IARIW 2021

Monday 23 – Friday 27 August

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Paper prepared for the 36th IARIW Virtual General Conference
August 23-27, 2021
Session 11: Non-cognitive Skills: How Are They Formed? What Are Their Returns?
Time: Wednesday, August 25, 2021 [14:00-16:00 CEST]

Striking Out? The Cognitive and Non-Cognitive Antecedents of Self-Employment*

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This version: July 2021

Abstract

We here use the employment-history data from the British Cohort Study to calculate an individual's total experience of self-employment from the time they left education up to age 30. We consider both ongoing and completed self-employment spells and show that, conditional on current employment, only the latter is correlated (negatively) with the life satisfaction that the individual reports at age 30, so that past (completed) self-employment scars. We also identify the childhood circumstances and family background that predict this adult self-employment experience. Educational achievement at age 16 reduces adult self-employment experience. Both boys and girls reproduce on average their parents' self-employment, so that this early-life self-employment experience, and its well-being consequences, is transmitted between generations.

Keywords: Self-employment, Cohort data, Life Satisfaction.

JEL Classification Codes: J21, J63, I31.

* We are grateful to Richard Layard, George Ward, Sarah Flèche and Nick Powdthavee for discussions as part of our long-run ongoing project on birth-cohort data and well-being. For the BCS and NCDS data access, we thank The Centre for Longitudinal Studies, UCL Institute of Education for the use of these data and to the UK Data Archive and UK Data Service for making them available. However, they bear no responsibility for the analysis or interpretation of these data. Andrew Clark acknowledges support from CEPREMAP, the US National Institute on Aging (Grant R01AG040640), the John Templeton Foundation, the What Works Centre for Wellbeing and EUR grant ANR-17-EURE-0001. Anthony Lepinteur acknowledges support from the Fonds National de la Recherche (Luxembourg).

1. Introduction

Is self-employment a choice or the last resort of those who cannot find an adequate job? Many articles have concluded that the self-employed are on average happier than the employed (some examples are Blanchflower and Oswald, 1998, Blanchflower, 2000, Clark and Senik, 2006, Benz and Frey, 2008, Schneck, 2014, and Pham *et al.*, 2018). These findings do raise an obvious question: if self-employment really produces greater well-being than employment, what are most of us doing wrong: Why are we not all self-employed?

Individuals differ in many ways on the labour market, and one is certainly their ability to make a success of self-employment, and surveys will mechanically be likely to pick up those for whom self-employment is successful. But what of those who tried self-employment and failed? We here look at both past and current self-employment in birth-cohort data. We find (as is common) that currently being self-employed is associated with higher subjective well-being, but on the contrary the total number of months spend self-employed since leaving school reduces well-being. Closer investigation reveals that this latter effect comes entirely from past completed self-employment spells. To this extent, self-employment is good for individuals when it works (i.e. is ongoing), but reduces their well-being when it did not (as the spell ended).

Given the different well-being implications of successful and unsuccessful self-employment, it is important to understand why some individuals become self-employed but others do not.

Evans and Jovanovic (1989) propose a formal model in which individual entrepreneurial ability determines the optimal size of the entrepreneurial project (here measured by the size of the capital stock), and individual wealth determines how much money the individual can borrow. As such, the individual may not be able to borrow enough for their project to reach optimal size. The choice between self-employment and wage employment leads individuals to sort into three groups:

employees, constrained self-employed (with sub-optimal capital stock), and unconstrained self-employed.

The key variables in this model are wealth (which determines borrowing capacity) and ability. Regarding the former, Blanchflower and Oswald (1998) explicitly test the proposition that individuals who have more wealth are less likely to be constrained in their ability to borrow, and so are more likely to become self-employed. Their empirical analysis of the UK National Child Development Survey, where wealth is measured by inheritances and instrumented by the death of a parent, confirms this prediction. Jensen *et al*. (2021) do not consider changes in wealth as such, but rather a Danish reform that allowed home owners to borrow against equity for other things than buying a house: this reform did not affect wealth but did change the liquidity of home-owners. This reform is shown to have had a small positive impact on entrepreneurship for the treated group. Malkova (2021) underlines the role of rising borrower-lender distance, as personal presence during a loan transaction is key. She considers the rising distance that comes from branch closures following the mergers of large banks. Branch closures reduce the number of self-employed businesses that depend on business loans (but increase the number that do not).

While risk-aversion and financial considerations have attracted a great deal of attention, they may not be the only impediment, or encouragement, to self-employment. Hurst and Lusardi (2004) find that the propensity to become a business owner is a non-linear function of wealth, being mostly flat with a positive element only at the top of the wealth distribution. They then suggest that a more-complete picture of self-employment should include childhood background:

> "*In future work, the role of family background on the probability of starting a business, along with the survival rate of that business, should be more explored. Children who receive inheritances are much more likely to start a business, regardless of when inheritances were received. While children who receive inheritances are likely to come from relatively wealthy families, it is unclear whether wealthy parents teach their children about either investment behaviour, in general, or small business investment, in particular. Furthermore, do wealthy parents provide an implicit insurance to their children, thereby limiting their downside risk*

in case the business fails? Understanding these questions may shed much needed light on the decision of households to start small businesses." (p.344)

We here follow this recommendation, and appeal to long-run birth-cohort data to consider both the causes and consequences of adult self-employment experience. We in particular focus on early-adulthood labour-market experiences, and calculate early-adulthood self-employment experience as the percentage of months spent in self-employment from the end of full-time education up to age 30. We will also split these months of self-employment up into those that were part of completed spells and those that refer to an ongoing spell of self-employment.

This self-employment experience is then correlated with the individual's life satisfaction reported at age 30. While being self-employed is commonly associated with higher levels of well-being, we provide a proviso in that early-life completed self-employment spells instead scar as they are associated with lower life satisfaction. We in addition find little evidence of any adaptation to ongoing spells of self-employment.

We then turn to the determinants of the different types of self-employment experiences. As noted above, our measure of this latter goes far beyond a simple dummy for currently being self-employed, and so exhibits much more variation across individuals. The birth-cohort data we use here allows us to relate this experience to a wide set of childhood characteristics and family background.

Better cognitive performance at age 16 reduces the share of active life spent in completed self-employment spells as adults, while non-cognitive skills at age 16 do not seem to play a significant role in predicting future self-employment of any type. Family background is more important. Wealthy parents favour both entry into self-employment and self-employment experience, and ongoing self-employment experience at age 30 rises with parents' education. Growing up with self-employed parents also translates into longer ongoing self-employment experience: there is thus

significant intergenerational transmission of self-employment. These effects of own educational attainment and parental self-employment are stronger for men.

We do find something of a social-norm effect: the negative effect of completed self-employment experience on adult well-being is stronger for children who grew up with rich and self-employed parents. "Failed" self-employment may scar more when compared to more-successful parents.

The remainder of the paper is organised as follows. Section 2 reviews some of the literature on the causes and consequences of self-employment. 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 Self-Employment Experience in a Life-Course Model of Well-Being

We here appeal to the life-course model of well-being in Layard *et al.* (2014) to investigate the causes and consequences of self-employment 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, both directly and in a mediated way via adult outcomes. Our objectives here are to first evaluate the extent to which early-adulthood self-employment experience affects adult life-satisfaction, and then see how this self-employment experience itself is correlated with family background and childhood characteristics. We review below some of the existing literature relating to these two questions.

a. Self-Employment and well-being: average effect and adaptation

A considerable literature has underlined that the self-employed report higher levels of job satisfaction than do paid employees in both cross-section and panel data (for example, Blanchflower and Oswald, 1998, Blanchflower, 2000, Clark and Senik, 2006, Benz and Frey, 2008,

Schneck, 2014, Pham *et al*., 2018). This correlation may at first sight seem puzzling, given that the self-employed have worse labour-market outcomes on many counts, such as lower earnings (Hamilton, 2000) and longer hours of work (Hyytinen and Ruuskanen, 2007).

Benz and Frey (2008) analyse German, British and Swiss data to show that the high job satisfaction of the self-employed may be explained by their greater autonomy at work. Their explanation is based on the notion of procedural utility, whereby individuals value not only the outcomes that they receive but also the processes via which these are obtained.

A number of contributions have gone beyond the average correlation between self-employment and subjective well-being to assess adaptation to changes in individuals' lives, where the short-run well-being effect may be larger than that in the longer run. Clark and Georgellis (2013) used British Household Panel Survey (BHPS) data to show that the well-being consequences of marriage, child-birth and widowhood only have temporary well-being effects. Other events are longer-lasting in subjective well-being terms, such as such as unemployment and being in a relationship (Clark *et al*., 2018), working-time reductions (Lepinteur, 2019), and entry into poverty (Clark *et al*., 2016). Some of the well-being adaptation literature is surveyed in Clark (2016).

The evidence on adaptation to self-employment is both scarcer and more ambiguous. Hanglberger and Merz (2015) and van der Zwan *et al*. (2018) both analyse German SOEP data, but find different time profiles: the former conclude as to complete adaptation to self-employment in terms of job satisfaction three years after starting a business, while the latter find a persistent positive effect lasting five years or more. The analogous analysis of BHPS data in Georgellis and Yusuf (2016) reveals complete adaptation to self-employment in terms of job satisfaction.

b. The childhood determinants of self-employment

There is a very active literature on the determinants of the decision to become self-employed, and Blanchflower (2000) provides a detailed literature review. A number of contributions have

assessed the role of personality traits on the probability of self-employment. We can consider these as childhood determinants if they are indeed fixed over time (although see Boyce *et al*., 2013, and Marsaudon, 2019, for dissenting views).

Starting a business is a risky decision, and the literature has extensively discussed the role of risk-aversion in determining self-employment. For example, Dohmen *et al*. (2010) use SOEP data to show that the self-employed are more likely than the employed to say that they are willing to take risks regarding the job-related domains of career and finances (but not with respect to other dimensions of health or driving their car). In Ekelund *et al*. (2005), a self-reported seven-item harm-avoidance scale is negatively correlated with current self-employment status in Finnish birth-cohort data; see also Cramer *et al*. (2002). Last, the experiment in Colombier *et al*. (2009) reveals that the real-life self-employed made repeated choices over lotteries in a Holt-Laury task that implied lower levels of risk-aversion than did the choices of the real-life employed.

Other than risk-aversion, self-employment has also been shown to be positively related to self-confidence (Ardagna and Lusardi, 2008), openness and extraversion (Caliendo *et al*., 2014), and the individual's confidence in their ability to start a business (Koellinger *et al*., 2007).

The relationship between education and self-employment does not appear to be linear. In OECD countries, Blanchflower (2000) finds that the less-educated individuals and, to a smaller extent, the higher-educated are both more likely to be self-employed. In Kim *et al*. (2006), in the US having a college degree is the best predictor of self-employment. As we will see below, the role of education in our data will mainly be in avoiding failed (i.e. completed) self-employment spells.

While personality (perhaps) and education remain fairly constant over time (so that their earlier-life values can be deduced from adult respondents), less is known about how family background and characteristics measured during childhood predict adult self-employment experience (including not only their current labour-force status, but also those in the past). 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 the individual's labour-market status during adulthood.

We complement this existing work on the causes of self-employment in two ways. As suggested by Hurst and Lusardi (2004) we first simultaneously take into account the influence of a variety of different dimensions of childhood and family background (measured during the respondent's childhood), rather than concentrating on the isolated effect of one or a small number of specific childhood characteristics (often measured retrospectively); 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 self-employment that picks up all of the time that the respondents spent self-employed between leaving education and age 30, rather than a simple dummy indicating whether the individual is currently self-employed at the time of the interview. This introduces more variability across individuals and provides a better understanding of what makes a successful entrepreneur. The following section describes our data and the way in which we construct our variables.

3. Data, Sample and Empirical Approach

a. The British Cohort Study

Our empirical analysis is based on the British Cohort Study (BCS), which follows the lives of more than 17,000 people born in England, Scotland and Wales in a single week of 1970. Over the course of the lives of cohort members, the BCS has collected information on, amongst others, physical, educational and social development, health, economic circumstances and gender attitudes. Since the birth wave of the survey in 1970, there have been ten other waves ('sweeps') at ages 5, 10, 16, 26, 30, 34, 38, 42, 36 and 51. At each sweep, different sources and methods were

used to gather information on the cohort members. In the birth survey, the main questionnaire was completed by the midwife present at birth and supplementary information was obtained from clinical records. As the cohort members aged, questionnaires were administered to parents, teachers and, eventually, the cohort members themselves. Medical examinations were also carried out and cohort members participated in thorough assessments of various aspects of their lives.[1]

The analysis of non-response in longitudinal studies has underlined that this is often systematic and not random. Ketende *et al.* (2010) analyse attrition in the BCS70 sample, where 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 dependent variables (self-employment experience since leaving education 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

The sample of respondents with non-missing values for our two dependent variables consists of 4753 observations for men and 5026 observations for women. The complete descriptive statistics appear in Table 1.

- **Self-employment experience**

[1] 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.

Respondents in the 5th sweep, at age 30, were asked to report their last ten episodes on the labour market.[2] They assign one status to each episode from the list of 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 self-employment experience for individual *i* at age 30 is then defined as follows:[3]

$$Self\_Emp.Exp_{i\,30} = \frac{Months\ Self\_Employment_i}{Months\ Active\ LM_i}$$

Here *Months Self_Employment*$_i$ corresponds to the number of months spent self-employed since leaving full-time education, and *Months Active LM*$_i$ the number of months full-time employed, part-time employed, full-time self-employed, part-time self-employed, or unemployed (*i.e.* active in the labour market) over the same period.[4]

Table 2 presents the descriptive statistics for self-employment experience at age 30. Under 15% of our sample of BCS respondents had already had some self-employment experience by age 30. For 9% of the sample, this self-employment covered under 50% of their active life, while 5% of the sample had spent more than half of their active life self-employed. Note that current self-employment (8%) is more prevalent than life-time self-employment (5.8%), while the opposite

[2] Ten or fewer episodes take almost all respondents back to the point at which they left full-time education. The ten respondents who listed more than ten episodes, and for whom we cannot then calculate lifetime self-employment experience, are dropped from the empirical analysis.

[3] The age-42 wave of the BCS also includes information on past labour-market experience, although unfortunately 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.

[4] Over 50% of the sample left full-time education at the earliest-possible age for this cohort, 16, and therefore have the maximum potential number of months active in the labour market at age 30 of 168 (corresponding to 14 years).

holds for unemployment (Clark and Lepinteur, 2019). Self-employment then becomes more likely with age, at least among this young sample, whereas unemployment prevalence falls.

- **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 our sample. Over half of respondents reply 7 or 8, with only few choosing values under 4. The resulting skewed well-being distribution is very common in the literature.

- **Other adult outcomes**

We consider a number of adult outcomes, as reported by the respondent at age 30. These are their equivalised household annual income, qualifications, non-criminality, current marriage or cohabitation, and number of physical health conditions.

- **Childhood characteristics and Family background**

The richness and long time-span of the BCS data allows us to include variables that were collected at various points between the respondent's birth and age 30. We take the following 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; post-marital conception; and low birth-weight.

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 child 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", "Self-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).

We also consider the respondent's childhood characteristics via 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 health 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 variable 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 self-employment experience during the individual's active life affects their life satisfaction at age 30 using the following OLS regression:[5]

$$LS_{i_{30}} = \alpha_1 Self\_Emp.Exp_{i_{30}} + \alpha_2 Emp.Status_{i_{30}} + \alpha_3 AO_{i_{30}} + \alpha_4 CO_{i_{16}} + \alpha_5 F0_{i_0} + \epsilon_{i_{30}} \quad (1)$$

[5] We have also run ordered-probit models, which produce very similar results. Note that the BCS data do include 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.

Here LS_{i30} is the life satisfaction reported by individual i at age 30 and $Self\_Emp.Exp_{i30}$ is the percentage of the time active in the labour market that was spent self-employed from the end of school up to age 30. $Emp.Status_{i30}$ is a vector of dummies for the individual's current 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 the individual adult outcomes at age 30, childhood outcomes at age 16, and family background before age 16.

In the above equation, α_1 is the lasting effect of past self-employment on contemporaneous life satisfaction, conditional on current labour-force status. However, it mixes the effects of two types of past self-employment: completed and ongoing self-employment experiences. We therefore also estimate the following regression via OLS:

$$LS_{i_{30}} = \beta_1 Ongoing\ Exp_{i_{30}} + \beta_2 Completed\ Exp_{i_{30}} + \beta_3 Emp.Status_{i_{30}} + \beta_4 AO_{i_{30}} + \beta_5 CO_{i_{16}} + \beta_6 F0_{i_0} + \epsilon_{i_{30}} \quad (2)$$

Here $Ongoing\ Exp_{i30}$ and $Completed\ Exp_{i30}$ are the percentage of the time active in the labour force that was spent in respectively ongoing and completed self-employment from the end of school up to age 30. A negative estimated β_1 coefficient therefore indicates adaptation to self-employment (current self-employment brings a lower life-satisfaction return the longer it lasts), while a negative value for β_2 suggests scarring from completed experiences of early-life self-employment. Note that these two variables are not exclusive: an individual can have both an ongoing self-employment spell and one or more past completed ones.

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

$$Self\_Employed_{i_{30}} = \gamma_1 CO_{i_{16}} + \gamma_2 F0_{i_0} + \mu_{i_{30}} \quad (3)$$

$$Self\_Emp.Exp_{i_{30}} = \theta_1 CO_{i_{16}} + \theta_2 F0_{i_0} + \mu_{i_{30}} \quad (4)$$

Here *Self_Employed$_{i30}$* is a dummy for being self-employed at age 30 and *Self_Emp.Exp$_{i30}$* is, as above, the share of active months spent self-employed up to age 30. These regressions establish whether childhood characteristics at age 16 and family background can predict early-adulthood self-employment. Our use of self-employment experience, which exhibits much more variation than a dummy for current self-employment, should improve the quality of the fit, as revealed by a higher adjusted R^2. We will also estimate ongoing and completed self-employment experiences using the specification in (4).

Blanchflower (2000) shows that education is negatively correlated with the probability of being self-employed, and as such expect cognitive and non-cognitive skills at age 16 may well play a role. We also expect the effect of family income to be positive: higher family income during childhood is likely to be positively correlated with inheritances and *in-vivo* transfers that can help to start a business. We last expect self-employment to be transmitted over generations: growing up with self-employed parents should be positively correlated with own self-employment.

4. Results

a. Self-employment experience and life satisfaction

Table 3 shows the results from the estimation of Equation (1), that of life satisfaction at age 30 on a variety of adult outcomes, including self-employment experience in the first row, and various childhood and family-background variables. The first column includes only self-employment experience as an adult outcome, while the second adds current labour-force status. The last column

then 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. All of the specifications include childhood characteristics and family background

In the first column there is a positive and statistically significant correlation between self-employment experience and age-30 life satisfaction, controlling for childhood characteristics and family background. Self-employment experience is expected to be highly correlated with the current labour force status, so that this first estimated coefficient might in particular capture the life-satisfaction effect of current self-employment. The introduction of both current and past self-employment together (with the other labour-force statuses) in column 2 renders the estimated coefficient of self-employment experience negative and significant. A one standard-deviation rise in self-employment experience (0.19, from Table 1) is now estimated to reduce life satisfaction by 0.03 points, while current self-employment increases it by 0.33 points. When we add the other age-30 adult outcomes as controls in column 3, the estimated coefficient on self-employment experience is a little smaller and that on current self-employment 28% larger. This is not surprising, as self-employment is correlated with worse outcomes such as lower income (Clark and Senik, 2006).

Conditional on adult outcomes, childhood characteristics and family background, past self-employment experiences from leaving school up to age 30 then reduce life satisfaction. However, this experience variable might confound two separate phenomena: adaption to ongoing self-employment experience and any scarring effect of completed past self-employment. This is addressed in Equation (2) where we separately estimate the effect of ongoing and completed self-employment experience. The results are listed in Table 4. With no other contemporaneous control variables in column 1, the estimated coefficient on completed self-employment experience is negative but not significant (*p*-value=0.15), while that on ongoing experiences is positive and

significant. The coefficient on completed self-employment remains negative and becomes statistically significant with the addition of controls in columns 2 and 3, but that on ongoing self-employment switches sign. This is due to the obvious correlation between ongoing self-employment and current self-employment. The negative estimates in columns (2) and (3), albeit not significantly different from zero, are consistent with adaptation to self-employment. The negative coefficient on unsuccessful early-life self-employment suggests that they scar, as previously found in BCS data for early-life completed unemployment spells (Clark and Lepinteur, 2019).

It is of course possible that the correlation between early-life self-employment and life satisfaction at age 30 reflect confounding factors, rather than a causal relationship. While the BCS 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 self-employment experience up to age 30 and life satisfaction at age 30. To help turn this channel off, we now consider 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 predict both life satisfaction at age 30 and early-life self-employment experience between will be held constant by controlling for life satisfaction at age 26.

The value-added results appear in Appendix Table A3.[6] The estimated coefficient on self-employment experience remains negative and significantly different from zero here at the 5% level at least in columns 2 and 3, with estimated coefficients that are comparable in size to those in the baseline regressions in Table 3. Columns 4 to 6 refer to ongoing and completed self-employment, with a pattern of results that is very similar to that in Table 4. This overall similarity between the

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

baseline and the value-added results suggests that omitted variables do not entirely explain our findings.

Not everyone may be equally affected by their self-employment experience. In Clark and Lepinteur (2019), life-satisfaction penalty from past unemployment experience is larger for those who had rich and employed parents. We therefore test for a moderating effect of childhood family environment, here captured by family income and father's and mother's self-employment when growing.

As ongoing and completed self-employment experiences affect adult life satisfaction differently, we carry out separate interactions with them. The results in Table 5 regarding family income are consistent with social-norm effects, a "failed" attempt at self-employment scars more for those who grew up in richer households. On the contrary, there is little in the way of a systematic pattern between the well-being consequences of own self-employment experience and the self-employment of the parents. This may well reflect small cell sizes when we interact the two.

b. How is self-employment experience determined by childhood characteristics and family background?

Given that contemporaneous self-employment and past self-employment experiences have considerable effects on adult well-being, it is important to understand their precursors. Table 6 shows how childhood characteristics and family background predict first self-employment at age 30 in the first column and then self-employment experiences (total, ongoing and completed) in the remaining columns.

Both cognitive and non-cognitive skills at age 16 were found to be important predictors of future unemployment experience in Clark and Lepinteur (2019). Here, having at least an O-level significantly reduces the share of total time spent self-employed while active by 1.65 percentage points, with most of this effect working via completed self-employment spells. The self-

employment experiences of individuals with low educational achievement may not so much be the outcome a choice, but rather a last resort for those who cannot find an adequate job. On the contrary, there is no relationship between non-cognitive skills at age 16 (behaviour and emotional health) and any of the self-employment measures at age 30.

Colombier and Masclet (2008) underlined the intergenerational transmission of self-employment in the French part of the European Community Household Panel data, considering the respondent's current self-employment status. We confirm that that there is intergenerational transmission: both mother's and father's self-employment during childhood significantly increase all of their child's self-employment measures. This intergenerational transmission works more via (successful) ongoing spells than (unsuccessful0 completed spells (this is especially the case for father's self-employment).

Family income and parents' education also predict their child's self-employment. These results are consistent with the idea that growing up in a rich and educated family facilitates the accumulation of the necessary monetary and human capital to start a business. It is notable that parents' education On the contrary, parents' education only predicts 'succesful' (i.e. ongoing) self-employment: holding money and cognitive and non-cognitive skills at age 16 constant, parental education can then be considered as a source of human capital that benefits ongoing entrepreneurs.

5. Conclusion

This article is the first to estimate the effect of the total experience of self-employment on well-being using cohort data. Based on the life-course approach of well-being we find limited evidence on adaptation to self-employment but we show that completed self-employment experiences continues to reduce current well-being, even controlling for a wide set of variables covering family background, and childhood and adulthood outcomes.

We predict the different stock measures of self-employment at age 30 using information on adolescence and family background as well as the probability to be currently self-employed. No type of self-employment experience is significantly predicted by behavioural and emotional outcomes at age 16. However, better cognitive skills at age 16 reduces the self-employment probability and experience for men. Growing up in a favourable context (high family income and educated parents) significantly increases self-employment experience. However, a high family income only predicts longer completed self-employment experience while parents' education only predicts longer ongoing self-employment experience. 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. Note that the intergenerational transmission of self-employment is somewhat stronger for men. Social norms might be behind this correlation. We show that the scarring effect of past completed self-employment is larger for children from favourable upbringings and with self-employed parents.

Our results have important policy implications. Facilitating the access to self-employment would increase well-being on the short-run

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Figure 1: BCS Life Satisfaction at age 30

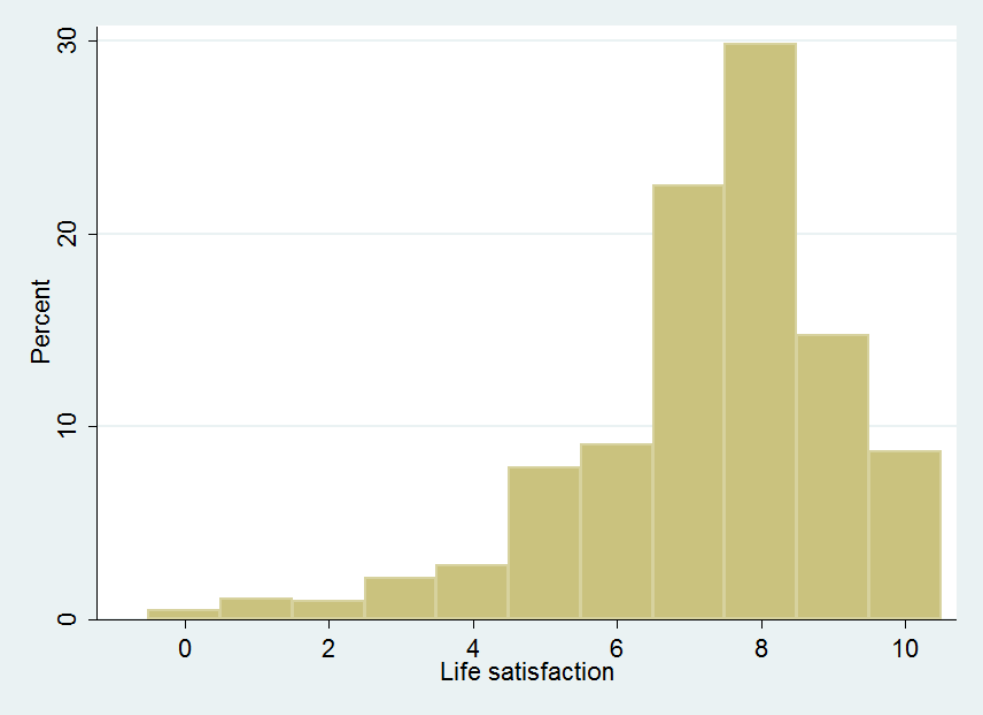

Table 1: Descriptive Statistics

	Unit	Mean	Standard Deviation
Adult Outcomes:			
Life satisfaction	0-10	7.35	1.80
Self-Employment Experience	Share	0.06	0.19
Ongoing Self-Employment Experience	Share	0.04	0.15
Completed Self-Employment Experience	Share	0.02	0.11
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 self-employment	Share	0.17	0.37
Father's employment	Share	0.74	0.26
Mother's self-employment	Share	0.08	0.26
Mother's employment	Share	0.74	0.27
Parental involvement	Index	6.34	0.88
Family break-up	0/1	0.22	
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 set out in Appendix Table A1.

Table 2: The Distribution of Self-employment Experience at age 30

Percentage of Active Life at age 30	Total self-employment (Percentage)	Ongoing self-employment (Percentage)	Completed self-employment (Percentage)
0	86.17%	92.05%	92.92%
]0, 10]	2.40%	1.60%	1.35%
[10, 25[	2.96%	1.39%	2.08%
[25, 50[	3.51%	1.83%	2.16%
[50, 75[	2.09%	1.23%	0.84%
[75, 100]	2.87%	1.90%	0.65%

Table 3: Life Satisfaction and Self-Employment Experience at Age 30

		Life Satisfaction (0-10)		
	Units	(1)	(2)	(3)
Self-employment experience	Share	0.233**	-0.163*	-0.142*
		(0.105)	(0.078)	(0.072)
Part-time employed	0/1		-0.098***	0.231***
			(0.026)	(0.027)
Self-employed	0/1		0.332**	0.426***
			(0.121)	(0.114)
Unemployed	0/1		-1.032***	-0.828***
			(0.167)	(0.152)
Out of the labour force	0/1		0.090	0.234
			(0.204)	(0.196)
Income	Ln			0.264***
				(0.029)
Qualifications	SD(index)			0.049**
				(0.022)
Non-criminality	Arrests (inv.)			0.058***
				(0.007)
Partnered	0/1			0.301***
				(0.030)
Physical health (lagged)	SD(index)			0.204**
				(0.077)
Observations		9779	9779	9779
Adjusted R^2		0.035	0.048	0.066

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 Ongoing and Completed Self-employment Experiences

		Life Satisfaction (0-10)		
	Units	(1)	(2)	(3)
Ongoing Self-Employment experience	Share	0.460**	-0.097	-0.098
		(0.177)	(0.159)	(0.156)
Completed Self-Employment experience	Share	-0.162	-0.215*	-0.210*
		(0.108)	(0.118)	(0.114)
Part-time employed	0/1		-0.098***	0.231***
			(0.026)	(0.027)
Self-employed	0/1		0.305*	0.407***
			(0.147)	(0.138)
Unemployed	0/1		-1.031***	-0.828***
			(0.167)	(0.152)
Out of the labour force	0/1		0.090	0.234
			(0.203)	(0.196)
Observations		9779	9779	9779
Adjusted R^2		0.036	0.047	0.065
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	Life Satisfaction (0-10)		
		(1)	(2)	(3)
Ongoing Self-Employment experience	Share	-0.095	-0.243	-0.075
		(1.026)	(0.231)	(0.179)
Completed Self-Employment experience	Share	2.591***	-0.094	-0.188
		(0.692)	(0.117)	(0.131)
Family Income	Ln	0.060**		
		(0.025)		
Ongoing Self-Employment experience # Family Income	Share*Ln	-0.004		
		(0.227)		
Completed Self-Employment experience # Family Income	Share*Ln	-0.687***		
		(0.162)		
Father's self-employment	Share		0.026	
			(0.069)	
Ongoing Self-Employment experience # Father's self-employment	Share* Share		0.383	
			(0.227)	
Completed Self-Employment experience # Father's self-employment	Share* Share		-0.446	
			(0.348)	
Mother's self-employment	Share			0.185**
				(0.066)
Ongoing Self-Employment experience # Mother's self-employment	Share* Share			-0.174
				(0.295)
Completed Self-Employment experience # Mother's self-employment	Share* Share			0.106
				(0.511)
Observations		9779	9779	9779
Adjusted R^2		0.066	0.066	0.066

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. * p<0.10, ** p<0.05, *** p<0.01.

Table 6: The Determinants of Self-employment at Age 30

	Units	Self-employed at age 30	Self-Employment Experience		
			Total	Ongoing	Completed
Intellectual performance (16)	0/1	-1.24 (0.84)	-1.65*** (0.03)	-0.64 (0.47)	-1.01*** (0.33)
Behaviour (16)	Index	0.24 (0.29)	-0.01 (0.20)	-0.04 (0.16)	0.03 (0.11)
Emotional health (16)	Index	-0.33 (0.28)	-0.08 (0.19)	-0.03 (0.16)	-0.05 (0.11)
Family income	Ln	0.82** (0.32)	0.45** (0.22)	0.22 (0.18)	0.24* (0.12)
Parents' education	Age	0.56* (0.29)	0.41** (0.20)	0.42*** (0.16)	-0.02 (0.11)
Mother's Self-employment	Share	1.46*** (0.29)	0.93*** (0.20)	0.57*** (0.16)	0.36*** (0.11)
Father's Self-employment	Share	1.62*** (0.29)	1.61*** (0.20)	1.49*** (0.16)	0.12 (0.11)
Mother's employment	Share	0.75* (0.40)	0.17 (0.27)	0.15 (0.22)	0.02 (0.16)
Father's employment	Share	-0.61 (0.41)	-0.16 (0.28)	-0.12 (0.23)	-0.04 (0.16)
Parental involvement	Index	0.42 (0.29)	0.10 (0.20)	0.10 (0.16)	-0.01 (0.11)
Family break-up	0/1	-0.55 (0.88)	0.28 (0.60)	-0.78 (0.50)	1.06*** (0.35)
Mother's mental health	Index	-0.03 (0.29)	0.40** (0.19)	0.29* (0.16)	0.11 (0.11)
No. of siblings	No.	0.51* (0.30)	0.37* (0.20)	0.28* (0.17)	0.09 (0.12)
Post-marital conception	0/1	-0.31 (1.01)	0.28 (0.69)	-0.01 (0.57)	0.30 (0.40)
White	0/1	-1.04 (2.10)	-2.08 (1.43)	-1.47 (1.18)	-0.61 (0.82)
Low birth weight	0/1	0.18 (1.19)	-0.49 (0.81)	-0.18 (0.67)	-0.30 (0.47)
Female	0/1	-6.59*** (0.56)	-5.25*** (0.38)	-3.43*** (0.31)	-1.82*** (0.22)
Observations		9779	9779	9779	9779
Adjusted R^2		0.025	0.043	0.028	0.013

Notes: Standard errors are in parentheses. All the independent variables are standardised (except the dummies). 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 statuses	30	Full-time employed, Part-time employed, Self-employed, Unemployed, and Out of the labour force	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?	Total (reversed) score used.	Respondent
Partnered	30	Currently married or cohabiting	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 questions)	Mother+child
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 questions)	Mother
Family Break up	0,5,10,16	Both natural parents live in household at 16	Reverse scale (0/1)	Mother
Mother's work	0,5,10,16	Currently employed	No. of waves answered Yes (/4)	Mother
Father's Unemployment	0,5,10,16	Currently unemployed	No. of waves answered Yes (/4)	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

Table A3: Life Satisfaction and Adult Outcomes at Age 30

		Life Satisfaction (0-10)					
	Units	(1)	(2)	(3)	(4)	(5)	(6)
Self-employment experience	Share	0.068	-0.249**	-0.242***			
		(0.072)	(0.086)	(0.079)			
Ongoing Self-employment Experience	Share				0.281**	-0.113	-0.120
					(0.117)	(0.145)	(0.142)
Completed Self-employment Experience	Share				-0.333**	-0.369**	-0.349**
					(0.146)	(0.150)	(0.136)
Part-time employed	0/1		-0.185***	0.033*		-0.185***	0.033*
			(0.029)	(0.018)		(0.029)	(0.018)
Self-employed	0/1		0.184	0.239*		0.129	0.190
			(0.121)	(0.114)		(0.144)	(0.135)
Unemployed	0/1		-0.792***	-0.682***		-0.790***	-0.680***
			(0.232)	(0.218)		(0.233)	(0.220)
Out of the labour force	0/1		-0.111	0.001		-0.110	0.001
			(0.195)	(0.194)		(0.196)	(0.195)
Income	Ln			0.151***			0.151***
				(0.034)			(0.034)
Qualifications	SD(index)			0.047***			0.048***
				(0.016)			(0.016)
Non-criminality	Arrests (inv.)			0.037**			0.036**
				(0.013)			(0.013)
Partnered	0/1			0.237***			0.236***
				(0.032)			(0.032)
Physical health (lagged)	SD(index)			0.109			0.109
				(0.066)			(0.066)
Life Satisfaction at age 26		0.372***	0.370***	0.358***	0.377***	0.373***	0.360***
		(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.009)
Observations		6698	6698	6698	6698	6698	6698
Adjusted R^2		0.194	0.199	0.207	0.193	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.