Divorce and the Cognitive Achievement of Children

(Job Market Paper)

Melissa Tartari[1]
University of Pennsylvania

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Abstract

It is commonly thought that divorce adversely affects child outcomes. Children of divorced parents exhibit lower test scores and lower educational attainment. A fundamental question is whether these correlations have a causal interpretation. Parents who divorce may also be less likely to invest in their children while together. Alternatively, they may choose to divorce to shield their children from the effects of marital conflict. The goal of this paper is to understand what generates the observed differences in children's cognitive achievement by their parents' marital status. I study the relationship between marital status and a child's cognitive achievement within a dynamic framework in which partners decide on whether to remain married, how to interact (with or without conflict), fertility, labor supply, time spent with their children, and child support transfers. Using the estimated behavioral model, I assess whether a child whose parents divorced would have been better off had divorce not been an option. I also consider the effects of pro-marriage policies, such as a bonus paid to low income married couples. Finally, I evaluate how better enforcement of existing child support guidelines would affect a child's cognitive achievement, taking into account induced changes in within-marriage behavior.

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1 Introduction

Approximately four out of ten children will experience the divorce of their parents before reaching adulthood and roughly one million children experience their parents' divorce every year in the U.S. (U.S. Bureau of the Census, 1992). These statistics raise concerns because a large empirical literature in sociology, developmental psychology, and economics shows that offspring of divorced parents fare worse than offspring of married parents along many dimensions. For instance, conditional on observed family characteristics, children of divorced parents tend to have lower test scores, lower educational achievement, and a higher likelihood of dropping-out of high school.[1]

The negative association between divorce and a variety of child outcomes is the basis of a renewed interest by Federal, state, and local governments in the family. Specifically, the belief that a two-parent family is the best environment for raising children is reflected in recent public policies. For example, the reform of the AFDC program in the mid 1990s gave a more favorable treatment to two-parent families both in terms of eligibility and work-requirements. Many states have also initiated new programs to foster marriage. In West Virginia, for example, low-income couples receive a $100 bonus for every month they remain married, and similar bonus programs are currently under consideration in other states. At the Federal level, the promotion of "healthy" marriages is on the current administration's agenda in the form of "Promoting Safe and Stable Families," a program which entails spending $1.5 billion to implement marriage-promoting activities.[2]

A difficulty with pro-marriage policies is that there is substantial evidence from child psychology that interparental conflict is bad for children, and such policies may promote conflict-ridden marriages. Specifically, conflict in marital relationships has been linked with children's adjustment problems (in the form of aggression and conduct issues, anxiety, depression, withdrawal, and low-self esteem) as well as academic problems.[3] Indeed, the literature that studies the relationship between interparental conflict and child development finds that "interparental conflict is a better predictor of children's adjustment problems than marital dissolution" (cfr. Grych and Fincham [23] page 1).

In light of this discussion, the natural question to ask is: *Would a child whose parents divorced have been better off had the child's parents stayed together?* To shed some initial light on this question, I next describe some characteristics of children and their families pre and post divorce. Figures I.1 and I.2 are based on

[1] For an overview of existing studies, see Haveman and Wolfe [25] and Amato [3].
[2] See Carasso and Steuerle [8] and Nock [35].
[3] See e.g. Amato et al. [2], Jekielek [27], Hanson [24], Booth, Crouter and Clements [4], Grych and Fincham [23].

mother and child observations from the National Longitudinal Survey of Youth 1979 (henceforth NSLY79) and a linked data set, the NSLY79 Children and Young Adult (henceforth NLSY79 CHYA). Figure I.1 shows the score of a child on the PIAT[4] math test by current and eventual marital status of the parents. Comparing children of currently divorced parents to children of currently married parents, we observe the typical negative gap. Interestingly, a sizeable part of this gap is already present during marriage: children whose parents will divorce in the future have scores that are very close to the scores of children of currently divorced parents.[5] Figure I.2 shows mothers' labor supply by current and eventual marital status. If we regard time spent working as a measure of time not spent with a child, there are two features worth observing. The first is the gap between children of currently divorced versus currently married parents: children of divorced parents receive less maternal time inputs. Second, the time spent with children by mothers who will divorce in the future and by currently divorced mothers are very similar.

Figure I.1: Age Profile of Standardized PIAT Math by Current and Eventual Marital Status of Parents

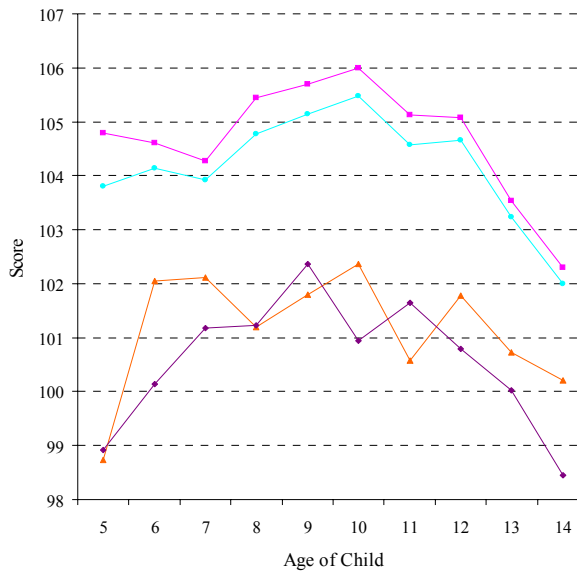
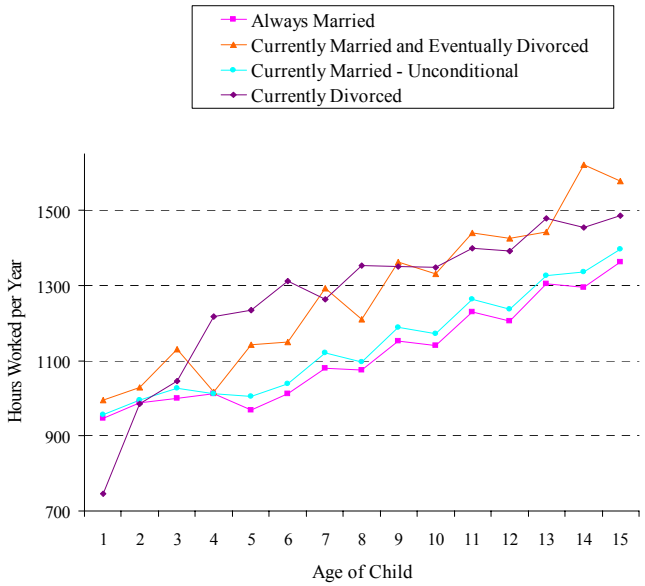


Figure I.2: Age Profile of Hours Worked by Mother by Current and Eventual Marital Status of Parents



[4] Peabody Picture Vocabulary Test.

[5] This descriptive finding is consistent with the analysis in Piketty [36] using French data.

The descriptive analysis conveys two messages.[6] First, taken together, the two figures suggest that comparing children's outcomes based only on contemporaneous marital status (or marital status at a specific child's age) provides an incomplete picture of the relationship between family structure and child outcomes. Second, there may be several explanations for the observed patterns and these explanations may have different implications as to whether a child whose parents divorced would have been better off had divorce not occurred. A first possible explanation is that there is permanent heterogeneity in the population of parents and the decision to divorce is selective on this heterogeneity. For instance, parents who attach less value to the wellbeing of their children may also be more likely to divorce. If so, the pool of divorcees would tend to be composed of parents who, even when together, invest less in their children. In this case, children would have experienced the same outcomes had the parents not had the option of divorcing.

An alternative plausible explanation for the patterns in the figures is that forward looking parents experience shocks that increase the future probability of divorce and that this reduces child investments. Eliminating the possibility of divorce could, in this case, lead to an improvement in child outcomes. As a third explanation, consider the case in which parents who attach more value to their children choose to divorce to insulate their children from the conflict in their marriage. The expectation of divorce might alter input choices during marriage, and a policy that forces them to stay together could either improve or worsen child outcomes.

There are two main difficulties in ascertaining whether a child whose parents divorced would have been better off had the parents stayed together. First, it is a counterfactual question that requires considering a scenario that is not realized. Even if it were possible to exogenously assign parents' marital status, such an experiment would only be informative about mean child outcomes and not about their distribution. Second, as Figure I.1 and I.2 would suggest, it may matter at what point, in the life of a couple or a child the divorce occurs.

Quantifying the effect that forcing (otherwise divorced) parents to remain together would have on a child is interesting as a thought experiment, but is not a realistic policy. Therefore, another goal of this paper is to understand the impacts of implementable family policies such as monetary incentives to stay married and better enforcement of existing state child support guidelines. To study the effects of these policies, we need

[6] The patterns that emerge from Figures I.1 and I.2 do not seem to be specific to the particular choice of a child's outcome (score in a math test) or measure of inputs invested in a child (labor supply of the child's mother). For instance, Figures I.3 and I.4 show similar patters. These figures focus, respectively, on an index of behavior problems a child exhibits and on the Home score which is an aggregate measure of the quality of a child's home environment.

to know how family structure and children's outcomes are jointly determined.

The questions addressed in this paper are: (1) *would a child whose parents divorced have been better off had the child's parents stayed together?*, (2) *through what mechanism are children better or worse off when family structure changes?*, (3) *how do (existing or implementable counterfactual) policies that change parents' incentives to stay married affect the wellbeing of children?*. To address these questions, I develop and estimate a sequential model of a couple's behavior from marriage onwards. In the model, parents value the quality of their children (a public good), which they can increase by investing inputs in the form of parental time, goods, and quality (absence or presence of conflict) of the marital relationship. Outcomes that are endogenously determined are child inputs, labor supply, fertility, divorce, child support transfers, and children's quality as measured by scores on cognitive tests. Within the production function-based approach that I adopt, marital status is not an input into the production of child quality *per se*. Rather, its correlation with input choices is endogenously derived. The model is dynamic to incorporate time-varying constraints as well as uncertainty about future wages, preferences, and child outcomes. Fertility outcomes unfold over time, and there is a limited window in a parent's lifetime over which offspring are children. Because I am interested in modeling behavior both within marriage and after divorce, each partner's preferences are primitives of the model.

Consistent with US family law, divorce is modeled as a unilaterally enforceable option. Divorce allows parents to shield their children from conflict but precludes joint time spent by parents with their children. It also causes a loss of scale economies as implied in my model by consumption being a public good within marriage but a private good after divorce. Finally, divorce implies underinvestment in children because the allocation chosen by divorced parents is assumed to be the outcome of a sequential game in which the father has control over money and the mother over a child's time.[7]

Conflict plays two roles in the model. As mentioned above, it is an input in the child quality technology. The second role of conflict is as an impediment to full exploitation of the "gains from trade". Specifically, the allocation chosen by married partners is assumed to yield a pair of utility values on the frontier of the couple's utility possibility set. What distinguishes otherwise equivalent conflict-free and conflict-ridden couples is that they may have different utility possibility sets.[8] The rationale for this difference is that high conflict couples may be unable or unwilling to mimic, in their negotiations, the repeated interaction that is

[7] In specifying this last defining feature of divorce I follow Weiss and Willis [40] and [41]. In their model the loss of control suffered by the noncustodial parent over the allocative decision of the custodial parent is used to explain the failure of many divorced parents to comply with court-mandated child support awards.

[8] In assuming efficiency for married couples without conflict I rely on evidence provided by e.g. Browning and Chiappori [7].

known to lead to efficient bargaining solutions. By allowing conflict to induce an inward shift of the utility possibility set I intend to capture, within a tractable reduced form approach, this strategic effect. Both through its (potentially adverse) effects on child quality, and because it constrains what is attainable within marriage, conflict may trigger a divorce.

The model is structurally estimated by a simulation-based approach, the Efficient Method of Moments introduced by Gallant and Tauchen [19]. The basic idea is to fit simulated data obtained from the model to an auxiliary statistical model which can be easily estimated and provides a complete enough statistical description of the data to identify the behavioral parameters. An advantage of using this method is that is simplifies the treatment of missing state variables that is pervasive when using longitudinal data. Another advantage is that the model naturally suggests auxiliary relationships.[9]

Using the estimated model, I answer the first two questions of interest by simulating behavior excluding the divorce option at the point when partners first want to divorce. Specifically, I compare a child's cognitive achievement and the inputs invested in the child under the counterfactual and the baseline scenario. In this way, I can assess the change in achievement for each child whose parents divorced, allowing me to recover the distribution of policy effects. I address the question of how policies that change parents' incentives to stay married affect the wellbeing of children by simulating behavior when existing child support guidelines are fully enforced or when a bonus is paid to married couples. A novel feature of some of the most recent child support guidelines is that the financial burden on the father depends on the amount of time he spends with his children. This feature is intended to provide incentives for more father-child interaction. Because labor supply and time with children are both endogenously determined in my model, I can study the effects of this kind of child support program in a way that fully incorporates any female labor supply response, and that accounts for changes in within-marriage behavior that are induced by changes in this post-divorce regulation.

The rich dataset used in estimation is constructed from the NLSY79 and the NLSY79 CHYA. A valuable feature of the data is the inclusion of longitudinal information about conflict between married parents jointly with information on time inputs invested in children and children's scores in cognitive tests. In particular, to capture marital conflict, I use the answer to the question: *How often do you and your spouse argue about children, chores, money, showing affection, religion, leisure, drinking, other women, wife relatives, husband*

[9] This method has been used to estimate a dynamic discrete choice model by van der Klaauw and Wolpin [39].

relatives? Virtually all endogenous outcomes of the model are observed, and the longitudinal dimension of the data affords me a rich unobserved heterogeneity structure. Finally, observations on childless couples beyond the age of having children as well as on childless divorced couples aid in identification of individual preference parameters.

The main findings can be summarized as follows. First, I find that a child whose parents divorced would have been better off had divorce not occurred. Specifically, both the mean within-child difference in test scores and the median are positive. The mean within-child difference in test scores is relatively small. However, it is three times as large as the difference in sample mean test scores between children of married and divorced parents. According to the model the reason for the estimated gain in test scores is that, when the divorce option is no longer available, a child receives more hours of maternal and paternal time, more goods, and parents engage in some but very little conflict. Second, I find that the West Virginia marriage bonus of $100 leaves the divorce rate unchanged; in fact, a bonus of $1200 per month would be required to reduce the divorce rate of low income couples by 5%. Finally, under perfect enforcement, new guidelines adopted by Arizona do not increase father-child interaction as intended. They do increase mother-child interaction within marriage, reduce female labor force participation (especially after a divorce), and reduce conflict within marriage. On balance, test scores are not higher.

The paper is organized as follows. Related literature is reviewed below. Section 2 covers the model and its solution. Section 3 contains a description of the data. Section 4 discusses estimation. Counterfactual and policy experiments are discussed in Section 5. I conclude with Section 6. The appendix contains exact functional forms and details of both the model and data construction.

1.1 Related Literature

A large body of literature studies the relationship between family structure and children's cognitive or educational outcomes. Haveman and Wolfe [25] survey works up to the early 1990s. Typically, these studies estimate the parameters of a regression equation in which the dependent variable is a child's outcome (measured at a specific age), and the explanatory variables are an indicator for whether parents are divorced, demographic variables, and, at times, variables such as family income and labor market participation of the mother. The coefficient of the divorce indicator is meant to capture the effect of family structure on child outcomes. More recent contributions (e.g. Ermish and Francesconi [13]), exploit longitudinal data and estimate the coefficient of the divorce indicator using sibling or child fixed-effect methods. Manski et al.

[31] investigate how children's outcomes would change if family structure could be exogenously assigned. Estimates are obtained under different assumptions about the amount of prior information available on the actual process generating family structure and outcomes. They estimate a parametric multi-equation model that adds to the child's outcome equation of the above studies a marital outcome equation. In addition, nonparametric bounds for the family structure effect are recovered.

Interpretation of the these approaches, in light of a static behavioral model in which parents care about their children's outcomes, can invest resources to increase those outcomes, and choose whether to stay married or divorce, reveals two shortcomings. First, to the extent that marital status is not a productive input *per se*, what is estimated is not a technological relationship. This means that no explanation can be provided as to why we observe differences in outcomes by family structure. Thus, all we can learn is the overall effect on children's outcomes of the changes that accompany a change in family structure in inputs, but not the mechanism by which inputs affect outcomes. A second shortcoming of many studies is that they fail to account for the potential endogeneity of family structure and of included inputs. They either assume that input choices and family structure are exogenous, or that they are exogenous conditional on an unobserved family or child fixed effect. They do not, for example, allow inputs to respond to previous child outcomes. Even when the endogeneity of family structure is addressed (e.g. Manski et al. [31]), the model does not permit extrapolation to other more realistic policies affecting the desirability, and hence the occurrence, of divorce. Hence, existing frameworks are not not rich enough to be used to evaluate the effect of pro-marriage or child support policies.

Piketty [36] suggests that what previous research has called the effect of divorce may in fact be the adverse effect of parental conflict. If conflict triggers divorce and is harmful for children, the sample of children whose parents are divorced would tend to be composed of children with lower outcomes due to the adverse effect of parental hostility during marriage. To support this selection argument, he compares outcomes of children whose parents are divorced to outcomes of children whose parents are still married but are observed to divorce within a two year spell. He finds that children in these two groups have statistically indistinguishable outcomes and that their outcomes are significantly lower than those of children whose parents are not observed to divorce. A key assumption required for his analysis not to be purely descriptive is that parents have perfect foresight or that the marital outcome is not responsive to contemporaneous and past child outcomes. Also, his findings would warrant the conclusion that parental conflict is responsible for

the pre-divorce poor outcomes of children only if conflict was the only determinant of children's outcomes. If parents who end up divorcing invest less time or financial resources in their children (while still married), the similarity in outcomes found in the data would be present even if conflict had no effect on children.

A recent paper by Brown and Flinn [5] also studies the relationship between children's achievement and divorce using a dynamic structural modeling approach. However, my framework differs from theirs in a number of ways. The first difference is in focus. Brown and Flinn are interested in the impact of family policies, such as unilateral versus bilateral divorce and custody arrangements, on both the welfare of children and of each of a child's parents. Accordingly, in their model, divorce regulations determine how much contact a parent has with a child (hence, effectively, preferences towards child quality), and what percentage of the noncustodial parent income is transferred in the form of child support. Instead, my model allows for time inputs to be chosen by parents and both female labor supply and child support transfers are endogenously determined. Because time spent by a parent with a child is not an object of choice, Brown and Flinn cannot study the impact of child support guidelines that reduce obligations based on time spent with a child by a parent. A second and related difference is in the treatment of the information available on the frequency of arguments between partners. Brown and Flinn use measures of conflict between parents at the time of a child's birth as an indicator of the permanent and exogenous quality of the marital relationship. Instead, I allow for a structural effect of conflict on children and conflict is a choice in my model. An implication of this difference is that Brown and Flinn's model restricts divorce to have a negative effect on child outcomes. Finally, they do not allow for permanent unobserved heterogeneity and restrict attention to one child couples.

2 Model

The model describes the sequential decision problem of a couple from the date of marriage onwards. Each partner is a forward-looking expected utility maximizer endowed with his/her own preferences. Children bring utility to their parents through their quality (measured by children's cognitive achievement). Partners make choices period by period[10] and have full information. How male and female preferences translate into a couple's endogenous outcomes depends on how partners interact, which in turn, varies depending on whether a male and female are married (as opposed to divorced[11]), as well as on whether they are parents of young

[10] Standard reasons of non-verifiability and complexity justify this assumption. In the US, prenuptial agreements are either not in use or largely under-regulated. Also, premarital agreements are not binding on issues of child custody and child support. On a related ground, in the model there is no borrowing or lending, nor accumulation of assets, and the budget constraint clears every period. See Mazzocco [32] for a collective dynamic model of full commitment.

[11] In this paper, divorce and separation are synonymous. Marriages are assumed to last at least one period.

offspring.[12] In the following subsections I present the details of the structure of the behavioral model.

2.1 Primitives and Behavior

Gender is denoted by j where $j = m$ for a male and $j = f$ for a female. Time is discrete and the horizon is finite. A decision period corresponds to two calendar years. Decision period one starts at the marriage date. The last decision period is when the female age is T (equal to 64). I denote the age of the female partner by t and a decision period by p.

2.1.1 Environment

Consistent with the time period over which the data used in estimation is collected, divorce is modeled as a unilaterally enforceable option. Also, in the event of a divorce involving children, the mother becomes the custodial parent[13], and child support transfers from a child's father to his ex-wife are voluntary[14].

2.1.2 Endogenous Variables

In each decision period, partners entering the period as married choose how much effort (e_m and e_f) to exert towards having a conflict-free marital relationship over the current period. Male and female effort levels translate into a binary mode of interaction a (which equals 1 for accommodating or conflict-free, 0 otherwise) through a stochastic technology $P_{B_a}(e_m, e_f)$ where P_{B_a} denotes the probability of interacting in an accommodating fashion. Married partners also choose whether to remain married or to separate ($d_M = 1$ for married, zero otherwise).

A couple that chooses to stay together makes fertility, consumption, and time allocation decisions. Specifically, a decision is made about whether or not to have the woman become pregnant and have a newborn child in the next period ($d_P = 1$ for a pregnancy, zero otherwise). A married woman can become pregnant beginning at the earliest age of t^{PREG} and ending at some exogenous age t^{FEC} when she becomes infecund. Offspring between the ages of 0 – a new born – and t^{ADULT} years are referred to as *children*[15], while couples that either do not have offspring, or whose offspring are all adults are called *childless*. The couple chooses

[12] To simplify the analysis I assume that there is no remarriage.

[13] Maternal custody is the most prevalent in the US. See Francesconi and Mutho [17] for a model of endogenous child custody.

[14] Less than half of all custodial parents received full child-support payments in 2001 according to U.S. Census Bureau data. As to custodial mothers who were divorced or separated and who were awarded and supposed to receive child support, 79% received some support, and of them only 64% received full support (see Grall [21]). See Farmer and Tiefenthaler [14] and Flinn [15] for a different treatment.

[15] At ages older than t^{ADULT} offspring are assumed to independently make their own quality accumulation decisions. In implementation, $t^{PREG} = 18$, $t^{INFEC} = 40$, $t^{ADULT} = 14$, and $T = 64$. Observe that T is larger than $t^{FEC} + t^{ADULT}$ so that at the last decision period the youngest (potential) offspring is no longer a child.

how much to jointly consume (c), how much to work (h_m and h_f), how much time to spend nurturing, monitoring, teaching, and caring for the existing children (l_m^q and l_f^q), as well as how much time to devote to private leisure (l_m^p and l_f^p). To illustrate, suppose there is one offspring who is still a child. In this case, l_m^q, the total time the father spends with his child, is the sum of two components: the time he spends alone with the child (m_1), and the time he spends with the child and the mother (p_1).[16] That is, $l_m^q = m_1 + p_1$ and similarly, $l_f^q = f_1 + p_1$. These decompositions generalize to any number of children (N^{kid}). By letting $C_{N^{kid}}$ represent the set of all the combinations (without replacement) of the elements $\left(1, 2, .., N^{kid}\right)$, I denote by $\{m_{\mathsf{c}}, f_{\mathsf{c}}, p_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\}$ the relevant collection of amounts of parental time spent with children.

Divorced women cannot become pregnant by their ex-husband. Accordingly, a couple that chooses to divorce has no fertility decision to make. Thus, an ex-wife and her ex-husband choose how much to consume (c_m and c_f), how much to work and how much time to devote to private leisure. If there are children, divorced parents also choose how much time to invest in the children and an amount of monetary transfers (in the form of child support), denoted by τ.[17]

In summary, the endogenous outcome vector contains some or all (depending on the couple's state) of the elements below:

$$\left(e_m, e_f, a, d_M, d_P, l_m^p, l_f^p, h_m, h_f, c_m, c_f, \{m_{\mathsf{c}}, f_{\mathsf{c}}, p_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\}, \tau\right). \tag{1}$$

2.1.3 Preferences

An adult individual of gender j is endowed with preferences over end of period offspring quality (Q', a local public good), consumption of a composite good (a local public good if partners are married or a private good if partners live apart), his or her private leisure, his or her total time spend with children, an indicator of a pregnancy, and the mode in which the couple interacts if married. Offspring's quality Q' aggregates the quality of each offspring (Q'_k) through a CES function. Shocks to preferences towards leisure and pregnancy (elements of a vector of shocks ε) shift the corresponding (marginal) utilities. Also, an indicator of current marital status (d_M) enters the individual per-period utility function additively as multiplied by a shock to the value of being married.

[16] This represents my attempt to capture the observation (e.g. Amato [3]) that certain emotional, cognitive and behavioral skills, such as showing respect, communicating clearly, and resolving disputes through negotiation and compromise, are primarily learnt by a child from observing how his or her parents relate to one another. According to this view, time alone with a parent is not a perfect substitute for time spent jointly with both parents.

[17] For simplicity, divorced partners do not choose how to interact. The underlying assumption is that either lack of proximity eliminates the reasons for conflict, or that conflict between divorced partners does not affect the decision making process and that children can be effectively insulated from conflict.

Permanent differences (ω) across couples in their preferences towards quality and quantity of children, conflict, and being married are also allowed for. The per-period individual utility function $u_j(\cdot)$ is indexed by an individual's gender, because male and female may value differently the quality of their children and their private leisure. In summary, the utility function is[18]

$$u_j\left(Q', c_j, l_j^p, l_j^q, d_P, a, d_M; \varepsilon, \omega\right). \tag{2}$$

2.1.4 Constraints

There are two kind of constraints: constraints on time and budget constraints.

Time Constraints Because time is a scarce resource (and cannot be stored), time uses are constrained as follows. Denoting by H the total time available to an adult individual over a decision period, it must be that

$$l_j^p + l_j^q + h_j = H \quad \text{for } j = m, f,$$

in addition to non-negativity constraints for each time use. Children are also assumed to have an amount H of time available. Thus, the total time a child is in the company of his or her parents is also assumed to be bounded above by H.[19] Upon separation, physical custody of a couple's children goes to the mother. Divorced parents are assumed not to spend time jointly with their children ($p_{\mathsf{c}} = 0$ for all $\mathsf{c} \in C_{N^{kid}}$).

Per-period Budget Constraints Each partner receives an hourly wage offer w_j. Individual wage offers are given by the product of the rental price of human capital R_j, and the amount of individual human capital Ψ_j. The latter depends on the amount of schooling obtained by the date of marriage, accumulated work experience, the permanent couple-specific component ω, and an idiosyncratic shock to productivity ε_j^W. I adopt a multiplicative form for the (gender specific) human capital function, which leads to the wage functions[20]

$$w_j = R_j \Psi_j = R_j \Psi_j^o e^{\varepsilon_j^W}.$$

[18] Elements of a couple's state space such as the number and the ages of the children and previous period female labor supply, as introduced later, may affect the utility derived from current outcomes. Because remarriage is not modeled, interactions between an indicator of marital status and number and ages of children is allowed for. The exact functional forms of the per-period utility function and CES aggregator function are given in Appendix A.

[19] In implementation H is taken to equal 12 hours per day times 729 days. School age children are assumed to have a lower amount of time available (the equivalent of 6 hours a day).

[20] A race specific effect is also allowed for. The model is silent as to what motivates this inclusion which is done for parsimony.

Married partners pool resources. Their per-period budget constraint is

$$c + \sum_{j=m,f} w_j \left(l_j^q + l_j^p\right) + \mathbf{I}_{N^{kid}} \varkappa \sum_{j=m,f} w_j h_j = \left(w_m + w_f\right) H, \tag{3}$$

with resources on the right-hand side and their uses on the left-hand side. The fraction of parents' income that is invested in children is $\varkappa$ and $\mathbf{I}_{N^{kid}}$ is an indicator equal to 1 if children are present and 0 otherwise. For a separated couple, the per-period budget constraints are

$$c_f + w_f \left(l_f^q + l_f^p\right) + \mathbf{I}_{N^{kid}} \varkappa \left(h_f w_f + \tau\right) = w_f H + \mathbf{I}_{N^{kid}} \tau, \tag{4}$$

$$c_m + w_m \left(l_m^q + l_m^p\right) + \tau = w_m H. \tag{5}$$

Transfers between ex-partners are voluntary and the net transfer from the father to the mother (τ) is non-negative. For any level of transfer τ, (4) implies that $\varkappa\tau$ is invested in the existing children. While $\varkappa$ is not a choice, it is allowed to depend on the permanent couple-specific component and number of children, i.e. $\varkappa\left(\omega, N^{kid}\right)$.[21] Details are given in Appendix A. In what follows I refer to the total amount of financial resources invested in children by parents as *goods*.

2.1.5 Technology

Child Quality For the k^{th} child, given permanent family characteristics (ω), beginning of period quality (Q_k), parental mode of interaction[22], and the child's age (age_k), the current period choice of parental time spent with the child $(m_{\mathbf{c}(k)}, f_{\mathbf{c}(k)}, p_{\mathbf{c}(k)})$, together with the amount of goods invested in the child (g), determines the child's end of period quality Q_k'.[23] Per-child goods g are given by total goods devoted to children (from (3) or (4) depending on the marital status of the couple) divided by an economies of scale factor that is allowed to depend on the number of children. Permanent family characteristics ω capture both the child genetic endowment at birth and the parenting skills of his or her parents. Idiosyncratic elements ε affect child quality technology in the form of shocks to the marginal productivity of parental time and/or as

[21] I treat expenditures in children as nondiscretiony since they are not observed.

[22] Conflict is a binary variable in the model for reasons of tractability. This treatment of conflict is consistent with the fact that some couples may engage in lively disagreements as productive, even perhaps enjoyed, means of solving everyday problems and children may actually learn valuable lessons concerning how to handle their own conflicts from observing adults' conflict. By treating conflict as binary I attempt to capture the distinction between "constructive" and "destructive" conflict. One can view what in the model is treated as absence of conflict as conflict that is not intense enough to erode the quality of the marital relationship or to adversely affect children.

[23] The presence of beginning of period quality among the inputs implies that the specification assumed is of the value added form (see Todd and Wolpin [38]). Typically this specification is adopted (within a linear regression framework) to overcome endogeneity problems stemming from unobserved child endowment. Here, instead, parsimony motivates the choice of functional form. The assumption I make is that beginning of period quality is a sufficient statistic for the history of past inputs. The non-linear specification adopted allows a child's endowment to affect the evolution of child quality as well as the marginal productivity of parental inputs beyond its correlations with past child quality.

unobserved inputs. In summary, letting the child-quality production function be denoted by $F(\cdot)$, the end of period quality of the k^{th} child is

$$Q'_k = F(m_{\mathsf{c}(k)}, f_{\mathsf{c}(k)}, p_{\mathsf{c}(k)}, g, a, Q_k, age_k, \omega, \varepsilon). \tag{6}$$

Adult offspring do not receive any parental investment and are assumed not to be affected by parental conflict. Their quality is given by (6) evaluated at zero inputs. The quality of a child at birth is given by (6) evaluated at zero inputs and age zero. The exact functional form of the child quality technology is given in Appendix A.[24]

A Married Couple's Mode of Interaction Married partners may interact in an accommodating fashion or in a non-accommodating fashion. They can improve their chances of having a conflict-free relationship by exerting (costly) effort towards it. Specifically, I posit the existence of a probabilistic mapping of male and female effort into a mode of interaction. That is, a is treated as a binary random variable whose probability distribution, summarized by P_{B_a}, is an increasing function of the effort exerted by the male and female. A detailed discussion of how the mode of interaction outcome is derived is postponed until decision-making (for given a) has been covered.

2.1.6 Initial Conditions and State Space

Initial Conditions and State Space at Marriage A newly married couple is characterized by a vector of initial conditions, denoted by $\bar{\Omega}_{t_1}$. Initial conditions include the partners' age at marriage (t_1 and age_{m,t_1}), the couple's race and education[25] ($race, ed_m, ed_f$), their accumulated work experience ($\exp_{m,t_1}, \exp_{f,t_1}$) and previous period female labor supply (h_{f,t_1-1}), the stock of accumulated conflict ($A_{t_1} \equiv 0$), and the permanent couple-specific component (ω). The couple's state space at marriage (Ω_{t_1}) contains initial conditions as well as the beginning-of-period realizations of the current-period shocks ε. In summary,

$$\Omega_{t_1} = \left(race, ed_m, ed_f, t_1, age_{m,t_1}, \exp_{m,t_1}, \exp_{f,t_1}, h_{f,t_1-1}, A_{t_1}, \omega, \varepsilon_{t_1}\right).$$

[24] Money invested in a child is assumed to buy a basket of inputs (clothes, tuition for school, toys, etc.) whose prices (and weights in the basket) have not changed over the time frame of the data. The technology for child quality is well specified also under the alternative assumption that those inputs that are omitted are exogenous and serially uncorrelated random factors. Elements of parents' state space may affect the technology for child quality e.g. age of the child. Differences in input quality are captured by unobserved permanent heterogeneity and by education of the parents which is included to capture, in a parsimonious way, variation in the teaching or mentoring abilities of the parents.I do not include race among the determinants of child quality because it does not capture inherited endowments.

[25] I restrict my sample to same-race couples and I assume that no further investment in education is made after marriage by either of the partners. The only role that race plays in the model is through the wage offer function.

Age and Decision-Period Specific State Space At a generic decision period $p > 1$, the state of a couple is denoted by Ω_{t_p}. Its pre-determined component ($\bar{\Omega}_{t_p}$) contains the couple's permanent information as well as the value of time-varying state space elements. The latter are the previous-period marital status ($ms_{t_{p-1}}$, equal to 1 if married and 0 otherwise), labor market experience and previous period female labor supply, a description of the couple's offspring (age and stock of quality of each offspring as collected in the vectors Q_{t_p} and age_{t_p}), and summary statistics for the history of the couple in terms of conflict (namely, accumulated stock of conflict, A_{t_p}, and last period mode of interaction, $a_{t_{p-1}}$). In summary,

$$\bar{\Omega}_{t_p} = \left(\bar{\Omega}_{t_1}, t_p, age_{m,t_p}, ms_{t_{p-1}}, \exp_{m,t_p}, \exp_{f,t_p}, h_{f,t_p-1}, A_{t_p}, a_{t_{p-1}}, Q_{t_p}, age_{t_p}\right).$$

The shock component ε_{t_p} of Ω_{t_p} collects all realizations of shocks relevant for the current period decision-making. For simplicity, in what follows, I dispense with the subscript p.

The Evolution of State Vector Pre-determined Components The pre-determined components of the state evolve as follows. A couple's marital status over the interval $[t-1, t)$, ms_{t-1}, is equal to $d_{M,t-1}$ if the couple was married when the female was of age $t-2$ and zero otherwise. The number of decision periods over which a couple has had conflict, A_t, is equal to A_{t-1} augmented by $(1 - a_{t-1})$. Labor market experience is equal to past work experience incremented by last period's labor supply. The stock of quality of the k^{th} offspring evolves according to (6). The number of offspring is incremented by one whenever there has been a pregnancy in the previous period and the number of children is incremented by a previous period pregnancy and decreased by the number of children that have reached adulthood.

Shocks The vector ε_t collects all shocks realized at the beginning of the decision period when the female is of age t. Specifically, ε_t^M is a shock to the value of being married and ε_t^{PR} is a shock to the utility of a pregnancy. Both these shocks are couple-specific and are relevant only for married couples. There is a vector of child-specific shocks to the quality of children ε_t^Q, and $\left(\varepsilon_t^F, \varepsilon_t^P\right)$ are couple-specific shocks to the marginal productivity of total child time with the mother and with both parents. Also, $\varepsilon_{j,t}^L$ is a shock to the marginal utility from private leisure and $\varepsilon_{j,t}^W$ is a wage draw. Both $\varepsilon_{j,t}^L$ and $\varepsilon_{j,t}^W$ are individual specific. All relevant shocks are observed by a couple at the beginning of a decision period. The time-varying ε-shocks are assumed to be jointly serially uncorrelated. Their joint contemporaneous distribution is denoted by f_{ε_t}. More details are given below.

Unobserved Permanent Heterogeneity The permanent components of preferences, constraints and technology are assumed to be jointly distributed according to $g(\omega)$. In the application, I assume g to be discrete with a fixed number of support points, which indicates a couple's type.[26] These permanent components are known to the partners from the beginning of the marriage.[27]

2.1.7 Timing and Behavior

At any decision period, partners (or ex-partners) first observe the realization of ε. A couple entering the decision period as married also draws, given effort, a mode of interaction ($a \in \{0, 1\}$). Given (ε, a) and the pre-determined elements of the state space ($\bar{\Omega}$), the endogenous state-specific outcomes listed in (1) are determined as follows.

A married couple, be it a conflict-free or a conflict-ridden couple, is assumed to make within-period jointly efficient choices, i.e. to choose an allocation that yields a pair of utility values on the frontier of the relevant utility possibility set.[28] What distinguishes conflict-free and conflict-ridden couples is that they have (potentially) different utility possibility sets (UPS). A couple's within-marriage UPS is fully determined by partners' preferences, the technology for child quality, the resource constraints, and the mode of interaction. To the extent that conflict has an adverse impact on a child quality, the UPS of a non-accommodating couple with children is a subset of the UPS of an accommodating couple. Non-accommodating couples may also suffer from an added source of "inefficiency". High conflict couples may be unable or unwilling to mimic, in their negotiations, the repeated interaction that is known to lead to efficient bargaining solutions. This second role of conflict is reproduced by means of a disutility from conflict as introduced in (2).[29]

Allocations of divorced couples with children are assumed to be the outcome of a (within-period) sequential game between father and mother in which the father has control over the (financial) resources and the wife has control over the child's time.[30] Finally, ex-partners of childless couples do not interact with each

[26] This treatment of unobserved heterogeneity follows that of Heckman and Singer [26].

[27] See Francesconi and Emersch [16] for a model in which child endowments are not revealed to parents at birth.

[28] The assumption that decision-making between married partners leads to efficient allocations is behind the Nash solution modeling approach adopted by Manser and Brown [30] and McElroy and Horney [33]. Chiappori's collective model nests models based on cooperative bargaining and relies on the sole assumption of Pareto efficiency (see [9], [10]). The efficiency assumption is not rejected by Browning and Chiappori [7] in a static framework and by Mazzocco [32] in a dynamic setup.

[29] Modeling this "interaction inefficiency" as a disutility parameter is purely a convenient device. I think of it as the reduced form of a structure that through delays, costly negotiations, or asymmetries in information would deliver efficiency losses. Explicitly incorporating this strategic dimension is beyond the scope of the present work. An alternative interpretation of the conflict disutility parameter is that fighting between spouses reduces their enjoyment of the marriage.

[30] This modeling approach seems consistent with child custody being the right and duty to care for a child on a day-by-day basis and to make major decision about the child. See also Del Boca and Riberio [12], Weiss and Willis [40], and Del Boca and Flinn [11].

other (for the purposes of the model). Each individual solves a standard finite horizon stochastic decision problem.

As the discussion below will make clear, divorce is brought about by exogenous changes in match quality (ε^M). The mode in which the partners would interact were they to stay together (in particular, in light of the adverse effect that conflict may have on children), child quality, the couple's history of conflict, and other elements of the state space affecting the option value of divorce determine whether a match quality shock is sufficiently negative to make divorce occur. It is assumed that the marital outcome is within-period jointly efficient. Thus, a divorce occurs only if it is not possible to make a partner as well off within marriage as after divorce without the other partner being worse off when married than when divorced. In what follows, I present the details about how behavior is modeled. In doing so, for convenience of exposition and because of the finite horizon, I cover some aspects of the model solution.

2.1.8 Within-Period Problem

The marital and mode of interaction outcomes are jointly determined with all other endogenous outcomes. However, for ease of exposition, I first describe decision making given a marital status outcome and a mode of interaction outcome. Later, I describe how marital status and mode of interaction over the current decision period are endogenously determined. I start from the last decision period (when the female is of age T and continuation values are normalized to zero). Later I extend the presentation to periods prior to the last. Because I describe the problem in its recursive formulation I find it convenient to use x' for next period values of a variable x, rather than the more cumbersome age of female notation. I use the general notation d to denote the relevant vector of endogenous outcomes.

Last Decision Period Consider a couple (partners or ex-partners) with state Ω at the last decision period. T is set large enough that the couple is childless. Among the elements in $\bar{\Omega}$ there is past marital status: the couple may have been married over the previous period or may have separated some time in the past. First, consider a previously separated couple. Each ex-partner of gender j chooses the allocation $d_j = (l_j^p, c_j)$ that is feasible and maximizes his or her individual per-period utility. I denote the value to individual j of choosing the utility-maximizing allocation d^* by $V^{S,j}(\Omega) = u_j(d_j^*; \Omega)$, where the superscript S stands for separation/divorce.

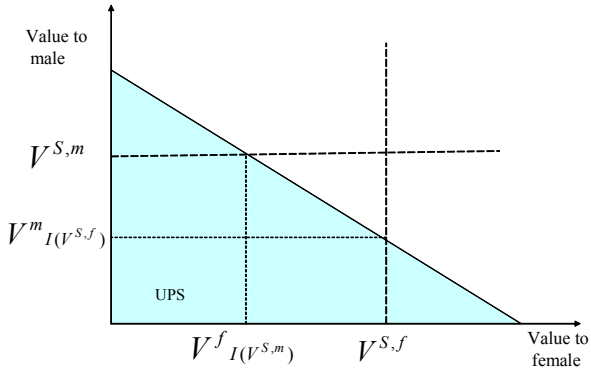
Next, consider a couple entering the last decision period as married. It is convenient to momentarily

dispense with the divorce option available to the partners. Thus, the only endogenous outcomes of concern are $d = (c, l_m^p, l_f^p)$ in a feasible set $D(\Omega)$. In light of the efficiency assumption, and given some generic female reservation value v_{bound}, the outcome d^* is a solution to the Pareto problem

$$\max_{d \in D(\Omega)} u_m(d; \Omega) \quad \text{s.t.} \quad u_f(d; \Omega) \geq v_{bound}. \tag{7}$$

For later use it is convenient to stress the dependence of the value functions of this problem on the mode of interaction. Also, to ease notation I suppress the dependence on Ω whenever possible. Accordingly, I denote the value to individual j from the efficient allocation d^* when the female reservation value is v_{bound} by $V_a^{M,j}(v_{bound})$ (where M stands for married) and set it to $u_j(d^*)$.[31] Now consider the marital outcome and the determination of v_{bound}. First, let $\underline{v}^f$ be the reservation value of the female partner conditional on marriage. That is, were the partners bound to stay together over the current period, the wife would attain a utility value of at least $\underline{v}^f$.[32] Next, given a UPS, let $V^j_{I(V^i)}$ denote the value to the gender j partner when the gender i partner's value is V^i and such that the pair $(V^m_{I(V^f)}, V^f_{I(V^m)})$ belongs to the Pareto frontier. By assumption a divorce occurs if and only if it is efficient. Thus, it occurs whenever $V^{S,f} > V^f_{I(V^{S,m})}$ and $V^{S,m} > V^m_{I(V^{S,f})}$. Graphically this condition means that the intersection of the vertical lines corresponding to the values from divorce to male and female falls outside (and to the north-east) of the couple's UPS, as shown in Figure M.1. These inequalities are clearly satisfied if the value from divorce of either partner is above the maximum he or she can achieve within marriage. A divorce may also occur when both spouses are potentially better off when married but there exists no allocation that can make one partner as well off when married as when divorced without making the other partner worse off.

Figure M.1: Efficient divorce (for given mode of interaction)



[31] Due to constraints on leisure the reservation constraint may not bind at a solution; if it binds it is a function of v_{bound}.
[32] The within-marriage reservation value captures the relative bargaining strength of husband and wife.

In summary, when staying married is the efficient marital outcome, the utility value from marriage to the husband is the value function of (7) where v_{bound} is

$$v_{bound} = \begin{cases} V^{S,f} & \text{if } \underline{v}^f \leq V^{S,f} \\ \underline{v}^f & \text{if } V^{S,f} \leq \underline{v}^f \leq V^f_{I(V^{S,m})} \\ V^f_{I(V^{S,m})} & \text{if } V^f_{I(V^{S,m})} < \underline{v}^f, \end{cases} \tag{8}$$

while the utility value from marriage to the wife is the right-hand side of the reservation constraint evaluated at the solution of the program.[33] The expression for v_{bound} in (8) shows that factors that affect opportunities of the partners outside marriage (as summarized by $V^{S,f}$ and $V^{S,m}$) can influence the within-marriage balance of power and the chosen allocation even when the marriage does not dissolve. In order to make explicit the dependence of the value from staying married on the mode of interaction a and the couples' state, I denote it by $V^{M,j}_a(\Omega)$.

At any given Ω, I denote by $\tilde{V}^j_a(\Omega)$ the value function

$$\tilde{V}^j_a(\Omega) = I_S V^{S,j}(\Omega) + (1 - I_S) V^{M,j}_a(\Omega), \tag{9}$$

where I_S is an indicator function that takes value one when a divorce is the efficient marital outcome or the only possible outcome (due to divorce being an absorbing state) and zero otherwise. Now I can introduce

$$V^j(\Omega) = a\tilde{V}^j_1(\Omega) + (1-a)\tilde{V}^j_0(\Omega), \tag{10}$$

the value function whose expected discounted value constitutes the future component of individual j's utility value at the decision period prior to the last.

Decision Periods Prior to the Last Denote the beginning of period state by Ω and the end of period state by Ω'. First consider decision periods at which the age of the female is such that if offspring exist they are adults. At those decision periods the determination of the endogenous outcomes is similar to that for the last decision period. The only difference is that in the problems described above the per-period utility function is replaced with the sum of the current utility function and the discounted expected future utility value, $E\left[V^j(\Omega')|\Omega, d\right]$, where the expectation is taken over the future shocks and conditional on current outcomes and state and $V^j(\Omega')$ is as in (10). The discount rate is denoted by β.

[33] If at the solution the female reservation constraint binds, the value from marriage to the wife is exactly v_{bound}.

Next, consider decision periods at which the age of the female is such that some of the offspring may still be children, and, to make the exposition complete, such that a pregnancy is still possible. Let me start by describing the derivation of the endogenous outcomes of a divorced couple with children. By assumption, divorced parents do not spend time with their children jointly. That is, upon divorce the total amount of time available to a child becomes a rival good (between parents). Also, divorced partners do not have new children. The extensive form of the complete and perfect information game they are assumed to solve is as follows. First, the father chooses a feasible level of transfers to the mother. Then, the mother observes the transfer and chooses a level of private consumption and how to use the time available to her subject to feasibility. Finally, the father observes the mother's consumption and time use choices and chooses his private consumption and how to use the time available to him subject to feasibility.[34] The payoff of an action is the current utility plus the discounted expected future utility it obtains. The subgame perfect Nash-equilibrium outcome is found by backward induction.[35] At the equilibrium outcome, the utility value from divorce to the partner j is denoted by $V^{S,j}(\Omega)$.

I conclude by describing the derivation of the endogenous outcomes of a couple with children that enters the current decision period as married. As before, I use the expositional device of first describing decision-making assuming that the marital outcome is for the couple to remain together, and then discuss how the marital outcome obtains. By assumption, the allocation chosen by a married couple yields a point on the frontier of their utility possibility set. Consequently, it is a solution to a Pareto problem similar to (7). The only difference is that, due to the presence of young children, the vector of endogenous outcomes is now $(d_P, l_m^p, l_f^p, c, d_P, \{m_{\mathsf{c}}, f_{\mathsf{c}}, p_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\})$. The marital outcome and the derivation of v_{bound} are now exactly as described at the last decision period. I can then obtain $\tilde{V}_a^j(\Omega)$ by (9) and $V^j(\Omega)$ by (10).

The full recursive solution of the model delivers a collection of pairs of expected value functions

$$\left\{\left(E\left[V^m(\Omega_{t+1})|\bar{\Omega}_{t+1}\right], E\left[V^f(\Omega_{t+1})|\bar{\Omega}_{t+1}\right]\right)|t = t_1, ..., T\right\} \tag{11}$$

for each possible $\bar{\Omega}_{t+1}$. In the literature, these functions are commonly referred to as the Emax functions.

[34] A child's time is always a limited resource whether parents are divorced or not. However, this constraint is never binding when parents are married since they can always spend time jointly with the child. This is not true for divorced parents. A divorced father may be constrained in the time he can spend with his children by the time the mother spends with them.

[35] The problem is presented in details in Appendix B.

2.1.9 The Mode of Interaction Outcome

Having covered the mode-of-interaction-specific value functions, I now explain how the mode of interaction outcome is generated. The mode in which partners interact when married is a random draw from a 2-point mass probability distribution such that the probability of interacting in an accommodating way is the previously introduced $P_{B_a}(e_m, e_f)$ evaluated at equilibrium effort levels.

Effort levels exerted are assumed to be the NE outcome of a within-period complete information simultaneous-move game between partners. Payoffs and strategies are as follows. Given partner i's effort e_i, partner j chooses effort level e_j that maximizes his or her expected utility gain from being in an accommodating marriage net of an individual effort cost (C). Formally, partner j's effort strategy solves

$$\max_{e_j} P_{B_a}(e_i, e_j)\,\tilde{V}^j_{a=0} + (1 - P_{B_a}(e_i, e_j))\,\tilde{V}^j_{a=1} - C(e_j) \qquad \text{for } i, j = m, f \text{ and } j \neq i, \tag{12}$$

where $\tilde{V}^j_a$ is as derived in (9).

Functional forms for P_{B_a} and $C(\cdot)$ are chosen to guarantee existence of a unique NE and to have a closed form solution to the system of best response functions. Specifically, the functional form chosen for P_{B_a} is such that an increase in the effort exerted by the partner i raises the desirability of exerting high effort for partner j. Futhermore, each partner can independently guarantee a minimum probability of having an accommodating marriage, but both spouses have to exert effort for the marriage to be accommodating with certainty. The individual cost of effort function is assumed to be convex.

Due to the complementarity assumption, the best response functions are weakly increasing. Also, the effort exerted by one partner is increasing in his or her gain from having an accommodating interaction ($\tilde{V}^j_{a=0} - \tilde{V}^j_{a=1}$). Unless there is no gain from being accommodating, exerting zero effort is not a best response. Letting (e^*_m, e^*_f) be the NE outcome of the game, the (potential) mode of interaction of a couple entering a decision period as married is a draw from $P_{B_a}(e^*_i, e^*_j)$, which turns out to be a weakly increasing function of the partners' gains from accommodation. Observe that if a divorce is the efficient outcome for all modes of interaction, (9) will be equal to the value from a divorce for both values of a. In that case, the outcome of the game would be zero effort exerted and the couple would be observed to divorce. Finally, in implementation the function P_{B_a} is allowed to depend on a couple's lagged mode of interaction (a_{-1}) and stock of accumulated conflict (A) to capture the fact that a couple that has a history of non-accommodating interaction may find being accommodating harder. In Appendix B, I present exact functional forms and derive the best response

functions and the effort outcome.

2.2 Solution Method

The model is numerically solved by backward recursion beginning when the female is 64 years of age.[36] There are three complications in solving the model numerically. First, endogenous outcomes such as time uses and child support transfers are continuous. Instead of using nonlinear equation solvers for the corresponding system of first order conditions, I choose to discretize both time uses and transfers. Discretization is implemented as follows. A time use outcome (e.g. female labor supply) is a fraction of total time available where fractions are restricted to belong to the set $\left\{0, \frac{1}{d}, ..., \frac{d-1}{d}, 1\right\}$ with d equal to 4.[37] At the present time, in order to limit the computational burden of the model, male labor supply is fixed at full time. Child support transfers are a percentage of male's full income where percentages are restricted to belong to the set $\{0\%, d_1\%, ..., d_{ngT}\%\}$ with ngT equal to 5 and $d_{ngT}\%$ equal to 30%.

A second complication is that, even with the coarsest discretization, the size of the endogenous outcome space explodes when the number of children present is larger than two. Instead of limiting the estimation sample to couples with at most two children, I introduce male and female continuation value functions at the birth of the third child. Details are given below.

The third complication is that the size of the state space makes a full solution of the problem computationally intractable. To solve this dimensionality problem, I adopt an approximation method in which the Emax functions in (11) are expressed as parametric functions of the state variables using methods developed in Keane and Wolpin [28]. The Emax functions are calculated at a subset of the state points and their values are used to fit global polynomial approximations in the state variables. At each decision period there are six such approximations for, respectively, married male, married female, separated childless female, separated childless male, separated female with children, and separated male with children. The multivariate integrations necessary to compute the expected value of the future value functions at those state points are performed by Monte Carlo integration over the structural shocks.[38]

[36] Simplified versions of the decision problems for married and separated couples are solved for ages between 56 and 64. The continuation values at female age 64 are normalized to 0. The latest age at which a female is observed in the data is 42 years.

[37] A quarter of total time available roughly corresponds to the number of hours that, if worked, classify as part-time work, while half of the total time corresponds to full-time work. To limit the computational burden of the model, the following restrictions are also imposed: (i) female labor supply cannot be above 1/2, (ii) if two children are less than six years apart in age and if a parent spends time with one of them, the other child is also present, (iii) each parent's total time with children cannot be above 1/2.

[38] I used 1500 state points and an average of 60 variables for the sapproximations of the Emax functions. I use 30 draws for numerical integration.

3 Data

3.1 Sample and Type of Information Available

The National Longitudinal Survey of Youth 1979 cohort is a multi-purpose panel survey that originally included a nationally representative sample of 12,686 individuals (of which 6,283 women) who were all 14 to 21 years of age on December 31, 1978. Annual interviews have been completed with most of these respondents since 1979, with a shift to a biannual interview mode after 1994. There is a core nationally representative random sample and oversamples of blacks, Hispanics, members of the military, and economically disadvantaged non-black/non-Hispanic. As of the 2000 interview round, all the women had attained the ages of 35 to 43. Starting in 1986, the offspring of the NLSY 1979 cohort of mothers have been assessed every two years (if under the age of 15). The number of offspring surveyed has increased from 4,971 in 1986 to 6,417 in 2000. As of 2000 these offspring are mostly below the age of 25 and are estimated to represent about 90 percent of all the offspring ever to be born to this cohort of women. Since 1988, offspring ages 10 and over have completed personal interviews. In this paper, I use NLSY79 when referring to the NLSY 1979-2000 data set and NLSY79 CHYA when referring to the 1986-2000 data set on offspring of NLSY79's females. My estimation sample excludes women from the military as well as the economically disadvantaged non-black/non-Hispanic subsamples. I follow women from the date of their first marriage through their last interview. Appendix C contains a detailed description of the sample inclusion criteria and of how the data set used in estimation was constructed.

The NLSY79 provides the information necessary to construct a work history for wife and husband, as well as marital and fertility histories. Information on hourly wage rates is either directly available or constructed based on earnings from labor and number of hours worked.[39] As to marital history, I exclude from the estimation sample those couples that cohabit prior to their marriage if the cohabiting partner is different from the first husband.[40] At each interview, respondents are asked about their current marital status. Typically, if a change has taken place from the previous interview, they are also asked about the date at which the change occurred. A separation/divorce (in the language of the paper) is said to occur when partners stop living together. To pin down this date, I rely on information on marital status at the interview, on the date when the husband or the father left the household (when available), on whether the

[39] Information on husbands' wages and labor supply is only available up to when the marriage ends.

[40] In fact, cohabitation prior to the first marriage is treated differently depending on its duration, whether it produced children, and whether it was with a man that has later become the husband of the female respondent. Details are in Appendix C.

father of the children lives in the household, and on the household roster. Finally, the NLSY79 provides the information necessary to establish the age and highest grade completed at marriage of a sample female's husband.

Starting in 1988, NLSY79 partnered females have been asked about how frequently they have arguments with their partner about children, chores and responsibilities, money, showing affection to each-other, religion, leisure time, drinking, other women, and her or his relatives. Other questions concerning the degree of satisfaction in the current relationship are also asked (e.g. degree of happiness). Biannually since 1994, offspring ages 10 and older have answered questions concerning the relationship between their biological parents. For instance, children are asked about how often their parents argue. Any approach used to map the information available into a family-specific binary indicator of conflict contains a component of arbitrariness. The binary indicator of conflict that I use in estimation relies exclusively on the female's report since: it is available for the longest period[41], allows longitudinal comparisons, is asked whether there are children or not, and it does not require aggregating reports over adult and young members of the same family. In constructing this indicator I choose not to focus on individual issues about which partners argue. While based on sample correlations some issues seems to be more stongly related to marital disruption than others (e.g. drinking and other women), singling them out would cause me to miss on other sources of conflict that may be of relevant for a child's development. Similarly, the existence of a negative association between arguing about some issues and either marital disruption or child attainment may be due not to the effect of conflict *per se* but to the underlying factors inducing partners to argue (e.g. money or drinking).

The NLSY79 and the NLSY79 CHYA contain many questions concerning the (total amount of) time that a parent has spent over a given spell of time or usually spends with a child. Questions are asked to the mother with reference to each child separately. In addition, children of age 10 or older are themselves asked questions regarding time spent with parents. One limitation of the data is that questions with a quantitative content convey information on how frequently a parent spends time with a child but not on how long they are together. Also, questions vary somewhat depending on the age of the child, the gender of the parent, and the marital status of the parents. To construct a longitudinal measure that is comparable across time, I take the following approach.[42] I use information on how often a divorced father sees his child and how long the encounter lasts to construct a day-based measure of time by a father with his child. The obtained number

[41] These questions have been asked since 1988 only, and the questions asked to children are available only for teenagers.
[42] More details are in Appendix C.

of days with the father (over a 2 year period) is described in Table ND.1. Next, I use answers to a few common questions[43] asked to children age 10 to 14 concerning time spent with each parent. Based on this information, I match children for whom I do not have an hourly amount of time with a parent with children for whom I do. The matching is performed using a propensity score approach and its results are summarized in Table ND.2. Finally, days are converted into hours. The third and final complication arises in using the hourly information so obtained. An example should clarify the problem. Consider a married couple with only one child. According to the model, the observed mother's total time with the child is $(f_1 + p_1)$, while the father's total time with the child is $(m_1 + p_1)$. Hence the two restrictions imposed by the data do not identify the three model magnitudes (m_1, f_1, p_1). All I know is that $p_1 \leq \phi \min\{(m_1 + p_1), (f_1 + p_1)\}$ for some k in the unit interval. I therefore impose "identifying" restrictions as explained in details in Appendix C. To illustrate, in the example considered the restriction imposed corresponds to assuming that if mother and father both spend some positive amount of time with their child, they do so jointly (i.e. ϕ equals one). Given these restrictions, the available data is discretized and mapped into the model variables for parental time with children.

The assessments in the NLSY79 CHYA measure cognitive ability, temperament, motor and social development, behavior problems, and self-competence of the children as well as the quality of their home environment. Assessment data are collected through mother report and administration of standard tests directly to the children. In particular, the NLSY79 CHYA includes three subtests from the full Peabody Individual Achievement Test (PIAT) battery. The PIAT is a wide-range measure of academic achievement. It is among the most widely used brief assessment of academic achievement. Also, the PIAT scores have been shown to be closely correlated with a variety of other cognitive measures. The advantage of using the PIAT assessments as a measure of child quality is the fact that they have now been repeatedly asked of children age five and older. I focus on two subtests: (1) the PIAT Math, offering a wide-range measure of achievement in mathematics, and (2) the PIAT Reading Comprehension, assessing the attained reading knowledge and comprehension.[44] For both tests, the NLSY79 CHYA data contain both raw scores (taking a value from 1 up to 84) and (age-specific) standardized score (based on national norms). In estimation I use

[43] For instance, questions on how often the parent misses important events or activities of the child, and how often parent and child share ideas and decisions.

[44] The PIAT Math consists of 84 multiple-choice items of increasing difficulty. It begins with such early skills as recognizing numerals and progresses to measuring advanced concepts in geometry and trigonometry. The PIAT Reading Comprehension subtest measures a child's ability to derive meaning from sentences that are read silently. For each of 66 items of increasing difficulty, the child silently reads a sentence once and then selects one of four pictures that best portrays the meaning of the sentence.

the average of PIAT Math and PIAT Reading Comprehension raw scores, since I want an absolute measure of achievement that captures gains over time as additional inputs are invested in a child.

The surveys collects information on child support and alimony payments. However, the data lack consistent information on entitlement which is one of the reasons why I model and treat all transfers as voluntary. The high rate of non-compliance also supports this assumption. I focus only on transfers in the form of child support and let them be zero whenever the custodial mother reports not to have received any income from child support.

3.2 Descriptive Statistics

Table DS.1 presents basic sample statistics. There are 1301 couples in the sample of which approximately 66% are white, 15% black and 19% Hispanic. The first part of the table provides descriptive statistics of the couples' conditions at marriage overall and separately by race/ethnicity. The average age of the female at marriage is 24.9 years, while that of the male is 26.5 years, with Hispanics marrying on average about 1 year earlier than either whites of blacks. The earliest age a female is married is 18 and the latest is 40 (not shown). Both the average wife and husband have completed high school with an average of about 13 years of school. While Hispanics have on average 1 year less of education, there is virtually no difference between black and white females' average educational attainment. Because males and females in the sample are in their first marriage and because I exclude spouses that had previous partnerships, the sample is somewhat skewed towards well-educated individuals and racial difference in educational attainments are on average small.[45] Also, there is high correlation in education between males and females suggesting positive assortative mating in education. On average, females start marriage with the equivalent of 5.8 years of work experience (12,790 hours), with Hispanic females having the lowest amount of labor market experience at marriage and white females having the highest. Males start marriage with an average of 2 years of labor market experience more than their spouse, where this difference is the highest for black couples.

The second part of Table DS.1 shows statistics on marital and fertility outcomes. Of the initial 1301 couples, 419 are observed to separate (32.2%). Black couples are more likely to separate than white or Hispanic couples by 10 percentage points. Because the sample contains incomplete spells, some of the marriages that are still intact in 2000 will end up in divorce and this will presumably bring the divorce rate

[45] The exclusion of never-married black females is the main reason for white and black females having the same average highest grade completed.

closer to the 50% figure found using other data sets. The average age of the female at divorce is about 30 years and the average length of marriages that end in a divorce is slightly below seven years. The marital survival function reproduced in Figure DS.1 shows that almost 15% of the black couples divorce within the first two years of marriage. There seem to be some evidence of positive duration dependence since the decline of the survival function is less rapid the longer the duration of a marriage. Returning to Table DS1, a sizeable fraction of the divorces observed (about 41%) do not involve children. Approximately 32% involve one child, 18% two children and 8% three or more children. If there is only one child involved in a divorce, he or she is on average between the ages of 5 and 6, with the average age (across siblings) increasing when there are more children involved.

The average number of children born within the first marriage is 1.62. To understand the below-replacement fertility rate one should observe that some of the females in the sample have not completed their fertility yet (the youngest age at last interview is 35). Furthermore, many of the females who experience a divorce before having given birth will go on to have children with other partners (not shown since this information is not used). Looking across racial/ethnic groups, Hispanics have the highest average number of children and blacks the lowest with only 1.3 children born within the first marriage (as driven by approximately 31% of black wives having given birth to no child within the first marriage and over the observation period). Computation of the same statistics for the entire sample of NLSY79 females shows that the exclusion of unmarried individuals is at the source of the somewhat low fertility rate. Table DS.1 also provides information about fertility patterns. In particular, it shows the average age of the female at first, second and third birth as well as the duration distribution from the date of marriage to the birth of each of the first two children. Fertility occurs quickly after marriage. A little more than 60% of the mothers had their first birth within two years of marriage. As the second column shows, of the women who had at least two children, 40% had their second birth within four years of marriage while about 13% did not have their second birth until after 10 years of marriage. Whites tend to delay the first birth longer than either blacks or Hispanics even though the average age at second and third birth is only slightly higher for whites than for blacks.

Table DS.1 further describes wages and labor supply. It first shows hourly accepted wages of husbands and wives. On average husbands earn \$6 per hour more than their wives, who make between \$13 and \$14 per hour. Pooling over periods, approximately 18% of the females do not work at all. Overall, females work an

average of 1275 hours per year and males an average of 2226 hours. Figure DS.2 shows a hump-shaped age profile of hours worked by females (by race/ethnicity). The labor supply of Hispanic females is the lowest throughout. The labor supply of black females is below that of white females at younger ages, but then overcomes it at age 26 to remain above it by an average of 200 hours after that (small sample sizes lower the precision of the estimates at both tails). Divorced females work more than married females at all ages, as shown in Figure DS.3. Figure DS.4 shows a much flatter age profile of hours worked by married males with little difference across racial/ethnic groups. The second part of Table DS.3 displays transition rates for males and females in terms of discretized labor supply. There is evidence of high persistence: about 79% of women who do not work in a period do the same in the next period. A slightly lower figure (71%) applies to transitions from full-time to full-time while there is markedly less persistence in part-time work (47%).[46] Transition rates for males show that about 85% of those in a full-time job in a period hold a full-time job in the next period.[47]

Returning to Table DS.1, and considering the amount of child support payments, divorced fathers are observed not to make any transfer to the custodial mother in approximately 39% of the periods. There is wide variation across races/ethnicities (for instance, the rate is slightly below 65% for blacks).[48] When some child support is paid, it amounts to about $2,900 per year per child. Fathers with high earnings transfer more; the correlation between amount of transfers and within-marriage average earnings is about 0.51 on average. The correlation between the amount of child support transfers and within-marriage average earnings of the mother is lower at 0.14. There is no correlation (0.08) between the amount a divorced father transfers to the custodial mother and the time he spends with his children. On average, in more than 18% of the periods, divorced fathers do not spend any time with their children. The first part of Table DS.3 shows transition rates for total time spent by mothers and fathers with their children. Neither parent spends more than a quarter of the available time with their children (i.e. no more than about 3 hours per day) and the transition rates are evidence of high permanence for both mothers and fathers.[49]

Considering now parental time from the point of view of a child, Table DS.1 shows that in about 12% of the periods, children of divorced parents do not see their father at all. The average number of days spent by a 10-14 year old child with his or her father is lower than the time spent with his or her mother. Also, a

[46] Virtually no female in the sample works three quarters of her time or all the time as the sample sizes in Table DS3 show.
[47] Virtually no male works all the time or not at all (the percentages being 1.21% and 3.34% respectively).
[48] This rate is higher than what is reported elsewhere for divorced couples. The discrepancy may be due to the fact that I consider as eligible for child support all mothers who share residence with at least one offspring below the age of 14.
[49] In considering this figure recall that time spent by mothers with children is not available if the child is less than 10.

child spends more time with a parent, be it the mother or the father, when parents are married as opposed to divorced (83 days versus 117 for the father and 114 versus 140 for the mother). Tables T.1 through T.4 report descriptive statistics for the raw time data.[50] Both Table T.1 and Table T.3 describe time spent by the father with a child, conditional on the marital status of the parents. Table T.2 describes time spent by the mother with a child when the child parents are married and Table T.4 when parents are divorced. A number of interesting patterns emerge from the tables: (1) as already conveyed by the (derived) number of days variables, mothers spend more time with their children than fathers do, (2) divorced parents spend less time than married parents with the decline in time spent being more pronounced for fathers than for mothers, (3) these difference are present at all child ages, (4) the gap in time spent by a child with his father between divorced and married parents tends to become larger the older the child is (and/or the more distant in the past the divorce is), (5) while the reduction in mother's time when divorced is accompanied by an increase in her labor market participation, the reduction in father's time when divorced is paired with virtually no change in his labor market participation.

The last part of Table DS.1 shows two statistics concerning the indicator of conflict among married partners used in estimation. This binary measure of conflict was obtained by aggregating a female's answers to ten questions each inquiring about the frequency of arguments on a specific issue.[51] The indicator classifies a couple as having conflict over a period if the female reports that she often argues with her partner on at least one of the ten issues considered.On average, married couples have conflict on at least one issue in 27% of the periods observed. The fraction of couples that are not having conflict this period and are observed to divorce in the next period is 6.5%. Couples experiencing conflict are twice as likely to divorce.

Descriptive statistics on the raw conflict variables are contained in Tables A.1 through A.4.[52] Table A.1 shows that the percentage of couples who argue often is the highest for "chores", followed by "money" and then "children" (12.5%, 11.1% and 9.2% respectively). It also shows that very few couples have arguments on some issues (e.g. "other women" and "religion"). Table A.2 reports a measure of association (the Kendal-tau) between answers by issue. Association is always non-negative and ranges from 0.57 for "wife's relatives" and

[50] These tables refer to a larger sample than the one used in estimation. Details are at the bottom of each table.

[51] To repeat, the issues are: children, chores and responsibilities, money, showing affection to each-other, religion, leisure time, drinking, other women, and her or his relatives.

[52] A limitation of the NLSY79 data on arguments between married partners, and hence of the binary measure of conflict I construct, is that it captures overt conflict (i.e. direct manifestation of hostile behavior) but not covert conflict (i.e. hostility expressed indirectly as withdrawal from arguments). Studies by psychologists assessing overt versus covert conflict tend to conclude that while both types of conflict (or of conflict management) are negatively associated with child well-being, the size of the former is larger than the size of the latter. See Grych and Fincham [23] .

"husband's relatives", followed by 0.42 for "money" and "chores", to 0.13 for "children" and "other women" (where perfect positive association is 1 and perfect negtive association is -1). Table A.3 describes association between conflict as reported by the mother and by her teenage offspring. The association is positive though relatively low. It varies depending on the issues and is highest when "children" is what parents argue often about (as reported by the mother).[53] The highest correlation between mother and child reports is however attained when the collection of mother's reports is collapsed into a binary indicator that takes the value one when parents argue often on at least one issue. This is the measure of conflict that I use in estimation i.e. I classify a couple has having conflict over a period if partners argue often about at least one of the ten possible issues. Another feature of this binary measure of conflict is that it is consistent with the evidence, given above, that there is some overlapping in couples' arguing: couples that argue about some of the issues are also more likely to argue about other issues. Finally, as shown in Table A.4, there is a negative (and significant) association between frequency of conflict between married partners and degree of happiness reported in the relationship.

Table DS.2 reports descriptive statistics concerning children's test scores (the average of PIAT Math and Reading Comprehension) for the estimation sample. On average a child test score is approximately 13.7 at age 5 and increases to 57 by age 14. Average test scores are higher for whites than for non-whites at all ages, with the gap growing over time from a little more than 1 point at age 4 to almost 10 points at age 14 when comparing whites and blacks. Hispanic children exhibit an even lower age 4 test score than black children but overcome them by age 10. The average (standardized) test score is approximately 3 points[54] higher when a child has married parents than when the child's parents are divorced, though the difference is not statistically significant. For comparison, the average behavior problem index (BPI) is also reported separately by the marital status of the parents. The BPI is a measure of quality of children ages 4 and over constructed by aggregating answers to a battery of questions measuring the frequency, range, and type of childhood behavior problems. Higher scores represent a greater level of behavior problems. There is a positive gap between BPI for children of divorced parents and of married parents (8.3 versus 7.2). The second part of Table DS.2 shows average (standardized) test scores by the conflict status of a child parent. If parents argue often on at least one issue (i.e. there is conflict), children have an average test score that is

[53] These findings are consistent with findings in the child psychology literature using other data sources. See Grych and Fincham [23].

[54] Standarized test scores have a mean of 100 and a standard deviation of 15.

3 points lower, though this difference is not statistically significant. Finally, the estimated coefficient of the indicator of lagged conflict in a regression of a child's test scores on education of the parents, age of the child and contemporaneous home score is reported for different specifications: OLS, value-added, value-added and mother's fixed effects, and value-added and child's fixed effects. The estimated coefficients are always negative, though not always significant at standard levels.

4 Estimation

There are two problems that arise in estimation. First, the initial work experience of the husband of a NLSY79 female is not observed.[55] For parsimony, instead of specifying a distribution for male experience at marriage (conditional on the other observed initial conditions) and estimating its parameters together with the other behavioral parameters, I impute male experience at marriage by assuming that unmarried males work full-time from the time they leave school to the time they get married.[56] Second, some of the state variables are missing every other year: this problem is dealt with by organizing the data so that a decision period corresponds to a 24-month period. Notwithstanding this aggregation, some of the state variables are missing over several consecutive periods. For instance, test scores are not available for children below the age of 5. As another example, questions concerning parental conflict (as reported by the female) have been asked starting only in 1988 (when a non-trivial fraction of the couples in the estimation sample had already been formed). This implies that lag of conflict and stock of conflict are often missing. A likelihood-based approach to the estimation of the structural parameters would deal with missing state variables by integrating over their distribution. Because the missing problem affects elements of the state space that take on many values (e.g. test scores are treated as continuous), this approach is infeasible.

I therefore pursue a moment based estimation strategy, the efficient method of moments, henceforth EMM (Smith [37], Gallant and Tauchen [19]).[57] The basic idea is to fit simulated data obtained from the model to an auxiliary statistical model that can be easily estimated and that provides a complete enough statistical description of the data to be able to identify the behavioral parameters. Following Wolpin and Van der Klaauw [39], I use a combination of approximate decision rules (that link endogenous outcomes of the model and elements of the state space) and structural relationships (such as the wage equations and the

[55] The reason for the missing data is that when a female respondent marries, no questions are asked as to her spouse's work history.

[56] The age at marriage of the males in the sample is relatively low and labor market participation over the observation period is heavily concentrated on full-time work (at all male ages).

[57] For an overview of this method see Gourieroux and Monfort [20].

test score production functions).[58]

More specifically, using actual data, y_A, I estimate by maximum likelihood a set of M_A auxiliary statistical relationships with parameters Θ_A. By construction, at the maximum likelihood estimates, $\widehat{\Theta}_A$, the scores of the likelihood functions (L_j for $j = 1, ..., M_A$) are zero. That is, $\frac{\partial L_j}{\partial \Theta_{A,j}} = 0$ where $\Theta_{A,j}$ is the vector of model j's parameters. Denoting Θ_B the parameters of the behavioral model, the idea of EMM is to choose parameters that generate simulated data ($y_B(\Theta_B)$) that make the score functions as close to zero as possible. This is accomplished by minimizing a weighted sum of the squared scores evaluated at the simulated data. The EMM estimator of Θ_B is thus

$$\widehat{\Theta}_B = \arg\min_{\Theta_B} \frac{\partial L}{\partial \Theta_A}\left(y_B(\Theta_B); \hat{\Theta}_A\right) \Lambda \frac{\partial L}{\partial \Theta_A'}\left(y_B(\Theta_B); \hat{\Theta}_A\right), \tag{13}$$

where Λ is a weighting matrix and where $\frac{\partial L}{\partial \Theta_A}\left(y_B(\Theta_B); \hat{\Theta}_A\right)$ is a vector collecting the scores of the likelihood functions across auxiliary models. When $M_A = 1$, the optimal weighting matrix is the inverse Hessian and $\widehat{\Theta}_B$ has a limiting normal distribution. For tractability, I estimate the M_A auxiliary models separately and choose as the weighting matrix a block diagonal matrix Λ^* such that each block is a consistent estimator of the inverse Hessian of the corresponding auxiliary model.

Finally, I assume that the probability of the unobserved types of heterogeneity can be represented by parametric functions of the state at marriage. Given the iid assumption for the shocks, this implies that initial states are exogenous given type.

4.1 The Auxiliary Statistical Models

The solution to the optimization problem presented above is a set of outcomes as functions of the state space at each decision period. One class of auxiliary models used consists of parametric approximations to these outcome functions. Following van der Klaauw and Wolpin [39], to keep these approximations parsimonious (as to preserve precision in the parameter estimates), I do not include all the state variables. Instead I specify outcomes as parametric functions of subgroups of state space elements.

A second set of auxiliary models comprises quasi-structural relationships related to the wage equations and the test score production function. Missing lagged test scores and/or parental inputs invested in a child substantially reduce the sample size available for estimating the parameters of the test score production

[58] Other applications include Magnac et al. [29] and Nagypal [34]. As Nagypal points out, efficiency of the EMM estimator has only been rigorously established for a particular semi-non-parametric method discussed in Gallant and Long [18]. Additionally, the methodology has been formally developed only for the case of one auxiliary model.

function. For this reason, I specify a battery of auxiliary models linking a child's end-of-period test score to different collections of its determining factors.[59] One advantage of this approach is that it exploits as much as possible the correlation information available in the data.[60] To help identify the unobserved permanent heterogeneity parameters the auxiliary models for these two outcomes include also elements of a couple's state space which are not determinants of labor market productivity or, respectively, inputs in the production of child quality. A third class of auxiliary models used consists of final forms specified as simple statistical models capturing the correlation between initial conditions and life-cycle events. Throughout, I make the assumption that state variables are missing randomly.[61]

The specific type of parametric approximation adopted depends on whether choice variables (for auxiliary models approximating outcome functions) and state variables (for auxiliary models approximating structural relationships) are discrete versus continuous. In all cases the score of the parametric approximation chosen can be analytically derived and the auxiliary parameters can be easily estimated. The following list comprises the set of auxiliary models used in estimation.

1. logit for marital status: There are 8 separate logits using alternative sets of variables representing groups of variables such as initial conditions (race, education, age and experience at marriage), current ages and experience, conflict-related variables, family composition variables, and child test scores.

2. logit for a pregnancy: There are 6 separate logits using alternative sets of variables representing groups of variables such as initial conditions, current ages and experience, conflict-related variables, family composition variables, and child test scores.

3. logit for having a non-accommodating relationship: There are 3 separate logits using alternative sets of variables representing groups of variables such as initial conditions, lagged conflict, and family composition variables.

[59] Availability of time inputs is restricted by the age of a child as well as by the marital status of the child's parents. Lagged test scores are missing whenever a child is less than 6 years of age. The amount of financial resources of which goods invested in a child are a percentage are missing whenever the labor supply or wage rate of either of parent is missing and/or the amount of child support transfers is missing. Conflict information is missing in all surveys prior to 1988.

[60] In fact, an advantage of the structural approach adopted is that it allows me to exploit cross-equation and cross-period restrictions. This enables me to augment the sample information used to estimated the technology parameters.

[61] The model implies that conflict information is not missing randomly since it is available only for marriages that have lasted long enough to be still intact at the 1988 survey. I deal with non-randomly missing conflict information as follows. The simulated conflict outcomes of a sample couple replica are used in the computation of the relevant score functions only starting from when the sample couple first reports conflict information. This implies that replicas of sample couples that have never contributed conflict information never contribute simulated conflict outcomes.

4. logit for the amount paid as child support over divorce being positive: There is 1 logit using initial conditions, and family composition variables.

5. regression of positive child support amounts: There are 4 separate specifications using initial conditions, family-composition variables, and labor market experience of the mother.

6. regression of log (accepted) wages: There are 4 specifications, 2 for males and 2 for females, using age, education, race and accumulated work experience.

7. ordered logit for labor supply: There are 5 specifications, 3 for females and 2 for males, one for each marital status category; each specification is estimated using groups of variables such as initial conditions, current age and experience of the partners, and family composition variables.

8. regression of log test scores: There are 14 separate specifications using alternative sets of variables representing groups of variables such as initial conditions and age of child, conflict-related variables and age of child, family composition variables and age of child, time and financial resources inputs and age of child, lagged test scores and age of child.

9. logit and/or linear probability models for time by parents with their children: There are 5 separate specifications, 1 for total time a child is with both parents, 3 for total time by a mother with her child, and 1 for total time by a father with his child; each specification is estimated using groups of variables such as initial conditions, current age and experience of the partners, and family composition variables.

10. logit and/or linear probability models for life-cycle events: There are 24 separate specifications concerning whether the couple divorces, the number of children born within the first marriage, the age of the female at first, second and third birth, the duration of a marriage to the first, second and third birth, the age of the female at divorce, the duration of marriages that end in divorced, and the fraction of divorced couples that have 1 and 2 children; initial conditions constitute the explanatory variables for these models.

The 82 auxiliary models described imply 401 score functions.[62]

[62] Estimates of the auxiliary parameters are not reported but are available upon request.

4.2 Simulating the Data for Estimation

I perform path simulations as follows.[63] Consider first a homogeneous population as to unobserved traits. For each trial value of the structural parameters and having solved the optimization problem, I recursively simulate the behavior of ten replicas of each sample couple starting at marriage. That is, given initial conditions, one-step ahead outcomes are obtained and are used to update the couple's state space at marriage according to the model laws of motion. The simulated state point is then used again to obtain one-step ahead predictions of behavior. This recursive process of prediction and updating is stopped when the sample couple of which the simulated couple is a replica stops contributing information[64] or when the simulated couple has a third birth, whichever occurs first.

To account for the unobserved heterogeneity, the simulation procedure is modified as follows. At given parameter values, I evaluate the probability of a sample couple (given initial conditions) of being of each of the possible types. These sample couple-specific probabilities are then used to draw the type of each of the ten replicas of a sample couple. Implementing this procedure at the true parameter values implies that the type distribution in the simulated data coincides with the type distribution in the sample data.

Because I perform unconditional simulations, and due to the fact that some of the auxiliary models are estimated on subpopulations defined on the basis of endogenous variables, a final modification of the objective function (13) is applied. What happens is that the number of simulated observations contributing to the computation of the scores of some of the auxiliary models may change as the values of the structural parameters change. Each element of a score function is therefore divided by the number of simulated observations contributing to its computation.[65]

4.3 Model Fit

Table P1 reports preliminary parameter estimates, while Table F1 and Figures F1 through F5 provide evidence on the within-sample fit of the model. The model predictions are based on a simulated sample of 13,010 couples (i.e. 10 replicas for each sample couple).

[63] The simulated data so obtained are therefore longitudinally consistent. This property allows me to use auxiliary models describing life-cycle events (the last set described above).

[64] A list of the reasons why a sample couple may stop contributing information is contained in Appendix A. The right-trimming of the simulated histories reproduces right-censoring in the data (due to sample attrition and incomplete spells), as well as the right-trimming that I have imposed when constructing a data set consistent with the behavioral model and the computational simplifications adopted (e.g. right-trimming due to remarriage, birth of children after a divorce).

[65] To avoid the problem of having no simulated observations for any of the auxiliary models estimated on endogenously defined subpopulations, I have included a group of models (which above is referred to as the third class) penalizing this occurrence.

Table F1 compares actual and predicted values for a number of summary measures of marital and fertility outcomes, time devoted to children by parents, child support transfers between divorced parents, and conflict between married partners.[66] The first few rows of the table show that the model captures the major facts concerning divorce. Both the overall divorce rate, age of female at divorce, and the distribution of the number of children involved in a divorce are matched closely. In the simulations, as in the data, the percentage of couples divorcing is about 30% and the average age of the female at divorce is approximately 30 years old. Also, both in the data and in the simulations, the pool of divorcees is skewed towards couples with no children or, if children are present, couples with one child as opposed to two children. The model, however, overstates the hazard of divorce at marriage durations below 6 years. This is due to overprediction of the number of marriages that end after just two years (corresponding to one decision period in the model).

Model fit is reasonably good for conflict outcomes as well. In the data, couples engage in conflict in about 3 out of 10 periods of married life and slightly more than half of all couples (55.6%) have experienced conflict at some point in their marriage. The model closely captures the first fact, while it overstates the second by a few percentage points (64% versus 55.6%). More interestingly, the model captures the fact that having experienced conflict in the past makes a couple more likely to experience conflict in the present (about 52% versus 17% in the data and 44% versus 10% in the simulations) as well as more likely to divorce (roughly 8% versus 4% in the data and 13% versus 12% in the simulations).

It is important that the model captures the major features of child support transfers. As shown in table F.1, the model fits both the percentage of divorced fathers that in any given period do not make any transfer (about 39%), as well as the average transfer when a payment is made (about $2900 in the data and $2800 in the simulations).

The next group of summary statistics concern fertility and the timing of births. While the model produces dispersion in the distribution of the number of children born within a first marriage, it overstates the percentage of couples that have a third child. This overprediction explains why the average number of children born to a couple is 1.61 in the simulations while it is 1.47 in the data. Another reflection of this overprediction is the fact that in the simulations women give birth at slightly lower ages than in the data. These discrepancies may suggest the need for more flexibility in the specification of the continuation value

[66] This table does not use NLSY79 weights, and hence the figures are not representative for the population of couples with the selected characteristics of my estimation sample. This explains the slight discrepancies between the descriptive statistics in Tables DS.1 and DS.2 and those in Table F.1.

function at the birth of a third child.

The major focus of this paper in on children's test scores and parental inputs. The second part of Table F1 shows that the model captures the average gap in test scores between children of married and divorced parents which, in raw scores, is about 1 score point. Figure F.1 portrays the age profile of test scores. It shows that the model predicts the increase observed in test scores as a child ages. The model does also reasonably well in terms of time that on average parents spend with a child both by marital status and gender of the parent. In particular, the gap between time by married and divorced fathers is well predicted. Figures F.3 and F.4, however, reveal that the model has problems in capturing the age profile of hours spent by a father with his child. The corresponding age profile for time spent by a mother with a child is portrayed in Figure F.2. The fit is good and this is all the more remarkable given that no data is available for ages below 6/8.

Returning to Table F.1, actual and predicted mean accepted wages are compared by gender. Wages are observed only for those who work and are not observed for divorced males. Predicted mean wages are within approximately one dollar of actual mean wages. The prediction is better for males than for females. This is probably because the labor supply is fixed at full-time for males, hence selection issues are not present, nor is the wage endogenous through accumulated labor market experience. As also shown, both married and divorced females' earnings are overstated by, on average, \$2500. The reason is that the model, as seen in Figure F.5, underpredicts female labor supply. In particular it overpredicts the fraction of females who do not work.

In fact, Figure F.5 shows that the model does capture the increasing trend present in the child age profile of hours worked by mothers. However, the model overstates the rate at which the labor supply of mothers increases as pre-school children age. The main cause of this departure is that in the simulations couples have more tightly spaced births (in the model as in data, mothers who have two young children work less than mothers with only one child). It should be emphasized that the model estimates the structural female wage offer distribution and wages are observed only for those females who work. Additonally it should be noted that mothers who want to spend time with their children could, instead of reducing labor supply (as observed in the data), reduce private leisure. The model is therefore able to capture the major trade-offs in terms of allocation of females' time.

5 Counterfactual and Policy Experiments

The behavioral model provides a mechanism through which children's quality and family structure are jointly determined within an environment characterized by uncertainty about the future. Also, considerations about future returns and constraints are taken into account when current decisions are made. One of the main goals of this paper is to ascertain whether a child whose parents divorced would have been better off had the child's parents stayed together. A second goal of this paper is to assess how existing or implementable counterfactual policies that change parents' incentives to stay married affect the cognitive achievement of children. These goals are achieved, first, by simulating behavior under appropriately defined counterfactual scenarios, and, second, by comparing counterfactual behavior to baseline behavior.

5.1 Are Children of Divorced Parents Worse Off?

There are two main difficulties in ascertaining whether a child whose parents divorced would have been better off had the child's parents remained together. First, it is a counterfactual question that requires considering a scenario that is not realized. Even if it were possible to exogenously assign parents' marital status, such an experiment would only be informative about mean child outcomes. It would provide no information about the distribution of outcomes or the individual effect of family structure. Second, it may matter at what point, in the life of a couple or a child divorce occurs. The structural approach adopted in this paper allows me to overcome both difficulties, while, at the same time, controlling for selection on unobservables.

To determine whether a child whose parents divorced would have been better off had parents stayed together I implement a counterfactual scenario in which parents who would otherwise divorce are forced to remain together. Specifically, I eliminate the divorce option from parents' outcome set at the point in their marriage when they first want to divorce. While this change in the outcome set comes to parents as a surprise, they are aware that divorce will not be an option in the future.[67] By means of this exogenous assignment of marital status to parents, I can then compare a child's cognitive achievement by family structure for each child who experienced divorce within the baseline scenario (i.e. when the divorce option was available). In fact, absent missing data problems with respect to state space elements at the time of divorce, this approach would allow to assess the effect of family structure for each sample child whose parents have been observed

[67] Implementation is as follows. First, I solve the model, at the estimated parameter values, when divorce is not available to partners (they are aware of this from the date of marriage). This provides me with a collection of estimates of the interpolation coefficients for the Emax functions, for male and female and at each female age. Second, I use these approximate Emax functions to simulate behavior of those couples who are observed to divorce under the baseline scenario stating at the point in their marriage when they were observed to divorce and given state space elements at that point.

to divorce.[68]

Before discussing the results of the counterfactual experiment, two implications of how the counterfactual is implemented should be highlighted. First, children whose parents chose not to divorce under the baseline scenario are unaffected. Second, because parents are surprised when they first want to divorce, the counterfactual implies that all pre-divorce endogenous outcomes are unchanged, in particular child inputs and child test scores.[69]

Tables C.1 through C.2 and Figures C.1 through C.3 provide evidence of the effect of family structure. Because NLSY79 sampling weights are used, the figures are representative for the population of couples with the selected characteristics of my sample. Figure C.1 displays the distribution of the within-child difference in test scores between the counterfactual and the baseline scenario (pooling over all child ages). Two aspects are worth observing. First, most of the mass of the distribution (97%) is on the positive part of the support. Thus, no matter when in the life of a child divorce occurred, and irrespective of the age of the child at the point when the test score difference is computed, a child is better off had his or her parents not divorced. Second, the mean difference is 3.17 test score points (the median is 3.44 and the standard deviation is 2.38), which is about three times as large as the difference in sample means between test scores of children of divorced and married parents.

Table C.1 describes observable permanent characteristics of those children who gain the most as well as the least from the exogenous assignment of family structure. Specifically, it shows that children of parents who are white, more educated, and who married later in life are those with the biggest gain. This is because children with more educated parents have a higher endowment at birth and enjoy higher productivity of parental inputs. The observed differences in parents' characteristics explain why the family structure effect is estimated to be larger than the difference in mean test scores by marital status of parents. The loss of scale economies involved in divorce is less detrimental to parents who face better labor market opportunities

[68] Because I use the same draws for the idiosyncratic shocks in the baseline and in the counterfactual simulations, the effect of family structure recovered controls for both permanent and idiosyncratic differences among couples and their children. Another advantage of using baseline simulated outcomes as opposed to actual outcomes is that I can analyze the effect of family structure beyond the sample period. This is valuable since most of the children in the estimation sample are relatively young when last observed.

[69] An alternative measure of the family structure effect can be obtained by eliminating the option of divorce from the beginning of the marriage. Other measures of the family structure effect can be obtained by, for instance, considering a counterfactual scenario in which parents may divorce only if their children are older than a certain age or only after a waiting period of predefined lenght. Because under these counterfactual scenarios all endogenous outcomes may change (including fertility), it is not possible to compare test scores for the same child across scenarios. Additionally, it should be noted that, because the model lacks the initial marriage choice, these experiments would not account for induced responses along this dimension.

because each partner can independently guarantee him or herself a high standard of living (i.e. the drop in consumption occurs at levels associated with a low marginal utility). Thus, the pool of divorcees tends to be composed of parents with relatively high quality children. These children would have fared much better had their parents stayed together.[70]

Figure C.2 and C.3 together with Table C.2 explain why children gain when their parents remain married. Averages of within-child change in parental time by the mother and father are described in Figure C.2. Under the counterfactual scenario, a child receives more parental time. The biggest increase is in time spent by the father with the child: the average increase across ages is about 1.8 hours. It should be noted that young children experience relatively large gains in parental time. For instance, two year old children receive almost 3 hours more of maternal time and about 1.7 hours more of paternal time. The transition rates reported in Table C.2 reveal that, while on average the change in parental time is positive, not all children experience an increase in parental time when moving from the baseline to the counterfactual scenario.

Figure C.3 compares average goods devoted to a child (by age) in the baseline and the counterfactual scenarios. The pooling of the mother's and the father's earnings and the absence of free-riding problems within a marriage is responsible for the sharp difference that emerges. When parents cannot divorce, a child receives on average $5200 more in financial resources per year. The difference is the largest at young ages, when on average a child receives more than twice as many financial resources under the counterfactual scenario as under the baseline scenario.

Conflict between married parents is also an input in the technology for child test scores. The maintained assumption of the behavioral model is that divorce allows parents to insulate their children from conflict. Because conflict is estimated to have an adverse effect on test scores, forcing otherwise divorced parents to stay together may worsen a child's test scores. This is because children are now subject to the mode in which their parents choose to interact. In fact, what I find is that when the option of divorce is no longer available, parents have little or no conflict. Under the counterfactual scenario, the percentage of couples per period with conflict is 2%: the corresponding figure for periods of married life preceding divorce (from baseline behavior) is 34%.

There are two explanations for this staggering reduction in conflict. First, it is estimated that the adverse

[70] The percentage change in test scores varies with the age of the child at the moment the test score is collected and with duration of exposure to divorce. For instance, the gain in test scores for children who were newborns when divorce occurred is 19.36% at age four and decreases to 3.55% at age 14. As another example, given a length of exposure to divorce of two years, the gain in test scores is 19.3% at age four and decreases to about 3.5% at age 14.

effect of conflict is higher the older the child is. Other things being equal, parents of older children gain more from being in an accommodating marriage. Thus, equilibrium effort levels are higher and, consequently, the probability of a conflict-free marriage is higher. The behavioral model provides a second explanation for the low conflict exhibited by couples under the counterfactual no divorce scenario. Of the couples that are observed to divorce in the baseline scenario, 45% do so because divorce is the efficient outcome when there is conflict within marriage. Conflict is so detrimental to these couples that when they draw a non accommodating mode of interaction they optimally choose to separate. Because divorce dominates a non-accommodating marriage, what drives the effort choice of these couples is the difference between the utility value of having an accommodating marriage and the value from divorce. When the divorce option is no longer available, what drives the effort choice is instead the difference between the value of being married and conflict-free and the value of being married and conflict-ridden. Given the ordering between the values of divorce and the value of being married and fighting, under the no divorce scenario partners exert more effort towards not having conflict. Hence the probability of drawing an accommodating mode of interaction is higher and the observed fraction of accommodating couples-periods is consequently higher. In fact, given that the gain from accommodation is higher the more adversely conflict affects children, the two explanations reinforce each other.

5.2 Policy Experiments

A goal of this paper is to assess how existing or implementable counterfactual policies that change parents' incentives to stay married affect the cognitive achievement of children. Thus, I consider two policies: West Virgina's marriage bonus paid to low-income couples as long as they remain married, and perfect enforcement of Arizona's child support guidelines. It should be noted that marriage bonuses are currently under consideration by several State and local governments in the U.S.[71] and the features of Arizona's child support guidelines are shared by child support guidelines adopted by many other U.S. States.

5.2.1 Perfect Enforcement of Arizona's Child Support Guidelines

In 1984, the U.S. Congress required every state seeking federal funding for public welfare programs to establish child support guidelines. Guidelines are numerical formulas that consider a limited number of factors (such as the income of the parents and the number of children). The purpose of these formulas is to

[71] For instance, Congress is considering one such plan by Kansas Senator Sam Brownback for Washington, D.C..

"approximate the proportion of parental income that would have been spent for child support had the family not been divided by divorce" (cfr. ABA [1] page 1, Chapter 11)[72]. Since the 1988 Child Support Act, State child support guidelines operate as rebuttable presumptions of the proper support amount. However, there are several reasons why courts may depart from the child support amount obtained through the numerical formula.[73]

Despite the fact that no nationwide child support guideline exists, most of the State guidelines are based on two models: the percentage-of-income model and the income-shares model. Fewer than 17 states establish child support awards based on a percentage of the noncustodial parent's income. Guidelines within this group do not explicitly consider the custodial parent's income. The implicit assumption is that the custodial parent is contributing an equivalent amount of support through direct expenditures and in-kind services. The income-shares model, which is used by 35 states, calculates an award using charts that list support amounts based on estimates of the cost of raising children in the US. The support amount is then prorated between parents based on each parent's proportion of the total income. Finally, 28 states allow for reductions for costs associated with parenting time in the amount of support owed by the noncustodial parent.[74]

The following principles are among those that the Advisory Panel on Child Support Guidelines recommended States to follow in enacting their guidelines: (i) "a guideline should not create extraneous negative effects on the major life decisions of either parent; in particular, the guideline should avoid creating economic disincentives for [...] labor force participation"; (ii) "a guideline should encourage the involvement of both parents in the child's upbringing; a guideline should take into consideration the financial support provided by parents in shared physical custody and extended visitation arrangements" (cfr. Williams [42]).

Because extensive effort and many resources have been devoted to improve the rate of enforcement of child support payments,[75] a scenario in which enforcement is perfect is of interest. The behavioral model estimated in this paper is well suited to study the effect of such a policy because both female labor supply and parental time with children are endogenous outcomes. Also, factors that affect opportunities of the

[72] This same sentence is also typically found at the beginning of State guidelines legislation.

[73] Examples of reasons for a departure are child care expenses and joint custody arrangements.

[74] This state-level information relies on Chart 3: Child Support Guidelines (posted on the ABA's web site) and is current as of November 2004. With reference to the percentage-of-income guidelines, there is variation across states as to whether this percentage changes with the noncustodial parent's income level and the ages of the children (it always increases with the number of children). A thid model, not discussed here, is the Delaware Madison formula currently adopted in 4 states. These and other details on guidelines, state by state, can be found at http://www.supportguidelines.com/links.html.

[75] For information on existing techniques for enforcing payments of child support and for statistics on compliance see the Federal Office of Child Support Enforcement's web site at http://www.acf.hhs.gov/programs/cse/.

partners outside of marriage (as is the case of perfect enforcement of child support) are allowed to influence the within-marriage balance of power, and hence the allocation chosen even when the marriage does not dissolve.

In performing this analysis I focus on Arizona's child support guidelines because: they follow the most prevalent model (i.e. income-shares), they have been recently updated to rely on the most recent studies on the cost of raising children[76], and they allow for adjustments for costs associated with parenting time.[77] The amount of child support owed by the noncustodial parent is found as follows. First, a basic child support obligation is determined on the basis of monthly family income and number of children. Figure Z.1 reproduces this information in the case of families with one and two children. The child support obligation is zero for family incomes below \$700, raises to \$2000 per month when family income is greater or equal to \$20,000, and is higher when there are two children. Figure Z.2 relies on the same information but displays child support obligation as a percentage of family income. For instance, when there are two children, the guideline assumes that 35% of family income is spent on children when family income is \$700 and that this percentage monotonically decreases with income until is reaches about 10% for incomes at or above \$20,000. Addittionaly, the percentage is higher when there are two children instead of one (but less than twice as large). The second step in the determination of the amount of child support owed entails prorating the basic child support obligation between parents and then reducing the amount by a time reduction percentage. This percentage is zero when the noncustodial parent spends less than 3 days with his or her children and increases to 0.486 when the number of days is between 173 and 182. In summary,

$$\text{CS due} = (1 - \text{time reduction percentage}) \times \text{CS obligation} \times \frac{\text{father's income}}{\text{family income}}.$$

Table Z.1 and Figure Z.3 report the results of implementing perfect enforcement of the Arizona's child support guidelines. Because under this counterfactual scenario the father no longer chooses the child support transfers, the allocation chosen by divorced parents is the outcome of a modified version of the sequential game that the father and mother were assumed to play under the baseline scenario. The extensive form of

[76] Originally, the income-share model was based on Thomas Espenshade's study "Investing in Children" (Urban Institute Press: Washington, D.C., 1984) using data from the 1972-73 Consumer Expenditure Survey. Among more recent studies on which existing state guidelines are based (e.g. Arizona's) is David Beston's "Alternative Estimates of the Cost of Raising Children from the 1980-86 Consumer Expenditure Survey" (Report to the US Department of Health and Human Services, University of Wisconsin Insitute for Research on Povety, 1990). The study was updated in 2001 ("Parental Expenditures on Children", in A Review of California's Statewide Uniform Child Support Guideline, May 2001). Arizona's current guidelines rely on this last study.

[77] The guidelines I consider have been effective starting January of 2005. Detailed information is available at http://www.supreme.state.az.us/dr/childsup/drguide.htm

the game is as follows. First, the mother chooses how much to work and how much time to spend with her children. Next, the father (having observed the mother's choice) decides how much time to spend with his children.

As seen in Table Z.1, the percentage of divorced couple and the average age of the female at divorce does not change while under the perfect enforcement scenario a larger fraction of divorcees separate before any child is born. Because male labor supply is fixed at full time and child support owed increases with the number of children, divorce is a more attractive option to the male the fewer children are involved. Additionally, Table Z.1 shows that married couples argue less. The percerntage of couples per period with conflict decreases from 30% to 24%. The male partner now gains more from an accommodating marriage because he tends to be worse off in divorce and because even a small negative shock (to the value of being married) may make it impossible for the female partner to be as well off within a non-accommodating marriage as she is when divorced. Under perfect enforcement the child support payment is twice as large as under the baseline scenario ($5992 versus $2792). However, goods invested in a child when the child's parents are divorced are almost half the amount when transfers are voluntary ($2746 versus $4615).

Figure Z.3 explaints this fact. Specifically, it shows that both married and divorced mothers work less under perfect enforcement (at all child ages). In fact, while divorced mothers work more than married mothers in the baseline scenario, this relationship is reversed under perfect enforcement. Enforcement of the guideline prescribed child support payment has a strong disincentive effects on female labor supply. This is because divorced mothers can guarantee a higher level of consumption to themselves without the need to work. Moreover, the higher consumption level attained by divorced females may entice them to choose more private leisure as opposed to more time with their children. As seen in Table Z.1 time with children by divorced mother is not higher under the perfect enforcement scenario than under the baseline. The lower labor supply by married females is explained by their higher power within marriage. Because divorce tends to be a more attractive option to females under perfect enforcement, the reservation utility value that they must be guaranteed within marriage is higher. Hence the within-marriage allocation entails more female private leisure as well as more time with children because mothers derive relatively more utility from it than from consumption (which is high due to economies of scale within marriage and thanks to the husband's earnings). Neither divorced fathers nor married fathers spend more time with their children under perfect enforcement. Children's test scores are virtually unchanged as a consequence of these combined changes in

parental inputs.

Overall, the results indicate that, once behavioral responses are accounted for, perfect enforcement of the Arizona's guidelines do create economic disincentives for labor force participation, do not lead to more involvement of the male parent, and do not lead to improvement in children's test scores. The major implication is a shift in the balance of power in favor of the female partner. Treating male labor supply as a choice may change these results, in particular it may reduce the strong disincentives for labor force participation by divorced females. Future research will abandon this restriction. It should be noted that these results are based on a model that abstracts from household formation. Hence, they do not account for changes in the pool of married couples that may be induced by changes in child support regulations. They do, however, account for behavioral responses in terms of marital, fertility, and time use decisions as well as decisions concerning how partners interact within marriage.

5.2.2 West Virgina's Marriage Bonus

Since 1996, West Virginia has offered a monthly cash incentive to married couples who receive welfare checks. The bonus is $100 a month.[78] To receive the bonus, a couple must be married, live in the same household, and both partners must be named on the monthly assistance check[79]. If partners divorce or separate, they no longer receive the bonus.[80] To my knowledge, research has not been conducted on whether couples would marry regardless of the incentive, or if the bonus is a disincentive to divorce. However, legislation introducing similar cash incentives (in conjunction with marriage counseling) has repeatedly been discussed at State and local levels.

Using the estimated model, I can assess how effectively the cash marriage bonus reduces the divorce rate. I implement this counterfactual policy by adding $100 to the financial resources available to married couples whose combined income is below the Federal poverty line. The findings indicate that a marriage bonus of $100 per month leaves the divorce rate unchanged. For the marital bonus policy to have any sizeable effect (on the divorce rate of low-income couples), the amount paid must be unrealistically high. A bonus of $1,200 per month is required to obtain a 5% reduction in the divorce rate.

[78] The average welfare case receives less than $300 per month.

[79] The only numbers available start in January 2001, when 1,615 couples were receiving the marriage incentive. That number reached 1,678 couples in April, and fell back to 1,633 in June. In the same year, the number of welfare cases was 14,000, most of them headed up by single mothers (who make up 70 percent to 80 percent of all welfare recipients in the state).

[80] The state checks its caseloads each month to see who is still married and who isn't.

6 Conclusions

In this paper, I have developed and estimated a dynamic non-unitary model of a couples' behavior from marriage onwards. Endogenous outcomes of the model are marital status and conflict of a couple, inputs invested in a child, the female's partner labor supply, fertility, as well as child support transfers between partners in the event of a divorce involving children. In the model, parents value the quality and quantity of their children, consumption, and leisure, and they may derive a direct disutility from having a conflict-ridden marriage. A child's test scores, a measure of child quality, is modeled as the output of a cumulative production process that takes as inputs parental time, financial resources and quality of the marital relationship of the child's parents. Marital status is not treated as a productive input. Instead, in the model divorce allows shielding of children from conflict but precludes joint parenting, it also causes loss of scale economies and implies loss of control by father on money transferred to ex-wife. Marital conflict is regarded as an input in the production of child quality. Through its adverse effect on children and as a potential impediment to the exploitation of "gains from trade", conflict may trigger a divorce. Additional features of the model include uncertainty about preferences, child quality technology and labor market returns. In particular, wages evolve with labor market experience, and unobserved heterogeneity is allowed for in preferences, child endowment or parenting skills, as well as in the within-marriage division of power between male and female partners and in the fraction of financial resources devoted to children.

The parameters of the model were estimated using the Efficient Method of Moments. Based on preliminary estimates, the model was shown to reasonably fit many different aspects of the data.

The model was used to understand whether children of divorced parents would have been better off had their parents stayed together. The estimated model implies that test scores of children of divorced parents would have been higher had parents not divorced. This improvement in test scores is due to higher parental time and goods inputs, and to the fact that parents choose to have very little conflict when forced to remain together. However, the size of the family structure effect seems relatively small. As the children in the sample age, it will be possible to use data on their educational attainment and labor market earnings to establish long term effects of the estimated change in test scores at ages below 15.

The model was also used to understand the impact of a pro-marriage policy such as a bonus paid to couples as long as they stay married, and of perfect enforcement of child support guidelines. For the marital bonus policy to have any sizeable effect on the divorce rate of low-income couples, the amount paid must

be unrealistically high ($1,200 per month to obtain a 5% reduction in the divorce rate). Next, I have considered perfect enforcement of child support guidelines that allows for a reduction in the amount owed by the noncustodial parent and that prorate the child support obligation between parents on the basis of each parent's share in the combined family income. Contrary to the goal of the guidelines, I find that these regulations create economic disincentives for the female labor force participation, do not lead to more involvement of the male parent, and leave children's test scores essentially unaffected.

In future research, I will not assume that males work full time. This will allow a more comprehensive study of the welfare implications of policies that differentially change the opportunities of males and females within-marriage and after divorce.

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A Exact Functional Forms

A.1 Utility Function

The per-period utility function $u_{jt}(\cdot;\Omega_t)$ is

$$
\begin{aligned}
u_{jt} \;=\; & \frac{c_{j,t}^{\lambda_{oo}}}{\lambda_{oo}} + \sum_{y=1}^{Y} \lambda_{1,y} I\left[type=y\right] N_t^{kid} + \sum_{y=1}^{Y} \lambda_{2,y} I\left[type=y\right] \left(N_t^{kid}\right)^2 + \\
& \sum_{y=1}^{Y} \left(\lambda_{3,y} I\left[type=y\right] + \sum_{j=m,f} \lambda_{4,j} I\left[gender=j\right] \right) Q_{t+1} + \lambda_5 \sqrt{Q_{t+1}} + \\
& \left(\lambda_6 I\left[20<t\leq 26\right] + \lambda_7 I\left[26<t\leq 32\right] + \lambda_8 I\left[32<t\leq t^{FEC}\right]\right) d_{Pt} + \\
& \lambda_9 d_{Pt} d_{Pt-1} + \sum_{y=1}^{Y} \widetilde{\lambda}_{10,t,y} I\left[type=y\right] d_{Pt} + \lambda_{11} I\left[durmar=1\right] d_{Pt} + \\
& \left(\tilde{\lambda}_{12,t} I\left[j=f\right] + \tilde{\lambda}_{13,t} I\left[j=m\right]\right) l_{j,t}^{p} + \lambda_{14,t} I\left[newborn\right] l_{f,t}^{q} + \lambda_{15,t}\left(p_{1,t}+p_{2,t}+p_{12,t}\right) + \\
& \lambda_{16} I\left[h_{f,t}=1 | h_{f,t-1}=0\right] + \lambda_{17} I\left[h_{f,t}=2 | h_{f,t-1}=0\right] + \lambda_{18} I\left[h_{f,t-1}=2 | h_{f,t-1}=1\right] + \\
& \sum_{y=1}^{Y} \widetilde{\lambda}_{19,t,y} I\left[type=y\right] d_{M,t} + \sum_{y=1}^{Y} \lambda_{20,y} I\left[type=y\right]\left(1-d_{M,t}\right) N_t^{kid} + \\
& \left(\lambda_{21} I\left[newborn\right] + \lambda_{22} I\left[2yold\right] + \lambda_{23} I\left[4yold\right] + \lambda_{24} I\left[6yold\right] + \lambda_{25} I\left[8yold\ or\ less\right]\right)\left(1-d_{M,t}\right) + \\
& \sum_{y=1}^{Y} \lambda_{26,y} I\left[type=y\right] a_t,
\end{aligned}
\tag{14}
$$

where Y, the number of types for permanent unobserved heterogeneity, equals two, and the composite end-of period child quality Q_{t+1} aggregates individual offspring qualities $\left(Q_{k,t+1}, k=1,2\right)$ by means of the following CES aggregator function

$$
Q_{t+1} = \left[\lambda_{27} Q_{1,t+1}^{\lambda_{28}} + \left(1-\lambda_{27}\right) Q_{2,t+1}^{\lambda_{28}}\right]^{\frac{1}{\lambda_{28}}}, \lambda_{28} \leq 1.
$$

In (14) I use the expression $I\left[\cdot\right]$ to denote the indicator function, *durmar* is the duration of the marriage, *gender* refers to the gender of the partners, and variables such as *newborn* refer to the presence in the family of a child of a child of a specific age (a newborn in this example). All the coefficients $\widetilde{\lambda}_t$ appearing in (14) are random coefficients:

$$
\begin{aligned}
\widetilde{\lambda}_{10,t,y} &= \lambda_{10,y} + \varepsilon_t^{PR}, \\
\tilde{\lambda}_{12,t} &= \lambda_{12} + \varepsilon_{f,t}^{L}. \\
\tilde{\lambda}_{13,t} &= \lambda_{13} + \varepsilon_{m,t}^{L}, \\
\tilde{\lambda}_{19,t,y} &= \lambda_{19,y} + \varepsilon_t^{M}.
\end{aligned}
$$

A.2 Child Quality Production Technology

I constrain the fraction of resources invested in children to depend on the number of children as follows: $\varkappa\left(\omega, N^{kid}\right) = \varkappa\left(\omega\right)\sqrt{N^{kid}}$. Per-child goods (*goods*) are the following function of the total amount of resources (G) subtracted from the budget constraint

$$
goods = \alpha_1\left(N^{kid}\right) G, \qquad \alpha_1\left(N^{kid}\right) \in \left[\frac{1}{N^{kid}}, 1\right], \qquad \alpha_1\left(N^{kid}\right) = I\left[N^{kid}=1\right] + I\left[N^{kid}=2\right]\alpha_1,
$$

where $\alpha_1(\cdot)$ captures economies of scale in financial resources invested in children. In consideration of the fact that test scores fall within the interval $[1, 84]$, the child quality production technology is

$$Q_{t+1} = 1 + \frac{1}{1 + e^{F(\cdot;\Omega_t)}} 83,$$

where Q_{t+1} denotes end of period quality of a child and where the function $F(\cdot;\Omega_t)$, governing the dependence on state space elements and contemporaneous inputs, is

$$\begin{aligned} F(\cdot;\Omega_t) \quad = \quad & \sum_{y=1}^{Y} \alpha_{2,y} I\left[type = y\right] + \alpha_3 age_t^k + \alpha_4 \left(age_t^k\right)^2 + \\ & \alpha_5 I\left[ed_f = HS\right] + \alpha_6 I\left[ed_f > HS\right] + \alpha_7 I\left[ed_m = HS\right] + \alpha_8 I\left[ed_m > HS\right] + \\ & \alpha_9 a_t + \alpha_{10} a_t \left(age_t^k\right)^2 + \alpha_{11} a_t \times \left(age_t^k\right)^3 + \alpha_{12} goods_t + \alpha_{13} goods_t \times age_t^k + \alpha_{14} Q_t^k + \\ & \alpha_{15}\left(m_{k,t} + m_{12,t} + p_{k,t} + p_{12,t}\right) + \alpha_{16}\left(m_{k,t} + m_{12,t} + p_{k,t} + p_{12,t}\right) age_t^k + \\ & \left(\alpha_{17} + \varepsilon_t^P\right)\left(p_{k,t} + p_{12,t}\right) + \alpha_{18}\left(p_{k,t} + p_{12,t}\right) age_t^k + \\ & \left(\alpha_{19} + \varepsilon_t^F\right) I\left[f_{k,t} + f_{12,t} + p_{k,t} + p_{12,t} = 1\right] + \left(\alpha_{20} + \varepsilon_t^F\right) I\left[f_{k,t} + f_{12,t} + p_{k,t} + p_{12,t} = 2\right] + \\ & \alpha_{21} I\left[f_{k,t} + f_{12,t} + p_{k,t} + p_{12,t} = 1\right] age_t^k + \alpha_{22} I\left[f_{k,t} + f_{12,t} + p_{k,t} + p_{12,t} = 2\right] age_t^k + \varepsilon_{k,t}^Q. \end{aligned}$$

A.3 Offered-Wage Equations

The male human capital function is

$$\begin{aligned} \ln \Psi_{m,t}^o \quad = \quad & \sum_{y=1}^{Y} \gamma_{o,y} + \gamma_1 black + \gamma_2 hispanic + \gamma_3 \exp_{m,t} + \gamma_4 \exp_{m,t}^2 + \\ & \gamma_5 I\left[ed_m = HS\right] + \gamma_6 I\left[ed_m = SC\right] + \gamma_7 I\left[ed_m = CA\right] \ , \end{aligned}$$

where HS, SC, and CA indicate the following three education levels: high school, some college, and college and above. Because the rental rate of human capital and the constant term in the human capital function are not separately identified $\gamma_{o,y}$ subsumes both. The female human capital function is of the same form, with parameters ς in place of γ. The hourly wage functions are

$$\ln w_{j,t} = \ln \Psi_{j,t}^o + \varepsilon_{j,t}^W \quad \text{for } j = m, f.$$

A.4 Female Reservation Value Function

Let $V_{\max}^{M,f}$ (respectively, $V_{\min}^{M,f}$) denote the maximum (respectively, minimum) utility value that the female partner can attain within marriage.[81] The female within-marriage reservation value function $\underline{v}^f$ belongs to the interval $[V_{\min}^{M,f}, V_{\max}^{M,f}]$ and the functional dependence is

$$\underline{v}^f(\Omega) = V_{\min}^{M,f}(\Omega) + \frac{1}{1 + e^{r(\Omega)}} \left(V_{\max}^{M,f}(\Omega) - V_{\min}^{M,f}(\Omega)\right) \quad \text{and} \quad r(\Omega) = \sum_{y=1}^{Y} r_{1,y}.$$

[81] I focus on the pair $(V_{\max}^{M,j}, V_{\min}^{M,i})$ that belongs to a couple's Pareto frontier. That is, I am not concerned with, for intance, female values that are below the value she attains at a point on the Pareto frontier that brings maximum utility to the male. A utility possibility set containing such pairs of utility values may arise in my model due to the existing constraints on private leisure. See Bergmstrong [6] and references therein for examples of similar cases.

A.5 Continuation Value Functions at the Birth of the third Child

The are two such functions, one for the wife and one for the husband. For parsimony, the future component of the value of having a third pregnancy to partner j is assumed to be given by the polynomial approximation to his or her Emax function evaluated at the end of period state point (ignoring the birth of the third child) shifted by a type-specific additive constant $\kappa(\omega)$.

A.6 Distribution of Structural Shocks

The structural shocks are $\varepsilon = \left(\varepsilon^L_{m,t}, \varepsilon^L_{f,t}, \varepsilon^{PR}_t, \varepsilon^M_t, \varepsilon^W_{m,t}, \varepsilon^W_{f,t}, \varepsilon^{Q_1}_t, \varepsilon^{Q_2}_t, \varepsilon^P_t, \varepsilon^F_t\right)$. It is assumed that ε is distributed as a multivariate normal with mean zero and variance-covariance matrix Σ_ε.

A.7 Type Probability Function

$$\begin{aligned}
\Pr(type = y) &= e^{s_y(\Omega)} / \left(1 + \sum_{y=1}^{2} e^{s_y(\Omega)}\right) \text{ for } y = 1, 2, \\
s_y(\Omega) &= s_{y,1} + s_{y,2} black + s_{y,3} hispanic + s_{y,4} I(ed_m = HS) + s_{y,5} I(ed_m = SC) + s_{y,6} I(ed_m = CA) + \\
s_{y,7} I(ed_f &= HS) + s_{y,8} I(ed_f = SC) + {}_{y,9}\, I(ed_f = CA) + s_{y,10} age_{m,t_1} + s_{y,11} t_1 + s_{y,12} \exp_{m,t_1} + s_{y,13} \exp_{f,t_1}.
\end{aligned}$$

B Details on the Behavioral Model

In this section I present details concerning the behavioral model left out from the main text. Specifically, I report the details of the sequential game played by divorced parents as well as derive the outcome of the mode of interaction game (given an assumption on the functional form of the probability of being accommodating).

B.1 The Outcome of Divorced Couples with Children

To present the problem solved by divorced couples with children it is convenient to introduce a reference programming problem:

$$\max_{d \in D(\Omega)} V^{S,j}(\Omega, d) \text{ s.t. } LOMs, \tag{15}$$

where

$$V^{S,j}(\Omega, d) \equiv u_j(d, \Omega) + \beta E\left[V^j(\Omega') | d, \Omega\right],$$

and d is the vector of outcome variables $\left(\tau, l^p_j, c_j, \left\{j_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\right\}; j = m, f\right)$. The outcome vector d takes values in the set $D(\Omega)$ which is the collection of allocations satisfying the relevant non-negativity constraints for time uses, consumption and transfers, child time constraint, and budget constraints. I let $j_{N^{kid}}$ denote the collection $\left\{j_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\right\}$ for $j = m, f$.[82] The subgame perfect Nash-equilibrium outcome of the sequential game played by divorced parents is found by backward induction as follows (suppressing the dependence on the state space elements for notational ease):

1. Given $(\tau, f_{N^{kid}})$ the male partner chooses $(m_{N^{kid}}, c_m, l^p_m)$ by solving problem (15); I denote the policy functions by $m^*_{N^{kid}}(\tau, f_{N^{kid}})$, $c^*_m(\tau, f_{N^{kid}})$, and $l^{p*}_m(\tau, f_{N^{kid}})$ where $m^*_{N^{kid}}(\tau, f_{N^{kid}})$ represents the collection of best response functions $\left\{m^*_{\mathsf{c}}(\tau, f_{N^{kid}}) | \mathsf{c} \in C_{N^{kid}}\right\}$.

[82] For instance if $N^{kid} = 2$: $C_{N^{kid}} = \{1, 2, 12\}$, $\mathsf{c}(1) = \{1, 12\}$, $\mathsf{c}(2) = \{2, 12\}$, and $m_{N^{kid}} = \{m_1, m_2, m_{12}\}$.

2. Given the best response function $m^*_{N^{kid}}(\tau, f_{N^{kid}})$ and τ, the female chooses $\left(f_{N^{kid}}, c_f, l^p_f\right)$ by solving problem (15) where $m_{N^{kid}}$ are replaced by the given best response functions $m^*_{N^{kid}}(\tau, f_{N^{kid}})$; I denote the policy functions by $f^*_{N^{kid}}(\tau)$, $c^*_f(\tau)$ and $l^{q*}_f(\tau)$.

3. Given the best response functions $m^*_{N^{kid}}(\tau) \equiv m^*_{N^{kid}}\left(\tau, f^*_{N^{kid}}(\tau)\right)$ and $f^*_{N^{kid}}(\tau)$ as well as $c^*_m(\tau) \equiv c_m\left(\tau, f^*_{N^{kid}}(\tau)\right)$ and $l^{p*}_m(\tau) \equiv l^p_m\left(\tau, f^*_{N^{kid}}(\tau)\right)$, the male chooses τ by solving problem (15) where $m_{N^{kid}}$, $f_{N^{kid}}, c_m$ and l^p_m are replaced by the respective best response functions; I denote the solution by τ^*.

The outcome of the sequential game is

$$d^* = \left(\tau^*, j^*_{N^{kid}}(\tau^*), c^*_j(\tau^*), l^{p*}_j(\tau^*);\ j = m, f\right).$$

B.2 The Mode Of Interaction Outcome

The individual cost of effort function is assumed to be quadratic in effort. The role of male and female effort as to the probability of an accommodating marriage ($P_{B_a}(\cdot)$ in the text) is assumed to be symmetric. This probability is additive in individual effort and also depends on the product of male and female effort. For the assumed functional forms, problem (12) rewrites as

$$\max_{e_j \in [0,1]} \left[b_o + b_1(a, A)\left(\frac{e_i e_j}{2} + \frac{e_i}{4} + \frac{e_j}{4}\right)\right]\left(V^j_{a=0} - V^j_{a=1}\right) - k e_j^2 \qquad i, j = m, f \ \text{ and } \ j \neq i,$$

where b_1 is given by one minus a logistic function of lagged conflict and stock of conflict and b_o is taken to be a small number.

I let d_j denote the difference in partner's j utility values from interacting in an accommodating mode rescaled by the marginal cost of effort (at individual effort level equal to one) and multiplied by $b_1/2$. Partner j's best response function is

$$e_j(e_i) = \begin{cases} 0 & \text{if } d_j = 0 \\ d_j e_i + \frac{d_j}{2} & \text{if } d_j > 0 \text{ and } e_i \in \left[0, \frac{1}{d_j} - \frac{1}{2}\right) \\ 1 & \text{if } d_j > 0 \text{ and } e_i > \frac{1}{d_j} - \frac{1}{2}, \end{cases}$$

The NE outcome of the game, denoted by $\left(e^*_m, e^*_f\right)$, is the solution to the system of male's and female's best response functions and is summarized in the table below where I use $\widetilde{e}_j$ to denote the expression $\frac{1}{2}\frac{d_j(1+d_i)}{1-d_j d_i}$.

$\left(e^*_m, e^*_f\right)$	Value of d_m			
	0	$\left(0, \frac{2}{3}\right]$	$\left(\frac{2}{3}, 2\right)$	$[2, \infty)$
Value of d_f				
0	$(0,0)$	$\left(\frac{d_m}{2}, 0\right)$	$\left(\frac{d_m}{2}, 0\right)$	$(1,0)$
$\left(0, \frac{2}{3}\right]$	$\left(0, \frac{d_f}{2}\right)$	$(\widetilde{e}_m, \widetilde{e}_f)$	$\begin{cases} \left(\min\{1, \widetilde{e}_m\}, \min\left\{\frac{3}{2}d_f, \widetilde{e}_f\right\}\right) \\ \qquad \text{if } d_m d_f < 1 \\ \left(1, \frac{3}{2}d_f\right) \quad \text{if } d_m d_f \geq 1 \end{cases}$	$\left(1, \frac{3}{2}d_f\right)$
$\left(\frac{2}{3}, 2\right)$	$\left(0, \frac{d_f}{2}\right)$	$\begin{cases} \left(\min\left\{\frac{3}{2}d_m, \widetilde{e}_m\right\}, \min\{1, \widetilde{e}_f\}\right) \\ \qquad \text{if } d_m d_f < 1 \\ \left(\frac{3}{2}d_m, 1\right) \text{ if } d_m d_f \geq 1 \end{cases}$	$(1,1)$	$(1,1)$
$[2, \infty)$	$(0,1)$	$\left(\frac{3}{2}d_m, 1\right)$	$(1,1)$	$(1,1)$

C Data

C.1 Sample Exclusions and Reasons for Left-trimming of Spells

NLSY79 male respondents are excluded from the estimation sample because no information is collected on their children. NLSY79 females respondents are excluded if: (1) they belong to either the military subsample or the supplemental economically disadvantaged white subsample[83], (2) they have never been married, (3) they provide inconsistent or incomplete information as to marital and fertility histories, or inconsistent information as to work history, (4) they do not provide enough information to establish the race, age at marriage, or education of their husband, (5) no information is available on their children due to the occurrence, before 1986, of any of the events that cause left trimming (see next paragraph), (6) they had a first marriage that lasted less than a year, (7) they have married at an age below 17, (8) they had out-of-wedlock births[84], (9) they have continued acquiring education after the marriage date, (10) they have experienced the death of some of their offspring, (11) they had offspring from different fathers within the spell of the first marriage, (12) they are mothers of twins, (13) they have experienced reunions with their first husband (unless the spell of separation is short and the husband has come back and has not been observed to leave again afterwards), (14) they had more than 5 kids within the first marriage, (15) they are adoptive or foster parents, (16) they have, at any point, been self-employed.

Survey information on female respondents, their partner and their children is used only up to the survey immediately preceding the earliest (if any) of the following events: (1) date of death of the husband, (2) starting date of cohabitation with a new partner following a separation/divorce or date of a second marriage, (3) date of birth of a child if the birth happens more than 6 months after the date of separation/divorce, (5) date of a reunion with the first husband if the separation has lasted at least 2 years, (6) date when a change in the usual residence of their children occurs (from residence with the mother to any other residence arrangement), (7) date of birth of a third child, (8) date of exit from the NLSY79 due to attrition. With the exception of the birth of a third child, these events are not contemplated in the model and in estimation are treated as exogenous.

C.2 Marital and Fertility Histories ($t_1, age_{m,t_1}, d_{M,t_p}, age^k_{t_p}$)

When a sample female reports for the first time to be married she is asked for the date when the marriage occurred. If this information is missing, but I know that a first marriage has taken place, I assume that the date of marriage falls in the middle between the two consecutive interview dates bracketing the change in marital status. Finally, because information on earnings and child support is collected on a calendar year basis, I take a marriage to have began the nearest month of January.

To determine the date when a female's husband left her household, I rely on information on marital status at the interview, on the date when the husband or the father left the household (when available), on whether the father of the children lives in the household, and on the household roster. When this information is not sufficient to establish an exact date, I use (when available) dates of legal separation and/or divorce, as long as consistent with information on the husband presence in the wife's household. In cases in which none of this information allows me to establish an exact date, but I know that partners have split in between two consecutive surveys, I assume that the date of the split falls in the middle between the two consecutive interview dates bracketing the change in marital status. Information on to the age of a female's husband at marriage comes from direct reports or from the household roster.

[83] Following the 1984 interview, most of the members of the military subsample were no longer eligible for interview. The entire economically disadvantaged non-black/non-Hispanic subsample was dropped following the 1990 survey.

[84] Females who had a partnership without offsprings before thier first marriage are included in the sample starting from the date of their first marriage.

A couple's fertility history is constructed based on information on the date of birth of each child who was born within the couples' first marriage. Because model periods last two calendar years, some adjustments are required for situations in which a couple's children are spaced less than one year apart from each other. I force the fertility history to fit into the model time frame by moving forward and/or backward the date of birth of children and drop a couple if these changes cause the date of birth to be moved by more than two calendar years.[85]

C.3 Work History and Labor Earnings

C.3.1 Female Data ($\exp_{f,t_1}, h_{f,t_p}, w_{f,t_p}$)

For each female respondent I obtain the total number of hours worked over a calendar year by aggregating the information contained in the weekly history for hours worked available in the NLSY79. I then use information on a female's total income from wages, salary, commissions, and tips (gross of deductions or taxes) to compute hourly wage rates. Because since 1994 interviews have been administered only every other year, I do not have observations on labor earnings (hence on wage rates) for calendar years 1994, 1996, and 1998 (while still observing hours worked in all calendar years). In consideration of the fact that the length of a decision period in my model is 2 calendar years, and to avoid having missing observations on female wage rates for the entire period 1994-2000, I perform an imputation procedure. For instance, if for a sample female, calendar years 1994 and 1993 happen to belong to the same decision period, I assume that the wage rate for 1994 is the same as for 1993. Due to how imputations are performed, they do not induce serial correlation in wage rates. All dollar amounts are adjusted by the consumer price index using 2000 as the base year.

Female labor market experience at marriage is an element of a couple's initial conditions. Typically, I determine experience at marriage by adding hours worked up to the date of marriage. If a female is 18 years of age or younger I set her experience at marriage to zero. For females who get married relatively late in life the following problem arises: a single missing observation on hours worked would cause experience at marriage to be missing. To maintain sample sizes, I do the following: (1) if a missing appears in a calendar year when, based on school attendance information or years of education and age, the female was still in school, I recode the missing as zero hours worked; (2) for missing hours over years after leaving school I edited all the females who have up to two pieces of missing information and chose, case by case, whether or not to fill in the missing with information on neighboring years (14 females in total). I exclude from the sample those females whose experience at marriage is still missing after these imputation attempts. Accumulated experience at decision periods after marriage is constructed by adding hours worked over decision periods. The missing problem resurfaces but no imputation is performed.

C.3.2 Male Data ($\exp_{m,t_1}, h_{m,t_p}, w_{m,t_p}$)

The NLSY79 contains several questions concerning the labor supply and labor earnings of a female's husband (as answered by the female). For each survey year since 1979, the marriage section contains information on the number of weeks (over the previous calendar year) during which the female's husband worked, as well as hours he usually worked (during working weeks). Starting in 1989, information on husband's rate of pay at his principal job is also collected. The income section contains information, starting in 1979, on husband's total income from wages, salary, commissions, or tips before deductions or taxes. Separately, information on husband's income from own business or practice, and other sources is also collected.[86] I use the variables in the marriage section to derive a husband's hourly wage rate and labor supply in a calendar year. However, I use the income information to detect data-entry problems, as well as in place of earning information from the marriage section when the latter is missing but I have

[85] This does slightly bias the sample towards women with fewer children and/or less tightly spaced births.
[86] At later survey years, information even more detailed is collected on the opposite sex adult sources of income.

information on labor supply. Since surveys have been biannual since 1994, I have observations neither on earnings nor on hours worked for calendar years 1994, 1996, and 1998. To maintain sample sizes, I proceed as follows. First I perform imputations. For instance, if for a couple, calendar years 1994 and 1993 fall within to the same model period, I assume that the number of hours worked by the husband and his hourly wage rate in 1994 are equal to the number of hours he worked in 1993 and the corresponding wage rate.[87] When partners live apart, the female is not asked questions concerning the labor supply and earnings of her ex-husband.

The NLSY79 does not ask a female who has changed her marital status from single to married for retrospective information on the labor supply history of her husband. I construct male experience at marriage based on the assumption that he has worked since leaving school. To increment male experience over time I convert this yearly measure of experience at marriage into a number of hours worked. I do so by assuming that the number of hours worked per year while single is equal to the number of hours a male is observed to work in the calendar year immediately following the marriage. Accumulated experience at decision periods after marriage is obtained as described above for females. Because I do not observe the labor supply of ex-husbands, male accumulated experience is missing for all periods following a separation/divorce.

C.4 Time Spent with Children ($\{m_{\mathsf{c}}, f_{\mathsf{c}}, p_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\}$)

Here I explain how the hourly measure of total time spent by a parent with a child – constructed as described in the main text[88] and summarized in Table ND.1 and ND.2 – is mapped into the model-relevant time outcomes $\{m_{\mathsf{c}}, f_{\mathsf{c}}, p_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\}$ for married as well as divorced parents, and for families with one as well as two children. I denote by j^k the "observed" hourly measures of total time spent by the parent of gender j with the k^{th}child where, to illustrate, what I refer to as the 1^{st} child is the first born if there are two children while he or she is the second born if the first born is no longer a child. In the case of a two-children family, the collection of observed hours by each parent with each child is

$$\left(m^1, m^2, f^1, f^2\right). \tag{16}$$

By letting all magnitudes involving a non-existent second child to be zero this notation also covers the case of a couple with only one child (the couple may or may not have a second offspring who is adult).

When there are two children the model-relevant collection of amounts of parental time spent with children is

$$\left(m_1, m_2, m_{12}, f_1, f_2, f_{12}, p_1, p_2, p_{12}\right), \tag{17}$$

where j_k is the time the parent of gender j spends with the k^{th} child (neither the other child nor the other parent being present), j_{12} is the time the parent of gender j spends with both children together (the other parent being absent), p_k is the time the parents spend jointly with their k^{th} child (the other child being absent), and p_{12} is the time the parents spend jointly with both children.

The link between observables (16) and model-relevant outcome variables (17) is given by the following four equations

$$\begin{aligned} m^1 &= m_1 + m_{12} + p_1 + p_{12}, \\ m^2 &= m_2 + m_{12} + p_2 + p_{12}, \\ f^1 &= f_1 + f_{12} + p_1 + p_{12}, \\ f^2 &= f_2 + f_{12} + p_2 + p_{12}. \end{aligned} \tag{18}$$

[87] For both male and female data, after aggregation, I impose consistency as follows: I set to missing the information available if total hours worked in a decision period is positive but labor earnings are 0, and I set to missing wage rate observations if the wage is below \$1 and above \$200. All nominal variables are deflated by the CPI.

[88] Days are converted into hours by assuming that a full day spent with a child corresponds to 8 hours.

This shows that some identifying restrictions must be imposed to recover (17) from (16): out-front five restrictions are needed. Before describing the restrictions I impose, I explain why having total time by a parent with his or her children as an outcome (l_j^q in my notation) as opposed to the model-relevant time outcomes (17) does not eliminate the need for imposing restrictions and is, in fact, not feasible. The total amount of time a parent of gender j devotes to his or her children, l_j^q, is $l_j^q = j_1 + j_2 + j_{12} + p_1 + p_2 + p_{12}$ or, after a substitution,

$$l_j^q = j^1 + j^2 - (j_{12} + p_{12}) \qquad \text{for } j = m, f. \tag{19}$$

Also, the total time the k^{th} child is with a parent cannot exceed H i.e.

$$\begin{aligned} H &\geq m_k + m_{12} + f_k + f_{12} + p_k + p_{12} \\ &= m^k + f^k - (p_k + p_{12}) \,. \end{aligned} \tag{20}$$

The expressions in (19) and in (20) show that (16) do not carry sufficient information to pin down l_j^q nor to verify whether the constraints on the time available to children are satisfied. Hence (16) cannot replace (17) as the model choice variables.

All of the restrictions I impose are expressed in terms of the observables (16), where I also treat as observable the fact that divorced parents do not spent time jointly with their children.[89] In summary, for married couples the set of restrictions imposed when there are two children is a super-set of the restrictions imposed when there is only one child. The set of restrictions for separated and married couples are not nested. The details are given below.

Imposing restrictions on the data allows me to map (16) into (17) and I use this latter set in estimation treating it as actual data. The same restrictions are used when solving the model. They do no affect the number of alternatives available to parents but reduce the number of possible values that each alternative may take. In what follows, I first consider divorced couples, then discuss married couples.

C.4.1 Identifying Restrictions

Divorced Couples Divorce implies that parents do not jointly spent time with their children. Thus,

$$p_1 = p_2 = p_{12} = 0. \tag{21}$$

Given (21), (18) reduces to

$$\begin{aligned} m^1 &= m_1 + m_{12}, \\ m^2 &= m_2 + m_{12}, \\ f^1 &= f_1 + f_{12}, \\ f^2 &= f_2 + f_{12}. \end{aligned} \tag{22}$$

If there is only one child, $m^1 = m_1$ and $f^1 = f_1$ and no additional restrictions are needed. If there are two children, the following inequalities are always satisfied:

$$j_{12} \leq \min\left\{j^1, j^2\right\} \text{ for } j = m, f. \tag{23}$$

The restrictions I impose imply that a parent's time with both children is zero only if the total time one of the children is with him or her is zero. In other terms, if a parent spends some time with each child, it must be the case

[89] there are many possible restrictions all consistent with the data available, my choice is arbitrary

that he or she spends some time with both children simultaneously. The situation of a parent who only spends time with each child individually is ruled out.[90] Formally, I assume that (23) hold with equality, namely

$$m_{12} = \min\left\{m^1, m^2\right\} \text{ and } f_{12} = \min\left\{f^1, f^2\right\}, \tag{24}$$

which, in turn, imply that either $m_1 = 0$ or $m_2 = 0$, and either $f_1 = 0$ or $f_2 = 0$.

Married Couples The equation in (18) imply that the following inequalities are satisfied

$$p_1 + p_{12} \leq \min\left\{m^1, f^1\right\} \text{ and } p_2 + p_{12} \leq \min\left\{m^2, f^2\right\}. \tag{25}$$

.I assume that (25) hold as equalities, namely,

$$p_1 + p_{12} = \min\left\{m^1, f^1\right\} \text{ and } p_2 + p_{12} = \min\left\{m^2, f^2\right\}. \tag{26}$$

If there is only one child the first of the restrictions in (26) reduces to $p_1 = \min\left\{m^1, f^1\right\}$, while the second is void. No additional restriction is needed in this case. In words, this means that I assume that if both parents spend time with their child, they spend part of it jointly. Consider a two-children family. Under the restrictions in (26), (17) is of one of the following four cases:

Case	Description	m_1	p_1	f_1	m_2	p_2	f_2	m_{12}	p_{12}	f_{12}
1	$m^1 < f^1 \& m^2 < f^2$	0			0			0		
2	$m^1 > f^1 \& m^2 < f^2$			0	0			0		0
3	$m^1 < f^1 \& m^2 > f^2$	0					0	0		0
4	$m^1 > f^1 \& m^2 > f^2$			0			0			0

(27)

where I leave a cell blank to mean unconstrained. This shows that imposing (26) has reduced the number of unknowns from 9 to 6 in cases 1 and 2 and to 5 in cases 2 and 3. I impose the following additional restrictions:

Case	Restrictions	Implications of Restrictions
1	$p_{12} = \min\left\{m^1, m^2\right\}$ $f_{12} = \min\left\{f^1 - m^1, f^2 - m^2\right\}$	$p_1 = 0$ or $p_2 = 0$ $f_1 = 0$ or $f_2 = 0$
2	$p_{12} = \min\left\{m^2, f^1\right\}$	$p_1 = 0$ or $p_2 = 0$
3	$p_{12} = \min\left\{m^1, f^2\right\}$	$p_1 = 0$ or $p_2 = 0$
4	$p_{12} = \min\left\{f^1, f^2\right\}$ $m_{12} = \min\left\{m^1 - f^1, m^2 - f^2\right\}$	$p_1 = 0$ or $p_2 = 0$ $m_1 = 0$ or $m_2 = 0$

(28)

In cases 2 and 3 it is true that either $f_1 = 0$ or $f_2 = 0$ and either $m_1 = 0$ or $m_2 = 0$ even without the restrictions in (28). Thus, the restrictions in Table (28) select out of the outcome vectors in Table (27) those that further satisfy $f_1 = 0$ or $f_2 = 0$, and $m_1 = 0$ or $m_2 = 0$, as well as $p_1 = 0$ or $p_2 = 0$.

C.5 Conflict Between Married Partners (a, a_{-1}, A)

C.5.1 Information Available

Starting in 1988, and then biannually since 1992, NLSY79 partnered females have been asked about how frequently they have arguments with their partner about children[91], chores and responsibilities, money, showing affection to

[90] Of course, adjustment based on how age-wise close the children are can be made. For instance, I could replace (24) with the restriction that $m_{12} = 0$ whenever the age difference is sufficiently big and retain it for children close enough in age.

[91] In 1988 these questions were asked to a partnered female only if there was a living and not adopted out child listed in the children's record. In 1992, this restriction was imposed only for the question concerning arguing about

each-other, religion, leisure time, drinking, other women, and her or his relatives. Possible answers to these questions are often, sometimes, hardly ever, and never. The response rate is above 98% for all questions. Other questions concerning the degree of satisfaction in the current relationship are also asked. In particular: would you say that your relationship is very, fairly, not too happy? Possible answers are: about every day, once or twice a week, once or twice a month, less than once a month. Biannually since 1994, children age 10-14 as well as young adults (15 and older), have answered questions concerning the relationship between their biological parents as well as between the mother and a step-father (if present). In particular, concerning biological parents, a question asked is: how often biological parents argue?.[92] Possible answers are: very often, fairly often, once in a while, and never. Young adult respondents may also choose to answer that biological parents do not have any contact. Hence, at any survey after 1988, there may be as many reports on the frequency of conflict between partners as the number of kids of age 10 through 14 plus their mother.

C.5.2 Construction of Model-equivalents

There are a number of difficulties in using this data. First, in all cases the frequency but not the intensity of arguments is inquired upon. Second, conflict may exist between partners lacking verbal or physical manifestation of whatever frequency or intensity. Third, on the one hand, the child's perception of conflict may be what affects his or her development. On the other hand, the existence of conflict between parents may hinder child development even if not perceived (hence reported) by the child. Last, as with all sensitive questions that have a negative connotation under-reporting may be present. Clearly, any approach used to map the information available into a family-specific binary indicator of conflict contains a component of arbitrariness. I choose to focus on the female's report of frequency of conflict on different issues in order to have longitudinally comparable information and classify a couple as having conflict over a given period is the answer is often to at least one of the 10 questions the female's respondent is asked.

C.6 Custody and Child Support Transfers (τ)

The NLSY does not collect information on which of the parent is the legal custodial of a child. However, starting in 1982, it collects information on the usual residence of a child over the previous calendar year[93]. I use this information to determine which parent has physical custody of the child after separation. I assume that legal custody coincides with physical custody.[94]

The NLSY79 surveys collects information on child support and alimony payments. The universe of respondents who are asked child support- related questions varies, the wording of the questions changes, and the degree of detail of the information collected also varies making the task of using this data longitudinally a demanding one. Because

children. In all other survey years the answer to the "arguing about children" question may or may not refer to existing children. The 1988 restriction is unfortunate since it implies that it is not until 1992 that couples without children are asked any of the conflict-related questions. Overall, of the 420 separations in my estimation sample, about 40% (165) involved no children and of these about 68% occurred prior to 1992 which means that for more then two thirds of the married partners that were not parents when they separated no information on marital conflict is available. Of the remaining separations involving children, about 22% occurred prior to 1988 which means that for almost a quarter of the couples that were parents when they separated no information on marital conflict is available. These considerations explain the high percentage of missing information.

[92] This and other two questions on parental agreement were derived from scales developed in the Standford Divorce Study (Buchanan, Macoby, and Dornbush, 1991).

[93] From 1979 to 1981 I know whether the residence of the child is in the mother's household or not.

[94] In all but the first round of the NLSY79 child data collection, all children born to NLSY79 women are generally eligible to be interviewed, subject to the following residential limitation. Children of age 0-14 must reside at least part or full time with the NLSY79 mother respondent. Restrictiosn were imposed in 1998 for children older than 14 and in 2000 the criteria were restricted to exclude from eligibility a random sample of the offspring from the black and Hispanic over samples.

information on entitlement is not collected for years prior to 1993, I choose not to use it. The lack of this kind of information is one reason why I model and treat all transfers as voluntary. A second reason is the added complexity of introducing this margin.[95] A third reason is that the rate of non compliance is high. In summary, I focus only on transfers in the form of child support (assuming that alimony payments are zero when not separately asked for) and let transfers be zero whenever the custodial mother reports not to have received any income from child support (whether or not she was awarded and/or entitled to a child support order - in case this information was to be available).

C.7 Time-Aggregation of Sample Information

There are two issues to be dealt with when mapping survey answers into model variables. A decision period in the model corresponds to two calendar years. However survey information does not come in this exact time-frame. First, up and included the 1994 survey, NLSY79 interviews were administered on an annual basis with a switch to a biannual mode afterwards (the NLSY79 CHYA has relied on biannual interviews since its inception). Second, only a few of the questions which are of interest to me explicitly refer to a calendar year (e.g. labor supply information and income information are collected with explicit reference to the calendar year preceding the interview year). Other questions refer to the 12 months prior to the date of interview (e.g. how often divorced parents have seen a child). Most questions do not make any explicit reference to a time period (e.g. questions concerning frequency of arguments), with a possible implicit reference to the time elapsed since the last interview.

For these reasons, a decision must be made as to how to map into the two calendar years of a model decision period both annual information concerning periods of time that do not overlap with a calendar year and information collected on a biannual basis. I deal with calendar date information as follows. I let a marriage start on January of the year when the wedding took place or on January of the year after the year of the wedding, whichever is the closest to the actual date of marriage. Given the model date of marriage, I use the actual date of birth of husband and wife to establish their model age at marriage. A child is assumed to be born at the beginning or at the end of the decision period within which his or her actual date of birth falls, whichever is closest to the actual date of birth. Exceptions to this rule are made only if it implies that two siblings are born in the same decision period (not allowed by the model), or if it implies that a child is born before the start of the marriage. A husband is assumed to have left the household of his wife at the beginning or at the end of the period within which his actual date of departure falls, whichever is closest to this date. The same treatment is applied to dates of remarriage or of a new partnership, as well as death of a household member. No aggregation/allocation rules are needed for labor supply information since it is collected with reference to a calendar year.

For the remaining survey information I use two aggregation or allocation rules, one for choice variables (outcomes) and one for states variables. Information concerning a choice variable is assumed to refer to the decision period within which the date of the interview when it was collected falls (whether or not it falls within the first or the second part of the two calendar year period). This rule is used for information on partner's conflict and time with children by parents and child support transfers. Because this information was collected every other year, there are no aggregation issues to deal with. Information concerning a state variable is assumed to refer to the decision period within which the date of the interview (when it was collected) falls if the date of the interview falls within the first 12 months of the decision period. Instead, the information is assumed to refer to the decision period after the one within which

[95] It should be remarked that in the NLSY79 data (1994-2000) more than 50% of the reported changes in the amount of child support were somehow influenced by the existing legislation. This statistics may however overestimate the importance of court-mandated arrangements since for those who do not report a change I do not know whether the amount paid is the one originally mandated by a court or one agreed on be the parts. See Farmer and Tiefenthaler [14] for a model of bargaining over child support and visitation that models state guidelines as implying minimum (or reservation) utility values to each parent beyond which the parents may improve with private agreements. See also Flinn [15] for related work.

the date of the interview falls if the date of the interview falls within the last 12 months of the decision period. This rule is used for children's test scores and sampling weights.

C.8 Discretization of Time Use Information

The collection of time use outcomes – expressed as hours per decision period – $\left(h_m, h_f, l^p_m, l^p_f, \{m_{\mathsf{c}}, f_{\mathsf{c}}, p_{\mathsf{c}} | \mathsf{c} \in C_{N^{kid}}\}\right)$ is discretized in steps. First, I map $\left(h_j, l^q_j, l^p_j\right)$ for male and female into fraction of total time available over a period. I do so by choosing the combination of grid points that exhausts time available and that minimizes the maximum abosulute deviation between actual hours and hours corresponding to grid points (for each of these three time uses). Second, given the discretized value of l^q_j, I apply a similar procedure to the collection of time with children outcomes. The main difference is that for married couples this discretization must be performed jointly because time spent jointly by parents with their children is an element of both total time by the father (l^q_m) and total time by the mother (l^q_f). The details of this procedure are available upon request.

Figure I.3: Age Profile of Behavior Problem Index by Current and Eventual Marital Status of Parents

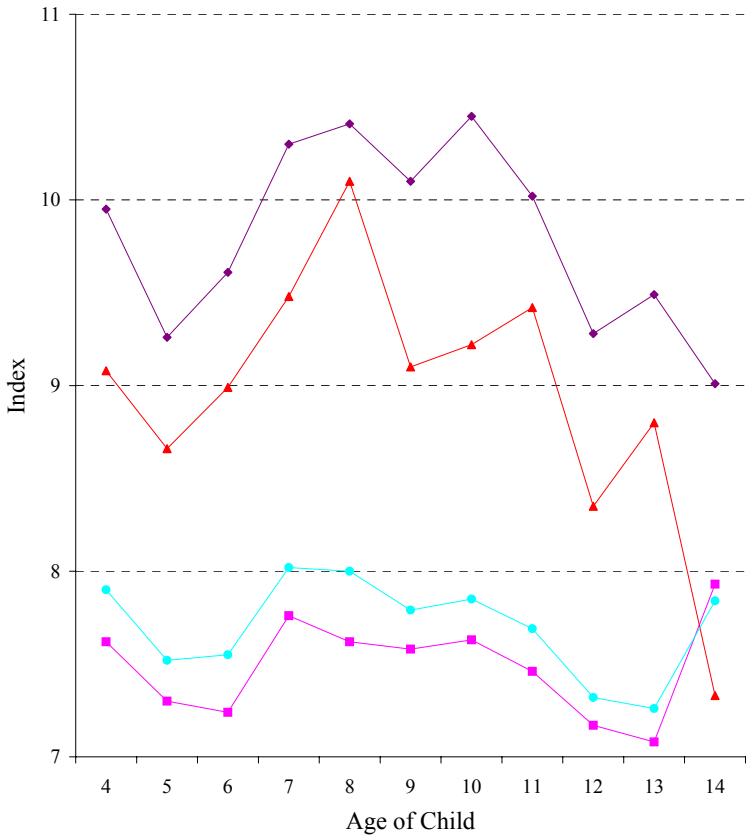
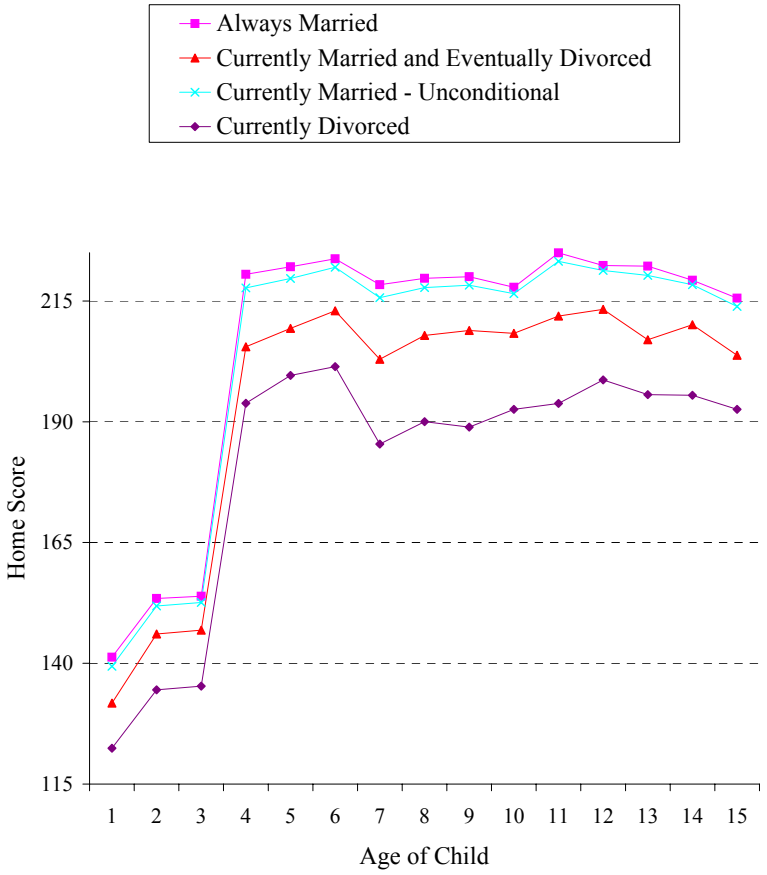


Figure I.4: Age Profile of Home Score by Current and Eventual Marital Status of Parents



Notes: NLSY79 1979-2000 and NLSY79 CHYA 1986-2000 (weighted). The visible jumps in the Home Score at age 3 and 6 are due to the fact that the score aggregates answers to different questions depending on the age of the child. The higher the score, the higher the quality of the cognitive stimulation and emotional support provided by a child's family. The Behavior Problem Index is a measure of quality of children age 4 and over constructed by aggregating answers to a battery of questions measuring the frequency, range, and type of childhood behavior problems. Higher scores represent a greater level of behavior problems.

Table DS.1: Means, standard deviations (in italics), and frequencies of selected variables by race/ethnicity.

	Race/Ethnicity							
	White		Black		Hispanic		All (weighted)	
Number and % of first marriages (couples)	862	66.26%	196	15.07%	243	18.68%	1301	100%
Age at Marriage of								
Wife	24.79	*4.49*	25.31	*4.59*	23.77	*4.03*	24.90	*4.53*
Husband	26.43	*4.73*	26.73	*5.12*	25.19	*4.78*	26.51	*4.86*
Age husband - Age wife	1.64	*3.12*	1.42	*3.23*	1.42	*3.26*	1.61	*3.13*
Highest grade completed of								
Wife	13.65	*2.2*	13.62	*1.93*	12.53	*2.54*	13.65	*2.21*
Husband	13.59	*2.52*	12.98	*2.14*	12.26	*3.02*	13.55	*2.53*
Correlation in spouses' education	0.54		0.41		0.56		0.54	
Cumulated hours of work at marriage of								
Wife (since 1979)	12,884	*7,716*	11,465	*7,774*	10,088	*7,028*	12,790	*7,703*
Husband (since ending school) §	16,607	*11,172*	18,044	*12,717*	15,129	*11,835*	16,743	*11,528*
Number and % of couples divorcing	259	30.05%	83	42.35%	77	31.69%	419	29.86%
Age of wife at divorce	29.67	*5.04*	29.70	*4.61*	29.77	*4.99*	29.71	*4.95*
Length of a marriage (in years)								
All marriages	17.45	*7.39*	15.03	*8.55*	17.26	*7.39*	17.44	*7.4*
Only marriages that end	6.84	*4.57*	5.54	*3.95*	7.04	*4.35*	6.74	*4.46*
Number and percentage of couples Involved in a divorce with								
no child	111	42.86%	33	39.76%	25	32.47%	169	41.95%
1 child	82	31.66%	32	38.55%	27	35.06%	141	32.34%
2 children	44	16.99%	15	18.07%	15	19.48%	74	17.72%
3 or more children	22	8.49%	3	3.61%	10	12.99%	35	7.99%
Age of children at divorce								
if 1 child is present	6.00	*5.80*	3.50	*4.52*	7.11	*8.25*	5.69	*5.92*
if 2 children are present	8.21	*7.48*	6.00	*6.71*	7.38	*6.89*	7.71	*7.23*
if 3 or more children are present	9.19	*7.74*	6.60	*7.07*	8.77	*7.62*	8.78	*7.65*
Number of children born within first marriage	1.63	*1.12*	1.30	*1.08*	1.94	*1.16*	1.62	*1.13*
% of Wifes with no offsprings		19.49%		31.63%		14.40%		20.48%
Age of wife at								
1st birth	27.58	*4.36*	27.29	*4.63*	26.07	*4.20*	27.56	*4.34*
2nd birth	29.90	*3.94*	29.64	*4.09*	28.86	*3.85*	29.91	*3.90*
3rd birth	31.64	*3.75*	31.06	*3.61*	31.02	*3.26*	31.64	*3.70*
Distribution of the durations from marriage to first and second birth (%)	First	Second	First	Second	First	Second	First	Second
2 years	58.83		76.15		74.00		60.35	
4 years	22.12	41.46	15.38	41.33	16.50	39.19	21.90	41.37
6 years	10.29	28.47	6.15	32.00	8.00	33.78	9.88	29.19
8 years	5.22	16.40	0.00	17.33	1.00	17.57	4.59	16.32
10 + years	3.53	13.67	2.31	9.33	0.50	9.46	3.27	13.12

Table DS.1: Means, standard deviations (in italics), and frequencies of selected variables by race/ethnicity (cont.)

	Race/Ethnicity							
	White		Black		Hispanic		All	
Hourly accepted wage rate* of								
Wife	$14.05	*$15.29*	$12.31	*$8.31*	$12.83	*$15.42*	$13.57	*$14.52*
Husband	$19.54	*$14.82*	$15.27	*$9.29*	$16.02	*$11.66*	$19.36	*$14.68*
Hours worked per calendar year by								
Wife	1,254	*881*	1,423	*863*	1,236	*907*	1,275	*886*
Husband	2,225	*612*	2,176	*648*	2,043	*697*	2,226	*610*
% of Females not working in a calendar year		18.56%		14.08%		20.61%		18.33%
% of Divorced fathers transfering $0		36.04%		64.32%		53.81%		38.88%
Amount of child support tranfers per child (on a yearly basis) *								
Including the $0 Amounts	$1,872	*$2,453*	$804	*$1,576*	$958	*$1,437*	$1,769	*$2,437*
Excluding the $0 Amounts	$2,927	*$2,515*	$2,252	*$1,928*	$2,073	*$1,469*	$2,894	*$2,543*
Correlation Between the amount of child support per child and the (within marriage) average of the Father's Earnings and Sample Size	0.51	325	0.51	128	0.49	119	0.53	572
Correlation Between the Amount of Child Support per Child and the (within marriage) average of the Mother's Earnings and Sample Size	0.13	399	0.03	192	0.36	162	0.14	753
Correlation between the amount of child Support per Child and the Number of Days the Father spends with His Children and Sample Size	0.07	298	0.04	169	0.37	121	0.08	588
% of Periods over which divorced father never see his children		17.34%		24.28%		18.32%		18.33%
% of Children of Divorced Parents Who Never See Him over a Year		7.72%		21.90%		16.46%		12.26%
Number of Days a Father Spends with a Child per year when								
parents are divorced (age <8)	91.07	*88.69*	61.60	*81.90*	64.95	73.81	88.92	*89.80*
parents are divorced (age 8-14)	88.30	88.20	56.53	73.16	50.03	73.19	80.14	85.67
parents are married (age 8-14)	118.60	*32.85*	100.01	*57.28*	123.10	*53.49*	117.23	*30.29*
Number of Days a Mother Spends with a Child per year when								
parents are divorced (age 8-14)	125.11	*56.98*	55.85	*41.15*	103.55	*70.86*	114.39	*58.67*
parents are married (age 8-14)	143.26	*50.92*	56.89	*33.22*	126.43	*60.23*	140.36	*52.94*

Table DS.1: Means, standard deviations (in italics), and frequencies of selected variables by race/ethnicity (cont.)

	Race/Ethnicity			
	White	Black	Hispanic	All
% of Periods of married life over which married couples have arguments often on one or more issues	26.93%	33.65%	33.65%	27.05%
% of Currently married couples that will divorce next period that are				
not currently arguing				6.57%
currently arguing on one or more issues				15.90%

Note: The data for this table comes from the 1979 to 2000 surveys of the NLSY79. Included are first marriages involving NLSY79 females that are not part of the military or of the supplemental poor whites samples. For a detailed description of sample exclusions see the appendix. Incomplete spells are included, and observations on a couple are not used starting from the survey, if any, at which any of the following events occurs: (i) the divorced female reports to have a new living partner, (ii) the husband or ex-husband dies, (iii) the divorced female becomes pregnant. Weighted statistics use the NLSY79 weight in the first survey.

* In 2000 US $.

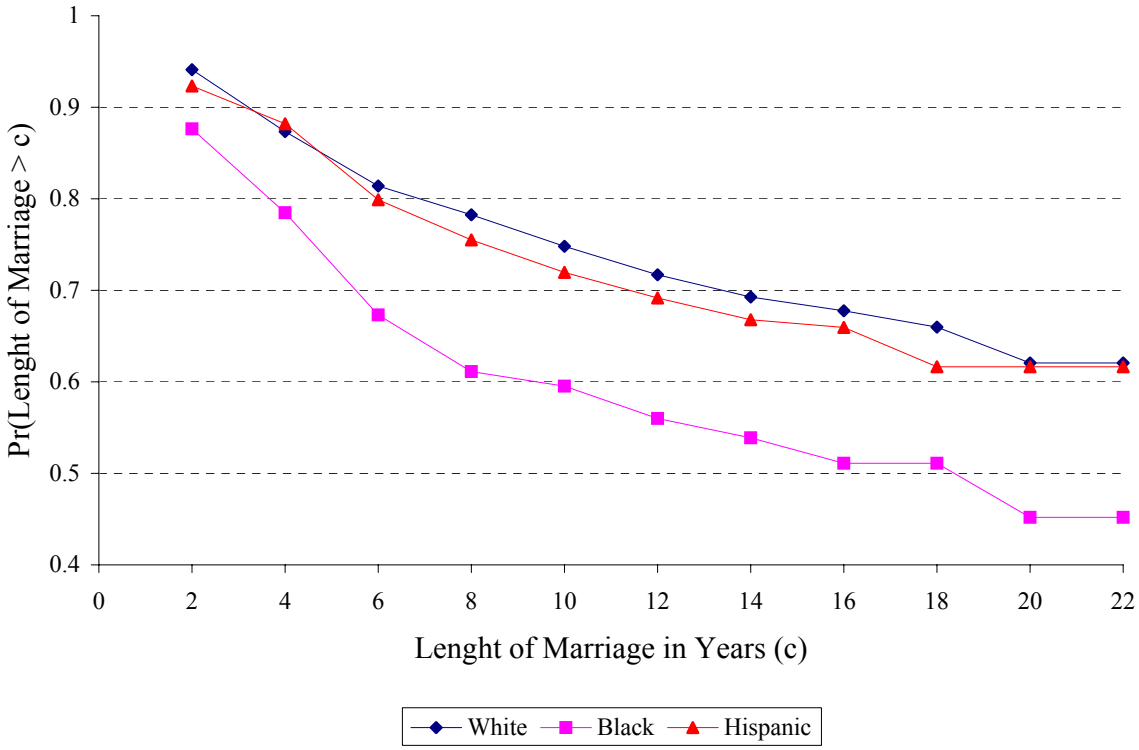
§ See the text for a description of how this information is constructed.

Table DS.2: Means and standard deviations of measures of child quality and their association with conflict and marital status of a child's parents.

	Race\Ethnicity											
	White			Black			Hispanic			All (weighted)		
	Avg	Sd	N	Avg	Sd	N	Avg	Sd	N	Avg	Sd	N
Average of Raw PIAT Mathematics and Reading Comprehension of a Child of age												
4-5 years	13.85	*3.74*	154	12.31	*3.93*	31	11.1	*3.62*	62	13.69	*3.79*	247
6-7 years	19.72	*6.88*	779	18.66	*6.72*	129	16.91	*6.29*	232	19.57	*6.88*	1140
8-9 years	34.94	*9.52*	739	32.28	*9.61*	120	31.17	*9.47*	210	34.72	*9.56*	1069
10-11 years	46.67	*8.48*	595	42.78	*9.65*	93	42.65	*8.84*	176	46.49	*8.59*	864
12-13 years	54.25	*8.71*	419	48.49	*10.06*	76	49.19	*8.48*	140	53.88	*8.98*	635
14-15 years	58.34	*9.29*	202	49.92	*10.02*	33	52.08	*8.10*	60	57.77	*9.92*	295
Average of age-standardized PIAT Mathematics and Reading Comprehension of a Child when												
parents are divorced	104.11	*10.22*	502	98.29	*12.04*	189	98.4	*9.83*	221	103.34	*10.49*	912
parents are married	107.31	*10.26*	1907	102.05	*11.67*	232	100.69	*10.80*	503	106.91	*10.56*	2642
Behavior Problem Index of a Child when												
parents are divorced	8.41	*6.17*	741	8.97	*6.19*	257	8.89	*5.49*	325	8.31	*6.04*	1323
parents are married	7.18	*5.23*	3039	8.2	*5.78*	371	7.73	*5.26*	852	7.23	*5.30*	4262
Average of age-standardized PIAT Mathematics and Reading Comprehension of a Child when over previous period parents												
did not argue										105.48	*11.48*	
argued often on one or more issues										102.01	*11.70*	
Estimated Effect of Interparental Conflict on the Average of End of Period PIATM and PIATRC when the Specifications of the Production Function is*												
OLS										-1.35	*0.40*	
Value Added (VA)										-0.46	*0.38*	
Mother FE and VA										-0.54	*0.55*	
Child FE and VA										-0.59	*0.64*	

* Also included: age of child, education of parents, home score. Weighted. All children of married parents.

Figure DS.1: Kaplan-Meier Estimate of the Marital Survival Function



Note: Estimation sample.

Figure DS.2: Age Profile of Female's Hours Worked

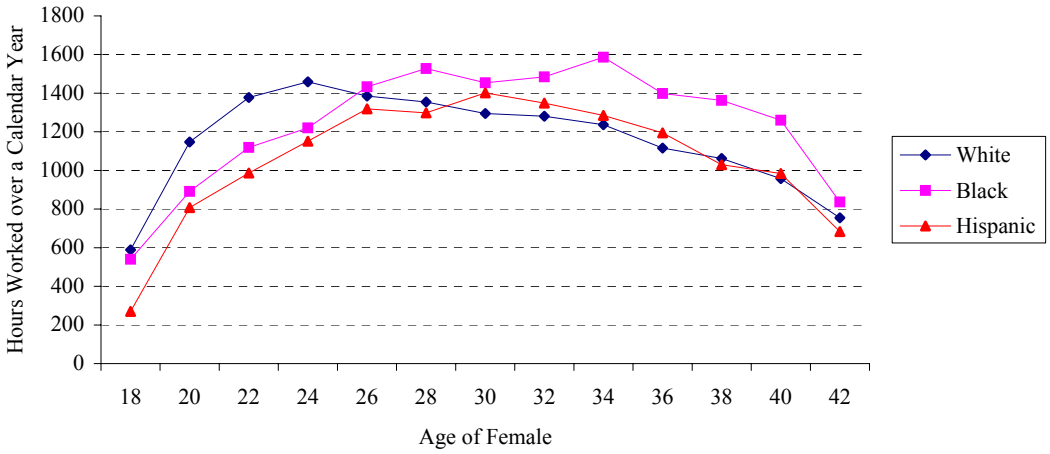


Figure DS.3: Age Profile of Female's Hours Worked by Marital Status

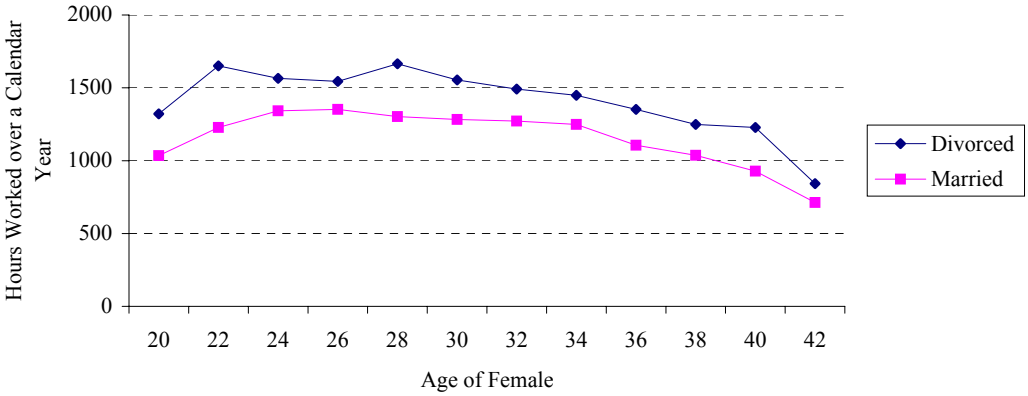


Figure DS.4: Age Profile of Male's Hours Worked (within marriage)

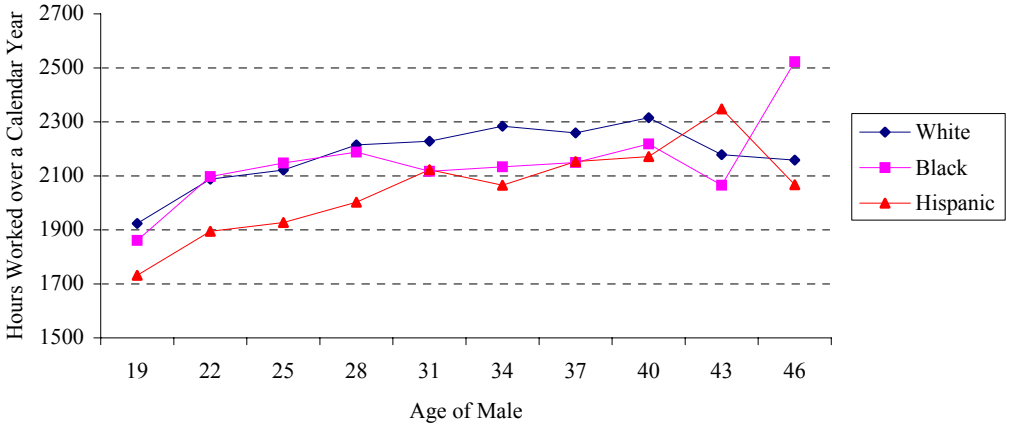


Table ND.1: Number of days a divorced father spends with his child over a 12 month period (by race/ethnicity and age of child) *

Age of Child (years)	Race/Ethnicity	Quantiles					Mean	Std. Error	Min	Max	N. Obs
		10%	25%	50%	75%	90%					
0 to 5	Hispanic	0	1	20	52	104	37.66	44.53	0	160	397
	Black	0	1	20	90	130	43.14	50.49	0	160	622
	White	0	4	40	80	120	43.28	45.43	0	160	686
	All Races	0	3	26	80	130	42.74	46.46	0	160	1705
6 to 9	Hispanic	0	0	9	40	104	31.30	41.75	0	160	496
	Black	0	1	12	40	90	33.48	43.83	0	160	643
	White	0	4	40	56	104	42.97	45.37	0	160	940
	All Races	0	2	27	52	104	40.37	45.02	0	160	2079
10 to 14	Hispanic	0	0	8	40	90	28.94	39.93	0	160	590
	Black	0	0	7	40	90	27.81	40.97	0	160	659
	White	0	1	26	50	100	36.48	41.88	0	160	1031
	All Races	0	1	20	45	100	34.49	41.70	0	160	2280

* Children born within a first marriage, whose father is alive and not living at home, and whose usual residence is with the mother.

All statistics are weighted using NLSY sampling weights.

Table ND.2: Number of days a parent spends with a 10-14 old child over a 12 month period (by gender of the parent and marital status)

Imputation/Prediction Approach	Parent	Marital Status	Selected Quantiles						Mean	St. Error	Min	Max	N. Obs
			5%	10%	25%	50%	75%	90%					
Propensity Score Matching	Father	Divorced †	0.00	0.00	1.00	20.00	45.00	100.00	34.49	41.70	0.00	160.00	2280
		Married	32.40	42.67	50.37	62.70	66.53	69.00	58.54	13.42	0.00	125.33	2438
	Mother	Divorced	14.00	23.00	38.29	56.00	75.25	104.00	60.11	32.72	0.00	160.00	1415
		Married	24.93	38.29	56.00	70.00	75.25	104.00	68.30	27.94	0.00	160.00	2479
Corner Solution (Tobit type I)	Father	Divorced †	0.00	0.00	1.00	20.00	45.00	100.00	34.49	41.70	0.00	160.00	2280
		Married	47.67	50.98	63.17	67.69	68.77	71.08	63.85	8.76	9.11	72.22	2351
	Mother	Divorced	38.88	46.96	52.43	64.29	68.20	68.82	59.87	9.93	23.31	72.22	1394
		Married	49.74	51.86	61.18	67.69	68.82	68.82	63.66	7.79	23.88	72.22	2443
Linear Regression ‡	Father	Divorced †	0.00	0.00	1.00	20.00	45.00	100.00	34.49	41.70	0.00	160.00	2280
		Married	45.72	49.63	62.93	66.26	67.42	69.14	62.75	9.04	1.25	71.27	2351
	Mother	Divorced	36.93	45.87	50.41	63.71	66.64	67.94	58.80	10.55	17.72	71.27	1394
		Married	47.53	49.33	61.61	66.34	67.94	67.94	62.57	8.18	17.74	71.27	2443

† Actual number of days; all others are predicted. Sampling weights used for all descriptive statistics.

* Children age 10 to 14 born within a first marriage, whose father is alive and whose usual residence is with the mother.

The set of explanatory variables used is the same across approaches: sex and race of the child, whether a sole child, and time-related categorical variables ("how often parent misses important events or activities", "how often parent knows who child is with when not at home", "how well parent shares ideas with child, "how often parent talks about important decisions with child", "child opinion on the quantity of time the parent spends with him/her vis-a`-vis his\her desired quantity").

‡ Negative predictions are replaced with a 0.

Table A.1: Distribution of the frequency with which a married couple has arguments on several issues*

Issue of Argument	How Often do You and Your Spouse Argue?				N. Obs
	Often	Sometimes	Hardly Ever	Never	
Chores	12.58	41.07	35.53	10.82	13,348
Children	9.24	33.14	36.38	21.23	13,334
Money	11.13	33.61	37.54	17.71	13,346
Showing Affection	7.14	19.20	37.18	36.47	13,345
Religion	1.14	5.48	20.27	73.11	13,347
Leisure	5.08	23.72	36.31	34.90	13,346
Drinking	2.11	7.52	16.36	74.01	13,343
Other Women	0.65	2.28	8.56	88.52	13,346
Wife Relatives	3.12	19.79	33.33	43.76	11,851
Husband Relatives	3.97	20.28	30.07	45.69	13,347

* Weighted, all years, all NLSY79 married females.

Table A.2: Association between a couple's having arguments about various issues*

Issue of Argument		Chores	Children	Money	Affection	Religion	Leisure	Drinking	Women	Wife Relat.	Husb. Relat.
Chores	k-tau	1	0.364	0.4226	0.3198	0.1699	0.2959	0.1793	0.1569	0.2197	0.2044
	se(K-tau)		*0.0073*	*0.0068*	*0.0071*	*0.0072*	*0.0072*	*0.0073*	*0.0076*	*0.0078*	*0.0073*
Children	k-tau		1	0.3423	0.2641	0.1702	0.2195	0.167	0.1348	0.2187	0.1882
	se(K-tau)			*0.0073*	*0.0075*	*0.0075*	*0.0076*	*0.0077*	*0.0079*	*0.008*	*0.0075*
Money	k-tau			1	0.3213	0.1949	0.2718	0.2043	0.1768	0.2448	0.2191
	se(K-tau)				*0.0072*	*0.0072*	*0.0073*	*0.0072*	*0.0073*	*0.0077*	*0.0073*
Showing Affection	k-tau				1	0.2894	0.3272	0.2045	0.203	0.2205	0.1921
	se(K-tau)					*0.007*	*0.0073*	*0.0074*	*0.0072*	*0.0079*	*0.0075*
Religion	k-tau					1	0.2748	0.2261	0.2139	0.1958	0.1719
	se(K-tau)						*0.007*	*0.0085*	*0.0091*	*0.0082*	*0.0077*
Leisure	k-tau						1	0.2273	0.1852	0.2594	0.2369
	se(K-tau)							*0.0074*	*0.0074*	*0.008*	*0.0076*
Drinking	k-tau							1	0.3078	0.1887	0.1659
	se(K-tau)								*0.0092*	*0.0082*	*0.0078*
Oth. Women	k-tau								1	0.1723	0.1825
	se(K-tau)									*0.008*	*0.0075*
Wife Relatives	k-tau									1	0.5759
	se(K-tau)										*0.0073*
Husband Relatives	k-tau										1

* Weighted, all years, reports by married females. The measure of association used is the Kendal-tao. The p-value of the chi-square test is always 0.00.

Table A.3: Association between reports of interparental conflict by mother and child*

Report of Interparental Conflict by Mother	Report of Interparental Conflict by Child: Raw Variable ‡ Kendall-tau	SE	Dichotomized Variable (1 if Very or Fairly Often, 0 otherw.) Kendall-tau	SE
Raw Variable †				
Chores	-0.1805	0.0170	-0.1398	0.0176
Children	-0.1895	0.0165	-0.1674	0.0175
Money	-0.1840	0.0170	-0.1422	0.0177
Showing Affection	-0.1484	0.0168	-0.1192	0.0181
Religion	-0.0549	0.0176	-0.0607	0.0193
Leisure	-0.1315	0.0170	-0.1089	0.0181
Drinking	-0.0943	0.0171	-0.0799	0.0197
Other Women	-0.0704	0.0189	-0.0858	0.0212
Wife Relatives	-0.1036	0.0170	-0.0774	0.0184
Husband Relatives	-0.0715	0.0170	-0.0499	0.0185
Dichotomized Variable (1 if Often, 0 Otherwise)				
Chores	0.1220	0.0182	0.1244	0.0219
Children	0.1376	0.0183	0.1492	0.0227
Money	0.1296	0.0181	0.1371	0.0225
Showing Affection	0.0831	0.0175	0.0678	0.0220
Religion	0.0342	0.0188	0.0384	0.0224
Leisure	0.0886	0.0188	0.0904	0.0231
Drinking	0.0693	0.0190	0.0729	0.0234
Other Women	0.0620	0.0179	0.0559	0.0247
Wife Relatives	0.0529	0.0178	0.0508	0.0225
Husband Relatives	0.0553	0.0191	0.0623	0.0226
Aggregates of Dichotomized Variables				
At least 1 issue	0.1832	0.0173	0.1696	0.0202
At least 2 issues	0.1405	0.0182	0.1489	0.0221
At least 3 issues	0.1238	0.0188	0.1379	0.0234
At least 1 issue of which one Children	0.1376	0.0183	0.1492	0.0227
At least 2 issues of which one Children	0.1411	0.0189	0.1624	0.0236
At least 3 issues of which one Children	0.1318	0.0189	0.1507	0.0242
At least 1 issue (excl. Money and Drinking)	0.1575	0.0176	0.1473	0.0206
At least 2 issues (excl. Money and Drinking)	0.1339	0.0186	0.1477	0.0227
At least 3 issues (excl. Money and Drinking)	0.1148	0.0183	0.1165	0.0240

* Sample: Children 10-14 years of age, born within a first marriage, whose father is alive and living at home.

† Categories are as follows: Often = 1, Sometimes = 2, Hardly ever = 3, Never = 4.

‡ Categories are as follows: Never = 1, Once in a while = 2 , Fairly often = 3, Very often = 4.

The descriptive statistics in the table are weighted and those highlighted are the 3 highest correlations, within each group of reports by mother and child.

Table A.4: Association between degree of happiness † and frequency of conflict**

Issue of Argument ‡	Kendall-tau	SE*
Chores	-0.2551	0.0077
Children	-0.1992	0.0079
Money	-0.2503	0.0075
Showing Affection	-0.2753	0.0075
Religion	-0.1370	0.0086
Leisure	-0.2071	0.0078
Drinking	-0.1825	0.0087
Other Women	-0.2238	0.0094
Wife Relatives	-0.1296	0.0085
Husband Relatives	-0.1141	0.0081

† Categories are as follows: Very Happy = 1, Somewhat Happy = 2, Not Too Happy = 3.

‡ Categories are as follows: Often = 1, Sometimes = 2, Hardly ever = 3, Never = 4.

* The p-value of a Chi square test of independence between column and row variables is always 0.000

** Weighted, married females.

Table T.1: Description of variables related to the time a father spends with his child when present in the mother's household *

Variable	Age of Child in Years	Proportion of Answers						N. Obs
		No	Yes					
Father Sees Child Daily	0	2.26	97.74					1743
	1	2.51	97.49					1895
	2	3.12	96.88					1892
	3	3.16	96.84					1952
	4	1.94	98.06					1787
	5	1.93	98.07					1732
	all ages	2.51	97.49					11001
		Daily	4 or More Times a Week	Once a Week	Once a Month	A Few Times a Year	Never	
How Often Father Spends Time with Child	6	89.59	7.29	2.68	0.25	0.14	0.05	1631
	7	89.02	8.06	2.47	0.18	0.05	0.22	1511
	8	88.36	8.96	2.18	0.18	0.20	0.12	1368
	9	88.96	7.48	2.82	0.44	0.23	0.06	1216
	10	88.36	8.49	2.40	0.40	0.34	0.01	1071
	11	84.88	10.63	3.58	0.40	0.36	0.16	902
	12	85.33	9.26	4.51	0.52	0.29	0.09	791
	13	82.09	12.72	3.92	0.33	0.56	0.38	638
	14	82.84	10.50	4.82	1.38	0.11	0.36	277
	all ages	87.51	8.81	2.97	0.35	0.23	0.13	9405
		All the Time	A lot	Sometimes	Almost Never			
How Often Father Misses Important Events or Activities †	10	0.31	15.24	39.88	44.57			796
	11	0.86	12.04	40.88	46.22			736
	12	0.70	13.15	36.65	49.50			702
	13	0.57	13.72	38.94	46.77			552
	14	0.22	13.81	35.41	50.56			242
	all ages	0.57	13.58	38.86	46.99			3028
		Not Very	Fairly	Quite	Extremely			
How Well Father Shares Ideas with Child †	10	6.92	18.49	38.20	36.39			795
	11	5.60	18.89	43.80	31.71			718
	12	8.84	26.09	36.22	28.85			704
	13	8.39	24.64	40.66	26.31			556
	14	11.63	25.23	37.50	25.64			239
	all ages	7.69	22.01	39.53	30.76			3012

Table T.1: Description of variables related to the time a father spends with his child when present in the mother's household * (cont.)

Variable	Age of Child in Years	Proportion of Answers			N. Obs
		Often	Sometimes	Hardly Ever	
How Often Father Knows who Child is with when not at Home †	10	66.13	27.31	6.56	635
	11	67.16	27.53	5.31	601
	12	66.39	27.41	6.20	562
	13	62.63	30.69	6.68	513
	14	57.14	32.49	10.36	235
	all ages	64.87	28.56	6.57	2546
		Often	Sometimes	Hardly Ever	
How Often Father Talks About Important Decisions with Child †	10	31.45	47.81	20.74	631
	11	32.97	44.75	22.28	608
	12	29.58	47.51	22.91	579
	13	27.06	52.00	20.94	520
	14	31.34	39.33	29.33	243
	all ages	30.49	47.07	22.44	2581
		Enough	Wish He Spent More	Too Much	
Child thinks Father Spends … Time with Child †	10	65.36	32.47	2.16	789
	11	66.51	31.15	2.34	725
	12	69.06	28.26	2.68	694
	13	70.58	27.25	2.17	546
	14	77.16	19.67	3.17	238
	all ages	68.43	29.16	2.41	2992
		Average	St. Deviation	Median	
Hours Worked by Father in a Year	0 to 4	2209.16	697.49	2080	5452
	5 to 9	2232.09	738.72	2080	3115
	10 to 14	2243.20	696.50	2080	609

All statistics in this table are weighted using the NLSY sampling weights. Except for hours worked by the father (which is from the NLSY79 data set), all information is from the Children of the NLSY79 Mothers. Survey specific-information is pooled across years. Unless otherwise specified, all information is reported by a child's mother. When statistics for a variable are not reported for a particular child age it is beacause that information was not collected for children of that age.

* The sample for this table includes children age 0 to 14 born within a first marriage, whose father is alive and present in the household of the mother.

† This information if self-reported by a child.

Table T.2: Description of variables related to the time a mother spends with her child when the child' s father is present*

Variable	Age of Child in Years	Proportion of Answers						N. Obs
		Always	Often	Sometimes	Rarely	Never		
How Often Mother Talks to Child While Working	0	46.16	43.56	7.77	0.87	1.63		1734
	1	47.72	43.51	7.89	0.52	0.36		1891
	2	46.14	46.58	6.58	0.49	0.21		1859
	all ages	46.71	44.59	7.40	0.61	0.69		5484
		Twice a Week or More	Once a Week	Once a Month	Hardly Ever			
How Often Mother Takes Child to Grocery Store	0	23.64	48.18	12.05	16.13			1745
	1	34.46	49.21	10.22	6.10			1890
	2	35.34	50.25	9.97	4.44			1866
	all ages	31.51	49.26	10.68	8.54			5501
		Never	Several Times a Year	Several Times a Month	Once a Week	3 Times a Week	Everyday	
How Often Mother Reads to Child	0	32.60	1.42	5.46	15.16	22.38	22.98	1736
	1	4.88	2.86	6.88	13.24	28.24	43.90	1889
	2	1.22	2.01	5.59	10.47	32.84	47.87	1898
	3	0.80	2.45	7.42	10.71	36.44	42.18	1835
	4	1.08	2.58	9.99	13.06	35.41	37.89	1806
	5	0.42	3.27	10.09	13.69	39.79	32.74	1780
	6	0.57	3.87	10.78	17.12	36.96	30.69	1661
	7	1.17	6.43	14.01	18.46	37.82	22.11	1514
	8	2.47	12.93	16.26	26.37	26.66	15.31	1373
	9	5.12	18.47	21.93	23.37	21.03	10.07	1191
	all ages	4.87	5.03	10.29	15.58	32.19	32.03	16683
		A lot	Sometimes	Almost Never				
How Often Mother Misses Important Events or Activities †	10	6.69	27.79	65.52				802
	11	4.23	27.68	68.09				729
	12	5.56	23.99	70.45				701
	13	4.60	25.22	70.18				555
	14	2.26	25.83	71.91				240
	all ages	5.07	26.26	68.67				3027
		Not Very	Fairly	Quite	Extremely			
How Well Mother Shares Ideas with Child †	10	4.23	11.77	39.06	44.94			809
	11	3.24	13.93	38.83	44.00			747
	12	4.95	16.67	39.82	38.56			715
	13	4.18	16.37	38.56	40.88			568
	14	9.20	15.33	35.59	39.88			246
	all ages	4.55	14.56	38.79	42.10			3085

Table T.2: Description of variables related to the time a mother spends with her child when the child' s father is present* (cont.)

Variable	Age of Child in Years	Proportion of Answers			N. Obs
		Often	Sometimes	Hardly Ever	
How Often Mother Knows who Child is with when not at Home †	10	57.69	8.32	33.99	940
	11	61.33	10.11	28.56	853
	12	59.79	11.07	29.14	823
	13	68.68	11.34	19.98	698
	14	64.36	15.57	20.07	356
	all ages	61.66	10.54	27.80	3092
		Often	Sometimes	Hardly Ever	
How Often Mother Talks About Important Decisions with Child †	10	45.03	42.23	12.73	661
	11	49.26	40.93	9.81	629
	12	45.11	42.25	12.64	597
	13	49.64	41.00	9.36	541
	14	45.49	43.75	10.76	249
	all ages	47.04	41.82	11.14	2677
		Enough	Wish Spent more	Too Much	
Child thinks Mother Spends … Time with Child †	10	81.40	15.04	3.55	792
	11	82.48	13.52	4.00	722
	12	82.62	12.85	4.53	690
	13	84.84	11.45	3.71	555
	14	88.56	9.02	2.42	238
	all ages	83.18	13.00	3.82	2997
		Average	St. Deviation	Median	
Hours Worked by Mother in a Year	0	957.87	897.83	820	1684
	1	1003.21	924.04	876	1824
	2	1029.97	931.45	945	1784
	3	1022.80	950.51	908	1835
	4	1011.42	920.37	882	1693
	5	1052.26	937.45	1000	1649
	6	1118.94	928.77	1115	1523
	7	1112.47	941.66	1088	1363
	8	1200.17	954.04	1208	1245
	9	1177.94	918.82	1248	1049
	10	1278.95	959.62	1316	908
	11	1260.48	943.23	1353	759
	12	1326.01	927.32	1350	637
	13	1316.50	927.77	1480	506
	14	1416.89	941.70	1520	405

All statistics in this table are weighted using the NLSY sampling weights. Except for hours worked by the mother (which is from the NLSY79 data set), all information is from the Children of the NLSY79 Mothers. Survey specific-information is pooled across years. Unless otherwise specified, all information is reported by a child's mother. When statistics for a variable are not reported for a particular child age it is beacause that information was not collected for children of that age.

* The sample for this table includes children age 0 to 14 born within a first marriage, whose father is alive and present in the household of the mother.

† This information if self-reported by a child.

Table T.3: Description of variables related to the time a father spends with his child when not present in the mother's household *

Variable	Age of Child in Years	Proportion of Answers								N. Obs
		No	Yes							
Father Sees Child Daily †	0	68.94	31.06							51
	1	80.11	19.89							94
	2	69.84	30.16							121
	3	77.65	22.35							148
	4	83.55	16.45							185
	5	83.83	16.17							214
	all ages	79.47	20.53							813
		No	Yes							
Child Ever Sees Father †	0	16.02	83.98							46
	1	11.83	88.17							89
	2	7.74	92.26							111
	3	9.25	90.75							133
	4	9.25	90.75							170
	5	7.29	92.71							201
	6	6.43	93.57							231
	7	8.01	91.99							254
	8	5.93	94.07							284
	9	8.83	91.17							271
	10	4.59	95.41							277
	11	7.57	92.43							250
	12	9.09	90.91							209
	13	7.44	92.56							184
	14	6.59	93.41							70
	all ages	7.59	92.41							2780
		Never	Almost Daily	2-5 times a Week	Once a Week	1-3 Times a Month	7-11 Times a Year	2-6 Times a Year	1 Time a Year	
How Often Father has Seen Child in Last 12 Months	0	19.45	17.27	12.02	17.89	11.01	5.81	9.22	7.32	123
	1	17.84	13.28	18.69	12.86	16.17	4.29	12.2	4.66	203
	2	20.86	12.92	15.78	13.87	20.79	4.5	7.66	3.61	264
	3	17.35	8.44	13.55	13.67	23.33	6.07	10.79	6.79	332
	4	20.27	7.54	15.2	11.42	21.77	7.95	10.75	5.11	433
	5	20.24	7.45	11.07	15.47	21.36	4.03	12.56	7.82	513
	6	20.1	3.45	16.25	11.94	21.74	8.76	12.6	5.17	565
	7	21	5.59	12.8	11.44	24.61	5.27	12.88	6.41	559
	8	17.3	5.07	14.96	15.5	21.42	4.81	13.75	7.18	591
	9	19.96	6.81	14.03	11.27	20.86	5.69	12.47	8.9	614
	10	21.84	3.29	12.83	12.57	21.49	5.05	14.66	8.26	603
	11	21.34	5.93	11.03	12.5	22.17	6.66	11.94	8.44	597
	12	24.24	3.82	9.55	14.7	17.22	8.84	13.1	8.53	499
	13	21.11	7.78	9.96	9.95	23.38	7.3	9.92	10.6	501
	14	25.82	3.26	7	10.48	19.73	9.61	15.32	8.77	390
	all ages	20.76	6.22	12.69	12.72	21.3	6.39	12.39	7.53	6787
		<1	1	2	3 to 7	8 to 14	15 to 31	>=32		
Length of Father Visit (Days)	0	63.19	20.93	4.52	9.84	0	1.52	0		99
	1	52.26	15.97	19.65	9.57	0.2	1.34	1		166
	2	56.41	11.25	17.48	12.69	1.06	1.1	0		206
	3	47.8	16.2	19.39	13.67	0.93	1.33	0.69		265
	4	35.72	14.93	35.93	9.49	1.4	1	1.53		334
	5	32.96	16.35	32.37	14.39	0.57	1.79	1.57		395
	6	29.95	19.9	28.5	18.67	1.21	0.28	1.49		435
	7	31.42	16.21	38.13	8.34	2.53	0.92	2.45		444
	8	32.48	16.64	31.2	13.48	2.6	1.28	2.32		466
	9	29.66	15.96	31.53	16.32	1.01	1.7	3.82		470
	10	29.71	17.59	34.65	12.38	2.16	2.07	1.45		454
	11	29.25	20.01	34.5	11.1	1.82	2.37	0.94		457
	12	29.41	16.46	33.47	13.29	2.01	2.66	2.71		370
	13	26.59	20.49	32.67	11.08	3.47	4.22	1.47		379
	14	35.15	21.22	26.56	9.1	3.64	1.25	3.08		284
	all ages	33.57	17.46	30.9	12.62	1.85	1.74	1.87		5224

Table T.3: Description of variables related to the time a father spends with his child when not present in the mother's household * (cont.)

Variable	Age of Child in Years	Proportion of Answers						N. Obs
		Daily	>=4 times a week	Once a Week	Once a Month	A few times a yea	Never	
How Often Father Spends Time with Child †	6	4.58	19.73	32.41	20.9	16.35	6.02	247
	7	7.52	16.42	34.25	20.09	16.46	5.26	271
	8	8.38	15.88	37.87	14.38	16.77	6.73	301
	9	12.4	13.64	31.16	21.51	15.97	5.32	286
	10	6.7	12.6	36.94	17.84	21.14	4.77	295
	11	10.97	15.08	30.23	15.41	23.44	4.86	277
	12	5.08	8.56	36.83	21.77	22.35	5.41	223
	13	10.9	16.27	25.64	23.16	14.26	9.76	205
	14	11.65	12.94	30.74	20.47	18.16	6.03	73
	all ages	8.49	14.74	33.28	19.16	18.38	5.95	2178
		All the Time	A lot	Sometimes	Almost Never			
How Often Father Misses Important Events or Activities	10	18.11	35.85	28.9	17.14			384
	11	19.58	35.69	27.07	17.66			419
	12	24.26	38.02	22.5	15.22			382
	13	24.41	35.99	23.82	15.78			380
	14	26.64	35.7	26.35	11.31			151
	all ages	22.01	36.29	25.66	16.03			1716
		Never Shares	Not Very	Fairly	Quite	Extremely		
How Well Father Shares Ideas with Child	10	16.37	17.49	20.93	26.47	18.73		310
	11	18.3	22.13	19.75	22.49	17.33		341
	12	23.57	19.98	20.07	26.63	9.76		335
	13	23.61	21.5	20.11	19.01	15.76		321
	14	24.11	19.64	17.87	23.99	14.39		136
	all ages	20.76	20.3	19.99	23.56	15.39		1716
		Often	Sometimes	Hardly Ever	Never			
How Often Father Knows who Child is with when not at Home	10	31.88	18.37	26.86	22.89			281
	11	31.9	18.47	27.36	22.28			333
	12	23.76	14.08	32.36	29.8			300
	13	24.9	14.24	31.74	29.12			330
	14	17.74	23.42	29.37	29.46			149
	all ages	27	17.02	29.59	26.39			1393
		Often	Sometimes	Hardly Ever	Never			
How Often Father Talks About Important Decisions with Child	10	15.93	28.6	33.92	21.55			280
	11	15.63	27.45	33.3	23.62			330
	12	14.37	25.71	31.21	28.71			304
	13	19.4	21.67	31.85	27.07			347
	14	15.99	23.23	32.3	28.47			158
	all ages	16.42	25.39	32.51	25.69			1419
		Never Spends	Enough	Wish Spent mo	Too Much			
Child thinks Father Spends … Time with Child ‡	10	18.35	35.18	42.26	4.2			382
	11	17.93	34.86	45.09	2.12			420
	12	25.01	36.68	36.24	2.07			375
	13	24.15	32.36	40.71	2.79			376
	14	28.78	24.79	42.76	3.67			151
	all ages	21.9	33.87	41.38	2.85			1704

Table T.3: Description of variables related to the time a father spends with his child when not present in the mother's household * (cont.)

Variable	Age of Child in Years	Proportion of Answers					N. Obs
		<1	1 to 10	11 to 100	101 to 200	>200	
Father Distance	0	8.9	36.28	24.05	4.89	25.87	121
(Miles)	1	6.88	38.96	33.51	3.7	16.94	196
	2	10.05	34.85	28.8	7.15	19.15	254
	3	11.72	31.43	30.11	4.1	22.64	315
	4	8.11	31.11	31.01	6.48	23.29	413
	5	9.73	31.11	25.35	6.21	27.6	499
	6	6.18	31.32	33.69	5.92	22.89	529
	7	6.06	29.27	31.86	6.78	26.03	537
	8	8.23	29.96	32.81	6.58	22.42	562
	9	6.15	30.53	31.61	5.81	25.91	583
	10	7.69	29.71	30.94	3.99	27.68	569
	11	5.91	25.53	36.23	5.49	26.85	557
	12	6.25	28.11	31.21	6.26	28.17	475
	13	8.17	25.23	33.3	7.62	25.68	479
	14	6.44	24.89	32.19	6.36	30.12	376
	all ages	7.49	29.52	31.66	5.95	25.38	6465

		Biological Father	Step Father	Other	No Father-Figure	N. Obs
Is There and if So	0	79.09	1.46	4.69	14.76	65
Who is Father-Figure	1	85.6	0.49	9.31	4.61	111
	2	76.91	1.57	10.46	11.06	156
	3	69.15	6.62	16.04	8.18	204
	4	68.56	9.76	14.62	7.06	270
	5	62.86	14.9	15.2	7.04	334
	6	68.11	13.22	11.08	7.59	384
	7	60.4	21.72	12.12	5.77	450
	8	62.56	18.03	14.54	4.86	492
	9	55.16	25.38	11.84	7.61	523
	10	56.53	25.89	11.31	6.27	556
	11	49.72	33.52	8.73	8.03	532
	12	50.86	31.39	11.06	6.69	449
	13	48.9	32.96	8.78	9.35	431
	14	36.94	45.77	9.18	8.11	182
	all ages	58.19	22.98	11.59	7.24	5139

* Children born within a first marriage, whose father is alive and not living at home, and whose usual residence is with the mother. All descriptive statistics are weighted using the NLSY probability weights. No constraints are imposed concerning the presence in the mother's household of a new partner/spouse.

† Sample sizes are smaller than for questions without this symbol since the condition that the father-figure is the biological father is imposed. Answers by children whose father-figure is not the biological father are not used.

‡ Sample Sizes are bigger for these questions than for the other self-reported questions since these question were asked starting in 1992 as opposed to 1994. All the self-reported questions were asked separately for "dads" (biological fathers) and step-fathers starting in 1994.

Table T.4: Description of variables related to the time a mother spends with her child when the child's father is not present.*

Variable	Age of Child in Years	Proportion of Answers						N. Obs
		Always	Often	Sometimes	Rarely	Never		
How Often Mother Talks to Child While Working	0	48.35	29.77	16.66	0.29	4.94		113
	1	43.36	43.46	8.55	0.96	3.67		193
	2	46.54	36.74	14.37	2.35	0.00		242
	all ages	45.78	37.75	12.79	1.48	2.20		548
		Twice a Week or More	Once a Week	Once a Month	Hardly Ever			
How Often Mother Takes Child to Grocery Store	0	30.53	38.31	12.30	18.86			457
	1	39.46	41.52	8.58	10.43			583
	2	35.56	42.69	16.21	5.54			694
	all ages	35.97	41.47	12.84	9.73			553
		Never	Several Times a Year	Several Times a Month	Once a Week	3 Times a Week	Everyday	
How Often Mother Reads to Child	0	40.27	4.00	7.21	17.87	17.01	13.63	114
	1	10.48	5.08	5.63	19.31	36.71	22.79	195
	2	2.01	3.65	13.07	19.15	30.99	31.13	252
	3	1.70	6.67	18.17	15.66	35.62	22.18	307
	4	1.43	4.01	18.69	15.80	41.57	18.51	417
	5	1.26	7.40	15.45	20.29	38.94	16.66	486
	6	0.79	6.59	18.59	22.48	36.76	14.79	529
	7	2.57	9.55	22.12	23.09	27.56	15.10	523
	8	3.10	13.28	23.27	28.15	24.13	8.08	549
	9	8.17	20.97	23.69	21.21	20.05	5.91	544
	all ages	4.07	9.72	19.00	21.33	30.95	14.94	3916
		A lot	Sometimes	Almost Never				
How Often Mother Misses Important Events or Activities †	10	10.48	37.77	51.76				380
	11	11.95	34.16	53.89				432
	12	17.33	31.97	50.70				407
	13	10.67	35.13	54.20				388
	14	13.35	39.53	47.13				160
	all ages	12.65	35.14	52.21				1767
		Not Very	Fairly	Quite	Extremely			
How Well Mother Shares Ideas with Child †	10	5.95	15.90	33.98	44.17			396
	11	6.24	17.53	34.37	41.86			437
	12	8.53	20.96	32.71	37.80			416
	13	9.62	21.40	32.03	36.95			396
	14	8.92	16.72	31.94	42.43			170
	all ages	7.71	18.76	33.16	40.37			1815

Table T.4: Description of variables related to the time a mother spends with her child when the child's father is not present* (cont.)

Variable	Age of Child in Years	Proportion of Answers			N. Obs
		Often	Sometimes	Hardly Ever	
How Often Mother Knows who Child is with when not at Home †	10	47.61	12.78	39.61	405
	11	50.85	12.02	37.14	443
	12	51.26	12.98	35.76	417
	13	55.72	16.73	27.54	396
	14	59.20	16.43	24.36	169
	all ages	52.13	13.88	33.99	1830
		Often	Sometimes	Hardly Ever	
How Often Mother Talks About Important Decisions with Child †	10	50.82	34.40	14.78	309
	11	47.81	37.88	14.31	367
	12	43.80	40.57	15.63	346
	13	43.71	40.21	16.08	369
	14	49.93	38.59	11.47	169
	all ages	46.74	38.44	14.81	1560
		Enough	Wish Spent more	Too Much	
Child thinks Mother Spends … Time with Child †	10	65.86	29.51	4.63	392
	11	71.11	25.21	3.68	433
	12	62.79	31.07	6.14	404
	13	73.99	19.36	6.65	387
	14	71.61	25.37	3.02	158
	all ages	68.90	26.06	5.04	1774
		Average	St. Deviation	Median	
Hours Worked by Mother in a Year	0	836.74	894.79	440	116
	1	1000.79	1004.31	839	194
	2	1029.05	950.34	1006	243
	3	1279.83	1000.29	1440	308
	4	1242.11	961.52	1610	408
	5	1304.66	946.09	1512	476
	6	1278.82	890.25	1576	511
	7	1418.70	961.32	1752	490
	8	1409.90	883.11	1720	516
	9	1407.71	936.97	1710	523
	10	1461.71	891.86	1807	492
	11	1470.66	910.98	1695	470
	12	1554.29	936.76	1840	387
	13	1545.31	894.25	1800	367
	14	1554.04	904.95	1960	268

All statistics in this table are weighted using the NLSY sampling weights. Except for hours worked by the mother (which is from the NLSY79 data set), all information is from the Children of the NLSY79 Mothers. Survey specific-information is pooled across years. Unless otherwise specified, all information is reported by a child's mother. When statistics for a variable are not reported for a particular child age it is beacause that information was not collected for children of that age.

* The sample for this table includes children age 0 to 14 born within a first marriage, whose father is alive and not present in the household of the mother. No constraints are imposed concerning the presence in the mother's household of a new partner/spouse. † This information if self-reported by a child.

Table P.1.: Parameter Estimates

1. Utility Function

	Symbol	Estimate		Symbol	Estimate
CRRA parameter	$\lambda 00$	0.7275	Private Leisure		
Number of Offspring			Male	$\lambda 12$	10.4216
Type 1	$\lambda 1,1$	-1.0145	Female	$\lambda 13$	24.8770
Type 2	$\lambda 1,2$	9.0266	Total mother's time with a newborn	$\lambda 14$	15.5039
Number of Offspring Squared			Joint time by parents with children	$\lambda 15$	1.6525
Type 1	$\lambda 2,1$	-2.1030	Utility cost to the female of transiting from		
Type 2	$\lambda 2,2$	-0.8002	not working to working full	$\lambda 16$	-3.0511
End of Period Composite Quality of Offspring/10			not working to working full-time	$\lambda 17$	-6.9100
Type 1	$\lambda 3,1$	5.4061	working part-time to full-time	$\lambda 18$	-1.8745
Type 2	$\lambda 3,2$	12.5616	Marital status is married		
End of Period Composite Quality of Offspring/10			Type 1	$\lambda 19,1$	-14.7269
male	$\lambda 4,m$	7.5269	Type 2	$\lambda 19,2$	-32.4981
female	$\lambda 4,f$	5.1792	Marital status is divorced x n. of children		
Power of End of Period Composite	$\lambda 5$	0.5000	Type 1	$\lambda 20,1$	11.1026
Quality of Offspring/10 †			Type 2	$\lambda 20,2$	0.0012
Pregnancy at age			Marital status is divorced x		
21-26	$\lambda 6$	6.0091	has a newborn	$\lambda 21$	-7.4112
27-33	$\lambda 7$	23.7209	has a 2 year old	$\lambda 22$	-5.3708
more than 33	$\lambda 8$	-7.5966	has a 4 year old	$\lambda 23$	-3.3759
Pregnancy x pregnancy in previous period	$\lambda 9$	-6.4745	has a 6 year old	$\lambda 24$	-1.0980
Pregnancy			has a 8 or less year old	$\lambda 25$	-17.4683
Type 1	$\lambda 10,1$	-1000.50	Current conflict		
Type 2	$\lambda 10,2$	-4.5333	Type 1	$\lambda 26,1$	-2.0631
Pregnancy x first period of marriage			Type 2	$\lambda 26,2$	-1.5001
Type 1	$\lambda 11,1$	-60.5185	First Born Weight in CES †	$\lambda 27$	0.5000
Type 2	$\lambda 11,2$	-58.5980	Elasticity of Substitution in CES †	$\lambda 28$	2.0000

Table P.1.: Parameter Estimates (cont.)

2. Log Wage Equations

	Symbol	Estimate
Male		
Constant	γ1,1	2.0880
Black		-0.2348
Hispanic	γ2	-0.1260
Accumulated Work Experience	γ3	0.0451
Accumulated Work Experience Squared	γ4	-0.0006
Education		
High School	γ5	0.1935
Some College	γ6	0.3443
College and Above	γ7	0.6354
Female		
Constant	ς1,1	1.6702
Black	ς2	-0.1058
Hispanic	ς3	-0.0584
Accumulated Work Experience	ς4	0.0740
Accumulated Work Experience Squared	ς5	0.0013
Education		
High School	ς6	0.0638
Some College	ς7	0.2024
College and Above	ς8	0.5354

3. Female Reservation Value Function

Constant		
Type 1	r1,1	0.5015
Type 2	r1,2	0.6225

4. Value Function at 3rd Birth

	Symbol	Estimate
Constant		
Type 1	κ1,1	-10.6033
Type 2	κ1,2	-17.9010

5. Probability of Accommodating

Constant	φ1	-20.8740
Lag of Conflict	φ2	18.9086

6. Variance-Covariance Matrix

log male wages	σ1,1	0.2156
log female wages	σ2,2	0.2204
pregnancy shock	σ3,3	1.5600
shock to the value of staying married	σ4,4	140.9982
male private leisure shock	σ5,5	2.0020
female private leisure shock	σ6,6	2.9781
shock to firstborn's quality	σ7,7	0.0025
shock to second born's quality	σ8,8	0.0025
shock to preferences towards mother' s time with children	σ9,9	0.0179
shock to preferences towards joint time with children	σ10,10	0.0166

** At the time of writing correlations are fixed at 0*

Table P.1.: Parameter Estimates (cont.)

7. Child Quality Production Function

	Symbol	Estimate
Scale economies for goods if 2 kids †	α1	0.7689
Constant		
Type 1	α2,1	-3.6705
Type 2	α2,2	-3.6600
Age of Child	α3	0.7780
Age of Child Squared	α4	-0.0552
Education of Mother		
High School	α5	0.1627
Some College and Above	α6	0.1971
Education of Father		
High School	α7	0.0629
Some College and Above	α8	0.1913
There is conflict between Parents	α9	-0.1590
Conflict x age of child	α10	0.0200
Conflict x age of child squared	α11	-0.0010
Per child goods	α12	0.0450
Per child goods x age of child	α13	-0.0010
Begin of period child quality	α14	0.0232
Time with father		0.0449
1.5 hours to 4.5 hours	α15	0.0518
1.5 hours to 4.5 hours x age of child	α16	-0.0023
Time with both parents	α17	0.0534
Time with both parents x age of child	α18	-0.0017
Time with mother		
1.5 hours to 4.5 hours	α19	0.2522
4.5 hours to 7.5 hours	α20	0.3339
1.5 hours to 4.5 hours x age of child	α21	-0.0190
4.5 hours to 7.5 hours x age of child	α22	-0.0370

8. Type Probabilities (Type 2)

	Symbol	Estimate
Constant	s1	2.1805
Age of male partner at marriage	s2	-0.1245
Age of female partner at marriage	s3	-0.1570
Education of male partner		
High School	s4	-0.0782
Some College	s5	-0.2174
College and Above	s6	0.2592
Education of female partner		
High School	s7	0.5760
Some College	s8	0.8190
College and Above	s9	0.8727
Black	s10	-0.4323
Hispanic	s11	0.3657
Labor market experience of male at marriage	s12	-0.0175
Labor market experience of female at marriage	s13	-0.0115

9.Other Parameters

Fraction of Full Income Devoted to Offspring		
Type 1	x1,1	0.1994
Type 2	x1,2	0.1192
Fixed consumption cost of children †	x2	0.1000
Discount rate *(not estimated)*	β	0.9500

(† the parameter has not been iterated upon)

Table F.1: Fit of the Model

	Data	Model
% of couples divorcing		
all	29.52	30.61
of which		
with no children	43.23	45.29
with 1 child	37.24	37.28
with 2 children	19.53	17.42
Marital survival by duration of marriage		
2 years	100.00	100.00
4 years	92.70	87.35
6 years	85.93	80.95
8 years	79.94	76.89
10 years	76.79	74.28
12+ years	74.10	72.33
Age of wife at divorce	29.89	29.50
% of couples that have ever had conflict	55.59	63.98
% of couples x periods with conflict	30.41	30.55
% of couples x periods with conflict given that in previous period they had		
no conflict	17.10	10.76
conflict	52.40	44.31

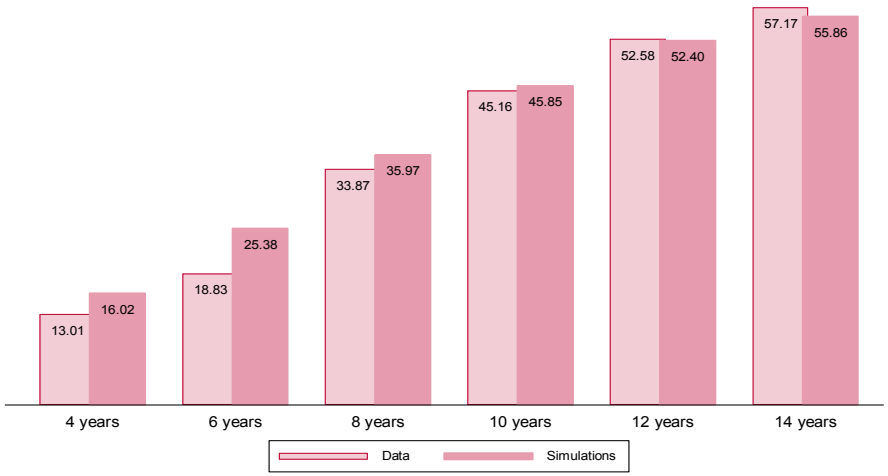
	Data	Model
Transition rate from married to divorced if		
no conflict in previous period	3.93	11.74
conflict in previous period	7.90	12.60
% of divoced fathers x period paying $0 for child support	39.39	38.95
Yearly amount of child support per child		
including $0	$1,686	$1,704
excluding $0	$2,961	$2,792
Number of children born within first marriage	1.47	1.61
Distribution of number of children born within first marriage (%)		
no kids	24.06	20.55
1 kid	23.06	28.55
2 kids	35.13	20.21
3 kids	17.76	30.69
Age of Wife at		
1st birth	27.81	27.10
2nd birth	30.42	28.05
3rd birth	32.06	31.25

Table F.1: Fit of the Model (cont.)

	Data		**Model**	
Difference in test scores between children of married and divorced parents (average of within-age differences)	1.03		0.94	
Distribution of total time spent by father with his children (>=8)	divorced	married	divorced	marrried
0 to 1.5 hours per day	67.07	42.32	78.96	39.90
1.5 to 4.5 hours per day	29.23	57.65	21.04	60.10
Distribution of total time spent by mother with his children (>=8)	divorced	married	divorced	married
0 to 1.5 hours per day	60.77	30.29	35.17	9.37
1.5 to 4.5 hours per day	39.23	69.71	64.83	86.06
Hourly wage of females		$13.21		$14.48
Hourly wage of males		$17.34		$17.75
Female earnings				
if married		$26,697		$28,373
if divorced		$24,383		$29,123
Male earnings				
if married		$38,999		$38,873

Figure F.1: Child Test Scores by Age

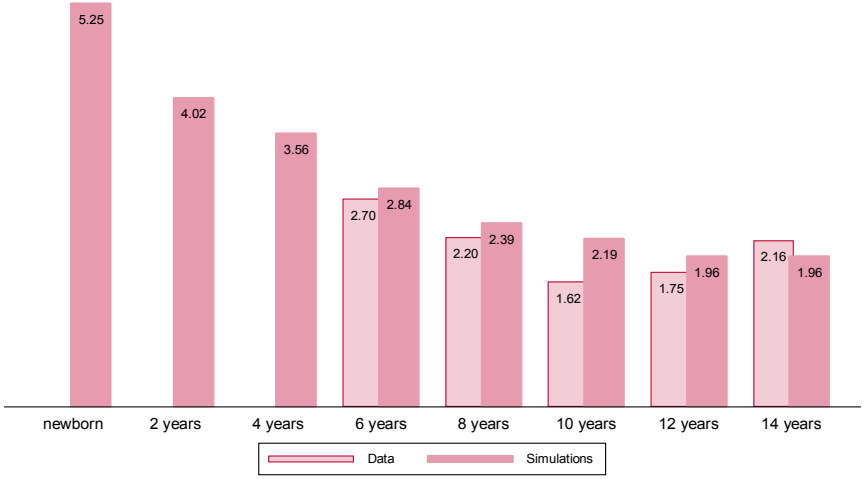
Actual data versus Simulated data



Population: all children

Figure F.2: Hours per Day Spent by Mother with a Child

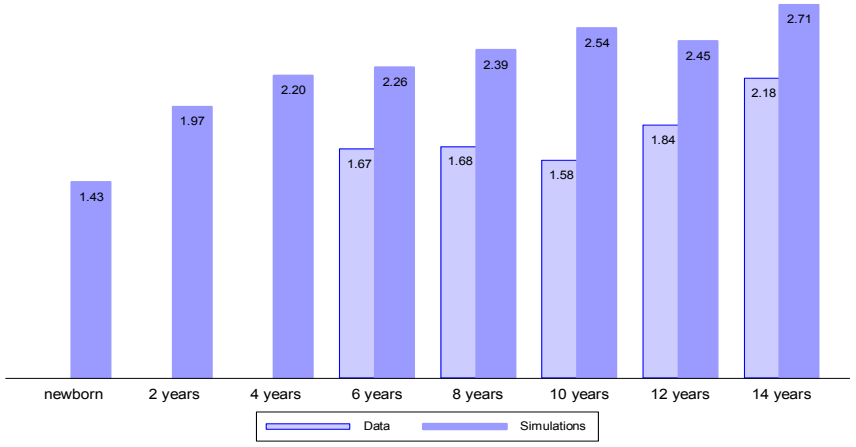
Actual data versus Simulated data



Population: all children

Figure F.3: Hours per Day Spent by a Married Father with a Child

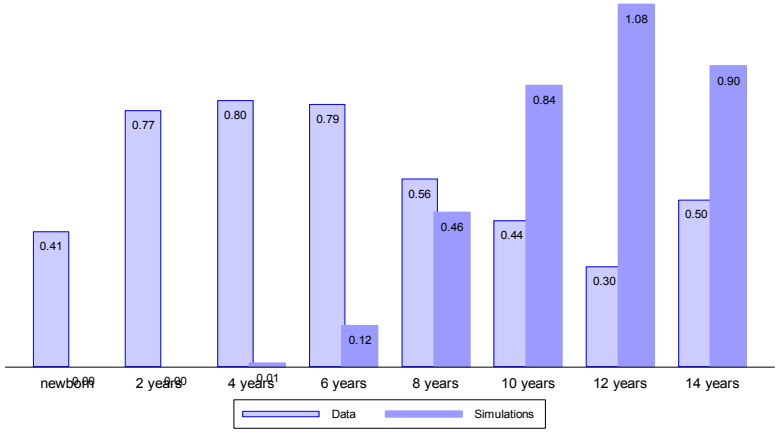
Actual data versus Simulated data



Population: all children

Figure F.4: Hours per Day Spent by a Divorced Father with a Child

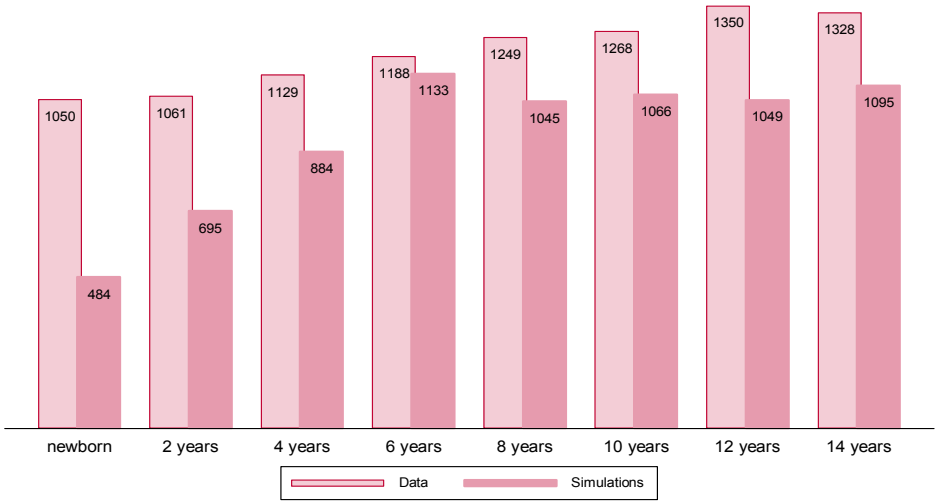
Actual data versus Simulated data



Population: all children

Figure F.5: Hours Worked per Year by Married Mothers

Actual data versus Simulated data



Population: all married mothers

Figure C.1: Distribution of the Change in a Child's Cognitive Achievement
(No Divorce minus Baseline)

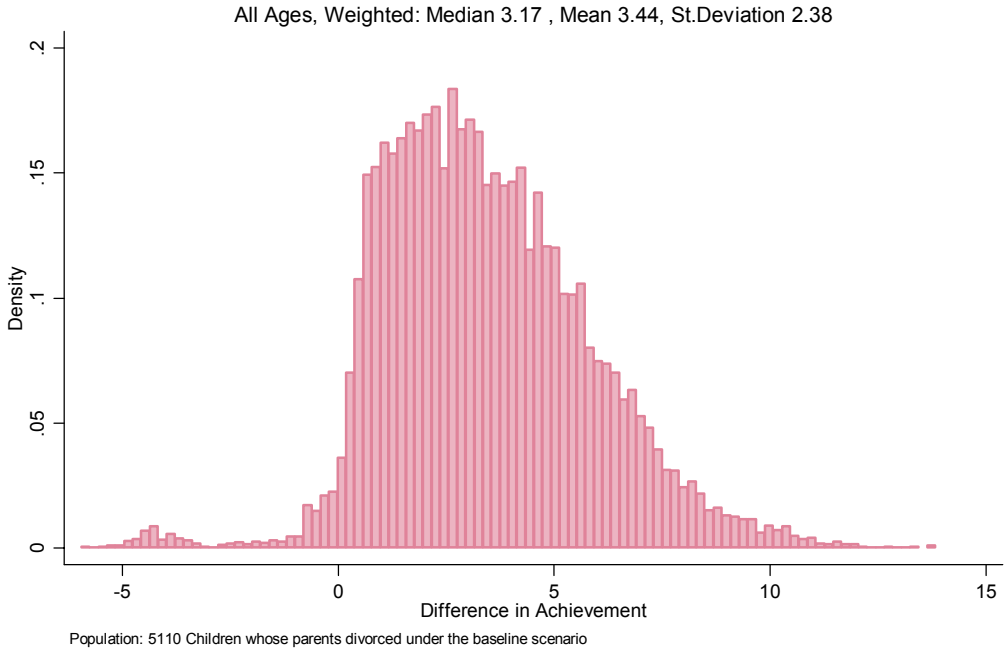
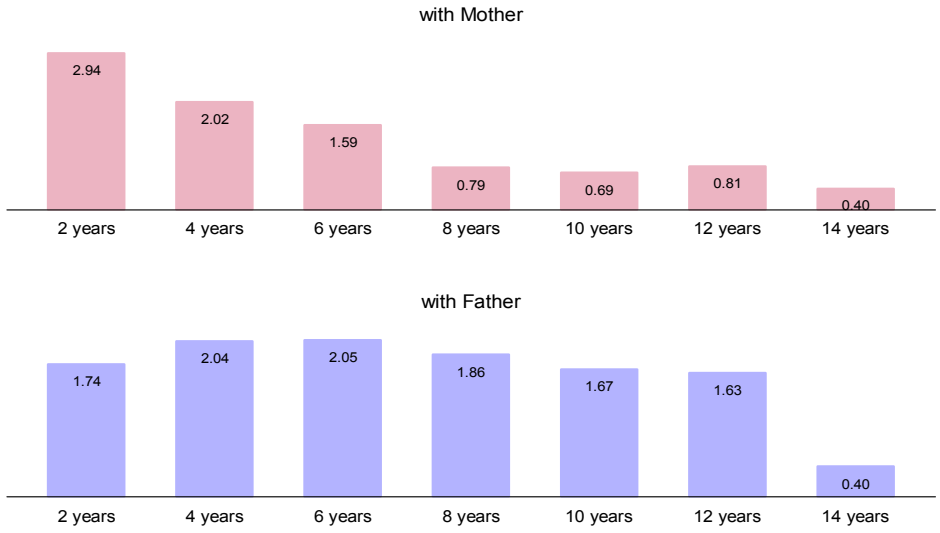


Table C.1: Characteristics of Parents whose Child's Change in Test Scores is in the Tails of the Distribution

	Change in Child Test Score is in	
	Bottom 10th percentile	Top 10th percentile
Characteristics of Parents:		
Distribution of Education of Mother (%)		
Less than High School	5.44	3.83
High School	42.18	41.10
Some college	23.54	19.61
College and above	28.85	35.46
Distribution of Education of Father (%)		
Less than High School	14.85	7.51
High School	42.04	33.96
Some college	19.10	16.98
College and above	24.01	41.55

Figure C.2: Within-Child Difference in N. of Hours per Day a Child Spends with Each Parent
Baseline versus No Divorce Scenarios, Averages by Age of Child

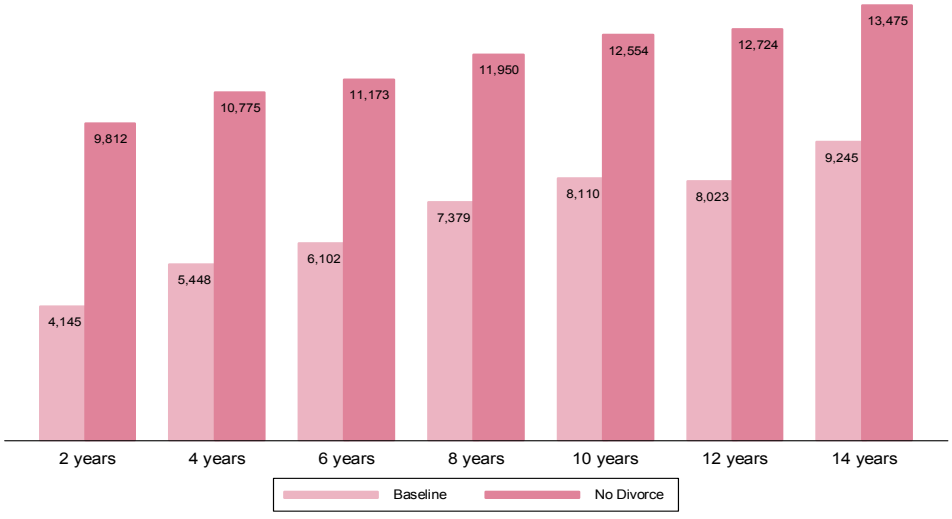


Population: 5110 Children whose parents divorced under the baseline scenario

Table C.2: Transition Rates for Time Spent by a Parent with a Child: Baseline versus No Divorce

Hours per Day		*No Divorce*	
	0 to 1.5	0 to 1.5	0 to 1.5
Baseline			
Mother			
0 to 1.5	38.83	53.84	7.33
1.5 to 1.5	3.38	91.7	4.92
Father			
0 to 1.5	28.52	71.48	
0 to 1.5	22.78	77.22	

Figure C.3: Financial Resource invested in a Child per Year (in 2000 $)
Under the Baseline and the No Divorce Scenarios, by Age of Child



Population: 5110 Children whose parents divorced under the baseline scenario

Figure Z.1: Arizona's Schedule of Basic Support Obligations

Figure Z.2: Arizona's Schedule of Basic Support Obligations
(as % of gross income)

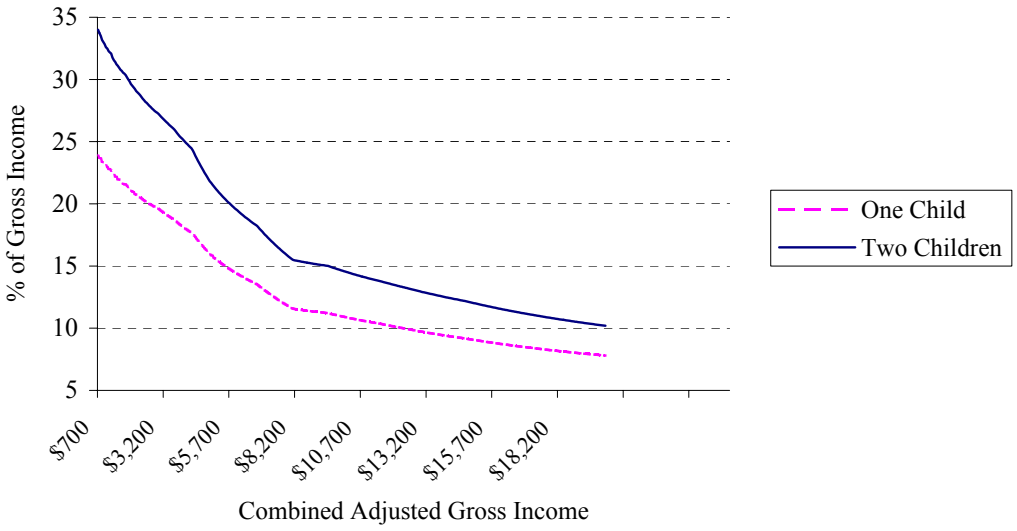


Table Z.1: Perfect Enforcement of Arizona's Guideline

	Baseline	Arizona
Number of children born within first marriage	1.61	1.65
% of couples divorcing		
all	30.61	30.12
of which		
with no children	45.29	49.59
with 1 child	37.28	37.65
with 2 children	17.42	12.76
Age of wife at divorce	29.50	29.39
% of couples that have ever had conflict	63.98	50.59
% of couples x periods with conflict	30.55	24.52
% of divoced fathers x period paying $0 for child support	38.95	0.21
Yearly amount of child support per child		
including $0	$1,704	$5,979
excluding $0	$2,792	$5,992

	Baseline	Arizona
Financial Resources Invested in a child per year		
within marriage	$10,488	$9,737
when divorced	$4,615	$2,746
Average N. of Hours per day spent by father with child		
divorced	0.69	0.50
married	1.96	1.85
Average N. of Hours per day spent by mother with child		
divorced	1.82	1.77
married	4.00	4.44
Test Scores by Age		
4	15.95	16.02
6	25.36	25.38
8	36.23	35.97
10	46.2	45.85
12	52.87	52.40
14	56.32	55.86

Figure Z.3: Mothers' Labor Supply: Baseline vs Arizona