What childhood characteristics predict psychological resilience to economic shocks in adulthood?

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Abstract

This paper investigates whether people's psychological resilience to one of the most important economic shocks – job loss – can be predicted using early childhood characteristics. Using a longitudinal data that tracked almost 3,000 children into adulthood, we showed that the negative effect of unemployment on mental well-being and life satisfaction is significantly larger for workers who, as adolescents, had a relatively poor father-child relationship. Maternal unemployment, on the other hand, is a good predictor of how individuals react psychologically to future unemployment. Although the results should be viewed as illustrative and more research is needed, the current article provides new longitudinal evidence that psychological resilience to job loss may be determined early on in the life cycle.

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1. Introduction

There is a growing body of literature in economics over the last decade on the causes and consequences of human psychological resilience, i.e. the evidence of a lower volatility in well-being and a quick return to a baseline level of happiness following a significantly bad life event (Rayo & Becker, 2007; Graham & Oswald, 2010; Perez-Truglia, 2012). This recent surge of interest among economists is fuelled by the releases of new longitudinal evidence of people adapting quickly and completely in terms of mental well-being and life satisfaction to negative life shocks, including adaptation to unemployment, disability, and bereavement (Clark et al, 2008; Oswald & Powdthavee, 2008; Frijters et al, 2011), as well as by the potential implications of how people adapt to bad shocks in life have in public policy and welfare evaluation (Frederick & Lowenstein, 1999; Layard, 2006; Loewenstein & Ubel, 2008).

According to psychologist George Bonanno (2004), psychological resilience in adulthood is defined as,

> "the ability of individuals in normal circumstances who are exposed to isolated and potentially highly disruptive event such as the death of a close relation or a violent or a life-threatening situation to maintain relatively stable, healthy levels of psychological functioning … as well as the capacity for generative experiences and positive emotions. (pp. 20-21)."

As one of the leading scholars in this area, Bonanno and colleagues have documented evidence that, on average, people are remarkably resilience to bereavement (Bonanno, Wortman, et al., 2002; Bonanno, Moskowitz, et al., 2005) and, more recently, to direct exposure of the September 11th, terrorist attack in 2001 (Bonanno et al., 2005; Bonanno et al., 2006). Using a measure of posttraumatic stress disorder (PTSD) as the outcome variable of interest, they were able to show that although an average adult tends to experience some short-term drop in his emotional and physical well-being following a traumatic event, his reactions to it tend to be relatively brief and usually do not impede his ability to function to a significant degree.

While studies by Bonanno and other scholars[2] have shown that evidence of psychological resilience to traumatic events is common, little continues to be known

[2] See, e.g., Freedy et al. (1992), Galea et al. (2002), and Boscarino et al. (2004).

about the heterogeneity and the determinants of the heterogeneity that forms the average (Bonanno, 2005). For instance, such questions as 'Why are certain individuals better than others at bouncing back from a bad life event?' and 'Why are they initially hurt less by such a shock?' continue to be imperfectly understood.

There is little theoretical work on psychological resilience. One of the more notable studies is the work by economists Liam Graham and Andrew J. Oswald (2010), in which psychological resilience is conceptualized as a by-product of how much stock of hedonic capital the individual has accumulated over the years. According to them, their definition of hedonic capital could include

> "social relationships with partners, friends and colleagues; health; self-esteem; status; and meaningful work. For some people, religious faith may also play a part. These things are stocks in that they rely on past inputs and are carried across time periods. (p. 373)."

What this implies is that our ability to cope with stress and adversity could have been accumulated early on in our childhood, and if we have lost a lot of psychological resources while we were young, it is likely that we will grow up to be less psychologically resilient in the future.

The conceptual framework of Graham and Oswald's model is arguably implicitly embedded in the household production model developed by Becker (1981) and the technology of skill formation model developed by Cunha and Heckman (2006). According to these models, early family and school inputs play a very important role in determining outcomes in adulthood, including cognitive and non-cognitive skills, earnings, employment, marital stability, health, and satisfaction with life overall.[3] It is thus possible that individual's ability to cope with stress and adversity is also determined in the same way as cognitive and non-cognitive skills. What this implies is that we may be able to use measures of family and school inputs, as well as indicators of different experiences in childhood and adolescence, to predict the extent of psychological resilience in adulthood.

[3] For empirical evidence of this, see, e.g., Todd & Wolpin (2007), Cunha et al. (2010), and Frijters et al. (2013).

The empirical evidence in this area comes primarily from studies in the psychology literature.[4] Findings range from the experiences of adversity in childhood – e.g. from having been sexually abused or a victim of violent crime – being detrimental (Compas et al., 1989; Flores et al., 2005; Enoch, 2011) to its having a positive influence on later resilience (Flynn & Biro, 1998; Flynn et al., 2004; DuMont et al., 2007). A number of studies, however, have reported having a good parent-child relationship to be one of the single most important moderators of adverse life events on child resilience and resilience in adulthood (Masten et al., 1990; DuMont et al., 2007). In addition to this, Brennan et al. (2003) have found that low levels of parental psychological manipulation, high levels of maternal warmth, and low levels of maternal overinvolvement all interacted with maternal depression to predict resilience outcomes in youth. Other studies have found objective measures of life successes which may have been accumulated since childhood such as income and wealth to have a protective effect on people's risk of developing a post-traumatic stress disorder (PTSD) following a negative life event such as the September 11th attacks and a death of loved ones (Hobfoll, 2002; Bonanno et al., 2007; Galatzer-Levy & Bonanno, 2012).

The current paper contributes to the economics literature on psychological resilience by asking a relatively unexplored question: Can certain childhood characteristics predict the extent of the psychological cost to one of the most important economic shocks, i.e. job loss? We know from previous studies in the well-being literature that unemployment induces, on average, one of the largest negative effects on individual's mental well-being and life satisfaction (e.g. Clark & Oswald, 1994; Darity and Goldsmith, 1996; Winkelmann & Winkelmann, 1998; Powdthavee, 2012). When economists have started looking more closely at the data, however, they found the negative effect of unemployment on individual's psychological well-being is significantly smaller in areas of high unemployment rates (Clark, 2003; Powdthavee, 2007; Clark et al., 2009). What this implies is that other people's unemployment has a stress-buffering effect on individual's own unemployment. Although this finding of unemployment as a social norm supports the idea that people from different contexts and backgrounds may react emotionally differently to

[4] For a few exceptional studies in the economics literature, see the work by Clark and Lelkes (2005) and Boyce and Wood (2011) who found religion and personality traits help buffer shocks on individual's well-being.

becoming unemployed, the empirical evidence is small and the nature of the phenomenon continues to be imperfectly understood in the economics literature.

In an attempt to fill part of this research void, the current study utilizes a unique, nationally-representative British longitudinal data set that tracked almost 3,000 adolescents (aged 11-15) into adulthood to explore which selected childhood characteristics predict the extent of people's psychological reaction – or what looks like a degree of psychological resilience – to future unemployment shocks. We base our selection of the childhood variables on what had been found in the psychology literature to be important predictors of adult resilience (Masten et al., 1990; Bonanno et al., 2007), as well as what are available in the British youth data. We then estimate one of the first micro-econometric mental well-being and life satisfaction regression equations in which an onset of unemployment in adulthood is interacted with an array of childhood characteristics of the survey respondent. We show that, on average, having a poor relationship with father as an adolescent predicts a significantly larger psychological reaction to unemployment shock in adulthood. This is robust even when we also allowed for the interactions between unemployment and factors that may be correlated with parent-child interaction, e.g., paternal mental well-being, paternal unemployment, and family income in childhood. By contrast, having an unemployed mother during the child's adolescent years appears to have buffered the negative unemployment effect experienced by the child in the future. There are also gender differences to our findings, with different childhood characteristics having different predictive power on male's and female's psychological responses to joblessness. Although little causal inferences could be made from these estimates, and further research is needed at this stage, the potential implications of our results are discussed.

2. Data

Our data set comes from the youth sample and the main adult sample of the British Household Panel Survey (BHPS). The BHPS is nationally representative of British households, contains over 14,000 adult individuals aged 16 and over, and has been conducted between September and Christmas each year since 1991 (Taylor et al, 2002). The youth sample – all children aged between 11 and 15 years – was first introduced to the BHPS in 1994 (Wave 4), and currently consists of around 800-1,400

person-year observations of youths in any given survey wave. These adolescents continue to be interviewed as part of the youth survey until they turn 16 before entering the main adult sample.

We make use of both the youth sample and the adult samples in our analysis. We use thirteen waves of the youth surveys, i.e. Waves 4 to 17 (or years 1994 to 2007). However, it should be noted that the maximum number of times that each individual could be interviewed in the youth survey is five, i.e. from aged 11 to 15. What this means is that for youth *i* who was eleven years old in Wave 4, his last wave in the youth survey will be in Wave 8 when he turned fifteen. When generating our main data set, we first take the within-person averages of everyone in our youth data. These within-person averages are then matched using the *PID* variable to the same person in the adult data. In other words, each person in the main BHPS survey, if they were interviewed as youths in the past, would have been matched with the average responses that they gave in the youth data set. Based on previous findings in the psychology literature (e.g. Masten et al., 1990; Hobfoll, 2002; Bonanno, 2004), the following childhood characteristics – which range from measures of parent-child relationships to the mental distress of the parents – are chosen as potential risk or protective factors to the negative psychological effect of unemployment in adulthood:

i) The number of child's close friends
ii) The frequency of child fighting with someone at school
iii) The frequency of child having arguments with father
iv) The frequency of child having arguments with mother
v) The frequency of child talking to dad about things that matter
vi) The frequency of child talking to mum about things that matter
vii) Father's mental distress level
viii) Mother's mental distress level
ix) Father's unemployment
x) Mother's unemployment
xi) Log of real household income per annum

The number of child's close friend is taken from the child's response to the question, "*How many close friends do you have – friends you could talk to if you were in some kind of trouble*?" with answers ranging from 1 to 11 close friends.

The frequency of child fighting with someone at school comes from asking the child, "*How often in the past month had you had a fight with someone that involved physical violence, such as hitting, punching, or kicking?*" Possible responses are "None", "Once", "2 – 5 times", "6 – 9 times", and "10 or more".

The frequencies of having arguments with father/mum are based on the following question, "*Most children have occasional quarrels with their parents. How often do you quarrel with your father/mother?"* Possible answers include "Hardly ever", "Less than once a week", "More than once a week", and "Most days".

The frequencies of child talking to dad/mum about things that matter come from asking children, "*How often do you talk to your father/mother, about things that matter to you?*", with possible answers ranging from "Hardly ever", "Less than once a week", "More than once a week", and "Most days".

Parental mental distress is derived from the General Health Questionnaire (GHQ-12) score, which was self-reported by the parents of the child. Many medical scholars and other researchers consider the scale to be a good proxy for mental stress and strain (e.g. Guthrie et al., 1998). Individuals indicate on a 4-point scale from 1 (no more than usual) to 4 (much more than usual) how often over the past few weeks they had lost sleep over worry, felt constantly under strain, felt they could not overcome difficulties, been feeling unhappy and depressed, been losing confidence, and been feeling like a worthless person. Individuals were also asked to indicate on a 4-point scale from 1 (better than usual) to 4 (much less than usual) on how often over the past few weeks that had felt that they were playing a useful part in things, felt capable of making decisions, been able to enjoy day-to-day activities, been able to concentrate, been able to face up to problems, and been feeling reasonably happy. We utilize the Caseness score of GHQ, in which the number of times the person places himself or herself in the fairly stressed or highly stressed category are added up together to form a total score. This is the BHPS variable HLGHQ2, with a scale running from 0 (lowest mental distress) to 12 (highest mental distress).

Finally, information on parental unemployment is drawn from a question in the main BHPS survey that asks all adults about their current labour force status, whilst real household income per annum during the adolescent years is taken from the derived household income variable in the BHPS divided by yearly consumer price index (CPI) which was then matched to the youth survey.

The correlation matrix of the eleven standardized average childhood characteristics is reported in Table A1 in the Appendix. Looking across the columns of Table A1, the highest correlation is 0.55, which comes from the relationship between the frequency of child having arguments with father and the frequency of child having arguments with mother. This implies that there is unlikely to be a problem of multicollinearity across the different childhood characteristics.

Our main sample consists of all adults aged 16 and over who had previously been interviewed in the youth survey. For example, adolescents who were 15 years old in Wave 4 of the BHPS would have been around 29 when they were interviewed as adults in Wave 18. We focus our attention only on children where both parents were present and traceable in the youth panel, which enables us to estimate the effects of both paternal and maternal unemployment on adult resilience in the same regression equation. [5] This produces an unbalanced panel of 8,779 observations (1,928 individuals). Of those, 4,479 observations (952 individuals) are females, and 4,300 observations (976 individuals) are males.

Information on individual's unemployment is drawn from a question in the main BHPS survey that asks all adults about their current labour force status. The unemployment rate in the sample stands at around 7% (N=586). Of those, 239 observations of females are unemployed and 349 observations of males are unemployed. It is worth noting that there are potentially many negative life events that we could use to test our hypotheses; for example, bereavement, disability, unemployment, etc. However, given the relatively young age of our adult sample (**aged between 16 and 29 years old**), it seems that the most appropriate life shock – in terms of observed cases – is the unemployment shock on individuals.

The measures of individual's well-being, which we use as the dependent variables, are mental well-being (or the *inversed* scores of the "Caseness" GHQ-12 described earlier, with a scale now running from 0 (lowest mental well-being) to 12 (highest mental well-being) and life satisfaction. Responses to the life satisfaction question are elicited using the following question: *"All things considered, how satisfied or dissatisfied are you with your life overall using a 1-7 scale? 1 = very dissatisfied, ... , 7 = very satisfied"*. The life satisfaction measure has been shown in

[5] The sample thus consists mostly of married/cohabiting parents, with a handful of separated and divorced parents who continued to participate in the surveys despite living in different households.

the literature to represent a measure of cognitive well-being as opposed to measures of affect well-being such as the GHQ-12 (Diener et al., 1985).

3. Empirical Strategy

To fix ideas, let us assume that there exists a reported well-being function of the following form

$$r = h(f(u, u \cdot c, x, t) + e, \tag{1}$$

where r denotes some self-reported number or level collected in the survey. The $f(\ldots)$ function is the individual's true well-being and is observable only to the person asked; $h(.)$ is a non-differentiable function relating actual to reported well-being; u is unemployment; c is a set of childhood characteristics; x represents a set of socio-economic characteristics other than the unemployment status of the respondent; t is time trend; and e is an error term that subsumes the respondent's inability to communicate accurately his or her well-being levels. Here, we assume that own unemployment has a detrimental effect on individual's well-being, but this negative effect is either moderated or exacerbated by what the respondent has gone through for the most part of his or her childhood or adolescence. Our main empirical model, which is a counterpart of (1), is then given by

$$w_{it} = \alpha + \beta_0 u_{it} + \sum_{s=1}^{11} \bar{c}_{is}\beta_s + \sum_{s=1}^{11} (u_{it} \times \bar{c}_{is})\gamma_s + x_{it}'\lambda + v_i + e_{it}, \tag{2}$$

where $i = 1, 2, \ldots, n$; $t = 16, \ldots, 29$ years old; v_i is the unobserved individual fixed effects, and v_{it} is the random-error term. In an attempt to capture as much information about the respondent's time in the youth panel as possible, $\bar{c}$ here represents a set of within-person averages of childhood variables taken from the unbalanced youth survey, i.e. aged 11-15. To aid interpretation of the results in our fully interacted model, the within-person averages of childhood characteristics, which are time-invariant, are **standardized** across the sample to have a mean of zero and a standard deviation of one. What this implies is that we can interpret the coefficient on unemployment, β_0 , as the estimated well-being effect of unemployment on respondents whose standardized childhood averages are equal to zero, and $\beta_0 + \gamma_1$ as

the estimated well-being effect of unemployment on respondents whose one of the standardized childhood averages is one standard deviation above the mean.

All of our estimation is done using either random effects or fixed effects linear model with cluster-robust standard errors (clustered at the individual level) (Cameron & Miller, 2013), although similar conclusions can be reached when a Conditional Logit estimator was used to estimate a model with a dichotomous well-being measure as an outcome variable (Ferrer-i-Carbonell & Frijters, 2004; see also Clark et al., 2001).

4. Results

Which childhood characteristics predict the extent of psychological reaction to unemployment in adulthood? Table 1 provides a first pass at this question. By comparing the raw means of mental well-being of the employed and the unemployed and their differences by childhood characteristics, we were able to arrive at three different conclusions.

The first, which is a standard finding, is that mental well-being and life satisfaction are generally lower for the unemployed than for the employed.

Secondly, within each employment category, we can see that people who had more close friends during adolescence, who talked to their parents about the things that matter more often, whose parents spent more time in unemployment while they were growing up, and who had higher household income as children were more likely than others to have better mental well-being and higher levels of life satisfaction as adults. By contrast, people who during their early teenage years had spent a significant amount of time fighting other people, arguing with their parents, and whose parents had reported lower mental well-being were more likely than others to have worse mental well-being and lower life satisfaction as adults.

Finally, and more importantly, we can see from the difference-in-difference at the cross-section that the well-being gaps between the unemployed and the employed are **larger** for individuals who, as adolescents, had fought with someone or had spent time arguing with their parents relatively more often compared to the average. By contrast, we can also see that the well-being gaps between the employed and the unemployed are **smaller** for individuals who had relatively higher numbers of close

friends, who had talked to their father about the things that matter more often, or whose parents had spent more time in unemployment during their early teenage years compared to the average. Nevertheless, we are unable to reject the null hypothesis that the cross-sectional difference-in-difference between the high group and the low group is equal to zero for almost every childhood characteristics.

Table 2 moves on to present our first econometric evidence. It reports the estimates for the random effects (RE) and fixed effects (FE) micro-econometric models. The dependent variables are mental well-being (measured cardinally on the 0 to 12 scale) and life satisfaction (measured cardinally on the 1 to 7 scale).[6] Exogenous control variables include age, age-squared, gender (in the RE estimation), year dummies, and regional dummies. Other socio-economic control variables include employment status (other than unemployment), marital status, income, education dummies, health dummies, number of children, and homeownership status. We also include the Big Five personality traits (extraversion, agreeableness, openness, neuroticism, and conscientiousness), as well as their interactions with the unemployment variable, to allow for the possibility that the well-being effects of unemployment vary across people of different personality types rather than by different childhood characteristics.[7]

Controlling only for the exogenous variables, we can see from the RE estimates in Columns 1 and 5 that unemployment enters both well-being equations in a negative and statistically significant manner. The estimated coefficient on unemployment is -0.635 [*S.E.*=0.138] in the mental well-being equation and -0.330 [*S.E.*=0.059] in the life satisfaction equation, which is consistent with the previous findings in this area (Clark & Oswald, 1994; Winkelmann & Winkelmann, 1999; Clark, 2003). The estimated main effects of the standardized average childhood characteristics are negative and statistically significant at conventional levels in both well-being regression equations for frequency of fighting with someone, frequency of having arguments with father, frequency of having arguments with mother, father's mental distress, and mother's mental distress. Individuals who, as adolescents, had relatively more close friends, talked to their father about things that matter more often,

[6] All the paper's results can be replicated with ordered estimators.

[7] These additional stock-like variables, which were obtained in Wave 15 of the BHPS, are entered with the same values across all waves for each respondent. For example, if respondent *i* has responded with a score of 14 on the extraversion scale in Wave 15, her extraversion score will be 14 in every other wave while she is still in the panel.

and had more income than the average tend to also be more satisfied with life as adults. It is interesting to note that the main effects of father's unemployment are positive and statistically significant in both sets of well-being equations. However, this may have been due to the fact that both father's mental well-being and family incomes – both of which are highly correlated with father's unemployment – are also included in the regression equations.

Turning to the interaction effects, only the coefficients on "*Unemployment* × *Frequency of having arguments with father*" and "*Unemployment* × *Mother's unemployment*" are statistically significant at conventional levels in the mental well-being equation, although with opposite signs. Conditioning on being unemployed, a one standard deviation increase in the frequency of having arguments with father is associated with a further drop in the unemployed's mental well-being by approximately 0.28-point. On the other hand, a one standard deviation increase in the maternal unemployment variable is associated with an increase in the unemployed's mental well-being by approximately 0.27-point. The estimated coefficients are robust even when we account for other interaction effects between unemployment and factors such as paternal mental well-being, paternal unemployment, and household income during adolescent years. Nevertheless, the same cannot be said about the estimates in the life satisfaction equation, as none of the interaction terms are statistically significantly different from zero.

The RE estimates are, nevertheless, subject to potential bias from the presence of unobserved individual fixed effects, v_i, as specified in Eq.2. For example, there may be time-invariant characteristics other than personality traits that jointly determine one's likelihood of having a bad parent-child interaction as an adolescent and the ability to withstand and adapt to economic shocks as an adult. This may include, e.g., individual and family characteristics that do not vary over time. We address this issue by re-estimating Eq.2 using the FE estimator and report the results in Columns 2, 3, 6, and 7 of Table 2.

Quantitatively similar results are obtained when we take individual fixed effects into account. Columns 2 and 6 produced the following results for, say, an unemployed person who was one standard deviation above the mean in the "*Frequency of having arguments with father*" variable. For these individuals, the estimated total effect of an unemployment shock on individual's mental well-being is

around **50%** larger in size than the main unemployment effect at $-0.603-0.292=-0.895$ [*S.E.*=0.251]. By contrast, the negative unemployment effect on mental well-being is almost completely offset for individuals who were one standard deviation above the mean in the "*Mother's unemployment*"; the estimated total unemployment effect for these groups of individuals is negative though statistically insignificantly different from zero at $-0.602+0.424=-0.178$ [*S.E.*=0.256]. It is worth noting here that the results are also robust to controlling for the interactions between unemployment and the Big Five personality traits. Note also that the main effects of the standardized average childhood characteristics were naturally dropped from the FE regressions as these do not change over time.

The results hardly changed following the inclusion of socio-economic control variables in Columns 3 and 6 of Table 2.[8] However, the interaction term "*Unemployment* × *Frequency of having arguments with father"* is now negative and statistically significant at the 10% level in the life satisfaction equation. The estimated heterogeneous effects of unemployment by different childhood characteristics on mental well-being and life satisfaction are better illustrated in Figures 1 and 2.

The extra drop in mental well-being for individuals who had frequent arguments with their father as adolescents is quantitatively important as well as statistically significant. Take, for example, the averaged unemployed person and the unemployed person whose "*Frequency of having arguments with father*" between the ages of 11 and 15 is one standard deviation higher than the average. The gap in mental well-being between these two groups of individuals is –0.350, with a statistically significant standard error of 0.204. Given the distribution of the mental well-being score, this is a large effect. It can completely offset the positive effect on mental well-being from becoming an outright homeowner or getting an A-level qualification; it is approximately equal to 25% of the negative effect brought about by disability; and it is slightly larger than the negative effect brought about by having one extra child.

As a robustness check, Columns 4 and 8 re-estimate FE equations on a restricted sample of individuals aged 21 and over, i.e. those who are likely to have left home, thus making them less prone than other younger children in the sample to be continually exposed to the same household environments such as argumentative

[8] See Table A2 in the Appendix for the rest of the estimates in Columns 3 and 7 of Table 2.

parents and/or caring parents. Since the majority of our adult sample is made up of people in their late teens, running FE on this restricted sample means that we lose around 6,400 (or 75%) of our original observations. Despite this, we continue to find, even in this significantly smaller sample, statistically significant interaction effects for both "*Frequency of having arguments with father*" and "*Mother's unemployment*" at conventional levels.

Table 3 separates the data by gender of the respondent. With the exception of male's life satisfaction, unemployment continues to be associated negatively and statistically significantly with individual's well-being in general. The estimated coefficient on the interaction term "*Unemployment* × *Frequency of having arguments with father"* remains negative throughout, although it is now only marginally significant in the female's mental well-being equation. Having had a relatively more disruptive time at school – i.e. recording a higher than average "*Frequency of fighting with someone*" – now predicts significantly lower levels of psychological resilience to job loss for men. Additionally, we also find women whose mother had spent more time in unemployment compared to the average when they were between 11 and 15 years old to be hurt less psychologically from becoming unemployed. Hence, what Table 3's results are implying is that the structure of a psychological resilience equation may be different across gender groups.

One question of interest is whether we can still obtain similar results with childhood characteristics that had been collected at different stages of child development? According to many studies in the household production function of human capital literature, the returns to family inputs on early childhood investments are typically larger than those on investments in late childhood and adolescents (Heckman, 2000; Carneiro & Heckman, 2003; Cunha & Heckman, 2008). Other types of inputs such as school and peers may also affect children differently at different ages. To test this, we replace the standardized average childhood characteristics between eleven and fifteen in Eq.2 by (a) the standardized childhood characteristics measured when the child was **eleven** in one set of equations, and (b) the standardized childhood characteristics measured when the child was **fifteen** in another set of equations. We then re-estimate these equations and report the new results in Tables A3 and A4 in the Appendix.

On the whole, we find evidence that the extent of negative psychological response to unemployment in adulthood may be explained by more childhood

characteristics measured at eleven than characteristics measured at fifteen. For example, the interaction term "*Unemployment* × *Frequency of having arguments with father"* is negative and statistically significant only in equations where the variable at eleven is used. We also find evidence of a significantly higher level of negative psychological reaction to job loss in terms of mental well-being for adults whose mother scored very low on the mental well-being scale when they were eleven years old. Having had a father to talk to about things that matter at this relatively early age predicts future resilience to unemployment, especially for men. Nevertheless, there are a few characteristics at fifteen that appear to matter more at predicting what resembles psychological resilience in adulthood compared to those measured at eleven, including, for example, household income in the full sample (see the mental well-being estimates) and number of close friends in the male sample (see the life satisfaction estimates).

What are the possible mechanisms that could be used to explain why children of certain characteristics grew up to be more or less psychologically sensitive to unemployment shock? More specifically, what might explain why children from relatively more argumentative households might be affected more psychologically by an unemployment shock, on average? One possible explanation for this is that children from these households may go on to receive less education and consequently will be more vulnerable to the psychic cost of joblessness because of the lower future employment opportunities that they have to face. However, though not reported here, our estimates on the childhood interaction effects remain statistically robust even in regressions where interactions between unemployment and different levels of education are allowed for, thus suggesting that the early confrontations with their father may have had a long-lasting impact on the unobserved psychological nature of the individuals that have not been accurately captured using the Big Five inventory. This may include – but not limited to – self-esteem and locus of control, the two factors that could also act as psychological buffers to an unemployment shock. Other explanations are also possible – e.g. children who argued a lot with their parents may find it hard to make friends as adults and therefore are less likely to have the kind of social supports they need to cope with becoming unemployed in adulthood.

What about the seemingly paradoxical result regarding the positive effect of maternal unemployment during adolescents on the well-being of the unemployed, evidence that is much stronger for females than for males? One possible explanation

for this is the social norm effect of other people's unemployment – i.e. the finding that unemployment hurts less psychologically when there is more of it around (e.g. Clark, 2003; Egger et al., 2006; Powdthavee, 2007; Clark et al., 2009). It is imaginable then that maternal unemployment experienced during the child's adolescent years may have had a long-lasting effect on their daughter's attitudes towards their own future unemployment. Another explanation might be that unemployed mothers get to spend significantly more time with their children during their unemployment spells, which could have had a positive and long-lasting impact on the stock of their children's psychological resources. This is not inconsistent with the latest findings that early maternal unemployment when the child was relatively young is positively correlated with self-reported happiness of the child (Powdthavee & Vernoit, 2013). [9] Nevertheless, it should also be noted here that we do not observe the same positive externality of paternal unemployment on sons' emotional reactions to own unemployment in our data set.

More broadly, our results seem to suggest that children who generally had lower levels of psychological resources in childhood tend to be less resilient to economic shocks in the future (Graham & Oswald, 2010). Yet, in the absence of randomized childhood characteristics and experiences, we cannot rule out that the interpretation of our results might have nothing to do with early losses of psychological resources. It may be that children of certain attributes, e.g. those with poor parent-child relationships, are more likely than others to select themselves into unemployment in the first place. If these attributes also happened to be correlated negatively with children's well-being, then it is reasonable to assume that these children will also grow up to be more fearful and anxious as adults (and thus are more negatively affected by job loss).

To shed some light on this issue, Table 4 divides the sample by employment status and checks whether people of certain childhood characteristics select themselves more often into unemployment as adults. Looking across the columns, we can see that the unemployed had, on average, a significantly more disruptive

[9] To test this potential pathway, we estimated another specification that includes an interaction term "*Unemployment* × *Mother's non-labour status"* as an additional variable in the equation. Similar to the interaction term "*Unemployment* × *Mother's unemployment",* the estimated coefficient on this interaction term is positive albeit statistically insignificant in both mental well-being and life satisfaction equations, thus implying that the positive externality from maternal unemployment might not be due entirely to the relatively more time unemployed mothers have for the child while he/she was growing up.

childhood compared to the employed. A typical unemployed person had, for example, a lot more fights that took place at school, more distressed parents, and less household income as adolescents than the employed, and we can reject the null hypothesis of equal means at conventional confidence levels. However, we cannot reject the null hypothesis that the employed and the unemployed are the same in terms of "*Frequency of having arguments with father"*, which was one of the only three factors that significantly explained the extent of psychological resilience to job loss in our full sample analysis. Hence, one conclusion here is that people of certain childhood characteristics may indeed select themselves into unemployment more often than others, but it is unlikely that this will explain everything about the extent of psychological resilience to job loss in adulthood. At any rate, it is still advisable for readers to treat our interpretations of the coefficients with care.

The next question of interest is whether adaptation to unemployment is slow and incomplete for certain groups of individuals. We do this by expanding Eq.2 to include leads and lags to unemployment – one-year lead and two-year lags to be precise – as well as their interactions with different childhood characteristics. We then estimated this new equation using the FE estimator on a sample in which at least three years of mental well-being and life satisfaction are consecutively observed.[10] Our empirical strategy here is similar to the one adopted by Clark et al. (2008), Frijters et al. (2011), and Powdthavee (2012). Given that the table produced a large number of coefficients, we present the geographical representations of the implied well-being effects of having spent three consecutive years in unemployment (from T to T+2) only for two groups of individuals: those who were below the average level in the standardized average "*Frequency of having arguments with father*" variable and those who were above it[11] – and display them in Figures 3a (mental well-being) and 3b (life satisfaction).

When we compare the dynamics of both well-being measures across these two groups of individuals, we can see that there is some evidence of a one-year anticipation effect to becoming unemployed at T for people who were above the average level in the frequency of having arguments with father as adolescents. Although neither group has completely adapted to unemployment at T+2 – a result

[10] The random effects specification is available upon request.
[11] Since this is one of the only three variables (the other two being frequency of fighting with someone and maternal unemployment) that, when having been interacted with the unemployment variable, is statistically significantly different from zero in the full sample regression.

that is generally consistent with the previous findings on adaptation to unemployment (Clark et al., 2008; Powdthavee, 2012), the estimated unemployment effect is, in most time periods, more negative for the people who were above the average level in the standardized average "*Frequency of having arguments with father*" variable compared to the people who were below it.

We next ask whether the extent of people's ability to cope with job loss varies significantly by unemployment types. To do this, we follow the research of Kassenboehmer and Haisken-DeNew (2009) and split the unemployment shock into unemployment by redundancies and unemployment by other reasons, e.g., dismissed, left for health reason, or temporary job ended, etc. Assuming that redundancies – which make up to around 15% of the unemployed – represent exogenous (or involuntary) changes in employment status, we re-estimated the FE specification of Eq.2 on mental well-being and life satisfaction, and report the implied well-being effects of unemployment in Table 5. Again, as in the previous table, we focused only on the interaction effects between unemployment and the "*Frequency of having arguments with father*" variable here.

We find people who became unemployed by redundancies to report, on average, significantly larger drops in mental well-being – but not in life satisfaction – compared to those who became unemployed for other reasons. However, we also find some evidence that unemployment – redundancies or otherwise – depressed mental well-being significantly more for those who reported to have had relatively more frequent arguments with their father in the past. For example, while an exogenous unemployment shock is associated with a drop in mental well-being for an average person by approximately 1-point, the negative effect is 50% larger at 1.507 [*S.E.*=0.404] for individuals who were one standard deviation above the average in the "*Frequency of having arguments with father*" variable. Finally, we are not able to find evidence to suggest that the extent of people's ability to withstand job loss varies significantly by unemployment types, i.e. we cannot reject the null hypothesis that the coefficients on "*Unemployment (others)* × *Frequency of having arguments with father"* and "*Unemployment (redundancies)* × *Frequency of having arguments with father*" are the same.

5. Conclusion

This paper uses data on mental well-being and life satisfaction to test theories of psychological resilience in economics. It empirically investigates whether psychological resilience to economic shocks in adulthood can be predicted using variables obtained in childhood. Consistent with the previous studies on the psychological effects of job loss, an unemployment shock is associated with a significant drop in both mental well-being and life satisfaction for the individuals. However, the drop in well-being is predicted to be around 50% larger for people who were one standard deviation above the mean in the frequency of having arguments with father between aged 11 and 15. Maternal unemployment, on the other hand, is found to be associated positively with the well-being of the unemployed. However, there are also many other factors such as having more close friends or father's mental distress that do not seem to predict heterogeneity in the psychological response to job loss in adulthood at all.

This paper is not without limitations. One natural objection to our results is that the relationship between, say, having a poor father-child relationship during childhood and psychological resilience in adulthood is not causal. While our FE estimation may have taken care of the unobserved person-specific characteristics that made people argued more with their father as children and less psychologically resilient as adults, we still do not know what may have caused such a poor father-child relationship to cultivate in the first place. Although this problem is not easily solved without a good identification strategy, we still believe that the ability to predict who will be more negatively affected by future economic shocks is one of the key components to optimal policy design. What this means is that even if our indicator of having a poor father-child relationship is nothing more than just a mirror reflection of something else that is unobserved about the child – e.g. time-persistent unobserved personality traits, then at least it serves its purpose as a device which can be used to gauge early a child's ability to cope and adapt to negative shocks in the future.

Another important objection, which was raised by one of the referees, is that the observed moderation effects on the negative psychological impact of unemployment may be due to short-run contemporaneous impacts of the selected childhood characteristics as well as long-run lagged impacts, which has so far been our preferred interpretation of the estimated interaction effects. Given that the expected length of an unemployment spell as well as its effect on saving, consumption, and other living conditions is a function of contemporaneous factors,

and that these contemporaneous factors are themselves related to the selected childhood characteristics, one might even conclude that the observed moderation effects are caused by short-run contemporaneous impacts rather than long-run lagged impacts of the childhood variables. Although attempts have been made in this paper to try and separate the short-run from the long-run effects in several cases (e.g., by using only those aged 21 and over in the analysis, by interacting the respondent's unemployment with contemporaneous variables such as education, and by using a longer lagged childhood variables measured at aged 11), we acknowledge that the explanation of short-run contemporaneous effects cannot be completely ruled out from the interpretation of our regression estimates. Hence, extra care must be taken when interpreting these coefficients, and that future research should reinvestigate the issue using different cohort data sets, such as the National Child Development Study (NCDS58) and British Cohort Study (BCS70), in order to try and distinguish lagged effects of childhood characteristics from short-run contemporaneous effects more effectively.

More generally, the results presented here have shown how people's psychological responses to economic shocks might be correlated with certain childhood variables. Future research should return to investigate what these other childhood characteristics are, how causal are their effects, and which of them are targetable by policy makers for interventions.

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Table 1: Raw data summary of mental well-being and life satisfaction of the employed and the unemployed by childhood characteristics

Panel A: Mental well-being	E_L	U_L	E_H	U_H	***DD***
Number of close friends	10.28	9.41	10.34	9.54	***0.15***
	(0.05)	(0.15)	(0.07)	(0.17)	
Frequency of fighting with someone	10.31	9.52	10.28	9.39	***-0.09***
	(0.05)	(0.15)	(0.06)	(0.16)	
Frequency of having arguments with dad	10.54	9.77	10.05	9.19	***-0.07***
	(0.05)	(0.15)	(0.06)	(0.16)	
Frequency of having arguments with mum	10.52	9.72	10.01	9.05	***0.02***
	(0.05)	(0.14)	(9.49)	(0.19)	
Frequency of talking to dad about things that matter	10.32	9.32	10.28	9.66	***0.38***
	(0.05)	(0.15)	(0.06)	(0.16)	
Frequency of talking to mum about things that matter	10.38	9.52	10.22	9.38	***0.02***
	(0.05)	(0.15)	(0.06)	(0.17)	
Father's mental distress (GHQ-12)	10.49	9.69	10.07	9.31	***0.09***
	(0.05)	(0.17)	(0.06)	(0.15)	
Mother's mental distress (GHQ-12)	10.49	9.80	10.03	9.12	***-0.22***
	(0.05)	(0.15)	(0.07)	(0.17)	
Father's unemployment	10.32	9.23	10.24	9.77	***0.63****
	(0.04)	(0.15)	(0.08)	(0.16)	
Mother's unemployment	10.29	9.39	10.36	9.84	***0.38***
	(0.04)	(0.12)	(0.14)	(0.27)	
Log of real household income per annum	10.31	9.57	10.30	9.29	***-0.19***
	(0.06)	(0.14)	(0.05)	(0.18)	
Panel B: Life satisfaction	E_L	U_L	E_H	U_L	***DD***
Number of close friends	5.26	4.77	5.35	4.96	***0.11***

	(0.02)	(0.07)	(0.03)	(0.08)	
Frequency of fighting with someone	5.35	4.93	5.20	4.76	***-0.06***
	(0.02)	(0.07)	(0.03)	(0.08)	
Frequency of having arguments with dad	5.44	5.05	5.15	4.68	***-0.09***
	(0.02)	(0.07)	(0.03)	(0.08)	
Frequency of having arguments with mum	5.42	5.00	5.13	4.61	***-0.14***
	(0.02)	(0.07)	(0.03)	(0.09)	
Frequency of talking to dad about things that matter	5.26	4.78	5.33	4.96	***0.12***
	(0.02)	(0.07)	(0.02)	(0.08)	
Frequency of talking to mum about things that matter	5.23	4.75	5.36	4.99	***0.12***
	(0.02)	(0.07)	(0.02)	(0.08)	
Father's mental distress (GHQ-12)	5.38	4.99	5.19	4.76	***-0.04***
	(0.02)	(0.08)	(0.03)	(0.07)	
Mother's mental distress (GHQ-12)	5.35	4.91	5.21	4.79	***0.01***
	(0.02)	(0.07)	(0.03)	(0.08)	
Father's unemployment	5.31	4.76	5.24	4.97	***0.27****
	(0.02)	(0.07)	(0.04)	(0.08)	
Mother's unemployment	5.29	4.84	5.38	4.91	***-0.02***
	(0.02)	(0.06)	(0.06)	(0.14)	
Log of real household income per annum	5.25	4.84	5.34	4.86	***-0.09***
	(0.03)	(0.07)	(0.02)	(0.08)	

Note: **<5%, *<10%. Mental well-being = inversed GHQ-12, with 0 = worst mental well-being, …, 12 = best mental well-being. Life satisfaction is on a 7-point scale (1 = very dissatisfied, …, 7 = very satisfied). E_L = Employed individuals with lower than average level of childhood outcome *j*; E_H = Employed individuals with the average or higher level of childhood outcome *j*; U_L = Unemployed individuals with lower than average level of childhood outcome *j*; U_H = Unemployed individuals with the average or higher level of childhood outcome *j*. *DD* = difference-in-difference, i.e., $(U_H - E_H) - (U_L - E_L)$. Standard errors are in parentheses.

Table 2: Mental well-being and life satisfaction regression equations with interaction effects between average childhood characteristics and unemployment

	Mental well-being				Life satisfaction			
VARIABLES	**All RE**	**All FE**	**All FE**	**Aged 21+ FE**	**All RE**	**All FE**	**All FE**	**Aged 21+ FE**
Unemployment	-0.635***	-0.603***	-0.765***	-0.345	-0.330***	-0.271***	-0.258**	0.106
	[0.138]	[0.153]	[0.238]	[0.598]	[0.059]	[0.063]	[0.114]	[0.208]
Standardized average childhood characteristics (aged 11-15 years old)								
Number of close friends	-0.037				0.066**			
	[0.054]				[0.029]			
Frequency of fighting with someone	-0.113**				-0.073***			
	[0.053]				[0.025]			
Frequency of having arguments with father	-0.131**				-0.048*			
	[0.059]				[0.026]			
Frequency of having arguments with mother	-0.137**				-0.088***			
	[0.064]				[0.028]			
Frequency of talking to dad about things that matter	0.038				0.106***			
	[0.057]				[0.027]			
Frequency of talking to mum about things that matter	-0.028				0.028			
	[0.060]				[0.029]			
Father's mental distress (GHQ-12)	-0.153***				-0.078***			
	[0.051]				[0.023]			
Mother's mental distress (GHQ-12)	-0.233***				-0.111***			
	[0.052]				[0.024]			
Father's unemployment	0.116***				0.051**			

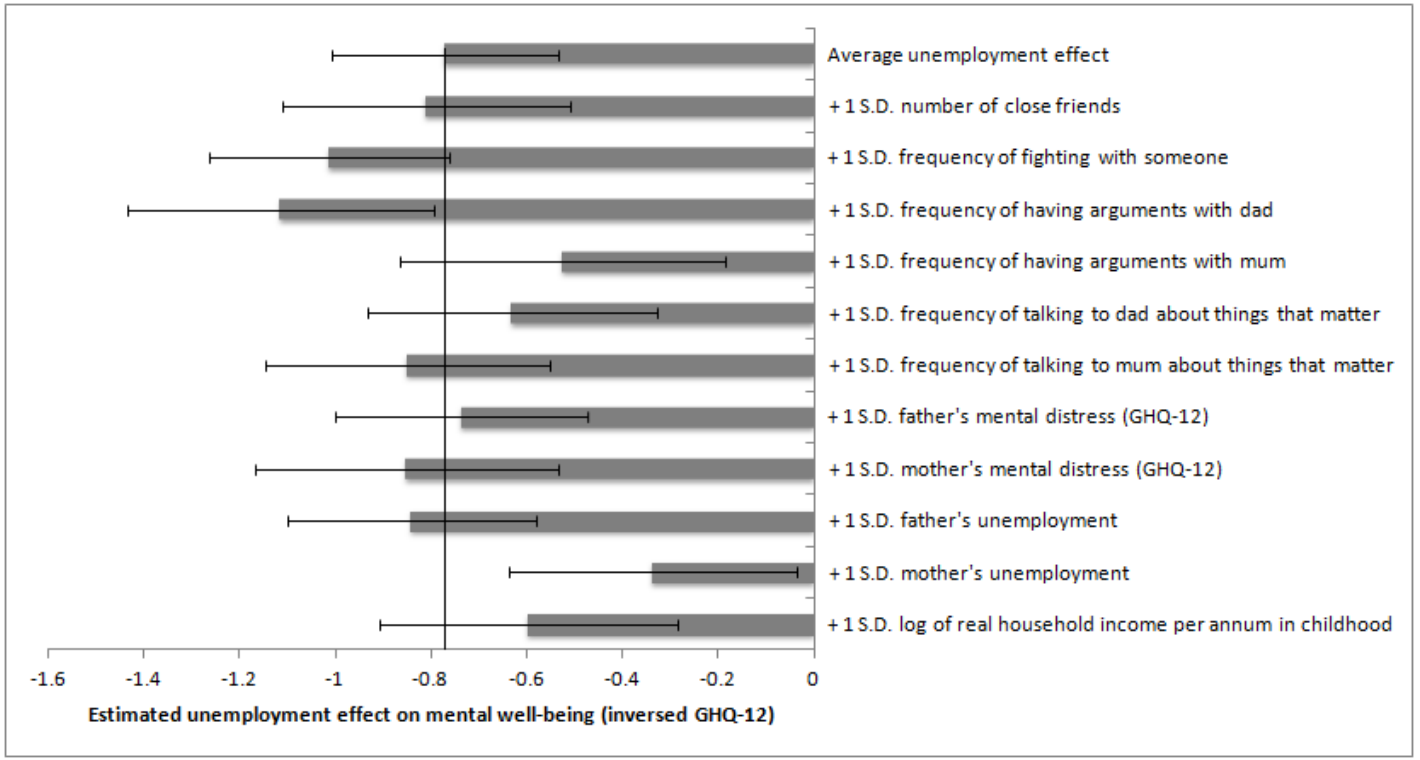
	[0.042]				[0.024]			
Mother's unemployment	-0.027				-0.034			
	[0.062]				[0.032]			
Log of real household income per annum	0.0250				0.085***			
	[0.054]				[0.025]			
Standardized average childhood characteristics (aged 11-15 years old) interacted with unemployment in adulthood								
Number of close friends	-0.000	-0.028	-0.046	-0.094	0.055	0.043	0.048	0.288*
	[0.151]	[0.153]	[0.164]	[0.404]	[0.068]	[0.070]	[0.070]	[0.147]
Frequency of fighting with someone	-0.125	-0.199	-0.248	-0.300	-0.083	-0.061	-0.079	-0.003
	[0.148]	[0.161]	[0.157]	[0.265]	[0.061]	[0.064]	[0.063]	[0.134]
Frequency of having arguments with father	-0.278*	-0.292	-0.350*	-0.606	-0.063	-0.100	-0.116*	-0.389***
	[0.169]	[0.203]	[0.204]	[0.374]	[0.065]	[0.069]	[0.070]	[0.130]
Frequency of having arguments with mother	0.170	0.142	0.240	0.145	-0.009	0.015	0.051	0.235*
	[0.178]	[0.214]	[0.218]	[0.383]	[0.073]	[0.080]	[0.081]	[0.140]
Frequency of talking to dad about things that matter	0.098	0.080	0.134	-0.119	0.029	0.006	0.028	0.080
	[0.159]	[0.183]	[0.181]	[0.435]	[0.067]	[0.069]	[0.071]	[0.163]
Frequency of talking to mum about things that matter	0.032	-0.008	-0.085	-0.608	0.037	0.032	0.005	-0.070
	[0.167]	[0.187]	[0.183]	[0.407]	[0.066]	[0.068]	[0.068]	[0.140]
Father's mental distress (GHQ-12)	0.006	0.045	0.028	-0.070	-0.021	0.004	0.005	-0.111
	[0.131]	[0.137]	[0.131]	[0.254]	[0.057]	[0.059]	[0.058]	[0.101]
Mother's mental distress (GHQ-12)	-0.065	-0.028	-0.087	-0.831*	-0.010	-0.037	-0.055	-0.230
	[0.148]	[0.177]	[0.175]	[0.442]	[0.060]	[0.064]	[0.062]	[0.208]
Father's unemployment	0.040	-0.031	-0.076	-0.657*	0.016	0.003	0.007	-0.154
	[0.117]	[0.129]	[0.123]	[0.339]	[0.068]	[0.078]	[0.073]	[0.159]
Mother's unemployment	0.271**	0.424**	0.427**	0.845**	0.031	0.066	0.067	0.260*
	[0.135]	[0.197]	[0.205]	[0.385]	[0.065]	[0.066]	[0.065]	[0.148]

Log of real household income per annum	0.143	0.199	0.167	-0.554	0.035	0.053	0.056	-0.209
	[0.184]	[0.209]	[0.201]	[0.403]	[0.072]	[0.076]	[0.074]	[0.164]
Exogenous control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic control variables	No	No	Yes	Yes	No	No	Yes	Yes
Observations	8,779	8,779	8,658	2,230	8,155	8,155	7,996	2,170
Number of individuals	1,928	1,928	1,917	659	1,918	1,918	1,893	658

Note: RE = random effects. FE = fixed effects. Exogenous control variables include age, age-squared, gender (in RE estimation), year dummies, and regional dummies. Socio-economic control variables include self-employment, full-time student, disabled, other non-labour activities, marital statuses, education dummies, log of real household income per annum, subjective health statuses, homeownership statuses, and interaction effects between unemployment and the Big Five personality traits (extraversion, agreeableness, openness, neuroticism, and conscientiousness). Columns 1-3 and 5-7 include all respondents e.g. aged 16-29. Columns 4 and 8 include only individuals who have likely left home e.g. aged 21-29.

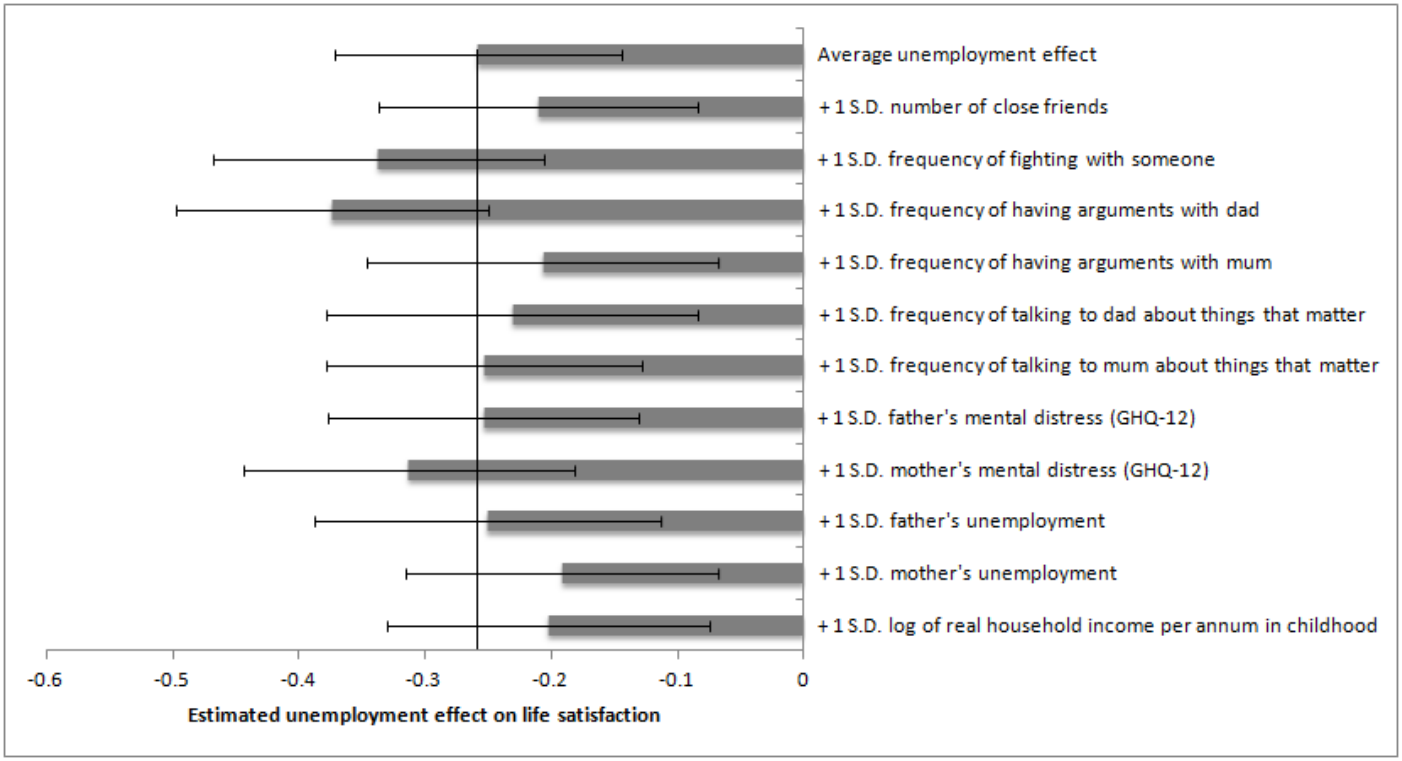
*<10%; **<5%; ***<1%. Cluster-robust standard errors (clustered at the individual level) are in parentheses.

Figure 1: The estimated effects of unemployment on mental well-being by childhood characteristics for all respondents (aged 16-29), regression-corrected



Note: 2-standard-error bands (90% C.I.) are reported: one s.e. above and one below. The vertical line represents the estimated effect of unemployment when all childhood characteristics are at their means, i.e. zero. The estimates are based on Column 3 of Table 2's specification.

Figure 2: The estimated effects of unemployment on life satisfaction by childhood characteristics for all respondents (aged 16-29), regression-corrected



Note: 2-standard-error bands (90% C.I.) are reported: one s.e. above and one below. The vertical line represents the estimated effect of unemployment when all childhood characteristics are at their means, i.e. zero. The estimates are based on Column 6 of Table 2's specification.

Table 3: Mental well-being and life satisfaction regression equations by gender for all respondents (aged 16-29), fixed effects regressions

VARIABLES	Men		Women	
	Mental well-being	**Life satisfaction**	**Mental well-being**	**Life satisfaction**
Unemployment	-0.928**	-0.015	-0.861**	-0.368**
	[0.437]	[0.160]	[0.337]	[0.161]
Standardized average childhood characteristics (aged 11-15 years old) interacted with unemployment in adulthood				
Number of close friends	0.008	-0.007	-0.065	0.123
	[0.203]	[0.080]	[0.261]	[0.105]
Frequency of fighting with someone	-0.352**	-0.152**	-0.460	-0.001
	[0.170]	[0.077]	[0.312]	[0.136]
Frequency of having arguments with father	-0.084	-0.120	-0.406	-0.017
	[0.300]	[0.119]	[0.274]	[0.098]
Frequency of having arguments with mother	0.252	-0.024	0.330	0.121
	[0.274]	[0.118]	[0.301]	[0.111]
Frequency of talking to dad about things that matter	0.207	0.204**	0.093	-0.049
	[0.239]	[0.101]	[0.268]	[0.124]
Frequency of talking to mum about things that matter	-0.151	-0.109	-0.051	0.120
	[0.245]	[0.104]	[0.290]	[0.102]
Father's mental distress (GHQ-12)	-0.212	-0.104	0.325	0.080
	[0.192]	[0.065]	[0.200]	[0.096]
Mother's mental distress (GHQ-12)	0.093	0.031	-0.193	-0.077
	[0.192]	[0.077]	[0.318]	[0.099]
Father's unemployment	-0.042	0.073	-0.068	0.009

	[0.179]	[0.091]	[0.218]	[0.138]
Mother's unemployment	0.037	-0.212*	0.684**	0.256***
	[0.264]	[0.110]	[0.275]	[0.082]
Log of real household income per annum	0.205	0.032	0.202	0.114
	[0.272]	[0.099]	[0.321]	[0.109]
Exogenous control variables	Yes	Yes	Yes	Yes
Socio-economic control variables	Yes	Yes	Yes	Yes
Observations	4,240	3,906	4,418	4,090
Number of individuals	972	957	945	936

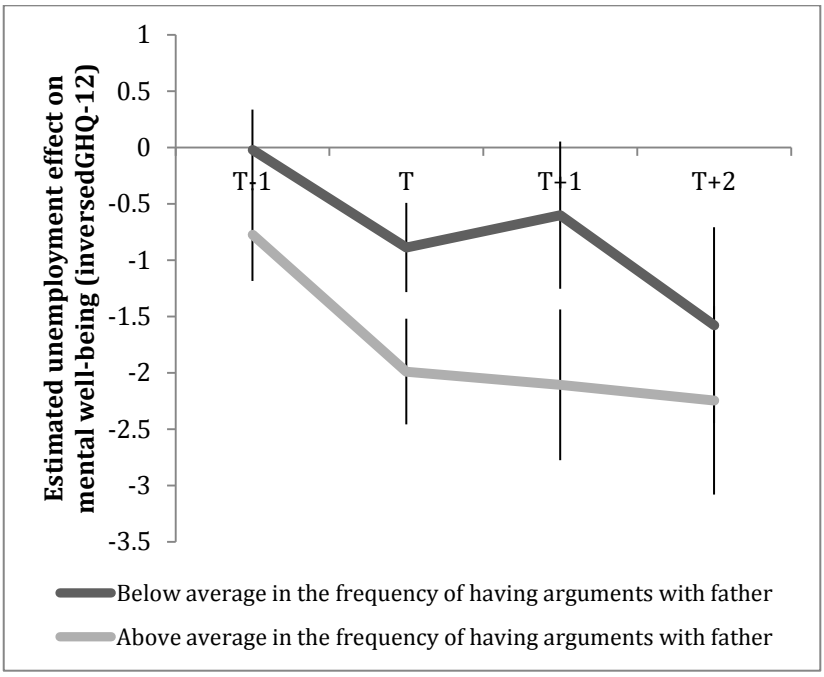
Note: *<10%; **<5%; ***<1%. Cluster-robust standard errors (clustered at the individual level) are in parentheses. Same set of control variables as in Table 2.

Table 4: Selection into unemployment by childhood characteristics

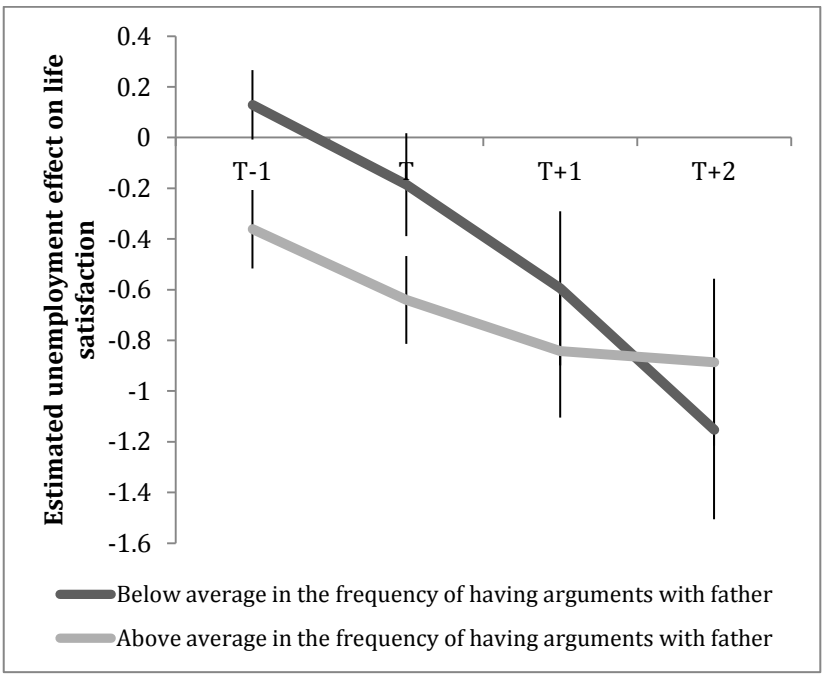
All	Proportion of people employed	Proportion of people unemployed	
Number of close friends	0.006	0.072	
Frequency of fighting with someone	0.030	0.265	***
Frequency of having arguments with father	0.035	0.062	
Frequency of having arguments with mother	-0.002	0.016	
Frequency of talking to dad about things that matter	-0.054	-0.200	*
Frequency of talking to mum about things that matter	-0.063	-0.227	**
Father's mental distress (GHQ-12)	-0.057	0.174	***
Mother's mental distress (GHQ-12)	-0.026	0.254	***
Father's unemployment	-0.001	0.287	***
Mother's unemployment	-0.051	0.286	***
Log of real household income per annum	-0.058	-0.407	***
Men			
Number of close friends	0.042	0.065	
Frequency of fighting with someone	0.066	0.262	*
Frequency of having arguments with father	0.012	0.113	
Frequency of having arguments with mother	0.007	0.082	
Frequency of talking to dad about things that matter	-0.059	-0.184	
Frequency of talking to mum about things that matter	-0.064	-0.172	
Father's mental distress (GHQ-12)	-0.040	0.128	
Mother's mental distress (GHQ-12)	-0.015	0.269	***
Father's unemployment	0.030	0.352	**
Mother's unemployment	-0.059	0.288	***
Log of real household income per annum	-0.059	-0.386	***
Women			
Number of close friends	0.006	0.132	
Frequency of fighting with someone	-0.023	0.188	*
Frequency of having arguments with father	0.047	0.009	
Frequency of having arguments with mother	-0.004	-0.023	
Frequency of talking to dad about things that matter	-0.018	-0.207	*
Frequency of talking to mum about things that matter	-0.003	-0.177	
Father's mental distress (GHQ-12)	-0.082	0.282	***
Mother's mental distress (GHQ-12)	-0.039	0.240	**
Father's unemployment	-0.042	0.165	*
Mother's unemployment	-0.036	0.320	***
Log of real household income per annum	-0.024	-0.392	***

Note: Figures in each cell represent the proportions of people employed and unemployed by childhood variables. Asterisks are based on the *t*-test that the two means – E *versus* U – are statistically the same. *<10%; **<5%; ***<1%.

Figure 3: The estimated well-being effects before and after unemployment for people of low and high frequencies of having arguments with father during adolescence, full sample



3a. Mental well-being



3b. Life satisfaction

Note: Year T is the year of unemployment. The individuals also remained in unemployment in T+1 and T+2. 2-standard-error bars (90% C.I.) are reported: one s.e. above and one below.

Table 5: The estimated well-being effects of different types of unemployment by frequencies of having arguments with father during adolescence, full sample

The implied well-being effects of unemployment	Mental well-being	Life satisfaction
Unemployed (other reasons)	-0.618***	-0.294***
	[0.232]	[0.109]
Unemployed (redundancies/layoffs)	-0.999***	-0.135
	[0.346]	[0.125]
Unemployed (other reasons) + 1 S.D. of frequency of having arguments with father	-0.975***	-0.434***
	[0.320]	[0.125]
Unemployed (redundancies/layoffs) + 1 S.D. of frequency of having arguments with father	-1.507***	-0.160
	[0.474]	[0.139]

Note: ***<1%. Cluster-robust standard errors (clustered at the individual level) are in parentheses.

Appendix A1: The correlation matrix of the standardized average childhood variables (aged 11-15)

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)
(i)	1.0000										
(ii)	0.1187*	1.0000									
(iii)	-0.0388*	0.1436*	1.0000								
(iv)	-0.0498*	0.1870*	0.5538*	1.0000							
(v)	0.0695*	-0.0524*	-0.0809*	-0.0932*	1.0000						
(vi)	0.0171*	-0.1541*	-0.0494*	-0.1154*	0.5439*	1.0000					
(vii)	0.0092	0.0836*	0.0715*	0.0375*	-0.0261*	-0.0156	1.0000				
(viii)	-0.0173*	0.1015*	0.0563*	0.0981*	-0.0548*	-0.0260*	0.2196*	1.0000			
(ix)	-0.0010	0.0308*	0.0052	0.0330*	-0.0051	-0.0465*	0.0546*	0.0939*	1.0000		
(x)	-0.0188*	0.0310*	-0.0092	0.0011	-0.0236*	-0.0075	0.0093	0.1209*	0.0952*	1.0000	
(xi)	0.0063	-0.0379*	0.0113	-0.0376*	0.1109*	0.0820*	-0.1051*	-0.1354*	-0.3099*	-0.2036*	1.0000

Note: (i) number of child's close friends; (ii) frequency of child fighting with someone at school; (iii) frequency of child having arguments with father; (iv) frequency of having arguments with mother; (v) frequency of child talking to dad about things that matter; (vi) frequency of child talking to mum about things that matter; (vii) father's mental distress level; (viii) mother's mental distress level; (ix) father's unemployment; (x) mother's unemployment; (xi) log of real household income per annum.

* indicates statistically significant at the 5% level.

Appendix A2: FE Estimates of the control variables in Columns 3 & 7 of Table 2

	Mental well-being	Life satisfaction
Age	-0.339*	-0.102
	[0.192]	[0.078]
Age-squared	0.007*	0.003*
	[0.004]	[0.001]
Self-employed	0.065	-0.116
	[0.266]	[0.126]
Full-time student	0.045	0.028
	[0.095]	[0.042]
Disabled	-1.464**	-0.397**
	[0.646]	[0.196]
Other non-labour activities	-0.099	0.025
	[0.169]	[0.075]
Married	0.102	0.317***
	[0.294]	[0.097]
Living as a couple	0.099	0.113**
	[0.154]	[0.056]
Widowed/widower	0.515	-0.276
	[1.251]	[0.245]
Divorced	1.215***	0.711***
	[0.329]	[0.224]
Separated	-0.182	0.458*
	[0.584]	[0.243]
Log of real household income per annum	-0.027	-0.019
	[0.045]	[0.018]
Education: A-level	0.368***	0.102
	[0.125]	[0.075]
Education: University degree	0.178	0.089
	[0.160]	[0.086]
Health: poor	-0.083	0.281
	[0.455]	[0.182]
Health: fair	1.000**	0.588***
	[0.447]	[0.178]
Health: good	1.399***	0.785***
	[0.450]	[0.179]
Health: excellent	1.674***	0.973***
	[0.451]	[0.181]
Number of children	-0.298**	-0.074
	[0.147]	[0.064]
Homeowner outright	0.325*	-0.012
	[0.171]	[0.065]
Mortgage/loan	0.284**	-0.002
	[0.136]	[0.051]

Unemployed × Extraversion	-0.005	0.002
	[0.015]	[0.009]
Unemployed × Agreeableness	0.018	0.005
	[0.033]	[0.018]
Unemployed × Openness	0.006	0.012
	[0.023]	[0.011]
Unemployed × Neuroticism	-0.034**	-0.006
	[0.017]	[0.014]
Unemployed × Conscientiousness	0.017	-0.014
	[0.022]	[0.014]
Observations	8,658	7,996
Number if individuals	1,917	1,893

Note: *<10%; **<5%; ***<1%. Cluster-robust standard errors (clustered at the individual level) are in parentheses.

Appendix A3: Fixed effects mental well-being regression equations with interaction effects between childhood characteristics at aged 11 or 15 and unemployment

	All		Men		Women	
VARIABLES	***a* = 11**	***a* = 15**	***a* = 11**	***a* = 15**	***a* = 11**	***a* = 15**
Unemployment	-0.876***	-0.962***	-1.091***	-1.197**	-0.910**	-0.985***
	[0.245]	[0.254]	[0.420]	[0.472]	[0.361]	[0.350]
Childhood characteristics at age = *a* interacted with unemployment						
Number of close friends	0.082	0.047	0.370	0.109	-0.013	-0.099
	[0.243]	[0.138]	[0.270]	[0.118]	[0.353]	[0.245]
Frequency of fighting with someone	-0.151	-0.145	-0.248	-0.232	-0.158	-0.281
	[0.191]	[0.167]	[0.209]	[0.197]	[0.539]	[0.353]
Frequency of having arguments with father	-0.663**	-0.115	0.013	-0.011	-1.277**	-0.114
	[0.306]	[0.238]	[0.380]	[0.341]	[0.519]	[0.356]
Frequency of having arguments with mother	0.295	-0.093	-0.299	-0.166	0.992	0.012
	[0.337]	[0.262]	[0.344]	[0.305]	[0.616]	[0.411]
Frequency of talking to dad about things that matter	0.464	-0.084	0.122	-0.065	0.623	-0.191
	[0.339]	[0.204]	[0.342]	[0.289]	[0.597]	[0.320]
Frequency of talking to mum about things that matter	-0.573	0.090	-0.117	0.018	-0.962	0.125
	[0.385]	[0.219]	[0.334]	[0.283]	[0.731]	[0.366]
Father's mental distress (GHQ-12)	0.125	-0.025	-0.102	-0.287	0.277	0.323
	[0.122]	[0.161]	[0.138]	[0.221]	[0.199]	[0.221]
Mother's mental distress (GHQ-12)	-0.396**	-0.213	-0.062	-0.017	-0.563**	-0.439*
	[0.197]	[0.156]	[0.226]	[0.165]	[0.283]	[0.263]
Father's unemployment	0.160	-0.041	0.136*	-0.059	0.191	-0.044

	[0.099]	[0.087]	[0.081]	[0.108]	[0.252]	[0.148]
Mother's unemployment	0.230*	0.332*	0.208	0.260**	0.129	0.444
	[0.130]	[0.174]	[0.212]	[0.109]	[0.242]	[0.362]
Log of real household income per annum	0.490	0.604*	0.340	0.549	0.533	0.800
	[0.412]	[0.314]	[0.400]	[0.387]	[0.804]	[0.590]
Exogenous control variables	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,650	8,650	4,232	4,232	4,418	4,418
Number of individuals	1,916	1,916	971	971	945	945

Note: *<10%; **<5%; ***<1%. Cluster-robust standard errors (clustered at the individual level) are in parentheses. Same set of control variables as in Table 2. The intertemporal correlations in the selected childhood characteristics between aged 11 and 15 variables in the full sample are -0.068 for "Number of close friends"; -0.016 for "Frequency of fighting with someone"; -0.028 for "Frequency of having arguments with father"; -0.033 for "Frequency of having arguments with mother"; 0.143 for "Frequency of talking to dad about things that matter"; 0.140 for "Frequency of talking to mum about things that matter"; 0.159 for "Father's mental distress (GHQ-12)"; 0.146 for "Mother's mental distress (GHQ-12)"; 0.104 for "Father's unemployment"; 0.009 for "Mother's unemployment"; and -0.059 for "Log of real household income per annum".

Appendix A4: Fixed effects life satisfaction regression equations with interaction effects between childhood characteristics at aged 11 or 15 and unemployment

	All		Men		Women	
VARIABLES	***a* = 11**	***a* = 15**	***a* = 11**	***a* = 15**	***a* = 11**	***a* = 15**
Unemployment	-0.265**	-0.284**	-0.134	-0.127	-0.298*	-0.408**
	[0.109]	[0.116]	[0.147]	[0.170]	[0.153]	[0.164]
Childhood characteristics at age = *a* interacted with unemployment						
Number of close friends	-0.022	0.063	-0.175	0.144**	0.147	-0.025
	[0.104]	[0.074]	[0.137]	[0.071]	[0.150]	[0.067]
Frequency of fighting with someone	-0.015	-0.014	-0.113	-0.102	-0.024	0.073
	[0.102]	[0.067]	[0.116]	[0.081]	[0.270]	[0.136]
Frequency of having arguments with father	-0.217**	-0.029	-0.263*	-0.087	-0.227	0.159
	[0.103]	[0.090]	[0.155]	[0.122]	[0.151]	[0.157]
Frequency of having arguments with mother	0.034	-0.049	-0.122	-0.114	0.197	-0.052
	[0.150]	[0.105]	[0.196]	[0.123]	[0.226]	[0.166]
Frequency of talking to dad about things that matter	0.408***	-0.035	0.480**	0.108	0.411*	-0.093
	[0.142]	[0.099]	[0.191]	[0.119]	[0.220]	[0.158]
Frequency of talking to mum about things that matter	-0.324*	0.060	-0.274	-0.080	-0.367	0.242*
	[0.192]	[0.094]	[0.266]	[0.130]	[0.297]	[0.139]
Father's mental distress (GHQ-12)	0.022	0.043	-0.047	-0.064	0.105	0.126
	[0.064]	[0.061]	[0.081]	[0.077]	[0.099]	[0.089]
Mother's mental distress (GHQ-12)	-0.056	-0.102	0.019	-0.077	-0.067	-0.108
	[0.082]	[0.062]	[0.112]	[0.072]	[0.111]	[0.099]
Father's unemployment	-0.046	0.034	-0.017	0.032	-0.103	0.053
	[0.055]	[0.048]	[0.068]	[0.060]	[0.102]	[0.089]

Mother's unemployment	0.082	0.006	-0.044	-0.083	0.181***	0.132**
	[0.055]	[0.048]	[0.047]	[0.061]	[0.069]	[0.055]
Log of real household income per annum	0.159	0.056	0.524**	0.097	-0.160	-0.172
	[0.184]	[0.130]	[0.231]	[0.143]	[0.295]	[0.248]
Exogenous control variables	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,990	7,990	3,900	3,900	4,090	4,090
Number of individuals	1,892	1,892	956	956	936	936

Note: *<10%; **<5%; ***<1%. Cluster-robust standard errors (clustered at the individual level) are in parentheses. Same set of control variables as in Table 2. See Table A3's note for the intertemporal correlations between in the selected childhood characteristics between aged 11 and 15 variables in the full sample.