What is the Source of the Intergenerational Correlation in Earnings?*

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Abstract

We use a dynastic model of household behavior to estimate and decompose the correlations in earnings across generations. The estimated model can explain 75% to 80% of the observed correlation in lifetime earnings between fathers and sons, mothers and daughters, and families across generations. We find that human-capital accumulation in the labor market, the nonlinear return to part- versus full-time work, and the return to parental time investment in children are the main forces driving the intergenerational correlation in earnings through their effects on fertility and the division of labor within the household. Assortative mating magnifies these forces.

Keywords: Intergenerational Models, Estimation, Discrete Choice, Human Capital, Panel Study of Income Dynamics.

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1 Introduction

The intergenerational correlation of income (IGC) is an important measure of social mobility. However, aside from a handful of papers, the source of intergenerational transmission of income remains to be explored. How much of the IGC can be attributed directly to parental human capital and how much is due to differences in parental investment? What role do labor markets and assortative mating in the marriage market play in the observed persistence of earnings? The impact of policies on intergenerational mobility critically relies on the answers to these questions. We address them by developing and estimating a dynastic model in which fertility, time, and monetary investment in children's human capital are endogenously determined by households. Time allocation within households, as well as fertility are important factors on the outcomes of children. We work to understand these choices and the determinants of household investment in children, and how they are affected by parents' education, skills, and patterns of assortative mating and labor-market participation. We use the estimated model to quantify the relative importance of these factors in the observed persistence in earnings across generations.

A small but growing literature has placed increased emphasis on estimating and analyzing the causal relationship and its driving mechanisms between parental and child income. However, papers that estimate a causal relationship typically do not consider households, parental investment, and fertility decisions.[1] While there is a large literature on the importance of family structure on children's outcomes,[2] most papers that account for the role of investment decisions in the IGC do not take into account fertility, assortative mating, and household decisions.[3] Our paper explicitly models the life-cycle sequential decisions of time investment, labor supply, and fertility and estimates the impact of income, parental characteristics, and assortative mating on the IGC.[4]

Among papers on the mechanism that generate intergenerational correlations in wealth or earnings are Castaneda et al. (2003) and De Nardi (2004). Lee and Seshadri (2015) analyzes and quantifies the mechanism underlying the IGC's accounting for parental investment in human capital and bequests in a dynastic framework. These papers do not use data on early time investment and fertility is exogenous. Abbott et al (2013) and Caucutt and Lochner (2012) develop

[1]For estimation of causal effects of parental income and education on child income, see Carneiro and Heckman (2003) and Belley and Lochner (2007). Lefgren et al. (2012) use instrumental variables to separate the impact of human capital and paternal income on their sons' income. They do not analyze household behavior, and do not consider the role of mothers or parental choices in the persistence of income. See Black and Devereux (2011) for a survey of the literature using instrumental variables and natural experiments to estimate causal effects.

[2]For a comprehensive survey of the literature on family and children's skill and human-capital development, see Heckman and Mosso (2014).

[3]Several other papers consider the role of assortative mating, see Chadwick and Solon (2002), Ermisch et al. (2005), and Holmlund (2008). These papers do not analyze the underlying mechanism of income transmission.

[4]Gayle et al. (2014) develop a dynastic model of human-capital transmission and endogenous marriage and divorce to explain the racial gap in outcomes. Gayle et al. (2018b) develops an estimator for dynastic models. These papers do not analyze the mechanism that causes the observed correlation in earnings.

an intergenerational model of parental investment in human capital in a model with exogenous labor supply and fertility. Daruich and Kozlowski (2016) analyze the mechanism underlying intergenerational mobility, accounting for quantity–quality trade-off. They do no analyze assortative mating or early investment and trade-off of time and monetary investment. To the best of our knowledge only three other papers estimate dynastic models in which labor supply, parental time with children, and fertility are endogenous (Gayle et al., 2014, 2018b; Bolt et al., 2018). None of these papers examines the source of the IGC.

Our model builds on dynastic models with endogenous fertility pioneered by Barro and Becker (1988, 1989) and models of human-capital transmission with exogenous fertility such as Loury (1981). Thus, parents derive utility from the number of children and their respective utilities. Our goal is to capture the impact of parental characteristics and their resource constraints on their decisions and on the IGC. We therefore extend the dynastic model to incorporate the life cycle. This extension allows us to study the choices of number and spacing of children. Our framework is a unitary household, which is the simplest way to capture variation in resources, trade-offs, and decisions of couples with different education levels and skills.

The altruistic parents choose sequentially whether to have a child, their respective labor supply, consumption, and time spent with children. Both time investment of mothers and fathers, as well as their income in the first five years of the child's life affect the children's completed education and their ability. In addition to ability and education, labor-supply patterns affect the accumulated human capital over the life cycle, which is also affected by whether individuals work full or part time, currently and in the past. We assume no borrowing and no saving. Thus, the main economic mechanism that generates correlation in earnings across generations is transmission of human capital through income and time investment in the early-childhood period, as well as a direct transmission of human capital from parents to children. This framework allows us to separate the effect of parental human capital from income and time investment on the IGC. Furthermore, we account for the impact of assortative mating patterns and the labor-market structure on the IGC. Assortative mating affects investment in children by its influence on the level and allocation of available resources – time and money – within the household. It also affects the outcomes and earnings of the children's households. For these reasons, assortative mating can increase IGC.[5] The nonlinear nature of earnings (i.e., the returns to experience) and the nonlinear returns to full-time versus part-time work can potentially affect labor-supply decisions and specialization patterns in different types of households. Moreover, through its effect on the labor supply (especially that of females), it can potentially impact fertility decisions.[6]

[5]See Fernández and Rogerson (2001), Fernández et al. (2005), and Greenwood et al. (2014) on the role of assortative mating in educational attainment and cross-sectional inequality. These papers did not explicitly model time-investment decisions or fertility and mainly relate the impact of assortative mating on cross-sectional inequality.

[6]Most existing dynastic models of human-capital transmission do not account for the interplay between labor-supply decisions, parental time with children, and fertility. However, Cordoba et al. (2016) holds labor supply and fertility as endogenous, but labor supply is not separated from fertility choice. It is a decreasing function of number of

We estimate our dynastic life-cycle model on data from the Panel Study of Income Dynamics (PSID) and show that it can replicate the intergenerational elasticity of earnings observed in the data. We then perform counterfactual exercise to decompose the persistence of earnings across generations into six effects: (i) assortative mating, (ii) the age–earnings profile, (iii) human-capital accumulation in the labor market, (iv) the nonlinearity in the return to part-time versus full-time work, (v) the direct cost of children depending on parental education, and (vi) the effect of nature – the automatic transmission of economic status across generations. To do that, we perform counterfactuals introducing the different factors sequentially. A major channel through which the above factors affect intergenerational mobility is through their effect on choices of parental time investment in children; our estimates of the production function of education show that parental time with children in the first five years has a large impact on completed education, over and above parental education, income in the first five years and skills.[7] Our first major finding is that the labor market is the main source of the IGC. We find that the source that generates the largest correlation is the returns to experience in the labor market; it accounts for roughly 42% of the observed persistence in IGC. Because returns to experience are larger for more-educated individuals, the returns to experience increase the dispersion in females' opportunity costs of time through the dynamic effect of current labor supply. Furthermore, the dynamic effects increase dispersion of current and future earnings. Our simulations show that the labor supply of educated females increases disproportionately, and that the total time they spend with their children decreases relative to the time spent by less- educated women. However, the time spent with each child of the more-educated women increases.[8]

There are several forces driving this result: As household income rises, the demand for both the number of children and their "quality" increases. However, the opportunity cost of time introduced by the returns to experience is higher for more-educated women. This reduces fertility and the total time spent with children in households with more-educated females. However, in households with more-educated females, the reduction in fertility is significantly greater than the reduction in total time spent with children, so time spent with each child increases. This relative decrease in the number of children and the rise in parental time spent with each child in more-educated households increases the intergenerational persistence in earnings. Introducing the nonlinear return to part-time versus full-time work further increases the correlation to a level above the one observed in the data. The mechanism is similar to the one in the returns-to-experience counterfactual.

children that capture the opportunity cost of time. As a result, our model makes different predictions. For example, the endogenous labor supply need not reduce correlation in earnings across generations as found in Cordoba et al. (2016).

[7] See Gayle et al. (2014, 2018a) for causal-effects estimates of the education production function.

[8] Our model is involved, and returns to experience have large income effects through the effect of both the male and the female in the household. Whereas we find small effects on husbands' labor supply, the increase in opportunity costs dominate and disproportionally raise labor supply of educated females. Note that increase in dispersion of earning of high- and low-education households also impact the demand for both quantity and quality of children.

The second major finding is that assortative mating by itself can account for less than 13% of observed persistence in earnings across generations.[9] However, when interacted with the earnings structure, it amplifies the persistence substantially.[10] The third main finding is that the estimated utility costs capture the increased demand for children of more-educated households and, therefore, acts to mute the persistence in earnings across generations.[11] Our estimates therefore emphasize the tension between the different factors that affect persistence: On the one hand, the demand for children rises with income. On the other hand, more-educated people's opportunity cost of time is higher. Because parental time with children has a large impact on their human capital, the (opportunity) cost of "quality" (measured as educational attainment) is higher for parents' with higher potential income. Since the demand for child quality also rises with income, assessing the impact of the different factors is an empirical question. Finally, overall parental characteristics transmitted regardless of behavior account for a significant fraction of the observed persistence in earnings.

The rest of the paper is organized as follows. Section 2 presents our theoretical model. Section 3 presents the data, empirical strategy, and estimation results. Section 4 presents the counterfactual decomposition. Section 5 concludes while the appendices contain estimation details along with additional tables and results.

2 Model

In this section, we present a dynastic life-cycle model of a unitary household to analyze transfers and intergenerational transmission of human capital. This framework is adapted from Gayle et al. (2014). The aim of this model is to capture the impact of fertility, labor supply, and time spent with children on child human capital and persistence of income across generations. We build on previously developed dynastic models that analyze the intergenerational correlation. In some models, such as those of Loury (1981) and Becker and Tomes (1986), fertility is exogenous, while in others, such as the models of Barro and Becker (1988, 1989), fertility is endogenous. Our model extends the standard dynastic framework by incorporating a life-cycle model, which is important to understanding fertility behavior, spacing of children, and timing of different types of investments.

2.1 Environment and Choices

Consider an economy populated with two groups of agents, females (f) and males (m). We denote the gender of an individual by $\sigma = \{m, f\}$. Each is indexed by a vector of lifetime invariant

[9] Added before the labor-market components.

[10] When added after the labor-market structure in the counterfactuals.

[11] This is consistent with Barro and Becker's (1989) prediction, that wealthier parents have more children, reducing the transfers per child and therefore the correlation in wealth across generations.

characteristics. Let x_f denote the type of female and x_m denote the type of male. Assume that the supports of x_f and x_m are finite. An adult lives for T periods. Adults may have children during their life. A child can be either female or male. Children become adults after being raised by both parents for T^e periods.

Figure 1 presents the time line within and across generations. Children (ages 0 to T^e) do nothing. This childhood period is divided into the early-childhood period ages zero to five years of age, and the later-childhood period (ages six to T^e). Parents make active investments in the early-childhood years and passive investments in later-childhood years. At age $T^e + 1$, young adults form households and are matched according to a marriage matching function $G(x_m, x_f)$. Between periods T^e and $T^e + T^f$, households supply labor, have children, spend time raising young children, and consume. From age $T^e + T^f + 1$ to T, older households supply labor, spend time raising existing young children, and consume without producing more children.

Consider a couple of type (x_f, x_m). Each period of their adult life, they jointly choose a discrete choice vector of labor supply and time spent with children for both spouses, as well as a birth decision and a continuous consumption choice c_t. Denote the household market work time $h_t = (h_{ft}, h_{mt})$, household time with children $d_t = (d_{ft}, d_{mt})$, and whether to have a child or not $b_t = \{0, 1\}$. All the discrete choices can be combined into one set of mutually exclusive discrete choices, represented as k, such that $k \in (0, 1, \ldots, K)$. Thus, k is a choice of h_t, d_t, and b_t. Let I_{kt} be an indicator for a particular choice k at age t. I_{kt} takes the value 1 if the k^{th} choice is chosen at age t and 0 otherwise. For expositional simplicity, assume the spouses are the same age.[12] Since these indicators are mutually exclusive, $\sum_{k=0}^{K} I_{kt} = 1$. The vector of state variables includes the history of past choices, time-invariant characteristics, and the gender of each child:

$$z_t = \Big(\{I_{k1}\}_{k=0}^{K}, \ldots, \{I_{kt-1}\}_{k=0}^{K}, \text{children age and gender}, x_f, x_m\Big).$$

The age and gender of each child are in the state space as well as the time spent with each child by each parent.

Human Capital and Earnings Life-Cycle Dynamics The earnings process depends on education, experience, productive ability, gender and race. It is the marginal productivity of workers, and we assume it is exogenous, linear, additive, and separable across individuals in the economy. The earnings equation is given by

$$w_\sigma(z_t, k_t) = \exp\left(\delta_0 + \delta_1 age \times edu + \delta_2 age^2 + \sum_{s=0}^{\rho} \delta_{\sigma,s}^{pt} \sum_{k_{t-s}} I_{k_{t-s}\sigma} + \sum_{s=1}^{\rho} \delta_{\sigma,s}^{ft} \sum_{k_{t-s}} I_{k_{t-s}\sigma} + \eta_\sigma\right). \quad (1)$$

The wage function depends on five factors: gender, returns to education, current hours

[12] This assumption is relaxed in the empirical implementation.

worked, and experience accumulated on the job. The wage function depends on the life-cycle returns to education captured by the interaction term of education and age. We have four mutually exclusive (completed) education groups: less than high school, high school, some college, and college. The earnings equation depends on current choice of hours in a nonlinear manner. For example, full-time work may pay more than twice as such as part-time work. These returns depend on the gender, and therefore, implicitly capture the fact that occupation choices of males and females might be different, and that the difference in the returns for part-time and full-time work are different in different occupations. Moreover, we include experience accumulated while working part-time and full-time as well as the current level of labor supply. Thus, our specification captures the depreciation of the value of human capital accumulated while working part time and full time. The returns to past experience is allowed to vary by gender. As a result, the gap of earnings between part-time and full-time work in the past (as well as present), might be different for men and women. If women are more likely to chose occupations that "penalize" part-time work, or to withdraw from the labor market, it will appear in our estimates as a smaller gap between returns to part-time versus full-time work.[13]

The earnings dynamics specified above distinguish between endogenous state dependence through the return to experience and persistent productivity heterogeneity, via education and innate ability (η_σ). To the extent that there is discrimination (gender or race) in the labor market, it will appear as differences in the unobserved skill distributions.

Children Outcomes We define the characteristics of a child by his or her education e' and innate ability η'. These are affected by the parents' characteristics, early-childhood monetary investments, early-childhood time investments, and the gender-adjusted presence and timing of siblings in early childhood. This intergenerational production function is determined by the following sets of equations. We refer to all variables with respect to children with $'$:

$$e' \quad = \quad \Gamma[e_f, e_m, \eta_f, \eta_m, D_f, D_m, W_f, W_m, \textit{\# of siblings}, \sigma'] + \omega' \tag{2a}$$

$$\eta' \quad = \quad \Gamma(\sigma', e') + \widetilde{\eta}'(\sigma') \tag{2b}$$

where e_f, e_m, η_m, η_f denote the education and parental skills of the father and mother, respectively. Let D_f, D_m denote total time investment in children in the first five years by the mother and father, respectively, and W_f, W_m be the total income earned in the first five years by the mother and father, respectively. As mentioned earlier, σ refers to the gender of an individual; therefore, σ' refers to the gender of the child.

ω' is a race–gender-specific luck component that determines the educational outcome of offspring. After the education level is determined, the child's innate ability, η', is determined as the

[13]See Gayle and Golan (2012) for explicit model of gender, gaps, and occupational sorting, in which returns to hours vary by gender.

sum of systematic, $\Gamma(\sigma', e')$, and random gender specific component, $\widetilde{\eta}'$. This random component is assumed to have finite support and to be independent of ω'. An important feature of this specification is that it divides the child's ability into a component determined by parental inputs through the effect of the educational outcome, innate ability, and a separable component that is directly transmitted through the parents' innate ability.

Budget Constraint Raising children requires parental time, d, and market expenditure. There is a per-period cost of the expenditures of raising a child, which is assumed to be proportional to the current earnings and the number of children in the household. The following equation descibes budget constraint.

$$c_t + \alpha(z_t)(N_t + b_t)w_t \leq w_t \tag{3}$$

where w_t is total household earnings: the sum of the earnings of the female, w_{ft}, and the earnings of the male, w_{mt}. N_t is the number of children at the beginning of period t, and b_t is the decision variable of whether or not to have a child in period t. Thus, $N_t + b_t$ is the total number of children at the end of period t in an adult life cycle. Thus, $\alpha(z_t)$ is the proportion of household earnings spent per child.[14] Notice that both labor-supply decisions (past, through labor-market experience, and present) and birth decisions affect the budget constraint.[15]

Preferences and Household Optimization Adult households care about consumption, leisure, the number of children, and the future household utility of their children.

The contemporaneous utility from consumption is given by $u_2(c_t, z_t, k_t)$. We substitute the consumption from the budget constraint in Equation 3 (which holds with equality) to write the household contemporaneous utility from consumption as a function of household income and current choices (note that the budget constraint depends on birth and labor-supply decisions)

$$u_2(z_t, k_t) = \alpha_c w(z_t, h_t) - \alpha_k(z_t)(N_t + b_t)w_t(z_t, k_t) \tag{4}$$

The linear specification assumes risk-neutral households with neither borrowing nor savings. The transfers to children are a function of the education of the spouses and their income levels. While this suggests expenditure variation by household education composition and income, we do not observe expenditures. Therefore, it captures differences in net utility from children by household education and income. The household's nonpecuniary benefits or costs from their

[14]This assumption is made because we do not observe expenditures on children in the data. Letting α be a function of z allows us to capture the differential expenditures on children made by households with different incomes and characteristics.

[15]Moreover, since education and skills are transmitted from parents to children (directly and indirectly), parental characteristics affect future generations' wages and, therefore, opportunity costs of time. This creates inseparability of feasible sets across generations which is a condition that create persistence in outcomes across generations in Alvarez (1999).

choice combination, k_t, is denoted by θ_{k_t}. Since it is attached to each combination of choices (for example, both spouses work full time, spend much time with children, and have a birth), it allows for nonlinearities in the utility from each activity, which depends on the other activities. For example, the cost of working full time might be greater when the other spouse also works full time and they are both spending much time with children and there is a birth relative to working full time when the other choices are different. Furthermore, it captures the potential complementarities of time. For example, it can capture complementarities in leisure activities if the value of working part time is greater when the spouse spends less time on working and with the children.[16] As is standard in discrete-choice models, an additive idiosyncratic component represents a transitory preference shock associated with each discrete-choice combination, k. To capture this feature of ε_{kt}, we assume that the vector $(\varepsilon_{0t}, \ldots, \varepsilon_{Kt})$ is independent and identically distributed (iid) across the population and time and is drawn from a population with a common distribution function, $F_\varepsilon(\varepsilon_{0t}, \ldots, \varepsilon_{Kt})$. The distribution function is assumed to be absolutely continuous with respect to the Lebesgue measure and assumed to have a continuously differentiable density. The total contemporaneous utility of the household is therefore given by

$$u_t(z_t, k_t) = \theta_{k_t} + u_2(z_t, k_t) + \varepsilon_{kt} \tag{5}$$

Note that the utility is separable in consumption and nonpecuniary utility. However, it is not separable across time. This is because the utility from consumption depends on income, which is a function of past labor-supply choices, and on the current number of children, which depends on past fertility choices.

Dynastic Formulation To describe the utility and choice problems households face, let β denote the intertemporal discount factor. We distinguish between the time preference, β, and the degree of altruism between generations, λ. Thus, $\lambda = 1$ means that a household cares as much about the utility of their children's households as they care about their own. Also, households discount the utility of each additional child by a factor of $1 - v$, where $0 < v < 1$: We assume diminishing marginal returns from children.

Extending the original Barro and Becker (1989) formulation to unitary households, we assume that the lifetime utility for a type-(x_f, x_m) household at age $T^e + 1$ is

$$\begin{aligned} U^i(x_f, x_m) = \max_{\{I_{T^e+1}, \ldots, I_T\}} & \sum_{t=T^e+1}^{T} \beta^{t-T^e-1} E_{T^e+1} \sum_{k_t \in K_t} \left(I_{k_t} u_t(z_t, k_t) \right) + \\ & \beta^{T-T^e-1} \lambda E_{T^e+1} \left[N_T^{-v}(z_T) \sum_{n=1}^{N_T} \sum_{f'=1}^{F} \sum_{m'=1}^{M} G(x'_f, x'_m) U_n^{i+1}(x'_f, x'_m) | x_f, x_m \right], \end{aligned} \tag{6}$$

where $U^i(x_f, x_m)$ represents the full value of the utility of a household at age $T^e + 1$ in generation

[16] Note, however, that we do not distinguish between leisure and any other activities that are related to neither children nor work.

i from that point forward. The expected value comes from the information at the beginning of life as an adult, so the household education and skills are known. The top line of Equation 6 represents the total lifetime utility from consumption and actions excluding the dynastic component. The expected value is over choices and the different state variables in the future periods (including number of children, experience affected by labor-supply choices, time with children, etc.). Note that the choices are made sequentially.

At the end of the life cycle, the number of children and their ages and genders are already known: $N_T(z_T)$ is the number of children in the household at the end of the individual life cycle given final state variable z_T.[17] The expected lifetime utility of the child's household is $U_n^{i+1}(x'_f, x'_m)$ and is indexed by n to identify the child's birth order. However, it takes the same form as $U^i(x'_f, x'_m)$ for given state variables due to stationarity assumption we discuss below. Notice that expectations at time $T^e + 1$ depend on the stochastic education production function and skill-formation function in Equations 2a and 2b which governs transitions from the parents' characteristics, x_f and x_m, and the expectations over their future fertility and investment decisions, into outcomes of the children. Moreover, the children's expected utility depends on the matching function $G(x'_f, x'_m)$. The decisions are made sequentially, so, at every period $t > T^e + 1$, households' choices maximize the expected lifetime utility $U(z_t)$.

2.2 Discussion

Several channels affect the intergenerational persistence of earnings in the model. First is that of parental education and skills. Although skills and education are endogenous across generations, they are predetermined when parents make fertility and investment decisions in children. These parental traits can be transmitted directly through the education- and skill-formation functions described in Equations 2a and 2b. Therefore, children with parents who have higher skills and higher potential earnings may have more skills and higher potential earnings creating correlation in earnings across generations.

Second, the costs of children in the budget constraint in Equation 3 depend on parental education as well as their earnings. In our formulation, this constraint is plugged into the utility function (see Equation 4) and, in practice (in the absence of data on expenditures on children), captures variation in net utility from children by household education and income. This variation by education composition and income affects fertility choices and demand for children. The resulting differences in choices of investment in children is affected by the taste and production-function differences. Clearly, the variation in the production function of education and taste impacts the time investment and labor-supply (and therefore household income entering the

[17] In practice, this is the expected number of children five years after the female reaches the end of her fertile period, but we use T for simplicity. As discussed above, the important assumption is that the children's education and skill outcomes become known to the parents after they can no longer consume or make investment in younger siblings.

education production function) decisions of parents creating indirect effects of the parental traits on intergenerational mobility.

Third, the assortative matching function, $G(x_f, x_m)$, can potentially amplify the correlation in earnings and reduce intergenerational mobility. This can occur simply because the education of both mothers and fathers directly increase the probability of high educational outcomes and skills; if there is assortative mating, more-educated offspring are also more likely to marry high skill–education spouses. Therefore, the correlation in the household's potential earnings is larger relative to a case in which assortative mating is weak (or relative to a random matching process). Furthermore, an indirect effect of assortative mating works through the impact of parental skills and education on their choices and investment in children. As discussed above, the variation of cost of children by household education and income can affect time allocation and fertility decisions.

Fourth, the labor-market and earnings structure can impact intergenerational mobility in several ways: (a) The potential nonlinearity in pay for full time and part time may create differential incentives for labor supply depending on the spouse's education composition. (b) Returns to experience have a dynamic effect on current labor-supply decisions. For example, withdrawing from the labor market, or working part time vs. full time impact several years ahead, depending on the rate of depreciation of human capital. (c) The age–earnings profiles vary by education level creating differences in returns to working in the labor market across education groups. The differential returns vary by ages. (d) Lastly, the pay gaps between males and females, as well as the differences in pay gaps for working part time versus full time, and the returns to experience, can vary by gender.

Because earnings (both current and future) reflect the opportunity costs of time, all these factors may affect the labor supply and specialization patterns in households. They are therefore tied to the time spent with children by each spouse (depending on the disutility from the different combinations of choices by households), as well as fertility decisions.

All four fundamentals in the model have complex impact on the patterns of fertility, labor supply, and time investment in children. By estimating the fundamental parameters of the models below and performing counterfactual exercises, we quantify the impact of these factors on intergenerational mobility.

3 Data and Estimation

3.1 Estimation

We employ a multistage estimation technique developed by Gayle et al. (2018b) to estimate the model using data from the PSID. The estimation method combines forward simulation (Hotz et al., 1994), an alternative-value-function representation for stationary dynastic models from Gayle et al. (2018b), and the Hotz and Miller (1993) inversion and proceeds in four steps. Step 1 estimates the (i) earnings equation, (ii) intergenerational education production function, and (iii) marriage-market matching function at age 25. Step 2 estimates the conditional choice probabilities (CCPs) of household decisions. Step 3 uses the alternative-value-function representations, the estimates from Steps 1 and 2, and the Hotz et al. (1993) forward simulation technique to estimate the household continuation value for each age in the life cycle. Finally, Step 4 employs the Hotz–Miller inversion to form moment conditions for a generalized method of moments (GMM) estimation of the utility-function parameters and the discount factors.

As mentioned in Section 2.2, the theoretical framework has several features that could generate earnings persistence across generations. Of these features, only the direct monetary costs of raising children are estimated in Step 4. The other important features – the earnings structure, education production function, the relative importance of "nature versus nurture," and the marriage market matching function – are estimated outside the model. The preference parameters, the monetary costs of raising children, and the discount factor are estimated using revealed preferences of households to have children and the division of labor within the households. Therefore, the intergenerational correlation in earnings is not targeted at any time during estimation of the model. This allows us to validate the model by assessing how well it is able to replicate the observed correlation in earnings across generations.

The conditions under which this general class of models are semiparametrically identified are established in Magnac and Thesmar (2002) and Pesendorfer and Schmidt-Dengler (2008). The critical assumption for achieving identification in our model is that the economic environment is stationary over generations. This assumption is standard in intergenerational models and is used both in the estimation and the identification of the intergenerational discount factors. Gayle et al. (2014) offer a more detailed discussion of identification in a more general setting.

3.2 Data

We use data from the Family–Individual File of the PSID for the years 1968 to 1996. The initial sample consists of 12,051 males and 17,744 females, each observed for at least one year during our sample period. The sample is restricted to white individuals between the ages of 17 and 55. Because the earnings equation requires knowledge of the last four years of labor-market employment history, we drop individuals with fewer than five years of sequential observations. To track parental time input throughout the early life of a child, we excluded parents observed after their children reached 16 years of age. We also excluded parents with missing observations during the first 16 years of the lives of their children. Furthermore, we excluded spouses of those dropped because of missing observations. After imposing these restrictions, the main sample contains 89,538 individual–year observations.

The theoretical model is a unitary model without divorce. This is a convenient and straightforward way of introducing household decisions and marital sorting into the dynastic model.[18] Consistent with the model, we use data on married couples. Ideally, the estimation should be completed using lifelong-married couples. However, this would significantly reduce the number of observations in our sample, thereby making it unrepresentative of the overall population. To mitigate this issue, we use two subsamples in the model estimation. The first sample consists of all individuals meeting the restrictions described in paragraph above in our main sample who were married for at least one year in our sample period. This sample contains 41,448 individual–year observations and is used in the estimation of Steps 1 and 2 (i.e., earnings equation, intergenerational education production function, the marriage-market matching function at age 25, and the household choice probabilities). The second sample consists of married couples who remained married over all the years observed in the PSID. This sample contains 32,144 individual–year observations and informs the estimate of the preference parameters and discount factors.

The summary statistics of the two samples are presented in Table 1. The table shows that the lifetime-married sample is on average about the same age as the ever-married sample. By construction, all individuals in both samples are married. The female-to-male ratio is 60% in the ever-married sample and is 50% by construction in the lifelong-married sample (we observe the same couple family over years). Those in the lifelong-married sample have, on average, one extra year of education, but this is not statistically significant. Individuals in the ever-married sample not only have more children, but they also have higher housework hours and time spent with children; in the lifelong-married sample, we observe higher annual labor income and labor-market hours for individuals. These are both consistent with the fact that child-bearing potentially reduces labor-market participation, especially that of women. However, we note that none of these differences are statistically significant. A similar pattern holds for the children's generation as well.[19]

3.3 Estimates of Earnings Dynamics and Ability

Figure 2 presents a graphical depiction of the main features of the estimates that will play a prominent role in generating persistence in earnings across generations. Appendix C (Table C.2) presents the estimates of the earnings equation. The specification of $W_{f(m)}(e, h_{f(m)t})$ is quadratic in age and differs by education level; however, we parsimoniously restrict this to be the same for females and males. The market prices per unit for part-time hours and full-time hours are different and this price difference varies by gender. For the return to experience, we adopt Gayle

[18]See, for example, Fernández and Rogerson (2001) and Fernández et al. (2005) for theoretical and empirical models that use the unitary-household formulation to introduce marital sorting in a dynastic model. For a dynastic model with a nonunitary household, see Gayle et al. (2014).

[19]Note that the model's stationarity assumption means that the children's generation is needed only to estimate the education production function.

and Golan's (2012) learning-by-doing specification.[20] The basic feature of this specification is that the return to experience differs by the type of experience (full time versus part time), gender, and how long ago this experience was obtained (depreciation). The earnings equation was estimated using a standard GMM using oast labor-market histories, age, and education as instruments.[21]

Table C.2 and the top panel of Figure 2 show that the age–earnings profile steepens with more education. The shape of the age–earnings profile is potentially important for the persistence of income across generations. Parents with different age–earnings profiles will choose a different timing of having children, as documented in Carneiro et al. (2015). Therefore, the timing of income in early childhood can affect the child's outcome. All else being equal, a flatter age–earnings profile implies that low-educated households would delay having children relative to high-educated households because the opportunity cost of time later in life is lower. The higher overall income of more-educated parents can also increase the demand for children, therefore reducing the intergenerational correlation in income, but the higher opportunity cost of time has the opposite effect.

Table C.2 shows that working full time pays 2.6 (2.3) times more than working part time for males (females). Coupled with the education gender gap displayed in the bottom panel of Figure 2, this provides an incentive for females to specialize less in market work. The gender gap increases with education, which would have more specialization in assortatively matched couples with high education, all else equal, possibly leading to more persistence in earnings across generations.

Finally, Table C.2 and the middle panel of Figure 2 show that the return to experience is highly nonlinear in part- and full-time work, with higher returns to full-time experience than part-time experience. This specification includes a depreciation of human capital, and the results show that part-time work may not generate enough returns to offset the estimated depreciation. Moreover, the part-time penalty in the return to experience (see the middle panel of Figure 2) increases over time but the increase is less for females than for males.[22] In general, both the nonlinearity in current hours and the return to experience introduce nonlinearity into the opportunity cost of spending time with children, which, in our model, could be a source of persistence in earnings across generations.

3.4 Intergenerational Education Production Function

Equations (2a) and (2b) specify the intergenerational production function. In the empirical implementation, $\Gamma_{f(m)}$ and $\Gamma_{f(m)\eta}$ are both linear functions. The intergenerational production func-

[20]Gayle and Golan (2012) show how the estimate of this specification can be rationalized with a simple labor-demand model.

[21]See Altug and Miller (1998) and Blundell and Bond (1998), among others, for details.

[22]This feature of the labor market has been found by other authors. Gayle and Golan (2012) and Gayle and Miller (2013) pointed out a similar structure for the USA, and Blundell et al. (2016) document a similar feature in Britain.

tion is one of the central components in the estimation of the dynastic models. We used an instrumental-variable identification strategy with a linear probability model (IV-LPM). There are three other methods of estimating discrete-choice models with endogenous regressors: maximum likelihood, control variable, and special regressor.[23] However, given the other issues in estimating the intergenerational production functions (discussed below), the IV-LPM is the most straightforward method for simultaneously dealing with all these issues.

A large literature discusses the estimation of the direct effect of parental traits and investment on children's income (Behrman, 1997; Behrman and Rosenzweig, 2002; Lee et al., 2015). There are two well-known fundamental problems with estimating the causal intergenerational schooling effect of parents' education. The first is the standard ability "bias" from the literature on the estimation of the returns to education. That is, more "able" mothers may obtain more schooling: If schooling or earnings ability is genetically transmitted to their children, the intergenerational education correlation between children and parents may merely reflect that more-able parents, who have more schooling, have more-able children who obtain more schooling. The second problem is that the relationship among parental traits, investment, and children's outcomes is normally estimated for mother–child pairs only. Thus, even among mothers with the same abilities, those with higher education may have children with greater educational and labor-market performances because of assortative mating.

The specification of the education production function in our model, equations (2a) and (2b), internalizes all these concerns, which are accounted for in the estimation as follows. First, in the theoretical model, we assume that observed ability in the labor market is a monotonic transformation of academic ability. Therefore, using the panel structure of our data on earnings, we are able to estimate fixed effects for both parents and children. We then use this estimated fixed effect in the estimation of the education production function to mitigate the ability bias. Second, we include fathers' education and home time in the education production function while explicitly accounting for household interactions implied by our model.

However, this leads to a third problem: the simultaneity of the inputs of both fathers and mothers and the endogeneity of which parent and type of parent spends time with a given child. The output of the intergenerational education production function (i.e., completed education level) is determined across generations, while the inputs, such as parental time investment, are determined over the life cycle of each generation. Therefore, we treat these inputs as predetermined and use instruments from within the system to estimate the production function. This leads to a system of equations that requires simultaneous estimation. The system of equations is the education production function in equations (2a) and (2b), as well as labor supply, income, time spent with children, and subsequent fertility equations.

To estimate our the system, we need a number of exclusion restrictions, which are motivated

[23]See Lewbel et al. (2012) for a comparison of the different approaches.

by our theoretical model. The first is the sex composition of siblings. The gender of a child affects his or her educational outcomes conditional on parental inputs and characteristics as well as the number of young siblings. However, the gender compositions on the siblings does not directly affect educational outcomes. The sex composition of the children enters the fertility and parental time because the sex of each child affects his or her educational and earnings outcomes. The sex composition also enters the fertility equation because birth is determined sequentially and parents' decisions of an additional birth in the model is a function of the number of children and their gender. We impose the exclusion restriction that the gender composition of the children does not affect labor supply directly, but only indirectly through its effect on the time parents spend with each child and fertility. This is similar to the siblings-sex ratio first used by Angrist and Evans (1998). This set of instruments therefore provides quasi-experimental variation in parental time and subsequent fertility. The second set of instruments – the difference in the age–earnings profile by education – is used to provide quasi-experimental variation in income, labor hours, and subsequent fertility, but is assumed not to have a direct effect on the parental time spent with children. See Appendix C for details on how we operationalized these two sets of instruments within a three-stage least squares (3SLS) framework.

Table 2 presents results of a 3SLS estimation of the system of individual educational outcomes; the estimates of the rest of the system of equations are in Table C.3 in Appendix C. Parental time investment is the sum of the parental time investment over the first five years of the child's life. The total time investment is a variable that ranges between 0 and 10 since low parental investment is coded as 1 and high parental investment is coded as 2. The estimation results show that controlling for all inputs, a child whose mother has a college education has a higher probability of obtaining at least some college education and a significantly lower probability of not graduating from high school relative to a child with a less-educated mother; while the probability of graduating from college is also larger, it is not statistically significant. If the father of a child, however, has some college or a college education, the child has a higher probability of graduating from college.

Table 2 also shows that while mothers' time investment significantly increases the probability of a child graduating from college or having some college education, fathers' time investment significantly increases the probability of the child graduating from high school or having some college education. These estimates suggest that while mothers' time investment increases the probability of a high educational outcome, fathers' time investment truncates low-educational outcomes. However, both parents' time investment is productive in terms of positively impacting their children's education outcomes.

Note that hours spent with children by mothers and fathers are at different margins, with mothers providing significantly more hours with their children than fathers. Thus, the magnitudes of the discrete levels of mothers' and fathers' time investment are not directly comparable: What constitutes low and high investment differs across genders. Figure C.2 highlights the relative magnitudes. It shows that fathers' time investment does have a significant impact on the education outcome of their children. For example, in a household consisting of two high-school–dropout parents, a daughter would have a 2% chance of graduating from college if the mother provides the sample-average time investment and the father has a low time investment for the first five years of the child's life. However, that chance of graduating from college increases to 15% if the father increases his time investment to high while the mother's time investment remains at the sample average. A similar pattern holds for all other household types.

Figures C.1 and C.2 highlight the relative importance of parental time investment versus the automatic transmission of education status from parents to children. It highlights the role of both "nature" (education status is automatically transferred from parents to children) and "nurture" (more parental time with children increases the probability of the children having a higher educational outcome). The relative importance of nature and nurture in accounting for the persistence of earnings across generations is a quantification question that needs to be answered with an optimizing behavioral framework, and parents may take actions that either enhance or diminish the relative effect of nature versus nurture.

3.5 The Empirical Marriage-Matching Function

The empirical marriage-matching function assigns household formation at age 25 for both the generations, parents and children. It is a multidimensional matching that assigns the spouse characteristics in terms of education and past labor supply. The details of the estimation of this matching function and its results are presented in Appendices A and C. Figure C.3 summarizes the main elements of this matching function over spousal education. It shows what is well known in the literature: Household matching with respect to education is highly assortative. Assortative matching in the marriage market has increased over time; however, in estimation, we will be entering the average matching rate over the sample period. This is necessary because of the stationarity assumption needed in the theoretical analysis.

3.6 Discount Factors and the Direct Costs of Raising Children

This section presents estimates of the intergenerational and intertemporal discount factors, the preference parameters, and childcare cost parameters. Table 3 describes the utility function estimates including the discount factors. It shows that the intergenerational discount factor, λ, is 0.795 (for a complete table of the estimates see Table A.1). This implies that in the second-to-last period of the parent's life, the parent's valuation of the utility of their child is 79.5% of their own utility. The estimated value is in the same range of values obtained in the literature calibrating dynastic models (Rios-Rull and Sanchez-Marcos, 2002; Greenwood et al., 2003). However, these studies do not have life-cycle models. We find that the estimated discount factor, β, is 0.813. This is smaller than the typical calibrated values. However, a few papers that estimate it do find lower values. For example, Arcidiacono et al. (2007) find it to be 0.8.[24] Lastly, the discount factor associated with the number of children, v, is 0.111. This implies that the marginal increase in value from the second child is 0.68 and of the third child is 0.60.

Table 3 also presents the marginal utility of income. The utility from income declines in the number of children; for a person and spouse, both with less than a high-school diploma, the coefficient on the interaction of children and family income is -0.309, implying that the net costs of raising children increase with the number of children as well as the family income.[25] The costs decline with own and spouse education. However, for all households, the net utility from children is negative and declining in family income, capturing the increase in spending on children for wealthier families. For families with the same number of children, the costs of children increase in income for all types of households. In our model, fertility decisions depend, therefore, on education and income through the costs in the utility function. The costs of children are lower in households with higher education, but these costs increase in income and income is higher for more educated households. The earnings equations capture the increase in opportunity costs of time for more-educated households which is important to understanding differential fertility rates by wealth and education. In general, in dynastic models with endogenous fertility such as the Barro–Becker model, the neutrality result holds – that is, wealthier people have more children, so the bequest per child is the same and there is no intergenerational persistence. As shown in the literature. See Alvarez (1999) and Cordoba et al. (2016) about relaxing several assumptions to create correlation in wealth (or earnings in our case) across generations. The question whether wealthier households have more or fewer children and whether investment per child increases in more educated households is therefore an empirical one.

3.7 Model Fit and Explanatory Power

There are many criteria for assessing the fit of a model; in this paper, we use three such criteria. The first is the statistical overidentifying J-test. We cannot reject the overidentifying test at the 5% level. The other two criteria require us to solve the model numerically. As such, we numerically solve the model and simulate 10,000 synthetic generations. The second criterion computes the unconditional choice probabilities of household labor supply, fertility, and parental time with children from these synthetic generations and compares them to the unconditional choice probabilities computed from the data. The comparison shows that our estimated model can replicate the observed choices in the data. This is a visual representation and aggregated summary of the restrictions in the J-test as these are the aggregates of the moments targeted in estimation. Hence, this criterion is not an independent source of model validation (Figure B.1 in Appendix B displays the results.). However, it is a useful benchmark for the counterfactual simulations to

[24]We are not aware of dynastic models in which the time discount factor is estimated.

[25]Note that the coefficients on children in the utility represent net utility because we cannot observe expenditures on children directly.

follow. Finally, given the synthetic data set, we calculate the IGC and compare the results to the estimates from the data. This is an independent source of model validation as these correlations are not moments targeted in the estimation. Table 4 provides the results of this latter exercise.

4 Source of the Intergenerational Persistence in Earnings

We conduct six counterfactual exercises (described below) to quantify the sources of the intergenerational correlation in earnings. Broadly, the counterfactuals quantify the effect of assortative mating, The structure of earnings that causes pay dispersion by education and skill group, preference differences, and the direct impact of parental characteristics on their child education.

1. The baseline counterfactual (CF0), is computed by eliminating most of the potential sources of IGC. In the education production function, the direct effect of parental education is normalized to that of high-school level (that is, all parents are assigned high-school education). Thus, only gender, parental time input, and the number of young siblings account for the variation in educational outcomes. Second, the spouse-matching function is set to be uniform with equal probabilities for each person to marry a spouse with any one of the four education categories. Third, the earnings equation 1 is set such that compensation varies with neither age nor experience (it is set for age 32 and the average experience of a high-school graduate). The return to full-time work is set to be twice as large as the return to part-time work, understating the return to full-time work. However, we keep the individual fixed effects that are systematically correlated with education. Therefore, on average, the potential earnings are higher for more educated individuals. Specifically, $w_{\sigma t}$ is evaluated at age 33, four years of full-time experience and high-school education for men, and at age 32 with four years of part-time experience and high-school education for females. The current labor supply is equal to the estimated coefficient on part-time work for males and females, respectively, and the coefficient on the returns to full-time work are set to be twice these coefficients. Therefore, the variation in earnings across individuals comes from differences in the current levels of labor supply and the variation in the fixed effects only.

   Lastly, the direct monetary costs of raising children that are a function of education are set to the values of high-school graduates; the only variation in the direct monetary costs of raising children is due to gender. Therefore, the only systematic source of correlation in this counterfactual is due to systematic differences in fixed effects in earnings for different education groups. This counterfactual creates variation in the net utility from children which depends on family income.[26] Otherwise, only the variation in the utility function is

[26]Note that although the cost of children (or net utility from children) is interacted with family income, there is no systematic difference in the income of spouses across education groups as spouses are randomly and uniformly assigned to individuals regardless of education.

due to the idiosyncratic taste shocks for labor supply and other choices may drive additional differences in choices. Each of the remaining counterfactuals adds back one element at a time to the previous counterfactual.[27]

2. The second counterfactual (AM) adds back the *assortative-mating* function in the data. It isolates the effect of assortative mating on the observed choices and intergenerational correlations in incomes. Therefore, individuals with higher education have on average higher potential earnings (through higher fixed effects) and their spouses have higher potential earnings as well.

3. The third counterfactual (AEP) adds back the estimated *age–earnings–education* relationship into the earnings equations. It therefore creates a steeper deterministic increase in potential earnings over the life cycle for more-educated individuals.

4. The fourth counterfactual (RTE) adds the estimated returns to labor-market experience in the earnings equation of the AEP counterfactual, creating a steeper increase in wages for individuals who work, and an even steeper increase for individuals who work full-time. Note that since our wage equation is not linear, the returns to experience vary by education.

5. The fifth counterfactual (FTPT) adds the estimated returns to full-time work to the earnings equation. That is, the actual returns to full-time work are more than twice the returns to part-time work, creating additional dispersion in earnings based on past labor supply.

6. The sixth counterfactual (UC) adds back the variation in direct monetary cost of raising children (or net utility from children), which varies by education group, to the FTPT counterfactual. This reduces the net utility costs (given household income) of more-educated couples relative to the costs in the baseline.

7. The seventh counterfactual (NA) adds back the effect of education in the education production function – the effect of nature – to the FTPT counterfactual. Therefore, it lacks the variation in net costs of children by education, but captures the direct effect of parental education on children's outcomes and its indirect effect on parental time allocation and fertility.

Since the order in which we add the different factors matters, we also repeated the exercise adding only one element at a time to the baseline. Since there is no substantial differences in the conclusions, we include the results in an online Appendix B Table B.3. To assess the impact of assortative mating, and also assess the impact of the earnings structure when matching is

[27]Our model is highly nonlinear, so the different factors in the model interact in nontrivial ways and the effects are not additive. To isolate the effect of the different factors affecting the correlation, we also add each factor separately to the baseline counterfactual and report the impacts in Appendix B Table B.2.

random, we first add the labor-market components and then add the assortative mating. We first add the effect of the age–earnings profile AEP′ to the baseline model in Counterfactual 1 CF0. We then add the returns to experience in the earnings equation, RTE′. In the forth counterfactual, we add the estimated returns to part-time and full-time work (FTPT′). And lastly, in the fifth counterfactual, we add assortative mating at the end (AM′). We discuss this further below. We report the results for income at age 35 and for lifetime income, but unless mentioned otherwise, the discussion focuses on the correlation of average income from age 30 to age 40.[28]

4.1 A Cumulative Decomposition

Tables 5 and 6 and Figures 3 and 4 present the counterfactual results. The tables present the labor supply, parental time with children, and fertility choices along with total and average time input in children for mothers and fathers. Figure 3 presents the decomposition of the intergenerational correlation in average earnings between ages 30 and 40 of fathers and sons, of mothers and daughters, and of the parent–child family incomes. Figure 4 presents the results of the second set of counterfactuals as outlined above. In the baseline counterfactual, CF0, the only dispersion across households with different education compositions is due to the fixed effects, which create differences in potential earnings, and iid taste shocks. Because of the variation in fixed effects, more-educated individuals have higher opportunity cost of time. This counterfactual, explains less than 6% of the observed correlations in family average incomes between ages 30 and 40. Counterfactual 2, AM, adds assortative mating: Potential total household income of an educated person is higher because this individual is more likely to marry a more-educated spouse. Similarly, the returns of investment in the education of children are larger since in addition to higher potential earnings (through higher fixed effects), they are more likely to marry a high-education spouse. However, assortative mating generates only about 10% of the observed correlation in earnings for families of fathers and sons and 15% for families of mothers and daughters.

The Effect of Labor Markets Counterfactuals 3–5 (AEP, RTE, and FTPT) measure the effect of the earnings structure on intergenerational mobility. The earnings structure refers to the age–education earnings profiles, returns to experience and the returns to part-time vs. full-time work. In each stage, the potential earnings dispersion among differently educated households increases, and the degree of the actual increase in pay dispersion across households with different education compositions depends on the households' labor-supply responses.

Counterfactual 3, AEP, adds the age–earnings profile into equation 1, changing the timing of income deterministically with age and, therefore, the labor-supply patterns. Moreover, it in-

[28] We also analyzed the impact of the different factors on mobility in terms of rank to rank transitions. That is, we repeated the counterfactuals and reported the distribution of percentiles of the children's earnings given their parents' percentiles in the earnings distributions. This helps us to assess the persistence at different parts of the income distribution. However, the analysis yielded no new conclusions.

creases the earnings dispersion across education groups because wage growth with age increases substantially with education. Nevertheless, its marginal impact on the intergenerational correlation in earnings is small, accounting for only 4.5%.

Figure 3 shows that adding labor-market experience into the earnings equations (RTE) significantly increases the persistence in earnings across generations, accounting for about 60% of the observed correlations for father–son and mother–daughter intergenerational pairs.[29]

Looking further into the mechanism that increases the intergenerational correlations in earnings, we turn to Tables 5 and 6, which show the effects of the different factors on parental choices. The impact on male labor supply is relatively small. However, female labor supply increases. The largest increase is in participation rates and full-time work of women in more-educated households (education of both spouses), with the largest increase for households in which both spouses are college educated. The effects are complex, yielding both an income and a substitution effect. The opportunity costs of more-educated females was already larger in the previous counterfactual which added the age–earnings–education profile. However, in that counterfactual, nonparticipation had only a one-period loss of earnings (because age–earning–education profiles are deterministic) and, therefore, did not have a very large effect relative to the current counterfactual. In the current counterfactual, the opportunity cost of time rises due to the dynamic effect of current participation on future earnings. This increase is larger for more-educated females. As a result, fertility declines. The largest decline in fertility is for households in which both spouses have some college or college degrees. These are the households for which the opportunity cost of time is the highest. Due to the large increase in the full-time work of females, there is also an income effect that increases demand for quality and quantity of children. But because of the increase in the opportunity cost of time, the demand for quality drives fertility down. As a result, mothers' time per child increases at a higher rate in high-education households. Fathers' time per child also increases in high-education households. Thus, the decline in fertility and the increase in parental time per child is consistent with a quantity–quality trade-off. In contrast, average time with children for both mother and father declines in households where both parents have less than a high-school education, mainly because of the more moderate decline in fertility in these households.

The introduction of the nonlinear returns to full-time versus part-time work (FTPT) raises the correlation to around 0.351, accounting for 140% of the intergenerational correlation in earnings in all intergenerational pairs. Table 6 reveals that this counterfactual increases the full-time work of women (substitution effect) and reduces the male labor supply (the income effect of an increase in the wife's earnings). Full-time work increases the most for educated females. Fertility declines the most for educated females married to educated males. This decline increases maternal time per child disproportionately for educated mothers. These responses are consistent with the in-

[29] As shown in Appendix B, Table B.3, this is the single factor that created the most persistence. It generates about 75% of the correlation in the simulated data (and about 55% of the correlation in the observed data).

troduction of the age–earnings–education profiles. However, fathers' time per child declines but not as much as the increase in maternal time (indicating increase in fathers' time spent on neither labor market nor childcare activities). Nevertheless, the impact of maternal and paternal time on children's outcomes is not symmetric. Overall, the large decline in fertility, stronger in households with college-educated fathers, and the increase in mothers' income raises the IGC. It is important to note the significance of this result: Without any effect of nature in the production function of the children's education – the automatic transmission of economic status across generations – the dynastic model can generate more persistence than is observed in the data.

Notice, however, that there are several channels through which the earnings structure creates persistence in earnings and reduces intergenerational mobility in our dynastic model. The large dispersion in opportunity costs of time and the increase demand for "quality" of children affects households in all generations. Therefore, it is not just the large dispersion in earnings of more- and less-educated parents in the second and future generations alone that increases the returns to investment in children's education disproportionally. Because parents internalize the effect of education on the incentives of the offspring, the increase in earnings dispersion in all generations, increases labor supply of educated women in all generations, which further raises the income of the children's generation relative to models in which offspring labor supply is exogenous or not considered.[30] Therefore, it amplifies persistence in earnings.

Utility Costs of Children Figure 3 shows the effect of the cost of children in the utility function in Counterfactual 5 (UC) by allowing the direct monetary cost of raising children to vary with education. Interestingly, this reduces the correlation to around 0.17, accounting for between 59% and 69% of the intergenerational persistence in earnings depending on the intergenerational pair considered. In our framework, this effect is captured through the direct monetary cost of raising children, which depends on education and income. In this counterfactual, the coefficient on the interaction of number of children and income is higher for more-educated households. That is, relative to the baseline utility, this counterfactual increases relative net utility from children of more-educated households, increasing fertility of more educated households relative to that of less educated ones. As a result, maternal time per child declines in households in which females have some college or a college degree and the males have at least a high-school diploma. While fathers' time with children increases in households with more-educated females, it is not enough to offset the decline in maternal time per child in these households.

Parental Traits Lastly, in Counterfactual 6 (NA), we add to Counterfactual 4 (FTPT) the variation of parental education to the education production function. Adding parental education to the education production function adds an additional 20% to the father–son correlation and 27% to

[30]Cordoba et al. (2016) make this point.

the mother–daughter correlation. There is very little effect on behavior, and the majority of the increase in correlation is from the direct effect of parents' education on children's education.[31]

In summary, the structure of the labor market – human capital accumulated through experience and the nonlinear return to part- versus full-time work – can endogenously generate up to 140% of the persistence in earnings observed in the data without any effect of nature. However, this is mitigated by the quality–quantity trade-off which reduces the persistence of earnings across generations. Overall, nurture accounts for between 58% and 68% of the observed persistence in earnings. While we find a small role for assortative mating in the absence of the labor-market structure, the mechanism through which the labor structure operates is the division of labor and specialization in the household. As such, we investigate the marginal importance of assortative mating in the presence of the labor-market structure.

4.2 The Complementarity of the Earnings Structure and Assortative Mating

Figure 4 presents the results from an alternative counterfactual simulation when we add assortative mating after adding the labor-market structure. As before, the impact of the age–earnings profile is small, and the impact of the human capital accumulated through on-the-job experience and the nonlinearity in full-time versus part-time work are significant and large. The main difference between the impacts of the labor-market structure in the alternative counterfactual designs is that in the absence of assortative mating, the impact of the labor market on mother–daughter persistence in earnings is muted. However, when we add assortative mating to the earnings structure in the labor market, the impact is very large and increases the IGC back to the level in the counterfactual UC – highlighting that while assortative mating by itself creates little of the observed persistence, interacting with the earnings structure amplifies its effect substantially. For families of fathers and sons, for example, the correlation of earnings measured as the average income between the ages of 30 and 40 increases by 66% (from 0.2118 to 0.3513), and for all families the correlation increases by more than 140% (from 0.135 to 0.33), when we introduce assortative mating to the model. Greenwood et al. (2014) also noted that assortative mating by itself does not increase the cross-sectional inequality, but plays a large role when women work. In our analysis of the intergenerational persistence in earnings, the female labor supply is the key mechanism through which assortative mating creates persistence. Fernández and Rogerson (2001) show the importance of assortative mating to understanding cross-sectional earnings inequality. Fertility is also important in their mechanism through the decrease in fertility with education.[32] While in our sample fertility does not decline with household education, the quantity–quality trade-off is

[31] The impact of parental education on the correlation when added to the baseline counterfactual is the second largest sole effect after the effect of the returns to experience.

[32] Our finding that the labor-market earnings structure increases persistence of earnings through the decrease in fertility matches previous findings in the literature. For example, Caucutt et al. (2002) find that returns to experience in the labor market delay fertility and decrease total fertility rates. The decline in fertility is central for generating persistence in our model.

important. Although we do not find that assortative mating on its own is important, our robustness check shows that interacted with the earnings structure, it amplifies the effect and creates larger inequality by increasing persistence and reducing mobility.

5 Conclusion

This paper estimates a dynastic model of intergenerational transmission of human capital in which unitary households choose parental time with children, fertility, and labor supply. We decompose the impact of four factors on the IGC: assortative mating, earnings structure, heterogeneity in preference of households with different education levels, and the impact of parental education on the children's education production function.

We find that accounting for the division of work within the household and endogenous fertility is important for understanding the mechanism of intergenerational transmission of human capital because it plays an important role in determination of parental time with children. A central finding is that the earnings structure has the largest impact on the persistence of earnings across generations. Specifically, the nonlinearity of earnings in the labor market in hours and returns to the labor-market experience have a large affect on specialization patterns in households and fertility. The disproportionately larger returns to working full time relative to part time and the returns to experience reduce overall maternal time with children but decrease fertility and increase time investment per child in high-education households. Therefore, the labor-market earnings structure increases the persistence of outcomes across generations. While the role of parental education in reducing mobility across generations is important, much of the observed persistence in earnings across generations can be attributed to the labor-market earnings structure. Lastly, we find that the impact of parental education on the net (utility) costs of raising children itself reduces the persistence of income. The intuition is in the spirit of Barro and Becker (1989). More-educated households are wealthier, increasing demand for children and reducing investment of time per child.

Our findings are related to the quantity–quality trade-off in the literature that often refers to a negative correlation between income and fertility. However, the literature on causal effects often finds that income has a positive effect on fertility; see, for example, Heckman and Walker (1990) and Lindo (2010). Our model predicts (as previously argued in the literature) an ambiguous relationship between fertility and income. On the one hand, if children are a normal good, higher income should increase demand; at the same time, the opportunity cost of time is higher. To the extent that parental time is important in early childhood, time also affects the quality of children and demand for quality increases with income as well. Our model captures all these elements and identifies and quantifies the causal effects of income and the opportunity cost of time. We find that increased income indeed raises fertility and reduces IGC substantially. Without the income effect on demand for children, the correlation would be substantially larger. However, we find that the observed correlation in earnings across generations is higher due to (i) the increased opportunity cost of time amplified by the earnings structure of returns to experience and full-time work and (ii) increased demand for children when accounting for the substantial contribution of parental time to children's educational outcome.

In our analysis, the impact of assortative mating is large, once interacted with the earnings structure. In order to focus on time allocation within households, we take the matching function as given, and we abstract from single-parent households. The role of the marriage market, however, is important. Analyzing the marriage market equilibrium in a dynastic framework, in which the supply of spouses by education is endogenous (because it is determined in equilibrium across generations) is complex, and we leave it for future work.

References

[1] **Abbott, B., G. Gallipoli, C. Meghir, and G.L. Violante.** 2013. "Education Policy and Intergenerational Transfers in Equilibrium." National Bureau of Economic Research Paper No. w18782.

[2] **Altuğ, Sumru, and Robert A. Miller.** 1998. "The Effect of Work Experience on Female Wages and Labour Supply." *Review of Economic Studies* 65 (1): 45–85.

[3] **Alvarez, Fernando.** 1999. "Social Mobility: The Barro–Becker Children Meet the Laitner–Loury Dynasties." *Review of Economic Dynamics* 2 (1): 65–103.

[4] **Angrist, Joshua D., and William N. Evans.** 1998. "Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size." *American Economic Review* 88 (3): 450–477.

[5] **Arcidiacono, Peter, Holger Sieg, and Frank Sloan.** 2007. "Living Rationally Under the Volcano? An Empirical Analysis of Heavy Drinking and Smoking." *International Economic Review* 48 (1): 37–65.

[6] **Barro, Robert J., and Gary S. Becker.** 1988. "A Reformulation of the Economic Theory of Fertility." *Quarterly Journal of Economics* 103 (1): 1–25.

[7] **Barro, Robert J., and Gary S. Becker.** 1989. "Fertility Choice in a Model of Economic Growth." *Econometrica* 57 (2): 481–501.

[8] **Becker, Gary S., and Nigel Tomes.** 1986. "Human Capital and the Rise and Fall of Families." *Journal of Labor Economics* 4 (3): 1–39.

[9] **Behrman, Jere R.** 1997. "From Parent to Child: Intergenerational Relations and Intrahousehold Allocations" in Jon R. Neill, ed., *Poverty and Inequality: The Political Economy of Redistribution.* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research: 105–126.

[10] **Behrman, Jere R., and Mark R. Rosenzweig.** 2002. "Does Increasing Women's Schooling Raise the Schooling of the Next Generation?" *American Economic Review* 92 (1): 323–334.

[11] **Belley, P. and L. Lochner.** 2007. "The Changing Role of Family Income and Ability in Determining Educational Achievement." *Journal of Human Capital* 1(1): 37–89.

[12] **Black, Sandra E., and Paul J. Devereux.** 2011. "Recent Developments in Intergenerational Mobility" in David Card and Orley Ashenfelter, eds., *Handbook of Labor Economics,* Volume 4, Part B. Amsterdam: Elsevier: 773–1823.

[13] **Blundell, Richard, and Stephen Bond.** 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87 (1): 115–143.

[14] **Blundell, Richard, Monica Costa Dias, Costas Meghir, and Jonathan Shaw.** 2016. "Female Labour Supply, Human Capital and Welfare Reform." *Econometrica* 84: 1705–1753.

[15] **Bolt, Uta, Eric French, Jamie Hentall Maccuish, and Cormac O'Dea.** 2018. "Intergenerational Altruism and Transfers of Time and Money: A Life-Cycle Perspective." Michigan Retirement Research Center Research Paper No. 2018-379.

[16] **Carneiro, Pedro, Italo L. Garcia, Kjell G. Salvanes, and Emma Tominey.** 2015. "Intergenerational Mobility and the Timing of Parental Income." Institute for the Study of Labor Discussion Paper 9479.

[17] **Carneiro, Pedro, and James Heckman.** 2003. "Human Capital Policy." National Bureau of Economic Research Working Paper No. 9495.

[18] **Castaneda, Ana, Javier Diaz-Gimenez, and Jose-Victor Rios-Rull** 2003. "Accounting for the US Earnings and Wealth Inequality." *Journal of political economy* 111 (4): 818–857.

[19] **Caucutt, Elizabeth M., Nezih Guner, and John Knowles.** 2002. "Why Do Women Wait? Matching, Wage Inequality, and the Incentives for Fertility Delay." *Review of Economic Dynamics* 5 (4): 815–855.

[20] **Caucutt, E. and Lochner, L.** 2012. Early and Late Human Capital Investments, Borrowing Constraints, and the Family. *National Bureau of Economic Research*. No. w18493.

[21] **Chadwick, Laura, and Gary Solon.** 2002. "Intergenerational Income Mobility among Daughters." *American Economic Review* 92 (1): 335–344.

[22] **Cordoba, J.C., X. Liu, and M. Ripoll.** 2016. "Fertility, Social Mobility and Long Run Inequality." *Journal of Monetary Economics* 77: 103–124.

[23] **Daruich, Diego, and Julian Kozlowski.** 2016. "Explaining Income Inequality and Intergenerational Mobility: The Role of Fertility and Family Transfers." Federal Reserve Board of St. Louis Working Paper No. 2018-11.

[24] **De Nardi, M.** 2004. "Wealth Inequality and Intergenerational Links." *The Review of Economic Studies* 71 (3): 743–768.

[25] **Ermisch, John, Marco Francesconi, and Thomas Siedler.** 2005. "Intergenerational Economic Mobility and Assortative Mating." Institute for the Study of Labor Discussion Paper No. 1847.

[26] **Fernández, Raquel, Nezih Guner, and John Knowles.** 2005. "Love and Money: A Theoretical and Empirical Analysis of Household Sorting and Inequality." *Quarterly Journal of Economics* 120 (1): 273–344.

[27] **Fernández, Raquel, and Richard Rogerson.** 2001. "Sorting and Long-Run Inequality." *Quarterly Journal of Economics* 116 (4): 1305–1341.

[28] **Gayle, George-Levi, and Limor Golan.** 2012. "Estimating a Dynamic Adverse-Selection Model: Labour-Force Experience and the Changing Gender Earnings Gap 1968–1997." *Review of Economic Studies* 79 (1): 227–267.

[29] **Gayle, George-Levi, Limor Golan, and Mehmet A. Soytas.** 2014. "What Accounts for the Racial Gap in Time Allocation and Intergenerational Transmission of Human Capital?" *Unpublished manuscript*, Department of Economics, Washington University in St. Louis.

[30] **Gayle, George-Levi, Limor Golan, and Mehmet A. Soytas.** 2018a. "Intergenerational Mobility and the Effects of Parental Education, Time Investment, and Income on Children's Educational Attainment." *Federal Reserve Bank of St. Louis Review* 100 (3): 281–295.

[31] **Gayle, George-Levi, Limor Golan, and Mehmet A. Soytas.** 2018b. "Estimation of Dynastic Life-Cycle Discrete Choice Models." *Quantitative Economics* 9 (3): 1195–1241.

[32] **Gayle, George-Levi, and Robert A. Miller.** 2013. "Life-Cycle Fertility and Human Capital Accumulation." *Unpublished manuscript*, University of Washington in St. Louis.

[33] **Greenwood, Jerremy, Nezih Guner, John A. Knowles.** 2003. "More on Marriage, Fertility, and the Distribution of Income." *International Economic Review* 44 (3): 827–862.

[34] **Greenwood, Jeremy, Nezih Guner, Georgi Kocharkov, and Cezar Santos.** 2014. "Marry Your Like: Assortative Mating and Income Inequality." *American Economic Review* 104 (5): 348–353.

[35] **Heckman, James J., and Stefano Mosso.** 2014. "The Economics of Human Development and Social Mobility." *Annual Review of Economics* 6: 689–733.

[36] **Heckman, James J., and James R. Walker.** 1990. "The Relationship Between Wages and Income and the Timing and Spacing of Births: Evidence from Swedish Longitudinal Data." *Econometrica* 58 (6): 1411–1441.

[37] **Holmlund, Helena.** 2008. "Intergenerational Mobility and Assortative Mating: Effects of an Educational Reform CEE DP 91." Centre for the Economics of Education Paper No. NJ1.

[38] **Hotz, V. Joseph, and Robert A. Miller.** 1993. "Conditional Choice Probabilities and the Estimation of Dynamic Models." *Review of Economic Studies* 60 (3): 497–529.

[39] **Hotz, V. Joseph, Robert A. Miller, Seth Sanders, and Jeffrey Smith.** 1994. "A Simulation Estimator for Dynamic Models of Discrete Choice." *Review of Economic Studies* 61 (2): 265–289.

[40] **Jones, Larry E., Alice Schoonbroodt, and Michèle Tertilt.** 2010. "Fertility Theories: Can They Explain the Negative Fertility-Income Relationship?" in John Shoven, ed., *Demography and the Economy.* Boston, MA: National Bureau of Economic Research: 43–100.

[41] **Lee, Sang Yoon, Nicolas Roys, and Ananth Seshadri.** 2015. "The Causal Effect of Parental Education on Children's Human Capital." Unpublished manuscript, University of Wisconsin–Madison, Department of Economics.

[42] **Lee, Sang Yoon, and Ananth Seshadri.** 2014. "On the Intergenerational Transmission of Economic Status." *Unpublished manuscript*, University of Wisconsin–Madison, Department of Economics.

[43] **Lefgren, Lars, Matthew J. Lindquist, and David Sims.** 2012. "Rich Dad, Smart Dad: Decomposing the Intergenerational Transmission of Income." *Journal of Political Economy* 120 (2): 268–303.

[44] **Lewbel, Arthur, Yingying Dong, and Thomas Tao Yang.** 2012. "Comparing Features of Convenient Estimators for Binary Choice Models with Endogenous Regressors." *Canadian Journal of Economics* 45: 809–829.

[45] **Lindo, Jason M.** 2010. "Are Children Really Inferior Goods? Evidence from Displacement-Driven Income Shocks." *Journal of Human Resources* 45 (2): 301–327.

[46] **Loury, Glenn C.** 1981. "Intergenerational Transfers and the Distribution of Earnings." *Econometrica* 49 (4): 843–867.

[47] **Magnac, Thierry, and David Thesmar.** 2002. "Identifying Dynamic Discrete Decision Processes." *Econometrica* 70 (2): 801–816.

[48] **Mookherjee, Dilip, Silvia Prina, and Debraj Ray.** 2012. "A Theory of Endogenous Fertility with Occupational Choice." *American Economic Journal–Microeconomics* 4 (4): 1–34.

[49] **Pesendorfer, Martin, and Philipp Schmidt-Dengler.** 2008. "Asymptotic Least Squares Estimators for Dynamic Games." *Review of Economic Studies* 75 (3): 901–928.

[50] **Rios-Rull, Jose-Victor, and Virginia Sanchez-Marcos.** 2002. "College Attainment of Women." *Review of Economic Dynamics* 5 (4): 965–998.

Table 1: Summary Statistics

	All		Married		Lifelong Married	
Variable	*N*	Mean	*N*	Mean	*N*	Mean
Panel A: Parent Sample						
Female	68,856	0.55	38,078	0.60	29,474	0.50
Married	68,856	0.55	38,078	1.00	29,474	1.00
Age	68,856	28.59	38,078	31.98	29,474	32.50
		(7.93)		(6.89)		(3.73)
Education (yrs. completed)	68,856	13.70	38,078	13.74	29,474	14.66
		(2.15)		(2.13)		(1.75)
No. of children	68,856	0.79	38,078	1.28	29,474	0.98
		(1.02)		(1.04)		(0.95)
Labor income (USD 2005)	68,739	22,295	38,003	31,357	28,854	38,217
		(2,779)		(2,987)		(2,043)
Labor-market hours	68,790	1,182	38,051	1,598	28,914	1,690
		(1,053)		(916.0)		(525.0)
Housework hours	49,865	729.9	38,078	788.2	29,348	694.8
		(591.1)		(614.2)		(356.7)
Time spent with children	68,856	257.7	38,078	417.0	29,348	215.3
		(487.8)		(570.0)		(295.5)
No. of individuals	5,112		3,431		2,372	
Panel B: Children Sample						
Female	20,682	0.53	3,370	0.82	2,670	0.50
Married	20,682	0.16	3,370	1.00	2,670	1.00
Age	20,682	20.98	3,370	24.60	2,670	29.20
		(3.64)		(3.64)		(2.42)
Education (yrs. completed)	20,682	13.39	3,370	13.05	2,670	14.15
		(2.01)		(1.84)		(1.70)
No. of children	20,682	0.18	3,370	0.85	2,670	0.37
		(0.52)		(0.86)		(0.61)
Labor income (USD 2005)	20,482	6,926	3,293	21,254	2,576	39,181
		(1,603)		(2,331)		(2,274)
Labor-market hours	20,476	892	3,290	1,467	2,576	1,878.1
		(891.7)		(927.1)		(525.8)
Housework hours	6,486	648.8	3,370	785.1	2,662	516.2
		(523.3)		(561.5)		(286.4)
Time spent with children	20,678	72.7	3,370	351.1	2,662	84.50
		(277.8)		(528.6)		(184.1)
No. of individuals	3,778		759		550	

Notes: Panel Study of Income Dynamics, 1968 to 1997. The number of observations of families is 16,072. Table uses both individual and spouse information. Therefore, for samples of married individuals, the total number of observations is twice the number of families. Standard deviations are listed in parentheses.

Table 2: 3SLS System Estimation of the Education Production Function

Variable	High School	Some College	College
High school father	0.084	0.007	−0.005
	(0.034)	(0.054)	(0.044)
Some college father	0.057	0.128	0.052
	(0.024)	(0.038)	(0.031)
College father	−0.038	0.017	0.123
	(0.032)	(0.051)	(0.042)
High school mother	0.110	0.101	−0.011
	(0.042)	(0.066)	(0.053)
Some college mother	0.041	−0.018	0.026
	(0.032)	(0.050)	(0.041)
College mother	0.102	0.128	0.038
	(0.038)	(0.059)	(0.048)
Mother's time	−0.043	0.060	0.053
	(0.021)	(0.034)	(0.027)
Father's time	0.026	0.096	0.028
	(0.019)	(0.029)	(0.025)
Mother's labor income	−0.032	−0.018	0.004
	(0.009)	(0.014)	(0.012)
Father's labor income	0.001	0.001	0.003
	(0.003)	(0.004)	(0.003)
Female	−0.004	0.136	0.086
	(0.017)	(0.027)	(0.022)
Number of siblings under age 3	0.010	−0.106	−0.043
	(0.020)	(0.033)	(0.026)
Number of siblings between age 3 and 6	−0.029	−0.025	0.009
	(0.026)	(0.042)	(0.034)
Constant	0.997	−0.118	−0.288
	(0.109)	(0.172)	(0.140)
Observations	1,332	1,332	1,332

Notes: The excluded class is less than high school. Standard errors are listed in parentheses. Instruments: sibling sex composition (i.e., fraction of female siblings under age 3 and between ages 3 and 6) and age–earnings profile (i.e., linear and quadratic terms of mother's and father's age when the child was five years old).

Table 3: Discount Factors and the Cost of Children

Marginal Utility of Income and Cost of Children		Discount Factors	
Variable	Estimates	Variable	Estimates
Family labor income	0.373	β	0.813
	(0.054)		(0.008)
Children × Family labor income	−0.309	λ	0.795
	(0.053)		(0.009)
Children × HS × Family labor income	0.055	υ	0.111
	(0.032)		(0.007)
Children × SC × Family labor income	0.082		
	(0.021)		
Children × COL × Family labor income	0.101		
	(0.056)		
Children × HS spouse × Family labor income	0.044		
	(0.046)		
Children × SC spouse × Family labor income	0.058		
	(0.055)		
Children × COL spouse × Family labor income	0.084		
	(0.048)		

Notes: Standard errors in parentheses. LHS: individual has less than a high-school education. HS: individual has completed high school but not attended college. SC: individual has completed more education than high school but is not a college graduate. COL: individual has at least a college degree.

Table 4: Intergenerational Correlation of Log Labor Earnings

	Individual Earnings		Family Earnings	
	Data	Model	Data	Model
Panel A: Father–Son				
Earnings at age 35†	0.251	0.146	0.317	0.159
	(0.099)	(0.033)	(0.094)	(0.035)
Average earnings from age 30 to 40‡	0.356	0.266	0.337	0.251
	(0.091)	(0.060)	(0.086)	(0.056)
Panel B: Mother–Daughter				
Earnings at age 35†	0.001	0.129	0.067	0.129
	(0.122)	(0.036)	(0.087)	(0.029)
Average earnings from age 30 to 40‡	−0.032	0.204	0.286	0.222
	(0.08)	(0.046)	(0.077)	(0.050)
Panel C: All				
Earnings at age 35†	–	–	0.175,4	0.143
	–	–	(0.064)	(0.032)
Average earnings from age 30 to 40‡	–	–	0.31	0.236
	–	–	(0.070)	(0.053)

Notes: Standard errors in parentheses. †Uses parent–child pairs at age 35. ‡Uses the average earnings for parent–child pairs when both are observed continuously between the ages of 30 and 40.

Table 5: Cumulative Decomposition Choices (Baseline, AM, AEP, and RTE)

		CF0				AM				AEP				RTE			
	Fem.	Male Education				Male Education				Male Education				Male Education			
Variable	Edu.	<HS	HS	SC	Col	<HS	HS	SC	Col	<HS	HS	SC	Col	<HS	HS	SC	Col
MALE Home Time	<HS	1.67	1.85	0.92	1.37	1.43	1.58	0.85	1.34	1.54	1.39	0.71	1.06	1.60	1.73	0.89	1.35
	HS	1.89	1.19	1.38	1.31	1.90	1.16	1.33	1.31	1.67	1.10	1.54	1.47	1.66	1.18	1.46	1.65
	SC	1.90	1.30	1.50	1.78	1.11	1.25	1.52	1.81	1.54	1.29	1.46	1.78	1.27	1.33	1.62	1.91
	Col	0.78	1.16	1.15	1.49	0.94	1.37	1.23	1.50	1.11	1.11	1.12	1.48	1.19	1.22	1.23	1.66
FEMALE Home Time	<HS	4.16	4.45	3.93	4.18	4.45	4.44	4.23	4.02	4.34	4.55	4.63	4.64	4.16	4.64	4.68	4.22
	HS	4.40	4.52	4.75	4.73	4.37	4.63	4.76	4.63	4.45	4.60	4.75	4.66	4.37	4.66	4.99	4.76
	SC	3.97	4.33	4.70	4.64	4.13	4.46	4.82	4.72	4.02	4.45	4.89	4.70	3.92	4.54	4.87	4.98
	Col	5.13	4.69	4.62	4.79	4.89	4.68	4.63	4.81	5.09	4.89	4.77	4.92	4.45	4.85	4.84	5.00
Birth	<HS	0.12	0.10	0.09	0.06	0.10	0.09	0.08	0.05	0.13	0.10	0.08	0.06	0.11	0.09	0.06	0.04
	HS	0.11	0.10	0.09	0.06	0.10	0.09	0.07	0.05	0.11	0.09	0.08	0.04	0.10	0.08	0.07	0.04
	SC	0.10	0.09	0.08	0.06	0.09	0.08	0.07	0.05	0.11	0.09	0.07	0.04	0.09	0.08	0.06	0.03
	Col	0.11	0.09	0.07	0.05	0.11	0.08	0.07	0.05	0.12	0.08	0.06	0.04	0.11	0.07	0.05	0.03
Number of Children	<HS	2.78	2.38	1.97	1.48	2.42	2.16	1.90	1.21	2.85	2.17	1.77	1.34	2.65	2.05	1.44	1.04
	HS	2.65	2.28	1.93	1.39	2.46	2.04	1.74	1.26	2.62	2.17	1.78	1.08	2.39	1.93	1.56	0.98
	SC	2.32	2.16	1.85	1.29	2.09	1.97	1.64	1.17	2.46	2.10	1.72	1.05	2.12	1.85	1.47	0.85
	Col	2.48	1.96	1.65	1.16	2.53	1.88	1.50	1.07	2.51	1.84	1.49	0.95	2.37	1.57	1.17	0.74
MALE: LS Part Time	<HS	0.04	0.07	0.02	0.06	0.03	0.04	0.00	0.04	0.04	0.03	0.01	0.04	0.04	0.04	0.01	0.06
	HS	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.03	0.04	0.04	0.02	0.04	0.03	0.03	0.02	0.05
	SC	0.05	0.03	0.02	0.03	0.04	0.03	0.02	0.03	0.04	0.03	0.02	0.04	0.05	0.03	0.02	0.04
	Col	0.01	0.03	0.02	0.04	0.01	0.02	0.02	0.04	0.00	0.03	0.02	0.04	0.02	0.03	0.02	0.04
MALE: LS Full Time	<HS	0.88	0.91	0.95	0.89	0.91	0.93	0.97	0.90	0.93	0.92	0.94	0.87	0.90	0.94	0.98	0.92
	HS	0.91	0.94	0.95	0.95	0.90	0.95	0.96	0.95	0.90	0.94	0.95	0.94	0.90	0.94	0.96	0.94
	SC	0.87	0.95	0.95	0.95	0.87	0.95	0.96	0.95	0.81	0.95	0.96	0.95	0.85	0.94	0.96	0.94
	Col	0.98	0.96	0.96	0.95	0.98	0.96	0.95	0.95	0.94	0.95	0.96	0.94	0.91	0.95	0.95	0.94
MALE: LS Part. Rate	<HS	0.92	0.98	0.97	0.95	0.94	0.97	0.97	0.95	0.97	0.95	0.95	0.91	0.95	0.98	0.99	0.98
	HS	0.95	0.98	0.98	0.99	0.93	0.98	0.98	0.98	0.95	0.98	0.98	0.98	0.94	0.98	0.98	0.98
	SC	0.92	0.98	0.98	0.99	0.91	0.98	0.98	0.99	0.86	0.98	0.98	0.98	0.90	0.97	0.98	0.98
	Col	0.98	0.99	0.98	0.98	0.98	0.98	0.97	0.98	0.94	0.98	0.98	0.98	0.94	0.97	0.98	0.98
FEMALE: LS Part Time	<HS	0.10	0.16	0.13	0.15	0.09	0.15	0.15	0.14	0.12	0.15	0.10	0.13	0.10	0.14	0.12	0.13
	HS	0.13	0.14	0.15	0.17	0.13	0.14	0.15	0.18	0.12	0.14	0.15	0.20	0.13	0.14	0.16	0.20
	SC	0.16	0.14	0.15	0.18	0.14	0.14	0.15	0.18	0.16	0.14	0.15	0.20	0.16	0.14	0.16	0.20
	Col	0.10	0.15	0.16	0.18	0.09	0.14	0.15	0.18	0.09	0.15	0.16	0.20	0.10	0.14	0.17	0.20
FEMALE: LS Full Time	<HS	0.20	0.20	0.27	0.26	0.16	0.19	0.19	0.32	0.17	0.21	0.25	0.28	0.17	0.22	0.25	0.35
	HS	0.18	0.19	0.22	0.25	0.17	0.19	0.22	0.25	0.19	0.19	0.23	0.29	0.18	0.21	0.25	0.32
	SC	0.19	0.20	0.22	0.26	0.17	0.20	0.23	0.26	0.17	0.20	0.23	0.30	0.19	0.22	0.27	0.37
	Col	0.27	0.21	0.24	0.29	0.26	0.22	0.25	0.30	0.25	0.22	0.27	0.34	0.19	0.28	0.35	0.44
FEMALE: LS Part. Rate	<HS	0.31	0.35	0.40	0.40	0.25	0.34	0.34	0.46	0.29	0.36	0.35	0.41	0.27	0.36	0.36	0.48
	HS	0.31	0.33	0.37	0.42	0.31	0.34	0.37	0.42	0.31	0.34	0.39	0.49	0.31	0.35	0.40	0.52
	SC	0.34	0.34	0.37	0.43	0.32	0.34	0.38	0.44	0.33	0.34	0.38	0.50	0.35	0.36	0.42	0.57
	Col	0.37	0.36	0.40	0.47	0.35	0.36	0.40	0.48	0.33	0.37	0.43	0.54	0.29	0.43	0.52	0.64

Notes: CF0: This is the baseline model. AM: This adds assortative mating to the base model. AEP: This adds the age–earnings profile to AM. RTE: This adds the labor-market experience to AEP. Fem. Edu.: Female education. LS: Labor supply. Part. Rate: Participation rate. The four categories of education are <HS (less than high school), HS (high school completed), SC (some college) and Col (college and above).

Table 6: Cumulative Decomposition Choices continue (RTE, FTPT, UC, and NA)

		RTE				FTPT				UC				NA			
	Fem.	Male Education				Male Education				Male Education				Male Education			
Variable	Edu.	<HS	HS	SC	Col	<HS	HS	SC	Col	<HS	HS	SC	Col	<HS	HS	SC	Col
MALE Home Time	<HS	1.60	1.73	0.89	1.35	0.71	1.41	0.31	0.61	1.10	1.69	1.38	0.00	0.61	1.41	0.31	0.61
	HS	1.66	1.18	1.46	1.65	1.45	1.01	1.14	1.26	1.16	1.32	1.63	1.83	1.45	1.01	1.14	1.26
	SC	1.27	1.33	1.62	1.91	1.02	1.00	0.96	1.53	1.29	1.41	1.73	1.91	1.00	1.00	0.96	1.53
	Col	1.19	1.22	1.23	1.66	0.40	1.30	1.05	1.58	0.45	1.28	1.28	1.69	0.40	1.30	1.05	1.58
FEMALE Home Time	<HS	4.16	4.64	4.68	4.22	4.84	4.59	4.59	3.52	4.98	4.96	4.58	3.93	4.91	4.59	4.59	3.52
	HS	4.37	4.66	4.99	4.76	4.26	4.74	4.98	4.93	4.48	4.72	4.93	4.78	4.26	4.74	4.97	4.93
	SC	3.92	4.54	4.87	4.98	3.79	4.66	5.06	4.95	3.89	4.43	4.83	4.73	3.80	4.66	5.06	4.95
	Col	4.45	4.85	4.84	5.00	5.01	5.00	5.13	5.14	5.33	4.65	4.71	4.79	5.01	5.00	5.13	5.14
Birth	<HS	0.11	0.09	0.06	0.04	0.08	0.07	0.04	0.02	0.04	0.04	0.01	0.01	0.08	0.07	0.04	0.02
	HS	0.10	0.08	0.07	0.04	0.09	0.06	0.04	0.02	0.06	0.06	0.05	0.03	0.09	0.06	0.04	0.02
	SC	0.09	0.08	0.06	0.03	0.08	0.05	0.03	0.01	0.06	0.07	0.06	0.05	0.08	0.05	0.03	0.01
	Col	0.11	0.07	0.05	0.03	0.10	0.04	0.02	0.01	0.08	0.07	0.06	0.06	0.10	0.04	0.02	0.01
Number of Children	<HS	2.65	2.05	1.44	1.04	1.95	1.61	0.94	0.41	0.99	0.88	0.31	0.16	1.94	1.61	0.94	0.41
	HS	2.39	1.93	1.56	0.98	2.19	1.45	0.93	0.42	1.42	1.40	1.16	0.87	2.19	1.45	0.94	0.42
	SC	2.12	1.85	1.47	0.85	1.83	1.27	0.82	0.30	1.45	1.65	1.46	1.26	1.83	1.27	0.82	0.30
	Col	2.37	1.57	1.17	0.74	2.05	0.96	0.48	0.24	1.79	1.65	1.46	1.56	2.05	0.96	0.48	0.24
MALE: LS Part Time	<HS	0.04	0.04	0.01	0.06	0.20	0.22	0.06	0.05	0.01	0.05	0.01	0.05	0.22	0.22	0.06	0.05
	HS	0.03	0.03	0.02	0.05	0.26	0.17	0.08	0.08	0.03	0.04	0.03	0.05	0.26	0.17	0.08	0.08
	SC	0.05	0.03	0.02	0.04	0.23	0.13	0.06	0.05	0.04	0.03	0.02	0.03	0.24	0.13	0.06	0.05
	Col	0.02	0.03	0.02	0.04	0.21	0.08	0.03	0.05	0.01	0.03	0.02	0.03	0.21	0.08	0.03	0.05
MALE: LS Full Time	<HS	0.90	0.94	0.98	0.92	0.70	0.73	0.90	0.90	0.90	0.87	0.97	0.89	0.68	0.73	0.90	0.90
	HS	0.90	0.94	0.96	0.94	0.67	0.80	0.90	0.90	0.89	0.93	0.95	0.93	0.67	0.80	0.90	0.90
	SC	0.85	0.94	0.96	0.94	0.63	0.84	0.92	0.92	0.86	0.95	0.96	0.95	0.63	0.84	0.92	0.92
	Col	0.91	0.95	0.95	0.94	0.73	0.90	0.94	0.93	0.98	0.95	0.96	0.96	0.73	0.90	0.94	0.93
MALE: LS Part. Rate	<HS	0.95	0.98	0.99	0.98	0.90	0.95	0.97	0.95	0.90	0.92	0.97	0.94	0.90	0.95	0.97	0.95
	HS	0.94	0.98	0.98	0.98	0.93	0.97	0.98	0.98	0.92	0.97	0.98	0.98	0.93	0.97	0.98	0.98
	SC	0.90	0.97	0.98	0.98	0.86	0.97	0.98	0.98	0.90	0.98	0.98	0.98	0.87	0.97	0.98	0.98
	Col	0.94	0.97	0.98	0.98	0.94	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.94	0.98	0.98	0.98
FEMALE: LS Part Time	<HS	0.10	0.14	0.12	0.13	0.14	0.17	0.20	0.22	0.18	0.21	0.27	0.29	0.14	0.17	0.20	0.22
	HS	0.13	0.14	0.16	0.20	0.15	0.16	0.19	0.26	0.14	0.16	0.17	0.20	0.15	0.16	0.19	0.26
	SC	0.16	0.14	0.16	0.20	0.15	0.17	0.20	0.24	0.16	0.14	0.16	0.16	0.15	0.17	0.20	0.24
	Col	0.10	0.14	0.17	0.20	0.13	0.18	0.19	0.22	0.15	0.15	0.14	0.15	0.13	0.18	0.19	0.22
FEMALE: LS Full Time	<HS	0.17	0.22	0.25	0.35	0.20	0.24	0.31	0.51	0.25	0.30	0.44	0.55	0.19	0.24	0.31	0.51
	HS	0.18	0.21	0.25	0.32	0.19	0.27	0.35	0.46	0.28	0.26	0.31	0.36	0.19	0.27	0.35	0.46
	SC	0.19	0.22	0.27	0.37	0.22	0.30	0.39	0.54	0.24	0.26	0.28	0.31	0.22	0.30	0.39	0.54
	Col	0.19	0.28	0.35	0.44	0.24	0.41	0.54	0.63	0.24	0.29	0.32	0.31	0.24	0.41	0.54	0.63
FEMALE: LS Part. Rate	<HS	0.27	0.36	0.36	0.48	0.33	0.41	0.51	0.73	0.43	0.50	0.71	0.84	0.33	0.41	0.51	0.73
	HS	0.31	0.35	0.40	0.52	0.33	0.42	0.54	0.72	0.42	0.42	0.48	0.56	0.33	0.42	0.54	0.72
	SC	0.35	0.36	0.42	0.57	0.37	0.47	0.59	0.79	0.41	0.40	0.44	0.47	0.37	0.47	0.58	0.79
	Col	0.29	0.43	0.52	0.64	0.37	0.59	0.73	0.84	0.40	0.44	0.46	0.46	0.37	0.59	0.73	0.84

Notes: RTE: This adds the labor-market experience to AEP. FTPT: This adds returns to full- vs. part-time work to RTE. UC: This adds the effect of education on the direct child-raising cost to FTPT. NA: This adds parental education to the production function in FTPT. Fem. Edu.: Female education. LS: Labor supply. Part. Rate: Participation rate. The four categories of education are <HS (less than high school), HS (high school completed), SC (some college) and Col (college and above).

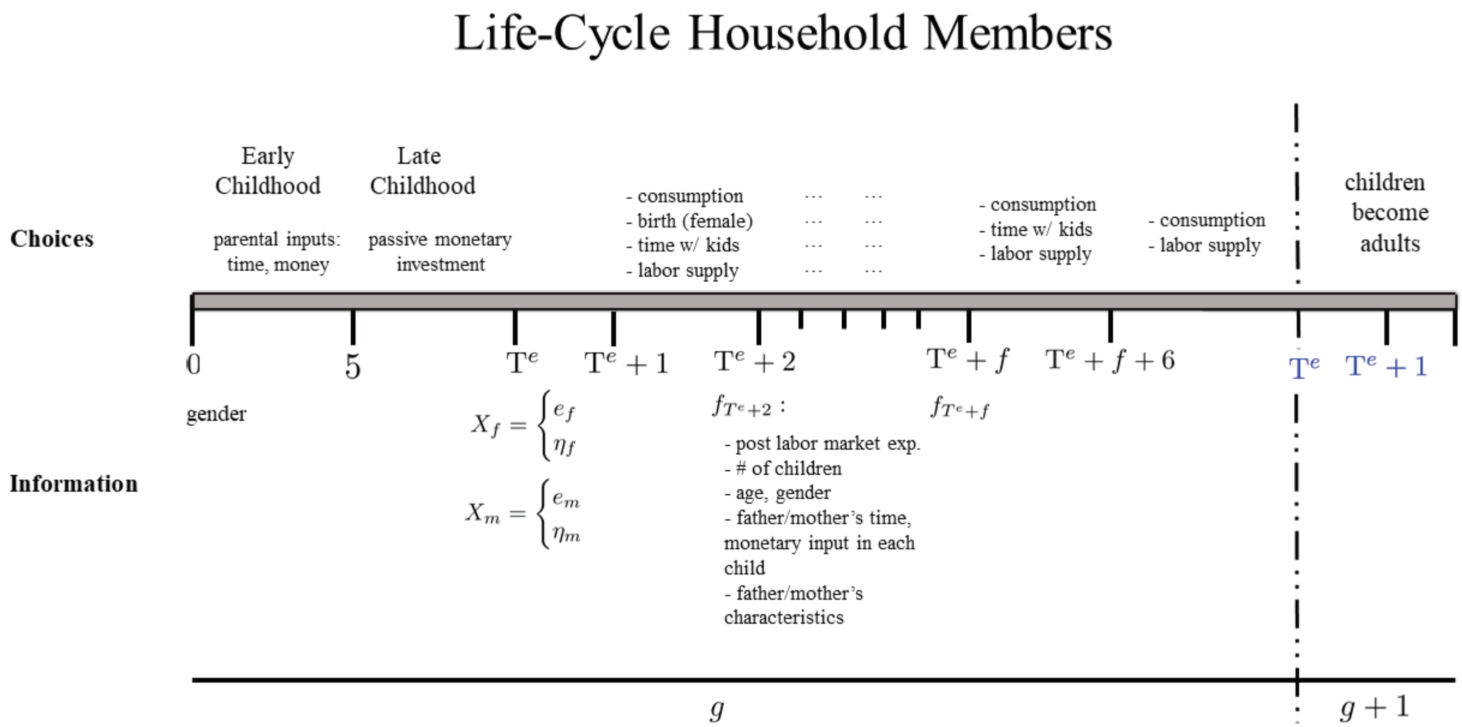

Figure 1: The model's timeline.

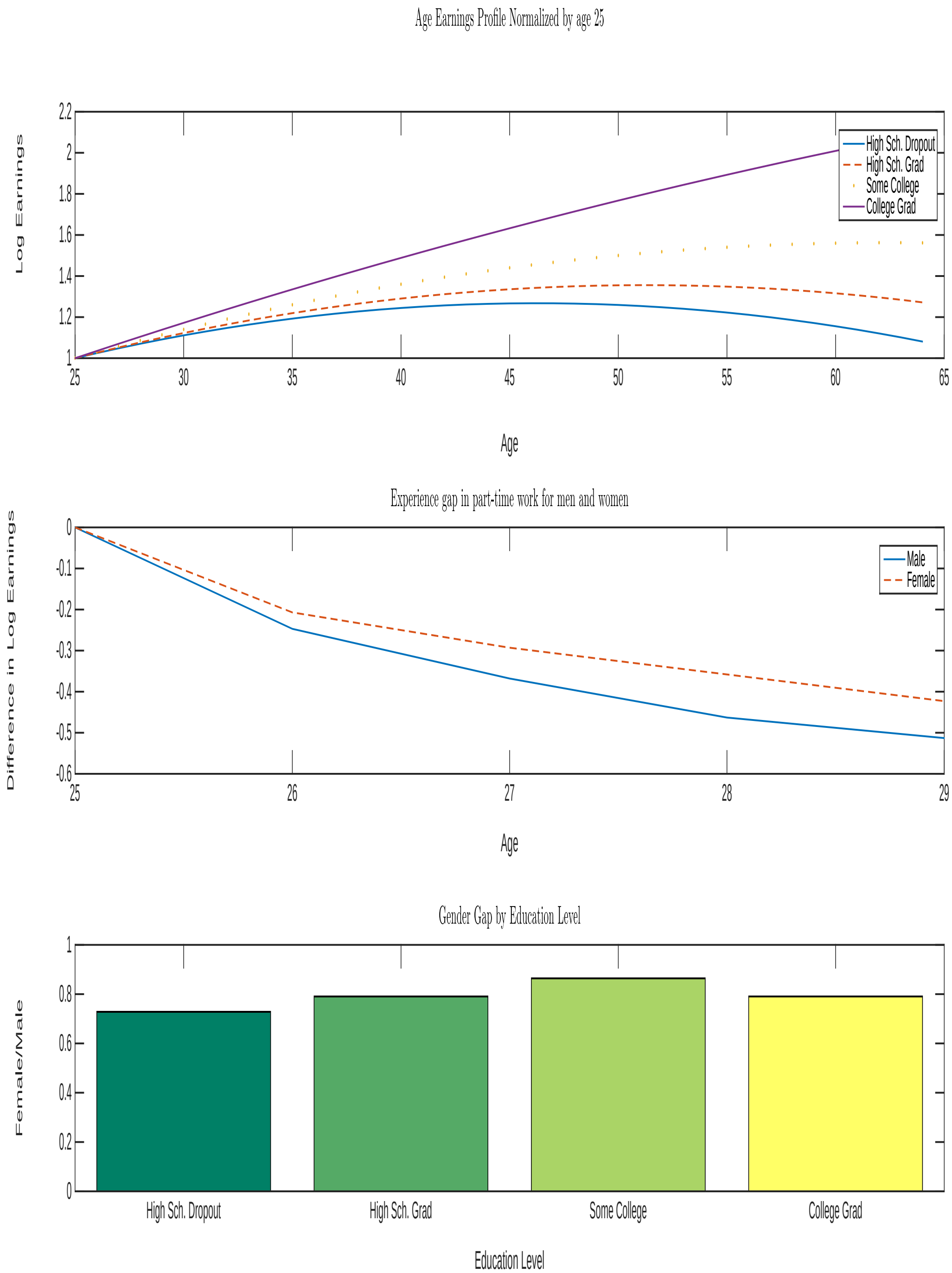

Figure 2: Education and gender earnings gaps. The top panel presents the estimated age–earnings profile by education group. The middle panel shows earning penalties of part-time versus full-time employment by gender and age. The bottom panel presents the average gender earnings gap, measured as the ratio of the average woman's earnings to the average man's earnings, by education groups.

Figure 3: Figure shows the intergenerational correlation between family income predicted by the model under the following counterfactuals. CF0: This is the baseline model. AM: This adds assortative mating to the baseline model. AEP: This adds the age–earnings profile to AM. RTE: This adds the labor-market experience to AEP. FTPT: This adds returns to full- vs. part-time work to RTE. UC: This adds the effect of education on the direct child raising cost to FTPT. NA: This adds parental education to the production function to FTPT.

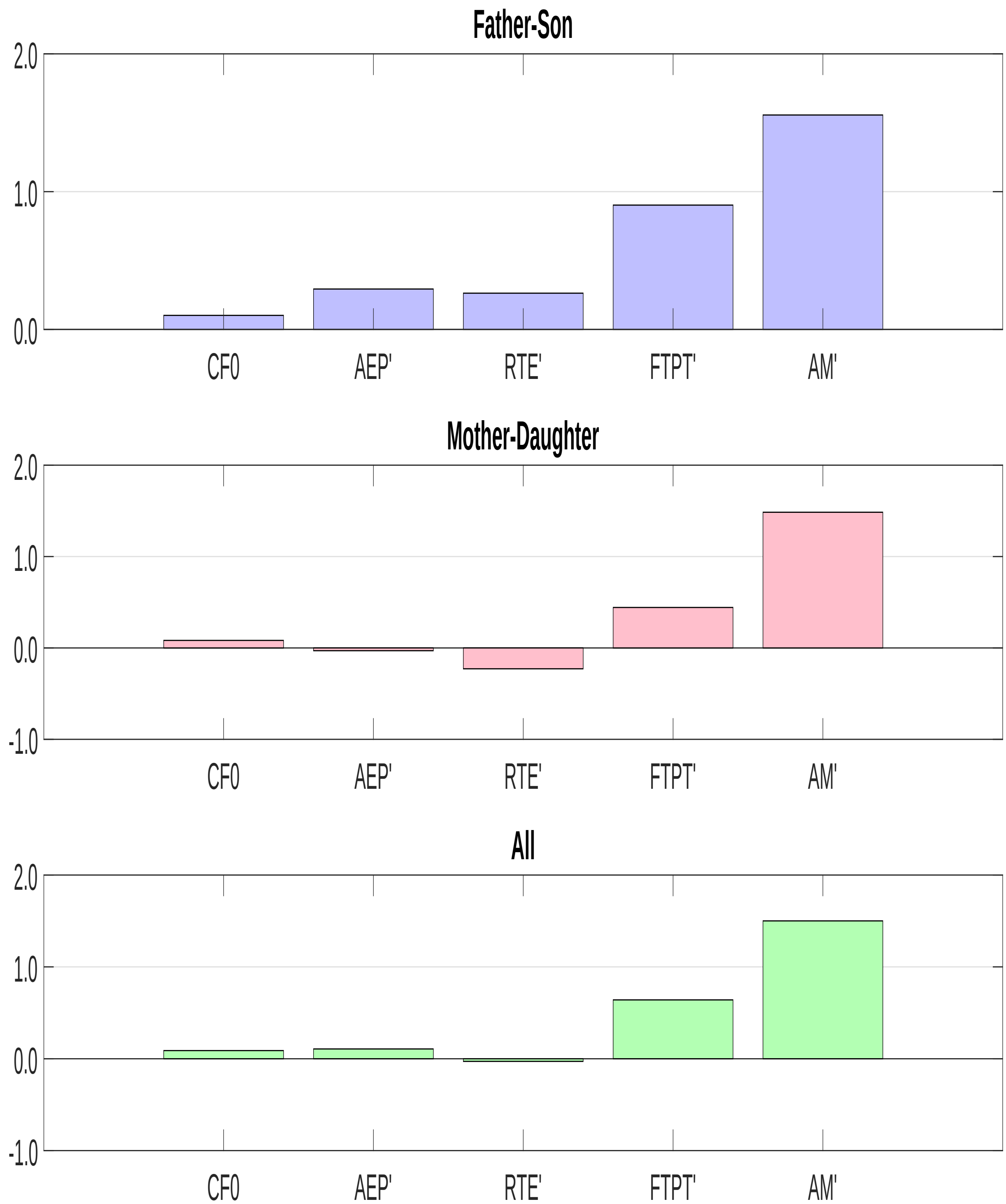

Figure 4: Figure shows the intergenerational correlation between family income predicted by the model under the following counterfactuals. CF0: This is the baseline model. AEP′: This adds the age–earnings profile to the baseline model. RTE′: This adds the labor-market experience to AEP′. FTPT′: This adds returns to full- vs. part-time work to RTE′. UC′: This adds the effect of education on the direct child-raising cost to FTPT′. AM′: This adds assortative mating to FTPT.

Supplement to "What is the Source of the Intergenerational Correlation in Earnings?"

In these online appendices, we (i) describe our estimation algorithm, (ii) present additional structural parameter and results tables, (iii) describe a set of additional counterfactual simulation results that demonstrate the robustness of our main results, and (iv) present tables of first-stage estimates that are used in the estimation of the structural parameters.

A Details of the estimation procedure and implementation

The estimation proceeds in 4 steps. In **step 1** the (i) earnings equation (Table C.2), (ii) intergenerational education production function (Table 2), and (iii) the marriage market matching function at age 25 (Tables C.4-C.9) are estimated. In **step 2** CCP for household choices (Tables C.10- C.16) are estimated. These estimated functions use the actual variables (wages, education outcomes of the children, spouse outcomes and the parental choices for the respective equations) in the data as the dependent variables. Also the explanatory variables of those functions include family (individual) characteristics and past and current choices. Therefore in the structural model, those explanatory variables are endogenously generated and supplied to these functions. The outcomes are just calculated by using the estimated coefficients of these functions whenever they are required. In **step 3** the alternative value function representation, the estimates from steps 1 and 2, and the Hotz et al. (1994)'s forward simulation technique are used to estimate the household continuation value for each age in the life-cycle. In **step 4** the Hotz-Miller (1993) inversion is used to form moment conditions for a generalized method of moment (GMM) estimation of the utility function parameters and discount factors.

A.1 Step 1

Estimation of the education production function, since its estimation itself is an important contribution, discussed in detail in the main text. So below estimation of earnings equation and marriage matching function will be summarized.

A.1.1 Estimation of the Earnings Equation

The earnings equation is estimated using a GMM dynamic panel data using choices as instruments, as in Altug and Miller (1998), Blundell and Bond (1998), among others. The earnings for a male (female) individual depends on education, experience, and innate ability (see section 2.1 in the paper). Observed earnings are assumed to be noisy measures of individual's actual earnings in the labor market as:

$$\ln w_{f(m)t} = W_{f(m)t}(e, h_{f(m)t}) + H_{f(m)t}(h_{f(m)T^e+1}, \ldots, h_{f(m)t-1}) + \eta_{f(m)} + \epsilon_{f(m)t} \tag{A.1}$$

The error term in (A.1) is conditionally independent over individuals, the covariates in the earnings equation and the current and past part-time full-time labour supply decisions defined in $W_{f(m)t}$ and $H_{f(m)t}$. Since the error term enters log earnings linearly and is independent of any variables known at time t, including current labour supply, this representation for earnings allows us to circumvent the selection. In the estimation the past labor-market experience is only relevant for the past 4 years given that the effect of experience with higher lags is insignificant.

The functions $W_{f(m)t}$ and $H_{f(m)t}$ are linear in their arguments and therefore the first difference of equation (A.1) gives

$$\Delta\epsilon_{f(m)t} = \Delta \ln w_{f(m)t} - \Delta x'_{1,f(m)t}\Pi_1 - \Delta x'_{2,f(m)t}\Pi_2 \tag{A.2}$$

where the vectors x_1 and x_2 collects the variables age squared, age and education interactions, and current labor supply decision (full-time dummy) in the former and the past full-time and part-time decisions for the male and female separately for the later. This equation is estimated using generalized method moments (GMM) estimation with the optimal instruments, using the conditional independence of the disturbances with the covariates. The $M \times 1$ parameter vector to be estimated can be written as $\Pi = (\Pi_1', \Pi_2')'$. Define the $T - T^e$ dimensional vector Y_n, the $(T - T^e) \times M$ dimensional matrix X_n, and the square $T - T^e$ matrix W_n as:

$$Y_n = (\Delta \ln w_{f(m),T^e+2}, .., \Delta \ln w_{f(m)T})' \quad \text{(A.3a)}$$

$$X_n = \begin{bmatrix} \Delta x_{1,f(m),T^e+2} & \Delta x_{2,f(m),T^e+2} \\ \vdots & \vdots \\ \Delta x_{1,f(m)T} & \Delta x_{2,f(m)T} \end{bmatrix} \quad \text{(A.3b)}$$

$$\Delta\epsilon_{f(m)} = (\Delta\epsilon_{f(m),T^e+2}, \ldots, \Delta\epsilon_{f(m)T})' \quad \text{(A.3c)}$$

$$W_n = E[(Y_n - X_n'\Pi)(Y_n - X_n'\Pi)' \mid X_n] \quad \text{(A.3d)}$$

The GMM estimator with lowest asymptotic covariance within this class is obtained as:

$$\hat{\Pi}_{GMM} = \left[N^{-1} \textstyle\sum_{n=1}^{N} X_n' \hat{W}_n X_n\right]^{-1} \left[N^{-1} \textstyle\sum_{n=1}^{N} X_n' \hat{W}_n Y_n\right] \quad \text{(A.4)}$$

where $\hat{W}_n$ is any consistent estimate of W_n (See Robinson (1987) for example).

A.1.2 Marriage Market Matching Function

Our model is a unitary household model. Parents decide on the number and also the spacing of the children in their life-cycle. For the completeness of the model in terms of generations of households, we need to construct the type of families formed for the children's generation. However this is an endogenous outcome in the model as it depends on the existence of the child in the first place. Secondly the gender and education of the child matters in the type of family he/she will form. The matching equations are required to match the children to their spouses in the second generation which completes the dynastic model.

The marriage market matching function is estimated at age 25 to abstract from the completed education considerations. Therefore depending on the characteristics of the adult child prior to age 25, the following equations are estimated: (i) Probability of husband's labor-market history (Table C.4); (ii) Probability of husband's education (Table C.5); (iii) Probability of husband's age group (Table C.6); (iv) Probability of wife's labor-market history (Table C.7); (v) Probability of wife's education (Table C.8); (vi) Probability of wife's age group (Table C.9). The estimation results are given in Appendix C of the paper. Obviously if the child is a female, only (i), (ii) and (iii) are estimated, and (iv), (v) and (vi) are estimated if the child is a male. Of those equations, the husband (wife)'s labor-market history is estimated using multinomial logit with not working, working part-time and working full-time as the discrete choices of the spouse. The variables used in the specification are age, education, number of all and only female children of the wife (husband), ages of the first 4 children of the wife (husband), wife (husband)'s time spent to the first 4 children and past 4 years of labor supply of the wife (husband); age group and education of the husband (wife), and also depending on which labor supply history is being estimated, the husband (wife)'s labor supply decisions of the previous years are used. For instance in the estimation of labor supply in year $(t-2)$, the labor supply decisions of the husband (wife) in years $(t-3)$ and $(t-4)$ are used. This is a consequence of the conditioning used in the estimation. Instead of estimating a big joint distribution of the husband (wife)'s characteristics, each of them are estimated as conditional probability distributions. Therefore husband (wife)'s labor-market history is estimated conditional on husband (wife)'s age and education as can be seen from the variable list mentioned. Similarly, husband (wife)'s education is estimated using multinomial logit with less than high school, high school, some college and college as the outcomes conditional on the same list of variables of the wife (husband) and education of the husband (wife). Finally husband (wife)'s age is estimated as a group variable using multinominal logit with the age span from 18 to 60 grouped into 8 age brackets conditional on the same list of variables of the wife (husband).

A.2 Step 2

Conditional choice probabilities are estimated using multinomial logit specification. The estimation results are given in Appendix C of the paper. The choice set that is feasible for the husband (wife) in a particular age can vary in the model depending on the state variable (i.e. wife (husband) can only spend time with their child if they have one already or if they choose to have one in the current period in case they don't have one already). Therefore all possible choice sets that wife (husband) can encounter in the life-cycle are estimated conditional on the state. This leads us to estimate 2 specifications for the husband; (i) husband with young children (9 choices) and (ii) husband without young children (3 choices which are just the labor supply decisions). In the estimation of the probabilities of husband with young children (Table C.10), husband has 9 choices as a combination of 3 discrete labor supply and 3 discrete time investment choices. Table C.11 estimates the multinomial logit specification with no work, part-time and full-time work as the choices, this is the estimation for the husband without young children case. The estimation equations use age, education, number of all and only female children of the husband, ages of the first 4 children of the husband, husband's time spent to the first 4 children, past 4 years of labor supply of the husband; age, education of the wife, wife's time spent to the first 4 children and past 4 years of labor supply of the wife as the covariates.

For the wife, there are 4 possible states in the life-cycle being in which leads to different choice sets. Those specifications of the states for the wife are; (i) infertile wife without young children (3 choices, Table C.12), (ii) infertile wife with young children (6 choices, Table C.13), (iii) fertile wife without young children (10 choices, Table C.14), (iv) fertile wife with young children (16 choices, Table C.15). Our model is based on households so we actually need to estimate the CCP for the household choices. Again as we did in the estimation of the matching function, we condition the wife CCP equations on the husband's choices. Therefore instead of estimating the joint distribution, we estimate the marginal (husband) and the conditional (wife) CCP equations. This is the reason for having husband choices in the wife CCP estimations. We also estimated one final CCP equation; fertile wife without young children (10 choices, Table C.15). This equation is not conditioned on the husband choices since this is used in the first period of the adult female child. Same set of covariates are used in all equations whenever they are feasible.

A.3 Step 3

In **step 3** the alternative value function representation, the estimates from steps 1 and 2, and the Hotz et al. (1994)'s forward simulation technique are used to estimate the household continuation value for each age in the life-cycle. Step 3 has some important intermediate steps that allows us to construct the continuation value. Starting with the alternative value function representation, those steps will be explained below.

A.3.1 Alternative value function representation

Equation (2) and equation (3) characterize the valuation functions of the problem. However to facilitate the estimator we need to find an alternative representation for the conditional valuation functions of the problem at any given t (adult age) in the life-cycle. The conditional valuation function in period t is defined as the value to the family of choosing a particular choice a_t net of the period preference shock ε_{a_t}. These functions can be written in terms of the model utility function parameters, discount factors and the estimated quantities from step 1 and step 2. The alternative representations for the conditional valuation functions for life-cycle problems with discrete choices were developed in Hotz and Miller (1993). Though not trivial but the dynastic life-cycle model can be shown to have alternative representations in the same spirit (Gayle et al., 2018b). Therefore relying on this representation, we form alternative valuation functions for the dynastic life cycle problem in terms of the utility function parameters, discount factors and the estimated quantities from step 1 and step 2 above.

In practice, we need to construct the conditional valuation function for every single observation from the data. Let be clear about what is meant by a single observation. There are N individuals we observe over years. The number of years we observe the individuals can vary. This means that we may be observing an individual from age 25 to 30 (6 years), and another one from age 25 to 45 (21 years). We set the number of years of data from age 25 to 55 (31 years). Therefore from a theoretical perspective, we may have an individual who we observe from age 25 to 55. However in reality we will have observations fitting into some part of this age range for a particular individual. A single observation is a particular age observation for the *nth* individual. This observation will include the state vector z_{nt} (state vector now also indexed by n to represent its dependence on the *nth* individual). Given z_{nt}, we will construct the conditional valuation functions for the individual using the forward simulation.

A.3.2 Forward simulation

The utility function is given as $u_{a_t}(z_{nt}) + \varepsilon_{nt}$ for period t (which corresponds to the particular adulthood age). The first part of the utility is known if the state vector z_{nt} and the choice a_t are known up to an unknown parameter vector γ. Moreover the utility function is linear in the parameter vector γ by the specification. The model parameters are $\theta = (\beta, \lambda, \nu, \gamma)$, We need to calculate the expected value of future utilities in order to construct the utility from the lifetime of own action and consumption (which depends on the unknown parameter vector θ). Referring to equation (3), we denote the period t counterpart of the utility from the remaining lifetime of own action and consumption as:

$$V_t^i(z_{nt}) = E_t \left[\sum_{s=t}^{T} \beta^{s-t} \sum_{a_s \in A_s} I_{a_s}^o \{u_{a_s}(z_{ns}) + \varepsilon_{a_s}\} | z_{nt} \right]. \tag{A.5}$$

However in the above form calculating the expectation requires calculating all the optimal choices in any future period conditional on choosing optimally in the periods before. Therefore this is quite cumbersome. We use the forward simulation method of Hotz et al. (1994) to construct the conditional valuation functions by simulating a set of future paths starting from the value of z_{nt} in period t. In this algorithm we generate a realized state variable z_{ns} for each future period conditional on the accumulated information up to that point. Then conditional on the simulated state variable, we calculate the CCPs (probabilities of choosing each feasible action a_s in period s) for the household and simulate the optimal choice a_s^o for that period. In this way, we have $(T-t)$ choices and state vectors generated for the household starting with the state variable z_{nt} in period t. Then we repeat this algorithm n_g times to create more simulated outcomes for the same household. Using these n_g paths we construct the simulated counterpart of the equation in (A.5).

Similarly we denote the period t counterpart of the lifetime utility for a household with state z_{nt} at age T^e+t as follows (referring to equation (2), our problem is a dynastic life-cycle problem, therefore includes discounted value of generation $i+1$ lifetime utility):

$$U_t^i(z_{nt}) = V_t^i(z_{nt}) + \beta^{T-t}\lambda E_t\left[N_{Tf}^{1-v}\overline{U}^{i+1}|z_{nt}\right]. \tag{A.6}$$

Observe that forward simulation algorithm described above helps us to construct the first expression on the right-hand side of equation (A.6). However we still need to construct the object $\overline{U}^{i+1}$. This is achieved through applying a matrix inversion implied by the stationarity assumption. Then relying on the representation obtained, a simulated version of the lifetime utility can be obtained using the forward simulation algorithm. This inversion will be discussed next.

A.3.3 Inversion

We assumed that the lifetime utility for a type-(f,m) household at age T^e+1 is as follows

$$U^i(f,m) = V^i(f,m) + \beta^{T-T^e-1}\lambda E_{T^e+1}\left[N_{Tf}^{1-v}\overline{U}^{i+1}|f,m\right] \tag{A.7}$$

If we stack this equation over all possible states and replacing expectations with the appropriate transition functions and the CCPs, we can get a matrix version of equation (A.7). With the stationarity assumption we end up with U_0 in both sides:

$$U_0 = \textstyle\sum_{a\in A} P(a)\otimes[V(a)+E(a)+\lambda\beta^{T-T^e-1}N_{Tf}^{-\nu}M^o(a)U_0], \tag{A.8}$$

where $P(a)$ represents the vector of grant CCPs associated with the possible choices along a life-cycle path that starts at each state variable at period 0, $V(a)$ is the utility from the lifetime of own action and consumption conditional on choosing life-cycle action a. $M^o(a)$ represents the intergenerational transition conditional on a. As one can see, this representation is a vital in the proposed estimation method and has been developed in Gayle et al. (2018b). Therefore equation (A.8) is used for solving the vector U_0.

A.4 Step 4

Finally, in **step 4** the Hotz-Miller (1993) inversion is used to form moment conditions for a generalized method of moment (GMM) estimation of the utility function parameters and discount factors. A brief sketch of this inversion and the GMM estimator are explained below.

The moment conditions in our framework can be obtained from the differences in the estimated and the model implied conditional valuation functions calculated for choice a_t versus choice a_t'. This representation is achieved using the one to one mapping between the CCPs and the model implied conditional valuation functions (Hotz-Miller inversion). Setting one of the choices as the base (first choice for instance), and assuming the preference shocks in the period utilities ε_{a_t} are extreme value type I distributed, we particularly obtain:

$$\xi_{nt,a_t}(\theta) = v_t(a_t, z_{nt}; \theta) - v_t(1, z_{nt}; \theta) - \ln(\frac{p(a_t, z_{nt})}{p(1, z_{nt})}) = 0 \quad (a_t \neq 1 \in A_t) \tag{A.9}$$

where $v_t(a_t, z_{nt}; \theta)$ represents the conditional valuation function from choosing action a_t in period t. The GMM estimator is obtained by forming the $(A_t - 1) \times (k)$ moment conditions for each of the ages from 25 to 55. (k) is the size of the instrument vector X_{nt}. Let $g_{nt,a_t}(\theta) \equiv X_{nt}.\xi_{nt,a_t}(\theta)$, so $g_{nt}(\theta) = (g_{nt,2}(\theta)', \ldots, g_{nt,A_t}(\theta)')'$ be the vector of the complete orthogonality conditions and let T_3 denote the set of periods for which the necessary conditions are valid.[33] Define and $g_n(\theta) = (g_{n,1}(\theta)', \ldots, g_{n,T_3}(\theta)')'$ as the vector of moment restrictions for a given individual over time. Similarly, define $\Phi(\theta) \equiv E_t[g_n(\theta) g_n(\theta)']$. Notice that the matrix $\Phi(\theta)$ is block diagonal with diagonal elements defined as $\Phi_t \equiv E_t[g_{nt}(\theta) g_{nt}(\theta)']$, and off-diagonal elements that are zero because $E_t[g_{nt}(\theta) g_{nt}(\theta)'] = 0$ for $s \neq t$, $s < t$. The $[(A_t - 1) \times (k)] \times [(A_t - 1) \times (k)]$ conditional heteroscedasticity matrix Φ_t associated with the individual specific errors $g_{nt}(\theta)$ is evaluated using a nonparametric estimator based on the estimated residuals, $g_{nt}(\theta)$, using an initial consistent estimator of θ. This estimator is similar to Robinson (1987) estimator except we use a kernel based nonparametric regressions instead of a nearest neighbor regression approach. To ensure none zero variance we trimmed the data. The optimal GMM estimator for, θ satisfies

$$\widehat{\theta}_{GMM} = \arg\min_{\theta} [1/N \sum_{n=1}^{N} g_n(\theta)]' \widehat{\Phi} [1/N \sum_{n=1}^{N} g_n(\theta)]. \tag{A.10}$$

Since the period utility function is linear in parameters, the above description of the moment conditions can be partially linearized conditional on some parameters of the model. This will further ease the estimation of the model. Therefore the GMM estimation can be conducted as a combination of a non-linear search for the parameters β, λ, ν and a linear OLS solution for the parameters γ for a given set of parameters $\beta^o, \lambda^o, \nu^o$.

[33] Note that T_3 does not have to be $38 (= 55 - 17)$ one can use less that 38 period in the final estimation. Reducing the number period in the final step will increase the computation speed of the estimator and the estimator will still be consistent but less efficient.

A.5 Additional Structural Estimation Results

Table A.1: Second stage estimates.

Variable	Estimates	Variable		Estimates
Discount factors		**Disutility/Utility of Choices**		
β	0.8132	Wife	Husband	
	(0.0078)	**Labor supply**		
λ	0.7953	No work	Part-time	0.0571
	(0.0093)			(0.0487)
υ	0.1111	No work	Full-time	0.2738
	(0.0068)			(0.0385)
Marginal Utility of Income		Part-time	No work	-1.8678
Family labor income	0.3730			(0.0441)
	(0.0535)	Part-time	Part-time	-0.7068
Children x Family labor income	-0.3094			(0.0515)
	(0.0525)	Part-time	Full-time	-0.4110
Children x HS x Family labor income	0.0552			(0.0457)
	(0.0321)	Full-time	No work	-0.5032
Children x SC x Family labor income	0.0820			(0.0613)
	(0.0210)	Full-time	Part-time	-0.9467
Children x COL x Family labor income	0.1007			(0.0557)
	(0.0556)	Full-time	Full-time	-0.1377
Children x HS spouse x Family labor income	0.0441			(0.0496)
	(0.0458)	**Time with children**		
Children x SC spouse x Family labor income	0.0576	Low	Medium	0.8340
	(0.0547)			(0.0417)
Children x COL Spouse x Family labor income	0.0839	Low	High	0.3726
	(0.0479)			(0.0344)
		Medium	Low	-0.0836
				(0.0415)
		Medium	Medium	0.2710
				(0.0304)
		Medium	High	0.1887
				(0.0532)
		High	Low	-0.2341
				(0.0473)
		High	Medium	0.6598
				(0.0536)
		High	High	-0.3787
				(0.0661)
		Birth		-0.1878
				(0.0675)

Notes: Standard errors in parentheses. LHS indicates completed education of less than high school; HS indicates completed education of high school but not college; SC indicates completed education of some college but not a graduate; COL indicates completed education of at least a college degree. The excluded choice is no work, no time with children, and no birth for both spouses.

Table B.1: Cumulative decomposition of the IGC.

	Single Effects							
	Model	CF0	AM	AEP	RTE	FTPT	UC	NA
Panel A: Father–son								
Family Labor Income								
Average: Age 30 to 40	0.251	0.0188	0.0343	0.0433	0.1603	0.3513	0.170	0.4222
	(0.056)	(0.019)	(0.020)	(0.020)	(0.036)	(0.079)	(0.038)	(0.095)
Panel B: Mother–daughter								
Family Labor Income								
Average: Age 30 to 40	0.222	0.0155	0.0444	0.0721	0.1404	0.3139	0.1291	0.4011
	(0.050)	(0.019)	(0.020)	(0.021)	(0.031)	(0.071)	(0.029)	(0.090)
Panel C: ALL								
Family Labor Income								
Average: Age 30 to 40	0.236	0.0165	0.0394	0.0566	0.1455	0.3292	0.1469	0.4086
	(0.053)	(0.013)	(0.014)	(0.014)	(0.032)	(0.074)	(0.033)	(0.092)

B Additional Counterfactual Simulation Results

In this appendix we present additional counterfactual simulation results.

B.1 Model Fit

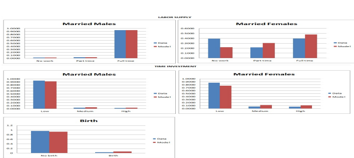

Figure B.1: Data versus Model Frequencies of Endogenous Choices.

Table B.2: An alternative cumulative decomposition of the IGC

Single Effects						
	Model	CF0	AEP′	RTE′	FTPT′	AM′
Panel A: Father–son						
Family Labor Income						
Average: Age 30 to 40	0.251	0.0188	0.0623	0.1438	0.2118	0.3513
	(0.056)	(0.019)	(0.022)	(0.032)	(0.047)	(0.079)
Panel B: Mother–daughter						
Family Labor Income						
Average: Age 30 to 40	0.222	0.0155	-0.0155	0.0386	0.0843	0.3139
	(0.050)	(0.019)	(0.02)	(0.023)	(0.032)	(0.071)
Panel C: ALL						
Family Labor Income						
Average: Age 30 to 40	0.236	0.0165	0.0168	0.0803	0.1352	0.3292
	(0.053)	(0.013)	(0.015)	(0.018)	(0.030)	(0.074)

CF0: Baseline. AEP′: Age–earnings profile. RTE′: Labor-market experience. FTPT′: Part versus full time. AM′: Assortative mating.

B.2 Main Simulation in Tabular Form

CF0: Baseline. AM: Assortative mating. AEP: Age–earnings profile. RTE: Labor-market experience. FTPT: Part versus full time. UC: Education effect of direct cost. NA: Parental education in the production function.

B.3 The Effect of Assortative Mating

B.4 Isolating the Effects of the Different Factors

In an alternative approach to access the effect of each potential factor, each one of the counterfactuals 1-5 adds back one element at a time to the baseline counterfactual. Our model is highly nonlinear and therefore, the different factors in the model interact in nontrivial ways and the effects are not additive. To isolate the effect of the different factors affecting the correlation, we add each factor separately to the baseline counterfactual and report the impact in Table B.3. Counterfactual 1 (CF1) adds back the *assortative mating* function in the data. It isolates the effect of assortative mating on the observed choices and intergenerational correlations in incomes. Counterfactual 2 (CF2) adds back the estimated age–earnings relationship into the earnings equations. Thus, it measures the age effect on earnings in the observed correlation. Counterfactual 3 (CF3) adds to CF0 the estimated *returns to labor-market experience* the earnings equation. Counterfactual 4 (CF4) adds the estimated *returns to full-time versus part- time* work to the earnings equation to CF0. Counterfactual 5 (CF5) adds back the direct monetary cost of children estimates which vary by education group. Counterfactual 6 (CF6) adds back the effect of education in the education production function, that is the effect of "nature," to CF0.

Table B.3 presents the results of the correlations when each factor is added to counterfactual 0 in isolation. In counterfactual 0 the correlations are small, it can create less than 6% of the observed correlations in family average incomes between ages 30-40. Counterfactual 1 adds assortative mating. It generates about 10% of the observed correlation in earnings in families of sons and 15% for families of mothers- and daughters. Counterfactual 2 introduces deterministic age–earnings component to the earnings equation. It potentially affects labor supply, and time with children by changing the opportunity costs of time over the life-cycle, and it can also affect fertility decisions, timing and spacing of children. For families of fathers and sons it increases the correlation to 0.068 explaining about 20% of the observed correlations; however, it reduces the correlation (to negative though insignificant) for families of mothers and daughters. The third counterfactual adds learning by doing (returns to labor-market experience). It introduced dynamics to the labor-market decisions. It has the largest effect on all the measured correlations. It generates 54% of the father–son family correlation in the data and 74% of the correlation in the simulated data. It has impact on the specialization patterns in the household as well as on fertility, which is further discussed in the main text. Counterfactual 6 adds the impact of parental education on children outcomes in the education production function, it is the factor that generates the second largest correlation: it generates about 60% of the observed correlation of father–son earnings in the simulated data. The rest of the counterfactuals have fairly small effects when added individually to the baseline simulation. However, this is not the case when we measure the cumulative effects which accounts for interactions between factors in the model. These interactions highlight the important mechanisms through which family structure, assortative mating and the earnings structure interact and we further analyze them in the main text.

Table B.4 presents labor supply, time with children, and fertility choices along with average time input in children for mothers and fathers for counterfactuals 1-6.

Table B.3: A pair-wise decomposition of the IGC

	Single Effects							
	Model	CF0	AM	AEP	RTE	FTPT	UC	NA
Panel A: Father–son								
Family Labor Income								
At age 35	0.159	0.018	0.031	0.050	0.108	-0.012	0.030	0.035
	(0.035)	(0.019)	(0.021)	(0.021)	(0.024)	(0.02)	(0.017)	(0.020)
Average: Age 30 to 40	0.251	0.019	0.034	0.068	0.182	0.028	0.002	0.152
	(0.056)	(0.019)	(0.020)	(0.020)	(0.041)	(0.026)	(0.017)	(0.034)
Individual Labor Income								
At age 35	0.146	0.032	0.067	0.081	0.190	0.012	0.019	0.159
	(0.033)	(0.019)	(0.021)	(0.021)	(0.042)	(0.027)	(0.018)	(0.035)
Average: Age 30 to 40	0.266	0.033	0.041	0.070	0.207	0.018	0.009	0.161
	(0.060)	(0.019)	(0.020)	(0.020)	(0.046)	(0.026)	(0.017)	(0.036)
Panel B: Mother–daughter								
Family labor Income								
At age 35	0.129	0.004	-0.003	0.037	0.088	0.044	-0.011	0.001
	(0.029)	(0.020)	(0.02)	(0.021)	(0.022)	(0.027)	(0.01)	(0.022)
Average: Age 30 to 40	0.222	0.016	0.044	-0.019	0.103	-0.024	-0.031	0.058
	(0.050)	(0.019)	(0.020)	(0.02)	(0.023)	(0.02)	(0.01)	(0.020)
Individual Labor Income								
At age 35	0.129	0.059	0.016	0.049	0.170	0.023	-0.002	0.050
	(0.036)	(0.029)	(0.033)	(0.0308)	(0.038)	(0.037)	(0.02)	(0.033)
Average: Age 30 to 40	0.204	0.029	0.041	-0.008	0.143	-0.020	-0.039	0.083
	(0.046)	(0.019)	(0.02)	(0.02)	(0.032)	(0.02)	(0.01)	(0.021)
Panel C: ALL								
Family Labor Income								
At age 35	0.143	0.012	0.014	0.042	0.098	0.019	0.007	0.017
	(0.032)	(0.014)	(0.014)	(0.015)	(0.022)	(0.019)	(0.012)	(0.014)
Average: Age 30 to 40	0.236	0.017	0.039	0.017	0.136	-0.004	-0.019	0.097
	(0.053)	(0.013)	(0.014)	(0.014)	(0.030)	(0.01)	(0.01)	(0.021)

CF0: Baseline. AM: Assortative mating. AEP: Age–earnings profile. RTE: Labor-market experience. FTPT: Part versus full time. UC: Education effect of direct cost. NA: Parental education in the production function.

Table B.4: A pair-wise decomposition of the Choices

VARIABLE			CF0 M. ED 1	CF0 M. ED 2	CF0 M. ED 3	CF0 M. ED 4	AM M. ED 1	AM M. ED 2	AM M. ED 3	AM M. ED 4	AEP M. ED 1	AEP M. ED 2	AEP M. ED 3	AEP M. ED 4	RTE M. ED 1	RTE M. ED 2	RTE M. ED 3	RTE M. ED 4
MALE Home time	F. ED	1	1.67	1.85	0.92	1.37	1.43	1.58	0.85	1.34	1.49	1.52	0.71	1.22	1.83	1.65	1.29	1.24
		2	1.89	1.19	1.38	1.31	1.90	1.16	1.33	1.31	1.97	1.18	1.58	1.50	2.08	1.24	1.51	1.39
		3	1.90	1.30	1.50	1.78	1.11	1.25	1.52	1.81	1.37	1.29	1.44	1.79	1.29	1.29	1.74	1.83
		4	0.78	1.16	1.15	1.49	0.94	1.37	1.23	1.50	1.11	1.14	1.09	1.47	1.45	1.17	1.32	1.62
FEMALE: Home time	F. ED	1	4.16	4.45	3.93	4.18	4.45	4.44	4.23	4.02	4.14	4.38	4.73	4.75	4.09	4.22	4.36	3.85
		2	4.40	4.52	4.75	4.73	4.37	4.63	4.76	4.63	4.36	4.59	4.78	4.60	4.34	4.61	4.77	4.65
		3	3.97	4.33	4.70	4.64	4.13	4.46	4.82	4.72	4.08	4.48	4.89	4.71	3.98	4.37	4.67	4.53
		4	5.13	4.69	4.62	4.79	4.89	4.68	4.63	4.81	5.09	4.87	4.77	4.91	5.16	4.75	4.68	4.70
Birth	F. ED	1	0.12	0.10	0.09	0.06	0.10	0.09	0.08	0.05	0.13	0.10	0.07	0.04	0.10	0.10	0.08	0.05
		2	0.11	0.10	0.09	0.06	0.10	0.09	0.07	0.05	0.12	0.10	0.08	0.04	0.10	0.09	0.07	0.05
		3	0.10	0.09	0.08	0.06	0.09	0.08	0.07	0.05	0.11	0.09	0.07	0.04	0.09	0.08	0.07	0.05
		4	0.11	0.09	0.07	0.05	0.11	0.08	0.07	0.05	0.12	0.08	0.06	0.04	0.10	0.07	0.06	0.04
No. of children	F. ED	1	2.78	2.38	1.97	1.48	2.42	2.16	1.90	1.21	2.86	2.26	1.68	0.95	2.48	2.21	1.78	1.07
		2	2.65	2.28	1.93	1.39	2.46	2.04	1.74	1.26	2.70	2.21	1.78	1.10	2.45	2.00	1.70	1.15
		3	2.32	2.16	1.85	1.29	2.09	1.97	1.64	1.17	2.44	2.10	1.72	1.06	2.02	1.91	1.61	1.11
		4	2.48	1.96	1.65	1.16	2.53	1.88	1.50	1.07	2.51	1.86	1.49	0.95	2.33	1.67	1.32	0.93
MALE: LS Part-time	F. ED	1	0.06	0.07	0.02	0.06	0.03	0.04	0.00	0.04	0.04	0.04	0.01	0.05	0.04	0.06	0.01	0.06
		2	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.03	0.04	0.04	0.03	0.04	0.04	0.03	0.03	0.04
		3	0.05	0.03	0.02	0.03	0.04	0.03	0.02	0.03	0.05	0.03	0.02	0.04	0.03	0.03	0.02	0.03
		4	0.01	0.03	0.02	0.04	0.01	0.02	0.02	0.04	0.00	0.03	0.02	0.04	0.02	0.03	0.02	0.04
MALE: LS Full-Time	F. ED	1	0.85	0.91	0.95	0.89	0.91	0.93	0.97	0.90	0.92	0.90	0.94	0.87	0.86	0.89	0.97	0.87
		2	0.91	0.94	0.95	0.95	0.90	0.95	0.96	0.95	0.89	0.94	0.96	0.94	0.91	0.94	0.95	0.95
		3	0.87	0.95	0.95	0.95	0.87	0.95	0.96	0.95	0.82	0.95	0.96	0.95	0.86	0.95	0.96	0.95
		4	0.98	0.96	0.96	0.95	0.98	0.96	0.95	0.95	0.94	0.95	0.96	0.94	0.89	0.95	0.95	0.94
MALE: Part. rate	F. ED	1	0.91	0.98	0.97	0.95	0.94	0.97	0.97	0.95	0.96	0.93	0.95	0.92	0.90	0.95	0.98	0.93
		2	0.95	0.98	0.98	0.99	0.93	0.98	0.98	0.98	0.93	0.98	0.98	0.98	0.95	0.97	0.98	0.98
		3	0.92	0.98	0.98	0.99	0.91	0.98	0.98	0.99	0.87	0.98	0.98	0.98	0.89	0.98	0.98	0.98
		4	0.98	0.99	0.98	0.98	0.98	0.98	0.97	0.98	0.94	0.98	0.98	0.98	0.90	0.98	0.97	0.98
FEMALE: LS Part-time	F. ED	1	0.11	0.16	0.13	0.15	0.09	0.15	0.15	0.14	0.11	0.14	0.11	0.18	0.12	0.13	0.11	0.15
		2	0.13	0.14	0.15	0.17	0.13	0.14	0.15	0.18	0.12	0.14	0.15	0.20	0.12	0.14	0.15	0.18
		3	0.16	0.14	0.15	0.18	0.14	0.14	0.15	0.18	0.16	0.14	0.15	0.20	0.15	0.13	0.16	0.18
		4	0.10	0.15	0.16	0.18	0.09	0.14	0.15	0.18	0.08	0.15	0.16	0.20	0.11	0.14	0.15	0.18
FEMALE: Full-time	F. ED	1	0.19	0.20	0.27	0.26	0.16	0.19	0.19	0.32	0.18	0.19	0.25	0.30	0.18	0.18	0.23	0.31
		2	0.18	0.19	0.22	0.25	0.17	0.19	0.22	0.25	0.19	0.19	0.24	0.29	0.18	0.20	0.23	0.29
		3	0.19	0.20	0.22	0.26	0.17	0.20	0.23	0.26	0.16	0.20	0.23	0.30	0.19	0.22	0.24	0.30
		4	0.27	0.21	0.24	0.29	0.26	0.22	0.25	0.30	0.26	0.22	0.26	0.34	0.22	0.25	0.29	0.36
FEMALE: Part. rate	F. ED	1	0.30	0.35	0.40	0.40	0.25	0.34	0.34	0.46	0.29	0.34	0.36	0.48	0.30	0.31	0.34	0.46
		2	0.31	0.33	0.37	0.42	0.31	0.33	0.37	0.42	0.31	0.33	0.39	0.49	0.31	0.34	0.38	0.47
		3	0.34	0.34	0.37	0.43	0.32	0.34	0.38	0.44	0.33	0.34	0.38	0.50	0.34	0.36	0.39	0.47
		4	0.37	0.36	0.40	0.47	0.35	0.36	0.40	0.48	0.33	0.37	0.43	0.54	0.33	0.39	0.45	0.55

CF0: Baseline. AM: Assortative mating adds assortative mating to CF0. AEP: Age-earnings profile adds the age–earnings profile effect to CF0. RTE: Labor-market experience adds the labor-market experience effect to CF0.

Table B.4 (continued): A pair-wise decomposition of the Choices

VARIABLE			CF0				FTPT				UC				NA			
			M. ED				M. ED				M. ED				M. ED			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MALE Home time	F. ED	1	1.67	1.85	0.92	1.37	1.30	1.34	0.65	0.35	1.11	1.55	0.28	1.31	1.98	1.67	0.78	1.27
		2	1.89	1.19	1.38	1.31	1.43	1.16	1.16	1.32	1.49	1.15	1.27	1.51	1.86	1.17	1.33	1.35
		3	1.90	1.30	1.50	1.78	1.25	1.14	1.38	1.66	1.06	1.41	1.42	1.72	1.21	1.35	1.54	1.79
		4	0.78	1.16	1.15	1.49	1.70	1.39	1.13	1.67	0.91	1.19	1.12	1.49	1.10	1.28	1.19	1.52
FEMALE: Home time	F. ED	1	4.16	4.45	3.93	4.18	4.22	4.48	4.12	4.02	4.76	4.32	5.09	3.71	4.40	4.63	4.34	4.03
		2	4.40	4.52	4.75	4.73	4.36	4.76	4.95	4.88	4.47	4.60	4.68	4.38	4.47	4.60	4.82	4.74
		3	3.97	4.33	4.70	4.64	4.12	4.74	5.00	4.58	4.07	4.44	4.58	4.43	4.01	4.40	4.83	4.66
		4	5.13	4.69	4.62	4.79	5.06	4.66	4.81	4.97	5.18	4.47	4.46	4.45	4.90	4.69	4.69	4.74
Birth	F. ED	1	0.12	0.10	0.09	0.06	0.09	0.08	0.05	0.03	0.07	0.06	0.05	0.04	0.11	0.09	0.08	0.05
		2	0.11	0.10	0.09	0.06	0.09	0.07	0.05	0.02	0.09	0.09	0.08	0.08	0.10	0.09	0.07	0.05
		3	0.10	0.09	0.08	0.06	0.07	0.06	0.04	0.02	0.09	0.10	0.09	0.09	0.10	0.09	0.07	0.05
		4	0.11	0.09	0.07	0.05	0.11	0.05	0.04	0.02	0.10	0.10	0.10	0.10	0.11	0.08	0.06	0.05
No. of children	F. ED	1	2.78	2.38	1.97	1.48	2.15	1.72	1.03	0.67	1.58	1.42	1.19	0.78	2.61	2.06	1.81	1.25
		2	2.65	2.28	1.93	1.39	2.11	1.55	1.12	0.56	2.11	2.08	1.87	1.84	2.47	2.05	1.74	1.19
		3	2.32	2.16	1.85	1.29	1.70	1.36	1.03	0.53	2.01	2.28	2.15	2.07	2.14	1.98	1.65	1.19
		4	2.48	1.96	1.65	1.16	2.54	1.23	0.84	0.42	2.41	2.35	2.31	2.31	2.56	1.83	1.49	1.04
MALE: LS Part-time	F. ED	1	0.06	0.07	0.02	0.06	0.02	0.03	0.02	0.05	0.01	0.03	0.01	0.05	0.03	0.05	0.01	0.05
		2	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.04	0.02	0.03	0.03	0.03	0.04	0.03	0.02	0.04
		3	0.05	0.03	0.02	0.03	0.05	0.03	0.02	0.04	0.03	0.02	0.02	0.02	0.05	0.03	0.02	0.03
		4	0.01	0.03	0.02	0.04	0.01	0.03	0.02	0.04	0.02	0.02	0.02	0.03	0.02	0.03	0.02	0.04
MALE: LS Full-Time	F. ED	1	0.85	0.91	0.95	0.89	0.91	0.94	0.95	0.91	0.93	0.91	0.97	0.93	0.88	0.92	0.94	0.89
		2	0.91	0.94	0.95	0.95	0.92	0.94	0.96	0.94	0.91	0.94	0.95	0.96	0.91	0.95	0.96	0.95
		3	0.87	0.95	0.95	0.95	0.85	0.94	0.95	0.94	0.87	0.95	0.97	0.97	0.86	0.94	0.95	0.95
		4	0.98	0.96	0.96	0.95	0.90	0.94	0.95	0.94	0.95	0.95	0.97	0.97	0.96	0.96	0.95	0.95
MALE: Part. rate	F. ED	1	0.91	0.98	0.97	0.95	0.93	0.97	0.97	0.96	0.94	0.94	0.98	0.98	0.91	0.97	0.95	0.95
		2	0.95	0.98	0.98	0.99	0.95	0.97	0.98	0.98	0.94	0.98	0.98	0.99	0.95	0.98	0.98	0.98
		3	0.92	0.98	0.98	0.99	0.90	0.97	0.98	0.98	0.90	0.97	0.98	0.99	0.91	0.98	0.98	0.98
		4	0.98	0.99	0.98	0.98	0.91	0.97	0.98	0.98	0.97	0.97	0.98	0.99	0.98	0.99	0.97	0.98
FEMALE: LS Part-time	F. ED	1	0.11	0.16	0.13	0.15	0.09	0.15	0.21	0.18	0.15	0.15	0.15	0.22	0.09	0.13	0.13	0.13
		2	0.13	0.14	0.15	0.17	0.13	0.15	0.17	0.23	0.12	0.14	0.15	0.15	0.13	0.14	0.15	0.17
		3	0.16	0.14	0.15	0.18	0.15	0.15	0.18	0.23	0.13	0.12	0.14	0.14	0.15	0.13	0.15	0.17
		4	0.10	0.15	0.16	0.18	0.12	0.17	0.19	0.24	0.07	0.14	0.14	0.13	0.11	0.14	0.15	0.19
FEMALE: Full-time	F. ED	1	0.19	0.20	0.27	0.26	0.22	0.19	0.26	0.38	0.24	0.24	0.28	0.39	0.16	0.20	0.20	0.31
		2	0.18	0.19	0.22	0.25	0.19	0.23	0.28	0.40	0.18	0.19	0.21	0.20	0.17	0.19	0.21	0.26
		3	0.19	0.20	0.22	0.26	0.22	0.27	0.30	0.41	0.21	0.20	0.21	0.22	0.17	0.21	0.22	0.27
		4	0.27	0.21	0.24	0.29	0.19	0.29	0.37	0.47	0.24	0.19	0.21	0.21	0.25	0.22	0.25	0.30
FEMALE: Part. rate	F. ED	1	0.30	0.35	0.40	0.40	0.31	0.34	0.46	0.56	0.39	0.38	0.44	0.61	0.25	0.33	0.33	0.44
		2	0.31	0.33	0.37	0.42	0.32	0.38	0.45	0.63	0.30	0.33	0.36	0.36	0.30	0.33	0.36	0.43
		3	0.34	0.34	0.37	0.43	0.38	0.42	0.48	0.64	0.34	0.32	0.34	0.36	0.32	0.34	0.38	0.44
		4	0.37	0.36	0.40	0.47	0.31	0.45	0.56	0.71	0.31	0.33	0.34	0.34	0.36	0.36	0.40	0.49

CF0 is the baseline. FTPT: adds returns to full-time versus part-time work to CF0. UC: adds the effect of education on the direct cost of raising children to CF0. NA - adds parental education to the production function. to CF0.

C Summary Statistics and First Stage Estimates

C.1 Summary Statistics

The table below provides summary statistics by education category.

Table C.1: Summary Statistics by Education

	Wife				Husband			
Variables	LHS	HS	SC	COL	LHS	HS	SC	COL
Age	31.05	31.08	31.26	32.09	31.13	31.18	31.41	31.94
	(3.99)	(3.91)	(3.90)	(3.99)	(4.04)	(4.05)	(4.00)	(3.94)
No. of children	0.74	0.86	0.82	1.00	0.82	0.84	0.92	0.95
	(0.74)	(0.90)	(0.91)	(0.98)	(0.97)	(0.88)	(0.94)	(0.96)
Labor income ($ US 2006)	8265	16,634	20,443	26,550	32,457	42,688	47,701	64,807
	(9478)	(1514)	(1772)	(2602)	(1952)	(2228)	(2802)	(3795)
Labor-market hours	828	1200	1268	1189	1995	2161	2149	2262
	(898)	(886)	(879)	(861)	(796)	(668)	(634)	(610)
Housework hours	1267	1068	946	954	339	375	374	382
	(13.5)	(11.2)	(11.0)	(10.9)	(6.88)	(6.80)	(6.67)	(5.72)
Time with children	270	280	295	360	78.20	86.40	77.20	92.50
	(421)	(423)	(459)	(499)	(196)	(217)	(224)	(206)
No. observations	204	3758	4524	7586	406	3942	3780	7944
Proportion (%)	1.4	24.8	30.7	43.2	2.9	27.1	25.0	44.9

Notes: Panel Study of Income Dynamics (PSID), 1968 to 1997. Standard deviations are listed in parentheses. LHS, less than a high school education. HS, high school. SC, some college. COL, at least a college degree.

C.2 Earnings Equation

Table C.2: Earnings Equation. Dependent Variable, Log of Annual Earnings

Variable	Estimate	Variable	Estimate	Variable	Estimate
Age-Earning Profile				Fixed Effect	
Age Squared	-4e-4	Female$\times$ Full-time	-0.13	Female	-0.48
	(1e-5)		(0.01)		(0.01)
Age$\times$ LHS	0.04	Female$\times$ Full-time $(t-1)$	0.11	HS	0.14
	(0.00)		(0.01)		(0.01)
Age$\times$ HS	0.04	Female$\times$ Full-time $(t-2)$	0.03	SC	0.12
	(0.00)		(0.01)		(0.01)
Age$\times$ SC	0.05	Female$\times$ Full-time $(t-3)$	0.01	COL	0.04
	(0.00)		(0.01)		(0.01)
Age$\times$ COL	0.10	Female$\times$ Full-time $(t-4)$	0.01	Female$\times$ HS	-0.05
	(0.00)		(0.01)		(0.01)
Return to Hours Worked		Female$\times$ Part-time $(t-1)$	0.15	Female$\times$ SC	0.05
Full-time	0.94		(0.01)		(0.01)
	(0.01)	Female$\times$ Part-time $(t-2)$	0.06	Female$\times$ COL	0.04
Full-time $(t-1)$	0.16		(0.01)		(0.01)
	(0.01)	Female$\times$ Part-time $(t-3)$	0.040	Constant	0.167
Full-time $(t-2)$	0.04		(0.01)		(0.01)
	(0.01)	Female$\times$ Part-time $(t-4)$	-0.00		
Full-time $(t-3)$	0.03		(0.01)		
	(0.01)				
Full-time $(t-4)$	0.04				
	(0.01)				
Part-time $(t-1)$	-0.09				
	(0.01)				
Part-time $(t-2)$	-0.08				
	(0.01)				
Part-time $(t-3)$	-0.07				
	(0.01)				
Part-time $(t-4)$	-0.01	Hausman Statistics	2296		
	(0.01)	Hausman p-value	0.00		

Notes: Standard errors are listed in parentheses. LHS, less than high school; HS, completed high school; SC, completed more education than high school but is not a college graduate; COL, at least a college graduate.

C.2.1 The Intergenerational Education Production Function Estimates

Table C.3: education production function- three stage least squares.
(Standard Errors in Parenthesis)

VARIABLES	(4) FLInc	(5) MLInc	(6) MTime	(7) FTime	(8) MWHours	(9) FWHours	(10) Siblings<3	(11) 3>Siblings≤6
F.W.Hours	6.816		-0.058	0.334	-0.198			
	(0.871)		(0.202)	(0.268)	(0.370)			
F. HS	-145.5		0.708	0.093	0.793	0.944	-0.118	-0.167
	(90.84)		(0.262)	(0.359)	(0.559)	(14.094)	(0.074)	(0.051)
F. SC	-67.68		0.013	-0.219	0.03	14.497	0.04	0.026
	(93.42)		(0.159)	(0.208)	(0.287)	(14.375)	(0.052)	(0.035)
F. COL	150.67		-0.169	1.038	-1.109	-24.759	0.015	-0.116
	(123.3)		(0.249)	(0.284)	(0.319)	(20.885)	(0.064)	(0.043)
F. Age 5	-8.364					0.774	-0.228	0.018
	(6.377)					(0.983)	(0.245)	(0.168)
F. Age 5^2	0.225					-0.019	0.009	0.001
	(0.176)					(0.027)	(0.007)	(0.005)
F. Age 5^3	-0.002					0.001	0.001	0.001
	(0.002)					(0.001)	(0.001)	(0.001)
F. Age 5× F. HS	11.519					0.094		
	(7.818)					(1.212)		
F. Age 5× F. SC	5.896					-1.345		
	(8.284)					(1.274)		
F. Age 5× F. COL	-15.047					2.048		
	(10.64)					(1.796)		
F. Age 5× F. HS^2	-0.287					-0.008		
	(0.220)					(0.034)		
F. Age 5×F. SC^2	-0.158					0.041		
	(0.240)					(0.037)		
F. Age 5× $F.COL^2$	0.476					-0.055		
	(0.302)					(0.051)		
F. Age 5× F. HS^3	0.002					0.001		
	(0.002)					(0.001)		
F. Age 5× F. SC^3	0.001					0.001		
	(0.002)					(0.001)		
F. Age 5× F. COL^3	-0.005					0.001		
	(0.003)					(0.001)		
MWHours		1.153	-0.439	0.552		-0.053		
		(0.101)	(0.109)	(0.132)		(0.049)		
M. HS		-32.988	0.969	-0.386	-3.781	0.104	-0.102	0.049
		(38.095)	(0.276)	(0.396)	(31.853)	(0.244)	(0.083)	(0.057)
M. SC		55.244	0.970	0.225	-6.802	0.210	-0.078	0.026
		(40.469)	(0.168)	(0.281)	(33.180)	(0.150)	(0.049)	(0.034)
M. COL		-47.114	0.211	-0.72	15.271	0.325	0.005	0.05
		(58.865)	(0.216)	(0.267)	(51.986)	(0.171)	(0.078)	(0.053)
M. Age 5		-1.199			1.432		0.068	0.265
		(3.103)			(2.601)		(0.298)	(0.205)
M. Age 5^2		0.03			-0.034		0.001	-0.008
		(0.094)			(0.079)		(0.009)	(0.006)
M. Age 5^3		0.001			0.001		0.001	0.001
		(0.001)			(0.001)		(0.001)	(0.001)
M. Age 5× M. HS		2.586			0.628			
		(3.583)			(3.010)			
M. Age 5× M. SC		-5.202			0.497			
		(3.878)			(3.185)			
M. Age 5× M. COL		3.776			-0.752			
		(5.525)			(4.906)			

Table C.3 (continued): education production function- three stage least squares.

VARIABLES	(4) FLInc	(5) MLInc	(6) MTime	(7) FTime	(8) MWHours	(9) FWHours	(10) Siblings<3	(11) 3>Siblings≤6
M. Age 5× M. HS^2		-0.063			-0.022			
		(0.109)			(0.092)			
M. Age 5 ×M. SC^2		0.158			-0.009			
		(0.122)			(0.101)			
M. Age 5× M. COL^2		-0.096			0.005			
		(0.171)			(0.153)			
M. Age 5×M. HS^3		0.001			0.001			
		(0.001)			(0.001)			
M. Age 5× M. SC^3		-0.002			0.001			
		(0.001)			(0.001)			
M. Age 5× M. COL^3		0.001			0.001			
		(0.002)			(0.002)			
MTime			0.122	-1.216				
				(0.197)	(0.174)			
FTime			0.029			-0.029		
			(0.135)			(0.107)		
MLInc							-0.022	-0.002
							(0.020)	(0.013)
F LInc							-0.019	0.004
							(0.007)	(0.005)
Female			-0.002	-0.047				
			(0.098)	(0.153)				
Black	-1.931	0.199	-0.868	0.058	0.069	-0.328	0.193	0.132
	(0.714)	(0.265)	(0.219)	(0.349)	(0.354)	(0.135)	(0.070)	(0.048)
Siblings <3			0.706	0.483				
			(0.233)	(0.335)				
3>Siblings≤6			1.338	0.22				
Girl Siblings <3			-0.201	-0.23			0.778	-0.085
			(0.237)	(0.330)			(0.034)	(0.023)
3>Girl Siblings≤6			-1.313	0.294			-0.011	0.986
			(0.832)	(1.121)			(0.057)	(0.039)
NHSFM					0.039	0.324		
					(0.615)	(0.328)		
NSCFM					0.025	-0.300		
					(0.396)	(0.177)		
NCOLFM					0.368	0.026		
					(0.420)	(0.212)		
Constant	47.301	13.459	5.407	-4.175	-8.018	0.025	0.882	-2.76
	(74.708)	(33.084)	(2.043)	(2.790)	(27.378)	(11.583)	(2.883)	(1.968)
N	1,332	1,332	1,332	1,332	1,332	1,332	1,332	1,332

Notes: Equations (1), (2) and (3) correspond to the Education Production Function given in Table 2, not reported here. FLInc (MLInc) is the total labor income of the father (mother) up to age 5. Child's education is: HSH, high school; SC, some college; COl, college. FTime (MTime) is total time investment of the father (mother) up to age 5. MWhours (FWhours) is the total work hours of the mother (father) iup to age 5. Father (mother) education, F.HS (M.HS), high school; F.SC (M.SC), some college; F.COL (M.COL), college. F.Age 5 (M.Age 5) is the age of the father (mother) when the child was 5 years old. Female, the child is a female. Black, the child is black. Siblings <3 is the number of siblings who are less 3 years of age when the child was less than 6. 3>Siblings≤6 is the number of siblings who are between the ages of 3 and 6 when the child was less than 6.

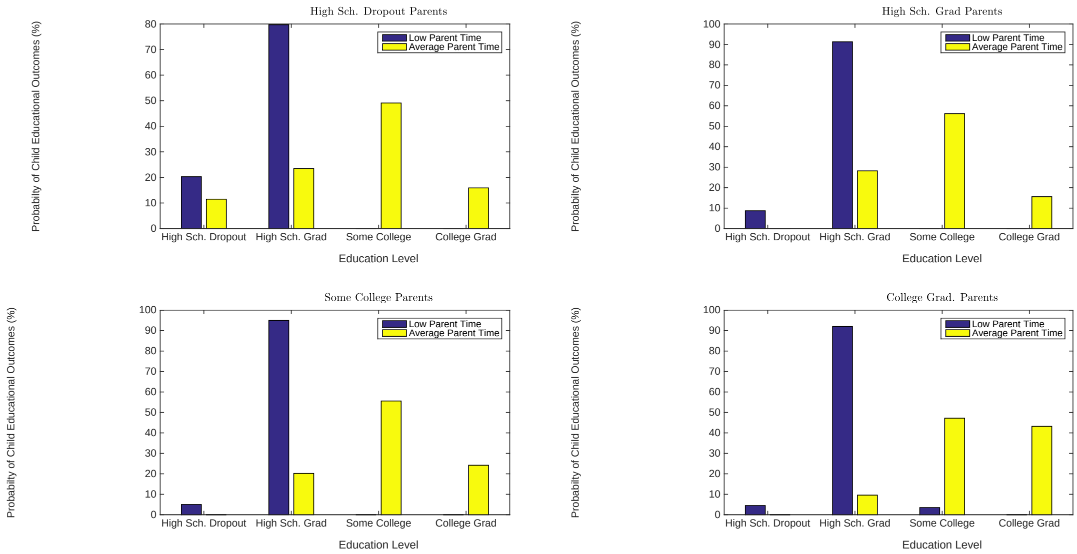

Figure C.1: The Effect of Parental Time on Educational Outcomes

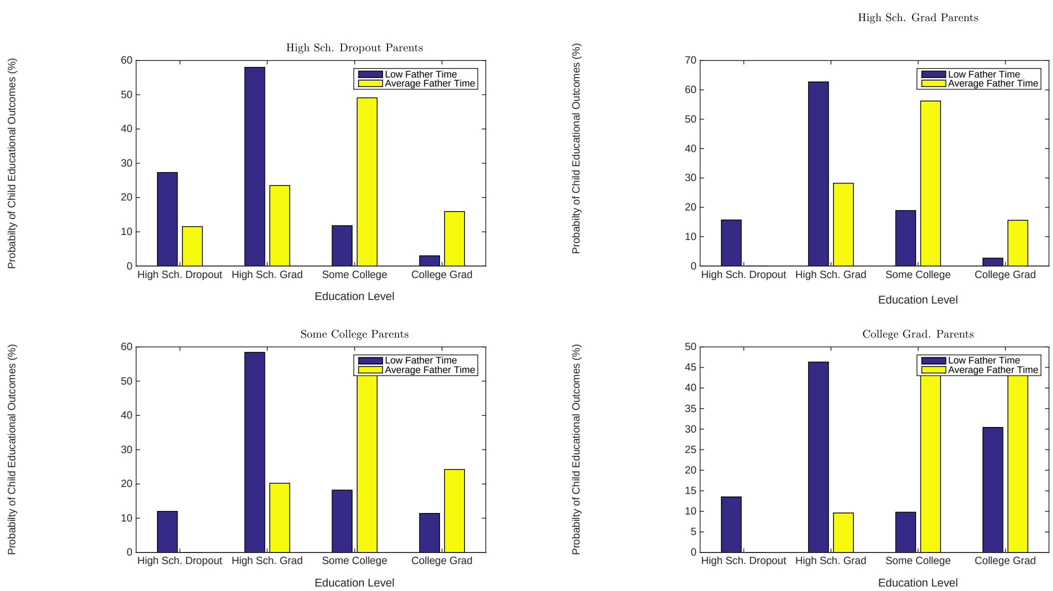

Figure C.2: The Effect of Fathers Time on Educational Outcomes

C.2.2 Marriage Market Matching

Marriage Pattern Summary

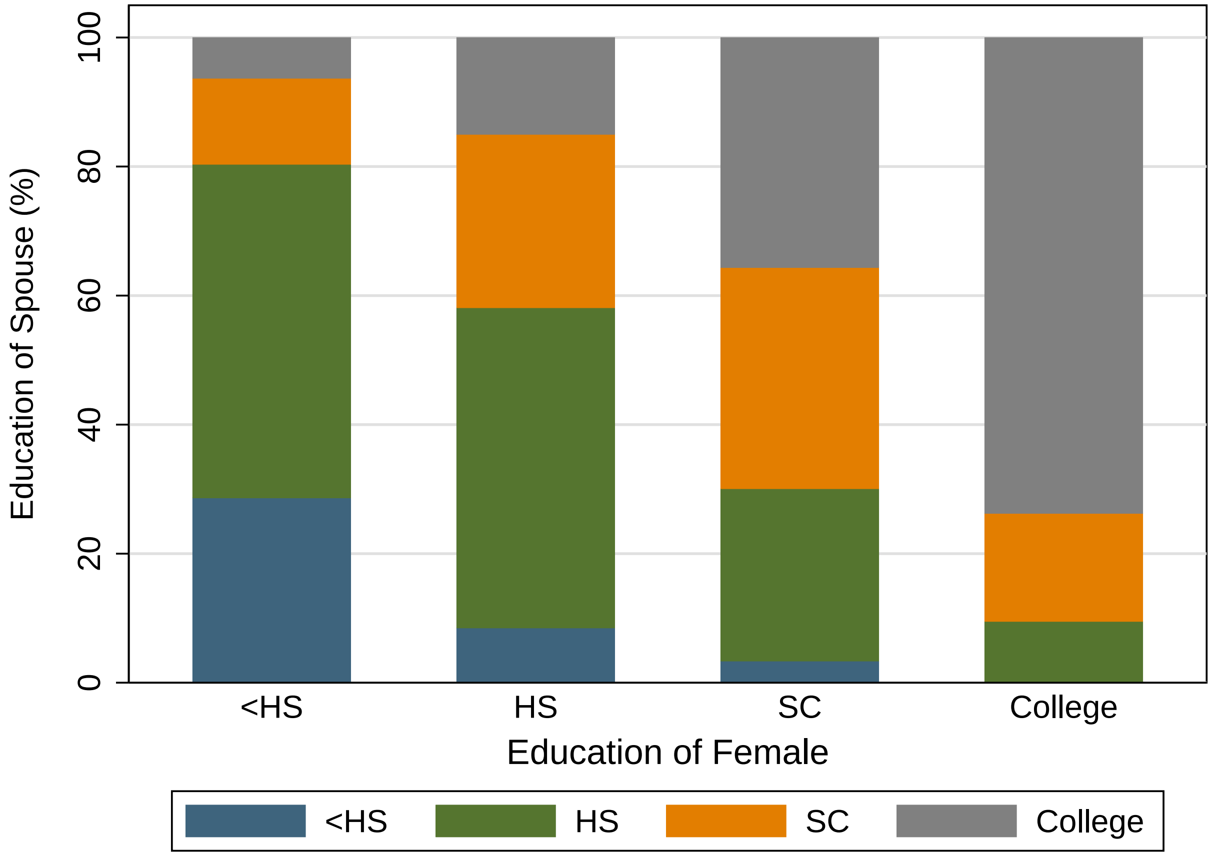

Figure C.3: Empirical Marriage Matching Pattern

Matching Function used in Structural Estimation We stated the estimation of our model at age 25 for female after most schooling decisions are completed. However, that means that some endogenous decisions, such as birth, time with children, and labor supply, have already taken place. To deal with this initial condition problem we use a more general marriage match function where initial match of female at age 25 is based on education, labor-market history, children, and age of husband. Age of husband are included to capture the marriage age gap in the data.

Table C.4: Probabilities of husband's labor-market history.
(Standard Errors in Parenthesis)

	Work $(t-1)$		Work $(t-2)$		Work $(t-3)$		work $(t-4)$	
Variable	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time
Spouse Part-time $(t-2)$	2.477	1.318						
	(0.174)	(0.117)						
Spouse Full-time $(t-2)$	2.638	3.563						
	(0.157)	(0.086)						
Spouse Part-time $(t-3)$	0.615	-0.111	2.792	1.689				
	(0.220)	(0.156)	(0.188)	(0.124)				
Spouse Full-time $(t-3)$	0.313	0.861	3.007	4.012				
	(0.198)	(0.126)	(0.171)	(0.088)				
Spouse Part-time $(t-4)$	0.816	-0.079	1.174	0.238	3.706	2.451		
	(0.229)	(0.169)	(0.208)	(0.152)	(0.166)	(0.119)		
Spouse Full-time $(t-4)$	0.203	0.181	0.64	1.18	4.026	5.184		
	(0.184)	(0.120)	(0.167)	(0.098)	(0.137)	(0.076)		
Spouse HS	-0.098	0.201	-0.129	0.208	-0.195	0.133	-0.204	0.149
	(0.134)	(0.087)	(0.142)	(0.091)	(0.148)	(0.095)	(0.145)	(0.071)
Spouse SC	-0.17	0.224	-0.307	0.194	-0.326	0.127	-0.412	0.143
	(0.147)	(0.093)	(0.155)	(0.097)	(0.161)	(0.101)	(0.159)	(0.075)
Spouse COL	-0.112	0.296	-0.155	0.299	-0.141	0.262	-0.008	0.239
	(0.162)	(0.100)	(0.168)	(0.104)	(0.172)	(0.107)	(0.165)	(0.080)
Spouse Age Group 2	-0.099	0.168	0.027	0.52	0.742	1.198	9.471	5.059
	(0.175)	(0.082)	(0.239)	(0.098)	(0.376)	(0.155)	(0.134)	(1.001)
Spouse Age Group 3	-0.253	0.065	0.064	0.491	0.518	1.206	9.82	5.767
	(0.205)	(0.104)	(0.265)	(0.114)	(0.394)	(0.166)	(0.160)	(1.002)
Spouse Age Group 4	-0.462	-0.053	-0.255	0.378	0.183	1.003	9.618	5.733
	(0.24)	(0.126)	(0.296)	(0.135)	(0.418)	(0.180)	(0.205)	(1.003)
Spouse Age Group 5	-0.418	-0.195	-0.199	0.305	0.264	1.051	9.458	5.632
	(0.261)	(0.146)	(0.316)	(0.153)	(0.436)	(0.196)	(0.234)	(1.005)
Spouse Age Group 6	-0.478	-0.274	-0.277	0.272	0.025	0.81	9.328	5.549
	(0.294)	(0.169)	(0.344)	(0.177)	(0.459)	(0.216)	(0.273)	(1.008)
Spouse Age Group 7	-0.223	-0.244	-0.172	0.251	0.63	1.044	9.112	4.987
	(0.338)	(0.199)	(0.381)	(0.204)	(0.488)	(0.241)	(0.303)	(1.011)
Spouse Age Group 8	-0.639	-0.605	0.051	0.241	0.674	1.067	9.591	5.249
	(0.458)	(0.274)	(0.484)	(0.298)	(0.571)	(0.331)	(0.398)	(1.021)
Black	-0.022	-0.197	-0.146	-0.335	-0.077	-0.302	-0.168	-0.476
	(0.092)	(0.056)	(0.096)	(0.056)	(0.097)	(0.057)	(0.093)	(0.040)
HS	-0.362	-0.159	-0.402	-0.22	-0.326	-0.146	-0.544	-0.43
	(0.158)	(0.104)	(0.167)	(0.104)	(0.174)	(0.110)	(0.170)	(0.081)
SC	-0.514	-0.35	-0.565	-0.447	-0.573	-0.37	-0.914	-0.835
	(0.169)	(0.109)	(0.178)	(0.109)	(0.186)	(0.116)	(0.183)	(0.086)
COL	-0.567	-0.303	-0.634	-0.412	-0.542	-0.37	-0.99	-0.965
	(0.188)	(0.120)	(0.197)	(0.120)	(0.202)	(0.126)	(0.195)	(0.093)
Age	0.13	0.073	0.197	0.09	0.239	0.121	0.348	0.371
	(0.064)	(0.033)	(0.070)	(0.034)	(0.069)	(0.038)	(0.064)	(0.029)
Age squared	-0.002	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004	-0.004
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Table C.4 (continued): Probability of husband's labor-market history (Standard Errors in Parenthesis)

	Work $(t-1)$		Work $(t-2)$		Work $(t-3)$		work $(t-4)$	
Variable	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time
Number of children	0.656	0.731	1.094	1.283	0.755	1.197	0.201	0.759
	(0.171)	(0.110)	(0.165)	(0.102)	(0.170)	(0.102)	(0.173)	(0.077)
Number of children Sq.	-0.138	-0.201	-0.241	-0.331	-0.11	-0.25	0.083	-0.060
	(0.058)	(0.038)	(0.056)	(0.036)	(0.059)	(0.039)	(0.059)	(0.030)
Number of female children	-0.055	-0.014	-0.056	0.009	-0.089	0.019	-0.075	0.014
	(0.082)	(0.055)	(0.082)	(0.056)	(0.081)	(0.054)	(0.071)	(0.037)
Age of 1st child	-0.064	-0.053	-0.088	-0.089	-0.067	-0.081	-0.015	-0.037
	(0.019)	(0.011)	(0.018)	(0.012)	(0.018)	(0.012)	(0.016)	(0.008)
Age of 2nd child	-0.02	0.013	-0.023	0.012	-0.028	-0.01	-0.047	-0.057
	(0.026)	(0.015)	(0.026)	(0.016)	(0.025)	(0.016)	(0.022)	(0.012)
Age of 3rd child	0.09	0.041	0.085	0.044	0.043	0.013	-0.031	-0.046
	(0.037)	(0.024)	(0.038)	(0.027)	(0.037)	(0.026)	(0.031)	(0.018)
Age of 4th child	-0.165	-0.024	-0.072	0.039	0.016	0.085	0.006	0.145
	(0.110)	(0.053)	(0.090)	(0.064)	(0.096)	(0.072)	(0.090)	(0.060)
Time spent 1st child	0.054	0.025	0.066	0.034	0.111	0.09	0.221	0.200
	(0.028)	(0.018)	(0.028)	(0.019)	(0.029)	(0.019)	(0.025)	(0.012)
Time spent 2nd child	-0.030	-0.017	-0.044	-0.038	-0.06	-0.054	-0.004	0.039
	(0.036)	(0.024)	(0.036)	(0.025)	(0.037)	(0.025)	(0.033)	(0.017)
Time spent 3rd child	-0.085	-0.018	-0.079	-0.001	-0.09	-0.028	-0.039	0.005
	(0.053)	(0.037)	(0.057)	(0.043)	(0.057)	(0.044)	(0.044)	(0.025)
Time spent 4th child	0.277	0.116	0.281	0.141	0.129	0.075	-0.046	-0.199
	(0.124)	(0.080)	(0.116)	(0.091)	(0.127)	(0.098)	(0.098)	(0.068)
Part-time $(t-1)$	1.234	1.315	0.119	0.116	-0.257	-0.211	-0.147	-0.215
	(0.143)	(0.089)	(0.147)	(0.084)	(0.148)	(0.087)	(0.140)	(0.064)
Part-time $(t-2)$	0.073	-0.11	1.493	1.569	0.306	0.314	0.139	0.051
	(0.165)	(0.110)	(0.162)	(0.099)	(0.166)	(0.097)	(0.147)	(0.068)
Part-time $(t-3)$	-0.184	-0.337	0.004	-0.287	1.531	1.559	0.251	0.363
	(0.17)	(0.116)	(0.175)	(0.117)	(0.166)	(0.107)	(0.161)	(0.071)
Part-time $(t-4)$	0.007	-0.156	-0.209	-0.472	-0.229	-0.512	1.337	1.334
	(0.163)	(0.111)	(0.163)	(0.112)	(0.166)	(0.107)	(0.148)	(0.073)
Full-time $(t-1)$	1.171	1.198	-0.067	-0.186	-0.427	-0.306	-0.307	-0.295
	(0.122)	(0.069)	(0.130)	(0.069)	(0.132)	(0.073)	(0.131)	(0.055)
Full-time $(t-2)$	-0.219	-0.28	1.489	1.642	0.25	0.166	-0.153	-0.091
	(0.151)	(0.093)	(0.152)	(0.083)	(0.160)	(0.085)	(0.154)	(0.063)
Full-time $(t-3)$	-0.405	-0.342	-0.427	-0.502	1.349	1.52	0.215	0.099
	(0.168)	(0.108)	(0.160)	(0.096)	(0.159)	(0.088)	(0.159)	(0.063)
Full-time $(t-4)$	-0.006	-0.048	-0.300	-0.322	-0.519	-0.699	1.154	1.242
	(0.149)	(0.096)	(0.145)	(0.089)	(0.137)	(0.081)	(0.138)	(0.055)
Constant	$t-4.325$	-1.813	-6.444	-3.278	-8.069	-5.176	-18.653	-12.945
	(0.902)	(0.467)	(0.989)	(0.486)	(1.045)	(0.534)	(0.934)	(1.088)
N	31,043	31,043	31,043	31,043	31,043	31,043	31,043	31,043

Notes: LHS -less than high school; HS - high school; SC -Some College; COL - College. Age groups: 1 - 18 to 23; 2 - 24 to 28; 3 29 to 33; 4 - 34 to 38; 5 - 39 to 43; 7 - 49 to 52; and 8 - older than 53.

Table C.5: Probability of husband's education.
(Standard Errors in Parenthesis)

Variables	HS	SC	COL	Variables	HS	SC	COL
Spouse Age Group 2	0.219	0.696	1.12	Number of children	0.033	-0.052	-0.064
	(0.105)	(0.122)	(0.171)		(0.093)	(0.100)	(0.110)
Spouse Age Group 3	-0.081	0.68	1.313	Number of children Sq.	-0.054	-0.041	-0.068
	(0.124)	(0.141)	(0.187)		(0.029)	(0.031)	(0.035)
Spouse Age Group 4	-0.553	0.376	1.045	Number of female children	0.089	0.251	0.122
	(0.145)	(0.162)	(0.207)		(0.040)	(0.043)	(0.046)
Spouse Age Group 5	-0.994	0.059	0.769	Age of 1st child	-0.014	-0.023	-0.032
	(0.161)	(0.178)	(0.222)		(0.010)	(0.010)	(0.011)
Spouse Age Group 6	-1.498	-0.304	0.479	Age of 2nd child	0.066	0.085	0.051
	(0.183)	(0.198)	(0.240)		(0.014)	(0.015)	(0.015)
Spouse Age Group 7	-2.297	-1.326	-0.315	Age of 3rd child	-0.048	-0.102	-0.056
	(0.202)	(0.218)	(0.260)		(0.019)	(0.021)	(0.022)
Spouse Age Group 8	-2.604	-2.076	-1.153	Age of 4th child	-0.095	0.048	-0.012
	(0.246)	(0.282)	(0.316)		(0.049)	(0.054)	(0.053)
Black	-0.429	-0.763	-1.844	Time spent 1st child	-0.019	-0.064	-0.064
	(0.050)	(0.055)	(0.064)		(0.014)	(0.015)	(0.016)
HS	1.43	1.749	2.242	Time spent 2nd child	0.051	0.062	0.109
	(0.066)	(0.085)	(0.155)		(0.020)	(0.021)	(0.021)
SC	1.606	2.815	4.055	Time spent 3rd child	-0.127	-0.067	-0.05
	(0.077)	(0.094)	(0.159)		(0.024)	(0.025)	(0.026)
COL	2.592	4.136	6.730	Time spent 4th child	0.24	0.016	0.064
	-0.152	-0.16	-0.203		(0.065)	(0.070)	(0.069)
Age	(0.072)	(0.100)	0.013	Constant	0.418	-0.65	-4.618
	-0.038	-0.041	-0.044		(0.533)	(0.578)	(0.643)
Age Squared.	0.003	0.003	0.002				
	-0.001	-0.001	-0.001				
Part-time $(t-1)$	0.088	0.131	0.049				
	(0.083)	(0.088)	(0.094)				
Part-time $(t-2)$	0.087	0.114	0.094				
	(0.092)	(0.098)	(0.103)				
Part-time $(t-3)$	0.107	0.084	0.106				
	(0.097)	(0.102)	(0.108)				
Part-time $(t-4)$	0.135	0.146	0.127				
	(0.094)	(0.099)	(0.103)				
Full-time $(t-1)$	0.17	0.118	-0.105				
	(0.072)	(0.077)	(0.084)				
Full-time $(t-2)$	0.106	0.098	-0.022				
	(0.086)	(0.092)	(0.100)				
Full-time $(t-3)$	0.018	0.042	-0.019				
	(0.091)	(0.097)	(0.104)				
Full-time $(t-4)$	0.151	0.151	0.105				
	(0.081)	(0.086)	(0.092)				
N	31,043	31,043	31,043	N	31,043	31,043	31,043

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least a college. Age group 1: ages 18 to 23; Age group 2: ages 24 to 28; Age group 3: ages 29 to 33; Age group 4: ages 34 to 38; Age group 5: ages 39 to 43; Age group 7: ages 49 to 52, and age group 8: ages greater than 53.

Table C.6: Probability of husband's age group.
(Standard Errors in Parenthesis)

Variables	Age Group						
	2	3	4	5	6	7	8
Black	0.279	0.28	0.371	0.394	0.493	0.642	1.044
	(0.091)	(0.102)	(0.110)	(0.117)	(0.128)	(0.146)	(0.184)
HS	-0.626	-1.004	-1.013	-0.76	-0.583	-0.779	-0.125
	(0.126)	(0.155)	(0.179)	(0.204)	(0.231)	(0.269)	(0.408)
SC	-0.532	-0.91	-0.958	-0.821	-0.533	-0.411	0.334
	(0.140)	(0.167)	(0.191)	(0.215)	(0.242)	(0.279)	(0.415)
COL	-0.158	-0.645	-0.846	-0.751	-0.668	-0.875	-0.581
	(0.191)	(0.216)	(0.236)	(0.258)	(0.282)	(0.316)	(0.448)
Age	1.46	1.864	1.449	0.628	-0.318	-1.35	-1.621
	(0.392)	(0.440)	(0.471)	(0.476)	(0.469)	(0.456)	(0.455)
Age Squared	-0.021	-0.019	-0.005	0.011	0.027	0.042	0.046
	(0.009)	(0.010)	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)
Part-time $(t-1)$	0.043	0.123	0.052	0.078	-0.035	-0.05	-0.542
	(0.128)	(0.143)	(0.155)	(0.167)	(0.187)	(0.229)	(0.361)
Part-time $(t-2)$	0.204	0.298	0.209	0.272	0.168	0.506	-0.486
	(0.180)	(0.190)	(0.201)	(0.212)	(0.232)	(0.272)	(0.410)
Part-time $(t-3)$	0.454	0.489	0.579	0.576	0.584	0.624	0.197
	-0.307	-0.311	-0.317	-0.324	-0.337	-0.364	-0.468
Part-time $(t-4)$	0.787	0.920	0.987	0.975	0.945	0.954	1.284
	-0.522	-0.523	-0.526	-0.529	-0.536	-0.55	-0.61
Full-time $(t-1)$	0.156	0.166	0.144	0.226	(0.021)	0.245	(0.003)
	-0.098	-0.112	-0.125	-0.141	-0.163	-0.204	-0.322
Full-time $(t-2)$	0.481	0.5	0.473	0.456	0.435	0.658	0.06
	(0.148)	(0.159)	(0.171)	(0.188)	(0.213)	(0.266)	(0.413)
Full-time $(t-3)$	0.413	0.437	0.498	0.41	0.495	0.396	0.199
	(0.210)	(0.216)	(0.225)	(0.238)	(0.258)	(0.302)	(0.442)
Full-time $(t-4)$	0.278	0.57	0.519	0.436	0.51	0.392	1.164
	(0.284)	(0.285)	(0.290)	(0.296)	(0.308)	(0.331)	(0.456)
Number of children	0.215	0.285	0.18	-0.26	-0.603	-0.983	-1.568
	(0.358)	(0.371)	(0.379)	(0.388)	(0.406)	(0.447)	(0.572)
Number of children Sq.	-0.122	-0.128	-0.128	-0.102	-0.138	-0.161	-0.019
	(0.247)	(0.250)	(0.251)	(0.253)	(0.256)	(0.265)	(0.297)
Number of female children	-0.259	-0.471	-0.541	-0.567	-0.536	-0.377	-0.274
	(0.143)	(0.149)	(0.152)	(0.154)	(0.157)	(0.163)	(0.188)
Age of 1st child	-0.067	-0.036	0.009	0.069	0.104	0.114	0.097
	(0.102)	(0.103)	(0.103)	(0.104)	(0.104)	(0.104)	(0.105)
Age of 2nd child	0.654	0.657	0.696	0.739	0.771	0.786	0.785
	(0.509)	(0.510)	(0.510)	(0.510)	(0.510)	(0.510)	(0.511)
Age of 3rd child	9.065	9.07	9.045	9.042	9.075	9.092	9.043
	(2.016)	(2.017)	(2.017)	(2.017)	(2.017)	(2.017)	(2.018)
Age of 4th child	1.048	1.275	1.317	1.198	1.23	1.288	1.445
	(0.409)	(0.099)	(0.054)	-	(0.042)	(0.051)	(0.081)
Time spent 1st child	0.173	0.211	0.23	0.219	0.216	0.195	0.222
	(0.062)	(0.063)	(0.064)	(0.065)	(0.066)	(0.068)	(0.072)
Time spent 2nd child	-0.313	-0.271	-0.262	-0.266	-0.278	-0.269	-0.301
	(0.290)	(0.290)	(0.291)	(0.291)	(0.291)	(0.292)	(0.293)
Time spent 3rd child	-4.631	-4.585	-4.534	-4.472	-4.458	-4.444	-4.359
	(1.417)	(1.417)	(1.417)	(1.417)	(1.417)	(1.417)	(1.418)
Time spent 4th child	1.2	1.445	1.363	1.544	1.606	1.622	1.329
	(1.356)	(1.319)	(1.319)	(1.318)	(1.319)	(1.320)	(1.326)
Constant	9.777	-30.357	-30.477	-22.548	-10.274	6.371	9.241
	(4.099)	(4.766)	(5.315)	(5.485)	(5.340)	(4.989)	(4.964)
N	31,043	31,043	31,043	31,043	31,043	31,043	31,043

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least college. Age group 1: ages 18 to 23; Age group 2, ages 24 to 28; Age group 3: ages 29 to 33; Age group 4: ages 34 to 38; Age group 5: ages 39 to 43; Age group 7: ages 49 to 52, and age group 8: ages greater than 53.

Table C.7: Probability of wife's labor-market history.
(Standard Errors in Parenthesis)

	Work ($t-1$)		Work ($t-2$)		Work ($t-3$)		Work ($t-4$)	
Variable	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time
Spouse Part-time ($t-2$)	1.914	1.656						
	(0.061)	(0.061)						
Spouse Full-time ($t-2$)	2.025	3.6						
	(0.075)	(0.062)						
Spouse Part-time ($t-3$)	0.479	0.017	1.993	1.814				
	(0.071)	(0.069)	(0.062)	(0.063)				
Spouse Full-time ($t-3$)	0.036	0.397	2.378	4.044				
	(0.085)	(0.074)	(0.080)	(0.068)				
Spouse Part-time ($t-4$)	0.439	0.26	0.677	0.284	2.214	2.077		
	(0.070)	(0.068)	(0.066)	(0.068)	(0.058)	(0.058)		
Spouse Full-time ($t-4$)	0.169	0.593	0.197	0.795	2.582	4.595		
	(0.073)	(0.064)	(0.075)	(0.065)	(0.065)	(0.056)		
Spouse HS	0.233	0.411	0.179	0.445	0.153	0.42	0.305	0.713
	(0.103)	(0.091)	(0.109)	(0.100)	(0.114)	(0.106)	(0.107)	(0.078)
Spouse SC	0.372	0.509	0.275	0.5	0.263	0.47	0.434	0.778
	(0.109)	(0.096)	(0.115)	(0.106)	(0.120)	(0.111)	(0.113)	(0.081)
Spouse COL	0.518	0.705	0.452	0.697	0.401	0.621	0.62	0.923
	(0.116)	(0.103)	(0.121)	(0.111)	(0.126)	(0.116)	(0.119)	(0.085)
Spouse Age Group 2	-0.036	0.346	0.413	0.816	1.02	1.346	9.323	10.984
	(0.112)	(0.091)	(0.142)	(0.110)	(0.226)	(0.168)	(0.085)	(0.065)
Spouse Age Group 3	-0.1	0.33	0.321	0.761	1.016	1.386	9.518	11.665
	(0.134)	(0.114)	(0.160)	(0.129)	(0.239)	(0.183)	(0.103)	(0.076)
Spouse Age Group 4	0.008	0.274	0.355	0.733	1.074	1.397	9.585	11.78
	(0.152)	(0.131)	(0.176)	(0.145)	(0.251)	(0.195)	(0.125)	(0.091)
Spouse Age Group 5	0.062	0.321	0.573	0.866	1.143	1.447	9.688	11.763
	(0.169)	(0.146)	(0.191)	(0.158)	(0.262)	(0.205)	(0.143)	(0.105)
Spouse Age Group 6	-0.083	0.193	0.454	0.666	1.197	1.462	9.898	11.99
	(0.198)	(0.172)	(0.217)	(0.184)	(0.279)	(0.220)	(0.172)	(0.127)
Spouse Age Group 7	-0.362	-0.202	0.198	0.538	1.04	1.313	9.985	12.139
	(0.265)	(0.222)	(0.279)	(0.229)	(0.325)	(0.253)	(0.242)	(0.174)
Spouse Age Group 8	0.294	0.339	0.786	0.356	0.929	1.197	10.129	11.705
	(0.476)	(0.403)	(0.466)	(0.426)	(0.527)	(0.412)	(0.420)	(0.298)
Black	-0.194	0.227	-0.22	0.304	-0.274	0.311	-0.261	0.379
	(0.064)	(0.052)	(0.067)	(0.054)	(0.069)	(0.055)	(0.063)	(0.039)
HS	0.056	0.151	0.013	0.087	0.01	0.122	0.041	0.136
	(0.094)	(0.079)	(0.099)	(0.086)	(0.103)	(0.088)	(0.098)	(0.069)
SC	0.003	0.087	-0.013	0.046	0.023	0.149	0.059	0.133
	(0.101)	(0.085)	(0.105)	(0.092)	(0.109)	(0.095)	(0.103)	(0.073)
COL	0.067	-0.101	-0.035	-0.204	-0.013	-0.088	0.027	-0.122
	(0.105)	(0.091)	(0.110)	(0.096)	(0.114)	(0.099)	(0.108)	(0.077)

Table C.7 (continued): probability of wife's labor-market history (Standard Errors in Parenthesis)

	Work $(t-1)$		Work $(t-2)$		Work $(t-3)$		Work $(t-4)$	
Variable	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time
Age	0.032	0.079	0.056	0.112	0.027	0.061	0.108	0.146
	(0.040)	(0.033)	(0.042)	(0.035)	(0.045)	(0.037)	(0.044)	(0.030)
Age squared	0	-0.001	-0.001	-0.002	0	-0.001	-0.001	-0.002
	(0.001)	-	(0.001)	-	(0.001)	(0.001)	(0.001)	-
Number of children	0.025	-0.97	0.43	-1.035	0.687	-0.349	1.005	0.399
	(0.092)	(0.081)	(0.093)	(0.086)	(0.093)	(0.087)	(0.087)	(0.063)
Number of children Sq.	-0.052	0.149	-0.173	0.106	-0.217	-0.087	-0.259	-0.327
	(0.029)	(0.026)	(0.030)	(0.028)	(0.030)	(0.029)	(0.027)	(0.022)
Number of female children	-0.031	-0.048	0.003	-0.046	-0.005	-0.043	-0.014	-0.074
	(0.036)	(0.033)	(0.037)	(0.035)	(0.036)	(0.035)	(0.033)	(0.026)
Age of 1st child	-0.01	0.055	-0.026	0.052	-0.032	0.018	-0.032	-0.012
	(0.011)	(0.008)	(0.010)	(0.009)	(0.010)	(0.008)	(0.009)	(0.006)
Age of 2nd child	0.043	0.039	0.036	0.05	0.028	0.044	0.009	0.036
	(0.012)	(0.009)	(0.012)	(0.009)	(0.011)	(0.009)	(0.010)	(0.007)
Age of 3rd child	0.01	-0.019	0.034	0.013	0.041	0.046	0.037	0.081
	(0.016)	(0.014)	(0.017)	(0.014)	(0.016)	(0.014)	(0.014)	(0.011)
Age of 4th child	0.09	0.027	0.12	0.043	0.098	0.075	0.058	0.072
	(0.035)	(0.032)	(0.035)	(0.033)	(0.033)	(0.033)	(0.028)	(0.024)
Time spent 1st child	0.001	0.017	0.005	0.04	0.008	0.03	0.028	0.069
	(0.014)	(0.012)	(0.014)	(0.013)	(0.014)	(0.013)	(0.012)	(0.009)
Time spent 2nd child	0.048	0.064	0.039	0.053	0.029	0.035	0.024	0.009
	(0.018)	(0.016)	(0.018)	(0.016)	(0.017)	(0.016)	(0.016)	(0.012)
Time spent 3rd child	-0.001	0.023	0.024	0.031	0.017	0.06	-0.01	0.084
	(0.028)	(0.024)	(0.028)	(0.025)	(0.027)	(0.025)	(0.024)	(0.019)
Time spent 4th child	-0.078	-0.066	-0.032	-0.008	-0.004	0.043	0.043	0.212
	(0.060)	(0.052)	(0.059)	(0.050)	(0.057)	(0.050)	(0.058)	(0.048)
Part-time $(t-1)$	1.625	1.673	0.28	0.47	0.208	-0.135	-0.312	-0.533
	(0.191)	(0.134)	(0.193)	(0.152)	(0.205)	(0.164)	(0.206)	(0.145)
Part-time $(t-2)$	-0.245	-0.603	1.953	2.023	0.562	0.672	0.342	0.088
	(0.177)	(0.142)	(0.202)	(0.148)	(0.211)	(0.166)	(0.218)	(0.141)
Part-time $(t-3)$	0.032	-0.229	-0.204	-0.536	1.967	2.092	0.456	0.534
	(0.172)	(0.154)	(0.184)	(0.150)	(0.214)	(0.155)	(0.216)	(0.137)
Part-time $(t-4)$	0.121	-0.42	0.127	-0.481	-0.086	-0.728	2.123	2.116
	(0.160)	(0.142)	(0.158)	(0.142)	(0.175)	(0.138)	(0.203)	(0.118)

Table C.7 (continued): probability of wife's labor-market history (Standard Errors in Parenthesis)

Variable	Work ($t-1$) Part Time	Work ($t-1$) Full Time	Work ($t-2$) Part Time	Work ($t-2$) Full Time	Work ($t-3$) Part Time	Work ($t-3$) Full Time	Work ($t-4$) Part Time	Work ($t-4$) Full Time
Full-time ($t-1$)	1.82	1.831	0.099	0.291	-0.059	-0.204	-0.474	-0.418
	(0.152)	(0.093)	(0.157)	(0.115)	(0.176)	(0.125)	(0.179)	(0.121)
Full-time ($t-2$)	-0.369	-0.783	2.09	2.198	0.384	0.604	0.173	0.124
	(0.129)	(0.102)	(0.168)	(0.112)	(0.184)	(0.135)	(0.198)	(0.117)
Full-time ($t-3$)	-0.015	-0.153	-0.433	-0.814	2.095	2.252	0.381	0.538
	(0.136)	(0.115)	(0.136)	(0.108)	(0.184)	(0.121)	(0.194)	(0.112)
Full-time ($t-4$)	-0.105	-0.511	-0.014	-0.415	-0.292	-1.088	2.302	2.213
	(0.116)	(0.102)	(0.116)	(0.097)	(0.120)	(0.090)	(0.177)	(0.094)
Constant	.074	-4.121	-5.471	-5.825	-6.176	-6.056	-16.01	-17.369
	(0.633)	(0.519)	(0.673)	(0.557)	(0.735)	(0.606)	(0.720)	(0.494)
N	27,541	27,541	27,541	27,541	27,541	27,541	27,541	27,541

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least college. Age group 1: ages 18 to 23; Age group 2, ages 24 to 28; Age group 3: ages 29 to 33; Age group 4: ages 34 to 38; Age group 5: ages 39 to 43; Age group 7: ages 49 to 52, and age group 8: ages greater than 53.

Table C.8: probability of wife's education.
(Standard Errors in Parenthesis)

Variables	HS	SC	COL	Variables	HS	SC	COL
Spouse Age Group 2	0.642	1.045	1.96	Number of children	-0.25	-0.521	-0.515
	(0.117)	(0.130)	(0.172)		(0.113)	(0.121)	(0.128)
Spouse Age Group 3	1.074	1.719	3.173	Number of children Sq.	0.037	0.089	0.17
	(0.154)	(0.168)	(0.206)		(0.036)	(0.039)	(0.040)
Spouse Age Group 4	1.035	1.931	3.841	Number of female children	0.16	0.226	0.06
	(0.180)	(0.194)	(0.232)		(0.048)	(0.051)	(0.054)
Spouse Age Group 5	0.883	1.862	4.36	Age of 1st child	-0.004	-0.071	-0.17
	(0.212)	(0.226)	(0.263)		(0.013)	(0.014)	(0.015)
Spouse Age Group 6	0.579	1.523	4.683	Age of 2nd child	-0.019	-0.018	0.028
	(0.271)	(0.286)	(0.317)		(0.014)	(0.015)	(0.016)
Spouse Age Group 7	-0.113	0.58	4.291	Age of 3rd child	0.016	-0.051	-0.066
	(0.393)	(0.417)	(0.441)		(0.019)	(0.021)	(0.021)
Spouse Age Group 8	-0.413	-0.195	2.914	Age of 4th child	-0.106	0.011	-0.032
	(0.664)	(0.743)	(0.777)		(0.033)	(0.038)	(0.036)
Black	-0.421	-0.005	-0.266	Time spent 1st child	0.037	0.08	0.09
	(0.064)	(0.068)	(0.077)		(0.018)	(0.019)	(0.020)
HS	1.573	2.106	3.875	Time spent 2nd child	-0.044	-0.025	-0.062
	(0.067)	(0.087)	(0.247)		(0.022)	(0.023)	(0.025)
SC	2.451	3.81	5.816	Time spent 3rd child	-0.009	0.044	-0.045
	(0.104)	(0.118)	(0.258)		(0.030)	(0.033)	(0.035)
COL	2.464	4.44	8.064	Time spent 4th child	0.636	0.528	0.575
	(0.163)	(0.170)	(0.285)		(0.101)	(0.103)	(0.103)
Age	-0.274	-0.327	-0.283	Constant	4.268	3.241	-1.119
	(0.056)	(0.059)	(0.064)		(0.836)	(0.882)	(1.001)
Age Squared.	0.004	0.005	0.004	N	27,541	27,541	27,541
	(0.001)	(0.001)	(0.001)				
Part-time $(t-1)$	-0.178	-0.206	-0.231				
	(0.183)	(0.200)	(0.223)				
Part-time $(t-2)$	-0.267	-0.353	-0.355				
	(0.195)	(0.212)	(0.231)				
Part-time $(t-3)$	-0.384	-0.472	-0.426				
	(0.200)	(0.219)	(0.235)				
Part-time $(t-4)$	-0.234	-0.456	-0.418				
	(0.186)	(0.203)	(0.214)				
Full-time $(t-1)$	0.021	0.032	0.204				
	(0.136)	(0.149)	(0.169)				
Full-time $(t-2)$	0.023	0.002	0.03				
	(0.149)	(0.162)	(0.180)				
Full-time $(t-3)$	-0.008	0.004	-0.026				
	(0.155)	(0.168)	(0.182)				
Full-time $(t-4)$	0.057	-0.047	-0.103				
	(0.134)	(0.144)	(0.154)				

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least college. Age group 1: ages 18 to 23; Age group 2, ages 24 to 28; Age group 3: ages 29 to 33; Age group 4: ages 34 to 38; Age group 5: ages 39 to 43; Age group 7: ages 49 to 52, and age group 8: ages greater than 53.

Table C.9: probability of wife's age group.
(Standard Errors in Parenthesis)

Variables	Age Group						
	2	3	4	5	6	7	8
Black	0.328	0.362	0.365	0.408	0.38	-0.326	-2.372
	(0.087)	(0.103)	(0.113)	(0.126)	(0.151)	(0.230)	(0.708)
HS	0.596	0.865	1.119	1.694	2.025	2.076	3.663
	(0.118)	(0.150)	(0.174)	(0.202)	(0.245)	(0.337)	(1.333)
SC	0.964	1.384	1.648	2.219	2.403	2.469	3.027
	(0.129)	(0.162)	(0.186)	(0.212)	(0.256)	(0.351)	(1.270)
COL	1.676	2.563	3.265	4.245	4.949	5.285	5.462
	(0.154)	(0.183)	(0.205)	(0.231)	(0.271)	(0.357)	(1.288)
Age	1.225	2.846	4.701	5.79	5.015	3.426	2.204
	(0.059)	(0.096)	(0.131)	(0.221)	(0.395)	(0.444)	(0.312)
Age Squared	-0.016	-0.037	-0.059	-0.069	-0.057	-0.037	-0.022
	(0.001)	(0.002)	(0.002)	(0.003)	(0.005)	(0.005)	(0.004)
Part-time ($t-1$)	0.14	0.012	0.084	0.023	0.242	-0.046	2.113
	(0.189)	(0.250)	(0.314)	(0.372)	(0.489)	(0.663)	(1.258)
Part-time ($t-2$)	0.25	0.092	0.082	0.16	-0.339	0.731	2.264
	(0.224)	(0.266)	(0.328)	(0.388)	(0.533)	(0.716)	(1.031)
Part-time ($t-3$)	0.158	0.081	-0.101	0.008	0.147	0.185	0.695
	(0.246)	(0.280)	(0.328)	(0.395)	(0.535)	(0.744)	(0.724)
Part-time ($t-4$)	0.18	0.401	0.224	0.147	-0.063	1.061	0.056
	(0.243)	(0.265)	(0.305)	(0.368)	(0.479)	(0.680)	(0.702)
Full-time ($t-1$)	0.323	0.292	0.395	0.25	0.17	-0.52	1.635
	(0.106)	(0.178)	(0.244)	(0.293)	(0.432)	(0.580)	(1.244)
Full-time ($t-2$)	0.312	0.259	0.282	0.154	-0.022	0.921	1.508
	(0.107)	(0.168)	(0.243)	(0.301)	(0.485)	(0.667)	(0.945)
Full-time ($t-3$)	-0.033	0.171	-0.051	0.044	0.217	-0.172	-0.35
	(0.120)	(0.165)	(0.229)	(0.296)	(0.479)	(0.728)	(0.682)
Full-time ($t-4$)	0.668	1.065	1.013	0.891	0.63	1.095	-0.111
	(0.124)	(0.148)	(0.196)	(0.254)	(0.357)	(0.625)	(0.589)
Number of children	-1.204	-1.667	-2.222	-3.101	-4.326	-6.034	-3.809
	(0.314)	(0.327)	(0.336)	(0.351)	(0.395)	(0.561)	(2.149)
Number of children Sq.	0.622	0.678	0.767	0.824	0.848	1.039	-1.26
	(0.236)	(0.239)	(0.240)	(0.242)	(0.250)	(0.287)	(1.109)
Number of female children	0.099	0.185	0.289	0.297	0.286	0.109	-0.271
	(0.114)	(0.121)	(0.124)	(0.128)	(0.135)	(0.153)	(0.298)
Age of 1st child	0.458	0.625	0.737	0.82	0.912	0.97	0.932
	(0.075)	(0.076)	(0.077)	(0.077)	(0.078)	(0.080)	(0.093)
Age of 2nd child	-0.6	-0.554	-0.517	-0.44	-0.377	-0.314	-0.102
	(0.224)	(0.225)	(0.226)	(0.227)	(0.227)	(0.227)	(0.237)
Age of 3rd child	-0.343	-0.168	-0.121	-0.057	0.031	0.081	0.582
	(0.322)	(0.316)	(0.317)	(0.317)	(0.317)	(0.318)	(0.356)
Age of 4th child	0.933	0.652	0.575	0.617	0.67	0.635	0.127
	(0.959)	(0.944)	(0.944)	(0.945)	(0.945)	(0.948)	(1.024)
Time spent 1st child	0.017	0.027	0.04	0.035	0.027	0.041	0.043
	(0.053)	(0.055)	(0.056)	(0.057)	(0.059)	(0.065)	(0.110)
Time spent 2nd child	0.066	0.111	0.144	0.182	0.244	0.295	0.539
	(0.112)	(0.113)	(0.114)	(0.114)	(0.116)	(0.120)	(0.163)
Time spent 3rd child	0.306	0.278	0.242	0.245	0.296	0.348	0.501
	(0.631)	(0.628)	(0.628)	(0.628)	(0.629)	(0.630)	(0.651)
Time spent 4th child	0.016	-0.055	-0.018	-0.041	-0.058	-0.133	0.039
	(1.000)	(0.978)	(0.979)	(0.979)	(0.980)	(0.993)	(0.995)
Constant	0.427	-50.609	-88.272	-115.728	-105.685	-76.427	-55.783
	(0.849)	(1.451)	(2.222)	(4.438)	(8.491)	(9.702)	(6.651)
N	27,541	27,541	27,541	27,541	27,541	27,541	27,541

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least college. Age group 1: ages 18 to 23; Age group 2, ages 24 to 28; Age group 3: ages 29 to 33; Age group 4: ages 34 to 38; Age group 5: ages 39 to 43; Age group 7: ages 49 to 52, and age group 8: ages greater than 53.

C.2.3 Conditional Choice Probability Estimation

All conditional choice probabilities are estimated using a flexible Logit model. The probabilities are broken into women and men with/without young children. The CCPs for women are also conditional on whether the women is in the fertility part of her life cycle.

Table C.10: CCP estimates for men with young children.
(Standard Errors in Parenthesis)

Variables	2	3	4	5	6	7	8	9
Black	-0.226	-0.582	-0.261	-0.582	-0.773	-0.297	-0.338	-0.43
	(0.236)	(0.187)	(0.337)	(0.321)	(0.192)	(0.284)	(0.300)	(0.192)
HS	0.146	0.588	0.475	0.772	0.779	-0.387	0.315	0.665
	(0.317)	(0.252)	(0.530)	(0.517)	(0.267)	(0.367)	(0.386)	(0.268)
SC	0.605	0.858	0.832	0.631	1.054	-0.173	0.335	0.988
	(0.359)	(0.292)	(0.581)	(0.598)	(0.307)	(0.434)	(0.441)	(0.307)
COL	1.233	1.784	1.763	1.854	2.302	0.903	1.576	2.017
	(0.527)	(0.453)	(0.793)	(0.743)	(0.462)	(0.595)	(0.625)	(0.464)
Age	-0.195	-0.197	-0.064	0.083	-0.158	0.015	0.105	-0.256
	(0.235)	(0.192)	(0.330)	(0.310)	(0.196)	(0.313)	(0.263)	(0.196)
Age Squared	0.001	0.001	0.001	-0.004	0.001	-0.001	-0.002	0.002
	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)	(0.005)	(0.004)	(0.003)
Part-time $(t-1)$	2.084	1.032	0.646	1.095	1.108	-0.133	0.848	0.959
	(0.466)	(0.306)	(0.527)	(0.605)	(0.353)	(0.412)	(0.434)	(0.343)
Part-time $(t-2)$	0.197	-0.618	0.04	0.716	-0.434	-0.658	-0.05	-0.597
	(0.471)	(0.362)	(0.581)	(0.680)	(0.389)	(0.483)	(0.559)	(0.387)
Part-time $(t-3)$	0.791	0.325	1.437	0.6	0.044	0.472	1.511	0.418
	(0.541)	(0.436)	(0.713)	(0.751)	(0.454)	(0.577)	(0.565)	(0.452)
Part-time $(t-4)$	-0.436	-0.528	-0.196	-0.11	-0.593	0.434	-0.458	-0.707
	(0.521)	(0.396)	(0.634)	(0.694)	(0.415)	(0.548)	(0.526)	(0.412)
Full-time $(t-1)$	2.61	3.515	0.236	1.634	3.628	-0.319	1.047	3.288
	(0.469)	(0.310)	(0.586)	(0.594)	(0.342)	(0.421)	(0.473)	(0.333)
Full-time $(t-2)$	0.149	0.497	-0.589	1.076	0.729	-0.434	0.011	0.657
	(0.446)	(0.337)	(0.664)	(0.637)	(0.353)	(0.459)	(0.558)	(0.351)
Full-time $(t-3)$	0.646	0.634	1.349	-0.207	0.221	0.516	1.261	0.55
	(0.469)	(0.372)	(0.792)	(0.734)	(0.383)	(0.522)	(0.560)	(0.382)
Full-time $(t-4)$	0.028	0.479	-0.06	0.453	0.591	0.962	-0.232	0.282
	(0.434)	(0.352)	(0.571)	(0.642)	(0.360)	(0.509)	(0.470)	(0.361)
Number of children	-1.664	-2.237	-1.144	-3.365	-2.419	-1.44	-1.741	-2.53
	(0.655)	(0.543)	(0.986)	(0.744)	(0.550)	(0.724)	(0.695)	(0.551)
Number of children Sq.	0.515	0.589	0.328	0.906	0.609	0.52	0.349	0.606
	(0.223)	(0.185)	(0.305)	(0.258)	(0.188)	(0.233)	(0.227)	(0.188)
Number of female children	-0.187	-0.15	0.027	-0.057	-0.114	-0.359	0.035	-0.192
	(0.175)	(0.135)	(0.255)	(0.252)	(0.137)	(0.204)	(0.201)	(0.138)
Age of 1st child	0.03	0.01	-0.119	-0.177	-0.04	-0.147	-0.298	-0.153
	(0.064)	(0.050)	(0.103)	(0.116)	(0.051)	(0.082)	(0.127)	(0.053)
Age of 2nd child	-0.004	0.118	-0.219	0.239	0.071	-0.233	0.344	0.119
	(0.139)	(0.115)	(0.269)	(0.198)	(0.118)	(0.210)	(0.206)	(0.121)
Age of 3rd child	-0.545	-0.522	0.777	-1.88	-0.482	-0.398	-0.577	-0.506
	(0.288)	(0.237)	(0.385)	(0.751)	(0.242)	(0.342)	(0.393)	(0.246)
Age of 4th child	-0.903	-0.403	-20.082	-0.871	-0.757	-0.297	-0.07	-0.45
	(0.688)	(0.304)	(3.857)	(0.746)	(0.367)	(0.573)	(0.526)	(0.352)
Time spent 1st child	-0.172	-0.124	0.308	0.23	0.113	0.107	0.15	0.239
	(0.069)	(0.052)	(0.100)	(0.097)	(0.053)	(0.074)	(0.084)	(0.053)
Time spent 2nd child	-0.047	0.09	-0.194	0.259	0.198	0.424	0.285	0.3
	(0.110)	(0.078)	(0.191)	(0.167)	(0.078)	(0.126)	(0.124)	(0.079)
Time spent 3rd child	0.277	0.018	0.043	0.558	0.19	0.348	0.163	0.328
	(0.206)	(0.158)	(0.257)	(0.520)	(0.160)	(0.237)	(0.194)	(0.161)
Time spent 4th child	-0.153	-0.206	9.796	1.153	0.092	-1.106	0.271	0.045
	(0.378)	(0.328)	(2.137)	(0.659)	(0.330)	(0.528)	(0.362)	(0.332)

Table C.10 (continued): CCP estimates for men with young children (Standard Errors in Parenthesis)

Variables	2	3	4	5	6	7	8	9
Spouse Age	0.151	0.053	0.181	-0.018	-0.017	0.283	-0.138	0.057
	(0.265)	(0.210)	(0.380)	(0.282)	(0.213)	(0.321)	(0.287)	(0.214)
Spouse Age Squared	-0.002	-0.001	-0.003	0.002	0	-0.005	0.001	-0.001
	(0.004)	(0.003)	(0.006)	(0.005)	(0.003)	(0.005)	(0.005)	(0.003)
Spouse HS	0.202	0.293	-0.291	-0.348	0.3	-0.461	-0.147	0.447
	(0.361)	(0.292)	(0.550)	(0.480)	(0.305)	(0.395)	(0.414)	(0.310)
Spouse SC	-0.45	-0.136	-0.601	-1.081	0.034	-1.133	-0.538	0.117
	(0.398)	(0.317)	(0.548)	(0.531)	(0.331)	(0.448)	(0.457)	(0.336)
Spouse COL	-0.384	0.1	-1.264	-1.519	0.294	-1.446	-0.442	0.223
	(0.551)	(0.465)	(0.961)	(0.726)	(0.475)	(0.609)	(0.631)	(0.479)
Spouse Part-time $(t-1)$	0.693	0.453	-0.69	0.936	0.616	1.125	1.083	0.767
	(0.371)	(0.317)	(0.817)	(0.513)	(0.321)	(0.516)	(0.455)	(0.323)
Spouse Part-time $(t-2)$	-0.127	-0.347	-1.458	-0.246	-0.284	-0.173	-0.245	-0.315
	(0.396)	(0.330)	(0.849)	(0.512)	(0.334)	(0.515)	(0.468)	(0.335)
Spouse Part-time $(t-3)$	0.115	0.2	-0.121	-0.269	0.133	-0.438	0.029	0.256
	(0.404)	(0.338)	(0.763)	(0.551)	(0.343)	(0.595)	(0.469)	(0.344)
Spouse Part-time $(t-4)$	-0.52	-0.586	-0.762	-0.686	-0.544	-1.407	-0.543	-0.539
	(0.371)	(0.304)	(0.657)	(0.541)	(0.308)	(0.502)	(0.445)	(0.310)
Spouse Full-time $(t-1)$	0.429	0.574	0.118	1.183	0.934	1.093	1.754	1.072
	(0.368)	(0.314)	(0.485)	(0.438)	(0.318)	(0.468)	(0.411)	(0.318)
Spouse Full-time $(t-2)$	0.118	-0.309	-0.303	-0.9	-0.297	0.225	-0.489	-0.465
	(0.419)	(0.353)	(0.674)	(0.524)	(0.357)	(0.523)	(0.473)	(0.359)
Spouse Full-time $(t-3)$	0.314	0.616	1.153	0.775	0.508	0.751	0.017	0.677
	(0.422)	(0.361)	(0.672)	(0.543)	(0.364)	(0.499)	(0.459)	(0.366)
Spouse Full-time $(t-4)$	-0.376	-0.348	-0.917	-0.214	-0.276	-1.059	-0.449	-0.379
	(0.372)	(0.309)	(0.525)	(0.510)	(0.313)	(0.446)	(0.432)	(0.314)
Spouse Time spent 1st child	0.029	0.063	-0.195	0.125	0.025	-0.022	0.07	0.059
	(0.071)	(0.057)	(0.107)	(0.098)	(0.058)	(0.093)	(0.087)	(0.058)
Spouse Time spent 2nd child	0.051	0.07	0.473	-0.219	0.1	0.107	0.034	0.054
	(0.099)	(0.076)	(0.187)	(0.160)	(0.078)	(0.169)	(0.111)	(0.079)
Spouse Time spent 3rd child	0.145	0.138	-0.818	0.352	0.116	-0.021	0.19	0.119
	(0.169)	(0.129)	(0.302)	(0.307)	(0.133)	(0.252)	(0.221)	(0.136)
Spouse Time spent 4th child	1.055	0.694	1.441	0.327	0.807	0.921	0.611	0.712
	(0.452)	(0.212)	(0.507)	(0.507)	(0.245)	(0.298)	(0.345)	(0.244)
Constant	0.691	4.653	-2.285	-1.05	3.565	-3.275	0.615	4.064
	(3.186)	(2.455)	(4.764)	(3.913)	(2.521)	(3.972)	(3.565)	(2.535)
N	13,073	13,073	13,073	13,073	13,073.000	13,073	13,073	13,073

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least a college.

Table C.11: CCP estimates for men without young children.
(Standard Errors in Parenthesis)

Variables	2	3	Variables	2	3
Black	-0.133	-0.363	Spouse Age	-0.26	-0.225
	(0.173)	(0.135)		(0.112)	(0.092)
HS	0.5	0.617	Spouse Age Squared	0.003	0.003
	(0.254)	(0.192)		(0.002)	(0.001)
SC	0.278	0.697	Spouse HS	0.498	0.368
	(0.285)	(0.215)		(0.322)	(0.250)
COL	0.802	0.881	Spouse SC	0.634	0.48
	(0.312)	(0.243)		(0.339)	(0.264)
Age	-0.211	-0.161	Spouse COL	0.554	0.47
	(0.117)	(0.089)		(0.374)	(0.294)
Age Squared	0.002	0.002	Spouse Part-time ($t-1$)	2.122	0.914
	(0.002)	(0.001)		(0.310)	(0.238)
Part-time ($t-1$)	2.122	0.914	Spouse Part-time ($t-2$)	0.009	-0.768
	(0.310)	(0.238)		(0.401)	(0.318)
Part-time ($t-2$)	0.009	-0.768	Spouse Part-time ($t-3$)	0.364	0.02
	(0.401)	(0.318)		(0.426)	(0.354)
Part-time ($t-3$)	0.364	0.02	Spouse Part-time ($t-4$)	0.856	0.047
	(0.426)	(0.354)		(0.401)	(0.333)
Part-time ($t-4$)	0.856	0.047	Spouse Full-time ($t-1$)	3.002	4.143
	(0.401)	(0.333)		(0.327)	(0.250)
Full-time ($t-1$)	3.002	4.143	Spouse Full-time ($t-2$)	-0.252	0.051
	(0.327)	(0.250)		(0.402)	(0.319)
Full-time ($t-2$)	-0.252	0.051	Spouse Full-time ($t-3$)	-0.058	0.264
	(0.402)	(0.319)		(0.433)	(0.362)
Full-time ($t-3$)	-0.058	0.264	Spouse Full-time ($t-4$)	0.945	0.394
	(0.433)	(0.362)		(0.372)	(0.310)
Full-time ($t-4$)	0.945	0.394	Spouse Time spent 1st child	-0.012	-0.015
	(0.372)	(0.310)		(0.050)	(0.035)
Number of children	-0.463	-0.622	Spouse Time spent 2nd child	-0.032	0.089
	(0.621)	(0.476)		(0.059)	(0.043)
Number of children Sq.	0.243	0.245	Spouse Time spent 3rd child	0.033	-0.048
	(0.234)	(0.187)		(0.097)	(0.071)
Number of female children	0.088	0.026	Spouse Time spent 4th child	-0.163	-0.12
	(0.166)	(0.123)		(0.199)	(0.169)
Age of 1st child	-0.002	0.025	Constant	6.598	7.568
	(0.034)	(0.023)		(1.435)	(1.101)
Age of 2nd child	-0.027	-0.027			
	(0.036)	(0.026)	N	14,484	14,484
Age of 3rd child	-0.116	-0.095			
	(0.074)	(0.055)			
Age of 4th child	0.172	0.132			
	(0.148)	(0.117)			
Time spent 1st child	-0.073	-0.07			
	(0.051)	(0.038)			
Time spent 2nd child	0.151	0.092			
	(0.060)	(0.046)			
Time spent 3rd child	-0.028	0.192			
	(0.144)	(0.120)			
Time spent 4th child	-0.196	-0.327			
	(0.196)	(0.161)			

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least a college.

Table C.12: CCP estimates for an infertile woman without young children conditional on the husband's choices.
(Standard Errors in Parenthesis)

Variables	2	3	Variables	2	3
Black	-2.030	-1.664	Spouse Age	0.662	-0.109
	(1.010)	(0.783)		(1.646)	(1.386)
HS	-0.175	0.902	Spouse Age Squared	-0.006	0.001
	(1.357)	(1.012)		(0.017)	(0.014)
SC	0.637	2.001	Spouse HS	8.479	-0.422
	(1.370)	(1.006)		(1.001)	(0.807)
COL	0.502	2.183	Spouse SC	8.143	-0.703
	(1.384)	(1.056)		(1.011)	(0.862)
Age	-0.211	-0.283	Spouse COL	7.497	-1.828
	(0.095)	(0.093)		(1.075)	(0.947)
Part-time $(t-1)$	2.465	2.729	Spouse Part-time $(t-1)$	-0.648	0.489
	(0.662)	(0.640)		(1.343)	(1.224)
Part-time $(t-2)$	0.338	-0.313	Spouse Part-time $(t-2)$	-0.513	-1.269
	(0.706)	(0.733)		(1.148)	(0.959)
Part-time $(t-3)$	1.592	1.361	Spouse Part-time $(t-3)$	-2.390	-1.648
	(0.727)	(0.780)		(1.036)	(1.003)
Part-time $(t-4)$	-0.345	-0.035	Spouse Part-time $(t-4)$	2.741	0.304
	(0.675)	(0.671)		(1.490)	(0.893)
Full-time $(t-1)$	2.702	5.154	Spouse Full-time $(t-1)$	0.145	0.446
	(0.681)	(0.586)		(0.814)	(0.759)
Full-time $(t-2)$	-0.050	0.577	Spouse Full-time $(t-2)$	0.074	-0.187
	(0.787)	(0.748)		(0.912)	(0.667)
Full-time $(t-3)$	2.228	1.840	Spouse Full-time $(t-3)$	-1.725	-1.079
	(0.970)	(0.909)		(1.044)	(0.652)
Full-time $(t-4)$	-0.901	0.151	Spouse Full-time $(t-4)$	2.464	-0.059
	(0.832)	(0.809)		(1.378)	(0.721)
No of children	0.030	0.015	Spouse Time spent 1st child	0.174	0.094
	(0.589)	(0.432)		(0.170)	(0.178)
Nor of female children	0.264	0.268	Spouse Time spent 2nd child	-0.173	-0.028
	(0.300)	(0.251)		(0.190)	(0.186)
Age of 1st child	0.108	0.115	Spouse Time spent 3rd child	-0.079	-0.078
	(0.066)	(0.061)		(0.132)	(0.078)
Age of 2nd child	-0.204	-0.074	Spouse Time spent 4th child	-8.145	-0.164
	(0.082)	(0.075)		(1.703)	(0.208)
Time spent 1st child	-0.315	-0.329	Spouse Choice 2	1.568	4.197
	(0.129)	(0.120)		(2.129)	(1.798)
Time spent 2nd child	0.318	0.080	Spouse Choice 3	-0.184	-0.468
	(0.146)	(0.119)		(0.861)	(0.827)
			Constant	8.219	13.684
N	852	852		(40.430)	(34.265)

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least a college.

Table C.13: CCP estimates for an infertile woman with young children choice conditional on the choices of husband.
(Standard Errors in Parenthesis)

VARIABLES	3	5	7	11	13
Black	-41.954	-44.106	-18.952	-39.072	-33.689
	(0.743)	(0.684)	(1.172)	(0.845)	(1.113)
Constant	16.362	16.65	17.343	15.956	15.263
	(0.583)	(0.515)	(0.353)	(0.704)	(1.022)
N	24	24	24	24	24

Notes: Due to low number of observations for this group of females with young children over the age of 45 in the data, only explanatory variable used is the race.

Table C.14: CCP estimates of a fertile women without young children conditional on the choices of the husband.
(Standard Errors in Parenthesis)

VARIABLES	2	3	4	8	9	10	14	15	16
Black	-0.145	-0.075	0.686	-0.189	0.042	0.609	-0.596	-0.486	0.855
	(0.088)	(0.070)	(0.137)	(0.173)	(0.230)	(0.164)	(0.203)	(0.367)	(0.241)
HS	0.371	0.777	0.426	0.331	2.170	0.719	0.309	0.524	0.095
	(0.131)	(0.116)	(0.303)	(0.255)	(1.036)	(0.416)	(0.281)	(0.662)	(0.565)
SC	0.546	1.068	0.535	0.176	2.531	1.220	0.483	0.795	0.361
	(0.140)	(0.124)	(0.312)	(0.289)	(1.055)	(0.427)	(0.305)	(0.669)	(0.568)
COL	0.755	1.286	0.307	0.124	2.643	1.572	0.612	1.098	0.640
	(0.156)	(0.139)	(0.342)	(0.325)	(1.068)	(0.445)	(0.330)	(0.722)	(0.590)
Age	-0.124	-0.095	0.198	0.495	0.228	-0.027	0.352	-0.323	-0.032
	(0.057)	(0.048)	(0.140)	(0.157)	(0.235)	(0.154)	(0.152)	(0.271)	(0.227)
Age Squared	0.002	0.001	-0.005	-0.010	-0.004	-0.001	-0.007	0.004	-0.000
	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)	(0.005)	(0.004)
Part-time $(t-1)$	1.755	1.422	1.401	0.579	1.812	1.383	0.078	1.350	1.544
	(0.102)	(0.097)	(0.256)	(0.192)	(0.284)	(0.275)	(0.214)	(0.338)	(0.340)
Part-time $(t-2)$	0.552	0.270	0.756	0.454	-0.146	0.853	0.628	0.685	0.834
	(0.123)	(0.112)	(0.289)	(0.283)	(0.383)	(0.381)	(0.266)	(0.455)	(0.501)
Part-time $(t-3)$	0.418	0.053	-0.065	0.072	0.079	0.013	0.059	0.470	-0.035
	(0.134)	(0.126)	(0.300)	(0.328)	(0.438)	(0.377)	(0.338)	(0.541)	(0.639)
Part-time $(t-4)$	0.200	0.072	0.023	0.624	0.382	0.105	-0.084	0.277	-1.861
	(0.128)	(0.118)	(0.328)	(0.293)	(0.386)	(0.313)	(0.337)	(0.489)	(1.069)
Full-time $(t-1)$	1.888	3.417	2.791	-0.170	1.670	2.168	-0.605	0.221	1.739
	(0.116)	(0.099)	(0.207)	(0.216)	(0.290)	(0.249)	(0.250)	(0.379)	(0.325)
Full-time $(t-2)$	0.209	0.707	1.174	0.797	0.325	1.657	0.709	0.965	1.013
	(0.141)	(0.120)	(0.239)	(0.255)	(0.329)	(0.290)	(0.262)	(0.457)	(0.435)
Full-time $(t-3)$	0.144	0.239	0.100	0.361	0.683	0.747	0.279	1.027	0.683
	(0.151)	(0.131)	(0.266)	(0.292)	(0.361)	(0.276)	(0.312)	(0.498)	(0.526)
Full-time $(t-4)$	-0.022	0.345	0.545	0.256	0.092	-0.135	0.046	-0.019	0.221
	(0.133)	(0.113)	(0.230)	(0.267)	(0.325)	(0.228)	(0.279)	(0.410)	(0.402)
No of children	0.267	0.048	1.966	1.318	2.824	0.808	1.738	3.355	0.083
	(0.131)	(0.112)	(0.503)	(0.592)	(0.775)	(0.475)	(0.620)	(0.575)	(1.118)
Nor of female children	-0.111	-0.148	-0.698	-0.094	-0.028	-0.258	-0.179	-0.254	0.356
	(0.069)	(0.060)	(0.277)	(0.340)	(0.421)	(0.287)	(0.331)	(0.537)	(0.530)
Age of 1st child	-0.009	0.042	-0.229	-0.093	-0.278	-0.037	-0.338	-0.381	-0.218
	(0.016)	(0.012)	(0.063)	(0.072)	(0.095)	(0.055)	(0.111)	(0.080)	(0.122)
Age of 2nd child	0.029	0.023	-0.089	-0.405	-0.294	-0.012	0.036	-0.210	-0.128
	(0.019)	(0.015)	(0.091)	(0.162)	(0.160)	(0.096)	(0.119)	(0.209)	(0.241)
Age of 3rd child	0.004	0.001	0.177	0.090	-4.732	-0.115	-0.790	-4.240	-0.240
	(0.034)	(0.028)	(0.122)	(0.338)	(0.359)	(0.252)	(0.190)	(0.393)	(0.353)
Age of 4th child	-0.066	-0.076	-3.581	-1.656	-0.249	-12.529	-0.857	-0.829	-1.641
	(0.067)	(0.073)	(0.408)	(0.340)	(0.327)	(0.000)	(0.222)	(0.355)	(0.368)
Time spent 1st child	-0.024	-0.074	-0.237	-0.139	-0.123	-0.003	0.057	-0.032	0.305
	(0.022)	(0.018)	(0.091)	(0.087)	(0.137)	(0.066)	(0.085)	(0.124)	(0.115)
Time spent 2nd child	-0.016	-0.014	-0.158	0.045	-0.175	-0.221	-0.196	-0.231	-0.277
	(0.027)	(0.022)	(0.107)	(0.183)	(0.160)	(0.128)	(0.141)	(0.201)	(0.368)
Time spent 3rd child	-0.016	0.004	-1.082	-0.128	-2.356	0.096	0.251	-2.258	0.329
	(0.037)	(0.032)	(0.457)	(0.250)	(0.705)	(0.207)	(0.112)	(0.734)	(0.330)
Time spent 4th child	0.016	0.042	-0.438	-0.573	-1.066	-9.049	-1.700	-0.941	-1.513
	(0.078)	(0.082)	(0.573)	(0.219)	(0.000)	(0.000)	(0.801)	(0.000)	(0.806)

Table C.14 (continued): CCP estimates of a fertile women without young children conditional on the choices of the husband.

(Standard Errors in Parenthesis)

Variables	2	3	4	8	9	10	14	15	16
Spouse Age	0.039	-0.010	0.084	-0.077	0.101	0.076	-0.047	0.522	0.256
	(0.051)	(0.041)	(0.101)	(0.117)	(0.167)	(0.148)	(0.119)	(0.254)	(0.196)
Spouse Age Squared	-0.001	0.000	-0.001	0.001	-0.003	-0.002	-0.000	-0.009	-0.005
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)	(0.003)
Spouse HS	0.147	0.197	0.525	0.129	-0.373	0.498	0.072	0.482	0.390
	(0.126)	(0.103)	(0.242)	(0.234)	(0.411)	(0.308)	(0.266)	(0.565)	(0.455)
Spouse SC	0.338	0.179	0.360	0.103	0.357	0.281	-0.147	0.573	0.348
	(0.134)	(0.112)	(0.257)	(0.256)	(0.406)	(0.321)	(0.295)	(0.581)	(0.460)
Spouse COL	0.435	0.106	0.182	0.398	0.342	-0.050	-0.096	0.624	-0.087
	(0.143)	(0.121)	(0.291)	(0.293)	(0.423)	(0.340)	(0.317)	(0.586)	(0.531)
Spouse Part-time $(t-1)$	-0.618	-0.828	-0.171	0.561	-1.008	-0.437	-0.736	0.255	0.578
	(0.213)	(0.185)	(0.368)	(0.386)	(0.621)	(0.488)	(0.577)	(0.629)	(0.710)
Spouse Part-time $(t-2)$	-0.608	-0.505	-0.770	-0.400	-0.197	-1.349	-0.423	0.837	-11.938
	(0.248)	(0.199)	(0.439)	(0.479)	(0.575)	(0.645)	(0.567)	(0.579)	(0.705)
Spouse Part-time $(t-3)$	-0.083	-0.146	-0.260	0.082	0.029	0.005	-0.337	-1.042	0.731
	(0.258)	(0.208)	(0.519)	(0.468)	(0.544)	(0.585)	(0.618)	(0.833)	(0.751)
Spouse Part-time $(t-4)$	-0.162	-0.199	-1.030	-0.417	-0.237	-0.424	0.491	0.110	-0.178
	(0.261)	(0.214)	(0.580)	(0.508)	(0.597)	(0.534)	(0.456)	(0.793)	(0.836)
Spouse Full-time $(t-1)$	-0.738	-1.181	-0.599	0.537	-0.475	-0.461	0.347	0.434	0.331
	(0.121)	(0.105)	(0.198)	(0.212)	(0.315)	(0.236)	(0.241)	(0.438)	(0.354)
Spouse Full-time $(t-2)$	-0.292	-0.308	-0.521	-0.165	0.018	-0.388	0.022	-0.036	-0.953
	(0.145)	(0.122)	(0.219)	(0.234)	(0.307)	(0.253)	(0.260)	(0.408)	(0.382)
Spouse Full-time $(t-3)$	0.043	-0.058	-0.034	0.043	-0.146	-0.168	0.318	-0.872	-0.137
	(0.170)	(0.143)	(0.275)	(0.277)	(0.353)	(0.298)	(0.291)	(0.459)	(0.468)
Spouse Full-time $(t-4)$	-0.045	-0.117	-0.423	-0.495	-0.447	-0.310	-0.251	-0.062	-0.037
	(0.156)	(0.128)	(0.250)	(0.260)	(0.342)	(0.270)	(0.271)	(0.446)	(0.381)
Spouse Time spent 1st child	0.002	0.039	0.090	-0.233	-0.035	0.022	0.011	-0.324	-0.038
	(0.027)	(0.022)	(0.075)	(0.113)	(0.111)	(0.075)	(0.071)	(0.165)	(0.118)
Spouse Time spent 2nd child	0.017	0.031	-0.018	0.157	-0.129	-0.194	-0.074	0.305	0.354
	(0.031)	(0.025)	(0.134)	(0.249)	(0.144)	(0.130)	(0.110)	(0.170)	(0.216)
Spouse Time spent 3rd child	0.006	0.001	-38.384	-0.043	-0.839	-112.041	0.147	-0.886	-1.344
	(0.047)	(0.041)	(1.019)	(0.336)	(0.658)	(0.000)	(0.090)	(0.475)	(0.530)
Spouse Time spent 4th child	0.111	0.057	-0.559	-0.299	-0.279	-3.836	-0.371	-0.305	-0.266
	(0.100)	(0.095)	(0.520)	(0.344)	(0.000)	(0.000)	(0.279)	(0.000)	(0.309)
Spouse Choice2	1.874	1.264	0.887	-0.463	1.374	1.628	-0.748	1.752	0.044
	(0.200)	(0.186)	(0.515)	(0.550)	(0.641)	(1.240)	(0.653)	(1.181)	(1.267)
Spouse Choice3	1.153	1.559	1.425	0.347	0.917	2.954	0.046	1.449	1.021
	(0.145)	(0.120)	(0.368)	(0.300)	(0.515)	(1.018)	(0.309)	(1.059)	(0.739)
Spouse Choice4	-2.748	-6.012	12.033	13.024	-1.046	14.364	13.123	-0.259	13.050
	(0.253)	(0.541)	(0.884)	(0.484)	(0.598)	(1.272)	(0.560)	(1.037)	(1.219)
Spouse Choice5	-2.820	-5.301	13.532	12.760	13.377	14.761	12.387	-0.886	-1.014
	(0.244)	(0.503)	(0.632)	(0.503)	(0.979)	(1.223)	(0.766)	(1.176)	(0.861)
Spouse Choice6	-2.715	-8.798	18.009	16.786	17.699	20.235	16.905	18.485	18.105
	(0.321)	(0.650)	(1.066)	(1.033)	(1.124)	(1.426)	(1.028)	(1.462)	(1.245)
Spouse Choice7	-3.792	-6.767	12.021	10.787	-1.545	14.392	12.402	13.584	13.008
	(0.301)	(0.497)	(0.769)	(1.155)	(0.664)	(1.189)	(0.665)	(1.202)	(1.161)
Spouse Choice8	-2.954	-4.812	11.508	-2.134	-1.230	14.222	13.146	13.355	-0.994
	(0.346)	(0.410)	(0.948)	(0.434)	(0.681)	(1.190)	(0.590)	(1.703)	(0.793)
Spouse Choice9	-3.961	-6.860	17.641	17.188	17.981	20.772	17.763	19.016	19.061
	(0.292)	(0.417)	(0.461)	(0.399)	(0.584)	(1.044)	(0.368)	(1.100)	(0.761)
Constant	$t-1.115$	-0.661	-8.212	-7.749	-10.421	-7.456	-6.153	-9.389	-8.838
	(0.743)	(0.622)	(1.848)	(1.996)	(3.299)	(2.714)	(2.124)	(3.879)	(2.903)
N	16,983	16,983	16,983	16,983	16,983	16,983	16,983	16,983	16,983

Notes: LHS, less than high school; HS, high school; SC, some college; COL, at least a college.

Table C.15: CCP Estimates for a fertile woman with young children conditional on the choices of the husband. (Standard Errors in Parenthesis)

variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Black	-0.273	0.024	0.002	-0.544	-0.514	-0.020	-0.190	-0.118	0.135	-0.770	-0.938	0.035	-0.527	-0.894	0.143
	(0.162)	(0.120)	(0.199)	(0.122)	(0.144)	(0.120)	(0.177)	(0.259)	(0.175)	(0.130)	(0.171)	(0.138)	(0.181)	(0.328)	(0.234)
HS	-0.147	0.353	-0.015	0.646	1.102	0.664	0.468	0.879	0.107	0.482	0.766	0.418	0.901	1.325	1.196
	(0.226)	(0.183)	(0.341)	(0.163)	(0.255)	(0.197)	(0.248)	(0.543)	(0.358)	(0.176)	(0.281)	(0.249)	(0.276)	(0.624)	(0.607)
SC	0.184	0.506	-0.113	0.696	1.478	0.999	0.559	1.154	0.616	0.840	1.542	0.845	1.289	2.023	1.709
	(0.266)	(0.215)	(0.376)	(0.199)	(0.280)	(0.225)	(0.291)	(0.568)	(0.376)	(0.208)	(0.303)	(0.275)	(0.298)	(0.665)	(0.626)
COL	-0.121	0.400	0.180	0.506	1.629	1.184	0.749	1.629	0.975	0.720	1.638	0.952	1.635	1.924	1.449
	(0.315)	(0.253)	(0.411)	(0.242)	(0.314)	(0.260)	(0.341)	(0.604)	(0.420)	(0.246)	(0.340)	(0.311)	(0.338)	(0.702)	(0.665)
Age	0.014	-0.172	0.052	0.033	0.050	-0.173	0.247	-0.167	0.102	0.135	-0.065	-0.191	0.366	-0.131	-0.207
	(0.153)	(0.120)	(0.233)	(0.112)	(0.138)	(0.121)	(0.179)	(0.244)	(0.198)	(0.120)	(0.147)	(0.143)	(0.186)	(0.281)	(0.265)
Age Squared	0.000	0.003	-0.001	-0.001	-0.001	0.003	-0.005	0.002	-0.003	-0.002	0.001	0.004	-0.007	0.001	0.003
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.004)
Part-time $(t-1)$	1.873	2.267	1.079	-0.238	1.741	1.904	-0.202	1.543	1.720	-0.471	1.316	1.458	-0.234	1.143	1.024
	(0.204)	(0.190)	(0.391)	(0.168)	(0.176)	(0.181)	(0.227)	(0.267)	(0.297)	(0.171)	(0.181)	(0.206)	(0.202)	(0.274)	(0.304)
Part-time $(t-2)$	0.785	0.518	0.236	0.173	0.566	0.398	0.189	1.273	0.469	0.152	0.570	0.507	0.336	0.911	1.135
	(0.214)	(0.189)	(0.392)	(0.174)	(0.190)	(0.185)	(0.234)	(0.327)	(0.337)	(0.175)	(0.196)	(0.211)	(0.212)	(0.296)	(0.351)
Part-time $(t-3)$	0.767	0.438	0.976	0.345	0.689	0.718	0.554	0.644	0.634	0.384	0.666	0.733	0.492	0.773	0.545
	(0.226)	(0.198)	(0.382)	(0.182)	(0.200)	(0.194)	(0.246)	(0.323)	(0.311)	(0.183)	(0.207)	(0.220)	(0.228)	(0.314)	(0.341)
Part-time $(t-4)$	0.453	0.297	-0.017	0.158	0.495	0.302	0.334	0.462	0.586	0.174	0.268	0.277	0.420	0.932	0.776
	(0.234)	(0.199)	(0.353)	(0.183)	(0.200)	(0.195)	(0.254)	(0.332)	(0.307)	(0.184)	(0.211)	(0.217)	(0.223)	(0.327)	(0.340)
Full-time $(t-1)$	1.574	3.368	2.502	-0.844	1.000	3.103	-1.079	0.777	2.051	-1.593	0.413	2.240	-1.315	0.480	1.164
	(0.208)	(0.176)	(0.306)	(0.172)	(0.182)	(0.168)	(0.270)	(0.307)	(0.276)	(0.199)	(0.201)	(0.193)	(0.259)	(0.312)	(0.293)
Full-time $(t-2)$	0.081	0.806	0.745	0.047	0.142	0.676	0.064	1.121	1.579	-0.145	0.051	0.635	0.260	0.614	1.641
	(0.240)	(0.192)	(0.340)	(0.190)	(0.209)	(0.190)	(0.266)	(0.353)	(0.300)	(0.198)	(0.231)	(0.219)	(0.239)	(0.365)	(0.350)
Full-time $(t-3)$	0.465	0.561	1.015	0.268	0.396	0.788	-0.082	0.131	0.638	0.295	0.438	1.011	0.160	-0.188	0.106
	(0.245)	(0.204)	(0.363)	(0.200)	(0.218)	(0.204)	(0.287)	(0.341)	(0.296)	(0.200)	(0.234)	(0.229)	(0.250)	(0.374)	(0.339)
Full-time $(t-4)$	-0.038	0.155	0.120	-0.132	0.232	0.440	0.071	0.292	0.507	0.161	0.170	0.386	0.089	1.128	1.005
	(0.221)	(0.174)	(0.271)	(0.170)	(0.188)	(0.173)	(0.235)	(0.317)	(0.262)	(0.170)	(0.201)	(0.194)	(0.223)	(0.337)	(0.311)
No of children	-0.125	0.074	-1.432	0.074	-0.148	0.055	-1.074	-1.071	-1.205	0.159	0.308	0.216	-0.987	-0.923	-1.101
	(0.195)	(0.148)	(0.395)	(0.138)	(0.162)	(0.144)	(0.253)	(0.362)	(0.289)	(0.140)	(0.172)	(0.165)	(0.227)	(0.320)	(0.382)
Female children	0.109	0.020	0.212	0.043	0.116	0.076	0.104	-0.006	0.025	0.024	-0.028	-0.004	0.013	0.061	0.074
	(0.108)	(0.084)	(0.157)	(0.081)	(0.092)	(0.083)	(0.130)	(0.189)	(0.139)	(0.082)	(0.095)	(0.092)	(0.114)	(0.179)	(0.164)
Age of 1st child	-0.082	-0.000	0.153	-0.063	-0.112	-0.027	0.002	-0.066	0.059	-0.099	-0.055	-0.021	-0.040	0.084	-0.075
	(0.046)	(0.036)	(0.060)	(0.035)	(0.041)	(0.036)	(0.055)	(0.081)	(0.053)	(0.037)	(0.044)	(0.040)	(0.053)	(0.089)	(0.073)
Age of 2nd child	0.205	0.106	0.012	-0.002	0.116	0.074	-0.026	0.069	0.112	-0.076	-0.130	-0.139	-0.035	-0.251	-0.286
	(0.084)	(0.062)	(0.189)	(0.062)	(0.069)	(0.062)	(0.140)	(0.171)	(0.128)	(0.069)	(0.082)	(0.075)	(0.116)	(0.187)	(0.223)
Age of 3rd child	-0.342	-0.240	-0.019	-0.063	-0.216	-0.361	0.602	-0.106	-0.058	-0.395	-0.465	-0.390	-0.045	-0.875	-0.193
	(0.198)	(0.114)	(0.921)	(0.124)	(0.143)	(0.122)	(0.213)	(0.444)	(0.315)	(0.147)	(0.194)	(0.155)	(0.311)	(0.751)	(0.563)
Age of 4th child	-0.134	0.021	-4.086	-0.512	-0.121	0.064	-9.502	-3.279	-4.614	-0.170	-0.145	0.204	-5.895	-0.931	-2.620
	(0.533)	(0.341)	(3.362)	(0.272)	(0.602)	(0.305)	(0.985)	(1.519)	(1.243)	(0.334)	(0.495)	(0.396)	(1.123)	(1.879)	(1.498)
Time 1st child	0.001	-0.073	-0.149	0.143	0.176	0.186	0.201	0.171	0.217	0.320	0.302	0.342	0.367	0.399	0.438
	(0.043)	(0.034)	(0.061)	(0.032)	(0.035)	(0.032)	(0.045)	(0.061)	(0.048)	(0.032)	(0.038)	(0.036)	(0.042)	(0.067)	(0.060)
Time 2nd child	0.000	0.049	-0.035	0.136	0.139	0.160	0.018	0.146	0.006	0.168	0.260	0.272	0.123	0.206	0.324
	(0.064)	(0.053)	(0.148)	(0.050)	(0.056)	(0.051)	(0.096)	(0.114)	(0.090)	(0.052)	(0.060)	(0.058)	(0.080)	(0.119)	(0.141)
Time 3rd child	0.124	0.002	-0.457	0.052	0.135	0.229	-0.116	0.165	-0.040	0.330	0.343	0.310	0.266	0.594	0.288
	(0.131)	(0.082)	(0.884)	(0.078)	(0.090)	(0.078)	(0.136)	(0.208)	(0.194)	(0.090)	(0.110)	(0.097)	(0.187)	(0.442)	(0.272)
Time 4th child	0.213	0.272	0.734	0.658	0.298	0.101	-0.238	-1.276	0.266	0.438	0.397	0.173	-1.169	-2.939	-1.923
	(0.386)	(0.254)	(2.521)	(0.188)	(0.387)	(0.225)	(0.509)	(0.643)	(0.675)	(0.220)	(0.287)	(0.266)	(0.627)	(1.160)	(0.721)
Constant	.921	-2.763	-8.224	-0.612	-4.392	-1.457	-2.894	-6.188	-5.026	-3.743	-4.973	-1.831	-8.189	-2.422	-7.337
	(2.086)	(1.617)	(3.232)	(1.502)	(1.851)	(1.597)	(2.182)	(3.376)	(2.715)	(1.549)	(1.893)	(1.919)	(2.413)	(3.719)	(3.675)
N	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205	13,205

Table C.15 (continued): CCP estimates for a fertile woman with young children conditional on the choices of her husband. (Standard Errors in Parenthesis)

variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Sp. Age	0.075	0.115	0.289	-0.046	0.024	-0.022	-0.032	0.315	-0.025	-0.001	0.107	-0.076	0.139	-0.003	0.328
	(0.115)	(0.087)	(0.207)	(0.078)	(0.104)	(0.087)	(0.134)	(0.230)	(0.147)	(0.086)	(0.112)	(0.109)	(0.131)	(0.180)	(0.189)
Sp. Age Squared	-0.001	-0.002	-0.005	0.001	-0.001	0.000	-0.000	-0.005	0.000	-0.000	-0.002	0.001	-0.003	-0.000	-0.006
	(0.002)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Sp. HS	0.211	0.266	0.240	0.017	-0.001	0.378	-0.411	-0.137	0.213	0.127	-0.010	0.070	0.014	-0.720	-0.287
	(0.230)	(0.174)	(0.331)	(0.163)	(0.203)	(0.179)	(0.238)	(0.418)	(0.332)	(0.174)	(0.225)	(0.212)	(0.244)	(0.376)	(0.361)
Sp. SC	0.245	0.363	0.439	0.176	0.067	0.326	0.101	-0.049	0.562	0.246	0.012	0.063	-0.034	-0.637	-0.142
	(0.257)	(0.195)	(0.346)	(0.187)	(0.225)	(0.199)	(0.262)	(0.441)	(0.342)	(0.194)	(0.248)	(0.235)	(0.269)	(0.424)	(0.388)
Sp. COL	0.071	0.112	0.408	0.291	0.001	0.044	0.079	-0.372	0.048	0.180	-0.158	-0.234	0.175	-0.202	-0.308
	(0.295)	(0.226)	(0.378)	(0.218)	(0.253)	(0.227)	(0.307)	(0.479)	(0.380)	(0.224)	(0.274)	(0.264)	(0.301)	(0.443)	(0.417)
Sp. Part-time ($t-1$)	-0.469	-0.758	-0.121	-0.110	-0.867	-0.232	-0.527	-0.726	-1.413	-0.210	-0.672	0.028	-0.528	-0.103	-10.495
	(0.404)	(0.321)	(0.556)	(0.297)	(0.411)	(0.318)	(0.480)	(0.720)	(0.698)	(0.330)	(0.448)	(0.383)	(0.471)	(0.715)	(0.513)
Sp. Part-time ($t-2$)	0.448	0.244	0.009	0.150	-0.074	0.025	-0.340	0.905	-0.003	-0.001	-0.172	-0.004	-0.459	-0.126	-1.515
	(0.410)	(0.327)	(0.527)	(0.311)	(0.375)	(0.330)	(0.541)	(0.622)	(0.578)	(0.335)	(0.453)	(0.389)	(0.478)	(0.811)	(1.103)
Sp. Part-time ($t-3$)	-0.735	-0.272	-0.310	0.026	-0.355	-0.546	-1.375	-0.290	0.164	-0.576	-0.673	-0.818	-0.213	-0.756	0.211
	(0.452)	(0.347)	(0.587)	(0.312)	(0.372)	(0.344)	(0.662)	(0.765)	(0.512)	(0.334)	(0.414)	(0.420)	(0.424)	(0.864)	(0.665)
Sp. Part-time ($t-4$)	-0.306	-0.072	-0.228	-0.285	0.178	-0.325	0.398	-1.466	-1.000	-0.595	-0.274	-0.462	0.063	-0.053	-0.166
	(0.417)	(0.304)	(0.600)	(0.318)	(0.357)	(0.311)	(0.430)	(1.103)	(0.562)	(0.342)	(0.384)	(0.387)	(0.421)	(0.641)	(0.609)
Sp. Full-time ($t-1$)	-0.205	-0.050	0.445	0.192	0.189	0.210	0.185	-0.087	0.258	0.412	0.017	0.432	0.260	0.287	0.481
	(0.300)	(0.237)	(0.403)	(0.236)	(0.285)	(0.241)	(0.356)	(0.502)	(0.357)	(0.259)	(0.326)	(0.296)	(0.352)	(0.519)	(0.532)
Sp. Full-time ($t-2$)	0.508	0.316	-0.177	0.215	0.052	0.320	0.388	0.485	0.490	0.186	0.463	0.013	0.020	0.234	-0.165
	(0.288)	(0.220)	(0.355)	(0.212)	(0.257)	(0.223)	(0.292)	(0.468)	(0.336)	(0.234)	(0.301)	(0.274)	(0.296)	(0.512)	(0.443)
Sp. Full-time ($t-3$)	-0.460	-0.355	-0.229	0.034	-0.585	-0.413	0.023	-0.033	-0.207	-0.311	-0.613	-0.429	-0.246	-0.011	-0.082
	(0.280)	(0.231)	(0.376)	(0.221)	(0.269)	(0.233)	(0.291)	(0.436)	(0.332)	(0.230)	(0.289)	(0.276)	(0.293)	(0.504)	(0.439)
Sp. Full-time ($t-4$)	-0.110	-0.036	0.286	-0.091	0.308	-0.057	-0.255	0.017	-0.281	-0.059	-0.368	-0.038	0.080	-0.184	-0.426
	(0.243)	(0.198)	(0.342)	(0.189)	(0.233)	(0.198)	(0.250)	(0.359)	(0.274)	(0.197)	(0.238)	(0.229)	(0.261)	(0.370)	(0.374)
Sp. Time 1st child	-0.019	-0.025	0.036	-0.052	-0.078	-0.099	-0.114	-0.006	-0.068	-0.082	-0.125	-0.123	-0.092	-0.218	-0.097
	(0.046)	(0.036)	(0.053)	(0.036)	(0.039)	(0.036)	(0.055)	(0.064)	(0.048)	(0.035)	(0.042)	(0.039)	(0.046)	(0.065)	(0.058)
Sp. Time 2nd child	0.006	-0.006	-0.099	-0.017	0.047	-0.006	0.088	-0.088	-0.026	-0.010	0.070	0.028	-0.017	-0.053	-0.107
	(0.074)	(0.062)	(0.134)	(0.062)	(0.066)	(0.061)	(0.106)	(0.114)	(0.096)	(0.063)	(0.069)	(0.064)	(0.084)	(0.132)	(0.112)
Sp. Time 3rd child	-0.234	0.019	0.075	-0.121	-0.108	-0.101	-0.330	0.065	-0.105	-0.076	-0.217	-0.124	-0.172	0.090	0.048
	(0.135)	(0.090)	(0.512)	(0.090)	(0.099)	(0.089)	(0.150)	(0.319)	(0.183)	(0.091)	(0.101)	(0.099)	(0.141)	(0.232)	(0.235)
Sp. Time 4th child	0.336	-0.057	-1.217	-0.240	-0.088	0.146	0.441	-1.048	-1.079	0.099	0.293	-0.171	-0.645	-0.330	-0.659
	(0.272)	(0.219)	(0.720)	(0.217)	(0.248)	(0.202)	(0.543)	(0.768)	(0.449)	(0.219)	(0.228)	(0.237)	(0.412)	(0.515)	(0.668)
Sp. Choice 2	1.830	1.518	2.002	1.135	2.213	1.492	0.945	2.354	0.962	1.067	1.185	2.196	1.345	2.387	-8.053
	(0.507)	(0.466)	(0.854)	(0.421)	(0.518)	(0.464)	(0.606)	(0.989)	(0.947)	(0.457)	(0.662)	(0.562)	(0.632)	(0.970)	(0.852)
Sp. Choice 3	0.736	1.296	1.157	0.672	1.213	1.049	0.456	1.155	1.049	0.810	1.377	1.449	0.787	0.688	1.181
	(0.322)	(0.271)	(0.627)	(0.231)	(0.351)	(0.273)	(0.380)	(0.832)	(0.542)	(0.257)	(0.387)	(0.372)	(0.428)	(0.837)	(0.796)
Sp. Choice 4	-8.898	1.303	1.667	0.600	-0.433	1.245	1.517	-7.868	0.701	1.075	0.814	1.597	2.010	1.476	1.463
	(0.505)	(0.555)	(0.931)	(0.512)	(1.136)	(0.568)	(0.706)	(0.912)	(1.215)	(0.550)	(0.927)	(0.738)	(0.694)	(1.370)	(1.398)
Sp. Choice 5	2.188	1.804	1.164	0.989	2.329	1.388	1.732	-7.039	1.988	1.097	2.491	2.173	1.168	-7.451	-6.745
	(0.714)	(0.674)	(1.332)	(0.673)	(0.718)	(0.703)	(0.806)	(0.965)	(1.086)	(0.699)	(0.804)	(0.825)	(1.057)	(0.976)	(0.975)
Sp. Choice 6	1.032	1.824	1.474	1.086	1.997	2.062	1.236	1.687	2.225	1.464	2.157	2.535	1.689	2.129	2.048
	(0.365)	(0.304)	(0.661)	(0.269)	(0.380)	(0.305)	(0.418)	(0.861)	(0.563)	(0.290)	(0.416)	(0.399)	(0.452)	(0.852)	(0.825)
Sp. Choice 7	0.308	1.348	2.628	0.451	0.300	1.611	1.231	1.192	2.175	1.092	0.251	0.997	1.081	2.216	2.536
	(0.729)	(0.483)	(0.780)	(0.483)	(0.749)	(0.479)	(0.672)	(1.317)	(0.767)	(0.493)	(0.844)	(0.744)	(0.735)	(1.085)	(1.031)
Sp. Choice 8	2.466	2.168	3.275	1.016	2.976	2.485	0.735	3.023	3.033	1.932	3.076	3.076	1.926	-6.799	-5.763
	(0.774)	(0.737)	(1.036)	(0.720)	(0.756)	(0.719)	(1.252)	(1.275)	(1.012)	(0.726)	(0.801)	(0.828)	(0.908)	(1.046)	(0.997)
Sp. Choice 9	1.018	1.579	1.640	0.939	1.880	2.421	1.057	2.212	2.652	1.770	2.599	3.308	2.043	2.497	3.176
	(0.397)	(0.326)	(0.678)	(0.293)	(0.397)	(0.324)	(0.454)	(0.859)	(0.572)	(0.310)	(0.432)	(0.411)	(0.465)	(0.874)	(0.818)

Table C.16: CCP estimates for a fertile woman without young children conditional of the choices of her husband

(Standard Errors in Parenthesis)

Variables	2	3	4	8	9	10	14	15	16
Black	-0.159	-0.091	0.597	-0.148	0.032	0.490	-0.409	-0.448	0.878
	(0.087)	(0.069)	(0.131)	(0.164)	(0.225)	(0.142)	(0.182)	(0.358)	(0.232)
HS	0.401	0.806	0.373	0.259	2.143	0.714	0.244	0.683	0.257
	(0.130)	(0.113)	(0.282)	(0.241)	(1.033)	(0.377)	(0.249)	(0.659)	(0.496)
SC	0.592	1.097	0.500	0.067	2.490	1.250	0.337	0.904	0.578
	(0.139)	(0.122)	(0.289)	(0.276)	(1.055)	(0.380)	(0.276)	(0.668)	(0.494)
COL	0.800	1.315	0.324	0.011	2.594	1.660	0.481	1.210	0.968
	(0.155)	(0.136)	(0.316)	(0.307)	(1.063)	(0.396)	(0.297)	(0.718)	(0.523)
Age	-0.122	-0.101	0.283	0.541	0.310	0.093	0.421	-0.218	0.014
	(0.057)	(0.047)	(0.137)	(0.143)	(0.223)	(0.139)	(0.131)	(0.254)	(0.209)
Age Squared	0.002	0.001	-0.007	-0.011	-0.006	-0.003	-0.009	0.002	-0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.004)	(0.003)
Part-time $(t-1)$	1.733	1.389	1.442	0.632	1.793	1.443	0.159	1.361	1.615
	(0.102)	(0.096)	(0.245)	(0.188)	(0.280)	(0.250)	(0.198)	(0.346)	(0.326)
Part-time $(t-2)$	0.549	0.275	0.524	0.400	-0.248	0.623	0.676	0.739	0.628
	(0.123)	(0.111)	(0.277)	(0.270)	(0.372)	(0.335)	(0.231)	(0.435)	(0.464)
Part-time $(t-3)$	0.415	0.048	0.001	0.114	0.053	0.061	0.201	0.409	0.134
	(0.134)	(0.125)	(0.302)	(0.309)	(0.413)	(0.338)	(0.283)	(0.520)	(0.607)
Part-time $(t-4)$	0.178	0.060	-0.026	0.662	0.504	0.119	0.115	0.472	-1.889
	(0.128)	(0.118)	(0.329)	(0.284)	(0.342)	(0.267)	(0.291)	(0.438)	(1.070)
Full-time $(t-1)$	1.879	3.388	2.862	-0.046	1.707	2.281	-0.408	0.347	1.907
	(0.116)	(0.099)	(0.200)	(0.206)	(0.293)	(0.229)	(0.232)	(0.373)	(0.320)
Full-time $(t-2)$	0.209	0.732	1.062	0.867	0.389	1.509	0.901	1.070	1.027
	(0.141)	(0.120)	(0.226)	(0.239)	(0.303)	(0.252)	(0.228)	(0.441)	(0.372)
Full-time $(t-3)$	0.129	0.208	0.125	0.288	0.636	0.803	0.187	0.986	0.636
	(0.151)	(0.130)	(0.254)	(0.276)	(0.334)	(0.241)	(0.279)	(0.485)	(0.502)
Full-time $(t-4)$	-0.032	0.338	0.537	0.282	0.128	-0.121	0.174	0.086	0.351
	(0.131)	(0.111)	(0.222)	(0.253)	(0.308)	(0.207)	(0.258)	(0.384)	(0.402)
No of children	0.653	0.294	1.517	0.118	0.453	1.335	1.575	-1.704	0.739
	(0.319)	(0.255)	(1.197)	(1.322)	(2.782)	(0.839)	(2.291)	(3.323)	(1.901)
No. of children Sq.	-0.175	-0.120	0.165	0.649	1.699	-0.355	-0.301	2.844	-0.886
	(0.122)	(0.099)	(0.615)	(0.650)	(1.842)	(0.447)	(1.220)	(2.004)	(0.843)
Nor of female children	-0.124	-0.160	-0.555	0.075	0.025	-0.219	0.183	-0.109	0.765
	(0.068)	(0.059)	(0.254)	(0.329)	(0.439)	(0.264)	(0.322)	(0.515)	(0.504)
Age of 1st child	-0.024	0.033	-0.191	-0.069	-0.225	-0.073	-0.327	-0.156	-0.252
	(0.019)	(0.014)	(0.070)	(0.083)	(0.121)	(0.052)	(0.147)	(0.129)	(0.129)
Age of 2nd child	0.039	0.031	-0.141	-0.489	-0.721	0.019	0.095	-0.767	0.065
	(0.021)	(0.016)	(0.122)	(0.149)	(0.443)	(0.104)	(0.193)	(0.501)	(0.176)
Age of 3rd child	0.045	0.032	0.155	-0.260	-2.976	0.167	-0.459	-4.250	0.218
	(0.038)	(0.033)	(0.219)	(0.482)	(1.074)	(0.100)	(0.546)	(1.072)	(0.191)
Age of 4th child	-0.029	-0.054	-2.880	-4.140	-1.494	-1.918	-1.551	-2.432	-0.985
	(0.069)	(0.075)	(0.499)	(0.557)	(1.365)	(0.400)	(0.977)	(1.722)	(0.881)
Time spent 1st child	-0.028	-0.073	-0.247	-0.127	-0.121	-0.043	0.047	-0.024	0.284
	(0.023)	(0.019)	(0.094)	(0.078)	(0.135)	(0.056)	(0.082)	(0.146)	(0.124)
Time spent 2nd child	-0.009	-0.008	-0.118	0.023	-0.160	-0.098	-0.124	-0.222	-0.087
	(0.027)	(0.022)	(0.110)	(0.161)	(0.172)	(0.101)	(0.126)	(0.162)	(0.268)
Time spent 3rd child	-0.001	0.010	-0.882	-0.084	-0.388	-0.140	0.262	-0.292	0.486
	(0.040)	(0.034)	(0.355)	(0.220)	(0.196)	(0.150)	(0.126)	(0.221)	(0.281)
Time spent 4th child	0.070	0.083	-0.492	-1.176	-0.097	-1.079	-1.195	0.390	-1.135
	(0.084)	(0.086)	(0.384)	(0.521)	(0.297)	(0.207)	(0.387)	(0.368)	(0.605)

Table C.16 (continued): CCP estimates for a fertile woman without young children conditional of the choices of her husband. (Standard Errors in Parenthesis)

Variables	2	3	4	8	9	10	14	15	16
Sp. Age	0.019	-0.024	0.049	-0.103	0.057	0.025	-0.084	0.457	0.214
	(0.050)	(0.040)	(0.091)	(0.117)	(0.163)	(0.123)	(0.106)	(0.245)	(0.198)
Sp. Age Squared	-0.001	0.000	-0.001	0.001	-0.002	-0.001	0.001	-0.008	-0.004
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)	(0.003)
Sp. HS	0.142	0.233	0.580	0.202	-0.306	0.584	0.141	0.391	0.482
	(0.126)	(0.102)	(0.241)	(0.231)	(0.397)	(0.276)	(0.238)	(0.573)	(0.427)
Sp. SC	0.326	0.215	0.432	0.219	0.436	0.394	0.016	0.544	0.381
	(0.133)	(0.110)	(0.254)	(0.252)	(0.397)	(0.287)	(0.271)	(0.582)	(0.451)
Sp. COL	0.458	0.167	0.302	0.573	0.530	0.193	0.193	0.736	0.127
	(0.142)	(0.119)	(0.284)	(0.282)	(0.413)	(0.305)	(0.285)	(0.593)	(0.499)
Sp. Part-time $(t-1)$	-0.490	-0.900	-0.183	0.364	-0.982	-0.446	-0.617	0.169	0.149
	(0.206)	(0.181)	(0.325)	(0.384)	(0.606)	(0.413)	(0.538)	(0.668)	(0.654)
Sp. Part-time $(t-2)$	-0.649	-0.646	-0.756	-0.486	-0.307	-1.521	-0.571	0.659	-11.387
	(0.246)	(0.198)	(0.423)	(0.459)	(0.533)	(0.560)	(0.524)	(0.540)	(0.352)
Sp. Part-time $(t-3)$	-0.039	-0.181	-0.350	0.014	0.015	-0.125	-0.496	-0.999	0.375
	(0.258)	(0.211)	(0.485)	(0.472)	(0.530)	(0.458)	(0.583)	(0.798)	(0.724)
Sp. Part-time $(t-4)$	-0.251	-0.333	-1.105	-0.599	-0.495	-0.605	0.178	-0.138	-0.328
	(0.259)	(0.210)	(0.562)	(0.490)	(0.585)	(0.503)	(0.431)	(0.757)	(0.820)
Sp. Full-time $(t-1)$	-0.605	-0.962	-0.500	0.535	-0.319	-0.243	0.368	0.506	0.360
	(0.118)	(0.102)	(0.186)	(0.201)	(0.305)	(0.211)	(0.230)	(0.428)	(0.326)
Sp. Full-time $(t-2)$	-0.334	-0.318	-0.438	-0.170	0.081	-0.314	-0.057	-0.051	-0.887
	(0.146)	(0.122)	(0.210)	(0.222)	(0.300)	(0.225)	(0.252)	(0.388)	(0.339)
Sp. Full-time $(t-3)$	0.097	-0.000	0.052	0.113	-0.076	-0.088	0.359	-0.776	-0.029
	(0.174)	(0.144)	(0.256)	(0.263)	(0.346)	(0.261)	(0.289)	(0.431)	(0.417)
Sp. Full-time $(t-4)$	-0.038	-0.115	-0.474	-0.559	-0.481	-0.379	-0.425	-0.080	-0.162
	(0.159)	(0.130)	(0.234)	(0.246)	(0.337)	(0.244)	(0.270)	(0.407)	(0.361)
Sp. Time 1st child	-0.005	0.037	0.116	-0.138	0.061	0.123	0.140	-0.187	0.074
	(0.027)	(0.022)	(0.075)	(0.106)	(0.109)	(0.055)	(0.073)	(0.181)	(0.106)
Sp. Time 2nd child	0.030	0.042	-0.006	0.095	-0.170	-0.189	-0.092	0.220	0.305
	(0.031)	(0.025)	(0.133)	(0.225)	(0.147)	(0.127)	(0.098)	(0.227)	(0.148)
Sp. Time 3rd child	0.005	0.003	-9.700	-0.054	-0.020	-9.346	0.091	-0.144	-0.770
	(0.047)	(0.041)	(1.243)	(0.303)	(0.153)	(0.792)	(0.094)	(0.157)	(0.143)
Sp. Time 4th child	0.153	0.095	-0.226	0.088	0.325	-0.141	-0.237	-0.158	0.248
	(0.102)	(0.096)	(0.488)	(0.277)	(0.278)	(0.343)	(0.233)	(0.463)	(0.233)
Constant	0.267	1.001	-7.172	-7.396	-9.702	-4.955	-6.047	-8.022	-7.359
	(0.719)	(0.601)	(1.712)	(1.914)	(3.182)	(1.919)	(1.855)	(3.386)	(2.550)
N	16,983	16,983	16,983	16,983	16,983	16,983	16,983	16,983	16,983

Notes: LHS is a dummy variable indicating that the individual has a completed education of less than high school; HS is a dummy variable indicating that the individual has completed education of high school; SC is a dummy variable indicating that the individual's completed education is greater than high school but he or she is not a college graduate; COL is a dummy variable indicating that the individual's completed education is at least a college.

References

[1] **Altuğ, Sumru, and Robert A. Miller.** 1998. "The Effect of Work Experience on Female Wages and Labour Supply." *Review of Economic Studies* 65 (1): 45-85.

[2] **Blundell, Richard, and Stephen Bond.** 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87 (1): 115-143.

[3] **Gayle, George-Levi, Limor Golan, and Mehmet A. Soytas.** 2018b. "Estimation of Dynastic Life-Cycle Discrete Choice Models. *Quantitative Economics* 9(3): 1195–1241.

[4] **Hotz, V. Joseph, and Robert A. Miller.** 1993. "Conditional Choice Probabilities and the Estimation of Dynamic Models." *Review of Economic Studies* 60 (3): 497-529.

[5] **Hotz, V. Joseph, Robert A. Miller, Seth Sanders, and Jeffrey Smith.** 1994. "A Simulation Estimator for Dynamic Models of Discrete Choice." *Review of Economic Studies* 61 (2): 265-289.

[6] **Robinson, Peter.** 1987. "Asymptotically Efficient Estimation in the Presence of Heteroskedasticity of Unknown Form." *Econometrica* 55(4): 875-891.