Engaging Absent Fathers: Lessons from Paternity Establishment Programs

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April 2012

Abstract

Policies aimed at improving the well-being of disadvantaged single-mother households often seek to engage non-resident fathers with their families. However, by providing an alternative family involvement method to marriage, such policies create an "intermediate" option that can have unintended consequences: while increasing support from otherwise absent fathers, they can also deter some parents from the fuller commitment of marriage and thereby lower involvement among otherwise married fathers. The latter effect may occur because some mothers value partial support outside marriage more than full support and interaction with lower-than-desired quality partners in marriage. To examine these ideas, this paper provides the first comprehensive analysis of the causal effects of in-hospital voluntary paternity establishment (IHVPE), the major US program that substantially lowered paternity establishment costs for new unmarried parents, and places the findings in the context of a conceptual framework. Using variation in the timing of IHVPE initiation, I show that while IHVPE increases paternity establishment rates by a substantial 38 percent, it also reduces the likelihood of parental marriage post-childbirth. Once I account for selection out of marriage, I find some evidence of a net reduction in paternal transfers: private health insurance provision for children declines, while maternal labor supply increases. On the whole, measures of child welfare such as total household income and child mental and physical health are unaffected, although children's access to preventative care declines.

*Columbia University, Department of Economics. Contact e-mail: mr2856@columbia.edu. I am very grateful for the abundance of support, guidance, and helpful comments from Janet Currie, Wojciech Kopczuk, and Ilyana Kuziemko. I thank Pierre-André Chiappori, Jonathan Dingel, Lena Edlund, Jane Fortson, Irwin Garfinkel, Jeanne Lafortune, Corinne Low, Katherine Meckel, Matt Neidell, Brendan O'Flaherty, Petra Persson, Kiki Pop-Eleches, Debbie Reed, Jonah Rockoff, Robert Santillano, Andrew Slater, Lesley Turner, Miguel Urquiola, Jessica Van Parys, Eric Verhoogen, Till von Wachter, Jane Waldfogel, Reed Walker, Elizabeth Ty Wilde, Afshin Zilanawala, participants at the Columbia University Applied Microeconomics Colloquium, participants at Mathematica Policy Research, Inc. summer 2011 brown bag seminars, participants at the Fall 2011 APPAM Research Conference, and participants at the January 2012 ASSA meetings for their comments and suggestions. I thank Jean Roth for help with the CPS-CSS data, and Patricia Barnes for access to and help with the restricted NHIS data. I also thank Irwin Garfinkel and Lenna Nepomnyaschy for sharing data on child support laws with me. The project described was supported by Award Number R24HD058486 from the Eunice Kennedy Shriver National Institute of Child Health & Human Development. The content is solely the responsibility of the author and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute of Child Health & Human Development or the National Institutes of Health. All errors are my own.

1 Introduction

Marriage can be seen as a contract that assigns individuals rights and obligations to their partners and, importantly, their children. In fact, since an unmarried mother is considered a child's sole parent by law, marriage can serve as a transfer of rights to children from mothers to fathers (Edlund, 2011). However, as the rate of *unmarried* births has been rising — such that in 2009, 41 percent of all births were out-of-wedlock (National Center for Health Statistics, 2011) — policymakers have been increasingly concerned with creating formal alternative "contracts" to marriage to promote greater involvement of unmarried fathers with their families. These issues are especially salient in light of the disadvantages that single-mother households face — in 2010, 43 percent of children in single-mother households lived below the poverty line (U.S. Census Bureau, 2010), and only a small fraction of them received any support from their fathers.[1]

While these policies seek to address the best interests of some of the most disadvantaged families in this country, their overall effectiveness may be complicated by the fact that they offer "intermediate" options that can actually deter some parents from the fuller commitment of marriage. Thus, although "intermediate" family policies that provide alternatives to marriage may increase support from otherwise absent fathers, they may also decrease marriage and thereby decrease involvement from otherwise married fathers. The discouragement of marriage may be particularly relevant in a context where mothers trade-off the benefits of paternal transfers and support with the costs of interaction with lower-than-desired quality partners in the same household. Consequently, alternative contracts that delineate partial paternal rights and obligations outside marriage may be more attractive to mothers who would prefer to have less interaction with their children's fathers (Edin and Kefalas, 2005). As a result, the net effects on parents' involvement with each other and their children are ambiguous.

In this paper, I examine these issues by providing the first comprehensive analysis of in-hospital voluntary paternity establishment (IHVPE), the major US program that substantially lowered paternity establishment costs for new unmarried parents, and place my

[1]According to data from March Current Population Survey supplements over 1989-2010, only 19% of never-married mothers report receiving any child support income.

findings in the context of a simple conceptual framework. The empirical analysis in this paper adds to a large literature on the overall effects of child support enforcement (e.g.: Garfinkel *et al.*, 1998; Freeman and Waldfogel, 2001; Aizer and McLanahan, 2006; Nepomnyaschy and Garfinkel, 2007, among others), and improves upon the existing evaluations of IHVPE programs (Turner, 2001; Sorensen and Olivier, 2002; Mincy *et al.*, 2005) by using a strategy that can arguably identify the causal effects of IHVPE and by considering a large number of states and several outcomes that impact family well-being in repeated cross-section data spanning more than one decade. The conceptual framework, which draws heavily upon related theoretical literatures on the role of paternity rights in marriage (Edlund, 2011) and on the implications of collective bargaining models for child expenditures (Browning *et al.*, forthcoming), provides an interpretation of the empirical findings.

IHVPE programs were implemented as part of a broader movement of strengthening child support enforcement that began in the United States in the 1980s and 1990s with a goal of helping single mothers receive a higher and more stable source of income support. As described in more detail below, IHVPE programs provide all unmarried new fathers with an opportunity to voluntarily acknowledge paternity at the hospital at the time of the child's birth if both parents agree. The process entails filling out and signing a simple form; no DNA testing is necessary. Paternity establishment grants fathers partial rights to their children and usually obligates them to make child support payments, and can therefore be viewed as a form of legal contract that offers an "intermediate" parental relationship option between the "extremes" of no contact and marriage.

Office of Child Support Enforcement (OCSE) annual reports highlight the effectiveness of IHVPE programs: the paternity establishment rate among children who need paternity established has increased from 29 percent in 1987 to 74 percent in 2002 (U.S. House of Representatives, Committee on Ways and Means, 2004). Since establishing paternity is a crucial prerequisite to obtaining a child support order for unmarried mothers, this increase is potentially significant — there is some evidence that child support payments constitute a substantial fraction of female-headed households' family incomes and that increased child support enforcement and payments lead to greater involvement of non-resident fathers with their children (see Garfinkel *et al.*, 1998 for a review). Yet while OCSE reports suggest that

this increase in paternity establishments was due to IHVPE programs, there could be other factors driving the effect. The same decade experienced a drastic increase in the proportion of births by unmarried mothers, thus inducing nontrivial selection into the population of families likely affected by paternity establishment programs. The observed increase in paternities could be at least in part driven by compositional shifts in the distribution of births by unmarried mothers. Further, there is little evidence on how IHVPE programs affect other family outcomes such as marriage, father involvement, and overall child well-being.

Using data from OCSE annual reports on the number of established paternities in each state and year over 1992-2005 along with information on the year of program implementation across states, I first analyze whether IHVPE programs are in fact effective at increasing paternity establishment rates. My results suggest that IHVPE programs increase paternity establishment rates by about 38 percent. I provide evidence that the timing of IHVPE implementation is uncorrelated with numerous state characteristics and that my results are not driven by pre-existing trends in paternity establishment rates. My results are robust across several specifications and data sources, and to controls for maternal and child characteristics, state time-varying economic and program participation variables, other child support enforcement laws, state Earned Income Tax Credit (EITC) expansions, and Aid for Families with Dependent Children (AFDC) waivers and Temporary Assistance to Needy Families (TANF) introduction, as well as to the inclusion of state and year fixed effects and state-specific time trends. This suggests that the identified relationship is causal and not driven by other factors.

I place the implementation of IHVPE and the subsequent increase in paternity establishment rates in the context of a theoretical framework, which is largely based on the foundations most recently summarized in Edlund (2011).[2] In this framework, fathers, who

[2]The key idea that forms the theoretical backbone of this line of work (which was developed in Edlund (1998), and then served as the basis for the conclusions in several papers including Edlund and Korn (2002), Edlund and Pande (2002), Edlund and Lagerlof (2006), Chiappori and Weiss (2007), Chiappori and Oreffice (2008), Saint-Paul (2008), Francesconi *et al.* (2010), and Bethmann and Kvasnicka (2011)) is the observation that an unmarried mother is a child's sole parent by default, and therefore marriage serves as a transfer of paternity rights from the mother to the father. In essence, marriage can be seen as a contract for trade in children, where the father must make a positive transfer to the mother in marriage in exchange for rights to his children. Further, rights to children are usually "lumpy", which allows for the possibility of out-of-wedlock fertility (see Edlund, 2011 for a detailed discussion of this argument).

are heterogeneous in quality, must make transfers to mothers in exchange for rights to their children. Unmarried parents choose the relationship they want to have: they can marry, they can legally establish paternity for the father, or they can maintain no formal relationship. While mothers have full rights to their children regardless of the parental relationship, fathers only obtain full rights to their children in marriage and can obtain partial rights if they establish paternity. Consequently the transfers offered by fathers in exchange for marriage are higher than the transfers that they offer if they establish paternity (and they offer no transfers if they maintain no relationship with the mother). The key ingredient of the framework is that maternal utility is more sensitive to father quality in marriage than outside marriage. Thus, mothers must trade-off the benefits of paternal transfers with the costs of interacting with lower-than-desired quality partners in marriage.[3] Following a decrease in the cost of paternity establishment, more mothers will expect partial transfers outside marriage and hence reject marriage to their children's fathers. In effect, the marriage threshold in father quality increases, which leads to an increase in the average characteristics of both married and unmarried fathers.

The decrease in the cost of paternity establishment should induce parents who would have previously maintained no relationship to establish paternity as well. Thus, the net effect on transfers from fathers to mothers is ambiguous. It depends on the relative magnitudes of the decrease in transfers from switchers out of marriage and the increase in transfers from switchers out of no relationship. The question of net impacts of IHVPE on measures of paternal transfers (such as involvement with the child and maternal labor supply) is ultimately an empirical one.

From the perspective of this framework, IHVPE introduction can be seen as an exogenous shock to the cost of establishing paternity. I analyze the effects of IHVPE programs on several measures of family behavior using data from March/April matched Current Population Survey Child Support Supplements (CPS-CSS) for 1994, 1996, 1998, 2000, 2002, 2004, 2006, and 2008.[4] I show that IHVPE programs have a negative effect on parental

[3]This concept is similar to the trade-off between economic gains and non-pecuniary benefits in marriage in the collective bargaining framework (Browning *et al.*, forthcoming).

[4]Because of changes to the CPS-CSS in the early 1990s, data collected in or after 1994 are not compatible with those from earlier survey years (Freeman and Waldfogel, 2001).

marriage. Specifically, the likelihood that a mother of a child aged 5 years or less is married to the child's biological father is decreased, while the likelihood that she is never-married is increased by about 13 percent at the sample mean. Additionally, the likelihood that a mother is either cohabiting with or married to someone *other* than the child's father is increased. This finding supports the idea that more mothers can choose against sharing a household with their children's fathers and instead pick other (more optimal) partners when paternity establishment becomes a readily available option. Importantly, using data from the universe of U.S. birth records, I find no effect on the likelihood that a mother is married *at the time of childbirth*, which suggests that IHVPE programs influence marriage behavior *post-childbirth* and that the marriage results are *not* driven by a spurious correlation between IHVPE intiation and out-of-wedlock fertility rates.

Because of the IHVPE-driven decrease in parental marriage, any analysis on a sample of mothers eligible to be asked Child Support Supplement (CSS) questions in the CPS is likely biased because of selection into the sample.[5] In fact, if IHVPE is an intermediate option that leads to an increase in the "marriage threshold" in father quality, then one should expect average characteristics among both married and unmarried CSS-eligible fathers to increase. I find evidence that supports this notion in the data.

To study the net effects of IHVPE on father involvement, I consider private child health insurance provision, the only measure of involvement available for all children, regardless of whether their parents are married or not.[6] I find that overall, IHVPE leads to a 4 percent decrease in children's private health insurance coverage. I also provide some suggestive evidence of negative effects on other measures of father involvement when accounting for selection out of marriage — fathers are less likely to make any child support payments or to have joint custody, spend fewer days with their children, and are less likely to pay for childcare expenses for their children. Finally, I show that IHVPE leads to a 3 percent increase in maternal labor supply, suggesting that IHVPE may lead to a net decrease in monetary

[5] All household members aged 15 years or older who are a biological parent of a child in the household from an absent parent are asked CSS questions.

[6] In the CPS-CSS, all other questions regarding father involvement are only asked of CSS-eligible mothers. However, private child health insurance provision can be seen as an important measure of father involvement. As I discuss in more detail in Section 7, the decrease in private health insurance coverage is driven entirely by a decrease in health insurance provision by members of the household, and is not compensated by any changes in children's coverage by members outside the household.

transfers from fathers to mothers and their children, which mothers must compensate for by working.[7]

Although IHVPE had important effects on family structure and some measures of paternal transfers, the net impacts on child welfare are minimal. Theoretically, if children's well-being depends both on paternal transfers and on the well-being of their mothers with whom they reside, then the effects of IHVPE on it are ambiguous. While some children may suffer from a decrease in paternal transfers, they may also benefit from living with mothers who are happier as a result of decreased interaction with lower-than-desired quality partners. Analysis of CPS data suggests that there is no effect on total family income, while data from the 1997-2010 Sample Child files of the NHIS show no consistent effects of IHVPE on measures of children's physical or mental health. I do find a negative effect on children's access to preventative care: the likelihoods that a child has any doctor visits and any well-child visits in the last 12 months both decrease by about 2 percent at the sample mean. This is perhaps driven by the decline in children's private health insurance coverage.

The paper proceeds as follows. Section 2 discusses the IHVPE programs in more detail. Section 3 reviews the relevant background literature, while Section 4 presents an overview of the conceptual framework. Section 5 discusses the data sources and presents summary statistics, while Section 6 discusses the empirical methods. Section 7 presents the main results and robustness checks. Finally, Section 8 concludes.

2 In-Hospital Voluntary Paternity Establishment Programs

Without legal paternity establishment, unmarried fathers essentially have no rights or obligations with regard to their children. Paternity establishment grants fathers the rights to request the court for partial custody and visitation privileges, to refuse requested adoptions, and to block foster care placements. However, fathers have no rights regarding many decisions about their children's well-being (such as consent over medical care) if the mother has sole custody. Importantly, paternity establishment allows mothers to seek a court order that obligates fathers to make child support payments.

[7]This result is also consistent with the decrease in marriage as married women are generally less likely to be in the labor force than unmarried women (U.S. Census Bureau, 2011).

In the 1970s and 1980s, paternity establishment was a relatively uncommon and costly process that occurred through the court system, and most paternities were only established several years after the child's birth, if ever (The Office of Child Support Enforcement, 1996). To address this issue, the Omnibus Budget Reconciliation Act (OMBRA) of 1993 required all states to establish IHVPE programs, and these programs were then expanded by the 1996 Personal Responsibility and Work Opportunity Act (PRWORA). Policymakers speculated that IHVPE programs would be effective as they attempt to reach families during the "happy hour" in the hospital following the birth of the child and encourage the father to stay involved in his family's life (U.S. Department of Health and Human Services, 1997a). As a result, all states have initiated an IHVPE program, in which all hospitals and birthing centers are required to provide adult unmarried new mothers and fathers with an opportunity to sign a voluntary paternity acknowledgement form. Both unmarried parents have to be present at the hospital to participate in IHVPE.[8] State child support agencies are required to make available materials for educating parents, and hospital staff must provide mothers and fathers with both written materials and oral explanations regarding the rights and responsibilities related to paternity establishment. Additionally, in some states, minor parents are either not allowed to participate in the IHVPE programs, require parental consent to acknowledge paternity, or have more lenient rules for rescinding paternity within a short period after childbirth.[9] Importantly, IHVPE involves no DNA testing for paternity - paternity is legally established after both parents sign the voluntary paternity acknowledgement form.

Prior to the federal mandate, many states provided some kind of "voluntary acknowledgement" forms to new unmarried parents, but only in some hospitals. According to a survey of state child support agencies conducted by the Department of Health and Human Services, the forms had "no real legal significance" and many states "only kept forms at the public health office and didn't promote the idea [of paternity acknowledgement]" (U.S. Department of Health and Human Services, 1997b). For the purposes of this study, I consider an IHVPE program initiated in a state only when the in-hospital voluntary acknowledgement of pater-

[8]According to data from the Fragile Families and Child Well-Being Study, over 1998-2000, 76 percent of unmarried mothers reported that the child's father came to the hospital at the time of the child's birth.

[9]Specifically, in 2004, the following states had special provisions restricting participation for minors: CA, DE, IL, KS, KY, TN, TX, UT, VA, WI, and WY (Roberts, 2004).

nity process becomes part of the state's legal code and/or the state implements a formal program that targets all hospitals and birthing centers in the state and involves education of new parents about the paternity establishment process.

Despite the federal mandate, the administration of the in-hospital paternity acknowledgement process was mostly under state discretion. Variation in the timing of IHVPE implementation across states stems largely from the length of time that it took to forge relationships between state child support agencies, vital statistics registries, and hospitals (U.S. Department of Health and Human Services, 1997b). By 1997, 37 states reported full implementation of IHVPE, while the rest listed reasons such as "too early for the [office of child support] staff to have contacted every state birthing hospital" to explain the delays (U.S. Department of Health and Human Services, 1997b). Since identification of the causal effects of IHVPE programs on paternity establishment and family behavior relies on the assumption that the timing of implementation is uncorrelated with other time-varying determinants of these outcomes, it is important to assess whether the differences in timing are related to other potential confounding variables. While it may be the case that early IHVPE implementers have more efficient administrative processes and more organized existing networks across state agencies, time invariant differences in these characteristics are absorbed by the inclusion of state fixed effects in my analysis.[10] I also find that none of the results in this analysis is driven by any particular state (all regression results are robust to the exclusion of each state, results available upon request). Finally, since the empirical evidence shows no correlation between IHVPE program initiation and numerous state time-varying characteristics of interest, it seems unlikely that unobserved state time-varying omitted variables pose serious issues.

Unfortunately, a unified source of information on the timing of IHVPE program implementation across states does not exist. For most states, I obtained information on the year (and month if possible) of program implementation from searches of state legal statutes on *LexisNexis Academic*, internet searches of state paternity programs, and direct conversations with officials at state child support agencies and IHVPE programs. Additionally, as

[10]Further, differences in linear trends in such characteristics across states should be accounted for by the inclusion of state-specific time trends.

Nepomnyaschy and Garfinkel (2007) have collected this information for several states, I use their data as well. Figure 1 shows the variation in the timing of IHVPE program implementation across states, while Appendix Table 1 presents more details for each of the 44 states in my data.[11] Births in these states account for about 96 percent of all births in the United States over the time period of analysis. Figure 2 plots the trend in the total number of paternities established in the United States over 1992-2007, and the substantial increase from about 600,000 to over 1.5 million in the late 1990s coincides with the time when most states implemented IHVPE programs.

3 Background Literature

3.1 Child Support Enforcement

The implementation of numerous child support enforcement measures (which include IHVPE programs, as well as automatic wage withholding, the new hires directory, and license revocation for non-payment among others) throughout the 1980s and 1990s across states created a "natural experiment" for researchers to study their overall effects. As a result, there is a wealth of literature that focuses on the effects of child support enforcement on numerous family and child outcomes. Garfinkel *et al.* (1998) provide a comprehensive review of this literature. The main conclusions that arise from studies of the 1980s and early 1990s are that 1) child support enforcement tends to increase father-child interactions and father influence in child support rearing, and 2) child support enforcement decreases the likelihood of remarriage and subsequent out-of-wedlock births for low-income non-resident fathers.[12] More recent research has considered the effects of child support enforcement on child support payments (Freeman and Waldfogel, 2001), the characteristics of consequent out-of-wedlock births (Aizer and McLanahan, 2006), abortion (Crowley *et al.*, 2009), and domestic violence (Fertig *et al.*, 2007).

Most of the studies in the child support enforcement literature use a combination of

[11] I do not have data for the following states: IA, MT, NH, NM, OK, WV, WY.

[12] Studies in this review consider the effects of child support enforcement on remarriage of divorced non-resident fathers rather than effects on first-time marriage for never-married fathers. These studies generally focus on the 1980s and early 1990s - a time period prior to widespread paternity establishment for fathers who are unmarried at the time of childbirth. Hence, effects for never-married fathers are rarely considered as child support enforcement cannot affect them if they do not establish paternity.

variation in child support policy implementation and child support spending across states and years for identification. These approaches may be problematic, as the timing of implementation and the changes in state spending may not be exogenous to child and family well-being. In this paper, I provide evidence that the particular timing of IHVPE program implementation is uncorrelated with many observable state characteristics (including the proportion of births by unmarried mothers and the implementation of other child support laws), and conduct numerous robustness checks to support the causal interpretation of my identification strategy. Further, I include controls for other child support laws in all of the analyses.

Additionally, this literature has generally not considered how child support policies may be providing an "intermediate" option for parental interaction between the "extremes" of no contact and marriage. IHVPE is a particularly striking example of such an "intermediate" option, since paternity establishment delineates both rights *and* responsibilities for new unmarried fathers. This feature of IHVPE contrasts with other child support enforcement measures that usually just punish fathers for non-payment and do not explicitly address rights to their children. Yet rigorous research on the causal effects of the IHVPE programs is quite sparse. The existing literature is limited to several reports on individual state programs (for example, Pearson and Thoennes, 1996; Ovwigho *et al.*, 2007; Wisconsin Bureau of Child Support, 2010) and analyses of a few states and over short periods of time (Turner, 2001; Sorensen and Olivier, 2002; Mincy *et al.*, 2005). In a study most closely related to this one, Mincy *et al.* (2005) find that establishing paternity in the hospital is associated with increased formal and informal child support payments and father-child visitation among children born out-of-wedlock using data from the Fragile Families and Child Well-Being Study. However, they do not exploit the state-year variation in program implementation and instead rely on cross-sectional and cross-city variation in in-hospital paternity establishment rates, which could be correlated with other factors that affect family well-being. Thus, despite controlling for a wide range of observable characteristics, their work is limited in its ability to establish a causal effect due to potential omitted variables bias.

To my knowledge, this paper is the first to examine the effectiveness of these programs for a large number of states and years, and to use methods that can arguably identify true

causal effects of the programs that are not confounded by unobservable factors like variation in the composition of unmarried births. By uncovering the causal effects of IHVPE programs, this paper can shed light on how paternity establishment at birth may impact the decisions of unmarried parents regarding involvement with each other and their children. Further, analysis of the causal effects of IHVPE on marriage behavior in particular can reveal the trade-offs in parental marriage decisions and thus have important implications for the impacts of other family policies that offer alternative contracts to marriage. The simple model that ties the existing theoretical literature to the novel empirical findings on marriage, paternal transfers, and child well-being is an additional contribution.

3.2 Marriage Behavior, Paternity Rights, and Non-Marital Childbearing

There exists an extensive theoretical literature on marriage markets, which are typically modeled as matching equilibria (Becker, 1973, 1974, 1993; Mortensen, 1988; Roth and Sotomayor, 1992; Iyigun and Walsh, 2004; Choo and Siow, 2006; Chiappori *et al.*, 2006) or within search models (Burdett and Coles, 1997; Aiyagari *et al.*, 2000; Chiappori and Weiss, 2003, 2007). A related influential line of work takes the collective bargaining approach to model resource allocation within marriage and divorce (Browning *et al.*, forthcoming). In this framework, marriage can be seen as a trade-off between economic gains and the non-pecuniary costs and benefits. Children can be modeled as public goods, and this has important implications for parental allocations of resources towards their children in and out of marriage. Specifically, Weiss and Willis (1985) show that after divorce, the non-custodial parent suffers a loss of control over the allocative decisions of the custodial parent, and thus it is not possible for the parents to achieve a Pareto-optimal allocation of their joint resources, resulting in under-provision of support from the father.[13]

However, while the collective bargaining approach provides a useful general framework for modeling interactions within families, I instead focus on the particular method developed by Edlund (1998), which treats *rights* to children as private goods that generate transfers from

[13]More recently, Chiappori and Weiss (2007) show that high expectations of remarriage can lead to an equilibrium in which divorced fathers commit to make more generous transfers as long as their ex-wives remain single. In related work, Aiyagari *et al.* (2000) construct and simulate a model of the marriage market, where for certain parameters, an increase in mandated child support raises overall welfare.

fathers to mothers. In the context of IHVPE programs, which legally delineate parental rights and transfers outside marriage, this perspective provides a natural way of understanding the implications of increased paternity establishment rates for consequent marriage behavior and family well-being.

The idea that marriage serves as a transfer of custodial rights to children from the mother to the father has been emaphsized in the anthropological and legal literature (Bohannan, 1949; Bohannan and Middleton, 1968; Grossbard, 1976; Posner, 1994; Edlund, 2006). In economics, this feature has been modeled most explicitly by Edlund (1998), which then served as a basis for a number of theories on: why prostitution is a well-paid profession (Edlund and Korn, 2002); the political gender gap resulting from a decline in marriage and the subsequent decline in private transfers from men to women (Edlund and Pande, 2002); and why an improvement in birth control technology increases the power of all women, including those who are not interested in the technology (Chiappori and Oreffice, 2008).[14] In recent work, Edlund (2011) provides a comprehensive overview of the main theoretical consequences of this feature, noting that marriage is in effect a contract for trade in children which transfers a defined share of rights to children from a woman to her husband. As a result, men must pay for marriage in exchange for custodial rights, hypergamy can exist where women marry up and men marry down, and out-of-wedlock fertility can occur when trade is not possible (due to the lumpy nature of custodial rights). Taken as a whole, this theoretical literature provides motivation to consider the effects of IHVPE programs, which enable fathers to obtain partial rights to their children in exchange for child support provision, on parental marriage behavior and transfers from fathers to mothers and children.

There is also a large strand of empirical literature that has focused on how various policies incentivize individuals to either marry or not. Some of this literature has specifically considered the incentives that women face to bear children out-of-wedlock, in particular due to welfare policies, as standard economic theories have clear predictions that greater financial

[14]There are several other papers that rely on this theoretical foundation to explain: the surplus of young women in urban areas resulting from the presence of high-wage men (Edlund, 2005); why women have higher status in individual-consent regimes where they are the recipients of the bride-price instead of their fathers (Edlund and Lagerlof, 2006); why marriage affects returns to human capital differently for men and women (Saint-Paul, 2008); why the institution of marriage reduces cheating in society (Bethmann and Kvasnicka, 2011); and why humans predominantly live in families instead of in promiscuous arrangements (Francesconi *et al.*, 2010).

benefits for single mothers should reduce marriage (Becker, 1993). Empirical studies of the effects of welfare generosity yield mixed results. Some studies of the effects of welfare reform on marriage find that the reduced generosity of the reform led to an increase in marriage (Schoeni and Blank, 2000; Bitler *et al.*, 2006), others find a negative effect on marriage (Rosenbaum, 2003; Bitler *et al.*, 2004; Fitzgerald and Ribar, 2005), while still others find insignificant effects (Ellwood, 2000; Kaestner and Kaushal, 2005).

To my knowledge, only one study has explicitly considered the effects of government policies on marriage behavior *post-childbirth* specifically. Using data from the Fragile Families and Child Well-Being Study, Knab *et al.* (2008) find that more generous welfare benefits are associated with a reduction in the likelihood of marriage to the biological father post-childbirth. This finding is similar in spirit to my results, as an increase in welfare benefits leads to higher income for mothers outside marriage, which may allow them to increase the marriage threshold in father quality. However, a limitation of the Knab *et al.* (2008) study is that the authors are only able to rely on cross-city variation in welfare generosity, and thus their results cannot be readily interpreted as causal. No studies have considered the impacts of IHVPE-induced increased paternity establishment rates at childbirth on subsequent marriage behavior.

3.3 Female Labor Supply

This paper also relates to a vast literature on the determinants of female labor supply. While a full review of this literature is beyond the scope of this paper (see Blundell and MaCurdy, 1999 for a survey), I attempt to highlight some relevant studies here. In general, the literature has focused on estimating labor supply elasticities separately for married and unmarried women (for example, Blau and Kahn, 2007, and Bishop *et al.*, 2009, respectively). Additionally, a number of studies are concerned with the effects of various public programs, such as the EITC, welfare, and childcare subsidies, on single mothers' labor supply (Berger and Black, 1992; Eissa and Liebman, 1996; Keane and Moffitt, 1998; Meyer and Rosenbaum, 2001; Ellwood, 2000; Hotz *et al.*, 2002; Moffitt, 2002, among many others). However, by considering married and unmarried women separately, these studies do not fully address the potential relationship between income shocks, *transitions in and out of* marriage, and

women's labor supply.

From a theoretical perspective, an intra-household bargaining framework has important predictions on the effects of changes in married women's outside options on their labor supply - if leisure is a normal good, then an increase in a married woman's relative bargaining power should lead to reduced labor supply (see Lundberg and Pollak, 1993; Lundberg and Pollak, 1996; Lundberg and Pollak, 2007; Gray, 1998; Chiappori *et al.*, 2002; Voena, 2011, among others). Similar to studies mentioned above, since this literature focuses on bargaining within married households, the interaction between bargaining power, marriage, and overall female labor supply for both married and unmarried women is understudied.

I seek to add to this literature by analyzing how IHVPE affects all mothers' labor supply, regardless of marital status. This is necessary, as the effects on marriage induce selection into the samples of married and unmarried families. Note that among mothers who would have remained unmarried in the absence of IHVPE, one might expect that IHVPE leads to reduced labor supply. Since IHVPE programs increase unmarried mothers' expectations of child support and arguably improve their bargaining power, this should lead to a substitution of more leisure relative to labor supply. However, the effects on all mothers are complicated by the fact that IHVPE reduces marriage. One might expect an overall increase in maternal labor supply if net transfers from fathers to mothers and children decline.

4 Conceptual Framework

I present an overview of a simple model to motivate how IHVPE programs can impact paternity establishment, marriage behavior and overall transfers from the father to the mother and child. The mathematical details of the model are presented in Appendix A.

This framework is a simplification of many of the arguments developed and summarized most recently by Edlund (2011), with a specific application to studying IHVPE programs. The key backbone of the model - that fathers must offer transfers to mothers in exchange for rights to children - was originally developed by Edlund (1998), and then served as the foundation for a wealth of theoretical literature in economics (e.g. Edlund and Korn, 2002; Edlund and Pande, 2002; Edlund, 2005; Edlund and Lagerlof, 2006 Chiappori and Weiss, 2007; Chiappori and Oreffice, 2008; Saint-Paul, 2008; Francesconi *et al.*, 2010; Bethmann

and Kvasnicka, 2011).

The model discussed here assumes that all mothers are homogeneous, while fathers are heterogeneous in quality. This distinction creates an asymmetry in which maternal utility in marriage depends on father quality, while paternal utility does not depend on mother quality. Consequently, maternal decisions conditional on father quality are modeled explicitly, while paternal decisions are not. The asymmetry seems natural given the inherent asymmetry in parental rights to children: mothers obtain full rights to their children regardless of marriage, while fathers may only obtain full rights in marriage. As a result, mothers arguably have more bargaining power in decisions regarding the relationships that they wish to maintain with their children's fathers. Overall, the purpose of this framework is to provide one interpretation of the empirical results with a particular emphasis on choices of mothers. Introducing additional heterogeneity on the mother's side and modeling fathers' decisions more explicitly would create theoretical complications that would take the focus of this paper away from its empirical contributions.

In the model, mothers and fathers make decisions about whether to enter marriage, establish paternity, or have no relationship after the birth of their children. To the extent that at least some aspects of people's decisions about their relationships with each other are related to their valuations of their potential partners' qualities, to their desires to have rights to their children, and to the costs and benefits of providing support for their partners and children, this model serves to highlight how these particular mechanisms might be affected by the implementation of IHVPE programs (see Edlund (2006) for further motivation about why these factors are particularly important in marriage).

Fathers give transfers to mothers both in marriage and in paternity. However, since marriage provides fathers with full rights to their children, while paternity only grants partial rights, the transfers in marriage are higher than the transfers in paternity for any given father.

The key assumption of the model is that the mother's utility in marriage depends directly on the father's quality, while her utility outside marriage does not. This seems like a reasonable assumption given that within marriage, the parents share decision-making power over household affairs and the well-being of their children, and usually interact with each other on a daily basis. On the other hand, since most unmarried mothers retain full custody

of their children and do not cohabit with their children's fathers, they are less sensitive to the fathers' partner qualities. Thus, mothers trade-off the benefits of paternal transfers with the costs of interacting with lower-than-desired quality partners — for low levels of father quality, a mother may value a lower transfer outside marriage more than a higher transfer within marriage. For example, if a mother thinks that having a partner who is involved in drug-dealing in the home is detrimental to her own and her child's well-being, then the costs of this behavior might outweigh any benefits of increased involvement and support that he would have provided within the household. This quality-transfer trade-off is similar in spirit to the trade-off between the economic gains and non-pecuniary costs or benefits of marriage that is formally presented in Browning *et al.* (forthcoming). The introduction of this trade-off in my framework allows for specific predictions for the net effects of IHVPE on transfers from fathers to mothers and children.

The idea that mothers who bear children out-of-wedlock may reject marriage to their children's fathers is further supported by evidence from anthropological and sociological work. According to this research, many poor women have children outside marriage because of the very high value they place on their roles as mothers against the backdrop of dire circumstances that present them with few opportunities to attain higher education or to have meaningful career aspirations (Edin and Kefalas, 2005). However, Edin and Kefalas find that poor women do not reject marriage overall - on the contrary, marriage is a revered goal of lifetime commitment that should occur with the right person and at the right time. Most unmarried couples are romantically involved at the time of childbirth and aspire to get married eventually (McLanahan *et al.*, 2001). However, men are more favorably disposed to the idea of marriage and are more likely to raise the question of marriage than women are (Edin and Kefalas, 2005). On the other hand, many women are cautious about marriage as they do not want to commit to something that could jeopardize their well-being and the well-being of their children. The men in their lives are often involved in criminal behavior, and exhibit patterns of "intimate violence, chronic infidelity, and an inability to leave drugs and alcohol alone" (Edin and Kefalas, 2005), and thus do not constitute ideal partners. Disadvantaged women interviewed in recent years view marriage as being about "adult fulfillment; it is something that [they] do for themselves, and their dreams about

marriage are a guilty pleasure compared to the hard tasks of raising a family" (Edin and Kefalas, 2005). Thus, for many poor women, the meaning of marriage has changed over the last few decades from being an institution primarily about childbearing and childrearing to being an elusive dream of personal fulfillment. One can argue that the widespread practice of paternity establishment at childbirth among unmarried parents has contributed to this change as mothers no longer feel the need to rely on support from the fathers within marriage in order to raise their children, and can decline marriage offers in hopes of better future partners and life circumstances.[15]

In my framework, there can be several consequences when costs to establishing paternity are lowered due to the introduction of IHVPE. First, parents who would have maintained no relationship previously are now induced to establish paternity: among them, the mothers (and children) now benefit from increased partial support, while the fathers benefit from partial rights to children. Second, some parents who would have married previously may now be induced to establish paternity instead if mothers value the partial support following paternity establishment more than their utility from full support and interaction with lower-than-desired quality fathers in marriage. As a result, we expect an increase in the father quality threshold for marriage, resulting in increases in the average characteristics of both married and unmarried fathers. The net effect on transfers from fathers to mothers and children depends on the relative magnitudes of the above two effects. In particular, if the decrease in support from fathers who would have married previously outweighs the increase in support from fathers who would have maintained no relationship before, the net effect on overall transfers can be negative. Finally, the net effect on child well-being is also ambiguous. On the one hand, children whose parents would have previously maintained no relationship will benefit from increased paternal transfers. On the other hand, children whose parents would have been previously married may experience both welfare decreases due to lower

[15]It is important to note that Edin and Kefalas (2005) conduct their study on 160 especially disadvantaged single mothers in inner-city Philadelphia. Consequently, these women's experiences are probably not representative of the experiences of average women, or even all unmarried mothers likely affected by IHVPE programs. However, given that 30 percent of single mother households live below the poverty line (U.S. Census Bureau, 2010), it may be that at least some of the mothers in my data share similar experiences and attitudes with the poor women interviewed by Edin and Kefalas. Nevertheless, Edin and Kefalas (2005) provide, at least, anecdotal motivation for studying the effects of IHVPE programs on marriage and family behavior.

paternal transfers and welfare increases as a result of residing with mothers who are happier from less interaction with low-quality partners.

5 Data and Summary Statistics

5.1 Paternity Establishment Data

Data on the number of paternities established over 1992-2005 in each state and year come from OCSE reports. Beginning in 1996, each report contains a table on the total number of paternities established in each state for five consecutive years (i.e., the 1996 report contains information for 1992-1996). Unfortunately, there is no concrete information on the number of paternities established in-hospital for all states (some OCSE reports contain a table on in-hospital paternity establishments, but these data come from voluntary reports by states and information is missing for many states and years). However, given that IHVPE programs could only affect paternity establishment rates at the hospital, we can interpret the changes in the total number of paternity establishments following IHVPE implementation as being driven by changes in in-hospital paternity establishments.[16] For the analysis, I use paternity data for the 43 states for which I have information on the year of IHVPE initiation and which initiated their programs in 1993 or later, which results in 601 state-year observations.[17]

5.2 Data on Maternal and Child Characteristics

In all analyses of effects on paternity establishment rates, I control for a number of maternal and child characteristics. These variables come from the National Center for Health Statistics (NCHS) Vital Statistics microdata from the universe of birth certificates in the United States over 1992-2005, collapsed into state-year cells. I include the log number of births, the percentage of births by unmarried mothers, the percentage of mothers in five age categories (<20 years, 20-24 years, 25-34 years, 35-44 years, 45+ years), the percentage of mothers in four education categories (<high school, high school, some college, college+), the percentage

[16] In fact, in the long run, we should expect paternity establishment rates outside the hospital to decrease as a result of IHVPE programs, as some families that would have established paternity later on instead establish it at the time of the child's birth.

[17] I exclude Washington, which initiated its IHVPE program in 1989. Additionally, Nevada is missing data on paternity establishments in 2000, so I exclude this state-year observation.

of mothers who are non-Hispanic white, black, and Hispanic, and the percentage of male births.[18]

5.3 Data on State Time-Varying Characteristics

Data on various economic and program transfer variables come from a database maintained by the University of Kentucky Center for Poverty Research. These data are available for 1980-2010, and are compiled from numerous sources including the U.S. Census Bureau, the Bureau of Labor Statistics, the Urban Institute, the Department of Agriculture, and the Council of State Governments, among others. As controls, I include the unemployment rate, the poverty rate, the minimum wage, the percent of the population that receives AFDC/TANF benefits, the welfare benefit for a 4-person family, the percent of the population that is on Medicaid, an indicator for a Democratic governor, and the percent of the state house that is from the Democratic Party in each state in the year before.[19] Additionally, I weight the regressions on paternity establishments using state-year populations that come from these data.

Summary statistics on state-year variables for the entire United States and for the 43 states included in my analysis on paternity establishments are presented in Appendix Table 2. These statistics suggest that the 43 states in my analysis are fairly representative of the whole country. This is not surprising as only eight relatively small states are missing from the data. In these states, the average yearly ratio of the total number of paternities established to the total number of unmarried births is 0.89. Note that this is an overestimate of the proportion of unmarried births with paternities established in-hospital, as my data are on paternities established for all children in each state and year (and not just newborns).

[18]It is important to note that including the percentage of births by unmarried mothers as a control would be problematic if IHVPE programs had an effect on the likelihood of marriage at the time of birth. However, as discussed in more detail in Section 7 and as shown in Table 4, there is no statistically significant correlation between IHVPE program initiation and the proportion of unmarried births. This finding is reassuring, as IHVPE programs should only affect outcomes post-childbirth, and hence suggests that IHVPE influences parental marriage behavior after childbirth. Finally, I show in Section 7 that the results are not sensitive to the exclusion of the state time-varying controls.

[19]The state time-varying controls are lagged because some of them could be considered endogenous if included concurrently. For example, if IHVPE programs affect the fraction of the population receiving AFDC/TANF benefits, then this control is potentially endogenous. Thus, lagged variables are included as IHVPE programs cannot affect any of these variables in the previous year.

5.4 CPS Child Support Supplement Data

To analyze the effects of IHVPE programs on marriage behavior and measures of father involvement, I use data from the biannual March/April matched CPS child support supplements (CSS) from 1994 to 2008. More details on the data and sample construction are presented in Appendix B. These data include households that were surveyed both in the March Annual Demographic File and in the monthly April CPS. In April, in addition to the standard CPS questions, all members of a household aged 15 and above who have a child in the household with a parent that lives outside the household are asked detailed questions regarding child support agreements, payments, and the involvement of the other parent.

My main analysis sample consists of all mothers with a youngest child aged 5 years or less in the household. Since there is some variation in how minors are treated in IHVPE programs, I further limit the sample to mothers aged 18-45 at the time of childbirth, and drop all mothers who moved from outside the US in the last year. This leaves me with $38,449$ mothers of youngest children aged 5 years or less in the CPS-CSS data, out of which $8,974$ are asked the CSS questions.

In this sample, a mother is categorized as married to the biological father if she is married and her child is coded as living with both parents in the household. A mother is categorized as married to someone other than the biological father if she is married, but the child is coded as living with only a mother in the household. Mothers who are married to the biological father are by construct ineligible to be asked CSS questions.

Table 1 presents some summary statistics on the mothers included in my sample of analysis from 44 states, weighted by CPS person weights.[20] Sixty-three percent of mothers are non-Hispanic white, while 14 percent are black and 17 percent are Hispanic. About 78 percent of mothers are married — 77 percent are married to the father of the child, while one percent are married to someone else. Overall, about 88 percent of children have any health insurance coverage, with 67 percent having private coverage. About 24 percent of all mothers are eligible to be asked CSS questions. Out of mothers who are asked CSS questions, only

[20]Since I have observations on children born in 1988 or later, I can include mothers from Washington in my analysis, as Washington initiated its IHVPE program in 1989. Thus, the total number of states in the CPS-CSS analysis is 44.

36 percent received any child support payments in the year prior to the survey: some of this is likely driven by the fact that many do not have any form of agreement with the father. About 70 percent of mothers, however, state that the father has legal visitation rights, and 14 percent state that the father has joint custody.

When I split the sample by whether or not an IHVPE program exists in a given state and child's birth year, it is evident that there are some differences. Most notably, children born in states and years with no IHVPE program tend to be older, but this is likely due to the fact that more states implemented IHVPE programs as time went on and so older children are more likely to have been born in a state and year without a program. Because of this, I include indicators for the children's single years of age in all specifications. In the crude comparison of state-year cells that do and do not have IHVPE programs, mothers in state-year cells with IHVPE programs are actually more likely to be married to the child's father. However, more rigorous regression analysis suggests that this is due to positive selection into these cells. As soon as basic maternal and child characteristics and state and year fixed effects are included, the effect is actually in the other direction. This highlights that omitted variables bias likely poses problems in cross-sectional analyses of IHVPE programs.

5.5 March CPS Data

To study effects of IHVPE on maternal labor supply and total family income, I take advantage of the larger sample sizes in the March CPS Annual Demographic Supplement files (King *et al.*, 2010) relative to the CPS-CSS. I use March CPS data for 1989-2010, and follow the same method as in the CPS-CSS to link mothers to their youngest children and to calculate their children's birth years (this method is described in Appendix B). As before, I limit my analysis to mothers aged 18-45 at the time of childbirth and drop all mothers who moved from outside the US in the last year. The resulting sample size is $212,504$ women with youngest children aged 5 years or less in the household.[21]

[21] Results using 1994-2008 March CPS data are very similar to the ones presented in this paper, and are available upon request. Further, results on maternal labor supply and family income using CPS-CSS data are qualitatively similar but not statistically significant, perhaps due to power issues. They are also available upon request.

5.6 NHIS Data

To examine the effects of IHVPE on child mental and physical health and access to care, I use the restricted version of the 1997-2010 Sample Child files of the NHIS with state identifiers.[22] These data contain detailed information on numerous parent-reported measures of health and access to care together with information on the state of residence and the year and month of birth for a randomly picked child within each NHIS sample household. I limit the analysis sample to mothers residing with a sample child in the household who is aged 7 years or less.[23] Note that sample children are not necessarily the youngest children in the household. This complicates the analysis, as sample children born prior to IHVPE implementation may have younger siblings who were affected by IHVPE leading to spill-over effects on children that I consider untreated. To address this issue and for comparability with analysis using CPS-CSS and CPS data, I have estimated models limiting the sample to sample children who are the youngest in their households. The results from this analysis are very similar to the results from using all the sample children, although less precise due to sample size reductions.

Additionally, these data contain more detailed information on household relationships than the CPS. Specifically, respondents are asked direct questions regarding cohabitation with an unmarried partner. Consequently, I use these data to study the effects of IHVPE on the likelihood of parental cohabitation and the likelihood of the mother cohabitating with someone other than the child's father.

For confidentiality reasons, actual sample sizes from these data cannot be released. In the public-use version of the analysis sample that contains all states, the sample size is about $67,100$ mothers of sample children aged 7 years or less. This is a reasonable approximation of the size of the true analysis sample, which omits data from seven relatively small states.

[22] More information regarding access to restricted NHIS data is available here: http://www.cdc.gov/rdc/.

[23] The age cut-off is higher than the one used in the CPS analysis because the NHIS data span a later time period. Thus, to retain more children who were born pre-IHVPE initiation, I include slightly older children aged 6-7 years.

5.7 Data on State Laws and Policies

Since past research finds effects of child support enforcement, EITC, and welfare policies on some of the outcomes of interest, it is crucial to control for these laws. I include controls for whether an automatic wage withholding policy, genetic testing for paternity establishment, a new hires directory, or a license revocation for non-payment policy are in place in each state and year of observation. These data come from Nepomnyaschy and Garfinkel (2007) for states that established these policies prior to 1994, and from my own searches of state statutes for the other states using *LexisNexis Academic*. I also control for indicators for whether a state EITC program has been implemented in each state and year using data from the Tax Credits for Working Families organization.[24] Finally, I include controls for whether AFDC waivers or the TANF program has been implemented in each state and year using information from Table 1 in Bitler *et al.* (2006).

6 Empirical Methods

In an ideal research setting, one would identify the causal effect of IHVPE by randomizing families into program treatment and control groups, and then comparing the outcomes of the two groups. However, absent such a design, I must rely on quasi-experimental variation in the timing of program initiation. This method depends on the assumption that the state-year variation in timing of IHVPE implementation is uncorrelated with other time-varying determinants of the outcomes of interest. While this assumption is not directly testable, in subsequent sections I present several indirect tests that suggest that this identification strategy is reasonably reliable for estimating causal effects of IHVPE.

Using state-year paternity establishment data from 43 states, I estimate a "first-stage" relationship between paternity establishment rates and IHVPE programs:

$$LogPat_{sy} = \beta_0 + \beta_1 * IHVPE_{sy} + \gamma' X_{sy} + \phi' C_{sy} + \mu_s + \alpha_y + \delta_s * y + \epsilon_{sy} \qquad (1)$$

for each state s and year y. $LogPat_{sy}$ is the log total number of paternities established in

[24] State EITCs are tax credits that supplement the federal EITC program. As of 2011, 25 states have introduced state EITC programs. See http://www.taxcreditsforworkingfamilies.org/ for more information.

state s and year y,[25] $IHVPE_{sy}$ is an indicator for whether an IHVPE program is operating in state s in year y, X_{sy} is a vector of maternal and child characteristics, including the log number of births, the proportion births by white, black, and Hispanic mothers, the proportion births by unmarried mothers, the proportion male births, and the proportion births by mothers in different educational and age groups. C_{sy} is a large vector of other state time-varying characteristics, including the state unemployment rate, the state minimum wage rate, the state poverty rate, the average AFDC/TANF benefit for a 4-person family, the proportion of the population receiving welfare benefits, the proportion of the population receiving Medicaid benefits, an indicator for whether the state's governor is Democratic, and the fraction of the state house that is Democratic in the year before, as well as indicators for whether different child support enforcement laws are in effect, indicators for whether a state EITC has been enacted, and indicators for whether an AFDC waiver or the TANF program have been implemented. μ_s is a state fixed effect, α_y is a year fixed effect $\delta_s * y$ is a state-specific time trend, and ϵ_{sy} is a state-year error term. Note that the inclusion of state and year fixed effects allows me to control for any time-invariant state-level variables and overall time trends that might affect paternity establishment rates. Further, the inclusion of state-specific time trends allows me to account for differential linear trends in paternity establishments across states over the time period of analysis.[26] The key coefficient of interest is β_1, which measures the percentage change in the number of paternities established as a result of the IHVPE program.

The analyses of the CPS-CSS, March CPS, and NHIS data are on the individual level instead of the state-year level. Consequently, I estimate the following equation:

$$Y_{isty} = \beta_0 + \beta_1 * IHVPE_{sy} + \gamma' X_{isty} + \phi' C_{st} + f(t) + \mu_s + \alpha_y + \delta_s * y + \epsilon_{isty} \qquad (2)$$

for each mother i, in state s, survey year t, with a youngest (or sample) child born in year y. Here, Y_{isty} is an outcome of interest, such as an indicator for whether the mother is married to the father of her child. In this specification, X_{isty} contains individual maternal and child characteristics, including indicators for maternal age group at birth, indicators for maternal

[25] As discussed in Section 7, results using the ratio of paternities established to the number of unmarried births as the dependent variable are very similar.

[26] In Section 7, I show that the results are not sensitive to the inclusion of the state time-varying controls and state-specific time trends.

education groups, indicators for maternal race, an indicator for child sex, and indicators for the child's single years of age. I include state and child birth year fixed effects, as well as state-specific time trends, as before. Additionally, since including indicators for the survey year induces multicollinearity with indicators for the child's age and birth year, I include a quadratic polynomial in the survey year instead. All the state time-varying controls are the same as in equation 1. Again, the key coefficient of interest is β_1, which measures the effect of the existence of an IHVPE program in the child's state and year of birth on the outcome of interest.

Note that since the CPS-CSS, March CPS, and NHIS data do not contain information on the child's state of birth, I assign the child's state of residence in the year before the survey as the child's state of birth (for non-movers, this variable is also the state of residence in the year of survey). This may be a problematic assumption if IHVPE program implementation is correlated with the likelihood of a mother moving out of her child's state of birth. For example, it may be the case that IHVPE programs have an effect on the likelihood of the mother moving in or out of the state where the father lives. However, I can test this directly in the CPS-CSS, and find no statistically significant effect of IHVPE on the likelihood of the father living in the same state as the mother and child at the time of the survey.[27] Additionally, similar mobility assumptions are often used in the literature that studies the long-run effect of prenatal and early childhood interventions - in fact, an individual's county of residence during high school has been assumed to be his/her county of birth or of residence during early childhood (Ludwig and Miller, 2007; Sanders, Forthcoming). Such assumptions are likely subject to more measurement error than the assumption that I rely on in this paper.

7 Results

7.1 Effects of IHVPE on Paternity Establishment

I first present some graphical evidence on the relationship between IHVPE program implementation and the paternity establishment rate. Figure 3 plots the average number of

[27] The key coefficient from estimating equation 2 with an indicator for the father living in the same state as the child as the dependent variable is -0.0084 with a standard error of 0.0073.

paternities established relative to the number of unmarried births by the number of years from IHVPE program initiation.[28] There is a substantial jump in the paternity establishment rate in the first year that the program is in effect. I plot the number of paternities as a ratio relative to the number of unmarried births instead of only considering the numerator because different numbers of states contribute to different points along the x-axis, so it is important to control for the underlying population that could potentially be affected by IHVPE programs at each point. Unfortunately, lack of earlier paternity data prevents me from creating a graph in which equal numbers of states contribute to each point. As a result, in Figure 4, I limit my analysis to states that initiated IHVPE in 1996 or later, and include 4 years before and 7 years after program initiation for each state, effectively creating a symmetric graph in which equal numbers of states contribute data to each point. The pattern in Figure 4 is very similar to the one in Figure 3 suggesting that the lack of a balanced panel in the full dataset should not pose serious problems.

Table 2 presents regression results on the effects of IHVPE programs on the log number of paternities established, which support the graphical evidence. In this table, the units of observation are state-year cells, robust standard errors are clustered on the state level, and all regressions are weighted by state-year populations.[29] The results suggest that IHVPE program implementation led to an increase of 0.32 log points (or, about 38 percent) in the number of paternities established.[30] Notably, once controls for maternal and child characteristics and state and year fixed effects are included, the inclusion of state time-varying characteristics, controls for child support laws, state EITC, and AFDC/TANF implementation, and state-specific linear time trends does not substantially alter the key coefficient of interest, providing some support for the validity of the identification strategy.[31]

[28]Specifically, I assume that the first year the program is in effect (equal to 0 in the graph) is the same as the year listed in Appendix Table 1 if only the year is listed or if the month of initiation is June or earlier. If the month of initiation is known and it is July or later, then I assume the first year the program is in effect is the following year.

[29]The unweighted regressions yield very similar results, which are available upon request.

[30]To interpret the coefficients in percentage terms, the dependent variable is in logs. However, results using the ratio of paternities established to the number of unmarried births as the dependent variable are very similar and available upon request.

[31]The sample size changes once controls for state time-varying characteristics are added as some of the variables are missing for certain state-year cells, and because I am missing data on the year of implementation for some child support laws for Kentucky and South Dakota.

My analysis relies on the assumption that the treatment and control states would have had similar trends in outcomes in the absence of IHVPE introduction. To assess the validity of this assumption, I present results from a regression where I include indicators for 3 years before IHVPE program initiation in Table 3. We should not expect to see significant differences in paternity rates in the years prior to IHVPE initiation. Reassuringly, in the fully-specified model, none of the coefficients on the indicators for years before IHVPE is statistically significant at the 5% level while the key coefficient of interest remains positive, large, and statistically significant. These results suggest that differential trends in paternity establishment rates prior to IHVPE should not pose serious concerns.

To further check the first stage effects on paternity establishment rates, I turn to a different source of data - micro data from the universe of US birth certificates. An in-depth discussion of the issues in these data and the estimation methods that I use is available in Appendix C. I find that IHVPE leads to an increase in the likelihood that a father's information is listed on his child's birth certificate (a proxy for paternity establishment). This finding is reassuring because it implies that my results on paternity establishment rates are robust across different data sets and methods.

The births data allow me to do another robustness check. Since IHVPE programs reach parents at the hospital immediately following childbirth, we should not expect to see any effects of IHVPE on pregnancy behaviors or birth outcomes. To check this, I estimate equation 1 with various pregnancy and birth outcomes as dependent variables. The results from these regressions are presented in Appendix Table 3. Out of coefficients for nine different outcomes, none is statistically significant at the 5% level, providing further support for a causal interpretation of my main results.[32]

7.2 IHVPE Program Initiation and Other Factors

The crux of my identification strategy relies on the assumption that the timing of IHVPE program implementation across states is uncorrelated with changes in other factors that are

[32]One might expect to see effects on pregnancy behaviors and birth outcomes if anticipation effects exist as knowledge about IHVPE programs spreads. So, one might expect that unmarried parents may change their behavior before childbirth in anticipation of IHVPE. However, the fact that I find no effects on pregnancy or birth outcomes suggests that anticipation effects are not particularly prevalent in this case.

not captured by a linear time trend. While I cannot rule out the possibility that there are some unobservable variables that fail this assumption, the evidence suggests that this is unlikely. In particular, Table 4 presents the β_1 coefficients from regressions that use various maternal, child, and state time-varying characteristics as dependent variables in the estimation of equation 1 with state and year fixed effects, and state-specific time trends, but without any other controls. Out of 18 coefficients, none is statistically significant at the 5% level. The only marginally significant coefficient is a positive effect on the likelihood of the mother being black.[33] The timing of IHVPE program initiation is uncorrelated with numerous factors, including the total number of births, the educational and age distributions of mothers, state economic, political, and program transfer variables, the timing of AFDC/TANF legislation, the timing of state EITC programs, and the timing of other child support laws.

Importantly, IHVPE program initiation is uncorrelated with the proportion of births by unmarried mothers as recorded in Vital Statistics data from the universe of all US birth records. This result is critical given that I show below that IHVPE programs decrease the likelihood of marriage in the CPS-CSS data. A potential concern with this finding is that it may be driven by selection - i.e., states that implemented IHVPE programs earlier also had higher growth rates in unmarried births. However, the fact that I find no effect of IHVPE programs on the proportion of births by unmarried mothers (if anything, the insignificant coefficient has the opposite sign than what would be consistent with selection), implies that the effects on marriage operate through behavior post-childbirth rather than selection.

One might also imagine that if knowledge about IHVPE spreads, individuals may change their marriage behavior prior to childbirth, in anticipation of IHVPE. This would imply that we should expect decreases in marriage rates *at childbirth* in years following IHVPE implementation. However, results from estimating a variant of equation 1 for the proportion of unmarried births as the dependent variable with a flexible specification that includes indicators for 5 years after IHVPE initiation suggest that this is not the case. There are no

[33]Minority mothers have higher rates of births out-of-wedlock - for example, in 2009, while overall, 41 percent of all births were by unmarried mothers, 71 percent of all births by black mothers were by unmarried mothers (National Center for Health Statistics, 2011). Thus, one concern might be that the negative effect on marriage in the CPS-CSS data is spuriously driven by the relative increase in black mothers. However, as shown below, the effect on marriage is robust to the exclusion of black mothers.

statistically significant coefficients on any of the indicators for years after IHVPE initiation (results available upon request). Consequently, it seems that most people are likely unaware of the existence of IHVPE until the time of childbirth, and the estimated effects on family outcomes are truly driven by behavior post-childbirth rather than through selection effects due to changes in the proportion of unmarried births over time.

Additionally, the fact that I find no correlation between IHVPE program initiation and the AFDC/TANF benefit in the previous year, the timing of AFDC/TANF legislation, or the timing of state EITC implementation suggests that the effects on marriage and labor supply are not driven by confounding impacts of welfare or tax credit generosity. Finally, the lack of correlation between IHVPE implementation and the percentage of the population on Medicaid in the previous year implies that the effects on child health insurance provision are not driven by changes in public health insurance generosity.

Taken together, the findings in Table 4 suggest that the timing of IHVPE implementation is likely uncorrelated with other determinants of paternity establishment rates and family behavior, and hence can be used as a valid natural experiment for identification of causal effects.

7.3 Effects of IHVPE on Marriage

After confirming that IHVPE programs in fact lead to a substantial increase in paternity establishment rates, I turn to analysis of marriage behavior in the CPS-CSS data. Figure 5 presents some graphical evidence of the effects of IHVPE on parental marriage. I plot the coefficients from estimating an event-study version of equation 2 that includes indicators for 6 years before and 6 years after IHVPE implementation relative to the child's birth year, with the corresponding 90% confidence intervals. These regressions also include state and birth year fixed effects as well as a quadratic polynomial in the survey year as controls.[34] Importantly, the figure shows that there are no statistically significant trends in marriage rates prior to IHVPE initiation. However, following IHVPE implementation, the coefficients from the marriage regression are consistently negative and mostly statistically significant at

[34]Specifically, I estimate: $Y_{isty} = \beta_0 + \sum_{k=-6}^{6} \theta_k * IHVPE_{syk} + f(t) + \mu_s + \alpha_y + \epsilon_{isty}$, where $IHVPE_{syk}$ is an indicator for k years from IHVPE implementation in state s and the child's birth year y. Figure 5 plots the θ_k coefficients and the corresponding 90% confidence intervals.

the 5-10% levels.

The regression results confirm the graphical evidence. Table 5 presents results from estimating equation 2 on the analysis sample of all mothers with a youngest child aged 5 years or less. All regressions are weighted by CPS person weights, and robust standard errors are clustered on the state level. As in the regressions for paternity establishments, the key coefficient of interest does not vary significantly as state time-varying characteristics, controls for child support laws, state EITC, and AFDC/TANF implementation, and state-specific time trends are included, providing further support for a causal interpretation of my identification strategy.

The results suggest that IHVPE programs reduce the likelihood of marriage to the biological father by about 4 percent at the sample mean. However, this estimate is an underestimate of the magnitude of the decrease in marriage *post-childbirth*, as the CPS-CSS data do not have information on the percentage of parents who marry after childbirth. To assess this magnitude, I turn to data from the Fragile Families and Child Well-Being Study, which suggests that about 13 percent of parents who were unmarried at childbirth will marry by the time their child turns 5 years old. With this estimate as a baseline, the approximate upper bound on the magnitude of the decrease in marriage post-childbirth is 22 percent (0.0283/0.13).[35]

I conduct numerous robustness checks that test the validity of the result on marriage in the CPS-CSS data. I include indicators for pre-trends in marriage, I limit observations to mothers of children born within a 4-year window around IHVPE program implementation, I omit black mothers (as results in Table 4 suggest a marginally significant positive correlation between IHVPE initiation and births by black mothers), and I estimate regressions omitting one state at a time. The results from these exercises are summarized in Table 6. Importantly, there are no statistically significant coefficients on marriage prior to IHVPE initiation, and the negative effect of IHVPE on marriage to the biological father is robust to the exclusion of children born more than 4 years before or 4 years after IHVPE implementation and to

[35]Note that the Fragile Families and Child Well-Being Study follows cohorts of births in 1998-2000. Most states had implemented IHVPE by this time. Consequently, it is likely that the baseline post-childbirth marriage rate prior to IHVPE was larger than 13%. This would imply that the true magnitude of the effect is somewhat lower than 20%. One can view the 4 and 22 percent effect sizes as lower and upper bounds, respectively, for the true effect size.

the exclusion of black mothers (despite reductions in sample size). Additionally, the effect is not driven by any particular state - the results from regressions that omit one state at a time are all very similar and statistically significant (results for states other than CA, NY, and TX are available upon request).

I next use data from the 1989-2010 annual March CPS files to investigate heterogeneous effects of IHVPE on marriage, as the much smaller sample sizes in the CPS-CSS data present test power issues for analyzing subgroup effects.[36] The results in Table 7 suggest that the negative effects on marriage are concentrated among mothers who are less than 25 years old and who have a high school education or less. These findings are consistent with the fact that IHVPE programs affect more disadvantaged parents on average, who are most likely to be unmarried at the time of childbirth.

Note that the conceptual framework predicts that IHVPE will lead to a decline in marriage if there exists a range of father quality in which mothers choose to remain unmarried and receive partial transfers instead of receiving full transfers and interacting with lower-than-desired-quality fathers within marriage. My findings imply that while younger and less educated mothers may choose to forego marriage following the introduction of IHVPE, older and more educated mothers do not exhibit such behavior. Assuming assortative matching, this suggests that relatively disadvantaged mothers are more likely to reject marriage to their similarly disadvantaged partners than their more advantaged counterparts.

One concern with this interpretation is that because disadvantaged fathers face more constraints in providing child support outside marriage, the mothers' expectations of increased partial support following IHVPE are less realistic. However, in the CPS-CSS data, about 29 percent of never married mothers with a high school degree or less report that the father pays some child support, and about 28 percent have children with private health insurance coverage, suggesting that a non-trivial fraction of disadvantaged fathers do provide some support for their children.

Finally, in Table 8, I consider the effects of IHVPE on other maternal relationship outcomes. I find that IHVPE programs increase the likelihood that a mother remains never

[36]The main results on marriage using annual March CPS data over 1989-2010 are very similar to the ones presented here and are available upon request.

married by about 13 percent at the sample mean. However, I also find an increase in the likelihood that a mother is married to someone other than the child's father. More detailed information from the NHIS suggests that there is similarly an increase in maternal cohabitation with a partner who is not the child's father. These findings are consistent with the idea that IHVPE allows more mothers to choose to share a household with new partners who are not their children's fathers.

7.4 Positive Selection In and Out of Marriage

To test the implications of my conceptual framework and study selection into the sample of unmarried fathers, I turn to the CSS-eligible sample in the CPS-CSS. This analysis is complicated by the "intermediate" nature of IHVPE that can lead to effects on two opposing margins: while potentially increasing support and involvement among otherwise absent fathers, these programs also deter marriage, leading to selection into the CSS-eligible sample. As a result, in analyses of CSS data, I cannot separate out the behavioral effects of fathers who would have never married in the absence of IHVPE from the changes in the characteristics of CSS-eligible fathers due to the decline in marriage. For example, a finding of increased father involvement in the CSS-eligible sample could be driven either by the positive selection effect as fathers who would have been married to the mothers in the absence of IHVPE may be more likely to stay involved with their child and are now more likely to be included in the CSS-eligible sample, or by a direct effect of IHVPE on the father-child relationship for parents *who would have remained unmarried in the absence of IHVPE*.[37]

The first row in Table 9 documents selection into the CSS-eligible sample. Specifically, consistent with the negative effect on marriage, IHVPE programs lead to a 1.7 percentage

[37]It is impossible to separate these effects in the data as I lack any counterfactual information on what would have happened to any particular set of parents in the absence of IHVPE. However, to assess the behavioral effects to the best of my ability, I estimate a probit model on the likelihood of marriage using only pre-IHVPE implementation data. As a result, I obtain a measure of the predicted probability of marriage for all mothers. Then, I estimate regressions for outcomes in the CSS using only data on mothers with a predicted probability of marriage lower than the median. Results from these regressions can shed light on the likely behavioral impacts on fathers who were least likely to marry prior to IHVPE. Unfortunately, sample size limitations reduce the power of my analysis so few coefficients are significant at the 5% level. However, I do find positive and statistically significant effects on the likelihoods of the father covering childcare and medical expenses (results available upon request). Thus, there is some suggestive evidence that IHVPE programs increased father involvement among fathers who would have never married in the absence of the program.

point (7% at the sample mean) increase in the likelihood of being in the CSS-eligible sample. The other rows in Table 9 present the results from estimating regression 2 on the CSS-eligible sample only. Some of the coefficients are not statistically significant, perhaps due to low sample sizes. However, there are positive and statistically significant coefficients for the likelihoods of the father making all child support payments, providing health insurance for the child, providing food for the child, and covering the child's childcare and medical expenses. These results suggest that fathers in the CSS-eligible sample tend to be somewhat more involved (or, "higher quality") after IHVPE.

Additional results presented in Appendix Table 4 show that IHVPE leads to an increase in the number of informal child support agreements, which is offset by (an insignificant) decrease in legal agreements. This finding is interesting given that, in theory, since paternity establishment is a mandatory prerequisite to obtaining a legal child support order, one would expect the opposite effect. However, analysis of the reasons for why mothers choose to not establish a legal agreement suggests that perhaps IHVPE programs encourage a more cordial relationship between the parents. For example, reasons such as "the child spends some of the time with the father", "the father provides what he can", and the mother "did not feel the need to get legal" are more likely, while there is no effect on the mother stating that she did not want contact with the father. These results suggest that fathers who are in the CSS-eligible sample post-IHVPE are more likely to maintain an agreeable relationship with the mother.

Finally, since the conceptual framework predicts an increase in the marriage threshold in paternal quality, we should expect positive selection into the sample of married fathers as well. To address this, I estimate equation 2 on a sample of all married households with a youngest child aged 5 years or less using paternal characteristics as dependent variables. The results from this analysis are presented in Table 10. They suggest that following IHVPE implementation, married fathers tend to be older and less likely to be receiving any public assistance. This evidence is consistent with the predictions of the theoretical framework.

7.5 Effects of IHVPE on Fathers' Transfers - Private Health Insurance Provision

Since studying the overall effects on paternal transfers with variables in the CSS is problematic due to the selection effects discussed above, I consider private health insurance provision, which is available for children in both the CSS-eligible and CSS-ineligible samples. Figure 6 plots the coefficients from an event-study version of equation 2 with indicators for 6 years before and 6 years after IHVPE initiation relative to the child's birth year. As with the results on marriage (see Figure 5), there are no statistically significant pre-trends in children's private health insurance coverage. However, following IHVPE implementation, the coefficients are consistently negative and generally statistically significant. The regression results in the first 5 columns of Table 11 confirm the negative effect. I find that IHVPE programs lead to a 4 percent reduction in the likelihood that a child has private health insurance. As with the results on paternity establishment and marriage, the inclusion of state time-varying controls and state-specific time trends does not significantly alter the coefficients.

To better understand the effect on children's health insurance coverage, I distinguish between private coverage provided by individuals in and outside the household, and coverage through public health insurance programs such as Medicaid, Medicare, and CHIP. In the last 5 columns of Table 11, I show that the negative effect on private health insurance coverage is driven entirely by a reduction in coverage provided by members of the household. There is no change in health insurance provision by individuals outside the household. Additionally, I find that there is no change in mothers' health insurance coverage following IHVPE.[38] These findings imply that the effect on children's health insurance coverage is driven by fathers: it seems that there are some fathers who only provide health insurance for their children if they are in the same household (and married to the mothers). Further, these results suggest that, at least for health insurance provision, the decline in father transfers due to a reduction in marriage outweighs any increases in transfers due to behavioral effects of IHVPE on fathers who would have never married the mothers previously.

It is important to note that there is no effect on overall child health insurance coverage.

[38] For "mother has any health insurance" as an outcome, the key coefficient is 0.0001 with a standard error of 0.0115. For "mother has private health insurance" as an outcome, the key coefficient is -0.0091 with a standard error of 0.0093.

This is likely due to the fact that mothers substitute public child health insurance coverage (such as CHIP) to compensate for the reduction in private coverage provided by the fathers. However, this speculation is merely suggestive, as the coefficient for CHIP coverage is positive but not statistically significant.[39]

One concern is that the result on health insurance could be driven by spurious correlation between IHVPE implementation and changes in public health insurance access. Throughout the 1990s and 2000s, many states changed their Medicaid eligibility thresholds, and all states implemented CHIP after October 1997. In Table 4, I have shown that IHVPE is uncorrelated with the proportion of the population receiving Medicaid, the major public health insurance program for low-income children in the 1990s. Since CHIP benefits became available after October 1997 and only eight states in my sample implemented IHVPE in 1998 or later, it is unlikely that IHVPE program implementation is correlated with CHIP availability at the time of childbirth. However, given that the CPS-CSS data spans 1994-2008, it is important to check the correlation between IHVPE implementation and CHIP benefits available at the time of observation in the data. To address this, I estimate equation 2 with the log total and state spending in the year of and the year before observation as dependent variables.[40] Appendix Table 5 shows that none of the coefficients is statistically significant, suggesting that correlation between IHVPE program implementation and CHIP generosity is an unlikely issue. This suggests that the results on children's private health insurance coverage are not driven by spurious correlations between public health insurance program changes and IHVPE.

As another robustness check for the results on private child health insurance coverage, I have estimated the relationship between IHVPE initiation and concurrent adult male health insurance coverage using data from the March CPS for 1989-2002.[41] While one might expect IHVPE to influence parental behavior and consequent child health insurance coverage, there should not be any effect on adult male health insurance coverage. However, if a spurious

[39]Information on CHIP coverage is only available in the CPS-CSS in 2002, 2004, 2006, and 2008.

[40]Data on annual state and total spending on CHIP for 1998-2008 comes from the Henry J. Kaiser Family Foundation state health facts.

[41]In this analysis, variation in IHVPE implementation is at the state/survey-year level (rather than the state/child-birth-year level used in the rest of the regressions). Hence, I use data through 2002 only because all states in my sample initiated IHVPE by 1999.

relationship between IHVPE and trends in access to health insurance in the US drives the effect on child health insurance coverage, then we may also see a correlation between IHVPE and adult health insurance. For example, if changes in employer-provided health insurance availability are correlated with IHVPE initiation, then the decrease in child health insurance may be driven by a decrease in their fathers' access to health insurance, and would not be a marker of lower father involvement. The results from estimating equation 2 with an indicator for any health insurance coverage in the year of observation as the dependent variable for a sample of all males aged 18-64 in the analysis states are presented in Appendix Table 6. The large sample sizes permit precise estimation of the coefficients of interest, which are reassuringly not statistically significant and very close to zero. This provides further support for the findings on private child health insurance coverage and facilitates their interpretation as lowered father involvement.

7.6 Effects of IHVPE on Fathers' Transfers - Other Measures of Involvement

To assess the effects of IHVPE on other measures of father involvement, I propose another solution to the issue of selection into the CSS. The main difficulty for estimation is that I do not observe information on father involvement for married fathers. To address this, I assume that marriage is a form of a "legal child support agreement". I also assume that married fathers "make all child support payments", "make child support payments on time most or all of the time", have legal visitation rights and joint legal custody, spend the whole year with the child, provide food, clothes, and gifts for the child, and cover childcare and medical expenses. Clearly, these assumptions may not hold true for all married fathers. Yet since a large literature finds that married resident fathers have higher quality parenting skills and greater degree of involvement with their children than non-resident fathers (Cooksey and Craig, 1998; Kalmijn, 1999; Carlson *et al.*, 2008), these assumptions are not entirely unreasonable. Nevertheless, the results from this analysis are merely suggestive and should be interpreted with caution.

The results, presented in Appendix Table 7, show that when married fathers are included in the analysis, the effect on any child support payments is negative and marginally significant, while the effect on all child support payments is negative and insignificant. Further,

fathers now spend fewer days with their children, are less likely to have joint legal custody, and are less likely to cover childcare expenses. These findings provide suggestive evidence that net father involvement along measures other than private health insurance provision declines.

One potential worry with this analysis is that the negative effects on father involvement are mechanically driven by the way I control for selection out of marriage - specifically, there are mechanically fewer fathers with a value of "1" for the indicator variables on father involvement due to the negative effect on marriage. To address this, I have estimated regressions treating the only variable available for both married and unmarried parents - private health insurance coverage of the child - in the same way by assigning a value of 1 for all married parents. Clearly, this is not an accurate assumption as only 78 percent of children in married households have private health insurance. However, as shown in Appendix Table 8, analysis with this imputed health insurance variable yields results very similar to those from using the true child private health insurance coverage variable.[42] This suggests that while it may not be true that all married fathers provide complete involvement and support for their children, as long as married fathers are more likely than unmarried fathers to do so, the method of assigning values of 1 for measures of father involvement for married fathers is not a poor approximation and arguably a passable way to account for selection out of marriage.

7.7 Effects of IHVPE on Fathers' Transfers - Maternal Labor Supply

I next turn to analysis of maternal labor supply in Table 12. IHVPE leads to a 3 percent increase in the likelihood that a mother reports working any hours in the last year in the March CPS, and the coefficient is consistent across specifications.[43] In Appendix Table 9, I document that the labor supply effect is consistent across different definitions (mother is employed, mother is in the labor force, mother had any own wage income last year, and

[42]More formally, I conduct a test of equality of regression coefficients across the two models (one with the dependent variable being the true in-household health insurance coverage, and the other with the dependent variable being the imputed health insurance coverage). The p-value on the F-test for equality of coefficients across the models is 0.9525, suggesting that the coefficients in the two models are not statistically different from each other.

[43]Results using data from the CPS-CSS are qualitatively similar, although the coefficients are not statistically significant perhaps due to smaller sample sizes.

mother worked any hours last year). There is no effect on wages or hours worked on the intensive margin. This suggests that the effect of IHVPE operates on the extensive margin by inducing more mothers of young children to enter the workforce.

The increase in maternal labor supply is consistent with the idea that net transfers from fathers to mothers and children have decreased as a result of IHVPE. Mothers are more likely to need to earn income as a result of the decline in father support.[44]

7.8 Net Effects of IHVPE on Child Welfare

While the findings presented above document that IHVPE not only influenced paternity establishment rates, but also affected consequent family structure and parental behavior, they cannot speak to the net effects on family well-being. However, at least from a policy perspective, we may particularly care about the overall effects of IHVPE on children's welfare. Theoretically, the effects are ambiguous. Children whose parents would have maintained no legal relationship in the absence of IHVPE will benefit from increased paternal transfers and involvement. On the other hand, children whose parents would have been previously married may suffer from a decrease in paternal transfers and involvement, but may also benefit from having mothers who have higher utility as a result of not being married to lower-than-desired quality fathers.

I first test whether IHVPE has affected total household income.[45] The first column in Table 13 presents results from estimating equation 2 with log total household income as the dependent variable using March CPS data.[46] While the key coefficient is positive, it is not statistically significant, suggesting that there is no net effect of IHVPE on total household income among households considered in my analysis. This net zero effect may arise because any decline in paternal monetary transfers as a result of the decrease in marriage is compensated for by an increase in income due to higher maternal employment. Additionally,

[44]It is also possible that mothers are more likely to take-up public assistance income as a result of the decline in transfers from fathers. However, I find no statistically significant effect on welfare receipt among mothers in the March CPS.

[45]Total household income is defined as the sum of total personal pre-tax incomes earned over the previous year of all adult individuals residing in the household. These include incomes from wages, businesses, farms, welfare transfers, SSI, retirement, unemployment transfers, worker's compensation, veterans' transfers, disability, dividends, rent, educational assistance, child support, alimony, financial assistance from friends and family, and other sources.

[46]Results using CPS-CSS data are qualitatively similar but less precise due to smaller sample sizes.

income from the mothers' new partners may also offset any declines in paternal monetary transfers.

The other columns in Table 13 present results on outcomes measuring children's physical and mental health and access to care in the NHIS. The results suggest that there are no net effects of IHVPE on children's physical health. There is a marginally significant negative effect on the likelihood of a child having any learning disabilities, although other measures of mental health are unaffected.[47] However, there is also a net decline in children's access to care - the likelihoods that a child has any doctor visits and any well-child visits in the last 12 months both decrease by about 2 percent at the sample mean. This finding may be consistent with a decrease in children's private health insurance coverage.

On the whole, I find little evidence that IHVPE affected child welfare, at least as measured by household income and the health outcomes available in NHIS. This may be surprising as this policy was likely implemented in hopes of improving the well-being of children born to unmarried parents. However, although IHVPE achieved its first-order goal of raising paternity establishment rates, I have shown that it also had important effects on family structure and behavior. My results suggest that in response to IHVPE, affected parents responded in such a way that left the average welfare of their children unchanged.

8 Conclusion

As more than one third of all babies in the US are born to unmarried mothers every year, there is a clear need for policies that address the needs of these children and their families. The fact that children raised in two-parent households tend to fare better along numerous measures of well-being has prompted many policymakers to focus on ways to encourage absent fathers to become more engaged with their families. These sentiments underlie many child support enforcement efforts and programs like IHVPE.

An important feature of such policies, however, is that they effectively offer an "intermediate" option for a parental relationship that is situated between the "extremes" of

[47] I have also estimated regressions with the following physical and mental health outcomes: any skin allergies, any frequent diarrhea, any hearing problems, any vision problems, any mobility problems, any stuttering, and mental retardation, any developmental delay, and ever diagnosed with ADD. None of the results is statistically significant.

maintaining no contact and marriage. Indeed, this is a common feature of many policies that aim to improve the welfare of disadvantaged populations. For example, two-year community colleges provide an "intermediate" option in education that is positioned between the options of no post-secondary schooling and a four-year university degree. A policy of promoting access to community colleges may in fact achieve its desired goal of increasing the educational attainment of students who would have otherwise not gone to college, but it may also have an unintended consequence of reducing the educational attainment of students who would have otherwise attended four-year universities. Clearly, while many students may still benefit from such a policy, understanding the effects on both margins is crucial for overall welfare analysis.

In this paper, I provide a detailed analysis of the causal effects of IHVPE, an important "intermediate" policy in the realm of family economics, and interpret my findings in the context of a conceptual framework. In this framework, fathers, who are heterogeneous in quality, can only obtain full rights to their children within marriage. On the other hand, mothers can enjoy full rights to their children regardless of whether they are married or not, and hence require transfers from the fathers in exchange for marriage (Edlund, 1998, 2011). By substantially reducing the costs of legal paternity establishment, IHVPE makes the "intermediate" option of paternity establishment, in which unmarried fathers gain partial rights while unmarried mothers expect partial transfers, relatively more attractive than the other options of no contact and marriage. In particular, for mothers, paternity establishment may be more appealing than marriage if they trade-off the benefits of paternal transfers with the costs of interacting with lower-than-desired quality partners. As a result, for certain levels of father quality, mothers will value child support payments outside marriage more than higher levels of support and involvement within marriage (Edin and Kefalas, 2005). This observation has important implications for more recent family policies that have promoted marriage through "Healthy Marriage Initiatives".[48] If some parents opt out of marriage when offered an "intermediate" alternative arrangement for family involvement, then marriage may

[48]The Deficit Reduction Act of 2005 provided $150 million in funding every year for "healthy marriage promotion and father involvement" (Administration for Children and Families, 1997). Most programs funded by these initiatives provide relationship education and counseling and conduct public advertising campaigns on "the value of healthy marriages" (Administration for Children and Families, 1997). Many of these programs are specifically aimed at unmarried pregnant women and expectant fathers.

not be the optimal choice for all parents.

By impacting behavior on two opposing margins, IHVPE has a theoretically ambiguous net effect on paternal transfers. It depends on the relative magnitudes of the decline in transfers by fathers who would have previously been married and the increase in transfers by fathers who would have remained unmarried in the absence of IHVPE. The effects on overall child welfare are similarly ambiguous: although some children may be hurt by the possible decline in paternal transfers, they may also benefit from improvements to their mothers' well-being arising from a reduced need to reside with lower-than-desired quality partners.

Using variation in the timing of IHVPE program implementation across states and years, I show that IHVPE programs increase paternity establishment rates by about 38 percent. I provide evidence that the timing of program initiation is uncorrelated with numerous state time-varying characteristics and that the results are not driven by pre-existing trends in paternity establishment rates. Further, I show that the effects are robust to the inclusion of controls for maternal, child, and state time-varying characteristics (including controls for other child support enforcement policies and the timing of state EITC and welfare reform policies), state and year fixed effects, state-specific time trends, and across many different specifications, methods, and data sets. This analysis provides confidence for the ability to interpret my results as causal.

I then proceed to study the effects of IHVPE programs on marriage and father involvement post-childbirth using data from CPS-CSS. I find that IHVPE programs lead to a decrease in parental marriage - for mothers whose youngest children are aged 5 years or less, the likelihood of marriage to the child's biological father decreases while the likelihoods of remaining never-married and being married to or cohabiting with someone other than the child's father increase. I also find that the negative effect on marriage leads to an increase in the average characteristics of both married and unmarried fathers, which is consistent with the idea of an increase in the "marriage threshold" in father quality.

Accounting for selection out of marriage, I show that IHVPE programs lead to net negative effects on some measures of father involvement, such as private health insurance provision. As further evidence of a decrease in paternal transfers, I document that IHVPE

leads to an overall increase in maternal labor supply. Finally, I show that IHVPE has little effect on overall child welfare, as measured by total household income and child physical and mental health. The only detectable effect is a decline in children's access to preventative care, which is perhaps consistent with a decline in private health insurance coverage.

The results from this analysis suggest that parents who bear children out-of-wedlock face many complex trade-offs in their decisions to be involved with each other and their children. As a result, a paternity establishment program that arguably seeks to engage absent fathers and increase child support payments and father involvement can actually have the opposite effects by discouraging marriage. Ultimately, most women who bear children out-of-wedlock arguably have the best interests of their own and their children's well-being at heart, given their often disadvantaged life circumstances and dearth of opportunities. Thus, policies that only serve to increase the engagement of absent fathers may sometimes turn out to be misguided, as not all fathers provide positive influences on their children or greater welfare for the mothers. Perhaps the hardships for mothers who bear children out-of-wedlock and their children can only be truly alleviated when economic opportunities for both poor men and women improve. Greater opportunities for women may lead them to delay childbearing until they are better able to provide for their children, while greater opportunities for men may increase the pool of marriageable partners who support and engage with their children and bring fulfillment to their wives.

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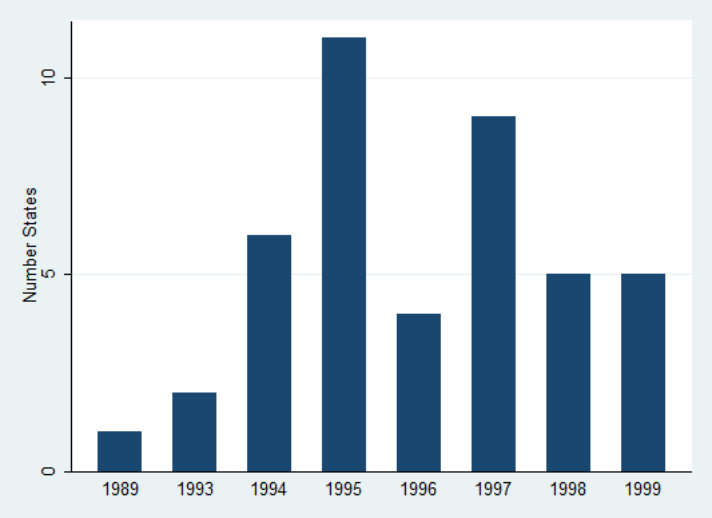
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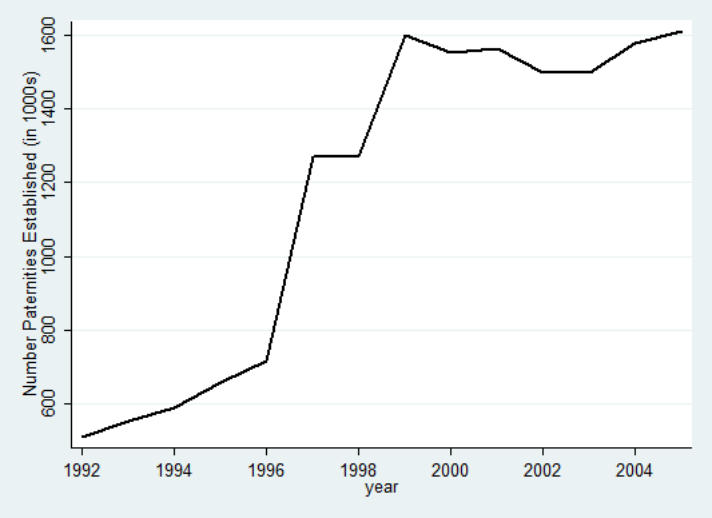
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Figure 1: Variation in IHVPE Program Initiation Across States



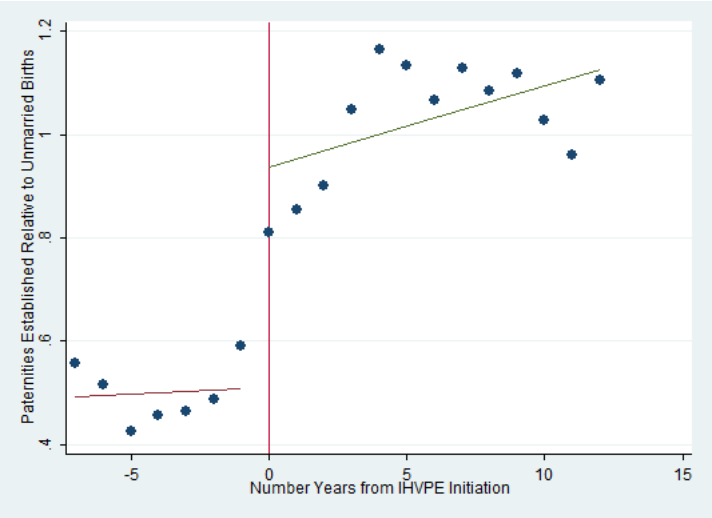
Notes: This figure plots the number of states that initiated IHVPE in each year. Forty-four states are included in the figure.

Figure 2: Number Paternities Established in the United States: 1992-2007



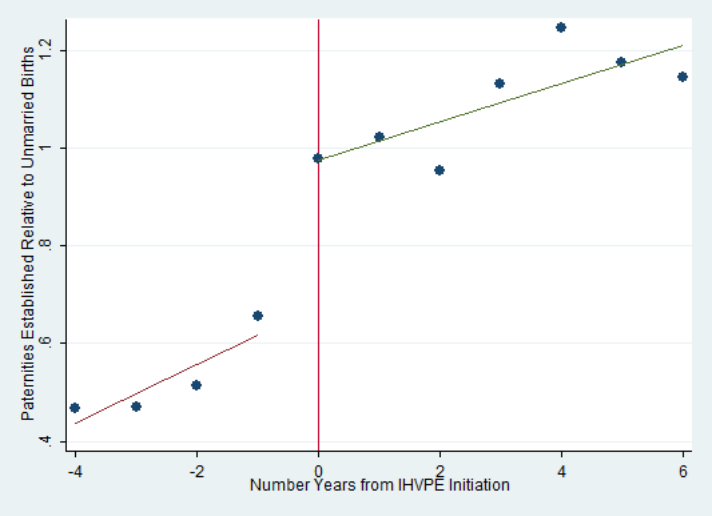
Notes: This figure plots the total number of paternities established in the US in each year.

Figure 3: Number Paternities Established Relative to Number of Unmarried Births: 1992-2005



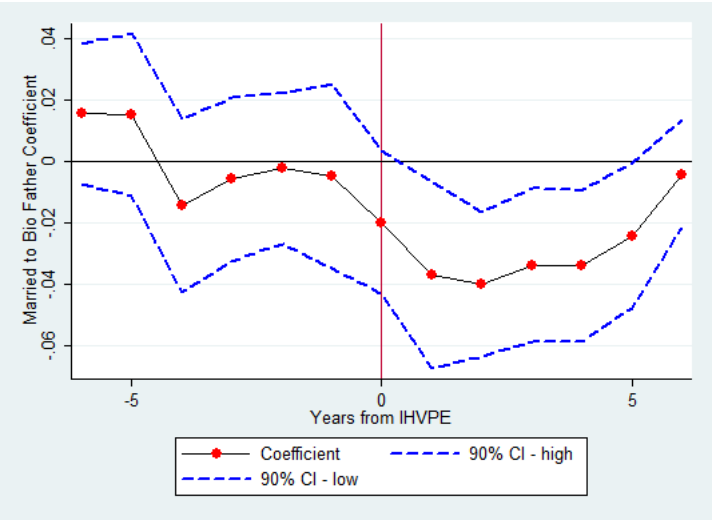
Notes: This figure plots the average of the total number of paternities established divided by the total number of unmarried births across states in each year before and after IHVPE program implementation.

Figure 4: Number Paternities Established Relative to the Number of Unmarried Births: 1992-2005, States that Initiated IHVPE in 1996 or Later



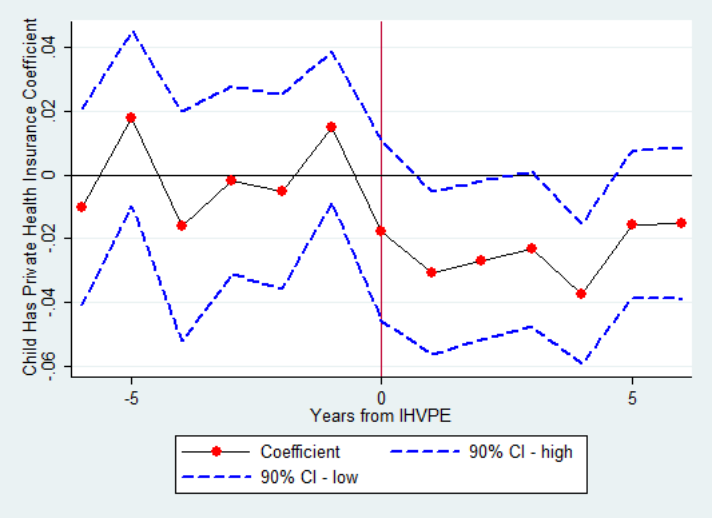
Notes: This figure plots the average of the total number of paternities established divided by the total number of unmarried births across states in each year before and after IHVPE program implementation for states that initiated IHVPE in 1996 or later.

Figure 5: Effects of IHVPE on Marriage to the Biological Father by Year



Notes: This figure plots θ_k coefficients (and 90% confidence intervals) from estimating the following equation: $Y_{isty} = \beta_0 + \sum_{k=-6}^{6} \theta_k * IHVPE_{syk} + f(t) + \mu_s + \alpha_y + \epsilon_{isty}$, where $IHVPE_{syk}$ is an indicator for k years from IHVPE implementation in state s and the child's birth year.

Figure 6: Effects of IHVPE on Children's Private Health Insurance Coverage by Year



Notes: This figure plots θ_k coefficients (and 90% confidence intervals) from estimating the following equation: $Y_{isty} = \beta_0 + \sum_{k=-6}^{6} \theta_k * IHVPE_{syk} + f(t) + \mu_s + \alpha_y + \epsilon_{isty}$, where $IHVPE_{syk}$ is an indicator for k years from IHVPE implementation in state s and the child's birth year.

Table 1: Summary Statistics for CPS-CSS Data: 44 States in 1994, 1996, 1998, 2000, 2002, 2004, 2006, and 2008

	WHOLE SAMPLE			IHVPE Program Exists in Child's State and Year of Birth	IHVPE Program Does NOT Exist in Child's State and Year of Birth
	N	Mean	SD		
Mother's Age at Birth: <20 years	38,449	**0.045**	0.206	**0.043**	**0.047**
Mother's Age at Birth: 35-45 years	38,449	**0.193**	0.395	**0.208**	**0.169**
Mother's Education: <HS	38,449	**0.141**	0.348	**0.140**	**0.143**
Mother's Education: HS	38,449	**0.296**	0.457	**0.274**	**0.333**
Mother's Education: Some College	38,449	**0.292**	0.455	**0.287**	**0.299**
Mother is Non-Hispanic White	38,449	**0.632**	0.482	**0.617**	**0.656**
Mother is Black	38,449	**0.144**	0.351	**0.137**	**0.155**
Mother is Hispanic	38,449	**0.173**	0.378	**0.186**	**0.152**
Child is Male	38,449	**0.510**	0.500	**0.511**	**0.508**
Child's Age	38,449	**2.180**	1.682	**1.890**	**2.648**
Mother is Married	38,449	**0.775**	0.417	**0.786**	**0.758**
Mother is Never Married	38,449	**0.137**	0.344	**0.138**	**0.135**
Mother is Married to Someone Other than Biological Father	38,449	**0.010**	0.102	**0.011**	**0.009**
Mother is Married to Biological Father	38,449	**0.765**	0.424	**0.775**	**0.749**
Child Has Any Health Insurance Coverage	38,449	**0.883**	0.322	**0.893**	**0.865**
Child Has Private Health Insurance Coverage	38,449	**0.673**	0.469	**0.669**	**0.678**
Mother is Eligible to be Asked CS Supplement Questions	38,449	**0.243**	0.429	**0.235**	**0.256**
Any CS Agreement	8,974	**0.583**	0.493	**0.575**	**0.593**
Legal CS Agreement (exists or pending)	8,974	**0.509**	0.500	**0.500**	**0.522**
Informal CS Agreement	8,974	**0.074**	0.261	**0.076**	**0.071**
Father Paid Any CS in Last Year	8,069	**0.358**	0.479	**0.359**	**0.357**
Father Paid All CS in Last Year	8,069	**0.221**	0.415	**0.221**	**0.222**
Father Paid On Time All or Most of the Time	6,629	**0.295**	0.456	**0.295**	**0.295**
Father Provided Child's Health Insurance	8,087	**0.145**	0.352	**0.142**	**0.149**
Father Has Legal Visitation Rights	8,974	**0.702**	0.457	**0.702**	**0.703**
Father Has Joint Legal Custody	8,974	**0.143**	0.350	**0.146**	**0.137**
Number Days Father Spent with Child in Last Year	8,295	**60.311**	93.891	**63.722**	**55.225**
Father Provided Any Gifts, Clothes, Food, Childcare or Medical Help	8,974	**0.558**	0.497	**0.566**	**0.545**

Notes: The sample of analysis includes all women with a youngest child aged 5 years old or less in the household who were between the ages of 18 and 45 at the time of childbirth in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin in 1994, 1996, 1998, 2000, 2002, 2004, 2006 and 2008. The sample omits all individuals who moved from abroad last year and assigns the state of last year's residence as the state of child's birth. Mothers are coded as married to the biological father if they are married and their child is coded as living with both parents in the household. Mothers are coded as married to someone other than the biological father if they are married, but their child is coded as living with one parent in the household. The summary statistics are weighted by the provided CPS person weights.

Table 2: Effects of IHVPE Programs on Paternities Established in 43 States: 1992-2005

	Dependent Variable: Log Number Paternities Established				
	(1)	(2)	(3)	(4)	(5)
IHVPE Program Exists in State and Year of Observation	0.3591**	0.3195**	0.3336**	0.3321**	0.3230**
	(0.1076)	(0.0983)	(0.0965)	(0.0989)	(0.1121)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes
N	601	573	545	545	545
R-squared	0.9396	0.9447	0.9443	0.9456	0.9593

Notes: Each column is a separate regression. Units of observation are state-year cells consisting of the following states: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin. Each of the listed states implemented an in-hospital paternity establishment program during this time period with information on the year of initiation. I assume that the first year the program is in effect (year of initiation) is the same as the year listed in Appendix Table 1 if only the year is listed or if the month of initiation is June or earlier. If the month of initiation is known and it is July or later, then I assume the first year the program is in effect is the following year.
The maternal and child controls include controls for the proportion of births with the following characteristics: mother's age (<20, 20-24, 25-34, 35-44, 45+), mother's education (less than HS, HS, some college, college+), mother's race (white, black, Hispanic), mother's marital status and child sex. The controls for state characteristics in the year before include the unemployment rate, the poverty rate, the state minimum wage, the percent of the population that receives AFDC/TANF benefits, the AFDC/TANF benefit for a 4-person family, the percent of the population on Medicaid, an indicator for a Democratic governor, and the fraction of the state House that is Democratic. The child support laws controls are indicators for whether the following child support enforcement laws are in place in the state and year of observation: universal wage withholding, genetic testing for paternity, new hires directory, and license revocation for non-payment. The state EITC implementation controls are indicators for whether a state EITC has been implemented in the state and year of observation. The AFDC/TANF implementation controls are indicators for whether an AFDC waiver or TANF has been implemented in the state and year of observation. All regressions are weighted by the state-year populations. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 3: Effects of IHVPE Programs on Paternities Established in 43 States with Pre-Trends: 1992-2005

	Dependent Variable: Log Number Paternities Established				
	(1)	(2)	(3)	(4)	(5)
3 Years Before IHVPE Program Initiation	-0.1535**	-0.1219	-0.1277	-0.1371+	-0.0765
	(0.0700)	(0.0738)	(0.0823)	(0.0798)	(0.0712)
2 Years Before IHVPE Program Initiation	-0.0802	-0.0600	-0.0713	-0.0923	-0.1203
	(0.0908)	(0.0949)	(0.0998)	(0.1028)	(0.0942)
1 Year Before IHVPE Program Initiation	-0.1715	-0.1746	-0.1816	-0.1802	-0.2074
	(0.1203)	(0.1220)	(0.1198)	(0.1167)	(0.1287)
IHVPE Program Exists in State and Year of Observation	0.2752***	0.2383**	0.2493**	0.2464***	0.2177**
	(0.0774)	(0.0737)	(0.0705)	(0.0682)	(0.0736)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes
N	601	573	545	545	545
R-squared	0.9406	0.9456	0.9453	0.9466	0.9605

Notes: Units of observation are state-year cells. Please refer to Table 2 for details about sample restrictions and controls. All regressions are weighted by state-year populations. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 4: IHVPE Programs and Maternal and State Characteristics in 43 States: 1992-2005

	Total Number Births	Proportion Births by Unmarried Mothers	Proportion Births with Mother's Age <20	Proportion Births with Mother's Ed: <HS	Proportion Births with Mother's Ed: College+	Proportion Births by Non-Hispanic White Mothers	Proportion Births by Black Mothers	Proportion Births by Hispanic Mothers	State Unemployment Rate in Previous Year
IHVPE Program Exists in State and Year of Observation	-3037.5170	-0.0122	-0.0003	0.0010	-0.0027	-0.0063	0.0022+	0.0024	0.0985
	(3600.9706)	(0.0106)	(0.0006)	(0.0016)	(0.0024)	(0.0045)	(0.0012)	(0.0025)	(0.1507)

	State Poverty Rate in Previous Year	State Minimum Wage in Previous Year	Proportion of Population Receiving Welfare Benefits in Previous Year	Welfare Benefit for 4-Person Family in Previous Year	Governor is Democratic in Previous Year	Proportion of Population on Medicaid in Previous Year	State EITC Implemented	AFDC Waiver Implemented	Universal Wage Withholding Implemented
IHVPE Program Exists in State and Year of Observation	0.4108	-0.0676	0.0023	-10.7172	-0.0633	-0.0039	0.0224	0.1369	0.0379
	(0.3390)	(0.0904)	(0.0022)	(7.1064)	(0.0779)	(0.0040)	(0.0516)	(0.1263)	(0.0976)

Notes: N = 601 state-year cells. Each coefficient is from a separate regression. Please refer to Table 2 for details about sample restrictions and controls. All regressions are weighted by state-year populations. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 5: Effects of IHVPE Programs on Marriage to the Biological Father in 44 States: CPS-CSS 1994-2008

	Dependent Variable: Mother is Married to Child's Biological Father				
	(1)	(2)	(3)	(4)	(5)
IHVPE Program Exists in State and Year of Child's Birth	-0.0338***	-0.0276***	-0.0278***	-0.0287***	-0.0283**
	(0.0076)	(0.0070)	(0.0072)	(0.0071)	(0.0084)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes
Quadratic Polynomial in Survey Year	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes
N	38,449	37,457	36,243	36,243	36,243
R-squared	0.2232	0.2239	0.2236	0.2237	0.2244

Notes: Each column is a separate regression. The sample of analysis includes all women with a youngest child aged 5 years old or less in the household who were between the ages of 18 and 45 at the time of childbirth in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin in 1994, 1996, 1998, 2000, 2002, 2004, 2006 and 2008. The sample omits all individuals who moved from abroad last year and assigns the state of last year's residence as the state of child's birth. Mothers are coded as married to the biological father if they are married and their child is coded as living with both parents in the household. The mother and child controls include controls for the woman's age at childbirth (<20, 20-24, 25-34, 35-44), woman's education (less than HS, HS, some college, college+), woman's race (white, black, Hispanic, other), child sex, and indicators for child's single years of age. The time-varying state characteristics include the unemployment rate, the poverty rate, the state minimum wage, the percent of the population that receives AFDC/TANF benefits, the AFDC/TANF benefit for a 4-person family, the percent of the population on Medicaid, an indicator for a Democratic governor, and the fraction of the state House that is Democratic. The controls for child support laws are indicators for whether the following child support enforcement laws are in place in the state and year of observation: universal wage withholding, genetic testing for paternity, new hires directory, and license revocation for non-payment. The state EITC implementation controls are indicators for whether a state EITC has been implemented in the state and year of observation. The AFDC/TANF implemenation controls are indicators for whether the AFDC waiver or the TANF program is implemented by the state and year of observation. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 6: Effects of IHVPE Programs on Marriage to Biological Father in 44 States: CPS-CSS 1994-2008 - Robustness Checks

	Dependent Variable: Mother Married to Biological Father					
	Pre Trends	4-Year Window	No Black Mothers	Omit CA	Omit NY	Omit TX
IHVPE Program Exists in State and Year of Child's Birth	-0.0246**	-0.0259+	-0.0257**	-0.0269**	-0.0294**	-0.0274**
	(0.0120)	(0.0137)	(0.0088)	(0.0084)	(0.0086)	(0.0098)
Child Born 1 Year Before Program Initiation	0.0032					
	(0.0123)					
Child Born 2 Years Before Program Initiation	0.0095					
	(0.0098)					
Child Born 3 Years Before Program Initiation	0.0038					
	(0.0106)					
Child Born 4 Years Before Program Initiation	-0.0065					
	(0.0137)					
N	36,243	17,263	31,907	32,553	33,910	33,831

Notes: Each column is a separate regression. Please refer to Table 5 for details about sample restrictions and controls. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 7: Heterogeneous Effects of IHVPE Programs on Marriage: March CPS 1989-2010

	Outcome: Mother is Married to Biological Father			
	Mothers Aged <25 Years	Mothers Aged 25-45 Years	Mothers with High School Degree or Less	Mothers with Some College or More
IHVPE Program Exists in State and Year of Child's Birth	-0.0281**	-0.0052	-0.0585***	-0.0004
	(0.0090)	(0.0068)	(0.0150)	(0.0051)
N	43,483	140,673	81,242	103,320

Notes: Each coefficient is from a separate regression. The sample of analysis includes all women with a biological youngest child aged 5 years old or less in the household who were between the ages of 18 and 45 at the time of childbirth in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin in the Annual March CPS over 1989-2010. The sample omits all individuals who moved from abroad last year and assigns the state of last year's residence as the state of child's birth. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the provided March CPS Supplement person weights. Robust standard errors are clustered on the state level.
Significance levels: + $p<0.10$ ** $p<0.05$ *** $p<0.001$

Table 8: Effects of IHVPE Programs on Maternal Relationships

	Mother is…			
	Never Married (CPS-CSS)	Married to Someone Other than Biological Father (CPS-CSS)	Cohabiting with the Biological Father (NHIS)	Cohabiting with Someone Other than Biological Father (NHIS)
IHVPE Program Exists in State and Year of Child's Birth	0.0173**	0.0056**	-0.0037	0.0086**
	(0.0059)	(0.0027)	(0.0033)	(0.0024)
N	36,243	36,243	--	--

Notes: Each coefficient is from a separate regression. Please refer to Table 5 for details about sample restrictions and controls in the CPS-CSS data. The NHIS regressions use data from the Sample Child Files of the National Health Interviews Surveys over 1997-2010 on all women with a sample child aged 7 years old or less in the household who were between the ages of 18 and 45 at the time of childbirth in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin. Sample sizes in the NHIS data cannot be released due to confidentiality concerns. Please see the text for more information about approximate sample sizes. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. The regressions using CPS-CSS are weighted by the provided CPS person weights, while the regressions using NHIS are weighted by the provided sample child weights. Robust standard errors are clustered on the state level.
Significance levels: + $p<0.10$ ** $p<0.05$ *** $p<0.001$

Table 9: IHVPE Programs and Formal and Informal Father Involvement: CPS-CSS 1994-2008, CS-Eligible Sample

Dependent Variable	N	Coefficient	SE
Mother Eligible to be Asked CS Supplement Questions	36,243	0.0166**	(0.0082)
Father Made Any CS Payments in Last Year	7,507	0.0077	(0.0207)
Father Made All CS Payments in Last Year	7,507	0.0431**	(0.0211)
Father Paid On Time All or Most of the Time in Last Year	6,141	0.0213	(0.0309)
Father Provided Health Insurance for Child	7,524	0.0479**	(0.0205)
Father Has Court-Ordered Visitation Rights	8,361	0.0068	(0.0301)
Father Has Joint Legal Custody	8,361	-0.0011	(0.0183)
Number Days Father Spent with Child	7,733	7.5032	(5.0383)
Father Provided Gifts for Child	8,361	0.0444	(0.0350)
Father Provided Clothes for Child	8,361	0.0263	(0.0240)
Father Provided Food for Child	8,361	0.0458**	(0.0215)
Father Covered Childcare Expenses for Child	8,361	0.0307**	(0.0145)
Father Paid for Medical Expenses for Child	8,361	0.0533**	(0.0199)

Notes: Each coefficient is from a separate regression.The sample of analysis includes all women with a youngest child aged 5 years old or less in the household who were between the ages of 18 and 45 at the time of childbirth in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin in 1994, 1996, 1998, 2000, 2002, 2004, 2006 and 2008. The sample omits all women who moved from abroad last year and assigns the state of last year's residence as the state of child's birth. Mothers are eligible to be asked child support supplement questions if they have a biological child whose father lives outside the household. The regressions control for the woman's age at childbirth (<20, 20-24, 25-34, 35-44), woman's education (less than HS, HS, some college, college+), woman's race (white, black, Hispanic, other), child sex, and indicators for child's single years of age. All regressions include controls for state characteristics in the year before; these include the unemployment rate, the poverty rate, the state minimum wage, the percent of the population that receives AFDC/TANF benefits, the AFDC/TANF benefit for a 4-person family, the percent of the population on Medicaid, an indicator for a Democratic governor, and the fraction of the state House that is Democratic. All regressions include indicators for whether the following child support enforcement laws are in place in the state and year of observation: universal wage withholding, genetic testing for paternity, new hires directory, and license revocation for non-payment. All regressions include indicators for whether the state EITC, the AFDC waiver or the TANF program is implemented by the state and year of observation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. The regression in the first row is weighted by the provided CPS person weights, while all other regressions are weighted by the CPS-CSS supplement weights. Robust standard errors are clustered on the state level. Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 10: Effects of IHVPE Programs on Married Fathers' Characteristics: CPS-CSS 1994-2008

	Father's Age	Father's Age <20	Father's Age 20-24	Father's Age 45+	Father's Ed: <HS	Father's Ed: HS Degree	Father's Ed: Some College	Father Receives Any Public Assistance
IHVPE Program Exists in State and Year of Child's Birth	0.2253+	-0.0001	-0.0206**	0.0145+	-0.0033	0.0084	0.0001	-0.0041**
	(0.1292)	(0.0011)	(0.0062)	(0.0072)	(0.0082)	(0.0124)	(0.0140)	(0.0015)
N	27,683	27,683	27,683	27,683	27,683	27,683	27,683	27,683

Notes: Each column is a separate regression. The sample of analysis includes all women married to the biological fathers of their children with a youngest child aged 5 years old or less in the household who were between the ages of 18 and 45 at the time of childbirth in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin in 1994, 1996, 1998, 2000, 2002, 2004, 2006 and 2008. The sample omits all women who moved from abroad last year and assigns the state of last year's residence as the state of child's birth. All regressions are weighted by the CPS person weights. The regressions control for the woman's age at childbirth (<20, 20-24, 25-34, 35-44,), woman's education (less than HS, HS, some college, college+), woman's race (white, black, Hispanic, other), child sex, and indicators for child's single years of age. All regressions include controls for state characteristics in the year before; these include the unemployment rate, the poverty rate, the state minimum wage, the percent of the population that receives AFDC/TANF benefits, the AFDC/TANF benefit for a 4-person family, the percent of the population on Medicaid, an indicator for a Democratic governor, and the fraction of the state House that is Democratic. All regressions include indicators for whether the following child support enforcement laws are in place in the state and year of observation: universal wage withholding, genetic testing for paternity, new hires directory, and license revocation for non-payment. All regressions include indicators for whether the state EITC, the AFDC waiver or the TANF program is implemented by the state and year of observation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 11: Effects of IHVPE Programs on Child Health Insurance Provision in 44 States: CPS-CSS 1994-2008

	Any Private Health Insurance Coverage					Coverage by Member of Household	Coverage by Person Outside Household	Coverage by Medicaid or Medicare	Coverage by CHIP	Any Health Insurance Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IHVPE Program Exists in State and Year of Child's Birth	-0.0236**	-0.0198+	-0.0197+	-0.0190+	-0.0241**	-0.0261**	0.0020	0.0044	0.0184	-0.0057
	(0.0107)	(0.0103)	(0.0109)	(0.0107)	(0.0102)	(0.0114)	(0.0038)	(0.0107)	(0.0192)	(0.0106)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic Polynomial in Survey Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
N	38,449	37,457	36,243	36,243	36,243	36,243	36,243	36,243	15,178	36,243
R-squared	0.2542	0.2557	0.2568	0.2569	0.2579	0.2474	0.0179	0.2056	0.0738	0.0493

Notes: Each column is a separate regression. Please refer to Table 5 for more details about sample restrictions and controls. All regressions are weighted by the provided CPS person weights. Information on CHIP coverage is only available in 2002, 2004, 2006, and 2008 in the CPS-CSS. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 12: Effects of IHVPE Programs on Mother's Any Usual Hours Worked in 44 States: March CPS 1989-2010

	Dependent Variable: Any Hours Worked (Mean=0.678)				
	(1)	(2)	(3)	(4)	(5)
IHVPE Program Exists in State and Year of Child's Birth	0.0144**	0.0171**	0.0189**	0.0191**	0.0191**
	(0.0064)	(0.0072)	(0.0074)	(0.0073)	(0.0074)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes
Quadratic Polynomial in Survey Year	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes
N	212,504	190,249	184,562	184,562	184,562
R-squared	0.0640	0.0644	0.0640	0.0642	0.0652

Notes: Each column is a separate regression. Please refer to Table 7 for details about sample restrictions and controls. All regressions are weighted by the provided March CPS Supplement person weights. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Table 13: Effects of IHVPE Programs on Measures of Child Well-Being

	Log Household Income (March CPS)	Any Asthma Episodes in Last 12 Months (NHIS)	Any Ear Infections in Last 12 Months (NHIS)	Any Learning Disability (NHIS, ages 3+)	Child is Unhappy Sometimes or Often (NHIS, ages 2-3)	Any Well-Child Visits in Last 12 Months (NHIS)	Any Doctor Visits in Last 12 Months (NHIS)
IHVPE Program Exists in State and Year of Child's Birth	0.0060	0.0025	-0.0027	-0.0090+	-0.0102	-0.0199**	-0.0148**
	(0.0096)	(0.0066)	(0.0062)	(0.0052)	(0.0142)	(0.0094)	(0.0069)
N	183,283	--	--	--	--	--	--

Notes: Each coefficient is from a separate regression. Please refer to Tables 7 and 8 for details about sample restrictions and controls in the March CPS and NHIS data. Sample sizes in the NHIS data cannot be released due to confidentiality concerns. Please see the text for more information about approximate sample sizes. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. The regressions using March CPS data are weighted by the provided CPS March Supplement person weights, while the regressions using NHIS are weighted by the provided sample child weights. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Appendix A - Conceptual Framework

Model Set-Up

To focus the model on father quality and paternal transfers, I make the simplifying assumption that all mothers are homogeneous. Thus, I assume all mothers obtain $Q > 0$ in utility from their children. Further all mothers obtain the same utility from children regardless of whether they are married, establish paternity, or maintain no relationship with the father. On the other hand, fathers only obtain full utility from their children in marriage. This asymmetry stems from the fact that most unmarried mothers retain full custody of their children and thus essentially maintain complete decision-making power over their children's well-being outside of marriage.[49] Since a mother can enjoy her full utility from her child outside marriage, she will only agree to marriage if she receives a non-negative transfer, t, from the father.

Fathers are heterogeneous in partner quality, denoted by q, which is distributed according to a cumulative distribution function, $F(q)$, with a support of $[0, \overline{Q}]$. For simplicity, I assume that a father's valuation of his children is the same as his quality, q.[50] Intuitively, lower-quality fathers value their time and resources allocated to other activities (such as drug use, time spent with friends or other women, etc. (Edin and Kefalas, 2005) more than to children and hence experience a lower utility from their children than higher-quality fathers.

The amount of parental rights that a father has to his child depends on the relationship that he has with the mother. Specifically, fathers obtain $\alpha_j q$ in utility from their children (for some constant $0 \leq \alpha_j \leq 1$), where j denotes three possible states - m (marriage), p (paternity), or n (no relationship). I assume that in marriage, fathers have full rights to their children ($\alpha_m = 1$), while outside marriage, fathers have partial rights if they establish paternity ($0 < \alpha_p < 1$) or no rights if they maintain no relationship ($\alpha_n = 0$). Note that this feature is similar to the "cohabitation" state described in Edlund (2011), although the framework presented here accommodates cases where a mother may not want to share a

[49] This assumption is the same as in most papers motivated by the theory originally developed by Edlund (1998).

[50] One could also assume that a father's valuation of his children is a direct function of his quality, $Q(q)$, where $Q(q)$ is monotonically increasing and $Q(0) = 0$. However, since this model is not attempting to address the relationship between father quality and valuation of children, I simply assume $Q(q) = q$.

household with the father through cohabitation but can still transfer a fraction of custodial rights to him.

Each father chooses the level of transfer to offer to the mother and child, $t_j(q)$ in states $j \in \{m, p\}$, in exchange for parental rights. I assume that to establish paternity outside marriage, fathers must pay a fixed cost, $c_p > 0$. This means that if a father maintains no relationship with the mother, then he receives no rights to his child and also incurs no costs.

The key element of this model is that the mother's utility in marriage depends directly on the father's quality, while her utility outside marriage does not. Consequently, I assume the following utility functions for the parents:[51]

For the mother,

$$M(Q, t_j(q), \theta_j(q)) = Q + t_j(q) + \theta_j(q) \qquad for j \in \{m, p, n\} \tag{3}$$

and for the father,

$$F(q, t_j(q), c_j) = \alpha_j q - t_j(q) - c_j \qquad for j \in \{m, p, n\} \tag{4}$$

where $\theta_p(q) = \theta_n(q) = 0$ for all q, and $c_m = c_n = 0$. Here, $\theta_m(q)$ is a function that represents the mother's utility from directly interacting with a q-quality father in marriage. I assume that $\theta'_m(q) > 0$ for all q and that the support of $\theta_m(q)$ includes both positive and negative values. This implies that for certain (lower) values of q, mothers may experience a disutility in marriage that they would otherwise have not experienced outside marriage. Consequently, we can represent the realizations of these utility functions in each of the possible states as follows:[52]

	Marriage	Paternity	No Relationship
Mother	$Q + t_m(q) + \theta(q)$	$Q + t_p(q)$	Q
Father	$q - t_m(q)$	$\alpha q - t_p(q) - c$	0

[51] I assume quasi-linear utility functions, which follows Edlund (2011) and Chiappori and Oreffice (2008), among others.

[52] From here on, I drop the subscripts on α, $\theta(q)$ and c, since the values for each parameter for two out of the three states are determined by assumptions discussed above.

Equilibrium

To solve for the equilibrium of this model, I make the assumption that the mother has full bargaining power.[53] I first solve for the father's indifference condition to find the transfers $t_m(q)$ and $t_p(q)$ that will make the father indifferent between marriage, paternity, and no relationship. The father's indifference condition is:

$$0 = \alpha q - t_p(q) - c = q - t_m(q) \tag{5}$$

It follows that fathers with will be indifferent between offering $t_p(q)^* = \alpha q - c$ in paternity and offering $t_m(q)^* = q$ within marriage. Note that fathers with $q < \frac{c}{\alpha}$ will offer negative transfers in paternity, which mothers will never choose. However, for all fathers with $q \geq \frac{c}{\alpha}$, mothers will agree to paternity over no relationship. We can denote the paternity threshold as $q_p = \frac{c}{\alpha}$.

The marriage decision is determined by the mother's utility. The mother will agree to marriage if:

$$Q + t_m(q)^* + \theta(q) \geq Q + t_p(q)^* \tag{6}$$

$$\rightarrow q + \theta(q) \geq \alpha q - c \tag{7}$$

$$\rightarrow (1 - \alpha)q + \theta(q) + c \geq 0 \tag{8}$$

The marriage threshold, q_m, will be a value of q that will satisfy equation $8 = 0$. Additionally, I assume that $q_m > q_p$ so no mothers prefer marriage with a father who does not want to establish paternity.[54] The expected amount in transfers to all of the mothers is determined by:

$$T = \int_0^{q_p} 0 dF(q) + \int_{q_p}^{q_m} t_p(q)^* dF(q) + \int_{q_m}^{\overline{Q}} t_m(q)^* dF(q) \tag{9}$$

$$= \int_{q_p}^{q_m} (\alpha q - c) dF(q) + \int_{q_m}^{\overline{Q}} q dF(q) \tag{10}$$

[53] This is the same assumption as in Edlund (2011) for the case where both the woman and man are of "low" quality. This assumption is certainly strong, although it reflects the qualitative evidence that low-income mothers tend to refuse marriage more often than fathers do (Edin and Kefalas, 2005).

[54] Formally, this is an assumption on the functional form of $\theta(q)$. It implies that for $q < \frac{c}{\alpha}$, it must be that $Q + q + \theta(q) < Q$, so $q < -\theta(q)$. Intuitively, this means that for fathers of very low quality, mothers prefer to have no interaction and no transfers over marriage with positive transfers.

Comparative Statics

IHVPE programs introduce an easily accessible and inexpensive way to establish paternity along with widespread education of fathers about their parental rights and obligations at the time of their child's birth. Consequently, I model the introduction of IHVPE programs as an exogenous decrease in c, the fixed cost of paternity establishment.[55]

Let us consider what happens when c decreases. First, the threshold for paternity, q_p, will also decrease as $\frac{\partial q_p}{\partial c} = \frac{1}{\alpha} > 0$. To calculate the effect on the marriage threshold, q_m, I use the implicit function theorem:

For $G(q_m, c) = (1-\alpha)q_m + \theta(q_m) + c = 0$, it holds that:

$$\frac{\partial q_m}{\partial c} = -\frac{\frac{\partial G}{\partial c}}{\frac{\partial G}{\partial q_m}} = -\frac{1}{(1-\alpha) + \frac{\partial \theta}{\partial q_m}} < 0 \tag{11}$$

since $\frac{\partial \theta}{\partial q_m} > 0$ and $\alpha < 1$.

Consequently, as c decreases, the threshold for marriage, q_m, will increase. This suggests that as the costs to establishing paternity are lowered, more parents choose this option. The switchers into paternity include both parents who would have previously maintained no relationship and parents who would have previously married.

Note that the increase in q_m also implies that we should see positive selection both in and out of the samples of married parents - the average q of unmarried fathers ($0 \leq q < q_m$) and the average q of married fathers ($q_m \leq q < \overline{Q}$) will rise as q_m rises.

To study the effects on the expected amount in transfers to the mothers, T, I make the simplifying assumption that q is distributed uniformly over $[0, \overline{Q}]$. Consequently, the total amount in transfers to all mothers is:

$$T = \frac{1}{\overline{Q}}\left[(\frac{1}{2}\alpha q^2 - cq)\Big|_{\frac{c}{\alpha}}^{q_m} + \frac{1}{2}q^2\Big|_{q_m}^{\overline{Q}}\right] \tag{12}$$

$$= \frac{1}{\overline{Q}}\left[\frac{1}{2}q_m^2(\alpha - 1) - cq_m + \frac{c^2}{2\alpha} + \frac{1}{2}\overline{Q}^2\right] \tag{13}$$

We can then solve for the derivative of T with respect to c:

[55] One could also model IHVPE introduction as an exogenous increase in α_p, the partial rights that the father expects to receive in the state of paternity. The predictions of the model would be the same.

$$\frac{\partial T}{\partial c} = \frac{1}{\overline{Q}}\left[\frac{\partial q_m}{\partial c}(\alpha - 1)q_m - c\frac{\partial_m}{\partial c} + \frac{c}{\alpha} - q_m\right] \tag{14}$$

The sign of the right-hand side in the above equation is ambiguous. Note that the first three terms in the brackets are positive, while the last term is negative. Clearly, the relationship between T and c depends on the parameters. The reason for this is that the decrease in c leads to an increase in the proportion of parents establishing paternity relative to both marriage and no relationship. Among fathers who would have remained unmarried in the absence of IHVPE, there is a positive effect on expected transfers. However, the switchers out of marriage transfer less than what they would have transferred in marriage ($\alpha q - c$ instead of q). Thus, the net effect on T depends on the relative magnitudes of these opposing effects. Ultimately, we must turn to data to understand what happens to T when costs of establishing paternity are lowered.

This framework yields four predictions: 1) IHVPE programs should increase paternity establishment rates by both lowering the paternity threshold, q_p, and raising the marriage threshold, q_m; 2) IHVPE programs should reduce marriage through an increase in the marriage threshold, q_m; 3) there should be positive selection both in and out of marriage as q_m rises; and 4) the effect on the total amount of transfers from the father to the mother and child is ambiguous and can be negative if the decrease in transfers by switchers out of marriage outweighs the increase in transfers by fathers who would have never married previously.

Appendix B - CPS-CSS Data

To analyze the effects of IHVPE programs on marriage behavior and measures of father involvement, I use data from the biannual March/April matched CPS supplements over 1994-2008 on child support. These data include households that were surveyed both in the March Annual Demographic File and in the monthly April CPS. In April, in addition to the standard CPS questions, all members of a household aged 15 and above who have a child in the household with a parent that lives outside the household are asked detailed questions regarding child support agreements, payments, and the involvement of the other parent.

I create a "youngest child" data set by considering all individuals who are the youngest within their household and who are aged 5 years or less.[56] I drop all children who have been adopted, who have a parent that died, or who live with either no biological parent or only a father. All children who live with at least one parent have information on the line number of his/her parent in the household (which can be a mother or a father). Thus, I am able to merge children who list their mothers' line numbers directly to their mothers. I merge children who list their fathers' line numbers to their fathers and merge the fathers to their spouses in the household to obtain information on the mothers. I drop all father-child pairs in which the father cannot be merged to a spouse in the household.[57] This results in a data set of mother-child pairs, and I use the mother as the unit of observation in all analyses.

Using the child's age at the time of the survey, I calculate the child's approximate birth year: *birth year = survey year - child age - 1*.[58] Since there is some variation in how minors are treated in IHVPE programs, I limit my analysis to mothers aged 18-45 at the time of childbirth. Finally, I drop all mothers who moved from outside the US in the last year. This leaves me with $37,901$ mothers of youngest children aged 5 years or less in the CPS-CSS data. Out of them, $8,957$ mothers are asked the CS supplement questions.

In this sample, a mother is categorized as married to the biological father if she is married and her child is coded as living with both parents in the household. A mother is categorized as married to someone other than the biological father if she is married, but the child is coded as living with only a mother in the household. Mothers who are married to the biological

[56] I randomly pick one child if there are multiple children that satisfy this condition (i.e., non-singleton children.).

[57] I do this because I want to use the mother as the unit of observation and data limitations prevent me from observing information on the child's mother when the father is listed as the child's parent and the parents are not married. As a result, all mother-child pairs in which the unmarried parents are cohabiting and the child's parent is listed as the father are dropped. This results in only about 1% of the sample being dropped. This may still be problematic if there is an effect of IHVPE programs on the likelihood that unmarried parents cohabit. However, I can check this given that I do observe mother-child pairs in which the unmarried parents are cohabiting and the child's parent is listed as the mother. There is no statistically significant effect of IHVPE on cohabitation for these mothers - the coefficient of interest is -0.000082 with a standard error of 0.0005. Additionally, results from the NHIS data where respondents are explicitly asked about cohabitation suggest that there are no effects of IHVPE on parental cohabitation; instead, the likelihood that a mother cohabits with someone other than the father increases. Thus, I can conclude that this omission is likely negligible.

[58] I choose this specification because since the data are collected in March/April, only individuals born in the first three-four months of the year will have had their birthday by the time of the survey. However, the results using *birth year = survey year - child age* are very similar and available upon request.

father are by construct ineligible to be asked CS supplement questions.

Appendix C - Birth Records Data and Robustness Checks

Given that my data on paternity establishments are at an aggregate state-year level, the micro birth certificate data would seem like an ideal source for examining heterogeneous effects of IHVPE programs across different demographic groups. These data do not contain information on paternity establishment, but an indicator for whether the father's information appears on the birth certificate may seem like a natural proxy. Unfortunately, the law that states that a father's information cannot appear on a child's birth certificate unless paternity is established only went into effect following PRWORA (Mincy *et al.*, 2005). Additionally, conversations with IHVPE program officials suggest that this law was not fully enforced until IHVPE programs were established. As a result, IHVPE programs had potentially offsetting effects on the likelihood of a father's information appearing on the birth certificate - on the one hand, there is a negative effect as it became more difficult to record a father's information on the certificate because paternity now needed to be established, while on the other hand, there is a positive effect as IHVPE programs encouraged paternity establishment and made it significantly less costly.

However, research about the IHVPE program in Arizona suggests that there is potential for overcoming this issue in this state. In particular, prior to IHVPE implementation in late 1996 (the program was in effect in all Arizona hospitals by January 1997), unmarried fathers were required to fill out a "paternity presumption" form in order to be added to the child's birth certificate. Thus, unlike in many other states, mothers could not simply fill in the father's information on their own. "Paternity presumption" was not a legal form of paternity establishment, and there were no coordinated efforts by hospital staff to encourage fathers to sign the form and to consequently appear on their children's birth certificates. Once IHVPE programs were implemented, fathers had to sign a voluntary acknowledgement of paternity form (which legally established their paternity) in order to appear on the child's birth certificate. Additionally, as a result of these programs, all unmarried parents were approached and fathers were in effect encouraged to sign the form and appear on the child's birth certificate. Consequently, IHVPE programs did not substantially affect the difficulty

of the father appearing on his child's birth certificate - he was required to sign a form both before and after the program. However, they did affect the likelihood of paternity establishment since all unmarried fathers were now presented with the option to sign the form.[59] All of these institutional factors allow me to estimate the effects of IHVPE program implementation in Arizona using a regression discontinuity (RD) framework.

Appendix Figure 1 presents the graphical evidence of an RD in Arizona. Notably, there is about a 10 percentage point jump in the likelihood of the father's information appearing on the birth certificate among children of unmarried mothers at the time of IHVPE implementation.[60] Appendix Table 10 presents the results from estimating different parametric RD equations, in which the running variable is the child's year-month of birth and the dependent variable of interest is an indicator for whether the father's non-imputed education, race, or age is recorded on his child's birth certificate. Following standard RD methodology (Imbens and Lemieux, 2008), I include different order polynomials in the running variable, which are interacted with an indicator for being born in or after January 1997 (when all of Arizona's hospitals had an IHVPE program in place). The results are generally similar across the specifications and suggest that IHVPE led to about a 22 percent increase in the likelihood of the father being listed on his child's birth certificate in Arizona. I have also estimated non-parametric RD regressions (Lee and Lemieux, 2010) using different size bandwidths ranging from 3 to 25 months around the cutoff. The results from non-parametric RD specifications are similar and available upon request. Finally, standard checks for discontinuities in other variables suggest that there are no discontinuities in observable characteristics of unmarried mothers in Arizona at the time of IHVPE implementation (available upon request).

As another check for consistency of results, I consider the nine states in my sample in which minor parents are largely exempt from IHVPE program participation. In these states, minors were subject to the same negative effect of IHVPE as all fathers were now required to establish paternity before being added to the child's birth certificate. However, given that minors were either forbidden from participating, required parental consent, or had very

[59]Information about Arizona's IHVPE program comes from personal communications with Marjorie Cook (Cook, 2010) and Patricia Martinez (Martinez, 2011). I am grateful to both of them for sharing this information with me.

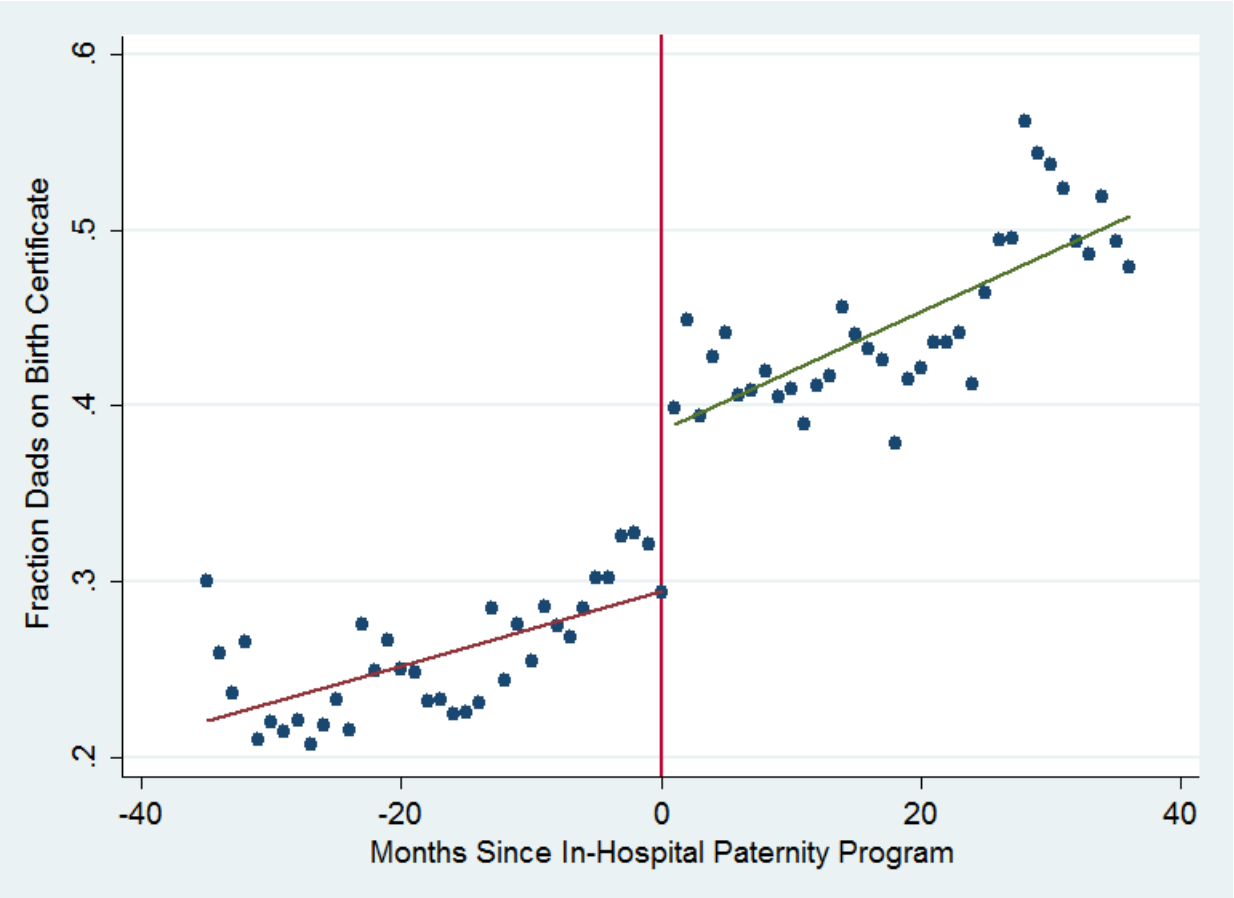
[60]The indicator for the father's information appearing on the birth certificate is equal to 0 if the father's non-imputed age, race, and education are all missing, and 1 otherwise.

lenient rules for paternity rescission, the effect on paternity establishment for minors should be effectively close to zero. Thus, comparing adult mothers to minor mothers in a difference-in-difference-in-difference (DDD) framework allows one to net out the effect of IHVPE on paternity establishment rates.[61] Using this strategy, I estimate the DDD effects of IHVPE for adult mothers relative to minor mothers on the likelihood of the father's information appearing on the child's birth certificate. Importantly, these regressions allow me to include a full set of state-year interactions, and effectively control for any observed and unobserved state time-varying factors. The results from this analysis suggest that IHVPE programs lead to a 6 percent increase in the likelihood of the father's information appearing on his child's birth certificate in the nine sample states, and are available upon request.

[61] Given that I do not observe the father's age unless his information is on the birth certificate, I can only compare minor mothers (<18 years) to adult mothers. The law regarding minors applies to parents as long as at least one parent is a minor. To the extent that some adult mothers have minor partners, this analysis might slightly underestimate the true effects of IHVPE.

Appendix Figures and Tables

Appendix Figure 1: Fraction Fathers with Information on Birth Certificates in Arizona: Unmarried Mothers, 1994-1999



Notes: This figure plots the proportion of births by unmarried mothers which have the father's information included on the birth certificate by month since IHVPE program initiation in Arizona in January 1997.

Appendix Table 1: Timing of IHVPE Program Initiation

State	Year (and Month) of Initiation	Source	Minors Can Participate?
Alabama	1994	Alabama Code Section 26-17-22, part c)	
Alaska	1997	Alaska Statutes 18.50.165	
Arizona	July, 1996	Marjorie A. Cook, Arizona Department of Economic Security Division of Child Support Enforcement. Personal communication: 12/27/2010	
Arkansas	1993	Arkansas Code 9-10-120	
California	January, 1995	California Family Code 7571	Can rescind easily
Colorado	June, 1996	C.R.S. 25-2-112, Sec. 3.5	
Connecticut	July, 1994	Conn. Gen. Stat. Sec. 17b-27	Yes
Delaware	January, 1995	http://www.paternitynet.com/art04.html	Can rescind easily
District of Columbia	2/27/1998	D.C. Code Sec. 16-909.03	
Florida	August, 1997	Fla. Stat. Sec. 742.10	Yes
Georgia	1999	OCGA 19-7-27	
Hawaii	1996	HRS 584-3.5	
Idaho	May, 1998	http://www.healthandwelfare.idaho.gov/portals/_rainbow/manuals/cs/chapter_3/3.8_voluntary.htm	
Illinois	1997	Garfinkel & Nepomnyaschy (2007)	Can rescind easily
Indiana	1997	Angelica Carter, Attorney with the Indiana State Child Support Bureau. Personal communication: 4/13/2011	
Kansas	1997	KSA 38-1137	Can rescind easily
Kentucky	7/15/1996	KRS 406.025	No
Louisiana	July, 1998	La.R.S. 40:46.1	
Maine	1996	22 M.R.S. Sec. 2761-B	
Maryland	1997	Garfinkel & Nepomnyaschy (2007)	
Massachusetts	1994	Garfinkel & Nepomnyaschy (2007)	Yes
Michigan	1/21/1993	Public Health Code - Act 368 of 1978	
Minnesota	6/15/1995	Molly Mulcahy Crawford; Paternity Program Administrator, Minnesota Department of Human Services, Child Support Enforcement Division. Personal communication: 4/20/2011	Yes
Mississippi	1995	www.acf.hhs.gov/programs/cse/pubs/1998/best_practices/bppat98.htm	
Missouri	July, 1994	R.S. Mo 193-087	
Nebraska	1995	R.R.S. 43-1408.01	
Nevada	1995	Nev. Rev. Stat. Ann. 449.246	
New Jersey	July, 1996	Paternity Opportunity Program: http://pop.njchildsupport.org/	
New York	March, 1995	www.lawny.org/index.php/advocate-page-attorney-resources-119/38-public-advocate-information/171-paternity-for-advocates	
North Carolina	1997	GS 110-132	
North Dakota	1996	N.D. Cent. Code 14-19-06	Yes
Ohio	1999	ORC Ann. 3111.71	Yes
Oregon	November, 1995	Or. Admin. R. 333-011-0048	
Pennsylvania	January, 1998	23 PA Cons. Stat. Sec. 5103	
Rhode Island	January, 1995	R.I. Gen. Laws § 40-6-21.1	
South Carolina	1994	S.C. Code Ann. § 44-7-77	
South Dakota	1994	S.D. Codified Laws § 25-8-50	

Notes: Searches of state statutes were conducted using LexisNexis Academic. Information on minors comes from Roberts (2004).

Appendix Table 2: Summary Statistics on State Characteristics: 1992-2005

	ALL STATES			43 SAMPLE STATES			43 SAMPLE STATES	
	N	Mean	SD	N	Mean	SD	IHVPE Program Does Not Exist	IHVPE Program Exists
Number Paternities Established Relative to Number Unmarried Births	714	**0.891**	0.437	602	**0.898**	0.433	**0.490**	**1.067**
Proportion Births by Unmarried Mothers	714	**0.333**	0.051	602	**0.334**	0.050	**0.320**	**0.340**
Proportion Male Births	714	**0.512**	0.002	602	**0.512**	0.002	**0.512**	**0.512**
Proportion Mothers Aged <20	714	**0.216**	0.065	602	**0.217**	0.066	**0.228**	**0.213**
Proportion Mothers Aged 20-24	714	**0.326**	0.041	602	**0.325**	0.040	**0.355**	**0.312**
Proportion Mothers Aged 25-34	714	**0.220**	0.029	602	**0.218**	0.027	**0.212**	**0.221**
Proportion Mothers Aged 35-44	714	**0.239**	0.061	602	**0.240**	0.061	**0.205**	**0.254**
Proportion Mothers Aged 45+	714	**0.075**	0.021	602	**0.075**	0.021	**0.087**	**0.070**
Proportion Mothers with Education: <HS	714	**0.292**	0.051	602	**0.290**	0.050	**0.299**	**0.287**
Proportion Mothers with Education: HS	714	**0.504**	0.040	602	**0.505**	0.039	**0.505**	**0.505**
Proportion Mothers with Education: Some College	714	**0.127**	0.035	602	**0.128**	0.035	**0.108**	**0.137**
Proportion Mothers with Education: College+	714	**0.001**	0.001	602	**0.001**	0.001	**0.001**	**0.001**
Proportion Non-Hispanic White Mothers	714	**0.609**	0.174	602	**0.599**	0.170	**0.626**	**0.587**
Proportion Black Mothers	714	**0.156**	0.101	602	**0.164**	0.099	**0.174**	**0.160**
Proportion Hispanic Mothers	714	**0.186**	0.166	602	**0.190**	0.167	**0.163**	**0.202**
Proportion Mothers who Smoked During Pregnancy	711	**0.128**	0.049	599	**0.125**	0.048	**0.145**	**0.117**
Proportion Mothers who Drank Alcohol During Pregnancy	714	**0.041**	0.160	602	**0.043**	0.165	**0.021**	**0.052**
Proportion Mothers who Initiated Prenatal Care in 1st Trimester	714	**0.819**	0.045	602	**0.820**	0.044	**0.802**	**0.828**
Unemployment Rate	714	**5.454**	1.379	602	**5.464**	1.371	**6.301**	**5.116**
Poverty Rate	714	**13.009**	3.242	602	**13.012**	3.178	**14.329**	**12.465**
State Minimum Wage	714	**4.869**	0.864	602	**4.854**	0.855	**4.120**	**5.159**
Welfare Benefit for 4-Person Family	714	**480.196**	180.220	602	**478.103**	183.740	**442.054**	**493.082**
Governor is Democratic	700	**0.415**	0.493	588	**0.399**	0.490	**0.484**	**0.364**
Fraction State House that is Democratic	686	**0.544**	0.125	574	**0.546**	0.124	**0.578**	**0.533**

Notes: Units of observation are state-year cells. All statistics are weighted by state-year populations. The sample states are: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin.

Appendix Table 3: Robustness Check - IHVPE Programs and Pregnancy Behavior and Birth Outcomes in 43 States: 1992-2005

	1st Trimester Prenatal Care Initiation	Child is Male	Mother's Weight Gain during Pregnancy (lbs)	Birth Weight (g)	Low Birth Weight (<2500g)	Very Low Birth Weight (<1500g)	Gestation (weeks)	Any Complications During Pregnancy or Delivery	Any Abnormal Conditions of Newborn
IHVPE Program Exists in State and Year of Birth	-0.0022	0.0005	-0.1327	-0.7468	0.0002	0.0000	-0.0122+	0.0069	0.0013
	(0.0030)	(0.0003)	(0.0839)	(0.9228)	(0.0003)	(0.0001)	(0.0066)	(0.0071)	(0.0040)
N	546	546	546	546	546	546	546	546	546

Notes: Units of observation are state-year cells. Each coefficient is from a separate regression. The states included in the analysis are: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin over 1992-2005. All regressions are weighted by the number births in each cell. All regressions include controls for state time-varying characteristics, controls for child support laws, controls for state EITC and AFDC/TANF implementation, state and year fixed effects, and state-specific time trends. Robust standard errors are clustered on the state level.
Significance levels: + $p<0.10$ ** $p<0.05$ *** $p<0.001$

Appendix Table 4: IHVPE Programs and Child Support Agreements: CPS-CSS 1994-2008, CS-Eligible Sample

	Any CS Agreement	Any Legal CS Agreement	Any Informal CS Agreement	No Legal Agreement b/c Child Spends Some of the Time with Father	No Legal Agreement b/c "Father Provides What He Can"	No Legal Agreement b/c Mother "Didn't Feel the Need to Get Legal"	No Legal Agreement b/c Father "Can't Afford Child Support"	No Legal Agreement b/c Mother Didn't Want Contact with Father
IHVPE Program Exists in State and Year of Child's Birth	-0.0183	-0.0469	0.0286**	0.0702**	0.0445+	0.0565**	-0.0517	0.0279
	(0.0329)	(0.0291)	(0.0117)	(0.0211)	(0.0224)	(0.0170)	(0.0343)	(0.0190)
N	8,361	8,361	8,361	3,740	3,979	8,077	3,740	8,077

Notes: Each coefficient is from a separate regression. Please refer to Table 9 for details about the sample restrictions and controls. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the CPS-CSS supplement weights. Robust standard errors are clustered on the state level. Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Appendix Table 5: Robustness - Correlation Between IHVPE Programs and CHIP spending: CPS-CSS 1998-2008

	Log State Spending on CHIP in Year of Observation	Log Total (State + Federal) Spending on CHIP in Year of Observation	Log State Spending on CHIP in Year Before Observation	Log Total (State + Federal) Spending on CHIP in Year Before Observation
IHVPE Program Exists in State and Year of Child's Birth	-0.1003	-0.0327	-0.0283	-0.0015
	(0.3013)	(0.3542)	(0.1878)	(0.1975)
N	25,750	26,020	21,514	21,650

Notes: Each coefficient is from a separate regression. Please refer to Table 7 for details about sample restrictions and controls. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level.
Significance levels: + $p<0.10$ ** $p<0.05$ *** $p<0.001$

Appendix Table 6: Robustness - IHVPE and Health Insurance Coverage of Adult Males, CPS 1989-2002

	Dependent Variable: Respondent Has Health Insurance				
	(1)	(2)	(3)	(4)	(5)
IHVPE Program Exists in State of Residence and Year of Interview	-0.0033	-0.0012	-0.0011	0.0004	-0.0034
	(0.0031)	(0.0023)	(0.0026)	(0.0029)	(0.0028)
Demographic Controls	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes
N	567,318	474,176	460,473	460,473	460,473
R-squared	0.1363	0.1381	0.1386	0.1386	0.1390

Notes: Each column is a separate regression. The sample of analysis includes all men ages 18-64 in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, DC, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin in 1989-2002. The demographic controls include controls for age (<20, 20-24, 25-34, 35-44, 45-54, 55-64), education (less than HS, HS, some college, college+), race (white, black, Hispanic, other), an indicator for being married, and an indicator for being currently employed. The time-varying state characteristics include the unemployment rate, the poverty rate, the state minimum wage, the percent of the population that receives AFDC/TANF benefits, the AFDC/TANF benefit for a 4-person family, the percent of the population on Medicaid, an indicator for a Democratic governor, and the fraction of the state House that is Democratic. The controls for child support laws are indicators for whether the following child support enforcement laws are in place in the state and year of observation: universal wage withholding, genetic testing for paternity, new hires directory, and license revokation for non-payment. The state EITC implementation controls are indicators for whether a state EITC is implemented by the state and year of observation. The AFDC/TANF implementation controls are indicators for whether the AFDC waiver or the TANF program is implemented by the state and year of observation. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Appendix Table 7: IHVPE Programs and Formal and Informal Father Involvement: CPS-CSS 1994-2008 - Accounting for Selection Out of Marriage

Dependent Variable	N	Coefficient	SE
Father Made Any CS Payments in Last Year	34,510	-0.0145+	(0.0078)
Father Made All CS Payments in Last Year	34,510	-0.0125	(0.0082)
Father Paid On Time All or Most of the Time in Last Year	33,328	-0.0143	(0.0096)
Father Has Court-Ordered Visitation Rights	35,302	-0.0073	(0.0083)
Father Has Joint Legal Custody	35,302	-0.0223**	(0.0081)
Number Days Father Spent with Child	34,758	-6.4014**	(2.7634)
Father Provided Gifts for Child	35,302	-0.0053	(0.0092)
Father Provided Clothes for Child	35,302	-0.0111	(0.0073)
Father Provided Food for Child	35,302	-0.0083	(0.0085)
Father Covered Childcare Expenses for Child	35,302	-0.0151+	(0.0082)
Father Paid for Medical Expenses for Child	35,302	-0.0081	(0.0099)

Notes: Each coefficient is from a separate regression. Marriage is defined as a legal agreement between the mother and father. Married fathers are also assumed to have "visitation rights" and have "joint legal custody", and are assumed to have spent 365 days with the child in the past year. They are assumed to have provided gifts, food, clothes, childcare, and medical help for the child. Please refer to Table 5 for details about sample restrictions and controls. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level.
Significance levels: + $p<0.10$ ** $p<0.05$ *** $p<0.001$

Appendix Table 8: Effects of IHVPE Programs on Imputed Private Child Health Insurance Provision: CPS-CSS 1994-2008

	Dependent Variable: Child Has Private Health Insurance (=1 if married parents)				
	(1)	(2)	(3)	(4)	(5)
IHVPE Program Exists in State and Year of Child's Birth	-0.0278***	-0.0230***	-0.0226***	-0.0230***	-0.0235***
	(0.0059)	(0.0054)	(0.0055)	(0.0055)	(0.0061)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
State FEs	Yes	Yes	Yes	Yes	Yes
Quadratic Polynomial in Survey Year	Yes	Yes	Yes	Yes	Yes
State Time-Varying Characteristics Controls	No	Yes	Yes	Yes	Yes
Child Support Laws Controls	No	No	Yes	Yes	Yes
State EITC Implementation	No	No	No	Yes	Yes
AFDC/TANF Implementation	No	No	No	Yes	Yes
State-Specific Time Trends	No	No	No	No	Yes
N	38,449	37,457	36,243	36,243	36,243
R-squared	0.1959	0.1970	0.1970	0.1970	0.1978

Notes: Each column is a separate regression. Children of married parents are coded as having private health insurance. Please refer to Table 5 for details about sample restrictions and controls. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level. Significance levels: + p<0.10 ** p<0.05 *** p<0.001

Appendix Table 9: Effects of IHVPE Programs on Mother's Labor Supply: March CPS 1989-2010

	Any Hours Worked	Mother is Employed	Mother is in Labor Force	Any Wage Income	Log Wage	Usual Hours Worked
Mean of Dependent Variable	0.678	0.582	0.628	0.643	9.427	23.600
IHVPE Program Exists in State and Year of Child's Birth	0.0188**	0.0152+	0.0127+	0.0210**	0.0189	0.5177+
	(0.0073)	(0.0079)	(0.0070)	(0.0074)	(0.0149)	(0.2983)
N	184,562	184,562	184,562	184,562	118,581	184,562

Notes: Each coefficient is from a separate regression. Please refer to Table 12 for details about sample restrictions and controls. All regressions include mother and child controls, controls for state time-varying characteristics, controls for child support laws, and controls for state EITC and AFDC/TANF implementation. All regressions include state and child birth year fixed effects, a quadratic polynomial in the survey year, and state-specific time trends. All regressions are weighted by the provided CPS person weights. Robust standard errors are clustered on the state level.
Significance levels: + $p<0.10$ ** $p<0.05$ *** $p<0.001$

Appendix Table 10: Parametric Regression Discontinuity Effects of IHVPE Program on Fathers on Birth Certificates in Arizona: Unmarried Mothers, 1994-1999

	Dependent Variable: Father's Info is on Birth Certificate				
	1st Order Polynomial	2nd Order Polynomial	3rd Order Polynomial	4th Order Polynomial	5th Order Polynomial
	Mean of Dependent Variable = 0.357				
Post-IHVPE Initiation	0.0747***	0.0755***	0.0953***	0.0321	0.0820**
	(0.0075)	(0.0111)	(0.0166)	(0.0203)	(0.0265)
Mother and Child Controls	Yes	Yes	Yes	Yes	Yes
Year and Month FEs	Yes	Yes	Yes	Yes	Yes
N	69,279	69,279	69,279	69,279	69,279
R-squared	0.0659	0.0668	0.0668	0.0672	0.0675

Notes: Each column is a separate regression. The running variable is the year-month of birth. The sample of analysis includes the universe of 1st parity births that occurred in hospitals by adult unmarried mothers in Arizona in 1994-1999. The mother and child controls are controls for the mother's age (<20, 20-24, 25-34, 35-44, 45+), mother's education (less than HS, HS, some college, college+), mother's race (white, black, Hispanic), and child sex. Standard errors are robust to heteroskedasticity.
Significance levels: + p<0.10 ** p<0.05 *** p<0.001