for this cohort, 16, and therefore have the maximum active life length at age 30 of 14 years.

The richness and long time-span of the BCS data allows us to include variables that were collected between the respondent's birth and age 30. We have family-background information at birth and during childhood (before age 16): family income, parental education, labour-force status and involvement with the child, family break-up, mother's mental health, the number of siblings and post-marital conception. Family income is measured at age 10 and parental education corresponds to the average age at which the respondent's parents left full-time education. The labour-force status of the parents was recorded in the BCS at ages 0, 5, 10 and 16. However, the format of the questionnaires is not the same over the various survey waves: the labour-force statuses "Employed" and "Unemployed" for both parents are consistently reported only at ages 0, 10 and 16. In our empirical analyses we will consider how often the mother and the father were observed to be employed at these three different child ages. Parental involvement at age 10 is reflected in an index summing the parental contributions to seven different activities with their children. We measure the mental health of mothers using the malaise score, which reflects psychological distress. The internal consistency of this score has been shown to be acceptable and the validity of the inventory holds for different socio-economic groups (Rodgers *et al*., 1999). The individual's childhood characteristics are captured by three variables measured at age 16: intellectual performance, behaviour and emotional health. Behavioural development comes from 17 questions similar to those found in the Strengths and Difficulties Questionnaire (see Meieloo *et al*. 2012, for more details on the validity and reliabiliy of this questionnaire during childhood) that are answered by the mother. Emotional development is picked up by the answers to eight questions from the mother and 22 from the child based on the malaise score. Last, child intellectual performance is a dummy for having achieved at least one O-level (NVQ2). More details on the exact wording and measure of all the family-background and childhood variables can be found in Appendix Tables A1 and A2.

c. Econometric models

We first estimate how unemployment experience during the individual's active life affects their life satisfaction at age 30 via the following OLS regression:[8]

$$LS_{i_{30}} = \beta_1 Unemp.Exp_{i_{30}} + \beta_2 Emp.Status_{i_{30}} + \beta_3 AO_{i_{30}} + \beta_4 CO_{i_{16}} + \beta_5 F0_{i_0} + \epsilon_{i_{30}} \quad (1)$$

Here LS_{i30} is the life satisfaction reported by individual i at age 30 and *Unemp.Exp$_{i30}$* is the percentage of the time active in the labour force that was spent unemployed from the end of school up to age 30. *Emp.Status$_{i30}$* is a vector of dummies for the individual's contemporaneous labour-force status at age 30 (full-time employed, part-time employed, self-employed, unemployed, or out of the labour market). Last, *AO$_{i30}$*, *CO$_{i16}$* and *F0$_{i0}$* refer respectively to individual adult outcomes at age 30 (income, qualifications, non-criminality, partnership and physical health), childhood outcomes at age 16 (intellectual performance, behaviour and emotional health) and family background before age 16 (family income, parental education, mother's employment, father's employment, parental involvement, family break-up, mother's mental health, the number of siblings and dummies for White, female and having low birth-weight).[9]

In the above equation, a negative and significant estimated *β₁* coefficient corresponds to a scarring effect of past unemployment on contemporaneous life satisfaction, conditional on current labour-force status.

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[8] We have also run ordered-probit models, which produce very similar results.
[9] The BCS data includes a small number of multiple births: 189 pairs of twins and one set of triplets at the time of birth. By age 30, we only have 91 pairs of twins left, which is too small for us to be able to introduce a family fixed effect.

We then turn to the determinants of current unemployment and unemployment experience at age 30, estimating the following OLS regressions:

$$Unemployed_{i_{30}} = \gamma_1 CO_{i_{16}} + \gamma_2\, F0_{i_0} + \mu_{i_{30}} \qquad (2)$$

$$Unemp.Exp_{i_{30}} = \theta_1 CO_{i_{16}} + \theta_2\, F0_{i_0} + \mu_{i_{30}} \qquad (3)$$

Here *Unemployed$_{i30}$* is a dummy for being unemployed at age 30 and *Unemp.Exp$_{i30}$* is, as above, the share of active months spent unemployed up to age 30. These regressions establish whether childhood characteristics at age 16 and family background can predict early-adulthood unemployment. The first of these equations is in the spirit of Layard *et al.* (2014), who considered the relationship between child outcomes and family background, on the one hand, and a number of adult outcomes at age 34, including unemployment. The fit of the unemployment regression there was poor, with an adjusted R^2 figure ranging between 0.007 and 0.010. Our use of unemployment experience, which exhibits much more variation than a dummy for current unemployment, should improve the quality of the fit, as revealed by a higher adjusted R^2.

We follow Heckman *et al.* (2006) and ask whether cognitive and non-cognitive skills at age 16 predict greater labour-market success by controlling for intellectual performance, behaviour and emotional health (*CO$_{i16}$*). We extend the scope of the analysis to family background *F0$_{i0}$* and pay special attention to the intergenerational transmission of labour-force status (as in Colombier and Masclet, 2008, for self-employment).

4. Results
a. The scarring effect of unemployment experience

Table 3 shows the results from the regression of life satisfaction at age 30 on a variety of adult outcomes, including unemployment experience in the first row, and various childhood and family-background variables. The first column only includes unemployment experience as an adult outcome and the second adds current labour-force status. The last column includes all of the other adult outcomes (income, qualifications, non-criminality, marital status and physical health, where the latter is lagged by one BCS wave) to the specification in column 2.[10] All of the specifications include childhood characteristics and family background

In the first column there is a significant negative correlation between unemployment experience and age-30 life satisfaction, controlling for childhood characteristics and family background. An increase of 14 percentage points in unemployment experience during active life (which corresponds to one standard deviation) produces a significant drop in life satisfaction of around one quarter of a point (0.14 x 1.640 = 0.23). However, as unemployment is serially correlated, this first estimate might reveal the life-satisfaction effect of current unemployment. As expected, the introduction of both unemployment variables together in column 2 somewhat reduces the estimated coefficient on unemployment experience. The latter does remain substantial though, with a one standard-deviation rise in unemployment experience now reducing life satisfaction by 0.17 points, and current unemployment reducing it by 0.83 points (which is consistent with the existing literature on unemployment and well-being). Last, past unemployment also has a scarring effect on other adult outcomes, such as earnings (Arulampalam, 2001). Unemployment experience may then affect current life satisfaction indirectly through other adult outcomes. We evaluate this possibility in column 3 by adding the other age-30 adult outcomes: this turns out to have only relatively little effect on the two estimated unemployment coefficients, both of which remain significant at the 1%

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[10] The determinants of well-being are often considered to differ for men and women. We have here carried out the analyses separately by gender but found no significant differences regarding the effect of unemployment experience.

level.[11] Conditional on adult outcomes, childhood characteristics and family background, past unemployment experiences from leaving school up to age 30 then continue to scar adult life satisfaction.

We also find that the positive effects of intellectual performance at age 16 and family income at age 10 in the first two columns become insignificant once we introduce the adult outcomes in column 3 (See Table A3 in the Appendix). From the life-course model of adult life-satisfaction, good grades at age 16 and family income then affect adult well-being only indirectly through better adult outcomes at age 30. However, some childhood characteristics continue to have direct significant impacts on well-being even controlling for adult outcomes. Good behaviour and mental health at age 16, as well as growing up with a mother with good mental health attract positive estimated coefficients, while that on family break-up is negative (Clark *et al.*, 2015). Last, conditional on family income, mother's employment is associated with lower adult well-being while father's employment is associated with greater adult well-being, which may reflect the deviation from traditional gender norms (Akerlof and Kranton, 2000).

Table 3 considered total unemployment experience since leaving school; we may also ask whether earlier unemployment matters more or less than later unemployment in this respect. Table 4 splits unemployment up into three ages: that between 16 and 20, 21 and 25, and 26 and 30. If there were to be discounting of past unemployment experiences, or in general a certain "critical age" for young people in the labour-market, then the effect of unemployment at different ages may not be the same. With no other contemporaneous control variables, in column 1 of Table 4, the estimated coefficient

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[11] We can also, conditional on unemployment experience, consider how many different unemployment episodes the individual has had. These do play an independent role, with more unemployment spells up to age 30 being negatively correlated with life satisfaction at age 30, conditional on total unemployment experience. The estimated coefficient on the latter remains negative and significant, and there is actually very little change in the explanatory power of the regression, as around three-quarters of the individuals who experience unemployment up to age 30 only experience it once.

on the most recent unemployment is significantly larger than that on the two earlier-unemployment variables. The introduction of contemporaneous controls in column 2 and 3 renders this difference insignificant (likely because unemployment between the ages of 26 and 30 is a better predictor of current labour-force status). As such, unemployment at any age continues to affect adult life satisfaction at age 30.

We next ask whether certain individuals are more affected by their unemployment experience than are others. Clark (2003) shows that the drop in life satisfaction due to unemployment is lower when living with an unemployed partner and in regions where the unemployment rate is higher. Along these lines, the effect of adult unemployment experience may be moderated by the childhood family environment. We here consider the role of family income and father's and mother's employment when growing up in the context of social-norm effects.

The results in Table 5 are consistent with social-norms. Those who suffer more from their own unemployment experience grew up in richer households and where both parents worked more. Clark (2003) shows that social-norm effects are stronger for men than for women. We confirm this finding in our analysis: the interactions terms are all significantly different from zero for men at conventional level while none of them is statistically significant for women. It may be argued that the employment-norm effects affect men more than women as the former are traditionally expected to be more active on the labour market (Akerlof and Kranton, 2000, and Bertrand *et al.*, 2015).[12]

In this sense, a less-favourable upbringing produces greater resilience to own adverse labour-market outcomes as an adult. However, in Clark (2003) smaller falls in well-being after unemployment entry produce longer subsequent unemployment spells. Less-favourable

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[12] Interacting the unemployment experience with father's unemployment and mother's unemployment yields similar results.

upbringings may then protect in a well-being sense but also produce the intergenerational transmission of unemployment.

It is of course possible that the correlation between unemployment experience between school leaving-age and age 30 and life satisfaction at age 30 reflect confounding factors, rather than a causal relationship. While the British Cohort Survey does allow us to control for a wide range of observable characteristics, both in adulthood and childhood, we cannot rule out omitted variables that simultaneously affect both unemployment experience up to age 30 and life satisfaction at age 30. To help turn this channel off, we estimate a value-added model that includes life satisfaction at age 26 among the regressors. The intuition here is that any omitted time-invariant variables Z that do predict both life satisfaction at age 30 and unemployment experience between leaving-school age and age 30 will be picked up by life satisfaction at age 26.

The results of this value-added analysis appear in Appendix Table A4.[13] The estimated coefficient on unemployment experience remains negative and significantly different from zero here at the 1% level. The estimated coefficient is much smaller than that from the baseline regression in Table 3. This is to be expected, as age-26 life satisfaction will already capture the effect of any unemployment experience up to age 26, so that our unemployment-experience coefficient in the value-added model now reflects the effect of the time spent unemployed between the ages of 26 and 30. The correct comparison here is between Table A4 and the third row of Table 4 (which shows the effect of unemployment between ages 26 and 30 without the lagged dependent variable of Table A4). The most complete specification in column 3 suggests that unobserved heterogeneity accounts for almost 45% of the correlation between unemployment experience and life satisfaction

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[13] The number of observations is lower here due to missing values for life satisfaction at age 26.

(in column 3: (-0.624+0.348)/(-0.624)=0.44). Nevertheless, unemployment experience remains a strong and significant predictor of lower life satisfaction at age 30.

Binder and Coad (2014) recently found that the detrimental impact of contemporaneous unemployment on subjective well-being is larger in the lower deciles of the well-being distribution. We hence re-estimate Equation (1) via a quantile regression with bootstrapped standard errors. The complete results appear in Appendix Table A5, and Figure 2 depicts the average effect of unemployment experience and the effects per life-satisfaction decile threshold. The estimated coefficients on unemployment experience are negative and significant for the first eight thresholds and thereafter insignificant. For the unhappiest of our sample (at the 10% threshold), one standard-deviation higher unemployment experience reduces life satisfaction by 0.27 points (-1.927 x 0.140 = -0.270) but has no effect at the top threshold (-0.005 x 0.140 = -0.001). As in Binder and Coad (2014), well-being acts as a buffer against adverse life events.[14]

b. How is unemployment experience determined by childhood characteristics and family background?

Given that unemployment has a large effect on adult well-being, it is important to understand its precursors. Table 6 shows how childhood characteristics and family background predict first unemployment at age 30 and then unemployment experience for the whole sample in columns 1 and 4 respectively. We separate men (in columns 2 and 5) from women (in columns 3 and 6) as labour-market outcomes and their determinants are likely to differ across gender. For instance, only 2.1% of women are officially unemployed at age 30 while the figure for men is 4.5%. On the

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[14] In Table A5 we find a fall in the effect of unemployment at age 30 over the life satisfaction quantiles, as in Binder and Coad (2014).

contrary more women (20.3%) than men (2.1%) are out of the labour force at that age. Women also have fewer active years between the end of full-time education and age 30 (9.4) than do men (10.9), and men have significantly higher unemployment experience (5% of their active life) than women (under 3%). These labour-market differences justify our separate analyses by sex.

The Adjusted R² in Table 6 is consistently two to three times larger for the regression of unemployment experience in columns 4 to 6 than for the regression of current unemployment at age 30 in columns 1 to 3. In terms of life-cycle well-being, the whole of unemployment experience matters more than just unemployment at one point in time, and in this sense it is encouraging that we have a better idea of what factors lie behind it.

The estimates in columns 1 and 4 are qualitatively comparable but are often more precisely estimated with unemployment experience as the dependent variable. In column 4, both cognitive and non-cognitive skills at age 16 are important predictors of future unemployment experience, as predicted by Heckman *et al.* (2006). Having at least an O-level reduces the share of time spent unemployed while active by 1.4 percentage points and one standard-deviation higher behaviour and emotional health reduce it respectively by 0.74 and 0.47 percentage points. This are sizeable effects considering that our estimation sample respondents spend on average 4% of their active life unemployed. Growing up with rich and involved parents also reduces unemployment experience: this is consistent with favourable childhood environments enhancing human-capital accumulation and consequently increasing the probability of labour-market success.[15]

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[15] Parental education in column 4 attracts, perhaps surprisingly, a positive estimated coefficient that is significant at the ten percent level. It is worth noting that this regression controls for family income and a number of other family success variables. Dropping family income in column 3 renders the estimated parental-education coefficient insignificant; the bivariate correlation between parental education and unemployment experience up to age 30 is indeed negative and significant.

Mother's and father's employment both predict unemployment experience in line with the intergenerational transmission of unemployment. We control for family income here, so this intergenerational transmission is non-pecuniary in nature. This is consistent with a social-norm effect: children who grow up with employed parents may spend less time unemployed themselves as the associated fall in well-being is larger than that for individuals with non-employed parents.

Comparing men to women, we do a better job in explaining men's unemployment experience up to age 30. In terms of the childhood variables, better intellectual performance and behaviour at age 16 are associated with less adult unemployment experience for both genders. This gender equality is not found for emotional health at age 16: the point estimate for men here is insignificant at -0.16 but is almost five times larger for women (-0.72) and very significant.[16]

Last, the family-background variables are far more important for men than for women. Family income, parental involvement and mother's mental health all predict men's unemployment experience but not women's.[17] Father's employment predicts future unemployment experience for both sexes (more strongly so for men), while mother's employment attracts a similar estimated coefficient across the sexes but is only significant (at the ten per cent level) for women.

5. Conclusion

This article is the first to estimate the scarring effect of the total experience of unemployment on well-being using cohort data. Based on the life-course approach of well-being, and consistent with

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[16] We can alternatively run a regression on the whole sample with all variables interacted with a "Female" dummy, a fully-interacted model. This naturally produces the same results, but presented in a different way (the significance of the male-female gap can be read off directly, but the main effect for the whole sample does not appear): these results are available on request.

[17] Combined with the results in Table 5, we thus have that men growing up in richer households experience less unemployment but suffer from it more. The net life-satisfaction effect via unemployment experience of having double average family income when growing up (compared to the average family income level) is negative: the more negative coefficient on unemployment experience outweighs the lower incidence of unemployment.

the existing literature, we find that past unemployment continues to reduce current well-being, even controlling for a wide set of variables covering family background, and childhood and adulthood outcomes (including current unemployment). The effects are non-negligible in size, with a one standard-deviation rise in unemployment experience reducing life satisfaction at age 30 by a quarter of a point. As unemployment experience is a stock variable, and assuming that the age-30 relationships also hold at other ages, early-life unemployment can have very substantial cumulative effects on well-being over adult life.

We predict this stock measure of unemployment at age 30 using information on adolescence and family background. Growing up in a favourable context (high family income, educated and involved parents) significantly reduces unemployment experience. Both sexes' unemployment experience is affected by their cognitive and behavioural outcomes at age 16 (as predicted by Heckman), and that of women also by their emotional health at that age. There is evidence of the intergenerational transmission of labour-market outcomes for both sexes, even controlling for family-background variables such as family income and parental education.

Social norms might be behind this correlation. In Clark (2003), the smaller the well-being drop from job loss the longer the subsequent unemployment spell. We show that the scarring effect of past unemployment is larger for those with employed parents, who may have greater adherence to a norm of employment that in turn produces greater intergenerational employment transmission.

It is also worth underlining that the family-background variables still have significant predictive power even controlling for child outcomes at age 16. As such, intervention at all ages will potentially reduce adult unemployment experience. That in early life via the various family variables, and that in adolescence via children's cognitive, behavioural and emotional-health outcomes, conditional on their family background. Our results suggest that any such successful intervention will have substantial well-being payoffs over adult life.

References

Akerlof, G. A., and Kranton, R. E. (2000). "Economics and identity." *Quarterly Journal of Economics*, *115*, 715-753.

Arulampalam, W. (2001). "Is unemployment really scarring? Effects of unemployment experiences on wages." *Economic Journal, 111*, 585–606.

Bell, D. N., and Blanchflower, D. G. (2011). "Young people and the Great Recession." *Oxford Review of Economic Policy*, *27*, 241-267.

Bertrand, M., Kamenica, E., and Pan, J. (2015). "Gender identity and relative income within households." *Quarterly Journal of Economics*, *130*, 571-614.

Binder, M., and Coad, A. (2015). "Heterogeneity in the relationship between unemployment and subjective wellbeing: A quantile approach." *Economica*, *82*, 865-891.

Böckerman, P., Bryson, A., Kauhanen, A., and Kangasniemi, M. (2019). "Does Job Support Make Workers Happy?" *Scottish Journal of Political Economy*, doi.org/10.1111/sjpe.12211.

Caspi, A., Wright, B.R.E., Moffitt, T.E., and Silva, P.A. (1998). "Early failure in the labor market: Childhood and adolescent predictors of unemployment in the transition to adulthood." *American Sociological Review, 63,* 424–451.

Clark, A.E. (2003). "Unemployment as a Social Norm: Psychological Evidence from Panel Data." *Journal of Labor Economics, 21*, 323-351.

Clark, A.E., Flèche, S., Layard, R., Powdthavee, N., and Ward, G. (2018). *The Origins of Happiness: The Science of Well-Being over the Life-Course*. Princeton NJ: Princeton University Press.

Clark, A. E., Lekfuangfu, W., Powdthavee, N., and Ward, G. (2015) "Breaking up for the Kids' Sake: Evidence from a British Birth Cohort." LSE, *Mimeo.*

Colombier, N., and Masclet, D. (2008). "Intergenerational correlation in self employment: some further evidence from French ECHP data." *Small Business Economics*, *30*, 423-437.

Corak, M., Gustafsson, B., and Österberg, T. (2004). "Intergenerational influences on the receipt of unemployment insurance in Canada and Sweden." In M. Corak (Eds.), *Generational Income Mobility in North America and Europe,* Cambridge: Cambridge University Press, 245-288.

Daly, M., Delaney, L., Egan, M., and Baumeister, R.F. (2015). "Childhood self-control and unemployment throughout the life span: Evidence from two British cohort studies." *Psychological Science, 26*, 709–723.

Di Tella, R., MacCulloch, R.J., and Oswald, A.J. (2001). "Preferences over inflation and unemployment: Evidence from surveys of happiness." *American Economic Review, 91*, 335–341.

Dolan, P., Peasgood, T., and White, M. (2008). "Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being." *Journal of Economic Psychology, 29*, 94–122.

Ekhaugen, T. (2009). "Extracting the causal component from the intergenerational correlation in unemployment." *Journal of Population Economics*, *22*, 97-113.

Gregg, P. (2001). "The impact of youth unemployment on adult unemployment in the NCDS." *Economic Journal, 111*, 626–653.

Gregg, P., and Machin, S. (2000). "Child development and success or failure in the youth labor market." In D.G. Blanchflower and R.B. Freeman (Eds.) *Youth Employment and Joblessness in Advanced Countries*, Chicago: University of Chicago Press, 247-288.

Heckman, J. J., Stixrud, J., and Urzua, S. (2006). "The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior." *Journal of Labor Economics*, *24*, 411-482.

Johnson, P., and Reed, H. (1996). "Intergenerational mobility among the rich and poor: results from the National Child Development Survey." *Oxford Review of Economic Policy*, *12*, 127-142.

Ketende, S.C., McDonald, J., and Dex, S. (2010). "Non-response in the 1970 British Cohort Study (BCS70) from birth to 34 years." *Centre for Longitudinal Studies, Working Paper No. 4*.

Knabe, A., and Rätzel, S. (2011). "Scarring or Scaring? The psychological impact of past unemployment and future unemployment risk." *Economica, 78*, 283-293.

Kokko, K., and Pulkkinen, L. (2000). "Aggression in childhood and long-term unemployment in adulthood: a cycle of maladaptation and some protective factors." *Developmental Psychology, 36*, 463.

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." *Economic Journal, 124*, F720–F738.

Machin, S., and Manning, A. (1999). "The causes and consequences of long-term unemployment in Europe." In O.C. Ashenfelter and D. Card (Eds.), *Handbook of Labor Economics, 3*, Elsevier, 3085–3139.

Nilsen, Ø.A., and Reiso, K.H. (2011). "Scarring effects of unemployment." *Department of Economics, Norwegian School of Economics. Working Paper No. 26/2011*

Rodgers, B., Pickles, A., Power, C., Collishaw, S., and Maughan, B. (1999). "Validity of the Malaise Inventory in general population samples." *Social Psychiatry and Psychiatric Epidemiology*, *34*, 333-341.

Stutzer, A., and Frey, B.S. (2010). "Recent advances in the economics of individual subjective well-being." *Social Research, 77*, 679–714.

Winkelmann, L., and Winkelmann, R. (1998). "Why are the unemployed so unhappy? Evidence from panel data." *Economica, 65*, 1–15.

Figures and Tables

Figure 1: Life Satisfaction at age 30 in the BCS
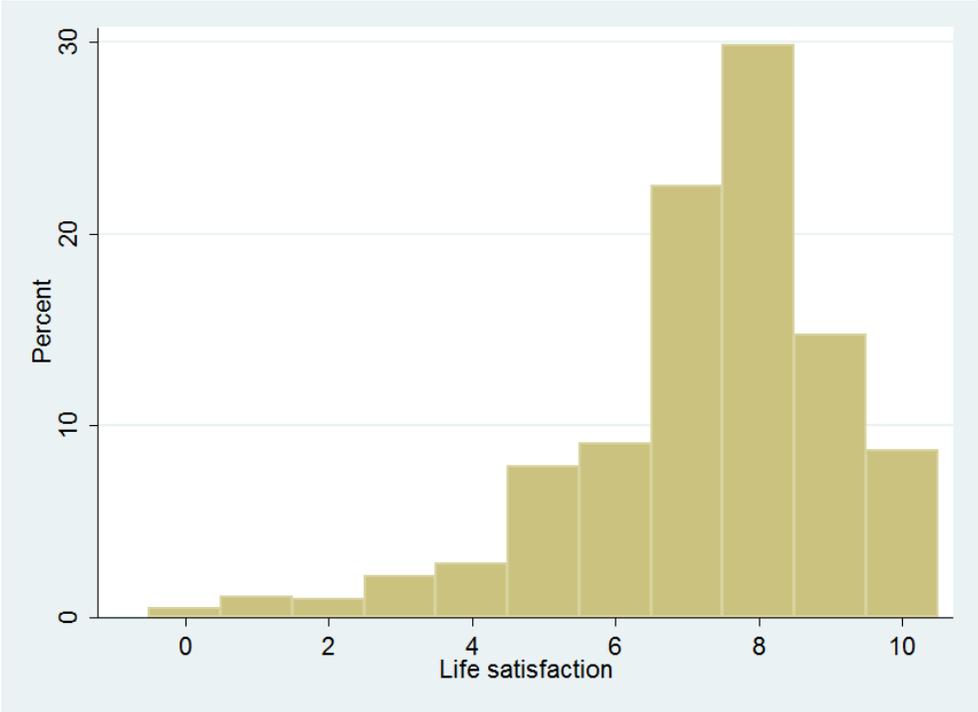
Figure 2: The Unemployment-Experience Effect over the Decile Thresholds of Life Satisfaction
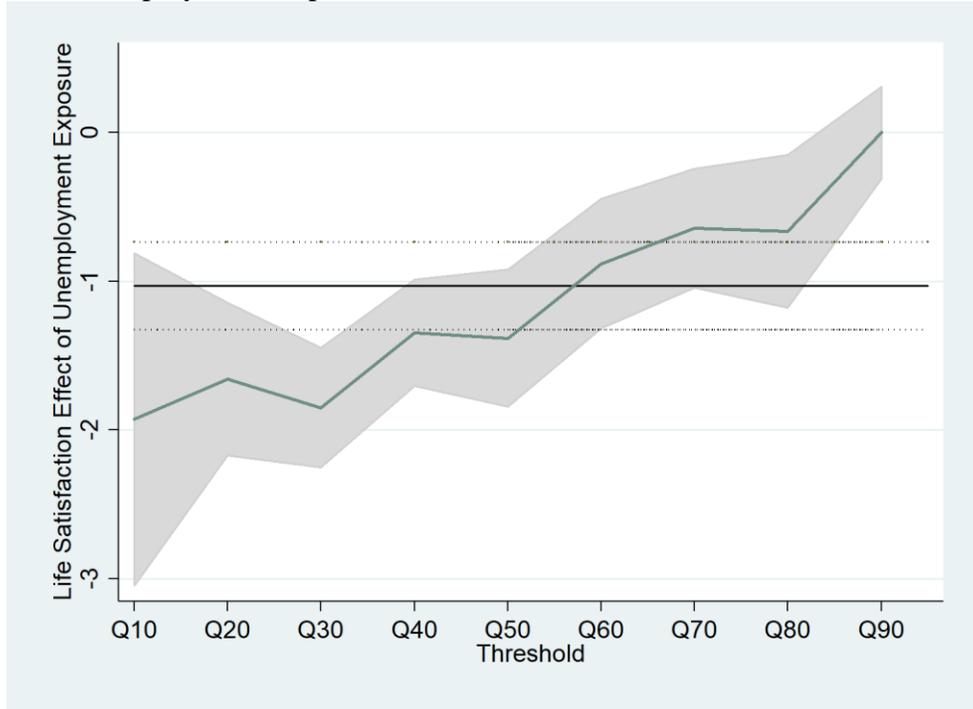
Note: The green line in this graph shows the estimated life-satisfaction coefficient at the nine different decile thresholds, and the grey area the associated 95% confidence intervals. The horizontal line is the average effect in the whole sample from Table 3, column 3 (with its associated confidence interval).

Table 1: Descriptive Statistics

	Unit	Mean / Proportion	Standard Deviation
Adult Outcomes:			
Life satisfaction	0-10	7.35	1.80
Unemployment Experience	Share	0.04	0.13
Physical health (lagged)	Index	0.28	0.59
Log Income	Ln	9.03	0.59
Qualifications	Index	3.51	1.20
Full-time employed	0/1	0.66	.
Part-time employed	0/1	0.12	.
Self-employed	0/1	0.08	.
Unemployed	0/1	0.03	.
Out of the labour force	0/1	0.11	.
Non-criminality	Arrests (inv.)	17.52	1.55
Partnered	0/1	0.30	.
Childhood Characteristics:			
Intellectual performance (16)	0/1	0.78	.
Behaviour (16)	Index	15.05	2.10
Emotional Health (16)	Index	17.12	1.87
Family Background:			
Log Family income	Ln	4.02	0.47
Parents' education	Age	15.77	1.77
Father's employment	Share	0.94	0.16
Mother's employment	Share	0.46	0.38
Parental involvement	Index	6.34	0.88
Family break-up	0/1	0.22	0.33
Mother's mental health	Index	0.68	0.11
No. of siblings	No.	1.74	1.19
Post-marital conception	0/1	0.92	.
Female	0/1	0.51	.
White	0/1	0.98	.
Low birth weight	0/1	0.06	.
Observations		9779	

Note: The scale of each variable is described in Table A1. We here show the proportion for dummy variables and the mean otherwise.

Table 2: The Distribution of Unemployment Experience at age 30

Unemployment Experience at age 30 (as a percentage of active life)	Percentage
0	77.25%
]0, 5]	8.54%
[5, 10[	4.16%
[10, 15[	2.04%
[15, 20[	5.54%
[20, 100]	2.54%

Table 3: Life Satisfaction and Adult Outcomes at Age 30

	Units	Life Satisfaction (0-10)		
		(1)	(2)	(3)
Unemployment experience	Share	-1.640***	-1.202***	-1.074***
		(0.111)	(0.163)	(0.168)
Part-time employed	0/1		-0.083***	0.228***
			(0.024)	(0.028)
Self-employed	0/1		0.141***	0.179***
			(0.043)	(0.034)
Unemployed	0/1		-0.830***	-0.739***
			(0.085)	(0.092)
Out of the labour force	0/1		0.011	0.091
			(0.108)	(0.122)
Income	Ln			0.244***
				(0.029)
Qualifications	SD(index)			0.070**
				(0.026)
Non-criminality	Arrests (inv.)			0.046***
				(0.005)
Partnered	0/1			0.298***
				(0.031)
Physical health (lagged)	SD(index)			0.198**
				(0.073)
Observations		9779	9779	9779
Adjusted R²		0.047	0.054	0.070

Notes: Standard errors are in parentheses. All regressions control for the age left full-time education and the childhood characteristics and family-background variables in Table 1. * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Life Satisfaction at Age 30 and Unemployment Experience at Different Ages

	Units	Life Satisfaction (0-10)		
		(1)	(2)	(3)
Unemployment experience (from age 16 to 20)	Share	-0.518***	-0.475***	-0.410***
		(0.081)	(0.067)	(0.063)
Unemployment experience (from age 21 to 25)	Share	-0.795***	-0.697***	-0.610***
		(0.081)	(0.068)	(0.064)
Unemployment experience (from age 26 to 30)	Share	-1.229***	-0.700***	-0.624***
		(0.123)	(0.167)	(0.172)
Part-time employed	0/1		-0.079***	0.224***
			(0.023)	(0.030)
Self-employed	0/1		0.140***	0. 178***
			(0.042)	(0.033)
Unemployed	0/1		-0.660***	-0.590***
			(0.075)	(0.070)
Out of the labour force	0/1		0.001	0.082
			(0.104)	(0.117)
Observations		9779	9779	9779
Adjusted R²		0.052	0.055	0.071
Adult Outcomes		No	No	Yes

Notes: Standard errors are in parentheses. All regressions control for the age when leaving full-time education and the childhood characteristics and family-background variables in Table 1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 5: Life Satisfaction and Adult Outcomes at Age 30 – Family-Background Heterogeneity

	Units	Whole	Men	Women	Whole	Men	Women	Whole	Men	Women
Unemployment experience	Share	-1.187***	-1.279***	-1.088***	-1.301**	-1.465***	-1.010***	-1.281***	-1.514***	-0.993***
		(0.161)	(0.217)	(0.242)	(0.274)	(0.211)	(0.186)	(0.081)	(0.280)	(0.173)
Family Income	Ln	0.054	0.013	0.085						
		(0.043)	(0.060)	(0.062)						
Unemployment experience x Family Income	Share*Ln	-0.459*	-0.766**	-0.146						
		(0.265)	(0.374)	(0.378)						
Father's Employment	Share				0.169**	0.162	0.168			
					(0.070)	(0.220)	(0.121)			
Unemployment experience x Father's Employment	Share* Share				-0.677*	-1.119**	0.109			
					(0.325)	(0.452)	(0.383)			
Mother's Employment	Share							0.008	-0.006	0.034
								(0.137)	(0.131)	(0.173)
Unemployment experience x Mother's Employment	Share* Share							-1.026*	-2.077***	0.283
								(0.564)	(0.532)	(0.756)
Observations		9779	4753	5026	9779	4753	5026	9779	4753	5026
Adjusted R²		0.067	0.076	0.098	0.070	0.085	0.068	0.071	0.085	0.068

Notes: Standard errors are in parentheses. All regressions control for the age left full-time education, the adult outcomes and the childhood characteristics and family-background variables in Table 1. All the estimates are centered. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 6: The Determinants of Unemployment at Age 30

	Units	P(Unemployment)			Unemployment Experience		
		All	Men	Women	All	Men	Women
Intellectual performance (16)	0/1	-0.94[*]	-1.37	-0.59	-1.38[***]	-1.17[*]	-1.52[***]
		(0.56)	(0.93)	(0.65)	(0.41)	(0.60)	(0.56)
Behaviour (16)	SD(index)	-0.77[***]	-0.86[**]	-0.70[**]	-0.74[***]	-0.95[***]	-0.52[**]
		(0.26)	(0.39)	(0.35)	(0.20)	(0.31)	(0.26)
Emotional health (16)	SD(index)	-0.34	-0.01	-0.56[**]	-0.47[***]	-0.16	-0.72[***]
		(0.23)	(0.39)	(0.28)	(0.17)	(0.24)	(0.22)
Family income	Ln	-0.31	-0.16	-0.46	-0.33[**]	-0.35[*]	-0.29
		(0.22)	(0.35)	(0.27)	(0.16)	(0.21)	(0.24)
Parents' education	Age	0.16	0.17	0.20	0.31[**]	0.15	0.47[**]
		(0.20)	(0.33)	(0.22)	(0.14)	(0.19)	(0.22)
Mother's employment	Share	-0.98[***]	-1.32[***]	-0.69	-0.56[**]	-0.53	-0.58[*]
		(0.37)	(0.60)	(0.45)	(0.14)	(0.41)	(0.33)
Father's employment	Share	-0.52	-1.55[***]	0.38	-1.03[***]	-1.39[***]	-0.78[**]
		(0.34)	(0.59)	(0.39)	(0.27)	(0.40)	(0.38)
Parental involvement	SD(index)	-0.42[*]	-0.96[**]	0.15	-0.45[***]	-0.51[**]	-0.36
		(0.24)	(0.40)	(0.26)	(0.17)	(0.24)	(0.22)
Family break-up	0/1	0.16	-0.12	0.50	0.26	0.66	-0.07
		(0.61)	(1.02)	(0.73)	(0.46)	(0.75)	(0.56)
Mother's mental health	SD(index)	-0.25	-0.49	-0.03	-0.31[*]	-0.65[**]	0.01
		(0.21)	(0.37)	(0.23)	(0.17)	(0.26)	(0.21)
No. of siblings	No.	0.55[**]	0.82[*]	0.28	0.54[***]	0.54[**]	0.51[**]
		(0.26)	(0.42)	(0.32)	(0.18)	(0.26)	(0.25)
Post-marital conception	0/1	-0.17	-1.01	0.68	0.54	0.44	0.68
		(0.69)	(1.23)	(0.71)	(0.47)	(0.75)	(0.59)
White	0/1	-0.45	-3.25	2.25[**]	-0.41	-2.21	0.96
		(1.72)	(3.27)	(1.05)	(1.25)	(2.08)	(1.31)
Low birth weight	0/1	-0.60	-0.84	-0.32	-0.18	-1.53[**]	1.06
		(0.76)	(1.31)	(0.85)	(0.60)	(0.70)	(0.94)
Female	0/1	-2.14[***]			-1.71[***]		
		(0.36)			(0.60)		
Observations		9779	4753	5026	9779	4753	5026
Adjusted R^2		0.021	0.029	0.012	0.043	0.056	0.033

Notes: Standard errors are in parentheses. All the coefficients are multiplied by 100. [*] p<0.10, [**] p<0.05, [***] p<0.01.

Appendix:

Table A1: BCS Variables

Variable	Measured at Age (year)	Question(s)	Scale	Reported By
Life satisfaction	30	How dissatisfied or satisfied are you about the way your life as turned out so far?	Responses reported on a 0-10 scale.	Respondent
Adult outcomes				
Income	30	Equivalised household annual income	£2012, log	Respondent
Qualifications	30	Highest level of education achieved	6 categories (No qualifications; CSE; O-level; A-level; Degree; Higher degree).	Respondent
Labour market status	30	Currently not unemployed	Dummy variable (0,1)	Respondent
Non-criminality	30	How many times has respondent been formally cautioned at the police station? How many times has respondent been found guilty by a criminal court?	The sum of the answers to the two questions is calculated: this goes from 0 to 18. We then reverse the score so that non-criminality ranges from 0 to 18.	Respondent
Partnered	30	Currently married or cohabiting	Dummy variable (0,1)	Respondent
Having children	30	Whether cohort member has any of own kids in the household	Dummy variable (0,1)	Respondent
Physical health conditions	26	Number of physical health conditions	Each condition is (0,1). Reverse-coded total points score from 15 questions (See Table A2 for details of questions)	Respondent
Child outcomes				
Academic Achievement	16	Has at least an O-level (NVQ2)	Dummy variable 0-1	Mother
Behaviour	16	17 questions on behavioural and hyperactivity problems	Each response recoded on (0,1) scale. Reverse-coded total score used. (See Table A2 for details of questions)	Mother
Emotional Health	16	22 questions answered by the child and 8 questions answered by the mother on emotional problems	Each response recoded on a (0,1) scale. Reverse-coded total score used. (See Table A2 for details of the questions)	Mother & child

35

Family				
Parents' Education	pre-birth	Age parents left full time education	Average score used.	Mother
Family Income	10	Equivalised family weekly income	£1986, log	Mother
Involvement	10	Frequency family goes for a walk together; goes on an outing together; has meals together; goes for holidays together; goes shopping together; chats for at least 5 minutes; goes to restaurant together	Each activity recoded on a (0,1) scale (rarely vs. sometimes or often). Total score used.	Mother
Mother's Mental Health	5,10	Malaise score	Each response is (0,1). Reverse-coded total points score from 24 questions. (See Table A2 for details of the questions)	Mother
Family Break up	0,5,10,16	Both natural parents live in household at 16	Reverse scale (0,1)	Mother
Mother's Employment	0,10,16	Currently employed	No. of waves answered Yes (/3)	Mother
Father's Employment	0,10,16	Currently employed	No. of waves answered Yes (/3)	Mother

Table A2: BCS Variables – Exact wording

Behaviour Scale (16)

Are the following statements about the child "Does not apply", "Applies somewhat" or "Certainly applies"? These are recoded into a binary variable with the first answer as 0 as the second two as 1.

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
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"? These are recoded into a binary variable with the first answer as 0 as the second two as 1.

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?

Malaise Score

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

Please tick all that apply. Have you suffered from any of these…

Hay Fever
Asthma
Bronchitis
Wheezing when you have a cold flu
Skin problems
Fit, convulsions, epilepsy
Persistent joint of back pain
Diabetes
Persistent trouble with teeth, gums or mouth
Cancer
Stomach or other digestive problems
Bladder or kidney problems
Hearing difficulties
Frequent problems with periods or other gynaecological problems
Other health problem

	Units	Life Satisfaction (0-10)		
		(1)	(2)	(3)
Unemployment experience	Share	-1.640***	-1.202***	-1.074***
		(0.111)	(0.163)	(0.168)
Part-time employed	0/1		-0.083***	0.228***
			(0.024)	(0.028)
Self-employed	0/1		0.141***	0.179***
			(0.043)	(0.034)
Unemployed	0/1		-0.830***	-0.739***
			(0.085)	(0.092)
Out of the labour force	0/1		0.011	0.091
			(0.108)	(0.122)
Income	Ln			0.244***
				(0.029)
Qualifications	SD(index)			0.070**
				(0.026)
Non-criminality	Arrests (inv.)			0.046***
				(0.005)
Partnered	0/1			0.298***
				(0.031)
Physical health (lagged)	SD(index)			0.198**
				(0.073)
Intellectual performance (16)	0/1	0.177***	0.173***	0.020
		(0.028)	(0.026)	(0.040)
Behaviour (16)	SD(index)	0.034***	0.031***	0.021***
		(0.005)	(0.005)	(0.006)
Emotional health (16)	SD(index)	0.150***	0.149***	0.137***
		(0.018)	(0.017)	(0.017)
Family income	Ln	0.039***	0.037**	0.024
		(0.013)	(0.014)	(0.017)
Parents' education	Age	0.019	0.017	-0.011
		(0.024)	(0.024)	(0.025)

Mother's employment	Share	-0.046	-0.053	-0.058
		(0.057)	(0.057)	(0.054)
Father's employment	Share	0.049**	0.050**	0.047**
		(0.019)	(0.019)	(0.020)
Parental involvement	SD(index)	0.059***	0.057***	0.052***
		(0.015)	(0.014)	(0.014)
Family break-up	0/1	-0.037	-0.038	-0.038
		(0.026)	(0.026)	(0.024)
Mother's mental health	SD(index)	0.075***	0.074***	0.065***
		(0.015)	(0.013)	(0.013)
No. of siblings	No.	0.023*	0.025*	0.032**
		(0.012)	(0.013)	(0.014)
Post-marital conception	0/1	0.135***	0.130***	0.092**
		(0.027)	(0.031)	(0.033)
White	0/1	0.341**	0.343**	0.355***
		(0.121)	(0.120)	(0.111)
Female	0/1	0.147***	0.161***	0.192***
		(0.016)	(0.022)	(0.027)
Low birth weight	0/1	-0.029	-0.035	-0.038
		(0.080)	(0.079)	(0.077)
Observations		9779	9779	9779
Adjusted R²		0.054	0.054	0.070

Notes: Standard errors are in parentheses. All regressions control for the age left full-time education and the childhood characteristics and family-background variables in Table 1. * p<0.10, ** p<0.05, *** p<0.01.

Table A4: Life Satisfaction and Adult Outcomes at Age 30

	Units	Life Satisfaction (0-10)		
		(1)	(2)	(3)
Unemployment experience	Share	-0.755***	-0.407***	-0.348***
		(0.169)	(0.109)	(0.100)
Part-time employed	0/1		-0.176***	0.037*
			(0.025)	(0.017)
Self-employed	0/1		0.096*	0.129***
			(0.045)	(0.044)
Unemployed	0/1		-0.672***	-0.603***
			(0.170)	(0.168)
Out of the labour force	0/1		-0.075	0.009
			(0.127)	(0.132)
Income	Ln			0.146***
				(0.037)
Qualifications	SD(index)			0.061***
				(0.018)
Non-criminality	Arrests (inv.)			0.034**
				(0.013)
Partnered	0/1			0.237***
				(0.034)
Physical health (lagged)	SD(index)			0.109
				(0.069)
Life Satisfaction at age 26	(0-10)	0.371***	0.370***	0.359***
		(0.009)	(0.009)	(0.010)
Observations		6698	6698	6698
Adjusted R²		0.194	0.198	0.207

Notes: Standard errors are in parentheses. All regressions control for the age left full-time education and the childhood characteristics and family-background variables in Table 1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A5: Life Satisfaction and Adult Outcomes at Age 30: Quantile Regression Results

	Units	Life Satisfaction (0-10)								
		Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Unemployment experience	Share	-1.927***	-1.657***	-1.849***	-1.345***	-1.382***	-0.882***	-0.642***	-0.663***	-0.005
		(0.725)	(0.280)	(0.133)	(0.163)	(0.205)	(0.125)	(0.169)	(0.223)	(0.198)
Part-time employed	0/1	0.054	0.222	0.283***	0.359***	0.354***	0.142***	0.301***	0.446***	0.564***
		(0.094)	(0.148)	(0.080)	(0.106)	(0.056)	(0.029)	(0.129)	(0.026)	(0.122)
Self-employed	0/1	-0.011	0.137+	0.160***	0.117***	0.204***	0.110***	0.143***	0.343***	0.069
		(0.232)	(0.071)	(0.053)	(0.018)	(0.045)	(0.038)	(0.052)	(0.047)	(0.262)
Unemployed	0/1	-1.345***	-0.840***	-0.690***	-0.788***	-0.689***	-0.758***	-0.486***	-0.348***	-0.325
		(0.381)	(0.224)	(0.120)	(0.087)	(0.075)	(0.059)	(0.093)	(0.103)	(0.280)
Out of the labour force	0/1	-0.527***	0.245**	0.048	0.069**	0.189***	0.102***	0.525***	0.548***	0.616***
		(0.076)	(0.097)	(0.042)	(0.035)	(0.020)	(0.025)	(0.071)	(0.055)	(0.200)
Income	Ln	0.558***	0.411***	0.288***	0.229***	0.229***	0.093***	0.160***	0.167***	0.162***
		(0.060)	(0.059)	(0.038)	(0.015)	(0.008)	(0.015)	(0.014)	(0.016)	(0.035)
Qualifications	SD(index)	0.117*	0.101***	0.112***	0.053**	0.027	0.025*	0.058**	-0.008	-0.014
		(0.067)	(0.030)	(0.028)	(0.027)	(0.017)	(0.014)	(0.027)	(0.026)	(0.035)
Non-criminality	Arrests (inv.)	0.081	0.083**	0.079***	0.049**	0.051**	0.029*	0.024	0.024	0.003
		(0.083)	(0.038)	(0.026)	(0.020)	(0.021)	(0.017)	(0.026)	(0.026)	(0.017)
Partnered	0/1	0.469***	0.438***	0.278***	0.327***	0.250***	0.116***	0.236***	0.315***	0.159***
		(0.084)	(0.032)	(0.057)	(0.049)	(0.038)	(0.031)	(0.066)	(0.049)	(0.056)
Physical health (lagged)	SD(index)	-0.041	0.027	0.040	0.004	0.054**	0.046****	0.031	0.013	-0.004
		(0.051)	(0.035)	(0.039)	(0.036)	(0.017)	(0.009)	(0.029)	(0.037)	(0.049)
Observations						9779				
Pseudo R²		0.065	0.085	0.053	0.050	0.048	0.011	0.015	0.030	0.033

Notes: Bootstrapped standard errors are in parentheses (100 replications). All regressions control for the age left full-time education and the childhood characteristics and family-background variables in Table 1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.