Essays on the effects of childhood experiences on household decision making

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Abstract

   This dissertation studies the effects of personal experience on household decision making. I gauge personal experiences using a novel measure: the childhood experience of father's job loss. This measure is appealing for the following reasons. First, father's job loss constitutes a salient experience that is likely to be remembered for years to come. Second, the experience directly relates to the perceived riskiness of labor income, the most important source of income for the majority of households. Third, the experience can be directly observed at the level of an individual in public datasets such as the PSID and HRS. Fourth, childhood experiences are in most cases determined decades before the adult household outcomes. As a result, the effects of these experiences are less susceptible to omitted variable problems than the effects of adult experiences.

   The first essay examines the effect of childhood experiences on the adult likelihood of participating in the stock market. I find that the experience of father's job loss reduces stock market participation by 2.9 percentage points in a sample where the mean stock market participation rate is 17%. The second essay studies the effects of the experience on household debt. The childhood experience of father's unemployment predicts 17% lower debt levels and 10% lower debt-to-income ratios|even though the sample consists by construction only of

   near- or already retired households. The third essay finds that the childhood experience of father's job loss is associated with a 2.4-percentage-point lower likelihood of being an entrepreneur in a sample where the mean entrepreneurship rate is 11%.

   The childhood experience of father's job loss should influence the formation of beliefs and risk attitudes only if the job loss is involuntary. As a pseudo-placebo test, I estimate the effect of the childhood experience of father quitting from his job voluntarily. As expected, I find no statistically significant effect for this experience. Father's job loss should have about the same effect on family life regardless of the age of the children. However, experiences gained at a very young age are probably neither memorized nor fully understood, and should therefore have little effect on the formation of beliefs and risk attitudes. As another pseudo-placebo test, I examine whether very early experiences influence later household choices. As expected, I find no evidence of such effects.

Acknowledgements

List of essays

1. Lehtoranta, Antti. Childhood experience of father's job loss and stock market participation. Unpublished working paper.

2. Lehtoranta, Antti. Childhood experience of father's unemployment and household debt. Unpublished working paper.

3. Lehtoranta, Antti. Childhood experience of father's job loss and entrepreneurship. Unpublished working paper.

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Introduction

A. Personal experiences and financial decision making

Recent research in the area of behavioral economics and finance suggests that personal experiences shape individuals' decisions. Investors may learn the profitability of investing from their own trades (Seru, Shumway, and Stoffman, 2010; Linnainmaa, 2011), and reinforcement learning may cause individuals to overweight their own experiences (see, e.g. Kaustia and Knüpfer, 2008, Choi et al., 2009, and Chiang et al., 2011). Also, some events may be so traumatic that even a single experience is sufficient to permanently affect individual behavior. For example, Malmendier and Nagel (2011) argue that personally experienced adverse macroeconomic shocks, such as the ones experienced during the Great Depression, reduce households' willingness to take financial risk.

Labor is the most important source of income for most households. If individuals overweight their personal experiences, father's job loss can lead them to have higher expectations on background risk. These expectations may cause households not only to refrain from investing in risky assets, but also to avoid taking more leverage or engaging in more risky labor market choices.

Personal experiences of adverse outcomes can also affect the formation of risk attitudes. Personally experiencing a negative consumption shock and its effects on family life can make individuals more averse to accepting a risk that could lead to another traumatic experience. Thus the adverse personal experience of labor market risk can lead to lower tolerance for income risk. Alternatively, those individuals who do not have the personal experience of a job loss may fail to anticipate the importance of the scarring effects that come with job losses, and thus may underestimate the utility shock of a job loss.

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Recent empirical work finds personal job-loss experiences to be associated with more cautious household financial choices. Tokuoka (2013) argues that siblings' job losses result in higher household savings rates. Knüpfer, Rantapuska, and Sarvimäki (2014) find that workers who were subjected to labor market shocks are averse to investing in risky assets.

Personal experiences are not only related to heterogeneity in household behavior, but are also linked with financial decisions made by sophisticated institutions. CEOs with personal experience of the Great Depression are more averse to using leverage in their companies (Graham and Narasimhan, 2004; Malmendier, Tate, and Yan, 2011; and Schoar and Zuo, 2011). Corporate personal-experience effects are not just limited to cohort effects, but micro-level experience also matters. Bernile, Bhagwat, and Rau (2014) argue that companies whose CEOs experience fatal natural disasters at the age of five to fifteen are more averse to taking on risk. To my knowledge, and apart from my own work, Bernile, Bhagwat, and Rau (2014) is the only other research to study the effects of traumatic childhood experiences on financial decision making.

B. Childhood experience of father's job loss

Losing a job is a traumatic experience to the family. Ruhm (1991) finds that workers that have experienced job losses have lower incomes in the near term. Jacobson, LaLonde, and Sullivan (1993) and von Wachter, Song, and Manchester (2007) find evidence of long-term income effects. In addition to the income shock, job losses have other scarring effects. Chan and Stevens (2001) show that a job loss reduces the probability of gaining employment. Strully (2009) links job losses with health problems in the short and long term, and Sullivan and von Wachter (2009) find that job losses increase the mortality risk especially in the short term. Rege, Telle, and Votruba (2011) find that father's job loss has a negative effect on children's school performance.

Traumatic childhood experiences are likely to be remembered for life, and they are also more likely than other experiences to affect the formation of expectations and risk attitudes.

However, not all job losses are traumatic: a voluntary job change is unlikely to be related to a significant income shock or health hazard, and it should not affect children's expectations or risk attitudes in any material way. Comparing the childhood experiences of father's voluntary and involuntary job displacements can be considered as a pseudo-placebo test.

Events experienced at different ages may have a different impact on expectations and risk attitudes. Cronqvist et al. (2014) suggest that in utero exposure to testosterone explains a share of the cross-sectional variation in household financial choices. However, personal experiences require sufficient cognitive capabilities to affect the development of the child; for example, a fetus cannot understand the importance of father's job loss and learn from that experience. Fontanari et al. (2014) show that probabilistic thinking develops around the age of five. Given that the formation of expectations requires at least rudimentary probabilistic thinking, it is unlikely that personal experiences before the age of five would have a direct impact on the formation of expectations.

Compared to adult experiences, childhood experiences allow for a clean identification of the causal effect of personal experience on household decision making. This is because childhood experiences are determined at an early age: children cannot cause their father's job displacements. Thus, the causal inference of the effects of childhood experience on later adult outcomes does not depend on controlling for adult variables such as household wealth, income, and education.

A job loss should have a similar effect on childhood family finances regardless of the age of the child. As a result, any difference in the estimated experience effect gained before or after the watershed age of five should arise only from the child's experience. Studying the experience effect for the under-five-year olds can be considered as a pseudo-placebo test.

It is likely that children learn about the job-loss events from their parents even if they were at the time too young to understand the event. This second-hand experience may also affect one's decision making, but probably less than the first-hand (i.e. personal) experience learned at the time of the event.

C. Data on childhood experiences of father's job loss

I study the effects of childhood experiences on household decision making using two publicly available datasets: the Panel Study of Income Dynamics (PSID) and the Health and Retirement Study (HRS). PSID is a longitudinal survey of US families and their children, conducted for the first time in 1968. The survey was repeated annually until year 1993, and biennially thereafter. The dataset consists not only of the original sample families but also of the children and grandchildren of the 1968 families. When the children of PSID families move away from home and start their own families, they are added as new PSID households to future surveys.

PSID's survey design offers several benefits. First, the dataset has employment history data for many sample families from as far as 1968 onwards. Second, father's employment history can be directly linked to the children's data. Third, father's employment status can be observed separately for different ages. This makes it possible to study whether the childhood experience effect depends on the age at which the experience was gained. Fourth, PSID records job losses within a year of the event, alleviating concerns that the recorded job-loss experience depends on the accuracy and veracity of the long-past event. Fifth, PSID specifically asks for the reason of job displacement. This makes it possible to separate voluntary job displacement events from involuntary job losses. While PSID's design is well-suited for studying childhood experiences, its deliberate oversampling of poorer households limits the variation in household-wealth related items. Moreover, PSID surveys wealth infrequently. Combined, these two survey-design features make it harder to find statistically significant household-wealth effects.

HRS is a biennial longitudinal survey of near- and already retired US households. The first HRS survey was conducted in 1992. Every HRS survey asks the sample households about their finances, employment, health, demographics, and many other characteristics. In addition, HRS collects data on the respondents' childhood family characteristics. In

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particular, it asks whether the respondents had before the age of 16 experienced an incident where father was unemployed for several months.

The survey design of HRS makes it possible to study the long-term effects of childhood experiences. The oldest HRS respondent cohorts were born before 1923 (thus including the children of the Great of Depression) and the youngest cohort was born in 1953. As the HRS data on household finances is collected for the period after 1992, childhood experiences predate realized household outcomes by decades. While the data on childhood experiences is collected from retrospective self-reports, any concerns of recall bias are alleviated by the nature of the event: if the childhood experience of father's unemployment is traumatic enough to affect the formation of expectations and risk attitudes, it is also likely to be remembered decades after the event.

Household behavior has also been studied using other publicly available datasets. The Survey of Consumer Finances (SCF) has detailed data on household wealth and finances. However, SCF surveys do not ask respondents about their childhood experiences, nor do they allow for intergenerational linking. Data from the National Longitudinal Survey of Youth (NLSY) has been used to study entrepreneurial choices and it contains information on self-employment as well as some information on parental employment. However, as the NLSY surveys 14- to 22-year-olds, childhood experiences are available for only a small fraction of the sample. Moreover, intergenerational matching is only possible for a subset of respondents whose mothers were part of the original survey (NLSY Child/YA). This dataset does not include information on father's job losses, which are probably more important for household welfare than mother's job losses.

D. Main results of the essays

The first essay studies the effects of childhood experience of father's job loss on stock market participation. Father's job loss experienced at the age of five to ten years decreases stock market participation by 2.9 percentage points in the PSID population in which 17% of the

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respondents invest in stocks. The pseudo-placebo tests also yield the expected outcomes. The childhood experience of father quitting his job is uncorrelated with later stock market participation, and father's job losses experienced before the age of five years also have a statistically insignificant effect on adult stock market participation. The stock market participation effect also holds in the long term. For the older HRS sample households, the childhood experience of father's unemployment decreases stock market participation by 2.9 percentage points. Given that the average stock market participation rate, 29%, is considerably higher in this sample, the results are consistent with the idea that the relative importance of the childhood experience decays in the very long run.

The second essay studies the effects of childhood experience on later household debt. I find that near- or already retired households with childhood experience of father's unemployment have 17% lower debt and 10% lower debt-to-income ratios. Experiences determined at childhood cannot be affected by adult household characteristics. This alleviates concerns that the results are biased due to omitted adult household characteristics. Models estimated with controls for contemporaneous log wealth or log income generate qualitatively similar experience effects.

The third essay studies the relationship between childhood experiences and household entrepreneurial choice. I find that experience of father's job loss between the ages of five and ten is associated with a 2.4-percentage-point lower likelihood of being a business owner. This effect is sizeable compared to the sample average business ownership rate of 11%. The pseudo-placebo tests yield the expected outcomes: childhood experiences of father's voluntary job displacement, and job losses experienced before the age of five have no statistically significant effect on entrepreneurial choice.

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Childhood experience of father's job loss and stock market participation

Antti Lehtoranta

Abstract

Using data from the Panel Study of Income Dynamics (PSID), I document that childhood experience of father's job loss decreases the propensity to own stocks as an adult. If this experience takes place at the age of 5–10 years, the probability of owning stocks decreases by 2.9 percentage points in a sample with mean stock market participation rate of 17%. This finding is robust to alternative definitions of age ranges and controlling for random unobserved effects. I also find an effect of similar magnitude in the Health and Retirement Study (HRS) data.

1. Introduction

Father's job loss constitutes a major shock to family life, and children are likely to remember it for the rest of their lives. Personal experience may affect both subjective expectations and attitudes towards risk. On the one hand, individuals who overweight personal experience and have experience about father's job losses may hold a higher subjective probability of labor income shocks than peers without such experience. On the other hand, traumatic experiences may affect the formation of risk preferences. The personal-experience hypothesis predicts that households with a job-loss experience should be less willing to invest in risky assets and thus be less likely to participate in the stock market.

Identifying the causal effect from adult personal experience to household behavior is not easy because unobserved household characteristics may be causal factors to both the personal experience and the stock market participation choice. The use of childhood experiences alleviates this concern: characteristics that do not affect the childhood experiences cannot bias the causal inference. Only such unobserved characteristics that were determined before or during childhood and affect both the experience and the later stock market choice, could bias inference. Given that I investigate the effects of job losses, it is sufficient for the identification of causal effect of childhood experience to assume that the job-loss events are uncorrelated with unobserved pre-childhood characteristics that also affect stock market participation choices later in life.

I study the effect of father's job loss on children's stock market participation using data from the Panel Study of Income Dynamics (PSID). PSID surveys the job histories of US families and their children after they have moved away from home and formed their own households. This sampling method allows me to create father's job-loss indicators that were collected soon after any job-loss event. This mitigates concerns for recall bias that could otherwise affect the measurement of the job-loss variable.

I find that the childhood experience of father losing his job due to factory closing or lay-off is associated with a 2.9 percentage points lower likelihood for the household to participate in the stock market. Compared to the sample average stock market participation rate, 17%, the estimated experience effect is economically large. I find no stock market participation effect when father quits his job voluntarily: the experience effect thus appears to arise solely from the experience of involuntary job losses.

I also investigate the childhood-experience effect for a sample of near- or already retired households using data from the Health and Retirement Study (HRS). HRS asks all participants whether before the age of 16 their father was unemployed for a period of several months or more. I find that the childhood experience of father's unemployment reduces the stock market participation rate by 2.9 percentage points. The absolute size of the childhood-experience effect is thus similar both in the PSID and HRS data sets. However, as the HRS average stock market participation rate is higher at 29%, the relative importance of the experience effect is smaller for the older population. Overall, the results are consistent with the idea that the relative importance of personal experience is reduced

over time.

The main specification of the estimated model only controls for factors at childhood. Adding a variable for log household income in adulthood in the regression will produce a similar experience effect. While this decreases the precision of the experience-effect estimate, it remains significant at conventional levels. Thus the childhood effect of father's unemployment is robust to unobserved factors determined before childhood that may affect adult stock market participation via the household income channel.

My research relates to three strands of literature. First, I contribute to the literature studying the effect of personal experience on investing (see, e.g. Kaustia and Knüpfer, 2008; Choi et al., 2009; Barnea, Cronqvist, and Siegel, 2010; Tokuoka, 2013; Bernile, Bhagwat, and Rau, 2014; Knüpfer, Rantapuska, and Sarvimäki, 2014). The article perhaps most closely related to mine is that of Malmendier and Nagel (2011), who suggest that stock market returns experienced over a lifetime are associated with household stock ownership. These stock market returns are identical to all members of the same cohort, so they might just as well proxy for cohort-specific differences in participation (see, for example, Ameriks and Zeldes, 2004). My paper offers a much stronger identification of the personal-experience effect because the experiences can be observed at the level of an individual.

Second, my paper adds to the literature on the determinants of stock market participation. Prior studies have shown it to be associated with a large number of investor-level characteristics, such as financial awareness (Guiso and Jappelli, 2005), financial literacy (van Rooij, Lusardi, and Alessie, 2011), genetic differences (Barnea, Cronqvist, and Siegel, 2010),

intelligence (Grinblatt, Keloharju, and Linnainmaa, 2011), internet access (Bogan, 2008), peer performance in the stock market (Kaustia and Knüpfer, 2012), social interaction (Hong, Kubik, and Stein, 2004; Brown et al., 2008), and trust (Guiso, Sapienza, and Zingales, 2008).

Third, my paper is related to the literature on the effects of job losses. I review this literature in detail in the next section.

The paper proceeds as follows. Section 2 discusses childhood experience of father's job loss. Section 3 describes the data used, and Section 4 shows the estimation results. Section 5 concludes.

2. Childhood experience of father's job loss

Father's job loss can have a severe impact on a household. Ruhm (1991) finds that workers that have experienced job losses have lower incomes in the near term. Jacobson, LaLonde, and Sullivan (1993) find evidence also for long-term income effects. In addition to reduced income, job losses scar workers in many other ways. Chan and Stevens (2001) show that job loss reduces the probability of gaining employment. Strully (2009) shows that job displacement causes health problems, and Sullivan and von Wachter (2009) find evidence of increased mortality especially in the short term.

Childhood experience of father's unemployment can affect stock market participation choices later in life via at least two distinct channels. Schmidt (1999) finds that average expectations of job displacement likelihoods deviate from actual rates of displacements. Heterogeneous beliefs about the labor market risk results in heterogeneous beliefs about

household background risk. Overweighting of personal and family experiences on job losses leads to higher subjective background risk expectations (Kimball, 1993; Guiso, Jappelli, and Terlizzese, 1996), and thus the personal experience of job loss causes households to refrain from participating in the stock market. Alternatively the childhood experience of the adverse outcomes from economic risk can affect the formation of risk attitudes. Although risk preferences can partially be explained by genetics (Cesarini et al., 2009), upbringing and environment are important factors in forming individual risk preferences. A childhood experience about the negative effects of an economic shock may lead to different value weighting of such events in future expectations. Those who do not have personal experience of job losses may fail to anticipate the different types of job-displacement scarring effects, and thus expect the utility loss from a job loss to be smaller than those who have personal experience of job-loss effects.

The effect of father's job loss is likely to differ depending on the age of a child. I follow Bradley et al. (2001) and divide childhood into 5-year intervals: early childhood (0–5 yrs), middle childhood (5–10 yrs), and early adolescence (10–15 yrs). While the early childhood is a time of rapid learning of language and cognitive skills, memories from this young age may not be retained. Personal experience that is not memorable is unlikely to affect expectations. Fontanari et al. (2014) show that probabilistic thinking develops around the age of five. Expectations require at least rudimentary probabilistic thinking, so I expect experiences before the age of five to have less impact on expectations than later experiences. While very young children may not remember father's job loss, parents still experience the

job-loss effects. It is likely that the children learn from their parents about the job loss and its effects at an older age. This second-hand experience may also affect one's decision making, but personal experience learned at the time of the event is likely to have a stronger effect on subjective beliefs than second-hand knowledge. Studying the job-loss experience effects on the early-childhood group is appealing also as a pseudo-placebo test. The long-term effects of the job loss on the family should be similar regardless of whether the event takes place when the children are below 5 years of age, or more than 5 years old, but its effect on children's behavior should be stronger if the children are old enough to understand the job-loss event. Thus, I expect that middle-childhood and early-adolescence experiences have stronger effects on adult stock market participation than early-childhood experiences of father's job loss.

3. Data

A. Panel Study of Income Dynamics (PSID)

PSID is a nationally representative survey of families and their children started in 1968.[1] PSID data were collected annually until year 1993, and biennially thereafter. Children of the PSID families who move away from home and start their own families are added as new PSID households to future surveys. Due to this design, PSID has been extensively used to study intergenerational effects of work- and income-related outcomes, such as intergenerational

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[1] The PSID oversamples low-income families. Details about the survey design are available in Hill (1991).

correlations in earnings (e.g. Behrman and Taubman, 1990; Couch and Dunn, 1997), income mobility (e.g. Solon, 1992; Chadwick and Solon, 2002), welfare receipts (Pepper, 1995), and wealth (Charles and Hurst, 2003).

Every PSID survey wave collects information about the household head's job. If the household head's job changes between survey waves, the reason for this job change is queried. Thus, PSID job-loss data is robust to recall biases; even if the household head forgets to mention a job loss, the PSID surveyors will notice that the current job does not match the information from the previous survey and will ask for the reason of the job change. PSID codes the open-ended job-change responses under various categories of which the categories of interest for studying job displacements are as follows: i) company folded, ii) laid off or fired, and iii) quit. The company-folded category includes mentions of the company changing hands or moving out of town, and the employer dying or going out of business. Job displacements due to quitting are different from the first two in the sense that quitting is a voluntary choice. The quit indicator can serve as a placebo event to find out whether the act of changing jobs affects childhood experience.

My sample consists of individuals with data on father's employment history available over various childhood periods. I match children's records to their father's job-history data, and look whether the father experienced a particular type of job-loss event within a specific childhood age range. Figure 1 provides an example on how to create the middle-childhood (5–10 years) experience indicators of father's job loss.

Table 1 shows the frequencies of the childhood-experience indicators evaluated over

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the different childhood periods, and also the frequencies using overlapping periods. The intergenerational matching between father's job history and children's formation of separate households reduces the sample size. While the PSID contains 8,870 separate responding households in the 2011 survey wave, the data allow the creation of early-childhood indicators only for 2,771 respondents, middle-childhood indicators for 3,412, and early-adolescence indicators for 3,536 respondents. 5-year period indicators require less job-history data and thus have more observations than the 10-year and 15-year experience measures.

About 7% of the respondents experienced a father's job loss due to factory folding in a given 5-year period in childhood. Lay offs are twice as common as factory closings. I define a "folded or laid off" indicator which is set to one if either the factory folded or the father was laid off. This combined indicator captures all job-displacement experiences that are related to involuntary job losses.[2] The combined factory-folded-and-laid-off experiences are reported for 23.5% of the individuals in the early-childhood group, 20.0% of the individuals in the middle-childhood group, and 16.3% of the individuals in early-adolescence group. The most common reason for the father not working in his previous job is quitting voluntarily. 37.1% of respondents had early-childhood, 28.5% had middle-childhood, and 20.8% had early-adolescence experience of father's job displacement due to quitting. Thus mostly due to the higher incidence of quitting from a job, almost half of the sample individuals had

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[2] The lay-off category also includes responses of being fired, which could be voluntary. Boisjoly, Duncan, and Smeeding (1998) manually examined the PSID coding of the "laid off or fired" responses and found that only 16% of the cases involved firings. Thus, interpreting all lay-off responses as indications of involuntary job losses induces only a small measurement error.

experienced a father's job displacement event of some type during the early-childhood years.

In PSID stock market participation is surveyed in waves of 1984, 1989, 1994, and from 1999 onwards every two years. For the 3,412 respondents for whom the middle-childhood job-loss experience indicator is available, I have 16,392 respondent-year observations for stock market participation. Table 2 shows descriptive statistics for this sample. On average, 17% of the households hold stocks. There is a degree of time variation in stock ownership; 70% of households never hold stocks, 5% of the households hold stocks in all surveyed years, and the remaining 25% hold stocks during some waves. Bricker et al. (2014) report that in the Survey of Consumer Finances (SCF) data 50% of US households held stocks either directly or indirectly. The difference between the SCF averages and this PSID sample is explained by two factors. First, due to the intergenerational matching, the PSID sample only consists of young households, and younger households are less likely to hold stocks. Second, the original PSID sample overweights low-income families. Due to intergenerational income effects, below-average incomes account for a large fraction of the sample.

I also control for household characteristics that were predetermined at childhood and may impact stock market participation. I do not control for adult education, wealth nor income, as these adult variables are likely to have been affected by childhood experiences. E.g. Rege, Telle, and Votruba (2011) find that father's job losses affect the school performance of children, and thus controlling for adult educational attainment would bias the estimation of the experience effect due to the bad control problem (Angrist and Pischke, 2009, pp. 64–68).

Hong, Kubik, and Stein (2004) find a strong correlation between being white non-

Hispanic and owning stocks. In my sample, 25% of households have an African-American head and 4% have a Hispanic head.[3] The average age of the household spouses is 31.7 years. The sample consists of 60% single and 40% two-spouse households, and 47% of all household members are men. The respondents' fathers have on average 12.5 years of education and mothers 12.4 years.[4]

B. Health and Retirement Study (HRS)

The Health and Retirement Study (HRS)[5] surveys near- and already retired US households biennially about their finances, employment, health, demographics and many other characteristics. The oldest HRS respondent cohorts were born before 1923 and the youngest cohort is born before 1953. Thus, HRS includes respondents from a wide range of cohorts, including children of the Great Depression.

While the HRS does not have information on the job histories of the respondent's fathers, HRS asks every respondent whether their father was unemployed for a period of several months or more before the age of 16 years. Table 3 shows the descriptive statistics for the same variables as for the PSID sample. HRS has data for 16,820 different households for whom there is information about both the childhood experience of father's unemployment

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[3] The share of African-Americans exceeds the national average due to the original PSID oversampling of poor families. The Hispanic share is below the current national proportion due to the original PSID sample being representative of the 1968 population. The later addition of a Latino sample to PSID does not show in my sample as the intergenerational matching requires me to use only the original PSID sample families.

[4] PSID right-censors the education variable at 17 years, omitting any postgraduate studies. Therefore the PSID measures for average years of education are downward biased.

[5] For an overview of the HRS survey design and background, see e.g. Juster and Suzman (1995).

and the household stock market participation. 22% of the HRS households have experience of father's unemployment and 29% participate in the stock market.

4. Results

A. Main results

Table 4 reports the marginal effects from a logit model of stock market participation explained by middle-childhood experience of father's job displacements. Model (1) includes only the factory-folded-or-laid-off experience indicator along with controls for survey wave effects. In this model, the childhood experience of father's job loss is associated with a 7.5-percentage-point decrease in the probability of owning stocks. This effect is statistically highly significant. Compared to the sample average rate of stock ownership, 17%, this estimated marginal effect is economically highly significant.

Model (2) adds controls for household characteristics that were predetermined in childhood and could affect the stock market participation preferences. The added controls include average age, average of household male indicators, indicator whether the household head is African-American, indicator for a Hispanic household head, and the number of years of education for parents. After controlling for these characteristic effects, the marginal effect of childhood experience effect is smaller, -2.9 percentage points, but remains statistically significant.

The model (2) estimate is 17% of the sample average participation rate, and thus economically significant. The relative size of this effect is similar to previous findings on the

size of experience effects. Malmendier and Nagel (2011) estimate that the effect of personal experience on stock market participation is 30% of their sample average participation rate. They estimate that a change in their stock return experience measure from the 10th percentile to the 90th percentile is associated with a 10.2-percentage-point increase in stock market participation rate compared to their sample average stock market participation rate of 34.2%. Using a sample where the average stock market participation rate is 21.2%, Knüpfer, Rantapuska, and Sarvimäki (2014) estimate that the personal experience of job loss reduces stock market participation by 2.9 to 3.1 percentage points decades after the job loss. Thus, the size of their experience effect is 14%–15% of the average stock market participation rate.

All of the model (2) control variables have the expected signs. An additional year of age increases the likelihood of stock market participation by 0.7 percentage points. The underlying logit model includes both a linear and a quadratic term for the household average age. The estimate for the linear term has a positive sign, and the quadratic term has a negative sign; both are statistically significant. However, the average marginal effect is positive, as the linear effect dominates for most of the sample members. Males are significantly more likely to hold stocks. A single male household owns stocks at a 5.1-percentage-points higher rate than a single female household. Households with African-American heads have a 11.9-percentage-points smaller probability of owning stocks. Similarly, households with Hispanic heads are estimated to have a lower likelihood to own shares, but this effect is not statistically significant. Parental education increases the

probability of owning stocks. An additional year of father's education is associated with a 2.0-percentage-points higher probability of owning stocks.

Model (3) estimates separately the factory-folded, laid-off, and quit effects without controlling for household characteristics. Both the factory-folded and the laid-off indicators are associated with lower stock market participation rates and the effects are statistically significant. The estimated marginal effect for the quit indicator is positive, but statistically insignificant. Model (4) adds the same set of controls to the logit model as model (2). Both the factory-folded and laid-off experiences have similar sizes, although both estimates are imprecisely estimated: the laid-off estimate is significant at the 10% level and the folded estimate is statistically insignificant. These results provide support for the notion that only involuntary job-loss experiences have predictive power for stock market participation decisions.

B. Robustness to unobserved effects

To control for biases that arise from unobserved heterogeneity explaining stock market participation, I estimate random effects (RE) models of stock market participation. Table 5 shows the marginal effects estimates from these models.

Models (1) and (2) show the marginal effect estimates from linear random effects models controlling for quadratic age, gender, ethnicity, Hispanicity, and parental education effects. In model (1) the childhood experience of father's job displacement due to factory being folded or due to lay-offs, reduces the marginal probability to own stocks by 3.8 percentage

points. Model (2) estimates separately the effects of experience of factory folded, lay offs, and quitting. Similar to the logit model estimates, the linear RE model estimates the factory-folded experience effect imprecisely, but the separate laid-off indicator is statistically significant. Compared to the estimates from the logit model, the linear RE model marginal effect estimate is larger.

The control variables again have the expected signs and their estimates are very similar to those from the logit model. An additional year of age increases the household participation rate by 0.7 percentage points. African-Americans have 8.4 percentage points lower probability to participate in the stock market. An additional year of father's and mother's education increases participation by 2.0 percentage points.

Models (3) and (4) estimate random effects logit models. The model (3) marginal effect estimate for the factory-folded-or-laid-off indicator is -2.8 percentage points and is statistically highly significant. Model (4) estimates a negative sign for both the factory-folded and laid-off variables, but only the lay-off effect is statistically significant. The estimate for the quit experience is $+0.6$ percentage points, but with an estimated z-value of 0.58 it is statistically insignificant.

These random effects estimates are similar to the main logit model estimates. The magnitudes of the effects are similar. Moreover, none of these models finds a significant correlation between the experience of father quitting his job and stock market participation. Thus, any unobserved heterogeneity that is uncorrelated with the childhood experience of father's job loss does not bias the main result.

C. Alternative age ranges

Table 6 shows the marginal effect estimates from logit models of stock market participation where the childhood experience indicator has been measured over different age ranges. The first column shows the estimation results for early-childhood (0–5 yrs) experiences, the second column repeats the baseline middle-childhood (5–10 yrs) results, and the third column shows the results for early-adolescence (10–15 yrs) experience. The last three columns show the results using overlapping age ranges. The fourth column shows the combined estimate measured for early-and-middle-childhood experiences (0–10 years), the fifth column for middle-childhood-and-early-adolescence experiences (5–15 years), and the sixth column using all childhood and early-adolescence experiences (0–15 years).

Considering that very young children are less likely to remember their father's job-loss experience, it is not surprising that the early-childhood estimate of −1.3 percentage points is not statistically significant from zero. The middle-childhood marginal effect of −2.9 percentage points and the early-adolescence effect of −4.0 percentage points are both economically and statistically significant. The estimate for the combined early-and-middle-childhood experience is −2.4 percentage points, but it is statistically significant only at the 10% level. The combined middle-childhood-and-early-adolescence estimate is −3.1 percentage points and significant at the 5% level. Finally, the combined childhood-and-early-adolescence estimate is −1.9 percentage points, and is not statistically significant.

These results indicate that the early-childhood experience period has less explanatory power than the middle-childhood and early-adolescence periods. While the early-childhood

estimates have negative signs as expected, the estimate sizes are smaller and statistically insignificant. This finding is consistent with the notion that job-loss events during early-childhood are unlikely to be remembered and thus have less impact than later experiences. While it is possible that parents share these experiences with their children at a later age, the effect of such second-hand information is likely to have a smaller impact on expectations and/or risk attitudes than direct personal experience.

D. Long-term effects of childhood experience

Table 7 shows the marginal effects estimates from a logit model of childhood experience of father's unemployment on stock market participation using HRS data. Model (1) includes only the childhood-experience indicator along with dummy controls for survey waves, sample cohorts, and U.S. Census divisions. Childhood experience reduces stock ownership by 3.6 percentage points. Model (2) adds controls for household characteristics: gender, ethnicity, Hispanicity, age (linear and quadratic), and parental education. Now, the childhood experience reduces stock market participation by 2.9 percentage points, but the effect is still statistically highly significant. Lastly, model (3) controls for receipts of surprise inheritances. Some inheritances may come in form of direct or indirect stock holdings, and thus a received inheritance may mechanically turn a household into a stock market participant. Thus, I use a surprise inheritance indicator as a control for inheritance effects, and find that those households that recently received a surprise inheritance have a 10.1-percentage-points higher likelihood of owning stocks. Controlling for this inheritance effect, I find that the childhood

experience of father's unemployment reduces the stock market participation rate by 3.6 percentage points. The change in the size of the estimate is mostly due to a smaller sample, as the data on surprise inheritance receipts is only available for a subset of observations.

To sum up, I find a statistically significant effect of childhood experience of father's unemployment on stock market participation also in a population of households that is near retirement or already retired. As the sample average stock market participation rate is 29%, the childhood experience estimate is 10%–12% of the size of the average participation rate. The relative size of the experience effect is smaller compared to the PSID results for younger households. The finding that the effect of experiences is diluted over time is consistent with the findings of Barnea, Cronqvist, and Siegel (2010) and Malmendier and Nagel (2011).

5. Conclusion

Personal experiences can have a significant impact on household stock market participation choices. Prior research indicates that the effects of personal experience decrease over time (Barnea, Cronqvist, and Siegel, 2010; Malmendier and Nagel, 2011). However, experiences in the very early formative years may have a stronger impact on individual beliefs and preferences, so that the experiences can still have an effect after many years.

This paper investigates the role of childhood experience of father's job loss on adult stock market participation. I find that childhood experience of father's involuntary job loss is associated with a 2.9-percentage-points lower stock market participation rate for an adult household. The size of this effect is 17% of the average sample stock market participation

rate and is thus economically significant. I also find evidence that childhood experience explains the stock market participation choices of the near- or already retired households. Although the relative size of the experience effect is lower among older households, the effect is still statistically and economically significant. These results show that childhood experiences have economically significant effects on household behavior even in the long term.

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Figure 1: PSID childhood-experience variable creation example

This imaginary example clarifies how I create the childhood experience of father's job displacement indicators. The household consists of the father and two children: Alice (born in 1961) and Ben (born in 1965). Father's job history is available from wave 1 to 18. Every wave in which his job changed from the one recorded in the previous interview, the reason for the most recent job displacement is inquired. In this example, the father experiences two job-loss events, one between waves 1 and 2 (factory folded), and another between waves 6 and 7 (lay-off). Alice's middle-childhood years fall partly outside of the time range for which father's job history is available, and thus Alice is dropped from the sample, leaving only Ben in the sample. Ben has experienced a lay-off event during his middle-childhood years, but he has experienced neither a factory-folded nor a quit event. Ben moves out of the family in year 1987 (at age 22) and forms his own household. Ben's newly formed household is added to the PSID survey from 1987 onwards and his stock market participation is surveyed thereafter in the wealth supplement data.
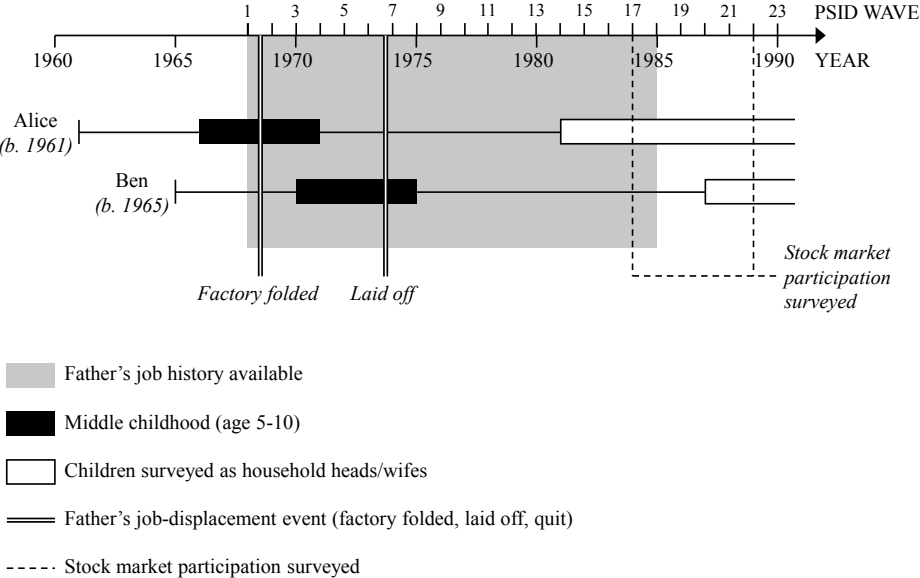
Table 1: Childhood experience of father's job displacements
This table shows the proportion of respondents with childhood experience of father's job displacement over the following periods: early childhood, middle childhood, and early adolescence. The sample includes only those respondents who later as adults were household heads or wifes during PSID survey waves that asked households about their stock market participation. Household heads' job is recorded every wave; if the current job differs from the job mentioned in the previous wave, the reason for this job change is asked. This job-change question is asked from all household heads whose job/employer changed between survey waves, including both employed and unemployed household heads. PSID codes these job displacement reasons under the following categories: 1) factory folded, 2) laid off, 3) quit. Folded or Laid off indicator combines the factory folded and laid-off indicators, and Any job change indicator combines all three indicators. Longer childhood experience periods require longer job history data and thus the number of respondents for whom the experience indicator can be calculated (N) is negatively related to the length of the age range.

Childhood period	Years	N	Father's job displacement experience (in %)				
			Factory folded	Laid off	Quit	Folded or Laid off	Any job change
Early childhood	0–5	2,771	7.8	18.1	37.1	23.5	48.9
Middle childhood	5–10	3,412	7.3	14.9	28.5	20.0	39.7
Early adolescence	10–15	3,536	6.7	11.1	20.8	16.3	31.4
Early and Middle childhood	0–10	2,394	14.1	25.2	50.0	33.1	61.4
Middle childhood and Early adolescence	5–15	2,964	12.8	21.2	39.3	28.9	51.5
Childhood and Early adolescence	0–15	2,077	19.0	29.8	56.9	39.1	67.4

Table 2: Summary statistics for dependent and control variables
This table reports summary statistics of the dependent and control variables for PSID households for which the father's unemployment indicator can be calculated (age range 5–10 years). The sample only includes survey years during which information on stock ownership data was collected. This sample consists of 3,412 distinct respondents. Q1 and Q3 refer to the 25th and 75th percentiles. Variables denoted by † are dummy variables. African-American and Hispanic dummies measure the response of the PSID household head. Average Age and Average Male are interview wave–household averages; for example, Average Male takes the value of 0 for a household with a single female, 0.5 for a household with both a female and male spouse, and 1 for a household with a single male. Father's and Mother's education are the medians of the parents' self-reported years of education from previous PSID survey responses.

Variables	N	Mean	Std.dev.	Min	Q1	Median	Q3	Max
Stock mkt participant †	16,392	0.17						
African-American †	16,390	0.25						
Hispanic †	15,156	0.04						
Average Age	16,391	31.7	7.16	15	26	31	37	57
Average Male	16,392	0.47	0.32	0	0.5	0.5	0.5	1
Father's education	16,392	12.5	3.04	1	12	12	15	17
Mother's education	16,287	12.4	2.30	1	12	12	14	17

Table 3: Descriptive statistics (HRS)
This table reports descriptive statistics for all observations of 16,820 different Health and Retirement Study (HRS) households. Q1 and Q3 refer to the 25th and 75th percentiles. Stock market participation and surprise inheritance are dummy variables measured at the household level (denoted by †). The remaining variables are household-level averages of variables individually surveyed. ‡ denotes household–wave averages of individual-level dummy variables. Male takes the value of 0 for a household with a single female, 0.5 for a household with both a female and male spouse, and 1 for a household with a single male. The household–wave averages may change over time due to changes in the make-up of households.

Variables	N	Mean	Std.dev.	Min	Q1	Median	Q3	Max
Stock mkt participant †	95,285	0.29						
Father unemployed ‡	97,328	0.22	0.37	0	0	0	0.5	1
Male ‡	97,328	0.38	0.34	0	0	0.5	0.5	1
African-American ‡	97,328	0.14	0.34	0	0	0	0	1
Hispanic ‡	97,328	0.08	0.26	0	0	0	0	1
Age	97,327	68.1	11.3	25	59	67	76	109
Father's education	83,227	8.97	3.30	0	7.5	8.5	12	17
Mother's education	84,995	9.27	3.05	0	7.5	8.5	12	17
Surprise inheritance †	56,766	0.009						

Table 4: Stock market participation and childhood experience of father's unemployment

This table reports the marginal probability of stock ownership for PSID households from logit models including childhood experience of father's unemployment. The estimates are shown as percentages. Factory folded, Laid off, Quit, and Factory folded or Laid off are dummy variables measuring childhood experience of father's job displacements. The experience measures are created for the period of Middle childhood (years 5 to 10). † denotes dummy variables. Average Age and Average Male are wave–household averages. The z-statistics based on clustered standard errors are shown in paranthesis. ***, **, and * refer to 1%, 5% and 10% significance levels respectively.

	Stock market participation			
	(1)	**(2)**	**(3)**	**(4)**
Factory folded or Laid off †	-7.49***	-2.95**		
	(-6.27)	(-2.18)		
Factory folded †			-4.83**	-2.86
			(-2.53)	(-1.45)
Laid off †			-7.94***	-2.97*
			(-6.11)	(-1.91)
Quit †			0.57	0.47
			(0.46)	(0.43)
Average Age		0.71***		0.71***
		(9.50)		(9.54)
Average Male		5.07***		5.05***
		(3.35)		(3.33)
African-American †		-11.90***		-11.89***
		(-11.00)		(-10.98)
Hispanic †		-1.60		-1.66
		(-0.67)		(-0.70)
Father's education (years)		2.00***		1.99***
		(7.84)		(7.80)
Mother's education (years)		1.80***		1.79***
		(5.68)		(5.69)
Wave dummies	Yes	Yes	Yes	Yes
Pseudo-R^2	0.014	0.126	0.015	0.126
$N_{\text{Households}}$	3,412	2,986	3,412	2,986
$N_{\text{Observations}}$	16,392	15,060	16,392	15,060

Table 5: Stock market participation and random effects models

This table reports the marginal probability of stock ownership for PSID households from linear and logit random effects (RE) models including childhood experience of father's unemployment. The random effects logit models are estimated assuming that individual random effects equal zero. The estimates are shown as percentages. Factory folded, Laid off, Quit, and Factory folded or Laid off are dummy variables measuring childhood experience of father's job displacements. The childhood-experience measures are created for the childhood age range of 5 to 10 years. † denotes dummy variables. Average Age and Average Male are interview wave–household averages. The z-statistics based on clustered standard errors are shown in parenthesis. *** and ** refer to 1% and 5% significance levels respectively. R^2 statistics reported for the linear models are overall R^2s while the RE logit model statistics are McFadden's pseudo-R^2s.

	Stock market participation			
	Linear RE model		Logit RE model	
	(1)	**(2)**	**(3)**	**(4)**
Factory folded or Laid off †	-3.75***		-2.83***	
	(-3.59)		(-2.80)	
Factory folded †		-2.37		-1.68
		(-1.49)		(-1.04)
Laid off †		-3.86***		-3.17***
		(-3.38)		(-2.84)
Quit †		0.12		0.59
		(0.11)		(0.58)
Average Age	0.72***	0.72***	0.68***	0.68***
	(10.79)	(10.82)	(9.45)	(9.44)
Average Male	3.10**	3.07**	3.42***	3.40***
	(2.56)	(2.53)	(2.97)	(2.95)
African-American †	-8.39***	-8.38***	-7.95***	-7.94***
	(-9.24)	(-9.19)	(-11.79)	(-11.76)
Hispanic †	-0.02	-0.05	0.80	0.76
	(-0.01)	(-0.02)	(0.37)	(0.35)
Father's education (years)	1.96***	1.96***	1.90***	1.89***
	(8.91)	(8.91)	(7.82)	(7.80)
Mother's education (years)	1.99***	1.98***	1.89***	1.89***
	(6.90)	(6.88)	(6.86)	(6.85)
Wave dummies	Yes	Yes	Yes	Yes
R^2	0.102	0.102	0.067	0.067
$N_{Households}$	2,986	2,986	2,986	2,986
$N_{Observations}$	15,060	15,060	15,060	15,060

Table 6: Stock market participation and experience over varying age ranges
This table reports the marginal probability of stock market participation for PSID households estimated from logit models of childhood experience of father's unemployment. The estimates are shown as percentages. The columns have the factory-folded-or-laid-off variables calculated over different age ranges; all other variables are the same in all models. † denotes dummy variables. Average Age and Average Male are wave–household averages of respondent level dummies. The z-statistics based on clustered standard errors are shown in parenthesis. *** and ** refer to 1% and 5% significance levels respectively.

	Stock market participation					
	Early child-hood	Middle child-hood	Early adoles-cence	Early and Middle childhood	Middle childhood and Early adoles-cence	Childhood and Early adoles-cence
	0–5 yr	5–10 yr	10–15 yr	0–10 yr	5–15 yr	0–15 yr
Factory folded or Laid off †	-1.31	-2.95**	-3.95***	-2.40*	-3.06**	-1.90
	(-0.94)	(-2.18)	(-3.03)	(-1.76)	(-2.50)	(-1.36)
Average Age	0.72***	0.71***	0.70***	0.72***	0.70***	0.68***
	(7.27)	(9.50)	(10.51)	(6.46)	(8.64)	(5.65)
Average Male	4.52***	5.07***	5.16***	5.11***	4.92***	5.09***
	(2.97)	(3.35)	(3.40)	(3.06)	(2.95)	(2.83)
African-American †	-10.98***	-11.90***	-13.25***	-10.76***	-12.48***	-11.22***
	(-10.00)	(-11.00)	(-12.66)	(-8.36)	(-10.76)	(-8.21)
Hispanic †	-1.77	-1.60	-3.98*	-1.55	-2.05	-0.76
	(-0.79)	(-0.67)	(-1.68)	(-0.61)	(-0.80)	(-0.28)
Father's education	1.94***	2.00***	1.91***	2.08***	2.02***	2.15***
	(6.63)	(7.84)	(8.09)	(6.36)	(7.35)	(6.10)
Mother's education	1.86***	1.80***	1.88***	1.91***	1.81***	1.88***
	(5.55)	(5.68)	(6.10)	(5.12)	(5.23)	(4.58)
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.107	0.126	0.134	0.106	0.121	0.099
N$_{Households}$	2,532	2,986	3,060	2,195	2,576	1,894
N$_{Observations}$	11,262	15,060	16,756	9,977	13,375	8,898

Table 7: Stock market participation of older households (HRS)
This table reports the marginal probability of household stock market participation on self-reported experience of father's unemployment before the age of 16 in HRS data. The estimates are shown as percentages. Stock market participation and inheritances are surveyed at the household level. All remaining variables, which are surveyed at individual–respondent level, are included as household–wave averages. Surprise inheritance indicator refers to a receipt of inheritance when the household members in the previous HRS surveys reported a zero probability of receiving an inheritance within the next 10 years. z-statistics based on clustered standard errors are shown in parenthesis. *** and ** indicate significance at the 1% and 5% levels respectively.

	Stock market participation		
	(1)	**(2)**	**(3)**
Father unemployed	-3.63***	-2.88***	-3.61***
	(-4.38)	(-3.22)	(-3.54)
Male		8.80***	8.51***
		(10.01)	(8.29)
African-American		-30.90***	-30.88***
		(-21.85)	(-18.54)
Hispanic		-32.64***	-33.63***
		(-16.49)	(-14.08)
Age		0.07**	0.11***
		(2.54)	(3.20)
Father's education (years)		1.47***	1.46***
		(10.12)	(8.99)
Mother's education (years)		1.26***	1.32***
		(7.54)	(6.99)
Surprise inheritance			10.08***
			(5.04)
Wave dummies	Yes	Yes	Yes
HRS cohort dummies	Yes	Yes	Yes
Census division dummies	Yes	Yes	Yes
Pseudo-R^2	0.001	0.086	0.084
N$_{Households}$	16,820	13,854	12,124
N$_{Observations}$	95,285	77,876	46,044

Childhood experience of father's unemployment and household debt

Antti Lehtoranta

Abstract

Using data from the Health and Retirement Study (HRS), I analyze whether the childhood experience of father's unemployment is related to lower household debt levels later in adult life. Childhood experiences allow a clear identification of credit demand effects, as they cannot be affected by contemporaneous factors that drive credit supply. I find that households with a father's unemployment experience hold 17% less debt and have 10% lower debt-to-income ratios. These results are consistent with the idea that dramatic experiences in individuals' formative years can have long-term effects on their decision making.

1. Introduction

Household leverage increased dramatically before the Great Recession, and researchers have debated whether this was due to an increase in credit supply or demand. Mian and Sufi (2009) argue that a change in credit supply, as proxied by the introduction of subprime mortgages, explains variation in household debt before the Great Recession. Keys, Mukherjee, Seru, and Vig (2009, 2010) suggest that financial innovation made securitization of mortgages easier, which lead to a higher credit supply. Gropp, Krainer, and Laderman (2014) maintain that a contraction in the supply of credit was the main driver of the deleveraging of household debt after the Great Recession.

There is also some evidence that credit demand affects household debt. Dell'Ariccia, Igan, and Laeven (2012) argue that high credit demand contributed to the deterioration in lending standards, and thus contributed to the boom in subprime mortgages. Duca and Kumar (2014) find that financially less literate and less educated households took on higher levels of debt before the crisis. My paper explains household debt by childhood experience of father's unemployment, a characteristic that is purely related to household demand for credit. Identifying a separate credit demand effect is not easy even using microlevel data, as many household characteristics correlate with factors that also affect credit supply. Using childhood experience allows for a clean identification of credit demand, as childhood events are unaffected by contemporaneous factors driving credit supply. Moreover, childhood experiences are unlikely to be known by loan officers, so they cannot have a direct effect on credit supply.

Father's unemployment constitutes a major shock to family life, and it is an event that even young children are likely to remember for the rest of their lives.[1] A job loss not only reduces income in the short and long term, but it also reduces the likelihood of gaining employment and is associated with health problems and increased mortality.[2] These scarring effects can permanently alter the children's beliefs on labor market risk: households with experience of father's unemployment may believe that their income is more volatile than that of their peers. Given that leverage amplifies the effect of income shocks on household consumption, households with traumatic personal experiences may choose to hold less debt. These experiences could also affect the formation of risk attitudes. Personal experience of unemployment shocks can result in lower tolerance for labor market risk, and households may choose to decrease their exposure to such negative shocks by holding less debt.

I study the effect of childhood experience of father's unemployment on household debt levels using data from the Health and Retirement Study (HRS). Controlling for random household effects, I find that the households with childhood experience of father's unemployment hold 17% less debt and have 10% lower debt-to-income ratios. These analyses also control for a host of household characteristics that were predetermined in childhood: age, cohort, ethnicity, health in childhood, and parents' education. Adding contemporaneous log wealth or log income to the regression models yields similar estimates of experience effects;

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[1] Past research has documented that adults remember childhood experience of e.g. novel events (Nelson, 1993), painful or frightening medical procedures (Goodman et al., 1994), and changes in the family structure (Hill, Yeung, and Duncan, 2001).

[2] See, e.g. Ruhm (1991), Jacobson, LaLonde, and Sullivan (1993), Chan and Stevens (2001), Strully (2009), and Sullivan and Von Wachter (2009).

this means that the regression estimates are robust to correlated unobserved effects that affect household debt level choices via income or wealth channels.

This paper relates to two strands of literature. First, I contribute to the literature that studies the effects of personal experience on household financial decision making. Prior studies have shown that personal experience is related to IPO participation (Kaustia and Knüpfer, 2008), stock market participation (Barnea, Cronqvist, and Siegel, 2010; Malmendier and Nagel, 2011), and home ownership (Cronqvist, Münkel, and Siegel, 2012). To my knowledge, my study is the first to document that personal experience affects household debt.

Second, this paper relates to the literature on the determinants of household debt. Despite of its importance, household debt has largely been neglected in the household finance literature (Zinman, 2014). Prior studies have shown that household debt is related to borrowing constraints and racial discrimination (Duca and Rosenthal, 1993), financing income shocks (Hurst and Stafford, 2004), subprime lending (Mian and Sufi, 2009), financial literacy (Duca and Kumar, 2014), and cutbacks in the provision of credit (Gropp, Krainer, and Laderman, 2014). My study differs from the literature in that it explains cross-sectional variation in household debt with a pure credit demand factor.

This paper proceeds as follows. Section 2 describes the data and the debt measures used. Section 3 reports the estimation results and Section 4 concludes.

2. Data

A. Household debt in the Health and Retirement Study

The Health and Retirement Study (HRS)[3] surveys near- and already retired US households biennially about their finances, employment, health, demographics and many other details on their living condition. HRS asks respondents to provide information on the value of the mortgages on their primary residence, their secondary residence, other home loans, and other debts (the question on other debts covers items such as credit card debt, medical bills, life insurance policy loans, and loans from relatives).

As some respondents are unable to provide the value of their debts in dollar terms, the HRS then asks them a series of unfolding bracket questions to provide a lower and upper bound for each item. I include in my sample only those responses that either give a dollar value or a full-bracket response to all constituent debt items. This filter reduces the sample by 2.5% for primary residence mortgages, 1.0% for secondary residence mortgages, 2.5% for other home loans, and 2.7% for other debts. For the combined household total debt measure, this filter reduces the sample by 6.0%. To obtain dollar values from the bracket responses, I use imputed values from the RAND Income and Wealth Imputation File version L.

Figure 1 shows the mean household debt over survey waves (including the partial data for wave 3). HRS erroneously skipped the secondary residence mortgage question for most respondents in the third survey wave, so the total value of household debt for that wave

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[3] For an overview of the HRS survey design and background, see e.g. Juster and Suzman (1995)

is missing. The jumps in household debt levels between waves 2 and 3, waves 3 and 4, and waves 6 and 7 are due to additions of new cohorts.[4] As younger households tend to have more debt than older households, the addition of younger cohorts increases the average household debt.

The real value of mortgages increased from 2004 to 2006 when no new cohorts where added. This indicates that even near- or already retired households took on more debt before the financial crisis, consistent with the aggregate trend documented by Mian and Sufi (2010).

Table 1 reports the fraction of HRS households that hold debt and the mean, standard deviation, skewness, 90th percentile, and 99th percentile of total household debt by survey wave. Household debt is unevenly distributed across the population. The majority of HRS households do not report any significant debts; only in the two first surveys did more than 50% of the households have debt. The cross-wave average household mean debt is $16,141 in 1982–84 dollars ($37,000 in 2013 dollars) and the 90th percentile value of debt is at $51,123 ($119,000 in 2013 dollars). Similar to the mean household debt, the 90th and 99th percentile figures exhibit an increasing trend during 2004–06, while the fraction of households with debt remained unchanged.

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[4] The original HRS sample consisted of respondents born between 1931 and 1941. From wave 2 onwards, AHEAD, an auxiliary study to HRS, was merged into HRS, adding the AHEAD cohort ("oldest old", born in 1923 or earlier) to the sample population. However, as the wave 2 survey of the AHEAD sample omitted many questions about assets and debts, information on debts is only available for this cohort starting from wave 3. In wave 4, the following two cohorts were added: Children of depression age (CODA, born 1924–30) and War babies (WB, born in 1942–47). In wave 7, the early baby-boomer cohort (EBB, born 1948–53) was added to the sample.

Survey respondents may systematically underreport the value of their true debts. Zinman (2009) finds that Survey of Consumer Finances respondents underreport credit card debt by a factor of two compared to Federal Reserve Board G.19 data. Karlan and Zinman (2008) find that while all respondents underreport the value of their consumer credit, female respondents tend to underreport more when the survey questions are asked by men. Further, HRS asks about the value of businesses, farms, real estate other than primary and secondary residence, and vehicles in netted terms, i.e. the value of debt related to these assets cannot be observed in the survey data. Thus, the HRS household debts are likely to be downward biased due to both the survey underreporting of debt and the netting of asset values. To my knowledge, there is no link between childhood experience of father's unemployment and biases in reporting debt. While these survey response errors may result in noisier measures of debt and hence less precise experience-effect estimates, the errors should not interfere with causal inference.

I only use data from wave 4 onwards, for which the data is of better quality for examining household debt. The first wave has data only for a single cohort. Waves 2 and 3 are based on merging HRS survey data with the AHEAD survey and as a result some data items are missing from the AHEAD sample. Wave 3 survey also erroneously omitted questions on secondary mortgages. Dropping data for the first three waves reduces the sample size from 96,649 observations to 83,388 observations.

B. Measures of household debt

Past research has rarely analyzed household leverage using microlevel data. Dynan and Kohn (2007) study the causes of the increase in household debt-to-income ratios using Survey of Consumer Finances (SCF) data from 1983 till 2007. Other prior studies of household leverage such as Mishkin (1978) and Mian and Sufi (2009, 2010) use either national aggregate or zip-code level data.

Survey-based household-level debt-to-income ratios are noisy because of two reasons.[5] First, households' annual incomes display variance that is unrelated to permanent income. Second, survey-based debt-to-income measures are affected by measurement errors in both the responses about household debt and household income. These two response errors are compounded in the debt-to-income ratio, and the response error in the denominator could also lead to excess skewness in the observed household ratios.

My first household debt measure is the total household debt. Given that the raw debt variable exhibits high levels of skewness, I log-transform it to make it approximately normally distributed. Taking the log also effectively limits the sample to households with a positive amount of debt.

My second measure is the log debt-to-income ratio, where household debts are scaled

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[5] While the mean of household debt-to-income ratios is a close analogy to the aggregate debt-to-income ratio, it is not the same measure, as in general $\overline{\frac{Debt_i}{Income_i}} \neq \left[\frac{\overline{Debt_i}}{\overline{Income_i}}\right]$. Both the mean of household ratios and the aggregate ratio exhibit similar time trends over HRS survey waves, but the levels are difficult to compare, as changes in the variances of the cross-sectional household debt and income affect the mean of household debt-to-income ratio, but do not affect the aggregate ratio.

by the household average income.[6] Unlike the SCF, the HRS is a longitudinal survey, and thus allows for estimating household time-average measures. The household average can be considered as a proxy for the household permanent income, insulated from temporary income shocks. Its measurement error is also decreased by the fact that the denominator is an aggregated measure. Given that the raw debt-to-income ratio exhibits excess skewness, I log-transform the variable to make it approximately normal.

C. Childhood experiences of father's unemployment

HRS asks all respondents since 1998 whether they have childhood experience of father's unemployment: "While you were growing up, before age 16, was there a time of several months or more when your father had no job?" 70% of all respondents have no experience of father's unemployment, 19% report that their father was unemployed, 9% of the respondents report that their father did not live with the family while they were children, 1% report that their father never worked, and the remaining 2% did not provide a response. The HRS figure for father being absent, 9%, is of similar magnitude to the 1960 Census of Population data in which 8% of children under 18 years were living with a single mother, and another 3% were not living with either parent.

I create a respondent-level indicator variable that receives the value of one if the respondent reported that his/her father experienced an unemployment spell, and zero if the

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[6] Graham and Narasimhan (2004), Malmendier, Tate, and Yan (2011), and Schoar and Zuo (2011) use an analogous debt-to-assets ratio to analyze the association between CEO personal experience and corporate borrowing.

respondent reported of no unemployment events. As the responses of father being absent or never having worked cannot be interpreted as an experience of father's job loss, I assign the unemployment indicator variable a missing value for all other responses. Thus, inclusion of the father's unemployment dummy variable in a regression model implicitly restricts the sample population to those households whose fathers were present during their childhood and at least occasionally working.

HRS piloted the father's unemployment question in a 1996 experimental module asked from a randomly drawn 10% subsample.[7] The question wording was different in this pilot: "While you were growing up did your father ever lose his job and not find a new one right away?" The respondents of this experimental module were asked the reworded question about the father's unemployment in a later survey. 81% of these responses were concordant. This less-than-perfect concordance rate is partly caused by the changed wording in the duration of the unemployment spell. Another factor that may contribute to the discordance is that the 1996 experimental module questions were asked at the very end of the lengthy survey, while in later surveys the question is asked at the beginning. Thus, fatigue may have affected the pilot study responses that required respondents to think back about their childhood years. Overall, given the wording change in the duration of unemployment spell, the responses to the father's unemployment question are reliable.

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[7] See Elo (1998) for a description of the retrospective childhood questions included in the experimental module.

D. Summary of explanatory and control variables

Because the dependent variables are measured at the household level, I aggregate respondent-level measures by taking household-survey wave averages. This aggregation only pertains to two-spouse households. For example, if only one of the spouses has childhood experience of father's unemployment, I assign the household's childhood-experience indicator variable a value of 0.5.

Childhood experience potentially affects many of the standard control variables included in estimation of models of household financial decision making. To avoid including potential outcome variables as controls in the debt regressions (Angrist and Pischke, 2009, pp. 64–68), my main specification only includes variables that either were determined already at the time of the childhood experience, or variables that are unlikely to be caused by childhood experience of father's unemployment. This restriction rules out control variables such as adult income, wealth, education, marital status and number of children.

Many respondent characteristics that have been predetermined before the childhood experiences may also affect the long-term debt choices of households. Duca and Rosenthal (1993) find that younger families and minorities are more likely to be credit constrained. Based on their findings, I include controls for the household age as well as ethnicity indicator variables denoting African Americans and Hispanics. I also control for age-period-cohort and gender effects that are commonly found to correlate with observed household behavior (see, e.g. Ameriks and Zeldes, 2004 and Croson and Gneezy, 2009).

Other early factors that may have a long tail on individual behavior include parental

characteristics. Many empirical studies (e.g. Kane, 1994) have found a strong link between children's educational attainment and parental education. To the extent that parental background determines ones' education, it will impact labor market outcomes and life style choices that could affect household leverage. However, parental education is likely to be correlated with how well off the childhood family was. Thus, parental education variables may not only control for intergenerational education but also proxy for childhood family socio-economic status.

Haas (2007) assesses the HRS childhood-health responses and finds that respondents are consistent over time in their childhood-health assessments, especially when the responses are dichotomized into good (excellent/very good/good) vs. poor (fair/poor) childhood health. Children with poor health can expect a higher likelihood of poor health also in adulthood. To the extent that these health risks are uninsurable, the higher subjective likelihood of health shocks acts as a higher background risk. Increased background risk discourages households from holding illiquid and high-risk assets (Guiso, Jappelli, and Terlizzese, 1996). I control for poor health in childhood using the Haas (2007) dichotomous measure. Poor childhood health could also be related to family socio-economic status, e.g. in events where lack of family wealth prevents provision of health care.

Table 2 reports descriptive statistics for household-wave averages of childhood experience of father's unemployment, gender, Hispanicity, African-American ethnicity, childhood health, age, and years of father's and mother's education. These statistics are calculated for the sample of 83,288 household-wave observations for which I can observe the total

value of household debts. As debts are measured at the household level, I average the individual characteristics into household averages. This averaging weights single households more compared to a scheme where each respondent gets an equal weight. Except for age, all of these controls are time invariant and any variation over waves only reflects changes in the household constituents, e.g. deaths, divorces, or marriages.

In this sample, 22% of the respondents have childhood experience of father's unemployment. Women are more numerous over all HRS survey waves. While the majority of HRS households consists of couples, there is a large number of single households, of which single female households constitute a majority. 15% of the sample respondents are African American and 9% Hispanic. 7% of the respondents report that they had poor health as a child. The average age of the respondents over all waves is 69.4 years. The respondents' parents have on average nine years of education.

Birth cohort, living area, and the survey time might also affect the observed household debt levels. I control for the HRS sample cohort, US Census region, survey wave, and their interactions in the debt level and debt-to-income regression models. Due to the age-period-cohort identification problem (Ameriks and Zeldes, 2004), the estimates of age effects are not identified unless a structure for the age, period, and cohort effects is assumed. However, given that the identification of the childhood-experience effect is unrelated to cohort effects, I am able to control for all age, period, and cohort effects without assuming any structure.

3. Results

A. Total household debt

Table 3 studies the effect of personal experience of father's unemployment on log debt. To control for any non-correlated unobserved effects at the household, I estimate random effects models.[8] In the spirit of Gormley and Matsa (2014), all regression models include dummy controls for cohort, US Census region, wave effects, and their interactions.[9]

Model (1) includes just the childhood experience indicator in the regression. With a z-value of -4.48, the variable is statistically highly significant. This result suggests that, compared to an otherwise identical household, a household with childhood experience of father's unemployment would hold 19% ($= e^{-0.22} - 1$) less debt. Model (2) adds controls for demographics. The childhood-experience estimate is almost unchanged in magnitude, and it remains statistically highly significant. The control variables have the expected signs; males have more debt and minorities hold less debt. Model (3) adds controls for parental education and self-perceived health in childhood. The effect of childhood experience is effectively unchanged at 17%, and attains a statistically highly significant z-value of -3.49. Estimates for the control variables also stay mostly the same; only the Hispanic variable loses significance after controlling for childhood health and parental education. The added control variables have the expected signs: poor childhood health has a negative sign and parents' education has a positive sign.

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[8] Although not reported formally, I also estimate all the models with OLS and find very similar results.

[9] I also estimate the models without interaction effects and get very similar results.

In untabulated results, I also control for contemporaneous log wealth and log income. The experience-effect estimates are unchanged and retain their statistical significance. Thus, the childhood-experience effect is robust to correlated unobserved factors that were determined before childhood and that could affect household debt via income and wealth channels.

B. Debt-to-income ratio

Table 4 reports the estimates for the log of household debt-to-income ratios. All regression models include dummy controls for cohort, US Census region, wave effects, and their interactions.

In models (1) and (2), the childhood experience of father's unemployment reduces debt-to-income ratios by 7% ($= e^{-0.07} - 1$). The z-values for the estimates, -1.67 and -1.61, are statistically significant at the 10% and 11% levels respectively. The lower statistical significance of these results compared to the ones reported in Table 3 could be due to the higher response error in the debt-to-income ratios. In model (3), the childhood experience reduces debt-to-income ratios by 10% ($= e^{-0.11} - 1$), and this estimate is significant at the 5% level (z-value -2.32). The variation in the estimate sizes between models (1-2) and model (3) arises from differences in the sample: the childhood effect is larger for those households that supply information on their father's education. This sample difference could arise from more accurate childhood-experience reports by those respondents who also report information on their father's education.

The estimates for controls differ somewhat from the log debt model estimates. Gender is not a statistically significant predictor of the household debt-to-income ratio. Minorities

have significantly higher debt-to-income ratios, while they have lower absolute debt. The overall R^2s are lower than in the log debt models, suggesting that the debt-to-income ratio is a noisier measure of household leverage than log debt.

4. Conclusion

This paper shows that a pure credit-demand factor, identified using data on household members' personal experience of hardship in childhood, can explain cross-sectional variation in household leverage. I estimate that childhood experience of father's unemployment results in adult households holding 17% less debt and having 10% lower debt-to-income ratios. Household debt levels are not determined solely by credit supply; my evidence shows that household preferences for debt also matter.

These results suggest that personal experiences can have very long-term effects. Experience effects tend to attenuate over time; some experiences may only affect households in the short term. However, the fact that a childhood event experienced decades ago results in a 17% difference in household debt, indicates that some personal experiences are powerful enough to have permanent effects on household decision making.

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Figure 1: Household debt breakdown over survey waves
This figure reports the average household debt by survey waves. The debts are given in 1982-84 dollars, which corresponds to $2.33 in 2013 dollar value. Other debts include credit card debt, medical bills, and loans from friends and family. I use the RAND Income and Wealth Imputation File version L imputed debt figures for those responses that gave a full-bracket range response. HRS did not collect second mortgage information in wave 3. The jumps in the debt values in waves 3, 4, and 7 are due to addition of new cohorts to HRS.
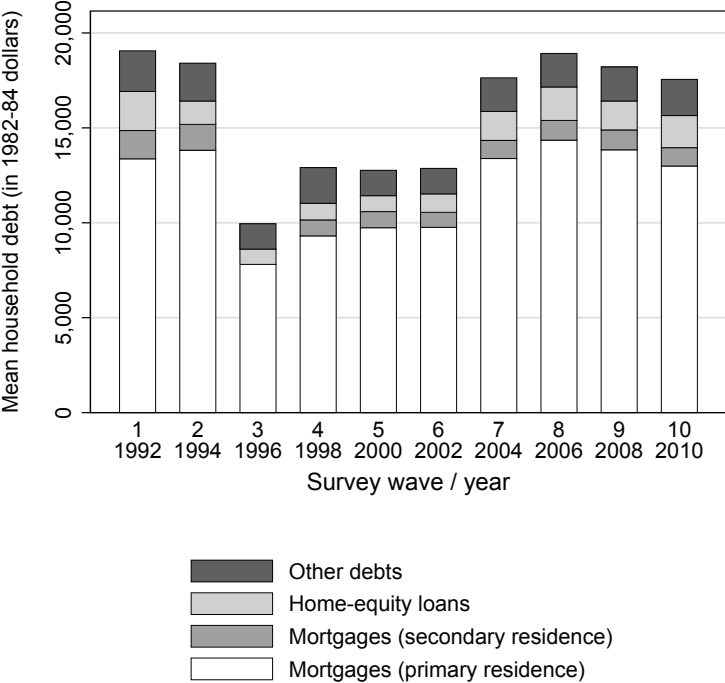
Table 1: Household debt by survey wave
This table shows descriptive statistics for HRS household debt over survey waves. The data include the RAND Income and Wealth Imputation File version L imputed debt values for those households that gave a full-bracket value response. The household-debt measure includes the values of primary residence mortgages, secondary residence mortgages, other home loans, and other debts; HRS does not survey the gross value of business, farm, or car loans. The household debt figures are in 1982-84 dollars; a 1982-84 dollar corresponds to $2.33 in 2013. The "Fraction of HHs with debt" column denotes the share of households that report a non-zero sum of debt. p90 and p99 refer to the 90th and 99th percentiles respectively. Wave 3 is missing, as respondents were erroneously not asked about mortgages on second residences. The number of respondents increases in waves 4 and 7 because HRS added new cohorts.

Wave	N	Fraction of HHs with debt	Household debt (in 1982-84 dollars)				
			Mean	Std. dev.	Skewness	p90	p99
1	6,717	0.63	19,057	48,673	22.3	54,526	160,371
2	6,644	0.62	18,408	62,734	44.6	53,979	154,325
4	13,591	0.43	12,907	47,873	49.7	42,368	137,072
5	12,461	0.43	12,764	33,116	8.0	43,517	132,053
6	11,537	0.40	12,865	33,249	6.7	44,608	141,163
7	12,812	0.46	17,635	43,095	7.7	57,609	189,130
8	11,913	0.46	18,919	51,633	10.6	60,881	215,054
9	11,174	0.45	18,207	49,445	10.0	57,875	212,210
10	9,800	0.46	17,554	50,232	10.9	55,934	192,792
Total	96,649	0.47	16,141	46,379	23.2	51,123	175,168

Table 2: Summary statistics for the explanatory and control variables
This table reports summary statistics of the explanatory and control variables for HRS households. The sample includes all 83,288 household-wave observations for which the household debt variable is available in HRS waves 4 to 10. Q1 and Q3 refer to the 25th and 75th percentiles. All measures are household-wave averages; for example Male takes the value of 0 for a single female household, 0.5 for a household with both a female and a male spouse, and 1 for a household with a single male. † denotes household-level averages of individual-level dummy variables. Age, father's education, and mother's education are measured in years.

Variables	N	Mean	Std.dev.	Min	Q1	Median	Q3	Max
Father unemployed †	70,867	0.22	0.37	0	0	0	0.5	1
Male †	83,288	0.37	0.34	0	0	0.5	0.5	1
Hispanic †	83,288	0.09	0.28	0	0	0	0	1
African-American †	83,288	0.15	0.36	0	0	0	0	1
Poor health as child †	83,041	0.07	0.22	0	0	0	0	1
Age	83,287	69.4	11.0	25	61	69	77	110
Father's education	66,420	9.00	3.34	0	7.5	8.5	12	17
Mother's education	71,523	9.26	3.15	0	7.5	8.5	12	17

Table 3: Determinants of household debt
This table reports the estimates from random effects models of household debt. The dependent variable is the natural logarithm of the sum of household debts. z-statistics calculated using standard errors robust to clustering at household level are shown in parenthesis. *** denotes non-zero correlation at the 1% level. ρ is the fraction of error term variation attributed to the respondent random effect.

	log debt		
	(1)	**(2)**	**(3)**
Father unemployed	-0.22***	-0.22***	-0.19***
	(-4.48)	(-4.49)	(-3.49)
Male		0.37***	0.33***
		(7.21)	(5.92)
African-American		-0.42***	-0.28***
		(-8.72)	(-4.89)
Hispanic		-0.36***	0.01
		(-5.35)	(0.13)
Age		-0.05***	-0.05***
		(-14.50)	(-11.83)
Poor health as a child			-0.31***
			(-3.39)
Father's education			0.06***
			(7.00)
Mother's education			0.03***
			(3.28)
Wave dummies	yes	yes	yes
Census region dummies	yes	yes	yes
Cohort dummies	yes	yes	yes
Wave-region-cohort interactions	yes	yes	yes
ρ	0.70	0.69	0.69
R^2 (overall)	0.114	0.146	0.166
Number of observations	31,058	31,058	25,511
Number of households	9,901	9,901	8,100

Table 4: Determinants of household debt-to-income ratios
This table shows the results from random effects models of household-level debt-to-income ratios. The dependent variable is the natural logarithm of the debt-to-income ratio, where the household time-averaged income is used in the denominator. z-statistics calculated using standard errors robust to clustering at respondent levels are shown in parenthesis. ***, **, and * denote non-zero correlation at the 1%, 5%, and 10% levels respectively. ρ is the fraction of error term variation attributed to the household random effect.

	log Debt-to-Income ratio		
	(1)	**(2)**	**(3)**
Father unemployed	-0.07*	-0.07	-0.11**
	(-1.67)	(-1.61)	(-2.22)
Male		-0.01	-0.03
		(-0.17)	(-0.58)
African-American		0.11***	0.14***
		(2.58)	(2.80)
Hispanic		0.31***	0.40***
		(5.09)	(5.29)
Age		-0.03***	-0.03***
		(-8.10)	(-7.26)
Poor health as a child			-0.01
			(-0.14)
Father's education			0.02***
			(3.42)
Mother's education			-0.01
			(-1.32)
Wave dummies	yes	yes	yes
Census region dummies	yes	yes	yes
Cohort dummies	yes	yes	yes
Wave-region-cohort interactions	yes	yes	yes
ρ	0.64	0.64	0.65
R^2 (overall)	0.056	0.063	0.066
Number of observations	31,054	31,054	25,507
Number of households	9,898	9,898	8,097

Childhood experience of father's job loss and entrepreneurship

Antti Lehtoranta

Abstract

Childhood experience of father's job loss is associated with lower levels of entrepreneurship. Using data from the Panel Study of Income Dynamics (PSID), I document that father's job-loss experience at the age of 5–10 years is associated with a 2.4-percentage-point decrease in the likelihood of being a business owner in a sample with average business ownership rate of 11%. Experiences at a very young age have no significant effect on entrepreneurial choice. Personal experience of job loss may also affect the perception of business risk; I find that the job-loss effect is stronger for experiences of company folding.

1. Introduction

Why do some individuals choose entrepreneurship over wage labor? Previous empirical work has found a number of household characteristics that explain entrepreneurial choice: age, ethnicity, family background in entrepreneurship, gender, and wealth among others.[1] Still much of the cross-sectional variation in entrepreneurial choice is left unexplained. I propose a novel household characteristic that explains cross-sectional variation in entrepreneurship: childhood experience of father's job loss.

Father's job loss is a major shock to the family. Job losses not only affect household income, but they also cause health problems and lead to increased mortality.[2] Father's job losses also have directly observable effects on children. Rege, Telle, and Votruba (2011) find that father's job loss has a negative effect on the children's school performance. Such scarring personal experiences are likely to affect subjective beliefs about labor market risk. If individuals overweight personal experiences in forming expectations, then those households with experience of job losses will hold more pessimistic expectations about labor markets.[3]

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[1] At least the following household characteristics have been shown to correlate with entrepreneurship: gender (Birley, 1989), liquidity constraints (Evans and Jovanovic, 1989; Hurst and Lusardi, 2004; Fairlie and Krashinsky, 2012), age and work experience (Evans and Leighton, 1989), ethnicity and discrimination (Fairlie, 1999; Blanchflower, Levine, and Zimmerman, 2003), parental experience of self-employment (Dunn and Holtz-Eakin, 2000), genetic factors (Nicolaou et al., 2008), optimism (Landier and Thesmar, 2009), entrepreneurial ability (Andersen and Nielsen, 2012), and the availability of collateral lending (Adelino, Schoar, and Severino, 2014).

[2] See, e.g. Ruhm (1991), Jacobson, LaLonde, and Sullivan (1993), Chan and Stevens (2001), Strully (2009), and Sullivan and von Wachter (2009)

[3] For example, Kaustia and Knüpfer (2008) find that individuals overweight personal experience in IPO participation, Brown, Ivković, Smith, and Weisbenner (2008) argue that individual stock market participation choice is driven by the average community participation rate, and Kaustia and Knüpfer (2012)

In addition, salient shocks experienced during childhood may affect the formation of risk preferences. Personally experiencing a negative consumption shock and its effects on family life can lead individuals to be more averse to accepting risk that could lead to another traumatic experience. Thus personal experience of father's job loss can be associated with more pessimistic expectations and lower tolerance for income risk.

Lower risk tolerance and pessimistic attitudes deter entrepreneurship. Kanbur (1979) and Kihlstrom and Laffont (1979) present models where risk averse individuals prefer wage labor over entrepreneurship. Van den Steen (2004) and Landier and Thesmar (2009) show that individuals with optimistic expectations become entrepreneurs. The personal experience of father's job loss can thus reduce adult entrepreneurial choice via either the risk-tolerance or expectation channel.

Childhood experiences allow for a clean identification of the effects of expectations and risk attitudes on entrepreneurial choice. This is because childhood experiences are determined at an early age: children cannot cause their father's job displacements, and the causal inference of the effects of childhood experience on later adult outcomes does not depend on controlling for adult variables. The causal effect of childhood experiences on adult entrepreneurial choice can be identified controlling only for variables that were determined at childhood, such as parental education and business background, and other invariant variables such as age, ethnicity, and gender.

To investigate the effects of childhood experience of father's job loss on entrepreneurship,

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find that the peer stock performance explains stock market entry decisions.

I use data from the Panel Study of Income Dynamics (PSID). The PSID data allow linking children's entrepreneurial choices to the employment history of their father. The fact that the job losses are recorded within a year of the job loss event mitigates concerns for recall bias driving the results.

I find that the childhood experience of father's involuntary job loss is associated with a 2.4-percentage-points lower likelihood of being a business owner. Given that in my sample the average business-ownership rate is 11%, the childhood-experience effect is economically significant. I find no effect on childhood experience of father quitting his job voluntarily, suggesting that only involuntary job losses affect later household decision making. I also find some evidence that job losses that are due to company folding have a larger effect on entrepreneurial choice than job losses due to layoffs. The principal difference between these two types of involuntary job losses is what happened to the employer: did it go bust or not. My findings are consistent with personal experience being overweighted in the formation of business survival expectations. For robustness, I also estimate my main results using self-employment as the measure for entrepreneurship, and the results are qualitatively similar.

Apart from the entrepreneurship literature cited in the first footnote, my paper relates to the literature that studies the effects of personal experience on household financial decision making. Prior studies have shown that personal experience is related to IPO participation (Kaustia and Knüpfer, 2008), stock market participation (Barnea, Cronqvist, and Siegel, 2010; Malmendier and Nagel, 2011), and home ownership (Cronqvist, Münkel, and Siegel, 2012). To my knowledge, my study is the first to document that personal experience affects

entrepreneurial choice.

This paper proceeds as follows. Section 2 describes the measurement of childhood experiences, entrepreneurship and control variables, and Section 3 reports the results. Section 4 concludes.

2. Data

The Panel Study of Income Dynamics (PSID) is a survey of US families and their children. The surveys were run annually from 1968 until 1993, and biennially thereafter. Children of the PSID families who move away from home and start their own families are added as new PSID households to future surveys.[4] Due to this design, PSID is extensively used to study intergenerational effects of work- and income-related outcomes.

A. Childhood experience of father's job loss

PSID surveys ask every wave about the household head's job status and employer information. If the household head reports being unemployed or the current job does not match the one recorded in the previous survey wave, the interviewers ask for the reason of the job loss. PSID then codes these verbal responses into the following job-displacement categories: i) company folded, ii) laid off or fired, and iii) quit. The company-folded category includes responses that are related to strictly involuntary job losses. The laid-off-or-fired category responses are also related to involuntary job losses, but not all employees may have

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[4] See Hill (1991) for details about the PSID survey design.

lost their jobs at the event.[5]

Both the factory-folded and laid-off responses indicate involuntary job losses, but these experiences may not be identical. Factory folding is an event where the whole business of the employer has experienced a major problem, perhaps even a bankruptcy. Lay offs are also related to problems in business, but not to the extent that the factory had to be closed. Thus, experience about losing a job due to factory folding may also affect one's perceptions about business risk.

Testing for the significance of the quit experience on entrepreneurial choice constitutes a pseudo-placebo test. The most important difference between a job change due to factory folding or lay offs and quitting is that quitting is voluntary. Father's voluntary job changes should have less impact on children than unwanted and perhaps unanticipated involuntary job losses. While quitting is similar to the involuntary job losses in that it involves changing jobs, voluntary job changes are not traumatic and should not affect the children's expectations and risk attitudes. Thus, if the father's quit experience were significantly correlated with the children's entrepreneurial choice, it would suggest that the experience effect is due to some other mechanism than expectations or risk attitudes.

The effect of father's job loss is expected to differ depending on the age of a child. I follow Bradley et al. (2001) and divide childhood into 5-year intervals: early childhood (0–5 yrs), middle childhood (5–10 yrs), and early adolescence (10–15 yrs). Personal experience

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[5]   Boisjoly, Duncan, and Smeeding (1998) manually investigate the laid-off-or-fired responses and find that the majority of the responses in this category involve lay offs and only 16% of the responses mention being fired.

that is not memorable is unlikely to affect expectations. Fontanari et al. (2014) show that probabilistic thinking develops around the age of five. Expectations require at least rudimentary probabilistic thinking, so I expect experiences before the age of five to have considerably less impact on expectations than later experiences.[6] Therefore, investigating the effects of the job-loss experience on the early-childhood group can be considered as a pseudo-placebo test.

My sample consists of individuals with data on father's employment history available over various childhood periods. I match children's records to their father's job-history data, and look whether the father experienced a particular type of job-loss event within a specific age range. Figure 1 provides an example on how to create the middle-childhood experience indicators of father's job loss.

Table 1 reports the frequencies of childhood experience of father's job losses over the three childhood periods as well as overlapping periods. The intergenerational matching of children to their father's job histories reduces the sample size. While the first PSID survey wave included 4,802 families, the data allow creation of the early-childhood experience indicators for 2,873 respondents, middle-childhood indicators for 3,547 respondents, and early-adolescence indicators for 3,658 respondents. The overlapping childhood periods require even longer job histories. Therefore, the sample is smaller in specifications that use longer childhood-experience measurement ranges.

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[6] Children are likely to learn at an older age about important family events that occurred when they were too young to understand. Still, personal experience learned at the time of the event is likely to have a stronger effect on the formation of subjective expectations than second-hand knowledge.

About 7–8% of the respondents have a childhood experience of father losing his job due to factory folding. Layoffs are more numerous than factory closings. 18% of the respondents have early-childhood, 15% middle-childhood, and 11% early-adolescence experience of father's job loss due to layoffs. Experiences of father quitting his job are even more common. 37% of respondents have early-childhood, 28% have middle-childhood, and 21% have early-adolescence experience of father quitting his job.

The incidence of the quit experience is highest for the early-childhood period and the lowest for the early-adolescence period. The childhood age ranges are mechanically correlated with the father's ages; a father of an adolescent cannot be a teenager himself. Thus, the pattern in the incidence rates is consistent with younger employees being more likely to change jobs. A similar pattern is evident also for the lay-off experience measures. This age pattern is consistent with seniority rules causing junior employees being first to be laid off.

I create a measure of involuntary job losses that combines the factory-folded and laid-off experiences. 24% of the respondents have early-childhood, 20% middle-childhood, and 17% early-adolescence experience of father's involuntary job loss. Involuntary job losses are less frequent than the job changes due to quitting. Overall, the experience of father changing his job is not rare. E.g. 49% of respondents have early-childhood experience of any type of father's job change.

B. Entrepreneurship and control variables

Table 2 reports summary statistics for the dependent and control variables for a sample for which father's unemployment can be measured during middle childhood (age 5–10 years). There is data on business ownership for all but one of the 3,547 respondents for whom the middle-childhood experience can be observed. In this sample, which by construction consists of young respondents, the rate of business ownership is 10.8%. The secondary entrepreneurship measure, self-employment, can be observed for 3,364 respondents, and the average self-employment rate is 8.8% (counting only those respondents who report being solely self-employed).

To avoid the bad control problem (see, e.g. Angrist and Pischke, 2009, pp. 64–68) from biasing the estimates of the childhood experiences, I include as controls only such variables that were determined at childhood. This restriction applies to contemporary variables such as education, income, and wealth.

Dunn and Holtz-Eakin (2000) find that the strongest parental effect on the self-employment choice runs through their own background in self-employment. In my sample, 21.4% of the respondents have fathers with business-ownership experience and 16.9% have fathers with self-employment experience. I consider all those fathers who have at least once before the childhood-experience evaluation period indicated that they own a business or are self-employed to have business-ownership or self-employment experience.[7]

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[7] I also define an alternative measure for entrepreneurial background that uses the time-median response of father's entrepreneurship status. The results remain qualitatively similar with this alternative measure.

The sample has 25.8% African-American and 4% Hispanic household heads.[8] 44.5% of the sample are men and the average respondent is 29.2 years old. The respondents' parents have on average 12.1 years of eduction.

3. Results

A. Main results

Table 3 reports how the marginal probability of being a business owner is explained by the middle-childhood experience of father's job loss. Model (1) includes only the combined factory-folded or laid-off indicator with survey-wave dummies. In this model, the childhood experience of father's involuntary job loss is associated with a 3.9-percentage-point decrease in the propensity of being a business owner. This effect is statistically highly significant and large compared to the mean business ownership rate of 10.8%. Model (2) adds controls for age, gender, African-American ethnicity, Hispanicity, father's and mother's education, and father's business ownership. The childhood-effect estimate is reduced to 2.4 percentage points, but it remains statistically significant (t-value $= -2.39$).

The estimates for the control variables have the expected signs. In the underlying logit model, the linear age receives a positive sign and the quadratic term a negative sign, suggesting an inverse U-shaped relation between age and entrepreneurship. As the majority of the respondents in this sample are still young, the linear age effect dominates;

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[8] The share of African-Americans exceeds the national average due to the original PSID oversampling of poor families. The Hispanic share is below the current national proportion due to the original PSID sample being representative of the 1968 population. The later addition of a Latino sample to PSID does not show in my sample as the intergenerational matching requires me to use only the original PSID sample families.

for the average sample respondent, an additional year of age increases the likelihood of being an entrepreneur by 0.9 percentage points. Males are 2.3 percentage points more likely to be entrepreneurs, while respondents from households with African-American heads are 4.8 percentage points less likely to be business owners. The estimate for having a Hispanic head of household has a positive sign, but the estimate is statistically insignificant. Parental background also matters. Father's business ownership increases the likelihood of the respondent being an entrepreneur by 4.7 percentage points. Mother's education is statistically insignificant.

The 2.4-percentage-points estimate for the childhood-experience effect is comparable in size to the estimates for the control variables. For example, the childhood experience variable has about the same marginal effect as gender, and it is about one half of the estimates for having an African-American household head or having a father with business experience.

Model (3) includes separate indicators for the factory-folded, lay-off, and quit experiences, as well as survey-wave dummies. Father's job-loss experience due to factory folding is associated with a 3.0-percentage-points decrease and experience due to lay offs is associated with a 3.8-percentage-points decrease in the probability of being a business owner. Both the factory-folded and laid-off indicators are statistically significant. The estimated effect for the quit indicator is very small, and it is statistically insignificant. This result is consistent with the idea that experiences of involuntary job losses have a larger effect on household behavior.

Model (4) adds the same set of controls to the logit model as model (2). The factory-

folded experience estimate is now −4.3 percentage points and it is statistically highly significant. The laid-off estimate retains its negative sign, but the estimate size is reduced and it is no longer statistically significant. The quit estimate has a positive sign and it is again statistically insignificant. The estimates for the control variables are similar to those in model (2).

The lower estimate for the laid-off effect compared to the factory-folded effect could be due to the factory-folded experience having a stronger impact on respondents' subjective expectations of business survival. If a company lays off employees, it is likely to continue its operations; but if jobs are lost due to company folding, the operation of the business also stops. Thus, the experience of factory folding may affect expectations of business risk. More pessimistic attitudes towards business risk are likely to further deter entrepreneurial choice.

B. Self-employment

Table 4 reports the marginal probability of childhood experience on the likelihood of being self-employed. Model (1) includes the involuntary job-loss-experience indicator controlling only for survey-wave effects. A childhood experience of father's involuntary job loss reduces the likelihood of being self-employed by 2.4 percentage points. This estimate is statistically highly significant with a t-value of −2.88. The effect is also economically significant, as the sample average self-employment rate is 8.8%.

Model (2) adds controls for age, father's experience of self-employment, gender, ethnicity, Hispanicity, and parental education. The childhood-experience estimate is reduced to 2.0 percentage points, but it remains statistically significant at the 5% level. The

control-variable estimates have the expected signs, although their estimates and statistical significance is smaller than in the business-ownership specifications. Only the father's entrepreneurial background has a larger estimate at 5.3 percentage points compared to the 4.7-percentage-point estimate in the main specification.

Models (3) and (4) estimate the effects of separate factory-folded, laid-off, and quit indicators. In model (3), similar to the business-ownership results shown in Table 3, the factory-folded and laid-off indicators have negative signs and are statistically significant, while the quit effect is statistically insignificant. Father's job displacement due to factory folding reduces the likelihood of being self-employed by 3.0 percentage points, and a lay-off experience reduces the likelihood by 1.7 percentage points. Model (4) adds controls, and the laid-off indicator is no longer statistically significant. The estimated effect for factory-folded experience is −4.4 percentage points. The estimates for the controls are very similar to the estimates for model (2).

Overall, the results for self employment are similar to the results that measure entrepreneurship using business ownership. The size of the estimated effect for the childhood experience is comparable in magnitude to the effects of being male, African-American, or having a self-employed father.

C. Alternative age ranges

Table 5 reports the marginal probability of childhood experience of father's job loss on business ownership using experience indicators measured over alternative age ranges. The first column shows the estimation results for early-childhood (0–5 yrs) experiences, the

second column repeats the baseline middle-childhood (5–10 yrs) results, and the third column shows the results for early-adolescence (10–15 yrs) experience. The three remaining columns show the results using overlapping age ranges. The fourth column shows the combined estimate measured for early- and middle-childhood experiences (0–10 years), the fifth column for middle-childhood and early-adolescence experiences (5–15 years), and the sixth column using all childhood and early-adolescence experiences (0–15 years). The control variables are the same for all six models.

Middle-childhood and early-adolescence experience of father's job loss are associated with a lower likelihood of being a business owner. The middle-childhood marginal effect is −2.4 percentage points and the early-adolescence effect is −2.7 percentage points. Both effects are economically and statistically significant at the 5% level. The estimate for the combined middle-childhood and early-adolescence experience is −2.9 percentage points, and it is statistically significant at the 1% level.

Given that very young children are unlikely to remember and understand the job-loss event, early-childhood experiences are unlikely to affect entrepreneurial choice in any material way. While the children may learn about the job loss and its effects from their parents at a later stage, this second-hand experience—if it exists at all—should not be as important as the first-hand experience. The marginal effect of the early-childhood experience of father' job loss is statistically insignificant and also the estimated effect is smaller at −0.9 percentage points. The overlapping age-range indicators that include the early-childhood job losses have slightly higher estimated effects, but they are also statistically insignificant.

4. Conclusion

This paper documents that childhood experiences are linked with the likelihood of becoming an entrepreneur later in life. I find that experiencing father's involuntary job loss at the age of 5–10 years is associated with a 2.4-percentage-points lower likelihood of owning a business. Father's unemployment experienced at age 10–15 yields a similar effect on entrepreneurship, but experiences at early childhood, age 0–5 years, do not have a statistically significant effect. Five-year-olds and younger are unlikely to remember their father's job loss or understand it. Thus, the job-loss events experienced in early childhood should have weaker effects on the formation of their expectations and risk attitudes. I interpret the insignificance of the early-childhood experience as evidence supporting the idea that the childhood experience of father's job loss affects expectations about labor market risk and the formation of risk attitudes.

A childhood experience of father's job loss can also affect perceptions of business risk. The estimated effect of a job-loss experience due to factory folding is larger than the effect of job loss due to layoffs. While both types of job losses are involuntary, they differ in what happens to the employers' business. An experience about a factory folding may affect the respondents' subjective expectations about business survival. Adverse experiences in the labor markets can thus also have long-term effects on perceptions of business risk and the willingness to become an entrepreneur.

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Figure 1: PSID childhood-experience variable creation example

This imaginary example clarifies how I create the childhood experience of father's job displacement indicators for a given household. The household consists of the father and two children: Alice (born in 1961) and Ben (born in 1965). Father's job history is available from wave 1 to 15. Every wave in which his job changed from the one recorded in the previous interview, the reason for the most recent job displacement is inquired. In this example, the father experiences two job-loss events, one between waves 1 and 2 (factory folded), and another between waves 6 and 7 (laid off). Alice's middle-childhood years fall partly outside of the time range for which father's job history is available, and thus Alice is dropped from the sample, leaving only Ben in the sample. Ben has experienced a lay-off event during his middle-childhood years, and he has not experienced a factory-folded or quit event. Ben moves out of the family in year 1984 (at age 19) and forms his own household. Ben's newly formed household is added to the PSID survey from 1985 onwards and his entrepreneurial choice is surveyed thereafter.
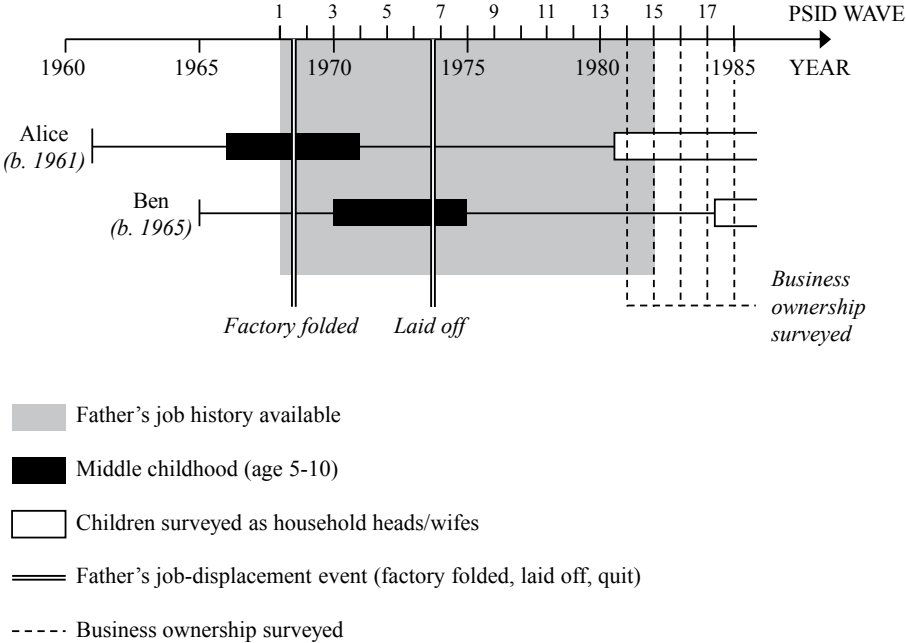
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Table 1: Childhood experience of father's job displacements
This table shows the proportion of respondents with childhood experience of father's job displacement over the following periods: early childhood, middle childhood, and early adolescence. The sample includes only those respondents who later as adults were household heads or wifes during PSID survey waves. Household heads' job is recorded every wave; if the current job differs from the job mentioned in the previous wave, the reason for the job change is asked. This job-change question is asked from all household heads whose job/employer changed between survey waves, including both employed and unemployed household heads. PSID codes these job-displacement reasons under the following categories: 1) factory folded, 2) laid off, 3) quit. Folded-or-laid-off indicator combines the factory-folded and laid-off indicators, and Any-job-change indicator combines all three indicators. Longer childhood experience periods require longer job history data and thus the number of respondents for whom the experience indicator can be calculated (N) is negatively related to the length of the age range.

Childhood period	Years	N	Father's job displacement experience (in %)				
			Factory folded	Laid off	Quit	Folded or Laid off	Any job change
Early childhood	0–5	2,873	7.9	18.3	37.0	23.6	49.0
Middle childhood	5–10	3,547	7.4	15.0	28.4	20.2	39.7
Early adolescence	10–15	3,658	6.7	11.4	20.9	16.7	31.7
Early and Middle childhood	0–10	2,487	14.3	25.5	49.9	33.5	61.6
Middle childhood and Early adolescence	5–15	3,074	12.9	21.5	39.2	29.2	51.6
Childhood and Early adolescence	0–15	2,149	19.2	30.2	56.8	39.6	67.6

Table 2: Summary statistics for dependent and control variables
This table reports summary statistics of the dependent and control variables for PSID households for which the father's unemployment indicator can be calculated (age range 5–10 years). This sample consists of 3,547 distinct respondents. Business ownership data is available for 3,546 and self-employment data for 3,364 respondents. Q1 and Q3 refer to the 25th and 75th percentiles. Variables denoted by † are dummy variables. African-American and Hispanic dummies measure the response of the PSID household head. Father's and Mother's education are the medians of the parents' self-reported years of education from previous PSID survey responses.

Variables	N	Mean	Std.dev.	Min	Q1	Median	Q3	Max
Business owner †	26,570	0.108						
Self-employed †	22,651	0.088						
African-American †	26,583	0.258						
Hispanic †	22,101	0.040						
Male †	26,585	0.445						
Father business owner †	21,814	0.214						
Father self-employed †	21,556	0.169						
Age	26,585	29.2	6.7	15	24	28	33	49
Father's education	26,585	12.1	3.2	1	11	12	14	17
Mother's education	26,382	12.1	2.4	1	11	12	13	17

Table 3: Business ownership and childhood experience of father's unemployment
This table reports the marginal probability of business ownership from logit models including the childhood experience of father's unemployment. The estimates are shown as percentages. Factory folded, Laid off, Quit, and Factory folded or Laid off are dummy variables measuring the childhood experience of father's job displacement. The experience measures are created for the period of middle childhood (years 5 to 10). † denotes dummy variables. The z-statistics based on clustered standard errors are shown in parenthesis. *** and ** refer to 1% and 5% significance levels respectively.

	Business ownership			
	(1)	**(2)**	**(3)**	**(4)**
Factory folded or Laid off †	-3.92***	-2.39**		
	(-4.83)	(-2.39)		
Factory folded †			-3.03**	-4.25***
			(-2.51)	(-3.54)
Laid off †			-3.76***	-0.88
			(-4.25)	(-0.71)
Quit †			-0.08	0.63
			(-0.09)	(0.55)
Age		0.89***		0.90***
		(9.70)		(9.75)
Male †		2.32**		2.36**
		(2.41)		(2.46)
African-American †		-4.81***		-4.76***
		(-4.70)		(-4.65)
Hispanic †		0.54		0.36
		(0.22)		(0.15)
Father's education (years)		0.88***		0.88***
		(4.12)		(4.14)
Mother's education (years)		-0.05		-0.04
		(-0.18)		(-0.14)
Father business owner †		4.74***		4.88***
		(4.15)		(4.26)
Wave dummies	Yes	Yes	Yes	Yes
Pseudo-R^2	0.010	0.066	0.010	0.067
$N_{Respondents}$	3,546	2,741	3,546	2,741
$N_{Observations}$	26,567	17,900	26,567	17,900

Table 4: Self-employment and childhood experience of father's unemployment
This table reports the marginal probability of self-employment from logit models including the childhood experience of father's unemployment. The estimates are shown as percentages. Factory folded, Laid off, Quit, and Factory folded or Laid off are dummy variables measuring the childhood experience of father's job displacement. The experience measures are created for the period of Middle childhood (years 5 to 10). † denotes dummy variables. The z-statistics based on clustered standard errors are shown in parenthesis. ***, **, and * refer to 1%, 5% and 10% significance levels respectively.

	Self-employed			
	(1)	**(2)**	**(3)**	**(4)**
Factory folded or Laid off †	-2.39***	-1.97**		
	(-2.88)	(-2.07)		
Factory folded †			-3.00***	-4.36***
			(-2.65)	(-4.39)
Laid off †			-1.75*	-0.02
			(-1.88)	(-0.01)
Quit †			-0.90	-0.35
			(-1.03)	(-0.33)
Age		0.65***		0.66***
		(7.02)		(7.13)
Male †		1.65*		1.67*
		(1.67)		(1.69)
African-American †		-4.28***		-4.25***
		(-4.64)		(-4.57)
Hispanic †		-0.23		-0.30
		(-0.11)		(-0.15)
Father's education (years)		0.13		0.14
		(0.64)		(0.70)
Mother's education (years)		-0.11		-0.11
		(-0.46)		(-0.44)
Father self-employed †		5.32***		5.54***
		(4.40)		(4.56)
Wave dummies	Yes	Yes	Yes	Yes
Pseudo-R^2	0.008	0.051	0.009	0.053
N$_{Respondents}$	3,464	2,668	3,464	2,668
N$_{Observations}$	22,626	15,552	22,626	15,552

Table 5: Business ownership and experience over varying age ranges
This table reports the marginal probability of business ownership estimated from logit models of the childhood experience of father's unemployment. The estimates are shown as percentages. The columns have the factory-folded-or-laid-off indicator variables calculated over different age ranges; all other variables are the same in all models. † denotes dummy variables. The z-statistics based on clustered standard errors are shown in parenthesis. ***, **, and * refer to 1%, 5%, and 10% significance levels respectively.

	Business owner					
	Early child-hood	Middle child-hood	Early adoles-cence	Early and Middle childhood	Middle childhood and Early adoles-cence	Childhood and Early adoles-cence
	0–5 yr	5–10 yr	10–15 yr	0–10 yr	5–15 yr	0–15 yr
Factory folded or Laid off †	-0.93	-2.39**	-2.70**	-1.28	-2.90***	-1.28
	(-0.88)	(-2.39)	(-2.19)	(-1.27)	(-2.88)	(-1.19)
Age (years)	0.95***	0.89***	0.93***	0.96***	0.92***	0.97***
	(9.68)	(9.70)	(9.03)	(8.93)	(9.31)	(8.60)
Male †	1.57*	2.32**	2.86***	1.89*	2.91***	2.15**
	(1.65)	(2.41)	(2.74)	(1.87)	(2.83)	(2.00)
African-American †	-3.79***	-4.81***	-4.35***	-2.77**	-4.46***	-3.20**
	(-3.60)	(-4.70)	(-3.80)	(-2.35)	(-3.96)	(-2.54)
Hispanic †	-0.22	0.54	-0.77	-0.58	-0.79	-3.68*
	(-0.09)	(0.22)	(-0.31)	(-0.21)	(-0.32)	(-1.65)
Father's education	0.71***	0.88***	1.08***	0.83***	1.04***	1.01***
	(3.04)	(4.12)	(4.70)	(3.30)	(4.57)	(3.86)
Mother's education	-0.28	-0.05	-0.13	-0.29	-0.15	-0.46
	(-0.99)	(-0.18)	(-0.44)	(-0.97)	(-0.51)	(-1.44)
Father business owner †	5.30***	4.74***	5.12***	5.38***	5.17***	6.10***
	(4.93)	(4.15)	(4.18)	(4.71)	(4.27)	(5.04)
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.058	0.066	0.069	0.058	0.071	0.066
$N_{Respondents}$	2,531	2,741	2,279	2,194	2,351	1,893
$N_{Observations}$	13,395	17,900	15,745	11,906	15,847	10,660

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