Teach Your Children Well –

Determinants and Consequences of Parenting Styles[*]

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Abstract

This paper analyzes the socio-economic determinants of parenting styles and the consequences of these choices for children's later in life outcomes. We use a Swedish survey on parenting styles when children are 15 years of age, linked to administrative registers of the children that span five decades. We investigate the empirical validity of a model in which parents choose a parenting style based on the ability level of the child, and the extent to which parents believe their child will have a similar career as themselves. In line with this model, our results show that parents are more often authoritarian when they expect their children to have similar careers as themselves, and that they are more often authoritative if their child has a higher ability level. We also find that choosing to be authoritarian improves children's long run outcomes when parents think children will have similar careers as themselves.

Key words: Parenting Style, Human Capital, Intergenerational Transmission

JEL-Code: D10, I20, J13

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1. Introduction

Parents are essential for children's development. The way in which parents raise their children varies between parents, and dominant parenting styles differ across time and between countries. This raises the questions why parents choose different strategies to raise their children, and whether certain parenting styles may be better for children than other parenting styles.

In a recent article, Doepke and Zilibotti (2017) posit that parenting styles emerge as the outcome of rational choice. In their model, parents care about their children's utility and can influence children's choices by affecting their preferences or by restricting their choices. The authors distinguish four parenting styles: parents can neglect their children (*neglecting*), they can allow children to make free choices (*permissive*), they can attempt to change children's preferences (*authoritative*), or they can restrict children's choices (*authoritarian*). Differences in socio-economic conditions can explain why parenting styles vary across parents, between countries, and over time. The socio-economic environment can differ in terms of economic incentives (e.g., returns to human capital) and social and occupational mobility (e.g., the extent to which children choose similar career paths as their parents, are in similar deciles of the income distribution, and have similar social status). The model predicts among others that when education is highly rewarded and when the returns to match talents with occupations are high, parents more often stimulate their children to follow education and to make independent specialization choices, by equipping them with preferences that are conducive for human capital investment. An authoritative parenting style enables parents to mold their children's preferences (*e.g.*, patience), while permissive parenting does not, and is hence not the dominant strategy. When social or occupational mobility is low, and children tend to follow their parents' footsteps, as is the case in more traditional societies, parents are more often inclined to choose an authoritarian style. Empirically, the authors show that historical trends and differences between countries in parenting styles are in line with the predictions of their model.

The model indicates that socio-economic conditions predict choices for parenting styles, and that given these conditions, adopting certain parenting styles may be beneficial for the child in the end. For instance, if parents expect their children to take over the family business, they may more often

choose to be authoritarian. Adopting another style may in this case lead to less beneficial long run outcomes for the child.

Our paper investigates whether there is empirical support for the model and its assumptions. For this, we use individual level data from the Stockholm Birth Cohort, enriched with censuses data. Our dataset links survey information on parenting styles collected when children were 15 years of age to register data that span five decades of the children's life course. The survey data contain information on the extent to which parents are permissive, authoritarian, or authoritative. These data enable us to study correlates of adopted parenting styles, and to analyze the consequences of parenting for child outcomes over their life course. We use primary school grades as a proxy for the returns to human capital. In addition, we have information on the occupations of the parents and of the grandparents. Parents with similar careers as their grandparents likely more often expect their children to have similar professional lives as themselves. We therefore define expected occupational mobility of the child as the difference between parents' and grandparents' educational levels and occupations.

Our results confirm key predictions of Doepke and Zilibotti's (2017) model. Parents choose less often to be permissive if the expected returns to education are higher. Moreover, they are more often authoritarian when they expect occupational mobility to be low. Concerning the relationship between parenting styles and long run outcomes, we find – in line with the predictions of the model – that children who grow up in environments with less occupational mobility have higher wages if they had authoritarian parents. In environments with more occupational mobility, children with authoritarian parents have lower wages.

Our analysis contributes to a small but burgeoning literature on the economics of parenting. Cobb-Clark, Salamanca and Zhu (2016) model parenting styles in a human capital framework. They find that effective parenting styles negatively correlate with socioeconomic disadvantage. Parenting styles are an important determinant of human capital formation, even when controlling for other parental investments. In a game-theoretic framework, parenting styles have been modeled as the control parents exert (or patience they display) in order to stimulate their child to display good behavior, study hard, or avoid risky behavior (e.g. Burton et al. 2002; Hao et al. 2008; Cosconati 2009; Lundberg et al. 2009). Empirical evidence indicates that parenting styles stimulate the production of

cognitive and non-cognitive ability (Dooley and Stewart 2007; Fiorini and Keane 2014). Zumbühl, Dohmen and Pfann (2013) show that parents who invest more in the upbringing of their children are more similar to them with respect to risk and trust attitudes. Ermisch (2008) notes that "parenting in early childhood contributes to the intergenerational persistence in incomes found in many studies" (p. 69).

The analysis extends the empirical assessment in Doepke and Zilibotti's (2017) work by analyzing differences in parenting styles within a cohort and by following these children for almost their entire working lives. Doepke and Zilibotti (2017) focus on analyzing whether historical trends and differences between countries in parenting styles are in line with the predictions of their model. One of their analyses uses individual level data, and hence comes closer to ours. Analyzing NLSY data, they show that children with neglecting or authoritarian parents perform worse at school, followed by children with permissive parents. Children with authoritative parents perform best. Our approach differs from theirs in the sense that we analyze to what extent parenting styles may be beneficial for longer run outcomes *given* the socio-economic environment in which the child grows up. We show that the benefits of parenting styles crucially depend on the environment.

The set-up of the article is as follows. In section 2, we provide a short review of Doepke and Zilibotti's (2017) model and extend this model by investigating life outcomes. In Section 3, we show how we test the predictions of the model. Section 4 presents the data. Section 5 reports the results. Section 6 concludes.

2. The model

a. Brief review of Doepke and Zilibotti's (2017) model

Doepke and Zilibotti (2017) provide a positive theory of parenting styles. They posit that dominant parenting styles emerge as an equilibrium outcome of a rational choice in varying socio-economic environments.

Figure 1 presents the model's basic idea. The vertical axis displays the stakes of the socio-economic environment. One can think of high stakes as high returns to human capital. The horizontal axis displays the incumbency premium. The incumbency premium is the inverse of the level of

occupational mobility. A dynasty is an example in which the incumbency premium can be high. In dynasties, children tend to choose similar career paths as their parents (*cf.* Kanbur and Stiglitz 2016). We will therefore use "dynasty" as a synonym of the incumbency premium μ throughout the text.

Following earlier work by Baumrind (1967), the authors distinguish four types of parenting styles: parents can neglect their children, parents can allow children to make free choices (*permissive* style), they can attempt to change children's preferences (*authoritative* style), or they can restrict children's choices (*authoritarian* style). The model predicts that in situations where education is highly rewarded, parents more often push their children to educate themselves, and permissive parenting will less likely be the dominant strategy. When parents expect their children to assume their role, occupational mobility will be low. Then parents more likely adopt an authoritarian style.

b. Effects of parenting styles on life outcomes

Doepke and Zilibotti's model posits that ability and occupational mobility make parents more disposed to choose certain parenting styles. A next dimension would be to investigate whether the choice for these styles also benefits children in terms of long run life outcomes.

A first prediction of the model is that children benefit from having authoritarian parents when they grow up in an environment with low occupational mobility. Figure 2 sketches potential relationships between life outcomes and occupational mobility for children with authoritarian and non-authoritarian parents. The figure shows that children with authoritarian parents have more favorable life outcomes at higher incumbency premium levels, while children with non-authoritarian parents have outcomes that are more favorable at lower incumbency premium levels.

A second prediction of the model is that at higher ability levels, children benefit less from having parents with a permissive parenting style. Figure 3 shows potential relationships between life outcomes and ability levels for children with more and less permissive parents.

The varying slopes in the figures illustrate that in order to investigate the relationships between parenting styles and life outcomes in varying socio-economic environments, we need to analyze empirical models of life outcomes with interactions between parenting styles and occupational mobility or ability levels.

3. Empirical strategy

Predicting parenting styles using ability and occupational mobility

First, we test two hypotheses to investigate the empirical support for Doepke and Zilibotti's model:

(H1) For a given incumbency premium, higher returns to human capital should be related to a lower likelihood of being permissive and a higher likelihood to be authoritative; and

(H2) When the incumbency premium is high, the likelihood of being authoritarian should be higher.

Consider the following regression models (one for each parenting style):

$$PS_j = C + \delta r_j + \beta \mu_j + \varepsilon_j,$$

where the $(3 \times 1) -$ vector of parenting styles PS_j includes permissive, authoritarian and authoritative styles, r_j is the expected returns to human capital for child j, and μ_j is the incumbency premium. The parameter vectors δ and β capture the correlation between parenting styles and returns to human capital, and between parenting styles and the incumbency premium, respectively. ε_j is a vector of error terms and C is a vector of constants. The hypotheses state that $\delta < 0$ when the dependent parenting style PS_j is permissive, and $\delta > 0$ when PS_j is authoritative. Moreover, $\beta > 0$ when PS_j is authoritarian.

Parenting styles and life outcomes

Next, we investigate the relationship with life outcomes. The consequential premise is that when incumbency premium levels are <u>high</u> *and* parents choose to be <u>authoritarian</u>, children attain more positive life outcomes. We test this hypothesis with the following model:

$$Y_j = C + \alpha_1 \mu_j + \alpha_2 PS_j + \alpha_3' PS_j \times \mu_j + \upsilon_j,$$

where Y are the long run outcomes of child j. In order to test whether certain parenting styles benefit children in certain conditions, we include interactions between parenting style variables and the incumbency premium. We expect $\alpha_3 > 0$, when the parenting style is authoritarian.

Another of the model's foretells is that when ability levels are <u>high</u> *and* parents choose to be <u>authoritative</u>, children should attain more positive life outcomes. Similar to the analysis for incumbency premium levels, we test this hypothesis using the following regression model:

$$Y_j = C + \alpha_4 r_j + \alpha_5 PS_j + \alpha_6' PS_j \times r_j + \epsilon_j,$$

with $\alpha_6 > 0$ when the parenting style is authoritative.

4. Data

In this section, we describe the dataset and the main measures in our analysis.

The Stockholm Birth Cohort Study[1]

We use data from the *Stockholm Birth Cohort Study* (SBC). In 2004/2005 SOFI at Stockholm University created the data set by means of a probability matching of two previously existing longitudinal data sets.[2] (*i*) The *Stockholm Metropolitan Study 1953-1985* consists of all children born in 1953 who were living in the Stockholm metropolitan area on November 1, 1963. This data source contains a rich set of variables concerning individual, family, social and neighbourhood characteristics; (*ii*) *The Swedish Work and Mortality Database* is an administrative data set that includes information on education, income, work, unemployment and mortality for all individuals

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[1] This section is partly taken from Golsteyn, Grönqvist and Lindahl (2014) who use the same dataset to study the predictive power of children's time preferences for later in life outcomes.
[2] The data sets have no personal identification codes. A unique identifier is created using 13 questions which are available in both data sets: county, municipality, sex, birth month, marital status, employment, profession, socio-economic index, number of apartments in the building, year of construction of the building, quality of the construction, index of overcrowding, occupation of the property's manager. To verify the matches, additional data on birth year of one or both parents was used. For 96% of the original cohort, data was matched. See Stenberg and Vågerö (2006) for a description of the dataset and the matching procedure. Codebooks of the data are available online at: http://www.stockholmbirthcohort.su.se/about-the-project/original-data-1953-1983.

living in Sweden in 1980 or 1990 who were born before 1985. The database contains information on the individuals up to 2001.

The SBC study includes survey data from a school study conducted in 1966 when the cohort members were 13 years old. During one school day, pupils at practically all schools in the county filled out two questionnaires. An important aspect of the survey is that it took place at school giving it a mandatory character. As a result, the non-response rate is only 9% (the percentage of pupils absent on that particular school day). The low non-response rate in combination with the fact that the survey included all students in the county is likely to increase the external validity of our study.[3]

In 1953, 15,118 children were born in Stockholm County. Not all children still lived in Stockholm at the time of the school survey (around 1%) and around 9% did not participate in the school survey, which leaves us with 13,606 observations.

Parenting styles

In 1968, when the children were 15 years old, a survey was held among a subsample of their parents. In this survey, parents are asked about the way in which they raise their children. The non-response among the parents is low: approximately 7% did not respond. As a result, we have information on around 2,800 parents.

In the survey, parents were asked to give their opinions on 19 statements concerning the style in which they raise their children. Table 1 gives all statements given to the parents and summary statistics of their answers. The answer categories range from 1 "Quite right" to 5 "Quite wrong." Parents also had the option to report that they do not know the answer.

For many of the statements, it appears obvious that agreeing with them reveals one of the three styles defined by Baumrind (1967), i.e. permissive, authoritative, or authoritarian. For instance, parents who agree with the statement that "a child must learn to obey" appear to have a more

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[3] Given the nature of our data it is relevant to ask whether our results can be generalized to other contexts. First, we can note that at the time when the data were collected, the Stockholm metropolitan area covered about one fourth of the Swedish population, so quite a large part of the population is covered. Secondly, Lindahl (2011) compares summary statistics for the SBC data and a nationally representative sample of individuals also born in 1953 and finds, as expected, similar income averages and variances. Her estimates are also very similar to those found in Norwegian studies based on nationally representative samples. Therefore, it is likely that our sample resembles the Swedish population.

authoritarian parenting style. However, since a permissive style in some ways is the opposite of an authoritarian style, one could also argue that *not* agreeing with this statement reveals that the parent has a permissive style.

We use exploratory factor analysis to determine the number of how many factors can be distinguished and which items belong to these factors. This factor analysis confirms our intuitive classification of the items to the three styles, indicated in the table. The Cronbach's Alphas – a measure of internal reliability of the construct – are 0.67 for the authoritarian style, 0.51 for the authoritative style, and 0.33 for the permissive style. A common threshold for acceptable Alphas is 0.5, implying that we can use the measures of authoritarian and authoritative styles in our analyses but also that the measure for permissive styles is weak. This is not surprising as we have few items related to permissive styles in our dataset and Cronbach's Alphas are strongly related to the number of items.[4] We will therefore pay particular attention to authoritarian and authoritative parenting styles and less to permissive parenting.

In our analyses, we use the principal components of each set of items as measures of the styles. Therefore, parents are not either permissive, authoritative or authoritarian, but their style can instead contain elements of each style to some degree. We standardize the principal components to a mean of zero and a standard deviation of one so that parameter estimates can be interpreted in terms of standard deviations.

Ability

A second important variable in the model is the returns to education. Ability is a key predictor of returns to education. As a proxy for ability, we therefore use primary school grades that the children attained in grade 6, at age 13. The literature indicates that cognitive ability is shaped in early childhood and that interventions after age 4 do not have persistent effects on IQ (see Heckman and Kautz 2014, for a review of this literature). School grades at young age are predictive of later differences in

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[4] Cronbach's Alpha can be defined as $\propto = \frac{N}{N-1}(1 - \frac{\Sigma_{i=1}^{N} S_{Y_i}^2}{S_X^2})$ in which X is the total of scores Y at a test with N items: $X = Y_1 + Y_2 + Y_3 + \ldots + Y_N$. S_X^2 is the variance of the observed total test scores and $S_{Y_i}^2$ is the variance of component i for the sample of persons (Develles 1991).

cognitive ability between individuals, as cognitive ability remains rank-order constant after age seven (see, e.g., Borghans et al. 2008). Borghans and Verhagen (2018) show that test scores at age 6 predict test scores at age 13 with high precision. As a result, grades at age 13 capture the persistent component of IQ. Figure 4 gives a histogram of the raw scores of this variable. In the analyses, we standardize this variable to a mean of zero and a standard deviation of one.

The incumbency premium μ

The incumbency premium μ is the comparative advantage of parents in transmitting skills to their children. This comparative advantage is higher when parents expect the lives of their children to be similar to their own. The recent literature on intergenerational mobility shows the importance of multiple generations' effects where the influence of grandparents must be taken into account (*cf.* Braun and Stuhler 2018, Lindahl et al. 2015, Nybom and Stuhler 2014, Olivetti and Paserman 2015, Olivetti, Paserman and Salisbury 2016). Thus, we refer to the incumbency premium as the dynasty variable μ.

Our measure of μ can be interpreted as the parents' occupational expectation for the child based on their own occupational attainment, in comparison with their own parents' educational and occupational attainments. In our data, we observe the educational level of the *j*-th child's parents (interviewee and husband of interviewee) and grandparents (parents of the interviewee and parents of the partner of the interviewee), each on a scale with nine levels.[5] We name these variables $EDUC_{p,j}$ and $EDUC_{g|p,j}$, respectively, in which *p* indicates the sex of the parent (0=mother and 1=father) and *g* indicates the sex of the grandparent (0=grandmother and 1=grandfather). Similarly, we have observations for the parents' and grandparents' occupations on a scale with nine levels.[6] We name these levels $OCC_{p,j}$ and $OCC_{g|p,j}$, respectively.

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[5] These educational levels are: (1) Elementary school only, (2) Vocational school, (3) Folk high school, (4) Junior secondary school, drop outs, noncommissioned officer´s training, dental nurse´s training (completed), (5) Junior secondary school, (6) Upper secondary school, drop outs, (7) Upper secondary school, (8) University (no degree), college of art exam, college of music exam, officer in the reserve, school of social studies (exam), (9) University degree, officer's training (for military officers).

[6] See appendix Table A1. These occupational levels are: (1) Upper middle class: owners of real estate and large farms, managers and large scale Entrepreneurs, (2) Upper middle class: high officials and employees other than managers, (3) Lower middle class: officials and nonagricultural employees, (4) Lower middle class: non-agricultural entrepreneurs, (5) Lower middle class: agriculture, (6) Working class: low rank employees, (7)

Let's assume that parents' and grandparents' occupations are fixed, and that the following relationships hold for expected occupational attainment:

(1) $\quad E[OCC_{p,j}] = \alpha_p + \sum_{g=0}^{1}(\beta_{gp}EDUC_{g|p,j} + \gamma_{gp}OCC_{g|p,j}) \quad$ for $j = 1, ..., N$

$\quad$ with $OCC_{p,j} = E[OCC_{p,j}] + \varepsilon_{p,j}$; $E[\boldsymbol{\varepsilon}_j] = E[(\varepsilon_{0j}, \varepsilon_{1j})'] = 0$, and $\text{Var}[\boldsymbol{\varepsilon}_j] = \begin{bmatrix} \sigma_0^2 & \rho \\ \rho & \sigma_1^2 \end{bmatrix}$.

This equation expresses the occupational expectations in an intergenerational mobility setting: it suggests that the expected occupation of child *j*'s parent *p* is linearly related to the educational attainments and occupational choices of the child's grandparents *g*.

In a second step, explained more fully below, we use the parameters of this model to predict what the parents expect the child's occupation to be.

One issue in our model is that the relationships differ for mothers and fathers of each individual child, but are correlated when $\rho \neq 0$. In essence, when $\rho > 0$ this may be due to, or associated with, assortative mating. Greenwood *et al.* (2014), for example, estimate a simultaneous equation model to correct for the possibility of assortative mating bias. In a regression of attainment of one parent (education or occupation), the authors include the attainment of the other parent. The model contains both endogenous and exogenous regressors. A problem with this approach is that the parameter estimates are subject to endogeneity bias. We suggest an alternative approach to account for the possibility that ρ may be non-zero. The fact that the system of equations (1) consists of a set of seemingly unrelated regression equations (Zellner 1962) allows us to obtain efficient and unbiased estimates for the parameter vector $\boldsymbol{\theta} = (\alpha_0, \alpha_1, \beta_{00}, \beta_{01}, \beta_{10}, \beta_{11}, \gamma_{00}, \gamma_{01}, \gamma_{10}, \gamma_{11})'$. System (1) contains the same set of exogenous regressors for both parents' equations. For a given child the errors are correlated across the equations but uncorrelated across individual children. The correlation parameter ρ is not separately identified, but the GLS parameter estimates are linear unbiased and efficiently estimated, and given that $\rho > 0$, all signs remain unchanged. Another advantage when

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Working class: non-agricultural skilled workers, (8) Working class: non-agricultural unskilled workers, (9) Working class: agricultural workers.

measuring expected occupational attainment using SURE instead of SEM is that we can use all available information, including single parent households instead of using couples only.

Given the estimates $\widehat{\boldsymbol{\theta}}_{SURE}$, it is possible to obtain an estimate $\hat{\mu}(j|s)$ for the occupation the parents expect the child to attain as follows. We assume that the parameters in (1) remain unchanged through time. That is, we assume that at the time the parents form their expectations about the child's occupation later in life, the system upon which these expectations are based is the same system – in terms of parameters – as the one which relates their own realized occupational levels to the occupational and educational levels of their own parents. Admittedly, this is a strong assumption, although not peculiar in a longitudinal regression framework. Consequently, we can use the parameters from (1) to estimate the expected occupation of the child given the *parents'* education and occupation. Dependent on whether the child is a girl or a boy, we compute the expectation $\hat{\mu}(j|s)$ as

$$\hat{\mu}(j|s) = \hat{\alpha}_s + \sum_{p=0}^{1}\left(\hat{\beta}_{ps}EDUC_{p,j} + \hat{\gamma}_{ps}OCC_{p,j}\right), \quad \text{for } j = 1, \dots, N$$

in which s is the child's gender (0=female, 1=male). It is important to note that the constant $\hat{\alpha}_s$ is merely a scaling variable and does not matter in this respect; $\hat{\mu}$ is our measure for the *incumbency premium*. It will be part of and included into a linear regression with a constant variable that differs for every parenting style.

Figure 5 shows a histogram of the raw scores of $\hat{\mu}$. In the analyses, we standardize this variable to a mean of zero and a standard deviation of one.

One interesting question is how the predicted occupation relates to the occupation the child actually has later in life. Actual occupations of the children are recorded in 1980 and 1990. The correlations between predicted and actual occupations turn out to be very strong: 0.36 in 1980 and 0.31 in 1990.[7] Therefore, it appears that the occupation our model predicts the child will have later on is a strong predictor of the actual occupation of the child.

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[7] We also estimated this correlation separately for men and women. For men, the correlations between predicted and actual occupations are 0.37 in 1980 and 0.35 in 1990. For women, these correlations are much lower: 0.27 in

Later in life outcomes[8]

We observe grade-point averages in compulsory school and high school and the highest education level completed with a diploma (e.g. high school, college). The grade-point averages are taken from local school registers in grade 9 in compulsory school and in the last year of upper secondary school.[9] Next to this, we have information on the choice of whether or not to enroll in the science track in high school.

Our next set of outcomes relates to long-run labor market performance. Data on long-run labor market outcomes are collected from several sources. We use the 1980 Census to collect information on earnings and disposable income at age 27. Administrative registers available between the years 1990 and 2001 are used to measure income at ages 37 and 47 respectively. We proxy long-run income by averaging incomes between ages 37 and 48 years (Böhlmark and Lindquist 2006; Haider and Solon 2006). Annual labor income, measured in thousands of SEK, comes originally from registers based on employers' compulsory reports to the tax authorities. It includes sickness benefits, parental benefits and income from self-employment and farming activity but excludes capital income, pensions, unemployment benefits and social assistance. Our measures of parental socio-economic status include both the father's and the mother's total annual labor income in 1963. These were taken from the official tax register and all amounts are presented in current prices. We calculate the average annual number of unemployment days per year and the share of years receiving welfare for the same period.

Additionally, we study health outcomes: obesity (BMI > 30) at military enlistment and early death (by age 50). Our choice of variables is driven by data availability. Some additional data on health are available but, unfortunately, this information is considered extra sensitive by the Swedish board of ethical approval and by the principal investigators of the SBC. We applied for the data but were not granted access. Therefore, we had to restrict our analysis to the measures that were made available to

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1980 and 0.20 in 1990. An explanation for these lower correlations for women is that they more often participate in the labor market than their parents.

[8] Parts of this section are similar as in Golsteyn, Grönqvist and Lindahl (2014).

[9] In the 1960s, grades were on a scale of 1–5 and relative to the performance of other students. The population grade distribution was assumed to be normal, which generates a national average for each cohort of 3.0.

us: BMI and all-cause mortality. Table 2 gives descriptive statistics of all life outcomes used in the analyses.

5. Results

The relationship between parenting styles, ability and the incumbency premium

We first investigate whether levels of ability and the incumbency premium predict the choice for parenting styles.

The model predicts that when the returns to human capital are higher, the opportunity costs of permissive parenting increase. Table 3 shows that higher ability is indeed associated with a lower chance of choosing a permissive or authoritarian parenting style. Figure 6 confirms this finding.

A second prediction of the model is that dynastic parents who expect their children to have similar careers as themselves will be more prone to be authoritarian. The table indeed shows that a higher incumbency premium is associated with a higher chance to be authoritarian. Figure 7 confirms this finding.

Table A2 in the appendix shows the correlations between separate parenting styles items, and the incumbency premium and ability. The relationship between authoritarian items and the incumbency premium is generally positive, confirming the predictions of the theory. For authoritative items, both the negative relationship with the incumbency premium and the positive relationship with ability are in line with the theory. For permissive parenting, the negative correlations with ability are in line with the theoretical predictions.

Table A3 uses only information about occupations (so not of education) to define the incumbency premium. The resulting correlations remain similar to those in table 3.

The predictive power of parenting styles, ability and the incumbency premium on later labor market outcomes

We now turn to the question under which circumstances the different parenting styles can be beneficial for children. In table 4, we analyze the effects on a vector of life outcomes of parenting styles, incumbency premium levels and the interactions between these variables. Table 5 shows the effects on

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a vector of life outcomes of parenting styles, ability levels and the interactions between these variables.

Table 4 reveals firstly that the incumbency premium is a strong predictor of life outcomes. Growing up in an environment with low occupational mobility (high $\hat{\mu}$) has adverse effects on several of the life outcomes, with the important exception of the positive effects on the wage at young ages. Children raised in such an environment follow less education, are more often on welfare or unemployed, and have a higher likelihood of an early death. They have higher wages at age 27, consistent with the idea that they get a head start in the labor market by following in their parents' footsteps. This benefit has disappeared by the age of 37, and at age 47 such children earn significantly less than children whose parents are less restrictive in having similar expectations for their child's future education and occupations.

Secondly, the table shows adverse effects of having authoritarian parents for several outcomes. Children with such parents invest less in education, have lower wages at age 37 and 47, and are more often on welfare. Children who have parents with a more permissive style achieve a lower GPA in compulsory school and in upper secondary school. Children with authoritative parents generally achieve favorable outcomes although the relationships are only significant for compulsory school GPA, the probability to complete upper secondary school, and for long term income.

Thirdly, the table reveals the interaction effects between parenting styles and the incumbency premium. An interesting finding is that the interaction between growing up in environments with low occupational mobility and authoritarian parenting styles is often significantly positive, notably for the chance to complete college and for income at age 37 and 47. This result shows that when occupational mobility is low, children benefit from having authoritarian parents. The interactions between the incumbency premium and authoritative or permissive parenting are less strong and mostly insignificant. An exception is that children in environments with low occupational mobility may benefit from having permissive parents in terms of compulsory school GPA, the chance to complete college, and for wages at age 37.

Table A4 uses only information about occupations (so not of education) to define the incumbency premium. The resulting correlations remain similar to those in table 4.

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Table 5 investigates the relationship between life outcomes and ability levels in combination with parenting styles. Ability has favorable relationships with all variables. In line with human capital theory, children with higher ability take on average more schooling, have higher wages, are less often on welfare or unemployed, and they are less likely to be obese or die at an early age.[10] In this table, the interactions between parenting styles and ability levels are mostly insignificant. This may imply that there is less support for the model in the ability dimension. One exception is the negative interaction between ability and authoritarian parenting in the relationship with completed college as the dependent variable. This interaction implies that when ability levels are higher, children are less likely to complete college if they have authoritarian parents.

6. Conclusions

Our paper investigates the empirical support of Doepke and Zilibotti's (2017) model with individual level data and extends their work by investigating the consequences of adopting certain parenting styles for outcomes later in life. We use data from the Stockholm Birth Cohort data, enriched with censuses data. The results partly support the model. Parents more often choose an authoritarian parenting style when occupational mobility is low. This choice benefits children in the long run. Children who grow up in environments with less occupational mobility have higher wages if they had authoritarian parents. In environments with more occupational mobility, children with authoritarian parents have lower wages. The effects we find are remarkably strong given that in one country at one point in time, variation in parenting styles is not expected to be very large.

This analysis helps to explain why parents choose different styles to raise their children. Our main conclusion is that there is not one optimal parenting style, but instead that the quality of the choice for a parenting style depends on the environment. This conclusion does not necessarily imply that parents always choose the style that fits best to the environment. Our results indicate that many parents could have made a better choice given their circumstances. Policy makers, pedagogues, and

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[10] Parents can be a valuable source of information to their children. Parenting styles determine how parents inform their children about, for example, schooling opportunities. Hoxby and Turner (2015) highlight the role of informational interventions in changing high achieving, low income children's awareness on key human capital topics such as educational costs, curricula availability in schools, and peers they seek.

other parental advisors may be able to help parents to choose their style by examining the circumstances in which the family operates.

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Figure 1
Model of parenting styles
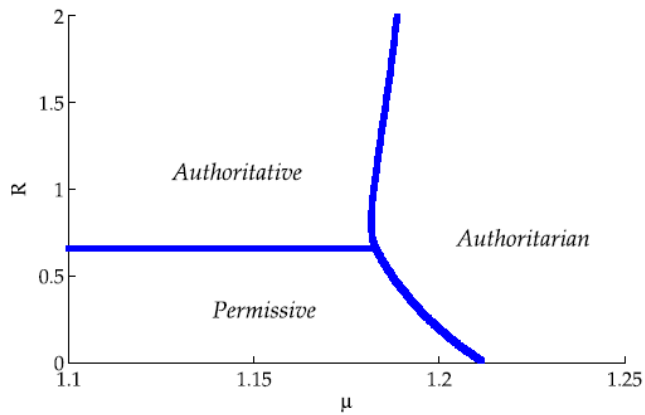
Source: Doepke and Zilibotti (2017, p. 1355).

Figure 2
Life outcomes, dynasties and authoritarian parenting style
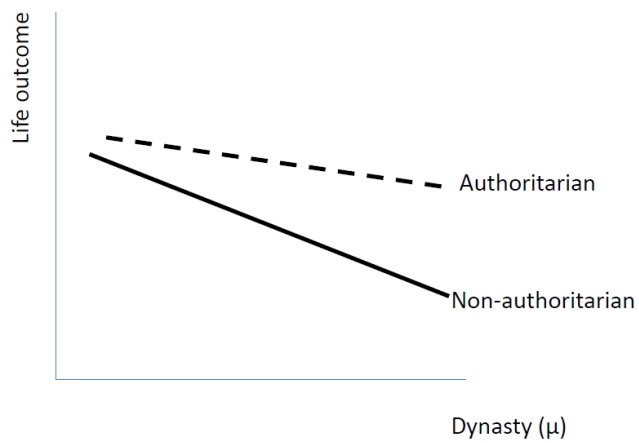
Figure 3
Life outcomes, ability and permissive parenting style

Table 1

Statements on parenting styles

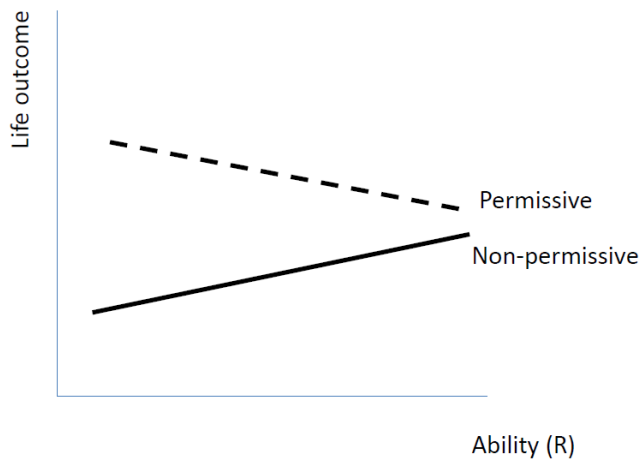|	Obs	Mean	Std. Dev.	Min	Max
Authoritarian					
Child must learn to obey	2819	4.43	0.81	1	5
Parents must not quarrel when the children are listening	2819	3.91	1.23	1	5
Children should be taught the difference between right and wrong	2819	4.93	0.27	3	5
Children must have firm rules	2819	4.58	0.65	1	5
When a child does not understand its own good, one has to force it	2819	3.01	1.15	1	5
Children must respect their parents	2819	3.70	1.22	1	5
Children should be taught to control themselves	2819	3.76	1.01	1	5
Too much freedom is not good for the child	2819	3.76	1.10	1	5
Parents must see to it that they are liked by the children	2819	3.83	1.14	1	5
Authoritative					
The child must learn how to manage on its own	2819	4.40	0.63	1	5
Children should be taught to think before acting	2819	4.73	0.50	1	5
The principal aim of child rearing is to develop the child's personality	2819	4.64	0.59	1	5
You have to be consistent when raising children	2819	4.63	0.60	1	5
One must give the child time	2819	4.83	0.40	1	5
One must keep one's promises	2819	4.93	0.27	2	5
Permissive					
The most important thing is that the child is happy and content	2819	4.20	0.97	1	5
Children ought to have things their own way	2819	1.67	0.78	1	5
The most important is that parents are fond of their children	2819	4.89	0.38	1	5
If only the child feels loved, nothing else matters	2819	3.53	1.14	1	5

Note: The answer categories ranged from 1 "Quite wrong" to 5 "Quite right."

Figure 4
Histogram ability
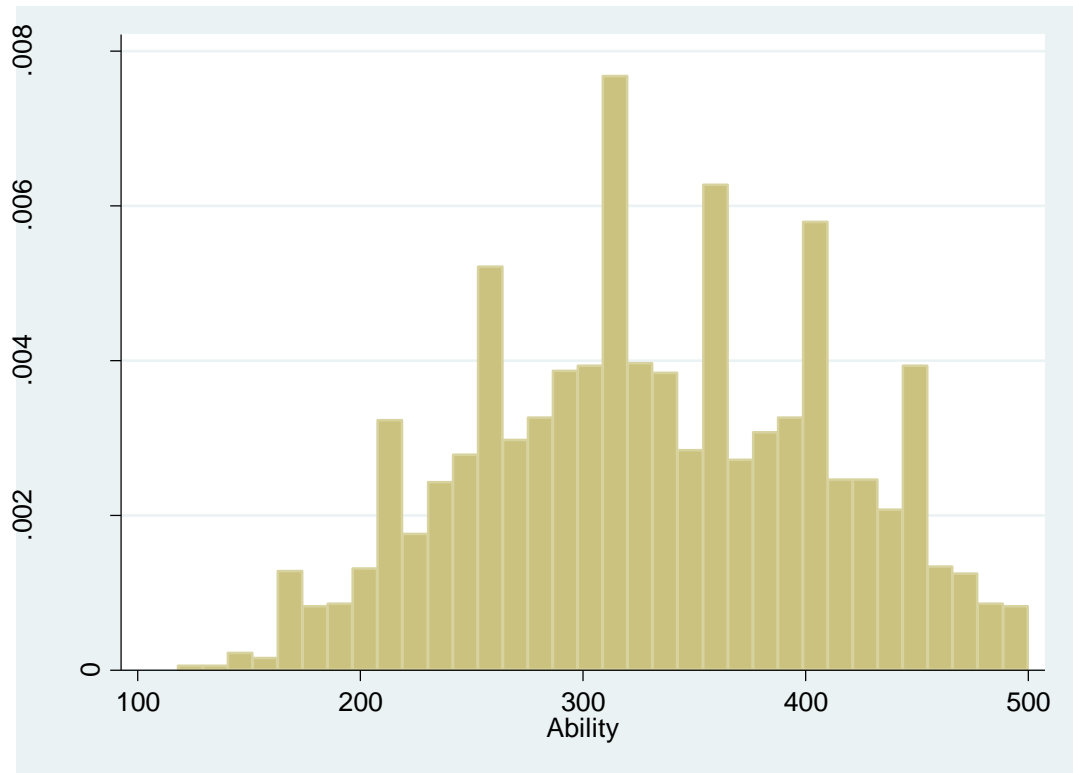
Figure 5
Histogram dynasty
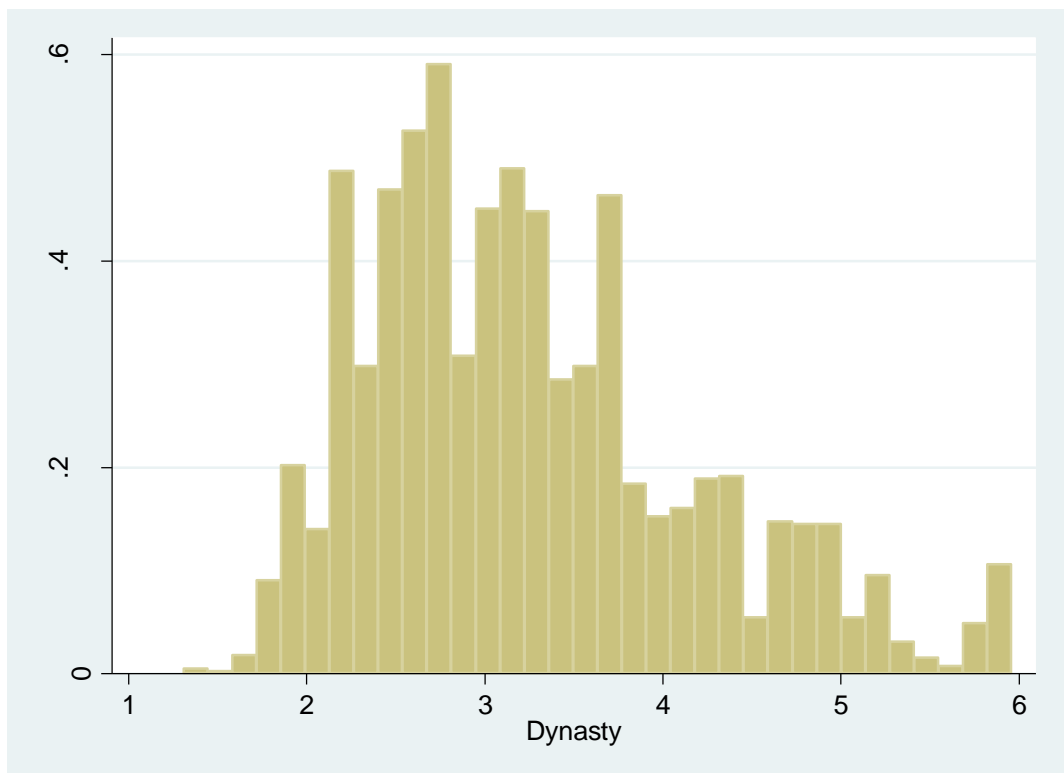
Table 2

Summary statistics of life outcomes

Variable	Obs	Mean	Std. Dev.	Min	Max
Compulsory school GPA (standardized)	2632	0	1	-2.72	2.04
Upp. sec. school GPA (standardized)	1396	0	1	-3.25	2.23
Completed upp. sec. school	2819	0.53	0.50	0	1
Completed college	2819	0.23	0.42	0	1
Enrolled in science track	1396	0.30	0.46	0	1
Log earnings age 27	2740	6.19	0.81	0	7.84
Log earnings age 37	2611	12.15	0.71	6.47	14.23
Log earnings age 47	2456	12.39	0.79	5.32	15.05
Log long-run income	2715	12.13	0.89	3.26	15.21
Share years on welfare	2768	0.06	0.17	0	1
Annual unemployment days	2763	13.01	32.14	0	238
Obese at enlistment	1427	0.10	0.30	0	1
Early death	2819	0.03	0.16	0	1

Table 3

Ability and dynasty as determinants of parenting styles

	(1) Authoritarian	(2) Authoritative	(3) Permissive
Dynasty	0.202***	-0.032	0.092***
	(0.019)	(0.022)	(0.019)
Ability	-0.206***	0.012	-0.101***
	(0.019)	(0.021)	(0.020)
Constant	-0.000	-0.001	0.000
	(0.018)	(0.019)	(0.019)
Observations	2,780	2,780	2,780
R-squared	0.117	0.001	0.026

Notes: Each column shows the result of a regression with a measure of parenting style as the dependent variables and measures of ability and dynasty as independent variables. All dependent and independent measures are standardized with a mean of zero and a standard deviation of one. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 6
Choice for permissive and authoritative style given ability
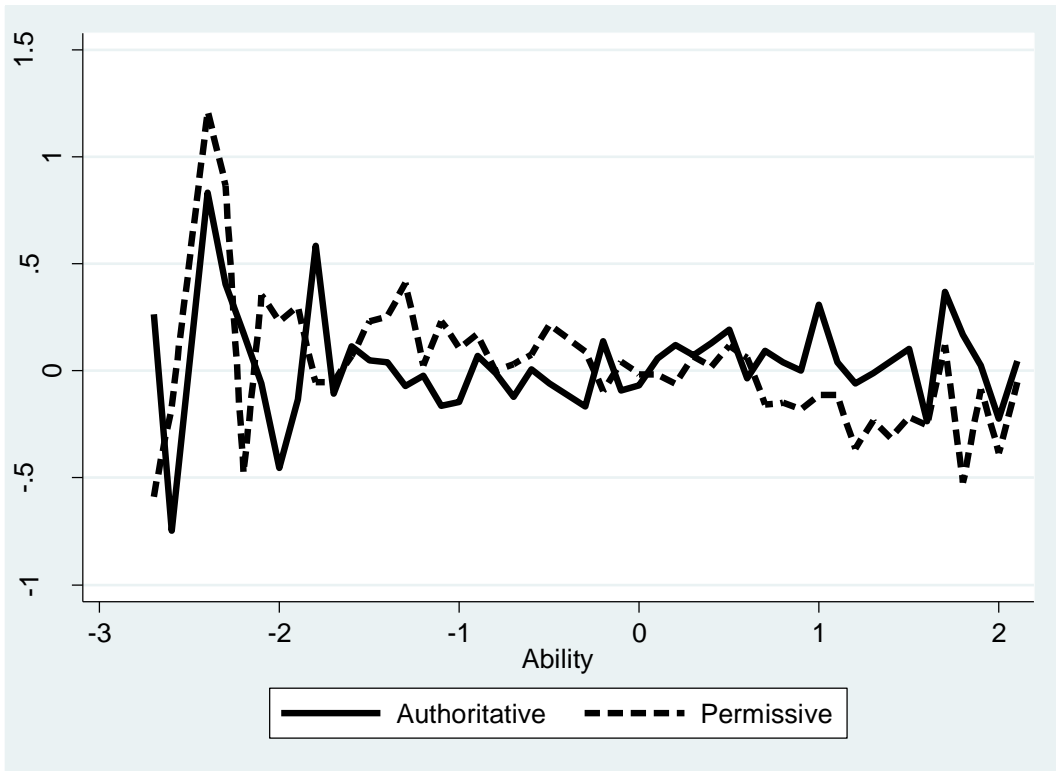
Figure 7
Choice for authoritarian style given the incumbency premium (mu)

Table 4
Life outcome regressions with interactions between parenting styles and dynasty

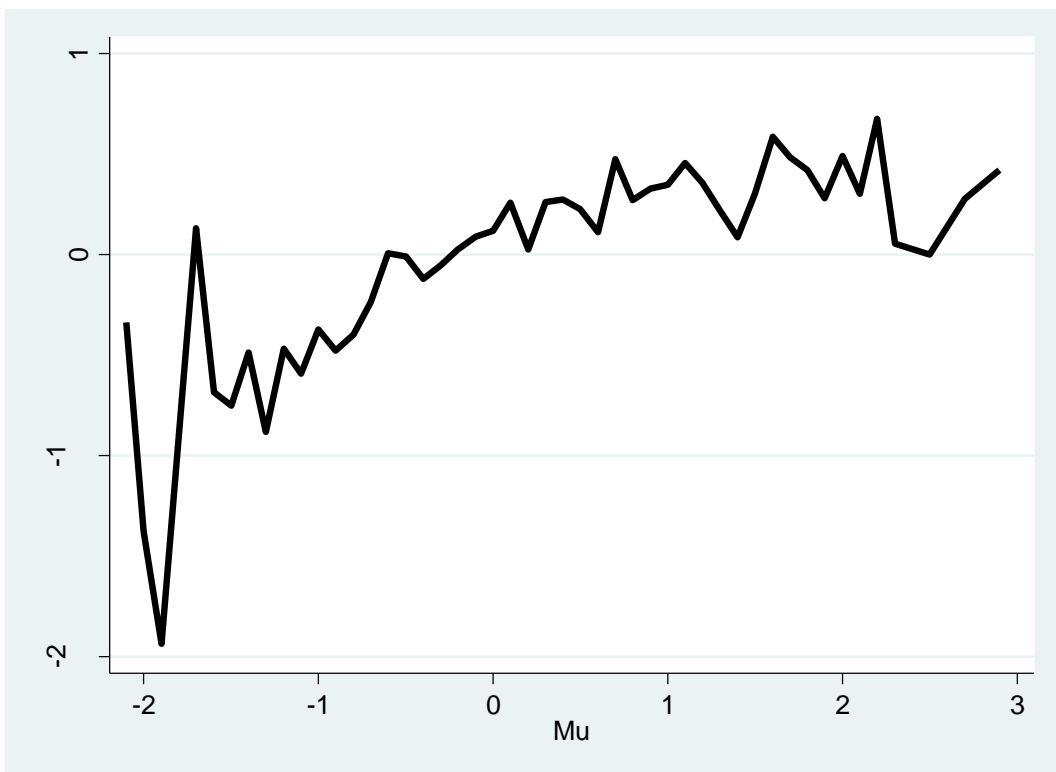|	(1) Compulsory school GPA (standardized)	(2) Upp. sec. school GPA (standardized)	(3) Completed upp. sec. school	(4) Completed college	(5) Enrolled in science track	(6) Log earnings age 27	(7) Log earnings age 37	(8) Log earnings age 47	(9) Log longterm income	(10) Share years on welfare	(11) Annual unemployment days	(12) Obese at enlistment	(13) Early death
Dynasty	-0.288***	-0.235***	-0.144***	-0.115***	-0.086***	0.047***	-0.004	-0.065***	-0.071***	0.022***	2.291***	0.011	0.013***
	(0.019)	(0.031)	(0.009)	(0.007)	(0.015)	(0.015)	(0.015)	(0.016)	(0.019)	(0.004)	(0.687)	(0.007)	(0.004)
Authoritarian	-0.186***	-0.099***	-0.093***	-0.048***	-0.010	-0.017	-0.046***	-0.038**	-0.062***	0.010**	1.223	0.005	0.001
	(0.021)	(0.032)	(0.010)	(0.009)	(0.014)	(0.018)	(0.016)	(0.019)	(0.019)	(0.004)	(0.774)	(0.009)	(0.004)
Authoritative	0.074***	0.042	0.029***	0.009	0.012	-0.005	0.022	0.002	0.039**	-0.000	-0.087	-0.003	-0.000
	(0.019)	(0.029)	(0.009)	(0.008)	(0.013)	(0.017)	(0.015)	(0.016)	(0.020)	(0.003)	(0.673)	(0.009)	(0.003)
Permissive	-0.046**	-0.061**	-0.010	-0.009	-0.018	-0.009	-0.005	-0.015	-0.018	-0.002	-1.205	-0.008	-0.006*
	(0.019)	(0.030)	(0.010)	(0.008)	(0.014)	(0.018)	(0.016)	(0.016)	(0.018)	(0.004)	(0.737)	(0.009)	(0.003)
Authoritarian*Dynasty	-0.002	0.019	-0.003	0.018**	-0.013	0.014	0.028**	0.030*	0.049**	0.001	-0.018	-0.000	0.002
	(0.021)	(0.033)	(0.010)	(0.008)	(0.015)	(0.016)	(0.014)	(0.018)	(0.019)	(0.004)	(0.743)	(0.008)	(0.004)
Authoritative*Dynasty	-0.006	0.040	-0.004	-0.006	-0.000	-0.015	-0.014	-0.015	-0.009	-0.002	0.006	-0.006	-0.001
	(0.018)	(0.030)	(0.008)	(0.006)	(0.014)	(0.012)	(0.013)	(0.013)	(0.015)	(0.003)	(0.648)	(0.006)	(0.003)
Permissive*Dynasty	0.046**	0.024	0.012	0.018**	-0.003	0.022	0.027*	0.001	0.006	-0.003	-0.207	0.010	-0.006
	(0.019)	(0.031)	(0.009)	(0.007)	(0.016)	(0.018)	(0.016)	(0.015)	(0.019)	(0.004)	(0.714)	(0.008)	(0.004)
Constant	-0.023	-0.120***	0.524***	0.219***	0.269***	6.184***	12.135***	12.384***	12.112***	0.061***	13.049***	0.098***	0.027***
	(0.019)	(0.028)	(0.009)	(0.008)	(0.013)	(0.016)	(0.015)	(0.017)	(0.018)	(0.003)	(0.658)	(0.009)	(0.003)
Observations	2,632	1,396	2,819	2,819	1,396	2,740	2,611	2,456	2,715	2,768	2,763	1,427	2,819
R-squared	0.152	0.082	0.151	0.114	0.031	0.005	0.009	0.015	0.020	0.024	0.008	0.005	0.008

Notes: Each column shows the result of a regression with a life outcome as the dependent variables and measures of parenting styles and dynasty as independent variables. All independent measures are standardized with a mean of zero and a standard deviation of one. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5
Life outcome regressions with interactions between parenting styles and ability

	(1) Compulsory school GPA (standardized)	(2) Upp. sec. school GPA (standardized)	(3) Completed upp. sec. school	(4) Completed college	(5) Enrolled in science track	(6) Log earnings age 27	(7) Log earnings age 37	(8) Log earnings age 47	(9) Log longterm income	(10) Share years on welfare	(11) Annual unemployment days	(12) Obese at enlistment	(13) Early death
Ability	0.767***	0.667***	0.272***	0.192***	0.224***	0.074***	0.125***	0.182***	0.249***	-0.043***	-5.053***	-0.034***	-0.016***
	(0.013)	(0.029)	(0.007)	(0.007)	(0.013)	(0.018)	(0.015)	(0.016)	(0.016)	(0.004)	(0.689)	(0.009)	(0.004)
Authoritarian	-0.036**	-0.046	-0.055***	-0.023***	0.006	0.010	-0.014	-0.015	-0.019	0.005	0.782	-0.003	-0.000
	(0.015)	(0.034)	(0.009)	(0.008)	(0.013)	(0.018)	(0.016)	(0.019)	(0.018)	(0.004)	(0.769)	(0.010)	(0.004)
Authoritative	0.006	-0.013	0.013	-0.002	0.009	-0.020	0.004	-0.007	0.015	0.003	0.221	-0.001	-0.000
	(0.014)	(0.029)	(0.008)	(0.008)	(0.011)	(0.016)	(0.014)	(0.016)	(0.019)	(0.003)	(0.635)	(0.009)	(0.003)
Permissive	-0.013	-0.033	-0.003	-0.006	-0.014	0.001	-0.001	-0.009	-0.003	-0.004	-1.456**	-0.005	-0.005
	(0.014)	(0.029)	(0.009)	(0.007)	(0.012)	(0.018)	(0.017)	(0.016)	(0.019)	(0.004)	(0.734)	(0.009)	(0.003)
Authoritarian*Ability	-0.016	-0.034	0.011	-0.024***	0.008	0.009	0.002	0.016	-0.002	-0.005	-1.559*	0.013	-0.002
	(0.014)	(0.032)	(0.008)	(0.007)	(0.014)	(0.019)	(0.016)	(0.021)	(0.017)	(0.004)	(0.839)	(0.010)	(0.004)
Authoritative*Ability	0.007	0.026	-0.010	-0.001	-0.010	-0.015	-0.021	-0.025	-0.023	0.001	0.578	0.001	0.002
	(0.013)	(0.029)	(0.007)	(0.007)	(0.014)	(0.018)	(0.015)	(0.018)	(0.017)	(0.003)	(0.666)	(0.011)	(0.004)
Permissive*Ability	-0.007	-0.029	0.013*	-0.003	0.002	-0.018	0.004	0.020	0.004	0.001	0.558	-0.023**	0.005
	(0.014)	(0.028)	(0.007)	(0.007)	(0.013)	(0.019)	(0.016)	(0.017)	(0.017)	(0.004)	(0.710)	(0.010)	(0.004)
Constant	-0.054***	-0.402***	0.531***	0.219***	0.177***	6.194***	12.147***	12.400***	12.128***	0.060***	12.538***	0.100***	0.027***
	(0.013)	(0.027)	(0.008)	(0.007)	(0.011)	(0.016)	(0.014)	(0.016)	(0.018)	(0.003)	(0.625)	(0.008)	(0.003)
Observations	2,607	1,381	2,780	2,780	1,381	2,703	2,576	2,427	2,679	2,731	2,726	1,405	2,780
R-squared	0.586	0.319	0.345	0.235	0.152	0.009	0.035	0.059	0.083	0.068	0.028	0.017	0.011

Notes: Each column shows the result of a regression with a life outcome as the dependent variables and measures of parenting styles and ability as independent variables. All independent measures are standardized with a mean of zero and a standard deviation of one. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix

Table A1

Classification of Occupations

1	Upper middle class: owners of real estate and large farms, managers and large scale entrepreneurs
2	Upper middle class: high officials and employees other than managers
3	Lower middle class: officials and non-agricultural employees
4	Lower middle class: non-agricultural entrepreneurs
5	Lower middle class: agriculture
6	Working class: low rank employees
7	Working class: non-agricultural skilled Workers
8	Working class: non-agricultural unskilled workers

Table A2

Correlation parenting styles items, and mu and ability

	Mu	Ability
Authoritarian		
Child must learn to obey	0.243***	-0.240***
Parents must not quarrel when the children are listening	0.013	-0.038**
Children should be taught the difference between right and wrong	0.055***	-0.035*
Children must have firm rules	-0.005	-0.038**
When a child does not understand its own good, one has to force it	-0.020	-0.025
Children must respect their parents	0.296***	-0.266***
Children should be taught to control themselves	0.174***	-0.160***
Too much freedom is not good for the child	0.117***	-0.164***
Parents must see to it that they are liked by the children	0.213***	-0.220***
Authoritative		
The child must learn how to manage on its own	-0.054***	0.041**
Children should be taught to think before acting	0.011	-0.019
The principal aim of child rearing is to develop the child's personality	-0.067***	0.038**
You have to be consistent when raising children	-0.034*	0.005
One must give the child time	0.009	0.023
One must keep one's promises	0.014	-0.005
Permissive		
The most important thing is that the child is happy and content	0.164***	-0.162***
Children ought to have things their own way	-0.142***	0.151***
The most important is that parents are fond of their children	0.038**	-0.042**
If only the child feels loved, nothing else matters	0.074***	-0.080***

Note: *** p<0.01, ** p<0.05, * p<0.10

Table A3

Ability and dynasty as determinants of parenting styles

	(1) authoritarian	(2) authoritative	(3) permissive
Dynasty	0.148***	-0.031	0.062***
	(0.019)	(0.022)	(0.019)
Ability	-0.232***	0.013	-0.114***
	(0.019)	(0.020)	(0.020)
Constant	0.000	-0.001	0.001
	(0.018)	(0.019)	(0.019)
Observations	2,780	2,780	2,780
R-squared	0.102	0.001	0.022

Notes: In the definition of the incumbency premium, only occupations are taken into consideration in this table. Each column shows the result of a regression with a measure of parenting style as the dependent variables and measures of ability and dynasty as independent variables. All dependent and independent measures are standardized with a mean of zero and a standard deviation of one. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A4

Life outcome regressions with interactions between parenting styles and dynasty

	(1) Compulsory school GPA (standardized)	(2) Upp. sec. school GPA (standardized)	(3) Completed upp. sec. school	(4) Completed college	(5) Enrolled in science track	(6) Log earnings age 27	(7) Log earnings age 37	(8) Log earnings age 47	(9) Log longterm income	(10) Share years on welfare	(11) Annual unemployment days	(12) Obese at enlistment	(13) Early death
Dynasty	-0.266***	-0.258***	-0.129***	-0.103***	-0.080***	0.058***	0.008	-0.055***	-0.061***	0.020***	2.319***	0.016**	0.015***
	(0.019)	(0.030)	(0.009)	(0.007)	(0.014)	(0.015)	(0.014)	(0.016)	(0.018)	(0.004)	(0.655)	(0.007)	(0.004)
Authoritarian	-0.202***	-0.104***	-0.104***	-0.058***	-0.010	-0.018	-0.050***	-0.044**	-0.070***	0.012***	1.483**	0.004	0.000
	(0.021)	(0.030)	(0.010)	(0.009)	(0.017)	(0.015)	(0.015)	(0.020)	(0.018)	(0.004)	(0.743)	(0.009)	(0.004)
Authoritative	0.082***	0.043	0.034***	0.014*	0.017	-0.004	0.024*	0.005	0.042**	-0.001	-0.176	-0.000	-0.000
	(0.019)	(0.028)	(0.009)	(0.008)	(0.013)	(0.017)	(0.015)	(0.016)	(0.020)	(0.003)	(0.665)	(0.009)	(0.003)
Permissive	-0.054***	-0.070**	-0.013	-0.012	-0.023*	-0.009	-0.007	-0.018	-0.021	-0.002	-1.243*	-0.009	-0.005*
	(0.019)	(0.029)	(0.010)	(0.008)	(0.014)	(0.018)	(0.016)	(0.016)	(0.018)	(0.004)	(0.742)	(0.009)	(0.003)
Authoritarian*Dynasty	0.015	0.024	-0.000	0.018**	-0.005	0.012	0.028**	0.037*	0.047**	0.001	0.606	-0.006	0.001
	(0.021)	(0.032)	(0.010)	(0.008)	(0.015)	(0.016)	(0.014)	(0.019)	(0.019)	(0.004)	(0.706)	(0.008)	(0.004)
Authoritative*Dynasty	-0.005	0.044	-0.004	-0.008	0.009	-0.011	-0.017	-0.019	-0.015	-0.002	-0.291	-0.006	-0.000
	(0.018)	(0.031)	(0.008)	(0.006)	(0.014)	(0.011)	(0.013)	(0.013)	(0.015)	(0.003)	(0.621)	(0.006)	(0.003)
Permissive*Dynasty	0.043**	0.008	0.013	0.018**	-0.012	0.021	0.018	-0.003	0.001	-0.004	-0.589	0.012	-0.005
	(0.020)	(0.032)	(0.010)	(0.007)	(0.016)	(0.019)	(0.016)	(0.015)	(0.018)	(0.004)	(0.737)	(0.008)	(0.005)
Constant	-0.024	-0.116***	0.524***	0.220***	0.273***	6.186***	12.138***	12.384***	12.115***	0.061***	12.931***	0.097***	0.027***
	(0.019)	(0.027)	(0.009)	(0.008)	(0.013)	(0.016)	(0.014)	(0.017)	(0.018)	(0.003)	(0.631)	(0.008)	(0.003)
Observations	2,632	1,396	2,819	2,819	1,396	2,740	2,611	2,456	2,715	2,768	2,763	1,427	2,819
R-squared	0.144	0.091	0.138	0.103	0.028	0.007	0.008	0.014	0.018	0.023	0.009	0.007	0.009

Notes: In the definition of the incumbency premium, only occupations are taken into consideration in this table. Each column shows the result of a regression with a life outcome as the dependent variables and measures of parenting styles and dynasty as independent variables. All independent measures are standardized with a mean of zero and a standard deviation of one. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1