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Research shows that stronger child support enforcement increases the amount of formal support received by children from their nonresident fathers. Yet, little is known about: 1) the informal cash and non-cash contributions that nonresident fathers make—especially to nonmarital children, 2) the effect of child support enforcement on these types of contributions, and 3) most importantly, the effect of child support enforcement on total (formal plus informal) child support contributions. Using data on unmarried parents from the Fragile Families and Child Wellbeing Study, we find that informal payments decline more rapidly than formal payments increase for the first 36 months, after which time this pattern flips. The flip suggests that public enforcement on average has positive effects on payments. States with stronger than average enforcement have larger than average increases in formal support and smaller decreases in informal support, resulting in a statistically insignificant increase in cash support. That the results differ substantially by when parents stopped cohabiting - with negative effects in the short-run and positive effects in the long-run - suggests that stronger child support enforcement may be efficacious in the long run.

INTRODUCTION

Because of the increase in the rates of divorce and nonmarital childbearing in the past 30 years, over half of children born during this period will spend some time in a single parent family (Bumpass and Sweet 1989). Child support paid by the nonresident parent (usually the father) is an important source of income for mothers and children and is positively associated with a number of child well-being indicators, such as educational attainment, schooling, and cognitive outcomes (Argys et al. 1998; Baydar and Brooks-Gunn 1994; Graham, Beller and Hernandez 1994; Knox and Bane 1994).[1] Research from the last two decades has shown that stronger child support enforcement increases the amount of formal support received by children from their nonresident fathers. Some qualitative research suggests that informal child support payments are quite common among unwed and low-income nonresident fathers and that strong child support enforcement leads to substitution of formal for informal support. Yet, little is known from quantitative research about: 1) the magnitude of informal cash and non-cash contributions that nonresident fathers make—especially to nonmarital children, 2) the magnitude of the effect of child support enforcement on these types of contributions, and 3) most importantly, the effect of child support enforcement on total (formal plus informal) child support contributions.

Today, over 1/3 of all births and nearly 70% of black births are to unmarried mothers (Hamilton et al. 2005), who are more likely to be poor and are less likely to receive formal child support than are previously married mothers (U.S. Census Bureau 2004, 2006). Informal and non-cash contributions from fathers may also be an important source of support for these families. Using data from the Fragile Families and Child Wellbeing Study, we describe the package of support (formal cash, informal cash, and non-cash) that nonresident fathers provide

[1] Because 82% of single-parent families are made up of a custodial mother and nonresident father, for the remainder of the paper we will refer to them in this way (U.S. Census Bureau 2004).

for their children, and estimate the effect of stronger child support enforcement on each type of support, and most importantly, on the total amount of cash support received. We find that over time, informal payments decline, formal payments increase, and total payments decline at first, but then increase. This time pattern provides evidence of the positive effects of child support enforcement. On the other hand, we also find that total child support payments are no higher in states with strong child support enforcement than in those with weak enforcement. Taken by itself, the implication of this first order result is pretty startling: stronger child support enforcement, at least for unmarried parents, accomplishes nothing. However, the effects of strong enforcement differ substantially by the length of time since parents have not been in a cohabiting relationship — with negative effects in the short-run, but positive effects in the longer-term. These more nuanced results suggest that stronger state child support enforcement may be efficacious in the long run.

PREVIOUS RESEARCH: THEORY AND EMPIRICAL FINDINGS

Fathers' child support payments depend not only on their income or ability to pay, but also on their willingness to pay. Weiss and Willis (1985) were the first to model willingness to pay. They treat children as collective goods and argue that because a mother may spend part of a child support transfer on herself rather than the child and the father cannot monitor how money is spent in the mother's household, he will voluntarily contribute less than is optimal. Similarly, Graham and Beller (2002), modeling child support payments as a classic 'prisoner's dilemma' game, predict non-optimal outcomes. Although a cooperative equilibrium produces the highest utility for both parents and the highest level of spending for the child, a non-cooperative (low-spending) equilibrium is actually achieved because of parents' mistrust. Building on both these

perspectives, Argys and Peters (2003) present a model where parents are able to achieve a cooperative equilibrium if the father can observe the children's well-being through regular contact with them. [2] Though these theories provide a rationale for government intervention to require child support payments that exceed what some fathers are willing to pay voluntarily, none systematically addresses the effects of child support enforcement on informal and total child support payments. But, this is easily done.

Formal child support involves a legal requirement established by a court or child support enforcement agency for the non-resident parent to pay a specified amount of child support. Formal child support obligations are now, more often than not, withheld from the earnings of the obligor and sent to a state agency that then forwards the payment to the custodial parent. If the parent is receiving welfare, only a small portion or none of the payment is forwarded to the mother and most or all of the payment is used to offset welfare benefits. Informal child support is a direct transfer from the nonresident father to the mother that involves no legal obligation.

Parent preferences for informal versus formal child support payments differ. Though some fathers might prefer the distancing from the mother that comes from the formality of a formal child support payment or the convenience of income withholding to transfer their income, in general, nonresident fathers will prefer informal payments because informal payments strengthen their bargaining position and their ability to monitor the mother's behaviors. For example, if the mother makes access to the child difficult, the father can withhold support payments. Mothers, as well as fathers, might prefer informal child support, to avoid the costs of government involvement in their personal affairs. Mothers might also prefer informal payments

[2] Argys and Peters (2003) estimate the effect of strict enforcement on voluntary contributions from noncustodial parents. The contributions are voluntary in that the amounts owed are based on cooperative divorce agreements as opposed to court ordered obligation amounts. Still, the obligations are approved by a court and are legally binding. Thus, voluntary contributions by divorced fathers are not equivalent to informal child support payments by unmarried fathers.

in order to encourage the fathers to be involved in child-rearing so long as the father's willingness to pay, compared to what the legal obligation would be, is relatively high. Finally, though mothers receiving welfare and the fathers of their children may prefer informal to formal payments, from which the child and mother gain little to nothing, in most welfare cases the parents are not free to choose, because as a condition of welfare receipt the mother turns over her right to formal child support to the state.

Willingness to pay child support (holding constant the ability to pay) obviously varies among fathers and most important, based upon both theory and empirical research, declines over time. Fathers' involvement with children, both financial and emotional, declines over time (Beller and Graham 1993; Seltzer, Schaeffer and Charng 1989). Once the cohabiting or romantic relationship ends, most fathers and mothers move on to other relationships and many bear new children. The new relationships, and especially the new children, decrease the father's willingness to pay child support because he will be more interested in providing for his new children (Manning and Smock 2000), and because he will be less interested in providing support to the mother's household in the presence of her new partner or new children which are not his.

If fathers' willingness to pay child support declines over time, the effects of child support enforcement on total child support payments is likely to increase over time. When fathers' willingness to pay is high and they are contributing more than they would be formally required to pay, the establishment of a formal child support obligation will shift the required portion of the payment from informal to formal support, reducing, but possibly not eliminating, informal support. If the father's willingness to pay does not change in response to the establishment of a formal obligation, there will be no change in the total support received. If the father treats the formal obligation amount as a maximum and ceases paying informal support, total support will

decline. When willingness to pay and informal payments are lower than the required obligation, enforcement will shift all informal support into formal support, and assuming enforcement is effective, increase formal support to the required amount, resulting in an increase in total support. Because willingness to pay declines over time, the gap between the formal child support obligation and willingness to pay increases and the effects of enforcement on total payments becomes increasingly larger.

In addition to the special case discussed above where fathers' willingness to pay exceeds the formal obligation amount, there are two reasons why the establishment of a formal child support obligation may be accompanied by a short term decrease in total child support. First, England and Folbre (2002) show that for fathers not yet subject to a formal child support obligation, the mother can use the formal system as a bargaining tool with which to induce the father to contribute more informally than he would be voluntarily willing to pay in order to avoid an even higher formal obligation. Once the mother (or the welfare department) initiates the process to obtain a formal award, however, he no longer has an incentive to voluntarily pay more and payment will drop to his original willingness to pay. Second, in many cases, the shift from informal to formal support will occur when parents' amicable relationships end, resulting in a cessation of informal support before formal support has begun. The lag between application for formal support and receipt of it can be quite lengthy, entailing establishing paternity-if not previously established, obtaining an order, and securing a payment on the order.

In short, theory provides no clear prediction about the effects of strong child support enforcement on total child support payments, but does predict that the longer the time period since parents have stopped cohabiting, the greater will be the shift from informal to formal

support and the stronger will be the positive effect of enforcement on total child support received.

The literature describes several other factors that can affect fathers' willingness to pay child support. First, fathers who have lived with the mother and child are likely to have a stronger attachment to the child and therefore a greater willingness to pay. Second, based on Weiss and Willis (1985), fathers who pay support may visit children more to monitor how their contributions are spent. Increased visitation may increase willingness to pay support, leading to more total support from fathers. Evidence suggests that support and visitation are positively associated, though the causal path is not clear (Huang 2009: McLanahan et al. 1994; Nepomnyaschy 2007; Peters et al. 2004; Seltzer, McLanahan and Hanson 1998; Seltzer et al. 1989; Sorensen and Pomper 2003; Veum 1993). Third, fathers will be less willing to pay child support if their children are receiving public assistance. In thirty states, child support paid on behalf of mothers on welfare is kept by the state in order to recoup public costs; in the rest of the states some portion (the first $50 or more) of the payment is passed through to the mother (Roberts and Vinson 2004). Therefore, in general, fathers have less incentive to pay child support through the formal system if mothers are on welfare because it is unlikely that their children will benefit from these payments. Finally, fathers with ties to the regular labor market have much less discretion in whether or how much child support to pay, because their support obligation is automatically withheld from wages (Bartfeld and Meyer 2003). These fathers may only reveal their willingness or unwillingness to pay support by reducing or terminating their participation in regular employment.

Several studies have described the prevalence of informal and in-kind support from fathers (Garasky et al. 2007; Greene and Moore 2000; Meyer and Cancian 2001; Miller and

Knox 2001; Nord and Zill 1996; Roberts 2000; Rangarajan and Gleason 1998; Seltzer and Schaeffer 2001; Teachman 1991), but only a few have examined the relationship between formal and informal support. Data from the Parents' Fair Share demonstration, focusing on low-income fathers, provide evidence of a substitution effect between formal and informal support, with fathers who are forced to pay formally decreasing their informal contributions (Miller and Knox 2001). Other evidence suggests that fathers who are paying formally or who have a child support order contribute more informal or in-kind support than those who do not (Meyer and Cancian 2001; Roberts 2000; Seltzer and Schaeffer 2001; Teachman 1991). Two of these studies (Meyer & Cancian and Seltzer & Schaeffer) were based on samples of mothers on public assistance and the fathers associated with them, who are presumably also low-income. Finally, using nationally representative data, Garasky et al. (2007) find no statistically significant relationship between receipt of child support and in-kind support from fathers; and this result held for children from lower and higher income families.

Findings from a number of qualitative studies of low-income fathers reveal that these men have many barriers to contributing child support through the formal system, but contribute informally to their children whenever they can (Edin 1995; Edin and Lein 1997; Furstenberg Jr., Sherwood and Sullivan 1992; Magnuson 2006; Pate 2002; 2006; Waller and Plotnick 2001). These studies suggest that low-income fathers (and mothers) prefer informal contributions to those made through the formal system because the former go directly to their children. This appears to be true even when fathers are aware of the penalties associated with non-payment of their formal obligations (Pate 2006).

Though there is ample empirical evidence that strong child support enforcement is associated with increases in formal child support payments (Beller and Graham 1993; Freeman

and Waldfogel 2001; Garfinkel and Klawitter 1990; Garfinkel and Robins 1994; Meyer et al. 1996; Miller and Garfinkel 1999; Sorensen and Hill 2004), none of these studies examined the effect of enforcement on informal or non-cash payments. Furthermore, because much of the above research was done on samples dominated by previously-married parents or those whose cohabiting or romantic relationships ended some time ago, even less is known about the effects of enforcement for unmarried parents with young children.

We contribute to prior literature in this area in several ways. First we focus on parents with nonmarital births, now more than 1/3 of all births in the U.S., and a large and growing proportion of the child support enforcement caseload. Second, this paper is the first to use population-based data to examine fathers' informal contributions to their children (both cash and in-kind) and the effects of child support enforcement on total cash support (formal plus informal) that unmarried mothers receive from the fathers of their children. Finally, using longitudinal data, we are able to examine the effects of time on the relationship between enforcement and child support outcomes.

DATA

This research uses longitudinal data from the Fragile Families and Child Wellbeing Study which examines the conditions and capabilities of new unwed mothers and fathers and the well-being of their children. The baseline data, collected between 1998 and 2000, consist of 4898 births (3711 unwed and 1187 marital) in 75 hospitals in 20 U.S. cities[3] (15 states) with populations of 200,000 or more. The data are representative of unwed births in each of the cities sampled.

[3] The following 20 cities in 15 states are included in the survey: Oakland, San Jose (CA); Austin, Corpus Christi, San Antonio (TX): Richmond, Norfolk (VA); Philadelphia, Pittsburgh (PA); Newark (NJ); New York (NY); Nashville (TN); Toledo (OH); Milwaukee (WI); Chicago (IL); Indianapolis (IN); Jacksonville (FL); Baltimore (MD); and Detroit (MI).

Mothers and fathers were interviewed in the hospital shortly after their child's birth, with follow-up interviews when the child was one, three and five years old. For a detailed discussion of the Fragile Families study design, see Reichman et al (2001). In this paper, we use the first four waves of data, which are hereafter referred to as the baseline, one-year, three-year, and five-year follow-up surveys, respectively.

Our study is based on 4,599 repeated observations on mothers (with nonmarital births) who were not cohabiting with the father at each particular wave, and who had at least one follow-up interview (all mothers were interviewed at baseline). The actual sample sizes for each follow-up wave are 1,412, 1,535, and 1,652 at the 1, 3, and 5-year surveys, respectively. The increasing sample sizes reflect the trend that more and more unmarried couples stop cohabiting as time from the child's birth increases. Although some cohabiting fathers have child support orders (if the mother received public assistance or if they were separated previously),[4] we choose to exclude this group from our main analyses for two reasons: to be consistent with most prior studies, which focus on custodial mothers with nonresident fathers; and, because of the incomparable measures of informal cash and in-kind contributions for cohabiting and noncohabiting fathers.[5]

We rely solely on mothers' reports about fathers' characteristics and contributions. This choice is a response to a trade-off between two types of biases, non-response bias due to missing fathers and measurement error due to mothers' potential underreporting of fathers' contributions. Although the Fragile Families study identified and interviewed a very large proportion of unwed

[4] Only 18% of fathers who were cohabiting with the mother at the 5-year survey have a child support order and 14% made a formal payment in the past year.

[5] The cash and in-kind contributions of nonresident fathers are explicit and relatively well measured in the data because they involve cross-household transfers. Some contributions of resident fathers may also be explicit, such as buying clothes or toys or actually transferring cash to the mother and child. But the biggest contributions of resident fathers are implicit and arise from sharing of household expenses, including rent, utilities, and food. These implicit transfers are more difficult to measure in general and are not well measured in the Fragile Families data.

fathers as compared with other national surveys, still about 25% of these fathers were not interviewed at the baseline survey. Most of them were non-resident fathers (Teitler, Reichman and Sprachman 2003). Therefore, focusing only on fathers who were interviewed would introduce substantial non-response bias. On the other hand, mothers may underestimate the level of child support received from the father. Mothers on public assistance may underestimate the amount of formal support from fathers, and all mothers may underreport informal and non-cash support from fathers. Prior research comparing administrative data of formal child support paid with mothers' and fathers' reports found that, as expected, mothers under-report and fathers over-report child support payments; however, mothers' reports are less biased (Schaeffer, Seltzer and Klawitter 1991). Because of the high response rates for mothers and the lower likelihood of systematic differences between interviewed and non-interviewed mothers, we choose to focus on mothers' reports in these analyses.[6]

Outcome Measures

We measure several types of contributions that fathers make to their children: formal child support, which is received through an established child support order; informal cash support, which includes any other financial contributions made outside the formal system; total cash support, which is the sum of the two above; and non-cash contributions, referred to as in-kind support. Mothers are asked how much formal and informal cash support the father has paid in the

[6] We compared mothers' and fathers' reports of child support received/paid in the 1-year data (the only survey for which fathers' report of child support paid is available) and found a very close relationship between parents' reports of support received. For example, 76% of mothers and 72% of fathers report informal support; 12% of mothers and 16% of fathers report formal support; and 74% of mothers and 87% of fathers report in-kind support. When we compare the results of our main models of the effect of CSE on contributions, the results from matched samples of mothers' and fathers' reports from the 1-year survey are strikingly similar. We also examined whether mothers' and fathers' reports of formal support differ by whether the mother received welfare, and find no evidence that mothers on welfare are misreporting the amount of formal support received.

past twelve months.[7] Because the amount of formal support mothers have received in the past year depends on when a child support order was established, failing to take account of how long a child support award has been in place introduces measurement error. Therefore, we construct a measure of child support received per month of eligibility to receive formal support, based on the number of months that mothers have had a child support order. For those without a child support order, the amount of formal support received is coded to zero. For informal cash support, we divide the amount reported by the number of months that parents have not been cohabiting (or the entire reporting period for those not cohabiting the entire time). We add the monthly formal and informal cash support together to construct the amount of total support received per month. Reported amounts of support at each wave are adjusted for inflation.

Mothers are asked how often in the past year the father has purchased clothes, toys, medicine, food or anything else for the child, with possible responses of: 'often, sometimes, rarely or never'. Food was the most commonly reported item purchased 'often' by fathers (22%), followed by clothes (19%), toys (17%), medicine (15%), and other items (9%), while the corresponding proportions of fathers who purchased each of these items 'often' or 'sometimes' were 37%, 38%, 39%, 28%, and 12%, respectively. Based on these distributions, we create a dichotomous measure for whether the mother received in-kind contributions from the father if she responded 'often' or 'sometimes' to any of the above items. Ideally, we would prefer to have a dollar value for in-kind support, but given the way these questions are asked, it is not possible. First, we cannot estimate how much of an item was purchased. Second, we cannot define the

[7] Mothers who were not able to provide the exact amount of child support in the first question were then asked a follow-up question consisting of seven ranges of payments. We assigned the midpoint of the following ranges for these mothers and included these amounts in the continuous measures of support received: <$500; $500-$1000; $1001-$2000; $2001-$3000; $3001-$4000; $4001-$5000; $5001-$10,000; and >$10,000. This was done for 4% (51) of mothers for formal support and 9% (115) of mothers for informal support.

meaning of 'often' or 'sometimes'. All of the father contribution variables are measured at each of the follow-up surveys (1-year, 3-year, and 5-year).

Child Support Enforcement

In this paper, the primary measure of the strength of child support enforcement is based on city-level child support outcomes from the 2000 Census. Our measure is a ratio of the likelihood of receiving child support to the predicted likelihood of receiving child support in a given city adjusted for a number of individual and city-level characteristics. More specifically, using a 5% sample from the Public Use Microdata Samples (PUMS) from the 2000 Census, we made an extract of never-married mothers in the 20 cities that are represented in the Fragile Families data and included in these analyses. The sample sizes of never-married mothers in the PUMS range from 67 in Corpus Christi to 6,999 in New York.[8] From this dataset, a variable for whether the mother received any child support was created.[9] This measure represents the likelihood that an average unmarried mother in that city receives child support; however, it may not be a good indicator of the strength of enforcement in that city, since it may be strongly associated with the demographic composition of the city. For example, cities with higher proportions of low-income families will have worse child support outcomes than cities with more advantaged populations, and these differences may be unrelated to the vigor of the child support enforcement system. Similarly, the likelihood of receiving child support in a given city may be associated with the

[8] Corpus Christi is an outlier in terms of sample size, the next smallest city is Richmond with 301 never-married mothers.

[9] The Census does not specifically ask about child support income. We proxy child support income with the "other income" category in the Census. Creating a similar category in the SIPP data, we calculated that over 90 percent of "other income" for unmarried mothers consists of child support payments. Therefore, we feel confident that the "other income" category is an acceptable child support proxy for this group of mothers.

strength of the labor market in that city. Therefore, we adjust the raw child support payment rate with a number of individual and city-level characteristics.

We regress the dichotomous variable for whether a mother had a child support payment on the mother's race/ethnicity, age, education, nativity, number of children, presence of child under age 6, state-level median male wage and maximum combined TANF/Food Stamp benefit. From this equation, we predict an aggregate city-level probability of receiving support, and divide the raw aggregate probability of receiving support by this adjusted measure. We standardize this ratio (convert to a z-score) so that a unit change represents a change of one standard deviation. Finally, this city-level aggregate measure is appended to the individual-level data by city of mothers' residence.

We believe this measure of actual to expected child support outcomes is the best single measure of the strength of child support enforcement because it encompasses not only the interaction of the strength of child support laws and fiscal effort to enforce the laws, but also the efficacy of city practices and the competence of the city bureaucracy in implementing the laws. States may be leaders in passing child support legislation, but it is possible that these laws are not actually enforced. Expenditures may be a good measure of a state's commitment to enforcement, but states with the worst collection rates may need to spend the most to improve their outcomes. Most prior studies have used state-level measures of enforcement. While legislation and expenditures are state-level indicators, implementation of laws happens at the local level. Therefore, using city-level indicators of the strength of enforcement captures this local variation in implementation and creates a more valid measure. Although our measure of child support enforcement has been purged of observed variables that could influence child support payments, it is possible that unobserved differences across cities lead to higher child support payments,

rather than the strength of enforcement. For this reason, as a robustness check, we also use a more exogenous measure of the strength of child support enforcement which is based on state child support policies and state expenditures for child support enforcement.

Based on the findings of Freeman and Waldfogel (2001), indicating that policies and expenditures on child support must be considered together, we create a measure of the interaction of legislation and expenditures. We include the following laws in the legislative measure: three laws pertaining to paternity establishment (allowing paternity to be established until the child is 18, mandating genetic testing, and making voluntary paternity conclusive); universal wage withholding; and the three most recent federally mandated laws (the New Hires directory, license revocation for nonpayment, and automation). For each law, we enter the year that the law became effective in the state, standardize it to have a mean of 0 and a standard deviation of 1, and then invert it, so that the longer the laws have been on the books, the greater the value. We use total expenditures on child support in the state for 1999, as reported by the Office of Child Support Enforcement (U.S. Department of Health and Human Services 2001), divided by the number of single mothers in the state from the 2000 Census. We then break down each measure into quintiles and create a three-level categorical variable, where 3 represents a state that is in the top 2 quintiles on both laws and expenditures, 1 represents a state that is in the bottom 2 quintiles on both measures, and 2 represents all other states. Child support outcomes are regressed on this categorical variable, with the worst-performing states and medium states (coded to 1 and 2) as the comparison group.

The values of the components of the PUMS payment rate ratio (percent of mothers with support and predicted probability of support), the standardized ratio, and the laws/expenditures multiplicative measure for the 20 cities in these analyses are presented in Appendix Table 1.

Parents' Relationship

As discussed previously, we expect that the package of support that mothers receive from fathers, as well as the effect of enforcement on this support, will vary over time. We create a time-varying measure for the length of time that the father has not been residing with the focal child. For mothers who ever cohabited with the father, this measure is the number of months since the parents stopped cohabiting; for mothers who never cohabited with the father, this measure is the age of the child in months.[10]

Covariates

We include a number of father, mother and child characteristics that have been found in prior research to be associated with fathers' ability and willingness to pay support. These variables are all taken from mothers' reports from the baseline interview, at the time of the child's birth.[11] First, is a group of basic demographics: father's age, race/ethnicity, education, and mother's nativity-as a proxy for father's nativity (which is not available from mothers' reports). Based on prior research, we expect that older, more educated, native-born, and white fathers will be more able to pay child support (Beller and Graham 1993).

Next, we include a number of other family characteristics which are important predictors of fathers' willingness and ability to pay support, most of which have not been available in other datasets: whether the father contributed cash or in-kind during the pregnancy, whether he visited in the hospital, whether the mother wanted him involved, whether he intended to contribute in

[10] The Fragile Families survey does not ask specifically for the date that parents stopped cohabiting, instead asking when parents' romantic relationship ended. For most parents who stopped cohabiting, these dates are likely the same. For those who have stopped cohabiting, but are still romantically involved, we impute the date stopped cohabiting as sometime between the two waves when they were cohabiting and then no longer cohabiting. A small number of parents transition from nonresidency back into residency and then back into nonresidency. These parents are assigned the number of months since stopped cohabiting based on the last transition into nonresidency and are assigned an indicator flag which is included in all regressions.

[11] There are two exceptions. Questions about father's multiple partner fertility and history of incarceration are only asked at the 1-year follow-up survey.

the future, the father's employment status (in the week prior to the birth), whether the father had a work-limiting disability, whether he had a problem with drugs or alcohol, whether he was ever in jail or prison, whether the parents have other children together, and both parents' multiple partner fertility. We expect that fathers who have other children with this mother, who have not been incarcerated, who were employed, who are not disabled, and who exhibited signs of commitment to the child during the pregnancy will be more willing and able to contribute financially to their children (Beller and Graham 1993; Lewis, Garfinkel and Gao 2007). The expectation for fathers' multiple partner fertility is not clear. On the one hand, fathers who have children with other mothers may have a larger child support burden and therefore are less likely to pay, though there is evidence that fathers are more likely to pay support for new biological children at the expense of previous biological children (Manning and Smock 2000). On the other hand, these fathers may have been previously exposed to the child support enforcement system and therefore may be more likely to have an order and to be paying (Cancian and Meyer 2005).

We include the child's gender, since there is some evidence that fathers may be more involved with male children, though findings are inconclusive (Diekmann and Schmidheiny 2004; Furstenberg Jr. et al. 1983; Lundberg, McLanahan and Rose 2007; Morgan, Lye and Condran 1988). We also include three measures of parents' homogamy (the difference in parents' ages and education levels, and whether they are of the same race/ethnicity). We expect that fathers who are more similar to mothers on these attributes are likely to be in more cooperative relationships with the mothers and be more willing to contribute to their children (Becker 1981). We also include the unemployment rate in the metropolitan area and the maximum TANF benefit in the state, at the time of the child's birth, both of which may be related to fathers' ability to pay support and mothers' need for child support. The metropolitan

unemployment rate ranges from 2.4 in Indianapolis to 6.5 in Corpus Christi (U.S. Department of Labor 2002), while the maximum TANF benefit for a family of three ranges from $163 in Tennessee to $593 in Wisconsin (SPDP 2001).

ANALYTIC STRATEGY

First, we present sample characteristics for the all mothers and by whether they ever cohabited with the father of the focal child. Next, we describe changes in fathers' contributions to their children over time. Specifically, we examine the changes in the dollar amounts of formal, informal and total support received per month as the time since parents stopped cohabiting increases for ever-cohabiting parents and as the child gets older for never-cohabiting parents. These results are presented graphically using locally weighted polynomial regressions (lowess or loess regressions) of each type of father contribution (the dependent variable) on the number of months since parents have not been together (the independent variable). Because theory provides no guide as to the functional form of the relationship between contributions and time, we take a nonparametric approach to these analyses. Lowess regression fits models to localized subsets of the data with bigger weight given to points nearer the point whose response is being estimated and smaller weight given to those further away. This method allows the function to vary at nearly every point (Cleveland 1979; NIST/SEMATECH).

Next, we estimate multivariate regressions for each type of father contribution on the strength of enforcement in the city, controlling for all previously discussed covariates. Because the amounts of informal, formal and total child support received per month are censored at zero, we estimate tobit regressions, and present marginal effects conditional on being uncensored and t-statistics. We use probit regression to estimate the probability of receiving in-kind support, and

present marginal effects evaluated at the means of the independent variables and z-statistics. Finally, we interact child support enforcement with the measures of time for both groups of mothers (ever and never-cohabiting with the focal child's father) separately to understand whether the effect of enforcement differs over time for the two groups. These results are presented graphically for ease of interpretation. Because our primary indicator of enforcement is measured at the city level, we adjust standard errors for clustering at the city level.

FINDINGS

Table 1 presents the means of the dependent and independent variables stratified by whether the couple ever cohabited, with asterisks indicating statistically significant differences between the groups. Mothers report on average $49 per month of informal cash support from fathers, but this amount varies substantially by whether parents ever cohabited, with ever-cohabiting mothers reporting $71 per month and never-cohabiting mothers reporting only $29 per month. Ever-cohabiting mothers also report more monthly formal support than never-cohabiting mothers ($41 vs. $34 per month), but this difference is not significant. Combining these types of support, ever-cohabiting mothers report almost twice the amount of total support per month than never-cohabiting mothers ($112 vs. $64). One-third of all mothers report receiving any type of non-cash support--clothes, toys, food, medicine, or other—often. Nearly half report receiving non-cash support sometimes or often. Though we cannot value non-cash support, we suspect that it is less valuable in dollar terms than cash support—the poor man's substitute for cash support and the less poor man's supplement to cash support. Still, in view of how common in-kind support is, an attempt to value it more precisely in future data collection would be useful.

The majority of mothers (52%) who are not cohabiting with the father of the focal child at each particular wave have never cohabited with him. Mothers who did cohabit with the father at some time since the child's birth stopped cohabiting an average of 26 months ago. An overwhelming majority of fathers exhibited signs of commitment to the child and mother at the time of the child's birth: 74% and 70% contributed money or other things during the pregnancy, 67% visited the mother and child in the hospital, and 86% intended to contribute in the future. Notably, 90% of mothers wanted the father involved in the child's life at the time of the birth. Not surprisingly, fathers who ever cohabited with the mother have much higher values on all these measures than those who did not. Similarly fathers who never cohabited with the mother were more likely to have children with other mothers (53% vs. 42%) and were less likely to have other children with this mother (21% s. 34%). The proportion of mothers who had children with other fathers (43%) did not vary significantly by whether they ever cohabited with the father of the focal child. Surprisingly, the degree of parents' homogamy, or positive assortative mating, did not significantly vary by whether they ever cohabited.

Overall, the mothers in our sample have had children with fathers who are mostly non-white (67% non-Hispanic black, and 22% Hispanic), young (76% under 30) and relatively poorly educated (40% have not completed high school). Only 50% of the fathers were working at the time of the child's birth, and 41% have spent some time in jail or prison. Fathers who previously cohabited with the mother are more advantaged on these two measures than those who never cohabited: 59% vs. 42% worked at baseline; and 39% vs. 44% had been incarcerated. Nearly half of mothers reported welfare or Food Stamp receipt at the time of the baby's birth and this did not vary by cohabitation status. Finally, these parents faced a relatively low average metropolitan unemployment rate of 3.9% and the average maximum state TANF benefit was $357.

Fathers' Contributions to Children

Figures 1 and 2 describe changes in fathers' cash contributions to their young children over time, separately for ever and never-cohabiting mothers. The groups are described separately because their payment patterns are so different. For previously cohabiting mothers, the amount of informal support received drops precipitously in the first few months after parents stop cohabiting, but then the slope flattens out, with no further reduction after approximately 40 months of non-cohabitation.[12] The amount of formal support increases steadily over time, surpassing the amount of informal support at approximately 3 years after break-up. Thus, the nearly offsetting increases in formal and decreases in informal cash support lead to a decrease in total support received in the shorter-term as decreases in informal support outpace increases in formal support, but an increase in the longer term as increases in formal support outpace decreases in informal support. Within the time period observed, however, total support doesn't come close to equaling its initial high point. The over time decrease in informal and total payments is consistent with theoretical predictions of declining willingness to pay, while the over time increase in total payments suggests a positive effect of child support enforcement on total child support payments. To be more precise, the initial decline in total child support payments followed by an increase in payments is consistent with an initial willingness to pay child support that at first exceeds the legally or formally required amount, but then declines steadily to below the legally required amount in combination with a child support enforcement system that is effective enough to halt and even reverse the decline in payments.

[12] The data for mothers who ever cohabited was also examined within a fixed effects approach to ensure that the drop in informal support was not being driven by the composition of mothers in the sample. Mothers who had lived with the father the longest time (with fathers with the highest willingness to pay support) would have the fewest months of nonresidency and could be overrepresented at the low end of the distribution, while those who lived with the father for the shortest amount of time (with fathers with the lowest willingness to pay) could be overrepresented at the other end. The fixed effects results which only focus on mothers in the sample at all three waves produced similar results to those in Figure 1, with an identically sharp drop-off of informal support after the first few months on nonresidency.

For parents who never cohabited, the amount of support received in each category is substantially smaller and there is no precipitous drop in informal support. There is, however, a large increase in formal support from approximately $5 to $50 per month over time, with the slope of that trajectory leveling off at the end. Finally, there is also an upward trajectory for total support received per month. Though not shown, the proportion of mothers reporting any in-kind support from fathers follows a similar pattern to informal cash support for both groups of mothers, steadily decreasing over time.[13]

In short, consistent with our theoretical expectations, for both groups, over time, informal and in-kind support decline, formal support increases, and the increases in formal support increasingly exceed the decreases in informal support. This pattern is consistent with a positive effect of child support enforcement. In the next section we explore the relationship between the strength of child support enforcement and each type of father contribution. Based on these graphs, generated with nonparametric analyses, the relationship between fathers' contributions and time is clearly nonlinear and appears to be quadratic. Therefore, we include quadratic terms for measures of time in the remainder of our analyses.

Multivariate Analyses

In Table 2, we examine the effects of child support enforcement on four child support outcomes: the amount of informal cash support, formal cash support, and total cash support, and the probability of receiving in-kind support. As previously shown, the payment patterns of those who ever and never cohabited are radically different. Because enforcement could affect selection into these groups and to simplify the analyses, the results in Table 2 are for both groups

[13] For mothers who previously cohabited, the proportion with in-kind support declines from nearly 75% a few months after parents stopped cohabiting to 40% for parents who have not been cohabiting for 60 months, while for those who never cohabited, in-kind support prevalence drops from 47% one year after the child's birth to approximately 33% 60 months after the child's birth.

combined; however, we interact the number of months that fathers have not lived with children (and the squared term) with an indicator for whether parents ever or never cohabited. Table 3 displays results from separate regressions for the two groups. Because the child support enforcement measure is converted to a z-score, the interpretation of the coefficient is the change in the dependent variable associated with a 1 standard deviation increase on the PUMS payment ratio. Mothers who live in a city with a child support enforcement regime that is one standard deviation above the mean, receive $5.06 per month more in formal cash support compared to mothers who live in a city with a regime at the mean. But they also receive $2.05 less per month in informal child support (though this coefficient is not statistically significant). When the two measures of cash support are combined into a measure of total child support; however, the difference between the increase in formal and decrease in informal shrinks from $3 to a statistically insignificant increase of only $0.62.

Mothers in strong enforcement cities are also 1.6 percentage points less likely to receive in-kind support. As discussed previously, we cannot compare the dollar amounts of in-kind and cash support received; however, we can compare the sizes of these effects. From Table 1, 48% of unmarried mothers receive in-kind support, thus a decrease of 1.6 percentage points represents a 3% decline in the proportion of mothers with in-kind support. On the other hand, mothers report $49 informal and $37 formal support per month. The $2.05 decrease in informal and the $5.06 increase in formal support represent a 4% decline and a 14% increase in these two measures, respectively. Therefore, it appears that the effect of strong enforcement on in-kind support is somewhat less pronounced than on cash support.

The interactions of time that father has not lived with child (and the squared term) and whether parents ever cohabited are significant for the three cash support outcomes, confirming

the findings from Figures 1 and 2, that these two types of families have quite different trajectories of support over time. In results not presented (available from authors) we evaluated these interactions graphically and the results were strikingly similar to the bivariate ones presented in Figures 1 and 2, except for a slight upturn for previously cohabiting mothers for informal support at the 60 month time point which is due to the functional form restriction of the quadratic term.

A number of measures of fathers' willingness to pay were related to fathers' informal contributions. Fathers whom the mother wanted involved in the child's life at birth and those who contributed money or other things during the pregnancy contribute more informal support. Both parents' multiple partnered fertility is associated with less informal support from fathers. Fathers who are black (marginally significant), more educated, older, and worked at baseline pay more informally, while those who were incarcerated pay less. Only two measures of willingness to pay were significantly related to formal support: whether the father visited the mother in the hospital and whether she wanted him involved at the birth, both of which led to more formal support. However, in a test of joint significance, all the willingness to pay variables were significantly related to all four types of contributions. Black fathers and those who had been incarcerated pay less formally, while more educated fathers and those who worked at baseline pay more. Mothers who were US-born received much more formal support than those who were not.

The predictors of in-kind support receipt are similar to those for informal support, with a few notable differences. Black fathers were much more likely to contribute in-kind (12 percentage points or 23% more) than white fathers, while fathers' education was not associated

with in-kind support contributions. Finally, the maximum TANF benefit in the state was positively associated with receipt of in-kind support.[14]

Table 3 presents results from a number of alternate specifications that probe further into our main results. First, we use an alternate indicator for the strength of enforcement: an interaction of laws and expenditures in the state. We find that mothers who live in states that are in the top third on this measure receive $9 less in informal support, but $21 more in formal support than those in the bottom two thirds. This results in a positive, but statistically insignificant increase of $4 in total support per month. Though the magnitude of the coefficients differs from our preferred measure of enforcement, the substantive results are identical.

Second, we disaggregate the sample by whether the parents ever cohabited and note the effect of enforcement on child support outcomes for the two groups. Mothers who ever cohabited with the father in strong enforcement cities receive $3.54 less informal support and $7.57 more in formal support than those in cities with less strict regimes, resulting in an insignificant increase of $1.51 in total support. For mothers who have never cohabited with the father, child support enforcement appears to have a weaker effect. There is no statistically significant relationship between enforcement and any of the outcomes for this group, though the $2.92 increase in formal support approaches significance. In Table 1, we noted that these fathers not only provide less of each type of support, but they are also less able to pay support (higher levels of incarceration and lower employment). In results not shown, we also found that mothers who never cohabited with the father are more likely to report that he is currently in jail at each wave, that the he is unknown, or does not know about the child. States with strong child support

[14] Because welfare generosity in general increases with income, fathers in more generous states will have higher incomes, which should lead to increases in both in-kind and informal cash support, which is what we find, though the informal coefficient is not significantly different from zero. Formal support, however, is discouraged by welfare because unlike informal and in-kind support, it reduces welfare benefits.

enforcement are no more likely to be successful than states with weak child support enforcement in collecting money from these fathers.

Finally, we examine whether there is an interactive effect between child support enforcement and the length of time that fathers have not lived with the child. The bottom panel of Table 3 shows the interaction coefficients for all mothers and then disaggregated for those who ever and never cohabited with the father. These coefficients are from regressions identical to those presented in Table 2 and include the main effects of enforcement and time as well as all previously discussed covariates. There is a strong, statistically significant time pattern of results for formal child support for the group of mothers who ever cohabited with the father, which is mimicked (in weaker terms) by the pattern for total support. Figures 3 and 4 display graphically the results for the two groups.

Figures 3 and 4 (for ever- and never-cohabiting mothers, respectively) have time since father has not lived with the child on the X-axis and amount of total support received per month on the Y-axis. These relationships are compared for mothers living in a state with the lowest level of enforcement and those in a state with the highest level of enforcement. For ever-cohabiting mothers (Figure 3), there is some evidence that as the time since parents' split increases, total support increases more and sooner in high enforcement states than in low enforcement states, a substantial difference of approximately $60 per month, or 48% of the mean.[15] Recall, however, that the coefficient for total support is estimated with much less precision than the one for formal support. So, although the point estimate at 60 months represents a 48% increase, the standard errors are so large that the 95% confidence interval includes a positive effect of 93% and a negative effect of 2% (not shown).

[15] The predicted mean of total support received per month for parents who have not been cohabiting for 60 months with all other variables held at their means is $126.

Strong enforcement may be associated with declines in total support soon after a relationship ends because a mother's pursuit of formal support can reduce a father's willingness to pay informally and because there are lags between the end of informal support and the beginning of formal support.[16] Over time, however, as one or both parents move onto other relationships, fathers' willingness to pay child support declines, leading to an increasing gap between willingness to pay voluntarily and the legally required formal child support amount. As a consequence, strong enforcement is likely to have an increasingly positive effect on total child support over time.

For never-cohabiting mothers, there is no difference in the trajectories and mothers in low enforcement states receive as much total support as those in high enforcement states.

Robustness Checks

We estimated a number of alternate specifications to test the robustness of our results, which are discussed below (results are available from authors). First, because mothers on welfare must give up rights to child support paid on their behalf, it is possible that this group of mothers may be unintentionally misreporting how much formal support is received from fathers. If this is true, our results for formal support and therefore total support received would be biased. In addition, fathers with children receiving TANF have less incentive to pay formal support because the state, rather than their child, receives the bulk of what they pay. Therefore, we estimated separate models by whether the mother received TANF at any of the three waves (never TANF, N = 2295; ever TANF, N = 2262). The results for both groups were substantively similar to those of the whole group, with coefficients for mothers ever on TANF slightly stronger for all outcomes and for mothers never on TANF slightly weaker.

[16] We find a 15 month average lag between the time that parents stop cohabiting and the time that a formal support agreement is put in place for mothers who ever cohabited.

Finally, there is some evidence from prior research that strong child support enforcement may impact parents' fertility, union formation and dissolution decisions (including marriage, cohabitation or romantic involvement), though the results are not conclusive and the direction of the sample selection is theoretically ambiguous for some outcomes (Aizer and McLanahan 2006; Carlson et al. 2004; Case 1998; Garfinkel et al. 2003; Huang 2003; Knab et al. 2007; Mincy and Dupree 2001; Nixon 1997; Plotnick et al. 2004; Yun 1992). Only one paper examined the direction of one of these types of selection biases. They found strong enforcement reduced the fertility of the lowest educated single mothers (those least likely to make investments in children) (Aizer and McLanahan 2006). We tested for one piece of this type of selection bias directly by estimating the effect of our measure of enforcement on the likelihood that parents cohabit at any wave. We found that living in a state that is one standard deviation above the mean on enforcement is associated with a 1.5 percentage point reduction in the likelihood that unmarried parents cohabit or marry within 5 years after the birth of their child. Given these and prior findings, it is unlikely that our results are being driven by negative sample selection.

SUMMARY AND CONCLUSION

In this paper, we describe the total package of support (formal, informal, total cash support, and non-cash contributions) that mothers with nonmarital births receive from the nonresident fathers of their children, and estimate the effect of child support enforcement on these contributions.

Informal support from fathers (whether in cash or in-kind) is an important resource for mothers with nonmarital births who are not residing with the father of their child and is more prevalent than formal support for up to about 36 months after cohabitation ends and 36 months after birth for fathers who never live with the child. Over time, informal support declines, formal

support increases, and the increases in formal support increasingly exceed the decreases in informal support. This pattern is consistent with theoretical predictions of declining willingness to pay child support over time and a positive effect of child support enforcement. These findings are also consistent with prior research suggesting that informal support (cash and in-kind) is particularly important in the lives of low-income families and that informal and formal support are substitutes.

There is also some evidence that states with strong child support enforcement collect more child support than states with more lenient enforcement, but the evidence is somewhat weaker. Strong enforcement is associated with more formal support and less informal support for all unmarried non-cohabiting mothers. While the increase in formal support is much larger than the decrease in informal support, the effect of stronger enforcement on total support is quite small and the standard errors are large, resulting in a difference that is not statistically significant. For fathers who have previously lived with the child, strong enforcement is associated with lower total payments in the short run and higher total payments in the long run. Strong enforcement states collect no more than weak enforcement states from fathers who have never cohabited. Fathers who never cohabited with the mother, as compared to those who have cohabited, have lower ability to pay child support and are more likely to be unaffected by strong child support enforcement because they are more likely to be in jail, or unemployed, or not know about the child.

Follow-up research is necessary to further explore the substitution of formal for informal support and to confirm our findings. First, the analysis should be extended in time. In two years, the 5th wave of the Fragile Families study will be completed, allowing the longitudinal analysis to be extended to 9 years post-birth. Second, future research should attempt to measure the dollar

value of in-kind contributions, since this appears to be an important source of support for unmarried families. A limitation of our study is that the indicator of the strength of child support enforcement only varies among 20 cities in 15 states and does not vary over time. Thus, replication of this study using a national dataset with policy variation across 50 states and over time, that also measures formal, informal, and in-kind support would be very useful.

The implications of our findings for child support enforcement policy are somewhat ambiguous. As described above, for more than a quarter century the federal government has encouraged and mandated states to strengthen child support enforcement. On the one hand, we find that child support enforcement on average is effective. This finding indicates that enforcement leads to long term increases in the incomes of mothers and their children and suggests that we "stay the course". On the other hand, the evidence that states with stronger enforcement systems do better than those with weaker enforcement systems is much less robust. For unwed parents as a whole, there is no statistically significant effect of strong enforcement. For the large subgroup of unwed parents who lived together at birth, the point estimates suggest that strong enforcement first reduces and then increases total support, but standard errors are large and our data do not extend far enough to be confident about the long term outcome. If longer term follow up indicates that stronger enforcement does not appreciably increase the total dollars of support that mothers receive in the long term, then the implications for policy would be quite different. Such a finding would suggest that strengthening child support enforcement, at best is a waste of resources--does nothing for children in unmarried families--and at worst actually reduces their resources. In this case, substantial adjustments to the system will need to be considered. Further research is necessary before the policy implications become clear.

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Table 1: Characteristics of Unmarried Parents by Whether they Ever Cohabited Since the Birth of the Focal Child

Variable	% or Mean (SD)		
	Full Sample	Ever-Cohabited	Never-Cohabited
N	4601	2188	2413
Fathers' Contributions			
Amount of informal cash support per month ***	49 (124)	71 (155)	29 (79)
Amount of formal support per month	37 (109)	41 (119)	34 (99)
Total amount of cash support per month ***	86 (159)	112 (187)	64 (123)
Receives any type of non-cash support often ***	0.32	0.41	0.24
Receives any type of non-cash support often/sometimes ***	0.48	0.58	0.40
PUMS Payment Rate Ratio	0.45 (1.37)	.47 (1.39)	.44 (1.36)
Parents' Relationship			
Parents never cohabited	0.52		
Parents ever cohabited	0.48		
Number of months parents have not been cohabiting		26.1 (15.8)	
Measures of Fathers' Commitment/Willingness to Pay			
Father contributed money during the pregnancy ***	0.74	0.88	0.62
Father contributed other things during preg ***	0.70	0.87	0.54
Father visited in the hospital ***	0.67	0.83	0.52
Mother wanted father involved ***	0.90	0.97	0.83
Father intended to contribute at birth ***	0.86	0.94	0.78
Father has kids with other mothers ***	0.48	0.42	0.53
Mother has kids with other fathers	0.43	0.42	0.44
Parents have other children together ***	0.27	0.34	0.21
Parents' Homogamy			
Parents are of same race/ethnicity	0.86	0.87	0.86
Difference in parents' education (father-mother)	-0.03 (0.83)	-.02 (.84)	-.03 (.83)
Difference in parents' ages (father-mother)	2.7 (5)	2.7 (5)	2.7 (5)
Sociodemographic Characteristics			
Father's race/ethnicity ***			
Father is white	0.09	0.12	0.07
Father is black	0.67	0.61	0.71
Father is Hispanic	0.22	0.25	0.19
Father is other race/ethnicity	0.02	0.02	0.03
Father's Education ***			
Father did not complete high school ***	0.35	0.36	0.32

Father has HS/GED diploma	0.40	0.41	0.40
Father has more than HS	0.20	0.20	0.20
Father education missing	0.05	0.03	0.08
Father's Age			
Father is less than 21	0.19	0.19	0.21
Father is 21-30	0.57	0.57	0.56
Father is older than 30	0.24	0.24	0.23
Father has been in jail ***	0.41	0.39	0.44
Father worked at baseline ***	0.50	0.59	0.42
Father has disability	0.06	0.06	0.07
Mother is US-born	0.93	0.92	0.93
Mother received welfare/FS at baby's birth	0.48	0.47	0.48
Age of child (months) ***	39.7 (19.4)	41 (19.2)	38.5 (19.6)
Male child †	0.53	0.51	0.55
City/State Characteristics			
MSA unemployment rate at child's birth	3.9 (1.2)	3.8 (1.2)	3.9 (1.1)
Maximum state TANF benefit at child's birth ($100)	3.57 (1.34)	3.52 (1.35)	3.61 (1.33)

Asterisks indicate significant differences between the ever and never-cohabiting groups.
*** $p < .001$; † $p < .10$

Table 2: Effect of Child Support Enforcement on Amounts of Cash Support and the Probability of Receiving In-Kind Support

	Amount of Informal [a]		Amount of Formal [a]		Total Support [a]		In-Kind Support [b]	
Measure of Enforcement								
PUMS Payment Ratio	-2.05		5.06	**	0.62		-0.016	*
	(1.11)		(3.17)		(0.35)		(2.07)	
Length of Father/Child Separation								
Months father has not lived w/child	-4.28	***	2.02	**	-3.85	***	-0.005	†
	(7.38)		(3.13)		(5.97)		(1.84)	
Months not lived w/child squared	0.05	***	-0.01		0.06	***	0.00007	†
	(5.55)		(0.89)		(6.76)		(1.87)	
Interaction of Time and Whether Parents Ever Cohabited								
Months not w/child * Never cohabited	2.00	**	1.68	*	3.50	***	-0.001	
	(2.86)		(2.53)		(4.06)		(0.26)	
Months squared * Never cohabit	-0.03	**	-0.02	*	-0.05	***	0.00001	
	(3.17)		(2.59)		(4.46)		(0.18)	
Measures of Fathers' Commitment/Willingness to Pay								
Father has never cohabited with mother	-20.10	*	-30.87	*	-45.65	**	0.007	
	(1.98)		(2.34)		(3.33)		(0.10)	
Father contributed money during preg	20.54	***	0.07		17.94	**	0.112	**
	(6.16)		(0.01)		(3.51)		(3.25)	
Father contrib other things during preg	6.49	*	-5.04		0.44		0.092	**
	(2.25)		(1.21)		(0.09)		(3.24)	
Father visited mother in the hospital	1.65		12.48	*	11.93	*	0.101	***
	(0.48)		(2.73)		(2.32)		(4.15)	
Mother wanted father involved	13.78	*	23.47	**	33.30	***	0.158	*
	(2.37)		(2.83)		(3.94)		(2.72)	
Father intended to contribute at baseline	4.56		-5.08		-0.87		-0.047	
	(1.25)		(0.76)		(0.16)		(1.48)	
Father has kids with other mothers	-8.08	***	-2.36		-10.14	**	-0.094	***
	(4.15)		(0.60)		(2.94)		(4.98)	
Mother has children with other fathers	-8.60	*	-2.62		-12.26	**	0.020	
	(2.56)		(0.63)		(3.49)		(0.80)	
Parents have other children together	-0.06		-3.25		-2.36		-0.016	
	(0.01)		(0.76)		(0.41)		(0.86)	
Parents' Homogamy								
Parents are of same race/ethnicity	4.04		-1.90		2.96		0.050	
	(1.22)		(0.31)		(0.50)		(1.56)	

Difference in parents' education (F-M)	-4.00	*	-4.92	*	-8.70	**	0.018	
	(2.42)		(2.18)		(3.23)		(1.51)	
Difference in parents' age (F-M)	-0.15		-0.39		-0.38		-0.001	
	(0.47)		(0.93)		(1.08)		(0.45)	
Sociodemographic Characteristics								
Father is black	11.25	†	-14.14	**	-5.18		0.115	**
	(1.80)		(3.03)		(0.63)		(2.91)	
Father is Hispanic	1.40		1.71		-0.44		0.021	
	(0.24)		(0.28)		(0.05)		(0.53)	
Father is other race/ethnicity	3.45		-5.69		-3.70		0.144	
	(0.43)		(0.45)		(0.23)		(1.58)	
Father has HS/GED diploma	7.03	*	13.46	**	16.97	***	-0.026	
	(2.49)		(3.02)		(4.89)		(1.13)	
Father has more than high school	12.43	**	27.65	**	36.06	***	-0.030	
	(3.46)		(3.23)		(5.98)		(0.96)	
Father is 21-30	5.62		1.75		11.47	**	0.022	
	(1.62)		(0.44)		(3.40)		(0.73)	
Father is older than 30	12.58	*	6.39		21.17	**	0.048	
	(2.23)		(1.13)		(3.57)		(1.22)	
Father has been incarcerated	-12.45	***	-9.61	**	-18.09	***	-0.143	***
	(4.33)		(2.84)		(6.67)		(8.21)	
Father worked at baseline	11.36	**	22.05	***	27.30	***	0.097	**
	(3.68)		(6.65)		(7.40)		(3.40)	
Father has disability	3.90		0.12		3.98		0.031	
	(0.59)		(0.01)		(0.52)		(0.94)	
Mother is US-born	-6.87		25.19	**	5.62		0.085	
	(0.85)		(3.29)		(0.66)		(1.32)	
Mother received TANF/FS at baby's birth	-1.06		-2.89		-4.57		0.012	
	(0.41)		(0.70)		(1.44)		(0.67)	
Age of child (months)	0.13		-0.43	†	-0.21		-0.004	**
	(0.78)		(1.72)		(1.20)		(3.01)	
Male child	-3.05		-0.66		-2.03		0.004	
	(1.15)		(0.21)		(0.54)		(0.20)	
City/State Characteristics								
MSA unemployment rate at child's birth	100.71		-31.88		10.71		-0.706	
	(0.70)		(0.24)		(0.08)		(0.80)	
Maximum state TANF benefit ($100)	0.84		-2.46		-0.64		0.014	**
	(0.89)		(1.41)		(0.54)		(2.86)	
Observations	6401		6401		6401		4521	

[a] Figures are marginal effects calculated at the mean of the independent variables from tobit regressions with robust t statistics in parentheses.
[b] Figures are marginal effects calculated at the mean of the independent variables from probit regressions with robust z statistics in parentheses.
*** p < .001; ** p < .01; * p < .5; † p < .10

Table 3: Child Support Enforcement and Fathers' Contributions Alternative Specifications and Interactions

	Amount of Informal		Amount of Formal		Total Support
Comparing Policy Measures					
All Nonresident Parents , N = 4601					
PUMS city payment ratio (repeated from Table 2)	-2.00		5.09	**	0.72
	(1.06)		(3.17)		(0.40)
All Nonresident Parents, N = 4601					
Laws * Expenditures (alternate policy measure) [a]	-9.08	*	21.03	*	4.34
	(2.39)		(1.98)		(1.15)
Comparing Ever and Never Cohabiting Parents					
Ever Cohabiting Parents, N = 2188					
PUMS city payment ratio	-3.54		7.57	**	1.51
	(1.22)		(2.94)		(0.51)
Never Cohabiting Parents, N = 2413					
PUMS city payment ratio	-0.96		2.92		0.002
	(0.74)		(1.57)		(0.00)
Interaction of Enforcement and Time					
All Nonresident Parents					
PUMS ratio * months father has not lived w/child	0.16		-0.50	*	-0.003
	(0.93)		(1.99)		(0.01)
PUMS ratio * months father not lived w/child squared	-0.001		0.004		0.0003
	(0.55)		(1.34)		(0.09)
Ever Cohabiting Parents					
PUMS ratio * months since stopped cohabiting	-0.306		-0.745	*	-0.522
	(0.73)		(2.55)		(1.51)
PUMS ratio * months since stopped cohabiting squared	0.007		0.008	†	0.010
	(1.03)		(1.83)		(1.63)
Never Cohabiting Parents					
PUMS ratio * age of child (months)	0.295		-0.123		0.220
	(1.40)		(0.37)		(0.50)
PUMS ratio * age of child (months squared)	-0.004		0.000		-0.003
	(1.63)		(0.03)		(0.64)

[a] Coefficient reflects effect for states that are in the highest tertile on earliest adoption of laws and highest expenditures vs. all other states.

All figures are marginal effects calculated at the mean of the independent variables from tobit regressions with robust t statistics in parentheses.
*** p < .001; ** p < .01; * p < .5; † p < .10

Appendix Table 1: Components of Measures of Enforcement

	City PUMS Payment Rate Ratio			State Laws * Expenditures Measure			
	Proportion with Support	Predicted Probability	**Standardized Ratio** [b]	Standardized Laws * Expend Index	Standardized Laws Index	CS Expend per Single Mother ($'s)	**Laws * Expend Interaction Tertiles** [a]
Toledo	0.29	0.19	3.07	0.37	-0.33	627	2
Milwaukee	0.22	0.14	2.80	0.47	0.26	618	3
Richmond	0.27	0.18	2.36	-0.11	0.08	290	2
Pittsburgh	0.22	0.16	1.94	0.15	0.09	428	3
Newark	0.19	0.14	1.80	0.18	-0.01	469	2
Norfolk	0.27	0.2	1.78	-0.11	0.08	290	2
Boston	0.17	0.15	0.79	-0.33	-0.32	336	2
Detroit	0.16	0.14	0.50	0.08	-0.12	416	2
Indianapolis	0.21	0.21	0.10	-0.50	-0.09	172	1
Nashville	0.21	0.21	0.09	-0.47	-0.29	215	1
Jacksonville	0.19	0.2	-0.03	-0.32	-0.33	300	2
Philadelphia	0.15	0.16	-0.30	0.15	0.09	428	3
Baltimore	0.15	0.16	-0.32	-0.05	-0.24	357	2
San Jose	0.18	0.19	-0.33	0.52	0.32	483	3
Oakland	0.14	0.15	-0.43	0.52	0.32	483	3
New York	0.12	0.13	-0.50	-0.58	-0.60	254	1
Chicago	0.14	0.17	-0.90	0.04	0.23	297	2
Austin	0.16	0.2	-0.98	0.00	0.28	252	2
San Antonio	0.15	0.2	-1.12	0.00	0.28	252	2
Corpus Christi	0.15	0.22	-1.72	0.00	0.28	252	2

[a] 1= states in the bottom two quintiles, 3 = states in the top two quintiles, 2 = all other states

[b] Cities are ordered from best to worst on the standardized payment rate ratio.

Bold indicates the final constructed measure used.

Figure 1: Fathers' Contributions by Months Since Stopped Cohabiting for Ever-Cohabiting Mothers

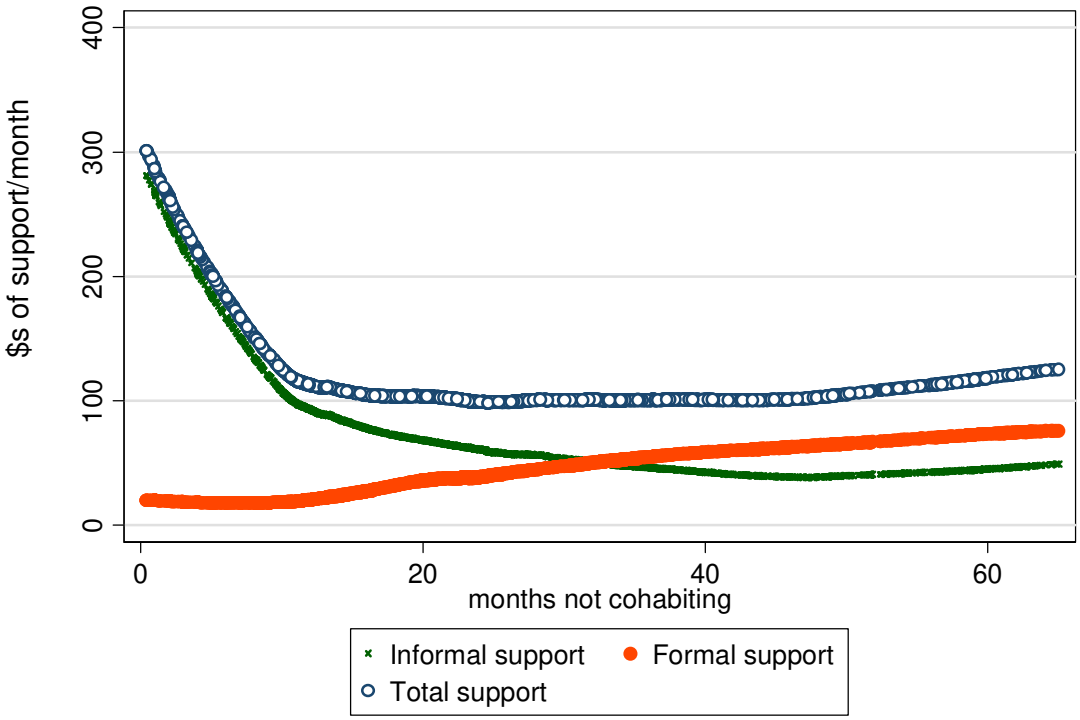

Figure 2: Fathers' Contributions by Age of Child (months) for Never-Cohabiting Mothers

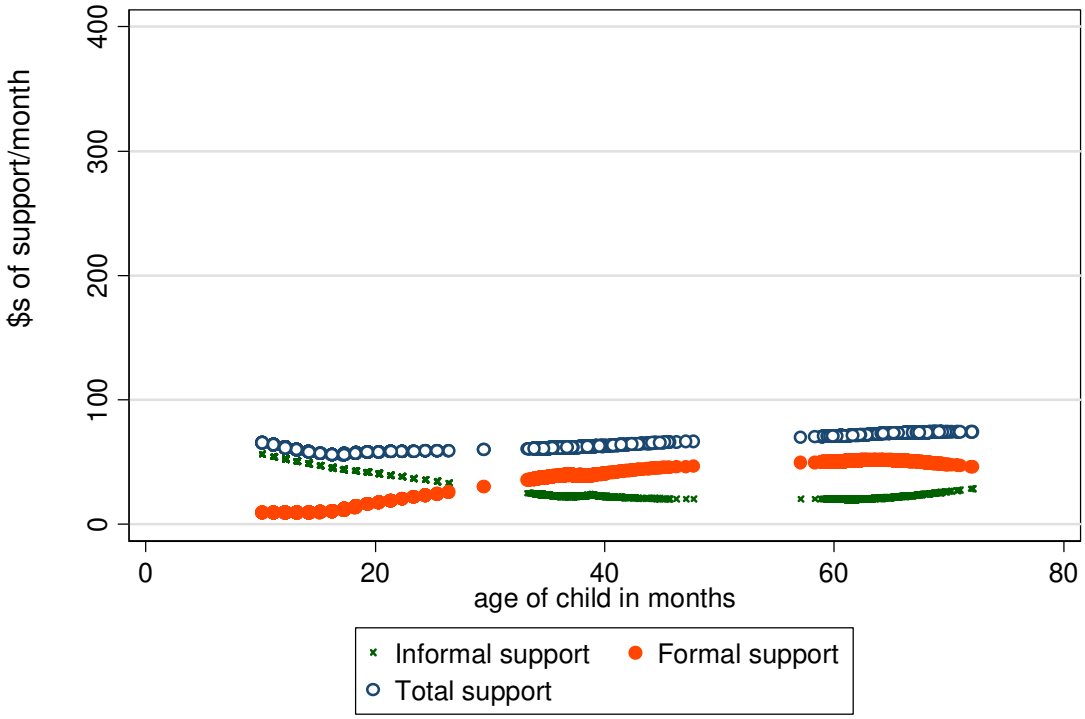

Figure 3: Interaction of Child Support Enforcement and Time Since Stopped Cohabiting on Total Support for Ever-Cohabiting Mothers

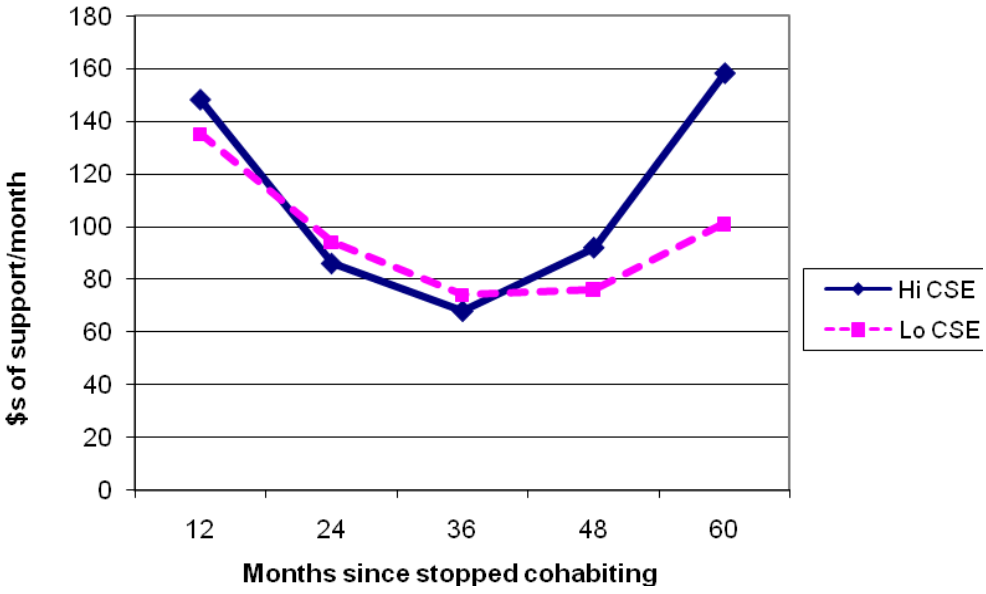

Figure 4: Interaction of Child Support Enforcement and Age of Child on Total Support for Never-Cohabiting Mothers