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EMPIRICAL ESSAYS IN FAMILY STRUCTURE AND EARLY CHILD OUTCOMES

By

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ABSTRACT

Empirical Essays in Family Structure and Early Child Outcomes

By

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This dissertation empirically explores the issues surrounding family structure in the United States and its consequences for the outcomes of young children. It highlights the instability hypothesis, which holds that the father's sporadic presence in the household lowers cognitive performance and exacerbates behavioral problems in young children. In addition, the de-institutionalization of marriage and the family in recent years has made the study of committed unmarried couples relevant to the discussion of family structure and child wellbeing. As a result, adverse outcomes for young children and factors linked to family dissolution among married and cohabiting couples are studied in detail.

The first chapter investigates how a father's presence in the household affects child cognitive performance as measured by the revised version of the Peabody Picture Vocabulary Test (PPVT-R). By meticulously defining all possible forms of paternal presence, while holding mother's presence in the household constant, the model distinguishes between *stability and family structure effects* of paternal presence. The empirical findings show that cognitive outcomes are statistically similar for children in stable single-parent and stable two-parent households. However, unstable family structures, characterized by a father's sporadic presence in the home, are shown to have adverse effects on cognitive performance compared to the stable single-parent family

structure. The profound implication of these findings is the importance of family stability relative to family structure in producing positive child cognitive outcomes.

The second chapter empirically tests the long-held view that parental incarceration negatively impacts child wellbeing. Stemming from the findings of the first chapter, all absences are not created equal. As such, the study will distinguish between the effect of a father's incarceration on the cognitive and behavioral development of the pre-school aged child and the effect of his absence in general. The findings suggest that when both incarceration and absence are treated as endogenous in the model, where identifying instruments are used for both in instrumental variables (IV) estimation, the effect of paternal incarceration is not observed to be statistically different from the effect of his subsequent absence.

The third chapter investigates the factors that influence the probability of family dissolution and explore whether the hazard of dissolution is characterized by duration dependence. Unlike previous works, this study goes beyond the examination of unions formed through marriage only, in order to observe unions formed through cohabitation as well. Factors such as age, race, education, religion and cohabitation are shown to significantly influence the risk of union dissolution. Religion and religiosity are shown to be especially important to union survival among cohabiting couples relative to married couples. The study finds no evidence of duration dependence among unions once marital status and other indicators of relationship quality are controlled for in the model.

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1.1. Introduction

Non-traditional and single-parent family structures are a growing phenomenon in the United States. According to the U.S. Census Bureau Current Population Reports, in 1996, 25.4% of all children under eighteen had only one parent in the household. This figure rose to 27.3% in 2002; during this period, over 80% of single-parent family households were headed by single mothers. The issue therefore remains as to how children are being affected by the growing trend of family structures, in which the father is seldom in residence. This study will examine how paternal presence in the household and stability of the family structure impact the child's cognitive development.

The fundamental identification problem in answering this question is that unobserved characteristics such as parental values, preferences and innate ability are potentially correlated with both paternal presence and child outcomes – a situation which could severely bias the estimated effect of paternal presence (Lang and Zagorsky, (2001) and Painter and Levine, (2000)). The problem can be addressed by including numerous family background and individual covariates to attenuate omitted variable

bias and subsequently make causal inferences (Antecol and Bedard, (2007); Lang and Zagorsky (2001); Painter and Levine (2000)). I employ this approach to address the identification problem using data from The Fragile Families and Child Wellbeing Study (FFCWS), which provides very rich data on family structure as well as a plethora of family background, household and individual correlates.

Prior studies have focused on the outcomes of adolescent children and the outcomes of adults who grew up in single-parent households (Antecol and Bedard, (2007); Corak, (2001); Lang and Zagorsky, (2001); Painter and Levine, (2000); Sandefur and Wells, (1997)). However, there is still much to learn about the impact of family structure on outcomes for young children, particularly pre-school aged children. Parental investments during early childhood years may significantly impact the brain development of the child, thus affecting cognitive skills and accordingly, human capital accumulation (Heckman (2000); Ruhm, (2004)). It is therefore imperative to investigate how the family setting affects early cognitive development due to the momentous impact this may potentially have on skills of the future labor force.

The outcome variable used to evaluate cognition is the revised version of the Peabody Picture Vocabulary Test (PPVT-R), as it conveniently serves as a measure of cognitive ability and academic readiness. Unlike Antecol and Bedard (2007) and Lang and Zagorsky (2001), the study finds no statistically significant effects of paternal presence when the indicator is defined as a continuous variable. However, once the model meticulously specifies all family structure types brought about by variations in paternal presence, the *stability effect* is clearly observed. First, the study finds that child cognitive performance within the stable two-parent family structure is not statistically

different from performance within the stable single-parent family structure. Second, unstable family structures, where paternal presence in the household is sporadic, yield more negative outcomes for the child than the stable single-parent household. In general, children of unstable families score on average about 1/5 of a standard deviation lower than children of stable single-parent families. Two-parent families are not shown to necessarily yield better cognitive outcomes than single-parent families and as such, the *family structure effect* is not substantiated by this study. The main implication of these findings is that when it comes to the cognitive development of pre-school aged children, the stability of the family structure is more important than the family structure type.

The paper is organized as follows. Section 1.2 provides a brief review of past works that examine the effect of paternal presence in the home. Section 1.3 describes a simple theoretical framework from which the model specification was derived. Section 1.4 discusses the econometric issues associated with measuring the effect of paternal presence. Section 1.5 gives the data description and descriptive statistics of the variables used in the model. Section 1.6 discusses the OLS regression results and robustness checks; Section 1.7 concludes with a summary of the findings and policy implications.

1.2. Literature Review

Child outcomes are not only shaped by the genetic endowments of parents, but also the allocation of resources within the household. Parents have genetic endowments such as health and intelligence that are considered heritable and thus, are passed on to children directly (Haveman and Wolfe, (1995); Scott-Jones, (1994)). Therefore, a child will inherit intellectual and health endowments from his/her parents regardless of the family

structure. However, parental genetic endowments also affect child outcomes by influencing the level and allocation of resources within the household. Family dissolution ultimately influences the resources devoted to child development. A highly intelligent and healthy father living in the household could significantly increase household income and subsequently the investments of both time and goods devoted to the child (Haveman and Wolfe, (1995)). The mother could also increase her time allocation within the household and her interaction with the child as a result (Scott-Jones, (1994)).

These arguments suggest that paternal absence could have deleterious effects on the cognitive performance of the child. Furthermore, the timing of paternal absence may also have varying effects (Haveman and Wolfe, (1995); Seltzer, (1994)). Using sibling comparisons, studies have shown that children exposed to paternal absence for a longer period of time experience more pronounced negative effects (Ermisch and Francesconi, (2001); Sandefur and Wells, (1997); Sutton-Smith et al., (1968)). However, the assumption must be made that siblings respond to paternal absence in the same way and that parents treat all children equally. There is also the selection problem associated with using sibling comparisons – it limits the analysis sample to families with multiple children (Sigle-Rushton and McLanahan, (2002)).

Other studies examine and exploit the reasons for paternal absence. Divorce for instance, as a cause of paternal absence, is much more endogenous than paternal loss through death (Corak, (2001); Lang and Zagorsky, (2001)). Divorce or separation may be caused by pre-existing factors and consequently, father absence would be endogenous in the model. Paternal absence through death, on the other hand, is arguably

more exogenous since it is not expected to be correlated with pre-existing factors[1]. Lang and Zagorsky (2001) exploit the exogenous variation provided by paternal death and concluded that this event decreased the probability of a son being married.

It is traditionally believed that paternal presence in the household yields positive repercussions for family and child outcomes. However, it has been shown that father presence may not be as important as previously thought (Corak, (2001); Lang and Zagorsky, (2001)). Lang and Zagorsky (2001) found that when family background and individual characteristics were controlled for, there was not much evidence of the positive impact on outcomes that one would expect (with the exception of father's death lowering the chances of the son being married). In particular, paternal absence had only modest effects on child cognitive ability as measured by the Armed Forces Qualification Test (AFQT).

Using a similar methodology however, Antecol and Bedard (2007) buttressed the traditional hypothesis on the importance of father presence, concluding that children were indeed "better off" the longer the biological father lived in the household. They found that an additional 5 years living with a biological father reduced the probability of outcomes such as smoking, drinking, convictions, marijuana use and pre-marital sexual activity.

Recently, there have emerged works that examine the stability of the family structure. Cavanagh and Huston (2006) showed that family instability was strongly associated with teacher and observer reports of child behavioral problems. Fomby and Cherlin (2007) bolstered these findings, noting that multiple family transitions produced

[1] If father's death is due to risky lifestyle choices such as dangerous occupations, criminal activities, unhealthy eating or drinking, death is arguably no longer an exogenous event.

more negative developmental outcomes than stable two-parent and even stable single-parent family structures. Similarly, Osborne and McLanahan (2007) concluded that partnership instability moderately contributed to behavioral problems in young children up to three years old.

Cavanagh and Huston (2006) hinted at the importance of unraveling family structure as a dynamic process rather than observing it in its discrete form. Instead of examining paternal presence as a continuous variable with a unique effect, the purpose of this study is to explore the possibility of multiple effects on the child's cognitive development by meticulously detailing all family structure types generated from variability in paternal presence over time.

1.3. Simple Theoretical Framework

The model is based on the following production function:

$$Y_i = F(T_i, P_i, H_i, X_i) \qquad (1)$$

where Y denotes the child's PPVT-R score as a measure of child output, T is a vector of variables modeling family structures, P is a vector of parental attributes affecting the productivity of time inputs, H denotes measures of household income and X is a vector of individual and family background covariates affecting performance[2].

The family structures are depicted as a tree diagram, in which the mother's presence is held constant while the father's presence is allowed to vary (see Figure 1.1). Binary variables are created to represent each form of paternal presence. Paternal

[2] Leibowitz (1977) employs a similar theoretical framework to show the effect of quality of time inputs on child output measured by the PPVT.

presence is specified in this way to examine how the stability and presence of a father impact the child's cognition simultaneously. These issues for children in their early developmental stages of learning (pre-school) have yet to be critically analyzed together, and this model specification will allow me to do exactly this.

It should be noted that these measures do not speak to the quality, but rather to the quantity of time the father spends in the home. Nevertheless, we expect that paternal presence (whether through marriage or common-law union) will have a positive impact on child cognitive ability. It is also important to reiterate that if the father is not consistently present in the home, a negative disruptive effect may ensue. The child's adjustment to untimely paternal shifts into or out of the household could detract from the quality and quantity of interaction time between the parent and the child (Amato and Booth, (1991); Cherlin, (1978); Seltzer, (1994)). In addition, family disruption may cause stress for parents as well as the child, generating parental aggravation and even child behavioral problems (McLanahan, (1985); Sandefur and Wells, (1997); Wu, (1996)).

Parental attributes such as schooling and substance abuse, P, affect time inputs and child cognitive ability and should be extensively controlled for in order to reduce omitted variable bias. In addition, higher household income, H, is assumed to have a positive effect on the child's PPVT-R score because more goods and services that foster educational development can be purchased (Leibowitz, (1977)). Individual and family characteristics, X, include the child's birth order, sex, race/ethnicity, father figures present in the home and household size. (See Table 1 for the full list of control variables.)

1.4. Econometric Approach

The production function (1) given above can be estimated as:

$$Y_i = \sum_{k=1}^{m} \delta_k T_{ki} + P_i \beta_1 + H_i \beta_2 + X_i \beta_3 + \mu_i + \varepsilon_i \qquad (2)$$

where Y denotes the child's PPVT-R score and T is the set of *m* family structure types engendered by variability in paternal presence; δ_k shows the effect of different family structures on cognitive performance. Father's time in the household as well as parents' education and income are potentially correlated with time-invariant and unobserved innate ability, parental values and preferences (captured by μ).

Since the Fragile Families dataset includes the Wechsler Adult Intelligence Scale – Revised (WAIS-R[3]) scores for both parents, I argue that these scores can be used as proxy variables for parents' cognitive ability. In addition, the dataset supplies several proxy variables for parental values and preferences (see Table 1 (section D) for the complete list of proxy variables, Z). If these variables are valid proxies for unobserved characteristics, listed above, the OLS estimator, δ, will be arguably unbiased: δ is expected to be upwardly biased if unobserved heterogeneity is not effectively addressed. The methodology of dealing with omitted variable bias in this way is formally known as the *Proxy-Variable OLS Solution* (Wooldridge, (2002) pg. 63-64). I argue that the proxy variables for parental ability, tastes and preferences, Z, are valid in that they are *redundant* (i.e. they can be ignored as long as μ and the

[3] The questions are acquired from the Similarities subtest expected to measure verbal concept formation and reasoning abilities (Wechsler, (1981)).

independent variables are directly controlled for) and once they are accounted for in the model, yield no correlation between μ and the independent variables. Put simply, once Z is incorporated into the model, the endogenous variables and Z should not be correlated with ε.

The reduced-form model becomes:

$$Y_i = \sum_{k=1}^{m} \psi_k T_{ki} + P_i \alpha_1 + H_i \alpha_2 + X_i \alpha_3 + Z_i \alpha_4 + \nu_i \qquad (3)$$

where Z represents the proxy variables for innate ability, parental values and preferences usually unmeasured in previous studies.

Prior studies have exploited variation from parental loss through death as well as sibling composition to attenuate omitted variable bias (Lang and Zagorsky, (2001); Sandefur and Wells, (1997)). However, as discussed in section 1.2, using these methods may introduce other sources of bias into the model. Exploiting sibling comparisons, for instance, requires the assumption that siblings receive equal parental investments; moreover, the analysis sample is restricted to only those families with multiple children (Sigle-Rushton and McLanahan, (2002)). Paternal death may also be endogenous in the model if death is caused by endogenous factors such as lifestyle and occupational choices. Furthermore, it cannot be used to examine multiple effects of paternal presence.

If the main observed and unobserved characteristics can be directly controlled for in the model using a rich set of control variables along with the proxy-variable OLS solution, then arguably the "true" impact of father's presence on child cognitive

performance can be isolated. The FFCWS aptly offers a wealth of data in which once unobserved and unmeasured characteristics can now be directly controlled for in the model. Even though this econometric method is not as elaborate as those employed in previous studies, omitted variable bias will be effectively attenuated without introducing other sources of bias.

1.5. Data Description

The Fragile Families and Child Wellbeing Study (FFCWS) supplies rich and detailed information on family structure, family characteristics and conditions. It follows a sample of approximately 5,000 children born between 1998 and 2000. Follow-up interviews were conducted at one, three and five years thereafter. For this analysis, I will only use data from the baseline, the one-year and three-year follow-up interviews.

The baseline interviews of both parents occurred shortly after the child was born, when both parents were likely to be present in the hospital for the birth of their child. As a result, the study was able to interview about 75% of all unmarried fathers in the sample – the cohort that is usually under-sampled in many surveys. Moreover, because both parents were interviewed at the baseline, data on missing fathers are also made available through the mother's responses.

The FFCWS uses stratified random sampling as the means of recruiting parents to be a part of the sample population. Of all 77 large cities in the United States with a population of 200,000 or more, 16 of these were randomly sampled. It is important to note that there are 20 cities that comprise the total FFCWS sample. However, 4 were

non-randomly selected as they were of special interest to specific foundations of this Study[4].

The cities were stratified according to policy milieu and labor market conditions. All cities were scored on their welfare generosity, the strength of the child support system and the state of the labor market. The indicators for welfare generosity are measures of the dollar value of monthly welfare payments; the strength of the child support system was determined by paternity establishment and the number of AFDC cases given awards and payments; labor market conditions of a city were primarily determined by unemployment rates.

For welfare generosity, the stringency of the child support enforcement system and labor market conditions, cities were scored then ranked in categories of strong, moderate or weak. A city is classified as 'extreme' if it ranked in the strong or weak categories (top or bottom quartiles of total points respectively) for all three policy regimes. Cities that had extreme values fell into one of eight possible cells. For instance: (i) generous welfare, stringent child support enforcement, and strong labor market; (ii) generous welfare, stringent child support enforcement, and weak labor market; (iii) insufficient welfare, stringent child support enforcement and strong labor market, etc. This represents different combinations of extreme forms of welfare, child support, and labor market regimes. Within each of these eight 'extreme' cells, 1 city was randomly chosen and over-sampled, providing about 325 births to the sample population. These cities were over-sampled in order to maximize variation in policy regimes. In total, there were 12 cities over-sampled – the 8 'extreme' cities and the 4

[4] These cities include: Detroit, MI; Oakland, CA; San Jose, CA; Newark, NJ

selected for specific foundations[5]. Approximately 100 births were sampled from each of the other 8 'non-extreme' cities with moderate policy regimes or labor market conditions; this helped facilitate the detection of non-linearities as well as create a nationally representative sample of non-marital births.

After the cities were selected, hospitals were then sampled such that each city sample was representative of non-marital births for that city. However, sampling hospitals within each of the twenty cities was not uniformly executed. First off, there were five cities in which there were only 5 birthing hospitals or less: Oakland, CA; Austin, TX; Newark, NJ; Richmond, VA and Corpus Christi, TX. Consequently, all hospitals in these cities were sampled.

By contrast, the other 15 cities had more than 5 birthing hospitals. For 12 of these, the hospitals were rank-ordered such that the hospital with the most non-marital births was sampled first; sampling would continue in descending order until the sample was representative of the non-marital births for that city – usually about 75%. Hospitals in New York, NY and Chicago, IL, were not rank-ordered using this rule[6]. These cities had numerous birthing hospitals and consequently, there was less need to secure the participation of any one hospital. Only hospitals with over 1,000 non-marital births per year were randomly sampled in New York, NY and Chicago, IL.

The sample frame for each hospital was a list of beds in the maternity ward. The design of the Study was to over-sample non-marital births and as such, non-marital births were sampled until a pre-set quota, based on 1996-1997 non-marital birth rates in

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[5] These 8 extreme cities are: Indianapolis, IN; Austin, TX; Boston, MA; Santa Ana, CA; Richmond, VA; Corpus Christi, TX; Toledo, OH; New York, NY.

[6] Hospitals in Philadelphia, PA, were also not rank-ordered using this rule. 63% of non-marital births to city residents were sampled from six of the eighteen hospitals.

each hospital, was reached. Marital births were also sampled until a pre-set quota was reached. Some parents were inevitably ineligible to be a part of the Study: (i) those parents under 18 in hospitals where interviewing under-18 parents was prohibited; (ii) fathers who were dead at the time of the child's birth; (iii) mothers who were not sufficiently fluent in English or Spanish to complete the interview; (iv) those parents who intended to give the child up for adoption.

There are implications for the use over-sampling of non-marital births on the estimation results. Not only will it affect the generality of the findings, but also the efficiency of the estimators. I have included city indicators in each regression in order to control for the idiosyncratic differences among cities, upon which over-sampling was based. Over-sampling is not expected to affect the consistency of the estimators so long as I have specified the model correctly.

1.5.1. Description of Variables in the Model

The child outcome that will be examined in this study is the revised version of the Peabody Picture Vocabulary Test (PPVT-R). The PPVT-R has two aims: (1) to test the respondent's receptive vocabulary capabilities for standard English and (2) to test the respondent's verbal ability[7]. The PPVT-R is also often used as a measure of academic readiness for pre-school aged children and hence is salient to examine.

Even though the PPVT-R is useful in measuring English Language proficiency and can even be useful to test respondents with mental and language impediments, one caveat is that it only serves as a reliable indicator of verbal ability for those living in an

[7] The PPVT-R is administered by the examiner, selecting a 'picture plate' which shows four different black and white images. The examinee must choose the image that best describes the stimulus word spoken by the examiner. American Guidance Service, Inc.
http://www.state.tn.us/education/ci/cistandards2001/la/cik3assesmentfolder/cik3rapeabodypicture.htm

environment where English is principally spoken. For instance, the PPVT-R scores of Hispanic and Latin-American children in the sample may not be reliable indicators of their cognitive skills. Consequently, the language chiefly spoken in the household must be controlled for (in some form) if the PPVT-R is to accurately measure the verbal ability of these children[8].

For the test, the child has to identify the picture that best describes the noun or the verb spoken by the examiner (Jeruchimowicz et al., (1971)). The PPVT-R is generally administered to individuals over the age of 2.5 years. The data on the PPVT-R are provided in the 36-month In-Home Longitudinal Study of Pre-School Aged Children (a module of the FFCWS). As a result, only a single cross-section of the data can be used for the purpose of analysis. This immediately reduces the analysis sample to only 2,368 respondents. The average age of the child at the time the test was administered was approximately 38 months, underscoring the importance of controlling for as many factors influencing the child's cognitive performance as the data will allow.

Table 1 shows the summary statistics of all the variables included in the model. The outcome measure is the child's PPVT-R standardized score and the independent variables include measures of paternal presence, parental attributes, income, family background, household conditions and proxies for parents' ability, values and preferences. The standardized form of the PPVT-R score was chosen because it adjusts for the mental age-score of each child.

1.5.2. Measures of Paternal Presence

[8] I include variables indicating whether the mother was interviewed in Spanish as well as parents' region of birth as proxy variables for chief language spoken in the child's household.

The analysis sample is restricted to those children who live with their mothers all (or most of) the time[9]. This ensures that any disruptive effect from paternal movement is not conflated by the disruptive effect that will possibly ensue from maternal movement into or out of the household. However, this restriction may introduce bias from sample selection because there are idiosyncratic differences between mothers who are primary caregivers and mothers who are not. Nevertheless, the vast majority of mothers in the sample are primary caregivers to the focal child and so we can argue that any selection bias caused by this restriction would be inconsequential. The restriction reduces the analysis sample from 2,368 respondents to 2,202 respondents. The final sample used for analysis is 1,745 respondents due to missing data for many of the covariates.

The central question needed to derive the family structure types is: *"Has the biological father ever been present in the household?"* From this question, different measures of paternal presence can be determined (See Figure 1.1). From Figure 1.1, we get the following measures:

1) Biological father present in the home since child's birth and married to mother
1) Biological father present in the home since child's birth and cohabits with mother
2) Biological father is no longer present in the home and mother is now married to social father[10]
2) Biological father is no longer present in the home and mother now cohabits with social father
3) Biological father is no longer present in the home and mother is now single

X) Social father is present in the home since child's birth and married to mother
X) Social father is present in the home since child's birth and cohabits with mother

[9] Ideally, I would like to restrict the analysis sample to children living with their mothers all the time. However, in the third-year follow-up interview, the mother is asked if the focal child lives with her "all or most of the time." As a result, all primary caregivers are grouped together despite the implications for instability.

[10] To simplify the various measures of paternal presence, I define "social father" as a man (who is not the child's biological father) living and romantically involved with the focal child's mother.

4) Biological father has never been present in the home but the social father is now married to mother
4) Biological father has never been present in the home but the social father is now cohabiting with mother
5) Interim relationships
6) Biological father has been completely absent and mother has been single since child's birth

Since the FFCWS does not ask the mother about a possible social father in the home at the baseline, it cannot be observed whether the social father had been present in the home since the child's birth. Therefore, the two measures associated with the social father's stable presence in the household (X) cannot be directly specified in the model[11].

I define an interim relationship as a cohabitational relationship that initiated and/or dissolved between the baseline and third-year follow-up interviews. Interim relationships could potentially include any of following family transitions:

{father present at birth, absent at one-year follow-up and returns by third-year follow-up; father absent at birth, absent at one-year follow-up and enters the home by the third-year follow-up; father absent at birth, present at one-year follow-up and third-year follow-up; father present at birth, social father present at one-year follow-up and father returns by third-year follow-up; father absent at birth, social father present at one-year follow-up, he then leaves and father enters the home by third-year follow-up; no father present at child's birth, social father present at one-year follow-up and mother is again single by third-year follow-up}

[11] These households would likely be captured in measures where the child's father has never been present but the social father is currently present – father's presence can be determined at the baseline while the social father's presence can only be determined in subsequent waves.

If we assume that the effects of marriage and cohabitation on early cognitive development are not statistically different from each other, these numerous measures can be condensed as follows[12]:

1) Biological father has been present in the home since child's birth *(stable two-parent family structure)*
2) Biological father used to be in the home but the social father is now present *(unstable two-parent family structure)*
3) Biological father used to be in the home but mother is now single *(unstable single-parent family structure)*
4) Biological father has never been present in the home but social father is now present *(unstable two-parent family structure)*
5) Interim relationships *(unstable family structure)*
6) Biological father has been completely absent and mother has been single since child's birth *(stable single-parent family structure)*

Consequently, the number of family structures specified in equation (3), m, is equal to 6. These family structures can be classified as: *stable two-parent*, *stable single-parent*, *unstable two-parent* and *unstable single-parent* households.

1.5.3. Descriptive Statistics

Table 1 illustrates that the standardized PPVT-R scores range from 40 to 137 points and the mean for children in the analysis sample is approximately 86 points. This low mean can be attributed to over-sampling of large cities[13] but should not influence the regression estimates. 50% of children lived in stable two-parent households while 20% of children lived with their single-mothers since birth. Moreover, over 1% of children had biological fathers who left but have social fathers present in the household by the mother's third-year interview; almost 11% of children had no social father present after their biological father left. By contrast, 6% of the children in the analysis

[12] The assumption of no statistical difference between marriage and cohabitation fails if the interpretation of cohabitation varies among the mothers of the sample.

[13] These cities include: Austin, TX; Baltimore, MD; Detroit, MI; Milwaukee, WI; Newark, NJ; New York, NY; Oakland, CA; Richmond, VA; San Jose, CA (Reichman et al. (2001)).

sample never had a biological father living at home but now have a social father present; 11% experienced numerous disruptions caused by interim relationships of the mother. These figures reveal that a large percentage of children had their biological fathers present at least partially; however, a much smaller percentage of children had social fathers to fill the role of the absentee biological father.

Table 2 gives the mean standardized PPVT-R scores for each family structure type. The general score means in Panel A show that children of the stable two-parent family type have higher PPVT-R scores on average than children of stable single-parent or unstable family structures. This is what we would expect a priori. However, the means also indicate that children of stable single-mother households have higher scores on average than children of unstable households. This lends credence to the theory postulated by Sandefur and Wells (1997), Wu (1996) and McLanahan (1985) that the stress associated with family disruption creates adverse outcomes for the child. The means also bolster Fomby and Cherlin's (2007) instability hypothesis, which posits that children's developmental outcomes are worse if they experience multiple family transitions as opposed to living in a stable environment. The outcome means insinuate that it is better for a father to be at home all the time than be there intermittently or not at all; it is also better for a father not to be at home at all than to be there intermittently.

The same pattern of results is also clearly evident in Panels B and C where the sample is split by gender in order to observe gender differences in the impacts of paternal presence. The results show that girls have higher average scores in general than boys as expected (Bornstein and Haynes, (1998)).

Table 3 illustrates other independent variables truncated by the following family types: stable two-parent family, unstable family and the stable single-mother family structure. The most striking characteristic is that predominantly (over 70%), black parents and their children represent the stable single-mother household. White and Hispanic parents largely belong to stable two-parent households, with over 30% of white parents and about 25% of Hispanic parents comprising this family type. Parents with at least college education largely constitute the stable two-parent family structure whereas over 25% of parents who were high school dropouts typify the unstable and stable single-mother family types.

72% of fathers and 39% of mothers of stable two-parent families report they use alcohol – more than any other family type. This is not as surprising as it would appear since most fathers and a large percentage of mothers belonging to other family types also use alcohol. Also not surprising is that the stable two-parent family structure is characterized by older parents and higher household income.

Unstable family structures, by contrast, typically display the youngest parents, the most residential moves since the child's birth, the shortest dating period before pregnancy and more mothers with mental or emotional problems compared to any other family type. For stable single-mother households, only 42% of children were breastfed, the lowest among all the family types. Parents associated with the stable single-mother household also have the lowest WAIS-R scores and household incomes.

One caveat in relying on these summary statistics is that they may reflect the use of over-sampling by the FFCWS. Observing the race averages indicate that about 52% of mothers and 55% of fathers in the analysis sample are black (47% of mothers and

49% of fathers in the total sample are black). The national average of blacks in the U.S. population is only about 12%[14]. Consequently, over-sampling directly increased the percentage of blacks in the sample. This provides an explanation for why a large percentage of children lived in stable single-parent households and only a small percentage had social fathers in the sample. Black children are less likely to have a father present in the household than any other racial or ethnic group. Subsequently, the means in Table 1 will be skewed by the use of over-sampling but this should not bias the regression estimators. In fact, it makes for a policy-relevant sample, where the results will yield direct implications for social policy.

1.6. Results

Table 4 presents estimates from a specification similar to those in columns (1) and (2) of *Tables 3 and 4* in Lang and Zagorsky (2001). They use the National Longitudinal Survey of Youth (NLSY) to examine how a parent's absence during childhood affects outcomes in adulthood. I define father's presence as the fraction of time the father has been living with the child, constructed as the total number of years the biological father has spent living with the child divided by the child's age. Column (2) indicates that as father presence increases from 0 to 1, the child's standardized PPVT-R score increases by 5.2 points (about 0.30 standard deviations) when only region-of-birth and interview-year dummies are incorporated in the model. However, when similar control variables to Lang and Zagorsky (2001) are included in Column (1), the impact of the fraction of time a father is present in the household is no longer statistically significant, with the point estimate falling to about 1.2 points. Father's presence has a larger positive impact

[14] U.S. Census Bureau, Census (2000).

on girls' than boys' PPVT-R scores in the simple regression model; however, the effect dissipates for both boys and girls once the relevant control variables are included, challenging the statistically significant, albeit modest effects found by Lang and Zagorsky (2001).

However, if the effect of paternal presence varies by family structure type, then the small and statistically insignificant results displayed in Table 4 should not be surprising. Multiple effects subsumed in a single measure become conflated and thus yield a statistically insignificant estimate.

Table 5 displays the results when the effect of paternal presence is allowed to vary by family structure. Column set (A) are regressions including only city, region-of-birth and interview-year dummies. Standardized PPVT-R scores are higher by about 4 points (0.24 standard deviations) for children of stable two-parent families relative to children of stable single-parent families. In addition, the stable single-parent family structure generates higher scores than if the father and/or social father were present for only a portion of the child's life illustrated by measures (2) and (4). These results underscore the implications derived from the outcome means in Table 2 and lend credence to the instability and stress hypotheses posited by Fomby and Cherlin (2007) and Sandefur and Wells (1997).

When exogenous variables (listed in Table 1) are included in the model in column set (B), the effect of a father's stable presence is no longer statistically different from the effect of his stable absence. The negative effect caused by family disruption is still apparent, nevertheless. In the instance where the biological father has left and the social father is now living in the household, the child is at about a 10-point disadvantage

(about 0.60 standard deviations); similarly, where the father was never present but the social father is currently present, the child's PPVT-R score is about 4 points (0.22 standard deviations) lower than in the stable single-parent case.

Unobserved heterogeneity is expected to upwardly bias the father presence coefficients. Therefore, column set (D) includes proxy variables (listed in section D of Table 1) for parental values, preferences and ability. When these proxy variables are included in the model, the coefficients measuring the father presence effects in general become larger than the coefficients in column (C), where all independent variables except the proxy variables for unobserved characteristics are accounted for. Column set (D) shows that family disruption lowers the child's test scores between 2 and 9 points (between 0.12 and 0.54 standard deviations) relative to the stable single-parent case.

The negative coefficient on *father is no longer present but social father is now present* has the largest magnitude 'across the board' of any unstable family structure defined. However, this family type also represents the fewest number of families (27 in total) compared to the other family types and as such, the large magnitude may just be a reflection of this small sample. Test scores when the father is completely present remains statistically similar to test scores when the father is completely absent, and thus the stability effect holds. What is also interesting is that family structures with two parents do not necessarily yield better outcomes than those with one parent. In particular, unstable two-parent family structures adversely affect child cognitive performance relative to the stable single-parent household. Consequently, the family structure effect is not confirmed by these findings.

Tables 6 and 7 indicate that in the naïve model, girls experience higher scores than boys when their fathers are completely present as opposed to completely absent. This is consistent with the outcome means discussed in the previous section. However, when the full set of variables are incorporated in the model, these gender differences are not as convincing. Depending on the family type, boys in unstable households score between 0.12 and 0.40 standard deviations lower than boys in stable single-mother households and girls in unstable households score between 0.01 and 0.80 standard deviations lower than girls in stable single-mother households when all variables are included in these regressions. These estimates are however, largely statistically insignificant due to small sample sizes.

The only statistically significant estimate belongs to the unstable family structure in which the child's biological father has left and the social father has entered the household. Boys living in this family setting score about 0.35 standard deviations lower than boys in stable single-mother households; similarly, girls belonging to this family type score about 0.75 standard deviations lower than girls living in stable single-mother households. This provides some, albeit weak evidence that during early childhood years, girls may in fact suffer more due to family disruption than boys. The stability effect on cognitive ability remains clearly evident since there is no statistical difference when the child lives in a stable two-parent home as opposed to a stable single-parent one.

1.6.1. The Resource Effect

An unusual feature of this model is the modest mediating effect of resources in the child's household. The resource effect is captured by household income per person

and shows that for an increase of $10,000, the child's PPVT-R standardized score improves by 1 point (results not shown). This estimate is statistically significant at the 5% level but the magnitude (6% of a standard deviation) suggests that the resource effect is surprisingly not as important in this model as one would have expected a priori, particularly because all families in the sample reside in urban areas. Nevertheless, its inclusion bears a strong implication for consistency of the family structure estimators. Column set (E) in Table 5 shows that when the resource effect is unaccounted for, the estimated effect of each family structure type gets smaller (except for the family type in which the father is no longer present but the social father is)[15], indicating upward bias. This reinforces the importance of controlling for as many factors as possible that concurrently influence child cognitive ability and family structure, ensuring unbiased estimators.

1.6.2. Robustness Checks

As stated in section 1.5, twelve large cities were over-sampled. If I have specified my model correctly, over-sampling should not affect the consistency of the estimators. As a sensitivity check however, I generate weighted estimators using national sampling weights from the FFCWS. The results in Table 8 column set (B) show that the weighted estimators are not statistically different from the un-weighted estimators in column set (A)[16].

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[15] This family type includes only 27 observations compared to the other family types, which each have at least 100 observations.

[16] The reason there is a difference in the sample size between the weighted regressions and the un-weighted regressions is that cities that were not randomly selected into the sample were not assigned weights. Of the twenty cities in the sample, Detroit, MI; Newark, NJ; Oakland, CA and San Jose, CA were selected based on special interest to some foundations. As a result, they were not assigned weights in the study.

The identification strategy employed also does not address heterogeneous family treatment effects. Despite mitigating unobserved heterogeneity, my methodology treats all families as identical except for time of paternal exit from or entry into the household. It is salient to note that two families can be identical based on observables at the time of the test despite one father's exit from his family. By controlling for conditions preceding the father's exit from or social father's entrance into the household, families can be distinguished from each other beyond just the look of their present family structure. I incorporate in the full regression mother's education since child's birth, parents' alcohol and drug use for all three waves, household income over all three waves and average number of adults and children in the household over all three waves. These results, as shown in column set (C), corroborate the main findings of the study.

1.7. Summary

This paper adds to the literature by utilizing rich, policy-relevant data to examine the various effects of paternal presence and family instability on child cognitive development. The results show that when an exhaustive set of control and proxy variables are incorporated in the model, the pre-school aged child is not necessarily better off when the father is home all the time as opposed to never being home but he/she is certainly better off when the father is never home as opposed to being home on a temporary basis. The study was therefore unable to reject the conventional hypothesis that stable paternal presence yields better cognitive outcomes than stable paternal absence.

The findings of Cavanagh and Huston (2006), Osborne and McLanahan (2007) and Fomby and Cherlin (2007) are endorsed by this study since a father's partial

presence in the home stunts cognitive development relative to when he is not living in the household at all. The study also adds to this literature by reinforcing the stability effect: there is no statistical difference between the stable single-parent household and the stable two-parent household when it comes to child cognitive development; for children of unstable family structures, their PPVT-R scores are lower by 2 to 9 points (an average of about 1/5 of a standard deviation) relative to children of stable single-parent households. On the other hand, the family structure effect is not supported by these results – unstable two-parent households are found to be worse than stable single-parent households as it pertains to child cognitive performance.

If the proxy-variable OLS solution and extensive covariates sufficiently attenuate unobserved heterogeneity, the causal relationship between paternal presence and child cognitive performance is only apparent in the stability the father generates within the family setting. Paternal presence improves cognitive development through the stability of family structure – any type of paternal presence will not necessarily engender positive results for the child. The stress hypothesis postulated by Sandefur and Wells (1997), Wu (1996) and McLanahan (1985) gives us some insight as to why this might be the case: unstable family structures produce negative outcomes due to the stress and anxiety that accompany each transition. The study was not able to determine whether more family transitions yielded more adverse effects on early cognitive development.

Moreover, the findings of Lang and Zagorsky (2001) and Antecol and Bedard (2007) are not reinforced by this study – the child does not seem to be better off as the father's length of residence increases. However, it is important to note that I cannot

predict how the child would adjust to his/her family transitions over the course of his/her life. Since, the subjects of study are pre-school aged children (average age is 38 months), it cannot be determined whether the negative effects of family dissolution are short-lived or are improved over time. The child may be able to adjust to his/her family structure as time progresses but this clearly goes beyond the scope of this paper. Further, these effects may not extend to other child outcomes such as behavioral problems or substance abuse. Future research may study this in more rigorous detail.

The main policy implication of the findings is the importance of encouraging family stability, as this should help improve the cognitive development of the children affected. There may also be implications for children parented by same-sex couples. If paternal presence only improves child cognitive performance through the stability of the family structure, it is quite possible that same-sex parents within a stable household may engender similar positive cognitive outcomes for their children as well.

Chapter 2.
Paternal Incarceration, Paternal Absence and Early Child Development

2.1. Introduction

By 2001, 2.7% of adults in the United States had been incarcerated, indicating a 50% hike since 1990. More interesting is the fact that 6 out of 10 inmates from 1996 to 2002 were minorities: 40% were black and 19% were Hispanic[17]. Since statistics show that over 50% of all inmates grew up in a single-parent household and 46% had a family member who was previously incarcerated, the increase in incarceration rates could disproportionately affect minority children as well as their parents. This study will investigate the extent to which the incarceration of a central family member – the father – influences developmental outcomes of young children.

The fundamental identification problem associated with this research question is the difficulty in isolating the impact on childhood development of paternal incarceration from the impact of unobserved factors correlated with incarceration. For example, if a criminal offender lived in unfavorable circumstances ex ante, poor child outcomes may simply be another result of the poor pre-existing conditions that also led to the father's incarceration. This problem will be addressed using instrumental variables estimation and a differencing method.

[17] Profile of Jail Inmates (2002), Bureau of Justice Statistics.

Another pertinent question inextricably linked to the research question is whether the effect of paternal absence due to incarceration is statistically different from the effect of his absence in general. The consensus among previous studies is that father absence has a negative effect on child outcomes (Antecol and Bedard (2007); Corak, (2001); Lang and Zagorsky (2001); Painter and Levine, (2000)). However, there is evidence that paternal absence does not always have a negative effect on child development. Jafee et al. (2003) argue that paternal presence may do more harm than good when the father exhibits anti-social behavior. In addition, other studies find that it is the instability of paternal presence (or absence) that engenders negative effects on child wellbeing (Craigie (2008); Cavanagh and Huston (2006); Fomby and Cherlin, (2007); Osborne and McLanahan (2007)).

From these studies, the question arises: "Are all absences created equal?" Would absence due to incarceration be more detrimental because of the circumstances under which the father became absent? Or, would incarceration induce an improved family situation due to the timely removal of an anti-social presence from the household? The study will attempt to distinguish the impact of paternal absence from the impact of paternal incarceration as they relate to early child development.

The data used to examine this problem is obtained from the Fragile Families and Child Wellbeing Study (FFCWS), which meticulously measures paternal incarceration as well as important early child developmental outcomes. Using these data, a prior study by Wildeman (2008) employed fixed effects estimation to show that paternal incarceration amplified aggressive behaviors in boys. In my study, paternal incarceration not only exacerbates aggressive behaviors and ODD symptoms in young children but also lowers

their cognitive test scores. However, when the effect of incarceration is effectively isolated from other factors with which it is correlated, the study finds no statistical difference between the effect of incarceration on child outcomes and the effect of paternal absence in general.

The paper is organized as follows. Section 2.2 provides a brief review of past works that discuss parental incarceration. Section 2.3 gives the data description and summary statistics of the variables used in the model. Section 2.4 explains the identification strategies I use to estimate the effect of paternal incarceration. Section 2.5 discusses the results from the differencing and instrumental variables estimation methods. Section 2.6 includes a summary of the findings and policy implications.

2.2. Background

The most apparent effect of parental incarceration is the strain on economic resources in the household. It is worth noting however, that the strain caused by incarceration does not only refer to economic capital, but social capital as well. Clearly, the structure and quality of family relationships are disrupted by incarceration. Non-resident parents are able to maintain frequent contact with children if they so choose. In the event of incarceration, however, children are more at a disadvantage since the avenue for frequent contact is physically obstructed. Moreover, the incarcerated parent may have been a serious drain on family resources prior to incarceration. He/She may even become incapacitated if the stable and supportive environment of the household is disrupted (*e.g.* due to violence, abuse or negligence). These hypotheses suggest that paternal incarceration may yield positive or negative outcomes for the child.

It can be strongly argued that criminal offenders and men predisposed to incarceration possess traits that frustrate family cohesiveness (Western, (2004)). Subsequently, weak attachment to the family would have occurred even if incarceration did not. Therefore, the factors and influences that predate paternal incarceration also help engender incarceration. Put differently, ex-post conditions are merely a continuation of the pre-incarceration situation. An attempt to simply compare children of incarcerated parents to children whose parents have never been incarcerated (but have similar background characteristics), will yield a biased incarceration estimator. This is because children of criminal offenders are exposed to unobserved factors, which not only increase the probability of parental incarceration, but also persist to adversely affect child wellbeing. Conversely, children whose parents have never been incarcerated are arguably less exposed to these factors and as a consequence, estimates from this simple method of comparison will not be consistent.

A generally unexplored effect of parental incarceration is its effect on the parent-child relationship. Incarceration disrupts the attachment mechanism between the incarcerated parent and the child, especially at early ages. This could possibly lead to both short-term and long-term effects on the child's well-being. Elicker et al. (1992) postulate that attachment of the child to the parent, particularly during infancy, increases social competence among peers. As a result, incarceration is expected to negatively affect child development due to its inherently disruptive nature.

Despite a priori expectations of an adverse effect, there is still much to be determined about paternal incarceration and child outcomes. The views presented above indicate an ambiguous effect of paternal incarceration that could be negative, positive or

even zero. Previous works have shown that family instability produces negative childhood outcomes (Cavanagh and Huston, (2006); Craigie, (2008); Fomby and Cherlin, (2007); Osborne and McLanahan, (2007)). However, is the effect of instability from incarceration different from the effect stemming from other sources of disruption such as divorce or the death of a parent? I examine these differential effects to determine the influence of incarceration on early child cognitive and behavioral measures.

2.3. Data and Variable Descriptions

The data for this analysis come from The Fragile Families and Child Wellbeing Study (FFCWS). It follows a sample of approximately 5,000 children born between 1998 and 2000. Parents were interviewed around the time of the child's birth, with follow-up interviews occurring at about ages one, three and five years thereafter. Data have been gathered on not only the child's developmental outcomes and characteristics, but also on family relationships and demographics of the parents and focal child. Because both parents are interviewed on these issues, the roles of both parents and particularly the father can be examined in detail. This proves to be especially important for the analysis, as it allows father characteristics possibly linked to his incarceration history to be incorporated in the model. Both parents report on the father's past and current incarceration status in the FFCWS, and the data also include a wide array of child developmental outcomes useful for this study. (For more information on the FFCWS data, see chapter 1, section 1.5.)

I will examine cognitive development measured by the Peabody Picture Vocabulary Test-Revised (PPVT-R) and behavioral problems displayed in the forms of aggression and oppositional defiant disorder (ODD). These outcome measures are

currently only given in the 36-month In-Home Longitudinal Study and as such, only a single cross-section of data may be used for estimation.

2.3.1. Early Child Development Measures

i. Peabody Picture Vocabulary Test - Revised (standardized)

The Peabody Picture Vocabulary Test-Revised (PPVT-R) is administered to children over the age of two and a half years old to measure their verbal ability and English Language proficiency. For the test, the focal child must state the noun or verb which best describes the image given on a picture plate (Jeruchimowicz et al., (1971)). The PPVT-R is also commonly used as a measure of academic readiness among pre-schoolers and is reliable even for those children with mental and language impediments. However, for children living in a household where English is not predominantly spoken, the PPVT-R does not reliably predict verbal ability. To control for this, I will incorporate in the model parents' region of birth as well as an indicator for whether the mother was interviewed in Spanish. PPVT-R scores are also standardized to adjust for the chronological mental age-score of the child.

ii. Aggression

Aggressive behavior disorders in a child are shown by acts undeniably intended to hurt or destroy a person, animal or object (Grusec and Lytton, (1988); Maccoby, (1980); Shaw and Giovanelli, (2000)). However, to accurately diagnose aggressive behavior disorders, one must be able to determine intentionality (Shaw and Giovanelli, (2000)). There are nineteen acts of aggression and defiance listed in the In-Home Longitudinal Study (see Appendix B) but intentionality of these

acts is indistinct. Even though intentionality and thus a conduct disorder cannot be diagnosed in this instance, it does not negate the importance of examining aggression in children, since incarceration and criminal propensities are often preceded by such misguided behaviors during childhood (Robins, (1978); Sampson and Laub, (1992); Wildeman, (2008)). Thirteen of the acts of aggression are averaged to create an index, ranging from 0 to about 2, with 0 indicating the least aggression[18].

iii. Oppositional Defiant Disorder (ODD)

Oppositional Defiant Disorder (ODD) can be described as recurrent disobedient, defiant and aggressive acts, particularly towards those in authority (Greene at al. (2002)). Unlike the aggression outcome measure, ODD is an actual conduct disorder. The In-Home Longitudinal Study provides six symptoms of ODD (see Appendix B) that are requisite for the diagnosis of this type of conduct disorder. These symptoms are averaged to create the child's ODD index, which ranges from 0 to 2, with 2 being the most defiant. Social factors such as poverty and family disruption are thought to increase the probability of diagnosis and will be incorporated in the model accordingly (Steiner et al. (2007)).

2.3.2. The Incarceration Measures

The father's incarceration history and status is inferred from information provided by both parents in the FFCWS. Mothers are asked about the fathers' current incarceration status and whether the father has ever been incarcerated. Fathers are asked about their current incarceration status and also about their most recent incarceration and release. It

[18] Note here that each individual measure ranges from 0 to 2 but averaging all measures creates a maximum of 1.92.

is important to note that mother and father interviews are conducted at different times, and hence, if one parent declares the father currently incarcerated but the other does not, this does not necessarily mean that either of the reports is inaccurate. The father could have been jailed and released prior to the other parent's interview but this information is not easily verifiable[19].

As a result, a father will be coded as having been incarcerated after the child's birth (i.e. incarceration ex post) if either parent reports in any interview that the father is currently jailed or if the father reports that he was recently incarcerated after the child's birth. Father's incarceration before the child's birth (i.e. incarceration ex ante) is difficult to determine from the data. Since follow-up interviews do not occur annually, the jail and release period could easily have transpired between interviews, so that subtracting the sub-sample of ex post incarcerated fathers from the total sample of ever-incarcerated fathers will not yield the precise sample of fathers incarcerated ex ante. The father is therefore classified as incarcerated ex ante if the year of his incarceration and the year of his release were before the focal child's birth year.

2.3.3. Summary Statistics

The summary statistics for all the dependent outcomes and independent variables are presented in Table 9. The analysis sample is restricted to children living with their mothers all (or most) of the time due to the concern that mother's unstable presence in the household could conflate any disruptive effect that ensues from the father's incarceration or partial absence[20].

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[19] There are questions on the time the father was jailed and released. However, these data are often missing in the FFCWS.

[20] The analysis sample is further limited to children whose fathers have impulsivity (DDI) scores to ensure a more accurate picture of the families in the IV sample.

The average PPVT-R standardized score for children in the analysis sample is approximately 86 points. This score seems low but may be attributed to the over-sampling of large cities in the FFCWS (Reichman et al. (2001))[21]. Family dissolution, low education and economic adversity are reality for many children in large cities and may help explain their low scores.

The child's aggression measure is an index of thirteen acts of violent and aggressive behavior[22]. They are averaged to create an index from 0 to about 2 that increases with the level of aggression; the mean of this aggression index in the analysis sample is 0.58. Similarly, the oppositional defiant disorder (ODD) symptoms are averaged, range from 0 to 2 and increase with the level of defiance. The mean of this index is 0.63.

Another important pattern displayed in the data is that parents of the focal child exhibit many characteristics associated with a high-risk environment. Of the fathers in the analysis sample, 38% were ever-incarcerated with almost 25% of these incarcerated since the child's birth. Over 40% of fathers have been absent at least in part while most parents have a high school degree or less. Household income per person is about $8000 per year with a standard deviation of over $13,000. With the high probability of single-parenthood, low education and low household income, the children in the Fragile Families Study are, in general, at a greater disadvantage.

However, these statistics do not give us a vivid picture of the differences between the child of an incarcerated father and the child whose father has never been incarcerated.

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[21] These cities include: Austin, TX; Baltimore, MD; Detroit, MI; Milwaukee, WI; Newark, NJ; New York, NY; Oakland, CA; Richmond, VA; San Jose, CA.

[22] The six ODD items are a subset of the nineteen acts of aggression in the FFCWS. These items are excluded from the aggression index, leaving only thirteen.

Table 10 presents comparisons of variable means by father's incarceration history. The child of an incarcerated father has a PPVT-R score that is about 4 points lower than the child whose father has never been incarcerated. Children of incarcerated fathers also display more aggressive and defiant tendencies as opposed to their counterparts.

In addition to these developmental outcomes, it is evident that other characteristics of the child's household vary by the father's incarceration history. Incarcerated fathers and their partners are more likely to be black and less educated relative to non-incarcerated fathers; children of non-incarcerated fathers also live in households with over $4000 more income per person.

2.4. Econometric Issues and Methods

2.4.1. Omitted Variable Bias

The simple model presented in equation (1) below, controls for exogenous individual characteristics, X, incarceration, I and absence, A, to explain child outcomes, Y.

$$Y_i = \beta_0 + \beta_1 I_i + \beta_2 A_i + X_i \beta_3 + \varepsilon_i \qquad (1)$$

The variable I, is not orthogonal to the error term, ε, since there are unobserved factors in ε that simultaneously influence child outcomes and the probability of paternal incarceration. Factors such as innate ability, deviant tendencies, tastes and preferences may be correlated with both incarceration and child outcomes and constitute time-invariant unobserved heterogeneity, θ, in equation (2). An identification strategy must be employed to eliminate unobserved heterogeneity for an unbiased estimator γ_1.

$$Y_i = \gamma_0 + \gamma_1 I_i + \gamma_2 A_i + X_i \gamma_3 + \theta_i + \mu_i \qquad (2)$$

To eliminate the time-invariant unobserved factors captured by θ, a differencing strategy is employed to identify the marginal effect of incarceration ex post on the outcome measures of early child development. If θ is interpreted as the father's "criminal type" and directly controlled for in the model, the marginal impact of paternal incarceration may in fact be isolated. Juvenile offenses and incarceration prior to the child's birth may well be a strong indicator of father's criminal tendency as well as other unobserved characteristics associated with his incarceration ex post. As such, this indicator will be used, in essence, as a proxy for "criminal type"[23]. It is important to note however, that this is an imperfect proxy because "criminal type" may not have been revealed prior to the child's birth. Further, the implicit assumption in using this strategy is that criminal propensities are fixed – variability stemming from criminality as a response to events ex post are not considered (*e.g.* father's unemployment occurring after child's birth could be the cause of incarceration ex post).

We also need to investigate whether absence due to incarceration engenders a different effect on child outcomes than paternal absence in general. For this reason, the model will directly control for father absence, to better isolate the marginal impact of paternal incarceration. Therefore, rewriting equation (1) to include juvenile offenses and incarceration ex ante, **Ia**, incarceration ex post, **Ip**, exogenous variables, X, and other independent variables, N, we get:

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[23] Grogger (1995) employs a similar differencing strategy to deal with unobserved heterogeneity in studying the impact of arrests on earnings and employment. For a sample of men arrested between 1972 and 1987, Grogger restricts the analysis sample to data on earnings and employment from 1980 to 1984. Labor market outcomes of men first arrested after 1984 are compared to a treatment group of men first arrested before 1985. Subsequently, men initially arrested in or after 1985 are similar in "criminal type" to those men initially arrested before this period, rendering comparison of their labor market outcomes unbiased.

$$Y_i = \varphi_0 + \psi\, Ip_i + \pi\, Ia_i + \varphi_1\, A_i + X_i\, \varphi_2 + N_i\, \varphi_3 + \nu_i \qquad (3)$$

The marginal impact of father's incarceration ex post is $[\overline{\psi} - \overline{\pi}]$ from estimation of equation (3). We can easily estimate this difference via regression by including an "ever-incarcerated" variable – an indicator for whether the father was jailed before or after the child's birth – in lieu of **Ia**.

2.4.2. Under-Reporting and Incarceration

An important caveat in using the FFCWS data is that incarceration is likely to be severely under-reported (Geller at al., (2006); Wildeman, (2008)). In prior studies, it has been concluded that convicted criminals tend to under-report their crimes by about 35% (Locander et al. (1976); Witte, (1980)). We can therefore assume that fathers in the FFCWS also significantly under-report their criminal activity as well as their jail sentences.

Similarly, it would be erroneous to assume that the mother's account of the father's incarceration status is any more accurate. The mother's account of father's incarceration is likely to be inaccurate due to incomplete information. Even if she truthfully reports what she knows about the father's criminal history, how much does she really know about what happened before she met him? A criminal background bears a negative stigma not only for the labor market but also for the marriage market (Western, (2004)). Therefore, the father may not have told his partner about past incarceration or even current incarceration (if they are no longer in close contact).

There is less convincing evidence to support "over-reporting" (i.e. reporting incarceration when this is untrue) simply because of the negative stigma associated with

event[24]. From these conjectures, we expect that reported incarceration is either true or under-stated. For an incarceration indicator equal to 1 if father is incarcerated and 0 otherwise: the true indicator for paternal incarceration is assumed to be equal to 1 when the father is reported as incarcerated but may also be equal to 1 when he is reported as non-incarcerated (0 otherwise). In this sense, under-reporting constitutes measurement error in the incarceration data and may be typified as *non-classical* measurement error.

Non-classical measurement error implies that OLS estimators will be susceptible to bias, but not necessarily attenuation bias (Haider and Solon, (2006)). Subsequently, it is uncertain whether the incarceration effect is over-estimated or under-estimated by OLS. Freeman (1984) also shows that measurement error in explanatory variables tends to be more severe in longitudinal data and as a result, under-reported incarceration could pose a serious problem for estimation using panel data. Wildeman (2008) does not address the measurement error problem in his use of panel data methods and as such, his estimated impact of paternal incarceration is likely to be biased. I intend to address this problem using two-stage least squares or instrumental variables (IV) estimation.

2.4.3. Instrumental Variables (IV) Estimation

A method that can be used to address both unobserved heterogeneity and the measurement error problem is two-stage least squares or instrumental variables (IV) estimation. The challenge is finding an exclusion restriction or instrument, i.e., a variable that is correlated with incarceration but not the error term, ε. One such variable, formalized by psychologist Scott Dickman, is the Dickman's Dysfunctional Impulsivity

[24] An extreme case in which the mother may "over-report" father's incarceration is if she believes he is such a terrible father/partner that he must have been in jail at some time whether or not she knows this for sure.

(DDI) scale (Dickman, (1990)). Dickman (1990) cites two different types of impulsivity – functional and dysfunctional. Functional impulsivity is described as "the tendency to act with little forethought, when such a style is optimal". Functional impulsivity can be described as responding to stimuli in ways that reflect enthusiasm and adventuresomeness or any response in which quick thinking is optimal (Dickman, (1990)). A prime example of functional impulsivity is "clutchness" in sports. We could argue that star athletes such as Roger Federer, Reggie Jackson, Michael Jordan, David "Big Papi" Ortiz, Tom Brady and Peyton Manning are all famous functional impulsives.

Dysfunctional impulsivity on the other hand, "is the tendency to act with less forethought than most people of ***equal ability*** when this tendency is a source of difficulty"[25]. This diagnosis insinuates that if we hold ability constant, dysfunctional impulsive individuals tend to act with less forethought or self-control when this response is not optimal. Disorderliness and disregard for facts, for instance, tend to reflect traits of dysfunctional impulsives (Dickman, (1990)). Alcoholics and excessive gamblers are sometimes diagnosed as dysfunctional impulsives as a result (Dickman, (1990); Petry, (2000)).

There are two main questions associated with using dysfunctional impulsivity as an exclusion restriction: (1) Is dysfunctional impulsivity related to functional impulsivity? (2) Is dysfunctional impulsivity related to unobserved factors such as innate ability? Dickman (1990) found no significant relationship between functional and dysfunctional impulsivity in his study. Therefore, not being able to control for functional impulsivity in the model should not violate the requirements of a valid instrument. In

[25] Dickman, Scott J. (1990), page 95.

addition, no direct relationship has been found between dysfunctional impulsivity and intelligence itself. Vigil-Colet and Morales-Vives (2005) found no direct relationship between impulsivity and intelligence but that impulsivity acts as a moderator variable between how an individual uses his resources and academic attainment. They find that the correlations between impulsivity and intelligence measures are largely linked to absence in planning strategies and lack of forethought in making decisions. Therefore, it can be deduced that dysfunctional impulsivity influences actions based on *the decision to think* rather than *the process of how one chooses to think.*

It is in this way that criminal behavior might be explained by dysfunctional impulsivity, as it is often used as a summary indicator for the capacity for self-control – a key determinant of crime (Farrington, (1998); Gottfredson and Hirschi, (1990)). Criminals (who get caught) are arguably hasty and their lack of planning results in arrest and eventually incarceration. The FFCWS includes six items from the original twenty-three item DDI scale; the items are then averaged to create the impulsivity index. The alpha for these questions using the FFCWS father sample is 0.84, indicating that this subset is representative of the full scale. Nevertheless, this construct will only be a valid instrument if it is uncorrelated with ability and other omitted variables while concurrently not affecting child outcomes other than through incarceration.

However, dysfunctional impulsivity is a heritable trait and as a result may influence child outcomes other than through incarceration. Impulsivity in humans is linked to serotonin levels in the brain which is in part genetically determined (Hodges, (2006)). However, if the heritable component of impulsivity can be directly controlled for in some way, the case can then be made that dysfunctional impulsivity is a valid

instrument or exclusion restriction. I will make the stringent assumption that any impulsivity the child may have genetically inherited from the father would be evidenced in symptoms of attention deficit and hyperactivity disorder (ADHD) since they encompass inattentiveness, hyperactivity as well as impulsivity in children (Winkler, (2006))[26].

There are six symptoms that must persist for at least a six month period for ADHD to be diagnosed (Winkler, (2006)). The 36-month In-Home Longitudinal Study aptly covers six key symptoms of ADHD and I will average these to create a measure that should capture the heritable component of dysfunctional impulsivity. The inclusion of child's ADHD symptoms in the model should net out any impulsivity the child would have inherited from the father, rendering the DDI an exogenous instrument.

There is also another instrument I will consider to ensure identification. Racial profiling (i.e. the targeting of racial minorities by police) makes minorities more likely to be arrested than other groups due to the mere fact that they are being watched more. Racial profiling should therefore be positively correlated with incarceration but not necessarily correlated with ε.

The FFCWS provides data for a suitable measure of racial profiling. The father is asked in the first-year and third-year follow-up interviews whether he has ever been stopped by police but not arrested (non-traffic purposes). I argue that a minority father who has been stopped by police for non-traffic reasons and not arrested may have been a target of racial profiling. However, if random non-traffic stops are considered standard

[26] The behavioral measures of aggression and ODD may be affected by dysfunctional impulsivity other than through incarceration if genetically inherited dysfunctional impulsivity is displayed in other forms beyond the inattentiveness, hyperactivity and impulsivity captured by ADHD.

policing procedure in the father's city, then this event no longer exemplifies racial profiling since these stops are now independent of race and ethnicity. Therefore, a more suitable measure of racial profiling is the average non-traffic stops in each father's city by his race or ethnicity[27]. Mean non-traffic stops for incarcerated fathers are 43% while the average is 39% for non-incarcerated fathers, illustrating an important difference between the experiences of incarcerated and non-incarcerated fathers in this regard.

Table 11 presents average non-traffic stops by city and race/ethnicity. The means indicate that among all fathers in the FFCWS sample, 40% have been stopped by police but not arrested (non-traffic). However, black fathers consistently experience higher rates of non-traffic stops than any other racial or ethnic group. In fact, for thirteen of the twenty cities surveyed, black fathers have higher rates of non-traffic stops than the city average. Similarly, Hispanics have rates higher than the city average in eleven cities; white fathers experience higher mean non-traffic stops in only three cities. Figure 2.1 depicts the relationship between non-traffic stops and race/ethnicity. It is clearly evident that non-traffic stops of black fathers are consistently greater than the city averages as well as non-traffic stops of other racial/ethnic groups. It is important to note that these rates of non-traffic stops vary significantly from city to city, ensuring that this proxy for racial profiling is not representing simple racial or ethnic differences. The statistics suggest that black fathers in the sample are not only most likely to be incarcerated but are also most likely to be stopped for non-traffic purposes. As such, the argument can be made that this proxy for racial profiling helps explain paternal incarceration.

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[27] It is important to note that this proxy potentially under-estimates racial profiling events. If a minority father is stopped by police for non-traffic reasons (i.e. profiled), then arrested for some non-traffic violation, he would have answered "no" to this question in the FFCWS. Therefore, this proxy arguably only captures those fathers who have been profiled but "came out clean".

It is also necessary to isolate the incarceration ex post effect from the absence effect. A father is classified as absent if at any time he is reported as not living with the focal child. There is reason to be concerned that father absence is correlated with a number of other household and family circumstances that may influence child outcomes (Antecol and Bedard, (2007); Corak, (2001); Craigie, (2008); Lang and Zagorsky, (2001); Painter and Levine, (2001)). The FFCWS includes a large number of variables that arguably serve to control adequately for these circumstances, allowing paternal absence to be treated as an exogenous regressor in the model. Still, the use of an estimation strategy that treats father absence as endogenous is prudent.

For identification of a model with two endogenous variables, there must be at least two exogenous instruments included in each first-stage regression. In addition to the two instruments for endogenous incarceration, I propose as instruments for paternal absence two indicators of father's paternal attachment. The measures of paternal attachment are: (i) the steady involvement of the father's biological father during his childhood, $\mathbf{Z_3}$ and (ii) the existence of another male who served as his father-figure during childhood, $\mathbf{Z_4}$. Strong connections to his biological father or a steady male role-model are expected to decrease the likelihood the father is absent from his own child's household. These indicators are assumed to be sequentially exogenous and thus orthogonal to the error term. The reduced-form equations for father absence and incarceration ex post are given in (4) and (5) below.

$$A_i = \kappa_0 + \kappa_1 Z_{1i} + \kappa_2 Z_{2i} + \kappa_3 Z_{3i} + \kappa_4 Z_{4i} + ADHD_i \lambda + X_i \omega + \upsilon_i \quad (4)$$

$$Ip_i = \varsigma_0 + \varsigma_1 Z_{1i} + \varsigma_2 Z_{2i} + \varsigma_3 Z_{3i} + \varsigma_4 Z_{4i} + ADHD_i \tau + X_i \iota + \sigma_i \quad (5)$$

OLS estimation of (4) and (5) will yield $\hat{A}_i$ and $\hat{Ip}_i$ which will then be introduced into equation (1) in place of incarceration, I, and absence, **A**. This second-stage regression should identify the effect of paternal incarceration ex post on the child outcome, **Y**.

2.5. Results

The summary statistics presented in section 2.3 imply that children of incarcerated fathers are at a significant disadvantage as evidenced by their adverse familial circumstances. However, these results do not clarify whether the outcomes associated with this situation are largely explained by paternal incarceration itself or the environment to which the child is exposed.

Table 12 shows estimates of the marginal impact of paternal incarceration using equation (3). For each child outcome, the regression includes an exhaustive set of covariates to mitigate unobserved heterogeneity (Craigie, (2008); Antecol and Bedard, (2007); Lang and Zagorsky, (2001)).The coefficients measuring the impact of a father's incarceration ex post are small in magnitude and statistically insignificant for all the child outcome measures. A father's absence on the other hand, significantly increases aggression and ODD indices by 0.03 and 0.05 respectively. Table 13 also illustrates that the estimated marginal effect of paternal incarceration ex post by his racial or ethnic group is not statistically different from zero.

These results bolster the perspectives presented in Section 2.2 which suggest that the effect of incarceration is indeed ambiguous and may not be statistically different from zero. While the differencing strategy isolates the marginal impact of paternal incarceration by controlling for bias from unobserved heterogeneity, the estimator still does not account for bias from measurement error. Moreover, if juvenile offenses and

incarceration ex ante, Ia, does not effectively capture father's "criminal type", the estimated marginal impact of incarceration ex post will be imprecise. An arguably more unbiased estimator would be the IV estimator, as it attempts to correct biases from both unobserved heterogeneity and measurement error.

OLS and IV regression models are exploited to assess causal arguments on paternal incarceration and early child development. In addition to incarceration ex post, OLS regressions in Table 14 control for exogenous variables that influence child outcomes. These estimated effects of incarceration ex post, like those presented in Table 12, are small in magnitude and are not statistically different from zero, excepting aggression. Incarceration ex post increases the aggression index by 0.06 and this coefficient is statistically significant at the 5% level. Similarly, father's absence increases both aggression and ODD indices by about 0.05 and 0.06 respectively and these estimates are statistically significant at the 1% level.

However, after addressing the econometric issues of unobserved heterogeneity and measurement error using IV estimation, incarceration ex post has a much larger and statistically significant effect. The IV estimates in Table 14 show that paternal incarceration ex post exacerbates both aggression and ODD symptoms and lower cognitive scores of the focal child. The IV estimates in columns (3), (6) and (9) indicate that cognitive scores fall by approximately 24 points while the aggression and ODD indices rise by 0.65 and 1.08 respectively and these estimates are all statistically different from zero. Conversely, the coefficients on father absence are all small and statistically insignificant in these regressions. The results therefore indicate that incarceration ex post heightens aggression and ODD symptoms of the child and deteriorates early cognitive

development. The magnitudes of these point estimates, when compared to the respective standard deviations, are quite substantial. In fact, they are all larger than their respective standard deviations (see Table 9) and consequently, should be treated with caution. IV estimates that are this large may insinuate a weak instrument problem.

Although these IV regressions control for paternal absence, they do not instrument for this potentially endogenous variable. The Hausman test for endogeneity indicates that both paternal incarceration and absence are endogenous in the model. The Hausman F-statistics provide evidence of endogeneity at the 1% level and as a consequence, it would be better to instrument for both incarceration and absence in the IV model (assuming the instruments are valid).

To effectively isolate the effect of paternal incarceration from that of paternal absence, instruments for paternal absence must be included in the first-stage regression. Columns (2), (5) and (8) present IV estimates for which both incarceration and absence are instrumented. Once paternal absence is identified in the IV model, the detrimental impact of a father's incarceration during the young child's life is no longer statistically different from zero and thus bolsters the results from the differencing strategy presented in Table 12. The effect of paternal absence is also not statistically different from zero. The first-stage F-Statistics for incarceration ex post and absence are 18.75 and 11.44 respectively and they both exceed 10, the simple rule-of-thumb recommended in Staiger and Stock (1997) to avert the potential bias of weak instruments. From the methods employed, we can therefore conclude that the effect of a father's incarceration on early child development is not statistically different from the effect which ensues from his subsequent absence.

2.6. Summary

This study was unable to reject the hypothesis that the effect of paternal incarceration on early child outcomes is no different from that of his generic absence. By exploiting instruments for these endogenous regressors, the results show the incarceration ex post effect is not statistically different from zero for measures of cognitive ability, aggression and ODD of pre-school aged children. Notwithstanding, if we assume generic paternal absence is exogenous, paternal incarceration reduces child test scores and amplifies their behavioral problems. Incarceration ex post engenders a 24-point disadvantage for the affected children relative to those who have never experienced paternal incarceration.

Similarly, aggression and ODD indices rise by 0.65 and 1.08 respectively as a result of a father's incarceration. These findings are similar to those of Wildeman (2008) since he finds that paternal incarceration increases aggressive behavior in boys by about 0.50 standard deviations and between 0.18 and 0.30 standard deviations in girls.

The importance of attending to children of incarcerated parents during the early developmental years is certainly reinforced here. An important policy recommendation would be for schools to be notified of the father's incarceration and the possible effects that may ensue. In particular, defiant, aggressive and generally disruptive behaviors by the child can be directly attributed to the father's incarceration and should be treated as such by the institution. The implementation of programs that support children of incarcerated fathers may also help ensure that these deviant and criminogenic tendencies are not proliferated as the child enters adolescence and even adulthood (Robins, (1978); Sampson and Laub, (1992); Wildeman, (2008)).

However, if paternal absence is indeed endogenous as the Hausman test indicates, the results from the IV regressions that instrument for both incarceration and father absence are most plausible. Even though the results indicate that there is no statistical difference between the effect of paternal incarceration and that of paternal absence, they do not render the study of paternal incarceration irrelevant, as the confidence intervals are large enough to contain effects of consequential size. For pre-school aged children, the negative stigma and externalities of the father's incarceration may not yet be clearly understood. These children are possibly unable to discern the difference between types of paternal absence as well as their implications. At this stage – a father absent is just a father absent. Future research would therefore do well to examine if older children or adolescents experience statistically different outcomes due to paternal incarceration.

Chapter 3.
An Analysis of the Causes and Correlates of Family Dissolution

3.1. Introduction

Many prior studies have focused on the consequences of family dissolution, particularly on child and parental outcomes (Corak, (2001); Lang and Zagorsky, (2001)). However, also of importance are the factors that cause dissolution in the first place, especially when children are involved. This study will investigate the time-invariant and time-varying factors that influence the probability of dissolution among couples with children and explore whether the hazard of family dissolution is characterized by duration dependence.

Non-marital cohabitation in the United States has been on the rise and has become a common phenomenon in recent decades. In fact, almost 5 million households were headed by cohabiting couples in the year 2000 (Lichter et al., (2006)). Moreover, 41% of these households had children under 18 living in them[28]. At the same time, marriage has been on the decline and divorce has been increasing in recent years. These trends imply that marriage and family in the United States is becoming in some sense de-institutionalized (Lichter et al. (2006); Cherlin, (2004); Nock, (2002)). The purpose of

[28] U.S. Census Bureau, Families and Living Arrangements, (2000)

this study is to therefore observe the factors associated with the risk of union dissolution – whether this union is bound through marriage or cohabitation.

Previous works have shown that factors such as age, cohabitation, pre-marital cohabitation, pre-marital conception, out-of-wedlock child-bearing, religious preferences, education and family background are strong factors affecting the probability a union will dissolve (Balakrishnan et al. (1987); Menken et al. (1981); Teachman, (1982)).Of these factors, this study finds that only cohabitation, race, religion and education are strong predictors of union breakdown. Recent studies have also explored the issue of duration dependence in unions, finding in general that the longer the union remains intact, the lower the probability of dissolution (Lichter et al. (2006); Svarer, (2004)). This study provides strong evidence that this observed duration dependence in unions is due to unobserved heterogeneity rather than true state dependence. Once relationship quality is controlled for, and in particular marital status of the couple, there is no statistically significant relationship between the duration of the union and the hazard of dissolution.

The paper is organized as follows. Section 3.2 provides a brief overview of previous works that examine the factors influencing the risk of dissolution. Section 3.3 discusses the data used for this analysis as well as the variables and their summary statistics. Section 3.4 gives the model specification. Section 3.5 discusses in depth the linear probability and logit estimates and Section 3.6 provides a brief summary of the findings.

3.2. Literature Review

Previous studies on the factors associated with the stability or dissolution of families have mainly focused on unions formed through marriage (Balakrishnan et al. (1987); Svarer,

(2004) and Teachman, (1982))[29]. According to this literature, the main factors that significantly contribute to dissolution include: duration of the union, age at the time of marriage, difference between the ages of spouses, premarital conception and birth, cohabitation before marriage, religion, religiosity, employment, educational attainment, family background and race (Balakrishnan et al., (1987); Larson and Holman, (1994); O'Connell and Rogers, (1984); Svarer, (2004); Teachman, (1982) and Webster et al., (1995)).

Some studies cite evidence of negative duration dependence on the hazard of union dissolution, indicating that unions that have lasted a longer period of time have a lower probability of subsequent dissolution (Lichter et al., (2006) and Svarer, (2004)). This may be explained by the fact that the couple has a longer period to determine if the match is a good one and consequently, the longer the union stays intact, the more likely the union is to be a good match (Svarer, (2004)). An alternative explanation is that over time, couples accumulate marriage-specific capital such as assets and children, which enhance the longevity of the union (Becker et al., (1977) and Svarer, (2004)). Note that the first explanation of observed negative duration dependence in the hazard of union dissolution implies that it is due to unobserved heterogeneity in union quality: unions that are better matches for whatever reason will tend to last longer. The second explanation is an appeal to a form of state dependence – holding constant the quality of the match, the longer any union manages to stay intact, the lower will be its probability of dissolving in the future. This paper will attempt to differentiate between these two explanations of

[29] One study by Lichter et al. (2006), examines the transitions of cohabiting unions among poor women into marriage or dissolution. However, they do not discuss per se the factors that lead to either of these transitions.

duration dependence in unions by controlling for a large number of proxies for relationship quality.

The risk of marital dissolution also tends to be negatively correlated with age at the time of marriage. This result is reinforced by the theory that younger couples are less responsible and experienced in dealing with the crucial issues that may affect the stability of the marriage (Balakrishnan et al. (1987); Menken et al. (1981); Teachman, (1982)). Menken et al. (1982) provide evidence that marriage before the age of twenty is more likely to end in divorce relative to first marriages occurring at later years. In addition to the age of marriage as a determinant of marital dissolution, the age difference between spouses is expected to be positively correlated with the risk of marital dissolution due to its effect on relations between spouses, marital satisfaction and even fertility (Balakrishnan et al., (1987); Casterline et al., (1986)).

Premarital conception and birth are also expected to heighten the risk of family dissolution. This can be attributed to the immediate effect on the courtship process by reducing the time in which partners have to determine the quality of the match (Grover et al. (1985); Larson and Holman, (1994)). As a result, the couple is potentially forced into a more speedy union. Those who marry after pre-marital conception and birth are therefore significantly more likely to experience marital instability (Balakrishnan et al., (1987); Menken et al., (1982); O'Connell and Rogers, (1984) and Teachman, (1982)). Balakrishnan et al. (1987) found that women with pre-marital births were twice as likely to experience marital instability in the first fifteen years of marriage as women who had post-marital births. Similarly, those who had pre-marital conceptions had about a 30% chance of separation in the first fifteen years of marriage relative to an 18% chance of

separation for women with post-marital births. It is important to note, however, that marriage after pre-marital conception is on the decline. From the 1950s to early 1970s, about 50% of women who had pre-marital conceptions married prior to their children's birth. By the 1980's, this figure declined to only 32% (O'Connell and Rogers, (1984)).

By contrast, cohabitation and cohabitation before marriage have both been on the rise. Out-of-wedlock births assigned to cohabiting couples increased from 33% to 50% for whites from the 1980s to the early 1990s (Sigle-Rushton and McLanahan, (2002); Bumpass and Lu, (2000)). There are conflicting findings, however, as to how cohabitation status before marriage influences the subsequent risk of dissolution. Balakrishnan et al. found in their study that women who engaged in pre-marital cohabitation had a 50% higher risk of dissolution relative to women who did not cohabit before marriage. By contrast, Svarer (2004) found that couples in the Danish marriage market who engaged in pre-marital cohabitation had a lower risk of divorce.

Family history is another important factor affecting marital and relationship stability. Marital or relationship quality serves as the mediating effect between family history and marital stability. This suggests that marital instability may be directly linked to low marital quality, particularly among those who have experienced a family history of marital dissolution. However, not only does family history influence marital quality, which subsequently affects stability, but also, it affects *how* marital quality affects marital stability (Webster et al., (1995)). Studies have shown that being exposed to a single-parent family structure during childhood is associated with marital instability during adulthood (Glenn and Kramer, (1987)); Larson and Holman, (1994); McLanahan and Bumpass, (1988)). Therefore, experiencing parental divorce and a poor quality marriage

during childhood could arguably engender an attitude more favorable to dissolution in the future, especially in the event of marital or relationship discordance (Greenburg and Nay, (1982); Larson and Holman, (1994)).

However, in addition to the early childhood experience of parental divorce or family dissolution, I argue that a woman's relationship with her father or father figure may influence her future relationship with men. I hypothesize that a strong involvement of a father during childhood will increase the likelihood that a woman will identify a positive match and thus decrease the risk of dissolution. A positive paternal influence is expected to not only increase the spousal quality of the mother herself, but also increase the likelihood that she will be able to identify high quality males as well. With positive assortative matching at work, a more stable union can be created.

The data used in this study include detailed information on the incarceration histories of male spouses, thereby allowing investigation of the impact of incarceration on the stability of a union. Incarceration interrupts earnings and employment, wage growth and human capital accumulation – all factors viewed to be important assets of a male partner. As a result, incarceration is expected to significantly increase the probability of divorce and dissolution among incarcerated men, and this expectation has been confirmed in the one previous study that has examined the topic (Western, (2006)).

Another factor that is believed to lower the risk of divorce is religiosity. Frequent church attendance has been shown to lower divorce rates in studies by Menken et al. (1981) and Teachman (1982). Balakrishnan et al. (1987) also reinforced these studies, finding that women who rarely or never attend church were about 2.5 times more likely to have their marriage terminated before 25 years than women who went to church at

least once a week. Other factors shown to be linked to the risk of marital dissolution include educational attainment, employment, race and ethnicity.

3.3. Data

The Fragile Families and Child Wellbeing Study (FFCWS) follows a cohort of approximately 5,000 children, born from 1998 to 2000. Its goal was to capture the conditions, capabilities and nature of the relationship of parents of these children, and particularly un-wed parents, during the nascent stages of the focal child's life (Reichmann, (2001))[30]. As a result, rich, detailed and new data are supplied on union duration and background, demographic and relationship characteristics of both parents. Follow-up interviews are conducted at one, three and five years thereafter, and so we have information on the duration of the parents' marital or cohabitational union prior to the child's birth or ex ante and up to the first five years of the child's life.

Because the focus of the study is the hazard of union dissolution, the sample is first restricted to only those families that are intact at the time of the focal child's birth, in that they report that they are either married or cohabiting. Unlike previous studies, I do not limit the analysis sample to those couples who are married at the time of the child's birth: one purpose of FFCWS is to observe un-wed parents and this is an apt dataset to look at non-traditional, yet stable family structures. The increasing number of couples who have chosen to cohabit instead of marry is in fact relevant to the literature on union dissolution and as such, they are included in the analysis.

Due to the richness of the data, the model will also controls extensively for background, demographic and relationship characteristics. The response rate for all

[30] The data are discussed in more detail in chapters 1 and 2 of this dissertation.

interviews subsequent to the baseline is over 85%; families for which mothers did not complete one of the interviews are excluded from the sample. This leaves 2,658 families in the sample.

A spell is defined as the length of time between two interviews. A spell is only usable if the biological mother and the biological father of the focal child were either married or cohabitating at the first interview of the spell. If, at the second interview of the spell, the mother reports that the couple is no longer married or living together, the relationship is coded as having dissolved. Since information is not provided as to the exact date of dissolution, it is assumed that the family was intact up until the day of the first interview of the spell. Because there are four interviews – a baseline, one-year, three-year and five-year follow-up interviews – a family can contribute a maximum of three spells to the sample. However, if a family is observed to have dissolved at the first-year (third-year) follow-up interview, it is dropped from the sample after contributing only one (two) spell(s). On average, the duration between interviews is about 20 months but does vary among the families in the analysis sample. To deal with this problem, I will control for the interval length or the months between interviews (Rogowski and Karoly, (2000)).

3.3.1. Summary Statistics and Description of Variables

Table 15 presents the summary statistics for the spells in the analysis sample. Only 16% of the couples in the analysis sample dissolved by the end of each spell, indicating a relatively low level of dissolution among couples in the sample within the first five years of the focal child's life. One question of interest is duration dependence, i.e. the relationship between the time the parents have been living together and the probability of

dissolution. For that reason, I constructed a variable measuring the length of time the parents were living together at the time of the interview that begins each spell. Table 15 indicates that the average duration of unions was approximately 5 years at the outset of each spell. With the duration of unions ranging from 0 to almost 28 years, I dissected this continuous variable into one, two or three year intervals. According to Table 15, only about 4% of couples had been together less than a year at the beginning of the spell, while over half of couples were together between one and five years. A little over 25% of unions had spanned five to ten years and 12% of unions had lasted over 10 years.

According to the literature, demographic characteristics of parents influence the survival rate of their union. As such, I have included in the model variables measuring race and ethnicity, age, age difference and education. Fathers are on average approximately 2.5 years older than mothers in the analysis sample and the mean of mother's age at the baseline is 26 years old. The racial composition of mothers in the analysis sample is also very evenly split among blacks, whites and Hispanics. There are more mothers who are high school dropouts and high school graduates than those with at least some college education. Relationship quality and characteristics influence the probability of dissolution as well, and included in the model are the mother's relationship with her father or father figure during her childhood, religious preference and religiosity as well as both parents' Dickman's Dysfunctional Impulsivity (DDI) scale.

In the model, the involvement of the mother's father during her childhood is included and the summary statistics indicate that most mothers had fathers who were at least somewhat involved in their lives during childhood. Most mothers are also of the

Catholic or Protestant faith but attend church only several times for the year (see Appendix C for scale).

Scott Dickman defined dysfunctional impulsivity as "the tendency to act with less forethought than others of equal ability" and the Dickman's Dysfunctional Impulsivity (DDI) scale is frequently used as a summary indicator for self-control (Dickman (1990); Farrington, (1998); Gottfredson and Hirschi, (1990)). Self-control could in several ways affect the risk of dissolution, particularly with respect to how both partners choose to handle problems that may arise in their relationship. A sub-scale of the DDI full-scale of 26 questions is provided in the FFCWS and the alpha of 0.84 indicates that this sub-scale is highly correlative with the full-scale. The scale ranges from 1 to 4 with 1 indicating the highest level of dysfunctional impulsivity; the questions are averaged to create a DDI index (see Appendix B). Both parents scored on average 3 on this scale, indicating little dysfunctional impulsivity in general.

Child characteristics may also play a role in the stability of a union. It has been shown that if the child is a boy, family dissolution is less likely (Bedard and Deschenes, (2004)). Similarly, the birth order of a child is correlated with the stability of a union and 26% of the children in the analysis sample are first-borns for both parents. Child-bearing outside of wedlock is associated with marital dissolution as well, and 58% of children at the baseline were borne out of wedlock. In addition, 2% of couples had marriages within six months prior to the focal child's birth. This confirms the statistics provided by O'Connell and Rogers (1984) that these "shot-gun" marriages are in fact declining.

In addition to controlling for time-invariant characteristics that might affect the probability of dissolution, the model also controls for characteristics that may vary over

the observation period. One of these is marital status. Each couple begins a spell in one of three states: cohabiting, married after an initial period of cohabitation, and married without cohabitation. At the baseline, about 45% of couples are in the first category; 27% are in the second, and about 28% in the third. As time progresses, it is possible for couples to move from cohabiting at the baseline to the pre-marital cohabitation category in subsequent waves. This happens to 188 couples or 3% of the analysis sample.

Potentially endogenous variables such as residential instability, change in incarceration status and change in household income are included in the model as lags, that is, they are measured based on events occurring at the beginning of the previous spell. This eliminates the potential endogeneity caused when, for example, relationship dissolution leads to a fall in income or a residential relocation; but this means that spells beginning with the baseline interview cannot be used in analyses that include these variables. In the subset of the sample for which these variables can be defined, 37% of couples have changed residence since the previous interview and only 2% of fathers changed their incarceration status. The mean household income is about $45,000 and the mean change in household income between interviews is negligible at almost $62.

3.4. Econometric Specification

Consider the linear probability model specification:

$$D_{it} = T'_{it}\gamma + X'_{it}\beta + \varepsilon_{it} \qquad (1)$$

where D represents the binary indicator of a dissolved family at the end of each spell. T is the duration of the union at the time of the interview that begins each spell. T is divided into intervals ranging from 0 to 12-plus years and these variables are included to

test for duration dependence of the length of a union. X is the vector of time-invariant variables expected to influence family dissolution.

In addition to duration dependence and time-invariant heterogeneity, time-varying factors also influence the probability of union survival. Cohabitation, pre-marital cohabitation, child-birth shocks and changes in household size have all been allowed to vary by spell. A couple is classified as cohabiting in each spell if the mother reports that both are living together but not married. Similarly, pre-marital cohabitation is recorded as such if a couple cohabited ex ante or in a spell prior to getting married. A child-birth shock occurs at the beginning of each spell in which the couple states they have a new-born or have adopted a child. The number of children and adults in the household is recorded at the beginning of each spell. These variables are given in the vector Z in equation (2) below:

$$D_{it} = T'_{it}\gamma + X'_{it}\beta + Z'_{it}\eta + \upsilon_{it} \qquad (2)$$

Some time-varying covariates that potentially influence union survival such as shocks to family income, are also themselves potentially influenced by union survival. To avoid this endogeneity problem, a vector of lagged variables Δ H such as the lagged change in incarceration status, lagged change in household income and lagged residential moves are included in (3) below.

$$D_{it} = T'_{it}\gamma + X'_{it}\beta + Z'_{it}\eta + \Delta H'_{it-1}\rho + \mu_{it} \qquad (3)$$

I estimate these models using OLS and Logit specifications.

3.5. Results

The linear probability model given in equation (1) is presented in Table 16. Column (1) presents results from the naïve model with no other control variables except the variables of interest. A union intact for 1 to 5 years does not statistically differ from a union intact for less than one year, in its probability of dissolving by the next interview. However, being together for 5 to 10 years significantly decreases the probability of dissolution by about 14%. In addition, remaining together for over 10 years decreases the likelihood of separation by about 19% and these estimates are all statistically significant at the 1% level. Figure 3.1 illustrates the hazard of union dissolution.

As discussed earlier, this observed duration dependence may be due to heterogeneity in underlying relationship quality. If so, controlling for some of this heterogeneity should lower the observed duration dependence. Column (2) controls for the time-invariant variables (except out-of-wedlock childbearing and marriage within 6 months of the focal child's birth) listed in Table 15. The results indicate that there is no statistical difference in the effect of being together for up to five years on the probability of union disruption. However, a union duration over five years positively influences the probability of a stable union. A union lasting from five to seven years significantly decreases the probability that a couple has separated at the end of a spell by 8%. Similarly, a union duration over ten years significantly decreases the risk of dissolution by 8 – 10%. In summary therefore, this model exhibits duration dependence in that the longer a couple stays together over the five-year mark, the lower the probability of a failed union. It also matches the findings reported in studies concerning the vulnerability of the union to dissolution during the first five years (Lichter et al. (2006) and Smock

(2000)). For cohabiting unions especially, this five-year period is where we see couples dissolve or transition to marriage (Lichter et al., (2006)).

Several time-invariant factors included in this model increase the probability of union failure. Compared to whites, a mother experiences about a 9% increased risk of dissolution if she is black and this estimate is statistically significant at the 1% level. Similarly, being a high school dropout significantly decreases the likelihood of survival by almost 5% relative to a high school graduate. If a mother reports no religious affiliation or is Baptist, the likelihood her union will fail rises by approximately 5%. There is, however, no significant relationship between frequency of church attendance and the risk of union dissolution.

College education and *not* being dysfunctional impulsive both significantly decrease the likelihood of dissolution by 4%. The older a mother is and the larger the age difference is between the couple, the lower the union failure rate, but by less than 1% per year. In addition, having a boy significantly decreases the failure rate by 3%.

When variables measuring marital status of the couple at the beginning of the spell are included in the model (columns (3) and (4) of Table 16), the observed duration dependence is no longer statistically significant, casting doubt on hypotheses that imply that time spent together per se will affect the hazard of union dissolution.[31] The column (3) results indicate that other things equal, a cohabiting couple has an 8 – 9% higher risk of separating than a married couple and this also is statistically significant at the 1% level.

[31] The excluded category for the duration intervals is 0 to 3 years in column (4). Since lagged variables are included in this model, only 18 couples who have been together for less than one year are included in this regression. Subsequently, using the 0 – 1 year interval as the sole excluded category will induce problems similar to a dummy variable trap.

The column (4) estimates investigate the impact of certain relationship shocks to the probability of union dissolution, including shocks to place of residence, incarceration status and household income. The most striking result from this specification is the magnitude of the coefficient on new incarceration lagged. A father's incarceration in the previous wave will increase the likelihood of union dissolution by about 51% and this estimate is statistically significant at the 1% level. The lagged change in household income also decreases the union survival rate but by less than 1% for every $10,000 positive shock to household income.

Logit estimates are presented in Table 19. This specification indicates the same factors significantly affect union disruption as in the linear probability model. However, in column (3), it is shown that couples together for 10 to 12 years have about 20% lower risk of union failure than couples together for less than a year and this estimate is statistically significant at the 10%.

3.5.1. Results for Subgroups

Also interesting is how the results change for various subgroups within the analysis sample. How do these results differ for low-educated mothers, black mothers, couples who are cohabiting or married at the baseline? These results are given in Tables 17 and 18. Estimates of the models reported in columns (3) and (4) of Table 16 are now reported for each subgroup.

Column (1) of Table 17 indicates that in general, the model does not exhibit duration dependence of union dissolution for low educated mothers after the fifth-year of the union. However, a slightly counter-intuitive result shown in column (2) is that couples together three to five years have a 7% higher probability of separation relative to

those couples with less experience. This result may be insinuating that the three to five year period is inherently fragile for low-educated women.

In addition to the implications these samples have for duration dependence, there are also implications for heterogeneity in the model. Some characteristics shown to be statistically similar to zero in the full analysis sample are now revealed to be statistically different from zero for certain sub-groups.

In Table 17 column (1), for low educated mothers, each year her spouse is older than her engenders about a 1% decrease in the union failure rate. Jewish mothers also experience a 9% lower risk of dissolution relative to Catholic mothers; by contrast, mothers with no religious affiliation are 8% more likely to have their union dissolve compared to Catholic mothers. When lagged endogenous variables are included in the model in column (2), church attendance improves the probability of union survival by 2%. In column (3) and (4), it is apparent that black mothers have a 12 – 15% higher risk of disruption when they cohabit. Column (4) of Table 17 shows that for black mothers, more church attendance decreases the probability of union failure by 3%.

Table 18 also shows results separately for spells involving couples who were cohabiting at the baseline versus those who were married at the baseline. For these subgroups, there is no evidence of duration dependence. Duration of the union does not significantly influence union dissolution for either cohabiting or married couples, once measures of couple heterogeneity are controlled for.

Columns (1) and (2) show that among spells that involved couples who were cohabiting at the time of the baseline interview, those that began with the couple being married are 8% more likely to remain intact than those that began with the couple

unmarried. It is also appears that religion plays a role in the risk of union dissolution for cohabiting couples. For cohabiting couples at the baseline, having no religious affiliation or being Baptist both raise the probability of union dissolution relative to Catholics. Irreligiosity and the Baptist faith increase the risk of dissolution by 6% and 7% respectively compared to Catholicism; when the time-varying lagged factors are included in the model, the Baptists experience a 12% higher risk of union failure compared to Catholics. For cohabiting Jewish mothers however, the probability their union will fail is 19% lower than for Catholic mothers. In addition, attending church reduces the cohabiting union's likelihood of failure by 1 – 2%. When we compare unions involving couples married at the baseline, there is no statistical evidence of religion or religiosity being a vital influence on the risk of dissolution. From these results therefore, religion is more important to the stability of cohabiting unions relative to marital unions. Column (4) also reveals that biological father involvement during the mother's childhood decreases the risk of dissolution by 5% among married couples.

3.6. Summary

This study seeks to examine the factors, both time-invariant and time-varying, which influence the probability of union dissolution. In contrast to previous studies, I do not restrict the analysis to only those unions formed through marriage, but include those unions formed through cohabitation as well. The inclusion of cohabiting unions in the study is particularly relevant in an age where some may argue that marriage and the family are becoming de-institutionalized, as cohabitation becomes more commonplace (Lichter et al. (2006); Cherlin, (2004); Nock, (2002)).

Using the linear probability model and logit specifications, the study finds that once variables capturing marital status are controlled for, the model no longer exhibits duration dependence of union dissolution. This sheds a different light on the findings of Svarer (2004) and Lichter et al. (2006) showing that the longer the union survives, the lower the probability of dissolution. This result may be due to marital status variables essentially acting as proxies for unobserved characteristics measuring the couple's level of commitment or match quality; however, it casts doubt on explanations of union stability that cite the importance of the accumulation of union-specific capital to the persistence of a union (Becker et al., (1977) and Svarer, (2004)).

Nevertheless, there are other crucial factors that do significantly affect a union's rate of survival. The model reveals that being black, a high school dropout and dysfunctional impulsive decrease the likelihood of a stable union. Similarly, having no religious affiliation or being Baptist positively contributes to union disruption relative to being Catholic. Positive age difference between partners (i.e. where the man is older) is not shown to increase the risk of dissolution, thus opposing the findings of Balakrishnan et al. (1987) and Casterline (1986). Mother's age and change in household income significantly lower the union dissolution rate.

The study also does not confirm the findings of Svarer (2004) that cohabiting couples face a lower risk of dissolution than married couples. In addition, unlike previous works, the model provides no evidence that out-of-wedlock childbearing, pre-marital conception or pre-marital cohabitation raises the likelihood of divorce among married couples (Balakrishnan et al., (1987); Menken et al., (1982); O'Connell and Rogers, (1984) and Teachman, (1982)).

Another striking result from the model is that incarcerated men have over a 50% higher risk of dissolution compared to non-incarcerated men; this result buttresses the theory presented in Western (2006) that incarcerated men are indeed less marriageable. For cohabiting couples, religion seems to be a vital influence in union breakdown relative to married couples. Unlike studies by Menken et al. (1981), Teachman (1982) and Balakrishnan et al. (1987), the study does not find that religion or religiosity reduces the risk of dissolution for married couples. These factors only appear to be important for unions formed through cohabitation. New births, household size and residential instability are not shown to significantly influence the survival or failure of a union.

Table 1. Summary Statistics

	Observations	Mean	Std. Deviation	Min	Max
PPVT-R Standardized Score	1804	86.47	16.64	40	137
A: Father Presence Measures (from Figure 1.1)					
1) Father Present since Child's Birth	1804	0.50	0.50	0	1
2) Father is no longer present but Social Father is now present	1804	0.01	0.12	0	1
3) Father is no longer present and Mother is now single	1804	0.11	0.31	0	1
4) Father has never been present but Social Father is now present	1804	0.06	0.24	0	1
5) Interim Relationships	1804	0.11	0.31	0	1
6) Father Absent since Child's Birth	1804	0.20	0.40	0	1
B: Exogenous Control Variables					
Birth Order	1804	2.15	1.34	1	13
Male	1804	0.52	0.50	0	1
Mother Black	1804	0.52	0.50	0	1
Mother Hispanic	1804	0.21	0.40	0	1
Mother: Other	1804	0.27	0.44	0	1
Mother Speaks Spanish	1804	0.04	0.19	0	1
Father Black	1804	0.55	0.50	0	1
Father Hispanic	1804	0.20	0.40	0	1
Father: Other	1804	0.24	0.43	0	1
C: Other Independent Variables					
Mother has some high school	1804	0.29	0.45	0	1
Mother has high school degree	1804	0.32	0.47	0	1

Table 1 (cont'd)

Mother has some college	1804	0.23	0.42	0	1
Mother has college degree and beyond	1804	0.11	0.32	0	1
Father has some high school	1804	0.24	0.43	0	1
Father has high school degree	1804	0.36	0.48	0	1
Father has some college	1804	0.18	0.39	0	1
Father has college degree and beyond	1804	0.10	0.30	0	1
Father smokes	1804	0.40	0.49	0	1
Father smokes (missing)	1804	0.16	0.36	0	1
Father uses alcohol	1804	0.65	0.48	0	1
Father uses alcohol (missing)	1804	0.23	0.42	0	1
Mother smokes in 2nd wave	1804	0.28	0.45	0	1
Mother uses alcohol in 2nd wave	1804	0.34	0.48	0	1
Mother's age	1804	27.87	5.95	17	47
Father's age	1804	30.32	7.07	18	70
Mother has mental or emotional problems	1804	0.05	0.22	0	1
Father has mental or emotional problems	1804	0.09	0.29	0	1
Household Income/person (10^{-3})	1804	6.89	10.20	0	100
Household Income/person (missing)	1804	0.08	0.28	0	1
Number of Residential Moves	1804	1.25	1.40	0	14
Child was Breastfed	1804	0.55	0.50	0	1
D: Proxies (Z_i)					
Mother's WAIS-R[32] score	1804	7.02	2.54	0	15
Father's WAIS-R score	1804	6.70	2.61	0	15
Paternal Importance[33]	1804	1.09	0.16	1	3
Mother considered Abortion	1804	0.29	0.45	0	1
Father suggested Abortion	1804	0.09	0.28	0	1
Either parent reports Parental Aggravation	1804	0.22	0.42	0	1

[32] WAIS-R – Wechsler Adult Intelligence Scale-Revised

[33] Index reflecting the mother's evaluation of the importance of the father's involvement in the upbringing of the child (see Appendix A)

Table 1 (cont'd)

Religiosity	1804	4.26	1.56	0	7
Child will not have Father's Last Name	1804	0.12	0.33	0	1
Father's Name is not on Birth Certificate	1804	0.07	0.26	0	1
Father did not visit Mother in Hospital for Child's Birth	1804	0.13	0.33	0	1
Length of time you knew Father before Pregnancy	1804	4.74	4.50	0	36

Data: FFCWS

Table 2. Comparison of the Standardized PPVT-R Score by Family Structure

	Observations	**Mean**	Std. Deviation	Min------Max	
Panel A: Boys and Girls					
1) Father Present since Child's Birth	906	**89**	17	40	137
2) Father is no longer present but Social Father is now present	27	**78**	14	40	105
3) Father is no longer present and Mother is now single	198	**84**	16	40	125
4) Father has never been present but Social Father is now present	113	**82**	16	40	110
5) Interim Relationships	195	**83**	16	40	118
6) Father Absent since Child's Birth	365	**85**	15	40	119
Panel B: Boys					
1) Father Present since Child's Birth	459	**88**	17	40	137
2) Father is no longer present but Social Father is now present	14	**79**	11	63	99
3) Father is no longer present and Mother is now single	104	**82**	17	40	117
4) Father has never been present but Social Father is now present	62	**82**	15	40	108
5) Interim Relationships	107	**82**	15	40	118
6) Father Absent since Child's Birth	197	**85**	17	40	119
Panel C: Girls					
1) Father Present since Child's Birth	447	**90**	17	40	130
2) Father is no longer present but Social Father is now present	13	**77**	18	40	105
3) Father is no longer present and Mother is now single	94	**87**	15	40	125
4) Father has never been present but Social Father is now present	51	**82**	16	43	110
5) Interim Relationships	88	**85**	16	40	117
6) Father Absent since Child's Birth	168	**86**	14	40	117

Data: FFCWS

Table 3. Summary Statistics of Independent Variables by Family Type

	Stable Father Presence N=903		Unstable Father Presence N=481		Stable Father Absence N=361	
	Mean	SD	Mean	SD	Mean	SD
Birth Order	2.12	1.27	2.22	1.46	2.11	1.33
Male	0.51	0.50	0.54	0.50	0.54	0.50
Mother Black	0.37	0.48	0.65	0.48	0.72	0.45
Mother Hispanic	0.25	0.43	0.17	0.38	0.15	0.36
Mother: Other	0.38	0.49	0.17	0.38	0.12	0.33
Mother Speaks Spanish	0.05	0.23	0.02	0.15	0.02	0.13
Father Black	0.41	0.49	0.65	0.48	0.76	0.43
Father Hispanic	0.24	0.42	0.19	0.39	0.15	0.36
Father: Other	0.35	0.48	0.16	0.37	0.09	0.29
Mother has some high school	0.21	0.41	0.37	0.48	0.36	0.48
Mother has high school degree	0.29	0.45	0.34	0.47	0.35	0.48
Mother has some college	0.25	0.43	0.20	0.40	0.21	0.41
Mother has college degree and beyond	0.20	0.40	0.03	0.18	0.03	0.16
Father has some high school	0.20	0.40	0.31	0.46	0.25	0.44
Father has high school degree	0.29	0.45	0.42	0.49	0.43	0.50
Father has some college	0.22	0.42	0.13	0.34	0.17	0.37
Father has college degree and beyond	0.18	0.38	0.02	0.15	0.02	0.14
Father smokes	0.37	0.48	0.48	0.50	0.37	0.48
Father smokes (missing)	0.09	0.28	0.19	0.39	0.28	0.45
Father uses alcohol	0.72	0.45	0.62	0.49	0.51	0.50
Father uses alcohol (missing)	0.13	0.33	0.28	0.45	0.39	0.49
Mother smokes in 2nd wave	0.23	0.42	0.34	0.47	0.33	0.47
Mother uses alcohol in 2nd wave	0.39	0.49	0.33	0.47	0.26	0.44
Mother's age	29.52	6.15	26.01	5.15	26.51	5.41
Father's age	31.96	7.00	28.51	6.32	28.90	7.34

Table 3 (cont'd)

Mother has mental or emotional problems	0.04	0.21	0.07	0.25	0.04	0.21
Father has mental or emotional problems	0.02	0.14	0.02	0.13	0.02	0.13
Other father figures present	0.07	0.25	0.11	0.31	0.13	0.34
Household Income/person (10^{-3})	9.44	12.08	4.63	7.66	3.82	5.77
Household Income/person (missing)	0.08	0.27	0.08	0.28	0.09	0.29
Number of Residential Moves	0.94	1.11	1.71	1.69	1.33	1.39
Child was Breastfed	0.65	0.48	0.48	0.50	0.42	0.49
Mother's WAIS Score	7.33	2.60	6.83	2.40	6.52	2.52
Father's WAIS Score	6.95	2.69	6.55	2.56	6.33	2.40
Paternal Importance	1.08	0.13	1.10	0.18	1.11	0.21
Either parent reports Parental Aggravation	0.23	0.42	0.21	0.41	0.22	0.42
Religiosity	4.22	1.53	4.28	1.59	4.31	1.60
Child will not have Father's Last Name	0.05	0.21	0.17	0.37	0.26	0.44
Father's Name is not on Birth Certificate	0.03	0.17	0.10	0.30	0.13	0.33
Father did not visit Mother in Hospital	0.04	0.19	0.17	0.37	0.28	0.45
Mother considered Abortion	0.20	0.40	0.35	0.48	0.41	0.49
Father suggested Abortion	0.05	0.22	0.12	0.32	0.13	0.34
Time you knew Father before Pregnancy	5.49	4.66	3.95	4.41	4.02	3.92

Data: FFCWS.

Table 4. Replication of Columns (1) & (2) of *Tables 3 & 4* of Lang and Zagorsky (2001)

	Boys & Girls		Boys		Girls	
	(1)	(2)	(3)	(4)	(5)	(6)
Lang & Zagorsky (2001)	-	-	3.26	8.94	2.56	9.89
			(0.83)	(0.96)	(0.75)	(0.79)
Child lives with mother all the time	1.237	2.005	1.607	1.659	2.058	3.711
	(2.016)	(2.112)	(2.540)	(2.598)	(3.116)	(3.415)
Fraction of time father is present	1.213	5.215	1.143	4.045	1.060	6.060
	(0.845)	(0.757)	(1.244)	(1.097)	(1.160)	(1.048)
Number of children in the household	-0.265		0.078		-0.473	
	(0.262)		(0.391)		(0.357)	
Mother Black	-4.707		-5.781		-3.549	
	(1.381)		(2.127)		(1.828)	
Mother Hispanic	-4.371		-4.669		-4.009	
	(1.340)		(2.203)		(1.657)	
Father Black	-3.177		-1.947		-4.499	
	(1.434)		(2.213)		(1.844)	
Father Hispanic	-1.358		0.978		-3.928	
	(1.457)		(2.364)		(1.806)	
Mother's age	0.047		-0.063		0.169	
	(0.094)		(0.138)		(0.128)	
Father's age	-0.100		-0.063		-0.165	
	(0.070)		(0.110)		(0.087)	
Father uses alcohol	-1.010		-1.279		-0.229	
	(1.160)		(1.690)		(1.580)	
Father uses alcohol (missing)	-0.347		0.552		-0.563	
	(1.219)		(1.759)		(1.702)	
Mother uses alcohol (2^{nd} wave)	3.030		2.651		3.359	
	(0.709)		(1.059)		(0.956)	
Mother has some high school	0.247		0.254		-0.106	

Table 4 (cont'd)

	(0.819)		(1.154)		(1.199)	
Mother has some college	4.194		4.003		4.407	
	(0.935)		(1.425)		(1.219)	
Mother has college degree and beyond	10.510		10.476		11.661	
	(1.606)		(2.465)		(1.933)	
Father has some high school	-1.754		-1.568		-1.688	
	(0.811)		(1.123)		(1.204)	
Father has some college	1.495		1.668		1.558	
	(0.970)		(1.421)		(1.336)	
Father has college degree and beyond	2.260		2.188		1.818	
	(1.644)		(2.563)		(1.932)	
R_Squared	0.22	0.11	0.18	0.08	0.32	0.17
Observations	2186	2186	1137	1137	1049	1049

Data: FFCWS.
Robust standard errors are in parentheses. All regressions include interview-year, region-of-birth and city dummies.

Table 5. Estimated Effects of Paternal Presence on Peabody Picture Vocabulary Test (PPVT-R) Scores

	A[34] No Controls		B[35] Exog. Controls		C[36] No Proxy Variables		D[37] All Variables		E[38] Without H. Income	
	(a)	(a)	(b)	(b)	(c)	(c)	(d)	(d)	(e)	(e)
1) Father present since child's birth	3.962	3.635	0.609	0.338	-0.601	-0.803	-0.550	-0.716	-0.448	-0.617
	(0.992)	(0.981)	(1.011)	(1.006)	(1.044)	(1.038)	(1.081)	(1.078)	(1.083)	(1.080)
2) Father is no longer present but Social Father is now present	-7.176	-7.097	-10.172	-10.235	-7.658	-7.744	-8.803	-8.850	-8.821	-8.864
	(2.666)	(2.648)	(2.793)	(2.765)	(2.659)	(2.645)	(2.788)	(2.784)	(2.793)	(2.788)
3) Father is no longer present and Mother is now single	-0.611	-0.649	-1.783	-1.870	-1.613	-1.691	-2.068	-2.168	-2.003	-2.108
	(1.412)	(1.406)	(1.346)	(1.345)	(1.344)	(1.344)	(1.362)	(1.362)	(1.360)	(1.360)
4) Father has never been present but Social Father is now present	-3.152	-2.971	-3.664	-3.619	-3.472	-3.457	-3.014	-2.998	-2.954	-2.936
	(1.671)	(1.663)	(1.707)	(1.704)	(1.666)	(1.659)	(1.635)	(1.625)	(1.639)	(1.630)
5) Interim Relationships	-2.033	-2.265	-2.027	-2.077	-2.316	-2.396	-2.324	-2.389	-2.265	-2.334
	(1.352)	(1.348)	(1.344)	(1.339)	(1.307)	(1.304)	(1.315)	(1.311)	(1.316)	(1.313)
Parents' Region of Birth	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
R-Squared	0.11	0.10	0.15	0.14	0.26	0.25	0.27	0.27	0.27	0.26
Observations	1804	1804	1804	1804	1804	1804	1804	1804	1804	1804

Data: FFCWS

[34] Regressions include no control variables listed in the Table 1 summary statistics but control for parents' region of birth in the first column.

[35] Regressions include only the exogenous control variables listed in section *B* of Table 1 summary statistics.

[36] Regressions include only the control variables listed in sections *B* and *C* of Table 1 summary statistics.

[37] Regressions include all the control variables listed in sections *B*, *C* and *D* of Table 1 summary statistics.

[38] Regressions include all the control variables listed in sections B, C and D of Table 1 summary statistics, except household income.

Table 5 (cont'd)

All regressions include interview-year and city dummies. Robust standard errors are in parentheses. Father's complete absence since child's birth (6) is the excluded category. Full regression results are available upon request.

Table 6. Estimated Effects of Paternal Presence on Boys' Peabody Picture Vocabulary Test (PPVT-R) Scores

	A[39] No Controls		B[40] Exogenous Controls Only		C[41] No Proxy Variables		D[42] All Variables	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1) Father present since child's birth	3.418	3.115	0.982	0.848	0.048	-0.137	0.484	0.397
	(1.499)	(1.464)	(1.496)	(1.465)	(1.619)	(1.591)	(1.664)	(1.647)
2) Father is no longer present but Social Father is now present	-4.573	-4.557	-7.034	-7.287	-5.167	-5.371	-5.744	-6.034
	(2.848)	(2.835)	(3.107)	(3.097)	(2.891)	(2.866)	(2.959)	(2.921)
3) Father is no longer present and Mother is now single	-1.738	-1.875	-2.325	-2.429	-2.836	-2.928	-2.653	-2.768
	(2.143)	(2.128)	(2.038)	(2.026)	(2.063)	(2.046)	(2.110)	(2.097)
4) Father has never been present but Social Father is now present	-2.772	-2.388	-2.873	-2.765	-3.343	-3.181	-2.598	-2.479
	(2.332)	(2.316)	(2.384)	(2.373)	(2.325)	(2.305)	(2.333)	(2.321)
5) Interim Relationships	-2.928	-2.878	-2.808	-2.679	-3.337	-3.240	-3.162	-3.005
	(1.934)	(1.934)	(1.919)	(1.903)	(1.911)	(1.898)	(1.901)	(1.893)
Parents' Region of Birth	Yes	No	Yes	No	Yes	No	Yes	No
R-Squared	0.10	0.08	0.17	0.16	0.23	0.22	0.26	0.25
Observations	943	943	943	943	943	943	943	943

Data: FFCWS

[39] Regressions include no control variables listed in the Table 1 summary statistics but control for parents' region of birth in column (1).

[40] Regressions include only the exogenous control variables listed in section *B* of Table 1 summary statistics.

[41] Regressions include only the control variables listed in sections *B* and *C* of Table 1 summary statistics.

[42] Regressions include all the control variables listed in sections *B*, *C* and *D* of Table 1 summary statistics.

Table 6 (cont'd)

All regressions include interview-year and city dummies. Robust standard errors are in parentheses. Father's complete absence since child's birth (6) is the excluded category. Full regression results are available upon request.

Table 7. Estimated Effects of Paternal Presence on Girls' Peabody Picture Vocabulary Test (PPVT-R) Scores

	A[43] No Controls		B[44] Exogenous Controls Only		C[45] No Proxy Variables		D[46] All Variables	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1) Father present since child's birth	4.450	3.808	1.544	1.023	-0.905	-1.529	-1.248	-1.745
	(1.303)	(1.305)	(1.371)	(1.374)	(1.386)	(1.392)	(1.436)	(1.440)
2) Father is no longer present but Social Father is now present	-10.479	-9.809	-11.270	-10.646	-10.139	-9.755	-12.328	-11.945
	(4.716)	(4.573)	(4.379)	(4.280)	(4.665)	(4.600)	(4.738)	(4.681)
3) Father is no longer present and Mother is now single	0.887	0.737	0.346	0.147	0.442	-0.070	-0.262	-0.724
	(1.754)	(1.763)	(1.733)	(1.750)	(1.666)	(1.688)	(1.694)	(1.712)
4) Father has never been present but Social Father is now present	-3.748	-3.724	-4.009	-3.875	-3.139	-3.133	-2.334	-2.332
	(2.423)	(2.407)	(2.431)	(2.418)	(2.413)	(2.399)	(2.361)	(2.339)
5) Interim Relationships	-1.319	-1.881	-1.666	-1.904	-0.746	-1.275	-0.779	-1.286
	(1.859)	(1.844)	(1.845)	(1.841)	(1.853)	(1.849)	(1.889)	(1.873)
Parents' Region of Birth	Yes	No	Yes	No	Yes	No	Yes	No
R-Squared	0.18	0.15	0.26	0.23	0.35	0.32	0.36	0.33
Observations	861	861	861	861	861	861	861	861

[43] Regressions include no control variables listed in the Table 1 summary statistics but control for parents' region of birth in column (1).

[44] Regressions include only the exogenous control variables listed in section *B* of Table 1 summary statistics.

[45] Regressions include only the control variables listed in sections *B* and *C* of Table 1 summary statistics.

[46] Regressions include all the control variables listed in sections *B*, *C* and *D* of Table 1 summary statistics.

Table 7 (cont'd)

Data: FFCWS
All regressions include interview-year and city dummies. Robust standard errors are in parentheses. Father's complete absence since child's birth (6) is the excluded category. Full regression results are available upon request.

Table 8. Robustness Checks

	A[47] Full Regressions		B[48] Using National Weights		C[49] Preceding Conditions	
	(1)	(2)	(3)	(4)	(5)	(6)
1) Father present since child's birth	-0.550	-0.716	-2.682	-3.234	-0.715	-0.820
	(1.081)	(1.078)	[4.406]	[4.524]	(1.456)	(1.453)
2) Father is *no longer present* but Social father is now present	-8.803	-8.850	-13.464	-13.810	-11.310	-11.063
	(2.788)	(2.784)	[5.334]	[5.034]	(4.303)	(4.276)
3) Father is *no longer present* and Mother is now single	-2.068	-2.168	1.580	1.162	-3.178	-3.223
	(1.362)	(1.362)	[4.371]	[4.327]	(1.793)	(1.794)
4) Father has *never been present but* Social father is now present	-3.014	-2.998	1.399	1.310	-3.052	-3.167
	(1.635)	(1.625)	[6.470]	[6.351]	(2.159)	(2.143)
5) Interim Relationships	-2.324	-2.389	1.021	0.598	-1.884	-2.009
	(1.315)	(1.311)	[5.409]	[5.395]	(1.729)	(1.710)
Region of Birth	Yes	No	Yes	No	Yes	No

[47] Regressions include all the control variables listed in sections *B*, *C* and *D* of Table 1 summary statistics. The results are the same as Table 5 column set (D) results.

[48] Regressions include all the control variables listed in sections *B*, *C* and *D* of Table 1 summary statistics; data are weighted using national sampling weights.

[49] Regressions include all the control variables listed in sections *B*, *C* and *D* of Table I summary statistics as well as mother's education since child's birth, parents' drug use over all three waves, the average number of adults and children in the household over all three waves and household income over all three waves.

Table 8 (cont'd)

R-Squared	0.27	0.27	0.39	0.38	0.29	0.28
Observations	1804	1804	1305	1305	1252	1252

Data: FFCWS.
All regressions include interview-year dummies; city dummies are included in the regressions presented in column sets (A) and (C). Robust standard errors are in parentheses. Jack-knife standard errors are in brackets. Father's complete absence since child's birth (6) is the excluded category. Full regression results are available upon request.

Table 9. Summary Statistics

	Obs. (1)	Mean (2)	Std. Deviation (3)	Min --- Max (4)	(5)
Dependent Outcomes					
PPVT-R	1541	86.374	(17.028)	40	137
Aggression	1986	0.579	(0.340)	0	1.923
ODD Symptoms	1999	0.631	(0.429)	0	2
Variables of Interest					
Incarcerated Ex Post	2549	0.097	(0.296)	0	1
Ever-Incarcerated	2549	0.377	(0.485)	0	1
Incarcerated Ex Ante	2549	0.076	(0.265)	0	1
Father Absent	2549	0.434	(0.496)	0	1
Exogenous Variables					
Male	2549	0.520	(0.500)	0	1
Birth Order	2543	2.092	(1.273)	1	13
Mother's Age	2549	28.351	(6.128)	17	48
Father's Age	2547	30.768	(7.045)	18	66
Mother Black	2549	0.466	(0.499)	0	1
Mother Hispanic	2549	0.235	(0.424)	0	1
Other	2549	0.185	(0.388)	0	1
Father Black	2549	0.485	(0.500)	0	1
Father Hispanic	2549	0.240	(0.427)	0	1
Other	2549	0.275	(0.447)	0	1
Mother Interviewed in Spanish	2549	0.073	(0.261)	0	1
ADHD Symptoms	2549	0.523	(0.574)	0	2
ADHD Symptoms (Missing)	2549	0.424	(0.494)	0	1
Mother was born in U.S.	2549	0.869	(0.337)	0	1
Father was born in U.S.	2549	0.804	(0.397)	0	1
Other Independent Variables					
Mother < High School Degree	2549	0.255	(0.436)	0	1
Mother has High School Degree	2549	0.313	(0.464)	0	1
Mother < College Degree	2549	0.233	(0.423)	0	1
Mother has at least College Degree	2549	0.136	(0.343)	0	1
Father < High School Degree	2549	0.229	(0.420)	0	1
Father has High School Degree	2549	0.348	(0.476)	0	1
Father < College Degree	2549	0.184	(0.387)	0	1
Father has at least Coll. Degree	2549	0.123	(0.328)	0	1
Household Income per Person (10^{-3})	2549	7.85	(13.57)	0	333.33
Household Income per Person (Missing)	2549	0.072	(0.258)	0	1
Father Smokes	2549	0.426	(0.495)	0	1
Father Smokes (Missing)	2549	0.069	(0.254)	0	1
Father Drinks	2549	0.696	(0.460)	0	1

Table 9 (cont'd)

Father Drinks (Missing)	2549	0.169	(0.375)	0	1
Mother Smokes	2548	0.261	(0.439)	0	1
Mother Drinks	2548	0.344	(0.475)	0	1
Mother has Mental Problems	2549	0.049	(0.215)	0	1
Father has Mental Problems	2549	0.017	(0.130)	0	1
Father Figure Present	2549	0.109	(0.312)	0	1
Number of Residential Moves	2547	1.192	(1.310)	0	11
Child was Breastfed	2549	0.569	(0.495)	0	1
Mother's WAIS-R Score	2543	7.011	(2.572)	0	15
Father's WAIS-R Score	2524	6.664	(2.661)	0	15
Paternal Importance	2530	1.089	(0.158)	1	3
Either Parent Reports Aggravation	2549	0.217	(0.412)	0	1
Religiosity Measure	2549	4.229	(1.564)	0	7
Child will not have Father's Last Name	2549	0.104	(0.305)	0	1
Father's Name is not on Birth Certificate	2549	0.061	(0.239)	0	1
Father did not visit Hospital at Child's Birth	2549	0.099	(0.299)	0	1
Mother considered Abortion	2539	0.249	(0.432)	0	1
Father suggested Abortion	2538	0.080	(0.271)	0	1
Time Mother knew Father prior to Pregnancy	2549	5.091	(4.791)	0	36
Instruments					
Father's Impulsivity	2548	3.019	(0.663)	1	4
Average Non-Traffic Stops	2549	0.406	(0.092)	0.125	0.8
Father's Biological Father Involved	2549	0.312	(0.464)	0	1
Father had Father-Figure	2549	0.668	(0.471)	0	1

Data: FFCWS

Table 10. Summary Statistics by Incarceration History

	Ever-Incarcerated			Never Incarcerated		
	Obs.	Mean	SD	Obs.	Mean	SD
Dependent Outcomes						
PPVT-R	677	83.780	(16.084)	864	88.406	(17.474)
Aggression	788	0.639	(0.368)	1198	0.539	(0.314)
ODD Symptoms	796	0.678	(0.454)	1203	0.599	(0.409)
Variables of Interest						
Father Absent	960	0.646	(0.479)	1589	0.305	(0.461)
Exogenous Variables						
Male	960	0.501	(0.500)	1589	0.532	(0.499)
Birth Order	956	2.259	(1.434)	1587	1.991	(1.154)
Mother's Age	960	26.316	(5.276)	1589	29.581	(6.280)
Father's Age	959	29.016	(6.384)	1588	31.826	(7.213)
Mother Black	960	0.581	(0.494)	1589	0.396	(0.489)
Mother Hispanic	960	0.204	(0.403)	1589	0.253	(0.435)
Other	960	0.143	(0.350)	1589	0.210	(0.408)
Father Black	960	0.605	(0.489)	1589	0.412	(0.492)
Father Hispanic	960	0.218	(0.413)	1589	0.254	(0.435)
Other	960	0.177	(0.382)	1589	0.335	(0.472)
Mother Interviewed in Spanish	960	0.039	(0.193)	1589	0.094	(0.292)
ADHD Symptoms	960	0.499	(0.565)	1589	0.538	(0.579)
ADHD Symptoms (Missing)	960	0.446	(0.497)	1589	0.410	(0.492)
Mother was born in U.S.	960	0.941	(0.236)	1589	0.826	(0.379)
Father was born in U.S.	960	0.864	(0.343)	1589	0.768	(0.422)
Other Independent Variables						
Mother< High School Degree	960	0.359	(0.480)	1589	0.193	(0.394)
Mother has High School Degree	960	0.370	(0.483)	1589	0.278	(0.448)
Mother< College Degree	960	0.182	(0.386)	1589	0.263	(0.440)
Mother has at least College Degree	960	0.022	(0.146)	1589	0.205	(0.404)
Father< High School Degree	960	0.334	(0.472)	1589	0.165	(0.371)
Father has High School Degree	960	0.406	(0.491)	1589	0.313	(0.464)
Father< College Degree	960	0.116	(0.320)	1589	0.225	(0.417)
Father has at least College Degree	960	0.009	(0.096)	1589	0.191	(0.393)
Household Income per Person (10^{-3})	960	4.38	(6.15)	1589	9.95	(16.16)
Household Income/Person (Missing)	960	0.096	(0.295)	1589	0.057	(0.232)
Father Smokes	960	0.599	(0.490)	1589	0.322	(0.467)
Father Smokes (Missing)	960	0.083	(0.277)	1589	0.060	(0.238)
Father Drinks	960	0.675	(0.469)	1589	0.708	(0.455)
Father Drinks (Missing)	960	0.217	(0.412)	1589	0.140	(0.347)
Mother Smokes	960	0.385	(0.487)	1588	0.185	(0.389)

Table 10 (cont'd)

Mother Drinks	960	0.340	(0.474)	1588	0.347	(0.476)
Mother has Mental Problems	960	0.066	(0.248)	1589	0.038	(0.192)
Father has Mental Problems	960	0.017	(0.128)	1589	0.018	(0.132)
Father Figure Present	960	0.122	(0.327)	1589	0.101	(0.302)
Number of Residential Moves	958	1.531	(1.487)	1589	0.987	(1.144)
Child was Breastfed	960	0.440	(0.497)	1589	0.647	(0.478)
Mother's WAIS-R Score	959	6.766	(2.435)	1584	7.159	(2.640)
Father's WAIS-R Score	950	6.409	(2.524)	1574	6.817	(2.730)
Paternal Importance	955	1.094	(0.177)	1575	1.086	(0.145)
Either Parent Reports Aggravation	960	0.251	(0.434)	1589	0.196	(0.397)
Religiosity	960	4.453	(1.611)	1589	4.093	(1.519)
Child will not have Father's Last Name	960	0.157	(0.364)	1589	0.071	(0.257)
Father's Name not on Birth Certificate	960	0.089	(0.284)	1589	0.044	(0.205)
Father did not visit Hospital at Birth	960	0.172	(0.377)	1589	0.055	(0.229)
Mother considered Abortion	956	0.333	(0.471)	1583	0.198	(0.398)
Father suggested Abortion	956	0.106	(0.308)	1582	0.064	(0.245)
Time knew father prior to Pregnancy	960	4.026	(4.035)	1589	5.735	(5.089)
Instruments						
Father's Impulsivity	959	2.838	(0.721)	1589	3.128	(0.599)
Average Non-Traffic Stops	960	0.431	(0.083)	1589	0.391	(0.094)
Father's Biological Father Involved	960	0.371	(0.483)	1589	0.277	(0.448)
Father had Father-Figure	960	0.663	(0.473)	1589	0.672	(0.470)

Data: FFCWS

Table 11. Average Non-Traffic Stops by City and Race/Ethnicity

	Black	Hispanic	Other	Average Non-Traffic Stops per City
City 1	0.46	0.43	0.29	0.43 (0.05)
City 2	0.39	0.40	0.32	0.38 (0.03)
City 3	0.48	0.21	0.27	0.43 (0.10)
City 4	0.47	0.38	0.30	0.44 (0.06)
City 5	0.34	0.30	0.24	0.32 (0.03)
City 6	0.41	0.36	0.13	0.34 (0.12)
City 7	0.47	0.43	0.37	0.44 (0.05)
City 8	0.38	0.48	0.29	0.43 (0.08)
City 9	0.57	0.54	0.34	0.47 (0.11)
City 10	0.50	0.50	0.38	0.47 (0.06)
City 11	0.33	0.35	0.26	0.33 (0.03)
City 12	0.36	0.39	0.30	0.36 (0.04)
City 13	0.44	0.31	0.32	0.38 (0.06)
City 14	0.39	0.20	0.42	0.39 (0.05)
City 15	0.50	0.20	0.20	0.42 (0.13)
City 16	0.42	0.80[50]	0.47	0.46 (0.08)
City 17	0.48	0.55	0.46	0.48 (0.03)
City 18	0.30	0.43	0.21	0.39 (0.08)
City 19	0.42	–	0.37	0.39 (0.02)
City 20	0.31	0.63[51]	0.38	0.35 (0.09)
Average Non-Traffic Stops Per Race/Ethnicity	0.44 (0.07)	0.40 (0.08)	0.32 (0.08)	0.40 (0.09)

[50] There are only 5 observations used for this mean (excluded from Figure 1.1).

[51] There are only 8 observations used for this mean (excluded from Figure 1.1).

Table 11 (cont'd)

Data: FFCWS
Notes: The table presents mean averages of non-traffic stops in each city by father's racial or ethnic group. Due to privacy reasons, the author is unable to identify the cities in the sample by name. Standard deviations are in parentheses.

Table 12. OLS Estimates of the Marginal Impact of Paternal Incarceration on Outcomes

	PPVT-R (1)	AGGRESSION (2)	ODD (3)
Incarcerated Ex Post	-2.057	0.002	0.028
	(1.608)	(0.039)	(0.044)
Ever-Incarcerated[52]	1.869	0.050	0.001
	(1.397)	(0.029)	(0.034)
Father Absent	-1.097	0.027	0.046
	(0.838)	(0.017)	(0.020)
Mother Interviewed in Spanish	-4.087	-0.067	-0.065
	(2.571)	(0.043)	(0.051)
Male	-2.033	0.036	0.034
	(0.698)	(0.014)	(0.017)
Birth Order	-0.622	0.012	0.003
	(0.334)	(0.007)	(0.008)
ADHD Symptoms	0.362	-0.005	-0.034
	(1.027)	(0.020)	(0.023)
ADHD (missing)	0.758	0.003	-0.046
	(1.180)	(0.023)	(0.027)
Mother's Age	0.130	-0.001	-0.001
	(0.118)	(0.002)	(0.003)
Father's Age	-0.085	-0.002	-0.002
	(0.086)	(0.002)	(0.002)
Mother Black	-4.215	-0.068	-0.153
	(1.463)	(0.032)	(0.037)
Mother Hispanic	-3.598	0.027	-0.035
	(1.473)	(0.033)	(0.038)
Father Black	-2.137	0.112	0.123
	(1.495)	(0.030)	(0.037)
Father Hispanic	0.023	0.035	0.029
	(1.570)	(0.031)	(0.037)
Mother Born in U.S.	3.427	0.170	0.093
	(7.148)	(0.070)	(0.119)
Father Born in U.S.	0.332	-0.007	-0.027
	(1.615)	(0.046)	(0.051)
Child was Breastfed	2.140	0.039	0.051
	(0.769)	(0.017)	(0.020)
Mother< High School Degree	0.557	0.019	0.027
	(0.921)	(0.021)	(0.024)
Mother< College Degree	3.809	0.018	0.015
	(1.027)	(0.021)	(0.025)
Mother has at least College Degree	9.841	0.014	0.016
	(1.835)	(0.028)	(0.037)
Mother's WAIS-R Score	0.374	-0.006	-0.001

[52] This indicator excludes those fathers who though reported as incarcerated at some point, it could not be determined whether they were incarcerated ex ante or ex post.

Table 12 (cont'd)

	(0.160)	(0.003)	(0.004)
Father's WAIS-R Score	0.354	0.004	0.001
	(0.149)	(0.003)	(0.004)
Father< High School Degree	-1.344	0.036	0.027
	(0.905)	(0.021)	(0.024)
Father< College Degree	0.178	-0.039	-0.015
	(1.034)	(0.021)	(0.025)
Father has at least College Degree	-0.891	0.006	-0.006
	(1.787)	(0.028)	(0.034)
Father Smokes	-0.633	0.019	0.010
	(0.871)	(0.017)	(0.021)
Father Smokes (Missing)	-2.215	0.026	0.043
	(1.753)	(0.047)	(0.056)
Father Drinks	-0.725	0.018	0.038
	(1.212)	(0.021)	(0.026)
Father Drinks (Missing)	2.281	-0.022	-0.009
	(1.660)	(0.034)	(0.043)
Mother Smokes	0.504	0.072	0.066
	(0.908)	(0.020)	(0.023)
Mother Drinks	1.790	0.007	0.026
	(0.797)	(0.016)	(0.019)
Mother has Mental Problems	0.301	0.053	0.072
	(1.497)	(0.035)	(0.043)
Father has Mental Problems	-0.385	0.082	0.168
	(2.082)	(0.066)	(0.072)
Father Figure Present	0.672	0.065	0.021
	(1.203)	(0.026)	(0.030)
Household Income per Person/10,000	0.892	-0.006	-0.001
	(0.446)	(0.005)	(0.007)
Household Income per Person (Missing)	-0.386	0.059	0.097
	(1.431)	(0.029)	(0.032)
Number of Residential Moves	0.288	0.008	-0.004
	(0.275)	(0.006)	(0.007)
Paternal Importance	5.998	-0.013	0.050
	(2.216)	(0.046)	(0.056)
Either Parent Reports Aggravation	-1.629	0.120	0.112
	(0.868)	(0.018)	(0.021)
Religiosity	0.153	0.013	0.020
	(0.238)	(0.005)	(0.006)
Child will not have Father's Last Name	0.228	0.021	0.029
	(1.162)	(0.029)	(0.036)
Father's Name is not on Birth Certificate	-1.599	0.014	0.031
	(1.492)	(0.036)	(0.044)
Father did not visit Hospital at Child's Birth	-0.950	0.011	0.001
	(1.264)	(0.029)	(0.033)
Mother considered Abortion	1.946	-0.022	-0.006
	(0.827)	(0.018)	(0.022)
Father suggested Abortion	-0.190	0.069	0.093
	(1.230)	(0.032)	(0.036)

Table 12 (cont'd)

Time Mother knew Father prior to Pregnancy	0.148	-0.001	-0.000
	(0.089)	(0.002)	(0.002)
R_Squared	0.23	0.12	0.11
Observations	1804	2143	2401

Data: FFCWS.
Notes: All regressions include city, region-of-birth and interview-year dummies. Robust standard errors are in parentheses.

Table 13. Estimates of the Marginal Impact of Paternal Incarceration Ex Post by Father's Race/Ethnicity

	Black			Hispanic			Other		
	PPVT-R	AGG.	ODD	PPVT-R	AGG.	ODD	PPVT-R	AGG.	ODD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Incarcerated Ex Post	-1.961	0.017	0.019	2.332	-0.111	0.110	-5.822	-0.020	-0.175
	(1.962)	(0.051)	(0.060)	(4.224)	(0.085)	(0.099)	(4.320)	(0.091)	(0.118)
Ever-Incarcerated	2.620	0.051	0.014	-3.514	0.061	-0.060	5.293	0.051	0.047
	(1.793)	(0.042)	(0.051)	(3.277)	(0.061)	(0.068)	(2.985)	(0.064)	(0.071)
Father Absent	-0.545	0.027	0.041	-2.098	0.022	0.017	-1.611	0.021	0.065
	(1.061)	(0.024)	(0.029)	(1.844)	(0.039)	(0.044)	(2.432)	(0.035)	(0.041)
Observations	996	1073	1161	369	497	603	439	573	637
R-squared	0.18	0.14	0.13	0.33	0.20	0.18	0.40	0.21	0.22

Data: FFCWS

Robust standard errors in parentheses

All regressions include the same control variables as the regression model displayed in Table 12. Regressions are truncated by father's racial/ethnic group in order to observe differences in the marginal impact of paternal incarceration ex post on the following child outcomes: Peabody Picture Vocabulary Test – Revised (PPVT-R), Aggression (AGG.) and Oppositional Defiant Disorder (ODD).

Table 14. OLS and IV Regressions of the Effect of Incarceration Ex Post on Child Outcomes

Dependent Outcome:	PPVT-R			AGGRESSION			ODD		
	OLS	IV[53]	IV[54]	OLS	IV[53]	IV[54]	OLS	IV[53]	IV[54]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
First-Stage F-Statistic – Incarceration	-	18.75	28.84	-	18.75	28.84	-	18.75	28.84
First-Stage F-Statistic – Father Absent	-	11.44	-	-	11.44	-	-	11.44	-
Hausman Test F-Statistic	-	4.62	7.20	-	4.69	8.80	-	10.04	19.74
Incarcerated Ex Post	-1.145	-70.607	-24.443	0.061	0.722	0.652	0.038	0.423	1.079
	(1.230)	(61.846)	(11.293)	(0.030)	(0.510)	(0.244)	(0.035)	(0.646)	(0.322)
Father Absent	-0.945	44.997	1.647	0.048	-0.099	-0.016	0.064	0.515	-0.047
	(0.912)	(60.550)	(1.634)	(0.017)	(0.402)	(0.032)	(0.021)	(0.530)	(0.042)
ADHD Symptoms	0.511	-0.895	0.131	-0.004	0.006	0.004	-0.044	-0.043	-0.030
	(1.192)	(2.659)	(1.283)	(0.022)	(0.026)	(0.023)	(0.027)	(0.033)	(0.031)
ADHD Symptoms (Missing)	0.538	1.092	0.385	0.006	0.013	0.014	-0.044	-0.028	-0.033
	(1.349)	(2.852)	(1.479)	(0.025)	(0.028)	(0.027)	(0.031)	(0.036)	(0.037)
Mother interviewed in Spanish	-6.647	-4.686	-7.386	-0.003	0.008	0.010	-0.034	0.003	0.008
	(3.109)	(6.568)	(3.274)	(0.048)	(0.048)	(0.048)	(0.057)	(0.070)	(0.064)
Male	-2.558	-3.572	-2.633	0.043	0.047	0.046	0.047	0.044	0.050
	(0.815)	(2.029)	(0.895)	(0.015)	(0.018)	(0.017)	(0.019)	(0.023)	(0.023)
Birth Order	-1.636	-0.702	-1.077	0.020	0.008	0.008	0.011	-0.005	-0.010
	(0.349)	(0.937)	(0.471)	(0.007)	(0.009)	(0.009)	(0.008)	(0.012)	(0.012)
Mother's Age	0.427	0.632	0.297	-0.005	-0.002	-0.001	-0.003	0.006	0.002
	(0.127)	(0.572)	(0.147)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)

[53] The instruments for endogenous paternal incarceration are: (i) Father's Impulsivity (DDI) and (ii) Racial profiling (average non-traffic stops within the father's city and racial group). The instruments for endogenous father absence are: (i) Father's biological father was very involved in his life during childhood and (ii) Father had a father figure who was not his biological father.

[54] The instruments for endogenous paternal incarceration are: (i) Father's Impulsivity (DDI) and (ii) Racial profiling (average non-traffic stops within the father's city and racial group). Father absence is assumed to be exogenous and as such, is not instrumented in these IV regressions.

Table 14 (cont'd)

Father's Age	-0.054	-0.097	-0.106	-0.001	-0.001	-0.001	-0.001	0.001	-0.001
	(0.100)	(0.192)	(0.111)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Mother Black	-4.857	-10.388	-4.130	-0.074	-0.089	-0.099	-0.192	-0.296	-0.235
	(1.726)	(9.809)	(1.972)	(0.033)	(0.057)	(0.038)	(0.043)	(0.076)	(0.054)
Mother Hispanic	-5.205	-7.627	-5.625	0.005	0.002	0.003	-0.049	-0.043	-0.049
	(1.600)	(4.395)	(1.765)	(0.032)	(0.035)	(0.033)	(0.040)	(0.047)	(0.045)
Father Black	-5.902	-8.467	-5.358	0.091	0.091	0.083	0.107	0.040	0.088
	(1.835)	(5.810)	(2.043)	(0.033)	(0.052)	(0.038)	(0.043)	(0.069)	(0.054)
Father Hispanic	-4.115	-6.631	-4.360	0.016	0.034	0.028	-0.008	-0.039	0.005
	(1.719)	(4.626)	(1.878)	(0.032)	(0.047)	(0.036)	(0.041)	(0.063)	(0.048)
Mother was born in U.S.	-3.203	-27.412	-8.814	0.131	0.261	0.231	0.180	0.145	0.378
	(5.371)	(26.573)	(7.629)	(0.084)	(0.188)	(0.103)	(0.096)	(0.253)	(0.157)
Father was born in U.S.	0.768	5.242	0.191	0.006	0.024	0.032	-0.032	0.059	-0.001
	(1.752)	(8.032)	(2.017)	(0.034)	(0.055)	(0.041)	(0.039)	(0.073)	(0.053)
R_Squared	0.14	-	-	0.05	-	-	0.05	-	-
Observations	1534	1534	1534	1979	1979	1979	1992	1992	1992

Data: FFCWS

Notes: All regressions include year and parents' region of birth dummies. Robust standard errors are in parentheses. The analysis sample is restricted to children living with their mothers all or most of the time. Father is classified as absent if at any time, he is not living in the child's household. The IV analysis sample is used for OLS regressions.

Table 15. Summary Statistics

Variables	Obs.	Mean	SD	Min	Max
Union Dissolved at the End of Each Spell	5768	0.16	0.37	0	1
Duration of the Union at the Start of Spell	5768	4.90	3.89	0	27.33
0-1 Year Interval	5786	0.04	0.19	0	1
1-3 Year Interval	5768	0.33	0.47	0	1
3-5 Year Interval	5768	0.23	0.42	0	1
5-7 Year Interval	5768	0.14	0.35	0	1
7-10 Year Interval	5768	0.13	0.34	0	1
10-12 Year Interval	5768	0.05	0.22	0	1
12 Plus Year Interval	5768	0.07	0.25	0	1
Time between interviews (Months)	5768	19.53	5.61	3	37
Time-Invariant					
Age Difference	2267	2.50	4.76	-15	32
Age Difference Squared	2267	28.84	65.04	0	1024
Mother Black	2450	0.34	0.48	0	1
Mother White	2450	0.30	0.46	0	1
Mother Hispanic	2450	0.31	0.46	0	1
Other	2450	0.05	0.21	0	1
Less than HS	2450	0.34	0.47	0	1
High School	2450	0.23	0.42	0	1
Some College	2450	0.26	0.44	0	1
College	2450	0.17	0.37	0	1
Dad Very Involved	2450	0.40	0.49	0	1
Dad Little Involved	2450	0.35	0.48	0	1
Dad Not Involved	2450	0.23	0.42	0	1
Father Figure Present	2450	0.24	0.42	0	1
No Religion	2450	0.09	0.29	0	1
Catholic	2450	0.35	0.48	0	1
Jewish	2450	0.02	0.12	0	1
Muslim	2450	0.02	0.12	0	1
Baptist	2450	0.20	0.40	0	1
Other Christian	2450	0.32	0.47	0	1
Freq. of Church Attendance	2445	2.88	1.36	1	5
Mother's Impulsivity Scale	2241	3.01	0.60	1	4
Father's Impulsivity Scale	1817	3.06	0.65	1	4
Focal Child is a Boy	2450	0.52	0.50	0	1
First Child	2450	0.26	0.44	0	1
Mother's Age at Baseline	2450	26.38	6.08	15	43
Out of Wedlock Childbirth	2450	0.58	0.49	0	1
Marriage within 6 mths prior to birth	2450	0.02	0.14	0	1
Time-Varying					
Number of Children in HH	5754	1.78	1.33	0	10
Number of Adults in HH	5753	2.33	0.82	1	9

Table 15 (cont'd)

Cohabit only	5768	0.45	0.50	0	1
Pre-Marital Cohabitation	5768	0.27	0.44	0	1
Married Only	5768	0.28	0.45	0	1
New Birth Shock	5768	0.76	0.43	0	1
Lagged Changes					
Residential Move	3318	0.37	0.48	0	1
New Incarceration	3316	0.02	0.13	0	1
New Release	3316	0.02	0.13	0	1
Household Income (10^{-3})	3318	45.35	47.54	0	935.87
Change in Household Income (10^{-3})	3316	-0.61	73.73	-906.86	923.70

Data: FFCWS
Note: The time-invariant summary statistics are calculated using the baseline sample only; all other summary statistics use the entire analysis sample.

Table 16. Linear Probability Estimates of the Correlates of Union Dissolution

	(1)	(2)	(3)	(4)
1-3 Year Interval	-0.031	-0.021	-0.007	.
	(0.036)	(0.035)	(0.035)	.
3-5 Year Interval	-0.049	-0.018	0.013	0.031
	(0.036)	(0.036)	(0.037)	(0.022)
5-7 Year Interval	-0.144	-0.082	-0.037	-0.015
	(0.036)	(0.037)	(0.038)	(0.024)
7-10 Year Interval	-0.138	-0.056	-0.013	-0.002
	(0.036)	(0.038)	(0.040)	(0.026)
10-12 Year Interval	-0.191	-0.099	-0.043	-0.029
	(0.037)	(0.038)	(0.040)	(0.028)
12 Plus Year Interval	-0.187	-0.082	-0.024	0.007
	(0.037)	(0.039)	(0.041)	(0.030)
Interval Length	0.005	0.005	0.007	0.007
	(0.001)	(0.001)	(0.001)	(0.003)
Age Difference		-0.004	-0.004	-0.001
		(0.002)	(0.002)	(0.002)
Age Difference Squared		0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)
Mother Black		0.086	0.068	0.052
		(0.016)	(0.016)	(0.020)
Mother Hispanic		-0.009	-0.017	0.004
		(0.015)	(0.016)	(0.020)
Other		0.009	0.014	-0.007
		(0.021)	(0.021)	(0.025)
Less than HS		0.044	0.036	0.015
		(0.017)	(0.017)	(0.023)
Some College		0.008	0.016	0.022
		(0.016)	(0.016)	(0.021)
College		-0.035	-0.006	0.014
		(0.016)	(0.016)	(0.022)
Dad Very Involved		-0.009	-0.010	-0.017
		(0.018)	(0.018)	(0.023)
Dad Little Involved		-0.018	-0.012	0.004
		(0.016)	(0.016)	(0.022)
Father Figure Present		0.000	-0.003	0.006
		(0.016)	(0.016)	(0.021)
No Religion		0.047	0.040	0.032
		(0.023)	(0.023)	(0.030)
Jewish		-0.002	0.020	0.053
		(0.027)	(0.027)	(0.038)
Muslim		-0.021	-0.007	0.010
		(0.040)	(0.039)	(0.055)
Baptist		0.043	0.039	0.063
		(0.019)	(0.019)	(0.025)
Other Christian		0.008	0.017	0.009
		(0.013)	(0.013)	(0.017)

Table 16 (cont'd)

Freq. of Church Attendance		0.001	-0.007	-0.008
		(0.004)	(0.005)	(0.006)
Mother Impulsivity Scale		-0.040	-0.036	-0.041
		(0.010)	(0.010)	(0.013)
Father Impulsivity Scale		-0.041	-0.040	-0.034
		(0.009)	(0.009)	(0.012)
Focal Child is a Boy		-0.025	-0.024	-0.007
		(0.011)	(0.011)	(0.014)
First Child		-0.021	-0.008	-0.000
		(0.013)	(0.014)	(0.019)
Mother's Age at Baseline		-0.005	-0.005	-0.004
		(0.001)	(0.001)	(0.002)
Out of Wedlock Childbirth			0.032	0.026
			(0.025)	(0.027)
Marriage within 6 mths prior to birth			-0.020	0.002
			(0.032)	(0.043)
Number of Children in HH			0.001	-0.001
			(0.005)	(0.008)
Number of Adults in HH			-0.008	-0.010
			(0.008)	(0.011)
Cohabit only			0.094	0.084
			(0.027)	(0.030)
Pre-Marital Cohabitation			0.011	0.009
			(0.012)	(0.016)
New Birth Shock			0.016	0.000
			(0.017)	(0.020)
Residential Move				0.017
				(0.015)
New Incarceration				0.508
				(0.068)
New Release				0.001
				(0.047)
Change in H. Income Def/10000				-0.004
				(0.001)
Observations	4108	4108	4095	2474
R-squared	0.03	0.09	0.11	0.14

Data: FFCWS

Robust standard errors are in parentheses. The excluded category for the duration intervals is 0 to 3 years in column (4). Since lagged variables are included in this model, only 18 couples who have been together for less than one year are included in this regression. Subsequently, using the 0 – 1 year interval as the sole excluded category will induce problems similar to a dummy variable trap.

Table 17. Linear Probability Estimates for Low-Educated and Black Mothers

	Mother Low-Educated		Mother Black	
	(1)	(2)	(3)	(4)
1-3 Year Interval	-0.009	.	0.012	.
	(0.043)	.	(0.067)	.
3-5 Year Interval	0.040	0.072	0.012	0.013
	(0.047)	(0.031)	(0.070)	(0.043)
5-7 Year Interval	-0.036	-0.003	-0.028	0.012
	(0.049)	(0.037)	(0.074)	(0.052)
7-10 Year Interval	0.031	0.051	0.008	-0.032
	(0.053)	(0.044)	(0.078)	(0.056)
10-12 Year Interval	-0.042	-0.040	-0.041	-0.069
	(0.056)	(0.043)	(0.088)	(0.070)
12 Plus Year Interval	-0.017	0.047	-0.073	-0.046
	(0.056)	(0.050)	(0.078)	(0.059)
Interval Length	0.007	0.009	0.011	0.011
	(0.002)	(0.004)	(0.003)	(0.005)
Age Difference	-0.008	-0.004	-0.005	-0.004
	(0.003)	(0.003)	(0.004)	(0.005)
Age Difference Squared	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Mother Black	0.076	0.045	0.000	0.000
	(0.025)	(0.033)	(0.000)	(0.000)
Mother Hispanic	-0.027	-0.030	0.000	0.000
	(0.025)	(0.031)	(0.000)	(0.000)
Other	0.012	-0.055	0.000	0.000
	(0.052)	(0.057)	(0.000)	(0.000)
Less than HS	0.038	0.019	0.039	0.075
	(0.018)	(0.024)	(0.033)	(0.044)
Some College	0.000	0.000	0.002	0.061
	(0.000)	(0.000)	(0.031)	(0.039)
College	0.000	0.000	-0.049	0.047
	(0.000)	(0.000)	(0.037)	(0.047)
Dad Very Involved	-0.018	-0.016	0.013	-0.025
	(0.026)	(0.034)	(0.033)	(0.042)
Dad Little Involved	-0.016	0.023	-0.016	0.013
	(0.023)	(0.030)	(0.030)	(0.039)
Father Figure Present	-0.009	-0.002	0.009	0.012
	(0.023)	(0.030)	(0.030)	(0.039)
No Religion	0.081	0.065	0.072	0.012
	(0.035)	(0.046)	(0.056)	(0.074)
Jewish	-0.093	-0.085	0.113	0.118
	(0.039)	(0.057)	(0.149)	(0.174)
Muslim	0.092	0.158	0.056	0.108
	(0.122)	(0.168)	(0.112)	(0.145)
Baptist	0.051	0.072	0.097	0.091
	(0.029)	(0.037)	(0.041)	(0.052)
Other Christian	0.034	0.021	0.060	-0.008
	(0.022)	(0.028)	(0.041)	(0.052)

Table 17 (cont'd)

Freq. of Church Attendance	-0.009	-0.017	-0.017	-0.027
	(0.007)	(0.009)	(0.010)	(0.013)
Mother Impulsivity Scale	-0.050	-0.058	-0.052	-0.066
	(0.014)	(0.018)	(0.020)	(0.027)
Father Impulsivity Scale	-0.048	-0.044	-0.042	-0.036
	(0.014)	(0.018)	(0.019)	(0.024)
Focal Child is a Boy	-0.036	-0.008	-0.029	0.007
	(0.017)	(0.022)	(0.023)	(0.029)
First Child	-0.007	-0.000	-0.018	-0.033
	(0.024)	(0.033)	(0.037)	(0.049)
Mother's Age at Baseline	-0.005	-0.005	-0.004	-0.004
	(0.002)	(0.002)	(0.003)	(0.004)
Out of Wedlock Childbirth	0.051	0.053	0.035	0.026
	(0.035)	(0.039)	(0.051)	(0.057)
Marriage within 6 mths prior to birth	-0.035	0.046	-0.032	-0.039
	(0.056)	(0.083)	(0.067)	(0.088)
Number of Children in HH	0.002	0.000	-0.008	-0.007
	(0.008)	(0.011)	(0.010)	(0.015)
Number of Adults in HH	-0.003	0.005	-0.015	-0.015
	(0.009)	(0.014)	(0.020)	(0.026)
Cohabit only	0.050	0.015	0.147	0.124
	(0.039)	(0.045)	(0.057)	(0.065)
Pre-Marital Cohabitation	-0.023	-0.046	0.022	0.006
	(0.024)	(0.032)	(0.031)	(0.040)
New Birth Shock	0.023	0.001	0.058	0.028
	(0.027)	(0.030)	(0.036)	(0.042)
Residential Move		0.015		0.042
		(0.023)		(0.033)
New Incarceration		0.466		0.442
		(0.076)		(0.090)
New Release		0.060		0.091
		(0.084)		(0.118)
Change in H. Income Def/10000		-0.004		-0.009
		(0.002)		(0.003)
Observations	2093	1224	1316	744
R-squared	0.09	0.14	0.10	0.18

Data: FFCWS
Robust standard errors are in parentheses
* significant at 5%; ** significant at 1%

Table 18. Linear Probability Estimates for Couples Cohabiting and Married at Baseline

	Cohabiting		Married	
	(1)	(2)	(3)	(4)
1-3 Year Interval	-0.016	.	-0.001	.
	(0.039)	.	(0.086)	.
3-5 Year Interval	0.003	0.041	0.011	-0.019
	(0.043)	(0.029)	(0.089)	(0.035)
5-7 Year Interval	-0.054	-0.003	-0.024	-0.054
	(0.048)	(0.041)	(0.090)	(0.034)
7-10 Year Interval	0.006	-0.001	-0.022	-0.045
	(0.055)	(0.050)	(0.091)	(0.037)
10-12 Year Interval	-0.018	-0.038	-0.053	-0.069
	(0.089)	(0.091)	(0.091)	(0.037)
12 Plus Year Interval	-0.054	-0.008	-0.029	-0.035
	(0.076)	(0.088)	(0.091)	(0.039)
Interval Length	0.007	0.008	0.006	0.007
	(0.002)	(0.004)	(0.001)	(0.003)
Age Difference	-0.007	-0.004	0.001	0.001
	(0.003)	(0.004)	(0.002)	(0.002)
Age Difference Squared	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Mother Black	0.091	0.061	0.033	0.029
	(0.026)	(0.035)	(0.018)	(0.024)
Mother Hispanic	-0.012	0.008	0.004	0.010
	(0.027)	(0.035)	(0.018)	(0.026)
Other	0.108	0.046	-0.019	-0.011
	(0.063)	(0.074)	(0.014)	(0.022)
Less than HS	0.044	0.021	0.000	-0.013
	(0.023)	(0.031)	(0.025)	(0.034)
Some College	0.034	0.059	-0.008	-0.012
	(0.024)	(0.032)	(0.019)	(0.026)
College	-0.024	0.034	-0.026	-0.018
	(0.051)	(0.063)	(0.018)	(0.025)
Dad Very Involved	-0.007	0.011	-0.009	-0.051
	(0.028)	(0.036)	(0.021)	(0.030)
Dad Little Involved	-0.013	0.035	-0.011	-0.033
	(0.024)	(0.032)	(0.021)	(0.029)
Father Figure Present	-0.025	-0.004	0.034	0.018
	(0.024)	(0.031)	(0.020)	(0.027)
No Religion	0.056	0.039	0.038	0.042
	(0.034)	(0.044)	(0.028)	(0.038)
Jewish	-0.189	-0.193	0.009	0.044
	(0.053)	(0.076)	(0.028)	(0.041)
Muslim	0.014	0.123	-0.023	-0.027
	(0.116)	(0.161)	(0.031)	(0.049)
Baptist	0.074	0.117	0.006	0.011
	(0.032)	(0.042)	(0.020)	(0.027)
Other Christian	0.046	0.030	-0.001	-0.006
	(0.027)	(0.034)	(0.012)	(0.017)

Table 18 (cont'd)

Freq. of Church Attendance	-0.014	-0.019	0.001	0.000
	(0.007)	(0.010)	(0.005)	(0.006)
Mother Impulsivity Scale	-0.054	-0.062	-0.021	-0.023
	(0.017)	(0.022)	(0.011)	(0.015)
Father Impulsivity Scale	-0.054	-0.052	-0.020	-0.015
	(0.014)	(0.019)	(0.011)	(0.015)
Focal Child is a Boy	-0.023	0.016	-0.024	-0.023
	(0.018)	(0.024)	(0.011)	(0.015)
First Child	-0.019	-0.003	-0.004	-0.007
	(0.024)	(0.033)	(0.015)	(0.021)
Mother's Age at Baseline	-0.005	-0.003	-0.003	-0.004
	(0.002)	(0.003)	(0.002)	(0.002)
Out of Wedlock Childbirth	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Marriage within 6 mths prior to birth	0.000	0.000	-0.011	-0.011
	(0.000)	(0.000)	(0.035)	(0.046)
Number of Children in HH	0.004	0.007	0.000	-0.005
	(0.009)	(0.013)	(0.005)	(0.007)
Number of Adults in HH	-0.006	-0.007	-0.009	-0.012
	(0.009)	(0.014)	(0.011)	(0.017)
Cohabit only	0.078	0.078	0.000	0.000
	(0.025)	(0.026)	(0.000)	(0.000)
Pre-Marital Cohabitation	0.000	0.000	0.008	0.007
	(0.000)	(0.000)	(0.012)	(0.016)
New Birth Shock	0.015	-0.014	0.010	0.006
	(0.029)	(0.032)	(0.018)	(0.021)
Residential Move		0.044		-0.014
		(0.025)		(0.016)
New Incarceration		0.491		0.562
		(0.074)		(0.183)
New Release		0.055		-0.030
		(0.100)		(0.037)
Change in H. Income Def/10000		-0.007		-0.003
		(0.002)		(0.001)
Observations	2102	1192	1993	1282
R-squared	0.06	0.12	0.07	0.09

Data: FFCWS
Robust standard errors are in parentheses
* significant at 5%; ** significant at 1%

Table 19. Logit Estimates of Union Dissolution

	(1)	(2)	(3)	(4)
1-3 Year Interval	-0.223	-0.124	-0.062	
	(0.213)	(0.232)	(0.230)	
3-5 Year Interval	-0.346	-0.113	0.050	0.209
	(0.220)	(0.245)	(0.246)	(0.155)
5-7 Year Interval	-1.169	-0.684	-0.389	-0.200
	(0.249)	(0.278)	(0.280)	(0.224)
7-10 Year Interval	-1.097	-0.404	-0.125	-0.083
	(0.250)	(0.285)	(0.295)	(0.246)
10-12 Year Interval	-1.914	-1.179	-0.803	-0.683
	(0.383)	(0.413)	(0.425)	(0.459)
12 Plus Year Interval	-1.825	-0.976	-0.515	-0.140
	(0.350)	(0.389)	(0.399)	(0.371)
Interval Length	0.040	0.047	0.056	0.063
	(0.008)	(0.009)	(0.012)	(0.021)
Age Difference		-0.038	-0.034	-0.011
		(0.015)	(0.015)	(0.020)
Age Difference Squared		0.002	0.001	0.001
		(0.001)	(0.001)	(0.001)
Mother Black		0.686	0.552	0.476
		(0.123)	(0.128)	(0.171)
Mother Hispanic		0.049	-0.013	0.171
		(0.151)	(0.158)	(0.202)
Other		0.119	0.187	-0.225
		(0.290)	(0.288)	(0.452)
Less than HS		0.264	0.205	0.087
		(0.121)	(0.124)	(0.168)
Some College		0.071	0.118	0.235
		(0.128)	(0.131)	(0.172)
College		-0.862	-0.576	-0.218
		(0.222)	(0.236)	(0.283)
Dad Very Involved		-0.085	-0.101	-0.212
		(0.140)	(0.141)	(0.191)
Dad Little Involved		-0.162	-0.127	0.021
		(0.124)	(0.124)	(0.163)
Father Figure Present		0.029	-0.003	0.048
		(0.122)	(0.123)	(0.159)
No Religion		0.352	0.342	0.285
		(0.180)	(0.186)	(0.258)
Jewish		-0.242	0.075	0.505
		(0.553)	(0.556)	(0.556)
Muslim		-0.156	-0.053	0.296
		(0.532)	(0.541)	(0.608)
Baptist		0.383	0.369	0.570
		(0.160)	(0.164)	(0.212)
Other Christian		0.121	0.222	0.131
		(0.138)	(0.144)	(0.187)
Freq. of Church Attendance		0.007	-0.064	-0.079

Table 19 (cont'd)

		(0.037)	(0.039)	(0.051)
Mother Impulsivity Scale		-0.312	-0.294	-0.346
		(0.081)	(0.084)	(0.109)
Father Impulsivity Scale		-0.310	-0.314	-0.274
		(0.071)	(0.072)	(0.097)
Focal Child is a Boy		-0.199	-0.209	-0.032
		(0.093)	(0.095)	(0.125)
First Child		-0.163	-0.063	0.020
		(0.118)	(0.129)	(0.172)
Mother's Age at Baseline		-0.046	-0.039	-0.036
		(0.012)	(0.012)	(0.016)
Out of Wedlock Childbirth			0.324	0.289
			(0.227)	(0.255)
Marriage within 6 months prior to child's birth			-0.119	0.060
			(0.379)	(0.451)
Number of Children in HH			0.014	0.008
			(0.043)	(0.063)
Number of Adults in HH			-0.041	-0.062
			(0.059)	(0.088)
Cohabit only			0.792	0.593
			(0.262)	(0.296)
Pre-Marital Cohabitation			0.221	0.086
			(0.199)	(0.233)
New Birth Shock			0.068	-0.044
			(0.142)	(0.166)
Residential Move				0.150
				(0.128)
New Incarceration				2.416
				(0.414)
New Release				0.020
				(0.451)
Change in H. Income Def/10000				-0.042
				(0.010)
Observations	4108	4108	4095	2474

Data: FFCWS
Robust standard errors are in parentheses
* significant at 5%; ** significant at 1%

Figure 1.1 (cont'd): List of Measures

All family structure types can be condensed as follows:
1 – Biological father has been present in the home since child's birth *(Stable two-parent family structure)*
2 – Biological father is no longer in the home but the social father is now present *(Unstable two-parent family structure)*
3 – Biological father is no longer in the home but mother is now single *(Unstable single-parent family structure)*
X – Social father has been present in the home since child's birth [Not observable in the data]
4 – Biological father has never been present in the home but social father is now present *(Unstable two-parent family structure)*
5* – Interim relationships include: father present at birth, absent at one-year follow-up and returns in third-year follow-up; father absent at birth, absent at one-year follow-up and returns in third-year follow-up; father absent at birth, present at one-year follow-up and third-year follow-up; father present at birth, social father present at one-year follow-up and father returns in third-year follow-up; father absent at birth, social father present at one-year follow-up and father returns in third-year follow-up. *(Unstable two-parent family structure)*
5 – Interim relationships include: no father present at child's birth, social father present at one-year follow-up and mother is single by third-year follow-up. *(Unstable single-parent family structure)*
6 – Mother has been single since child's birth *(Stable single-parent family structure)*

Figure 1.1.

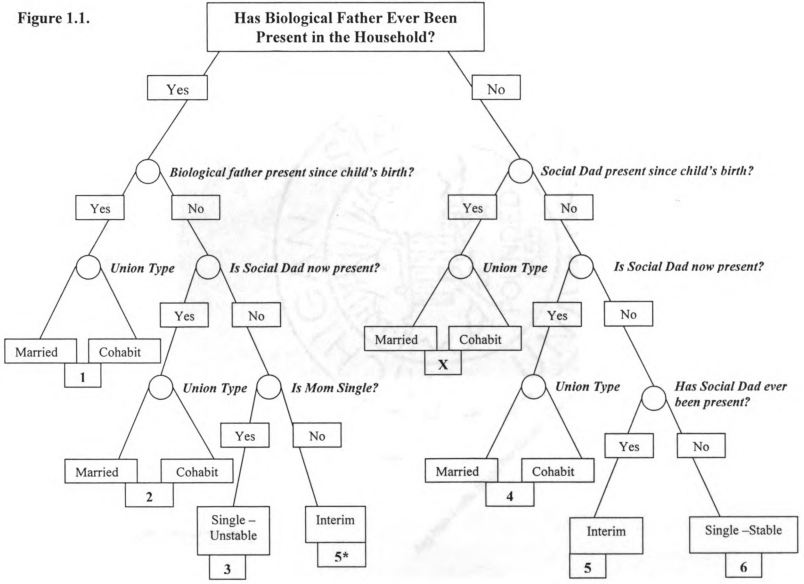

Has Biological Father Ever Been Present in the Household?
Yes
No
Biological father present since child's birth?
Social Dad present since child's birth?
Yes
No
Yes
No
Union Type
Is Social Dad now present?
Union Type
Is Social Dad now present?
Yes
No
Yes
No
Married
Cohabit
Married
Cohabit
1
X
Union Type
Is Mom Single?
Union Type
Has Social Dad ever been present?
Yes
No
Yes
No
Married
Cohabit
Married
Cohabit
2
4
Single – Unstable
Interim
Interim
Single –Stable
3
5*
5
6

Figure 2.1. Average Non-Traffic Stops by City and Race/Ethnicity

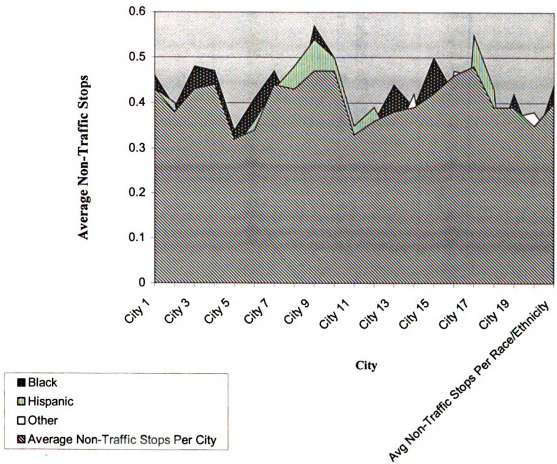
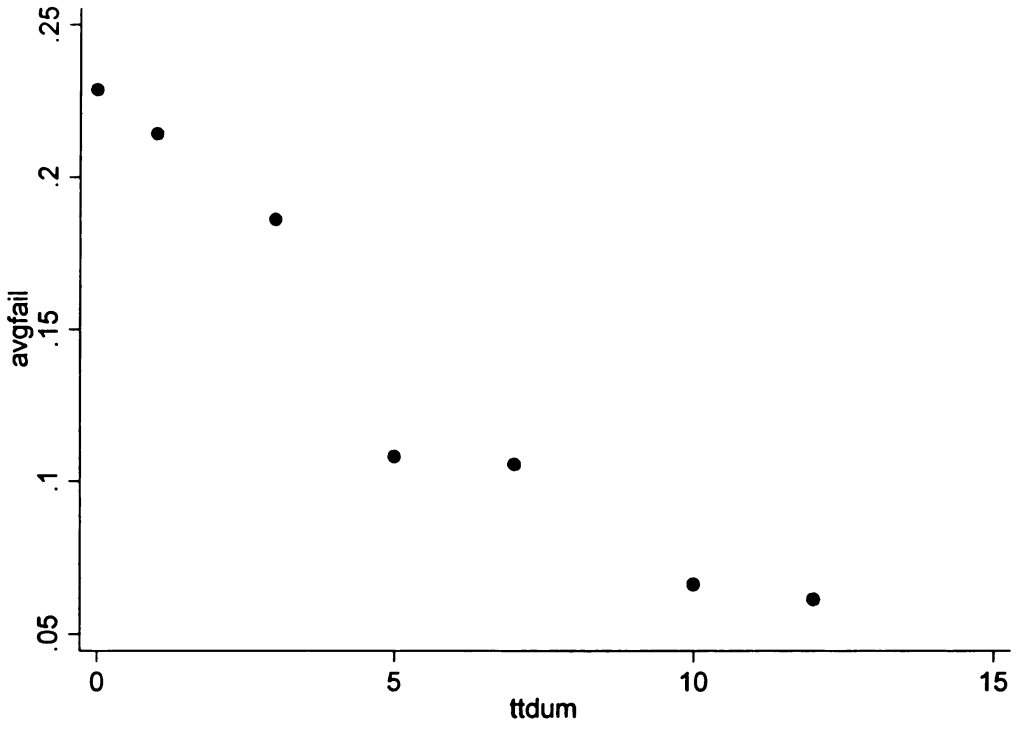


Figure 3.1. The Hazard of Union Dissolution



avgfail – Probability of Failure
ttdum – Duration of the Union at a start of a Spell

Appendix A.

Constructed Variables	*Definition*
1) Fraction of time Father is Present	The total number of years father has spent living with the child divided by age of the child.
2) Household Income/Person	Household income divided by household size.
3) Paternal Importance	Average of the questions reflecting the mother's evaluation of the importance of the father's involvement in the upbringing of the child. Likert scale: {(1) Very important, (2) somewhat important and (3) not important} ▪ How important is it for father to teach child about life? ▪ How important is it for father to provide direct care to child? ▪ How important is it for father to show love and affection to the child? ▪ How important is it for father to provide protection for child? ▪ How important is it for father to serve as authority figure and to discipline the child?
4) Mental/Emotional problems	The parent is characterized as having mental or emotional problems if he/she is taking medications for mental illnesses such as anxiety, depression or ADD.
5) Other father figures present	Defined as all men over the age of eighteen, living in the child's household aside from the male spouse/partner.
6) Parents' Drug Use	Parents' level of smoking, alcohol consumption and illegal drug use over the all three waves.
7) Parent Reports Parental Aggravation	Both parents answer four questions on aggravation on a scale of 1 to 4 (1 being the most aggravated). He/She is classified as aggravated if he/she rates his/her aggravation as 1 or 2 on the aggravation scale.
8) Residential Instability	The total number of residential moves the child has experienced since birth.

Appendix A (cont'd)

9) Father Absent	The child's biological father is reported as absent from the child's household in any wave.
10) Religiosity	The number of times per week mother attends church.
11) Ever-Incarcerated	This indicator excludes those fathers who are reported as incarcerated, but it could not be determined whether they were incarcerated ex ante or ex post.

Appendix B.

Scales Documentation

Aggression	ODD	ADHD	DDI – Father's Impulsivity
Can't wait turn	Defiant	Cannot concentrate	I often say whatever comes into my head without thinking
Demanding	Disobedient	Cannot sit still	Often I don't think enough before I act
Breaks others' things	Angry moods	Quickly shifts actions	I often say/do things without considering the consequences
Easily frustrated	Temper tantrums	Demanding	My plans fail because I fail to think them through first
Gets in fights	Uncooperative	Gets into everything	I often make up my mind w/o considering the situation
No guilt after misbeh.	Stubborn	Can't wait turn	I get into trouble because I don't think before I act
Hits others			
Hurts animals/people unintentionally			
Attacks people			
Punishment doesn't change behavior			
Screams a lot			
Selfish/won't share			
Wants a lot of attention			
Likert Scale:			
0-Not True	0-Not True	0-Not True	1-Strongly Agree
...	...	...	...
2-Very True	2-Very True	2-Very True	4-Strongly Disagree
Alpha on Full Sample:			
0.88	0.77	0.72	0.84

Notes: The items are averaged to create each scale.

Appendix C.

Religiosity – How often do you attend religious services?

Likert Scale:

1 – Once a week
2 – Several times per month
3 – Several times per year
4 – Hardly
5 – Never

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