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Child Support Enforcement and Fathers' Contributions to Their Nonmarital Children

Lenna Nepomnyaschy and

Rutgers, The State University of New Jersey

Irwin Garfinkel

Columbia University

Abstract

This study examines the total package of child support that mothers receive from the nonresident fathers of their children, by focusing on three components of total support: formal cash, informal cash, and in-kind support. Using the Fragile Families and Child Wellbeing Study, this article considers how contributions change over time and the effects of child support enforcement on these contributions. Findings suggest that total cash support received drops precipitously over the first 15 months of living apart (as informal support drops off) and then increases slightly after 45 months (as the increase in formal support overtakes the decrease in informal support). While the study finds no effect of enforcement on total support received in the first 5 years after a nonmarital birth, the substantial differences in total cash support received by the length of time that parents have not been cohabiting suggest that strong enforcement may be efficacious over time.

Because of the increase in the rates of divorce and nonmarital child-bearing 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.¹ Research suggests that this support is positively associated with a number of child well-being indicators, such as educational attainment, schooling, and cognitive outcomes (Baydar and Brooks-Gunn 1994; Graham, Beller, and Hernandez 1994; Knox and Bane 1994; Knox 1996; Argys et al. 1998). Research from the past 2 decades shows that strong child support enforcement is associated with increases in 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 fathers to substitute formal support for informal support. Yet qualitative research reveals little about (1) the magnitude of informal cash and in-kind 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 important, the effect of child support enforcement on total (formal plus informal) child support contributions.

Today, 40 percent of all births and 72 percent of black births are to unmarried mothers (Hamilton, Martin, and Ventura 2009), who are more likely to be poor and less likely to receive formal child support than are previously married mothers (Fields 2004; Grall 2006). Informal and in-kind contributions from fathers may also be an important source of support for these families. Using data from the Fragile Families and Child Wellbeing Study, this

¹Because 82 percent of single-parent families are made up of a custodial mother and nonresident father, the article will refer to single-parent families as a unit consisting of a custodial mother, a child or children, and a nonresident father (Fields 2004).

article describes the package of support (formal cash, informal cash, and in-kind) that nonresident fathers provide for their children and examines changes over time in this package of support. This study also estimates the effect of strong child support enforcement on each type of support and, most important, on the total amount of cash support received.

Previous Research: Theory and Empirical Findings

Willingness to Pay Declines over Time

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

Willingness to pay child support (when ability to pay is held constant) varies among fathers and over time. Fathers who have lived with the mother and child are likely to have a stronger attachment to the child than those who have not, and they are therefore likely to have a greater willingness to pay (Johnson 2001). Fathers who visit their children may be more willing to pay than those who do not, because visiting fathers can monitor how their contributions are being spent and can observe their children's well-being (Weiss and Willis 1985; Argys and Peters 2003). Evidence suggests that support and visitation are positively associated, though the causal path is not clear (Seltzer, Schaeffer, and Charng 1989; Veum 1993; McLanahan et al. 1994; Rangarajan and Gleason 1998; Seltzer, McLanahan, and Hanson 1998; Peters et al. 2004; Nepomnyaschy 2007; Huang 2009). Theory also suggests that fathers' willingness to pay declines over time (Beller and Graham 1993). Once the married, cohabiting, or romantic relationship ends, most fathers and mothers move on to other relationships, and many bear new children. These new relationships, and especially the new children, may decrease the father's connection to his children and his willingness to pay (Furstenberg 1995). Empirical evidence confirms that contact with children for some, but not all (Cheadle, Amato, and King 2010), fathers declines over time (Seltzer et al. 1989; Rangarajan and Gleason 1998; Edin, Tach, and Mincy 2009), particularly in the presence of a mother's new partner (Juby et al. 2007); so too, child support is found to decline over time, particularly in the presence of the fathers' new biological children (Manning and Smock 2000), the mothers' new partner, or the mothers' new children (Rangarajan and Gleason 1998).

Many Parents Prefer Informal to Formal Child Support, Initially

Although the theories above discuss child support as a one-dimensional concept, child support payments can actually be differentiated into formal, informal (either cash or in-kind), and total cash support. Formal child support involves a legal requirement established by a court or child support enforcement agency. Under this requirement, the nonresident parent must 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. Informal cash child support involves a direct transfer from the nonresident father to the mother and involves no legal obligation. In-kind support is the fathers' contribution of any noncash goods or services directly to the mother or child. Several quantitative studies describe the prevalence of

informal and in-kind support from fathers (Teachman 1991; Nord and Zill 1996; Rangarajan and Gleason 1998; Greene and Moore 2000; Roberts 2000; Meyer and Cancian 2001; Miller and Knox 2001; Seltzer and Schaeffer 2001; Garasky et al. 2009), but only a few examine the relationship between formal and informal support. Data from the Parents' Fair Share Demonstration, which focuses on low-income fathers, provide evidence of a substitution effect between formal and informal support; fathers who are forced to pay formally decrease their informal contributions (Miller and Knox 2001). Other evidence suggests that fathers who pay formally or have a child support order contribute more informal or in-kind support than those who do not pay formally or have such an order (Rangarajan and Gleason 1998; Roberts 2000; Meyer and Cancian 2001; Seltzer and Schaeffer 2001; Garasky et al. 2009).

Although some fathers might prefer the distance from the mother that comes with a formal child support payment or the convenience of transferring support through income withholding, much evidence suggests that fathers, particularly low-income fathers, prefer informal payments (Furstenberg, Sherwood, and Sullivan 1992; Edin 1995; Edin and Lein 1997; Bradshaw and Skinner 2000; Waller and Plotnick 2001; Pate 2002; Magnuson 2006; Pate 2006). First, informal payments strengthen the father's bargaining position and his ability to monitor the mother's behavior. For example, if the mother makes access to the child difficult, the father can withhold support payments. Second, research suggests that low-income fathers have numerous barriers to finding and keeping regular jobs. These barriers include low levels of education, health problems, poor work histories, and prior incarceration records (Garfinkel, McLanahan, and Hanson 1998; Sorensen and Zibman 2001; Waller and Plotnick 2001; Pate 2002; Cancian and Meyer 2004; Sinkewicz and Garfinkel 2009). These barriers make it unlikely that they will be able to consistently meet their formal child support obligations, making informal payments preferable.

There is also evidence that low-income mothers prefer receiving informal support to receiving formal child support payments (Edin 1995; Edin and Lein 1997). First, mothers may want to avoid government involvement in their personal affairs. Second, mothers may prefer to receive informal payments in order to encourage fathers to be involved in child rearing, so long as the father is willing to pay as much or more than what the legal obligation would be. Finally, both mothers and fathers may prefer informal support if the mother is on welfare. In all but two states (Vermont and Wisconsin), child support paid on behalf of mothers on welfare is kept by the state in order to recoup public costs (in 18 states, mothers may keep the first \$50.00 of support received; Roberts and Vinson 2004). If the mother is on welfare, informal support is clearly preferable because fathers' payments can go directly to children. However, though these parents may prefer informal to formal payments, most welfare recipients are not free to choose; the mother relinquishes her right to formal child support as a condition of welfare receipt.

To summarize, the theoretical and empirical literatures on fathers' willingness to pay and parents' preferences for different types of support underscore the importance of changes over time for understanding these relationships. Theory and prior research discussed above suggest the following hypotheses: (1) when couples first split up, informal support will be the predominant mode of child support; (2) informal cash and in-kind child support will decrease as willingness to pay decreases; and (3) formal support will become more common over time as voluntary willingness to pay declines.

The Effects of Child Support Enforcement Are Ambiguous in the Short Run

Although declining willingness to pay over time provides a theoretical rationale for public child support enforcement and an ample empirical literature suggests that states with stronger child support enforcement regimes collect more child support (Garfinkel and Klawitter 1990; Beller and Graham 1993; Garfinkel and Robins 1994; Meyer et al. 1996;

Miller and Garfinkel 1999; Freeman and Waldfogel 2001; Sorensen and Hill 2004; Huang 2010), in the short run at least, the effects of enforcement on child support payments are ambiguous. If the amount that the father is willing to pay and the actual amount of informal payments are lower than the required formal obligation, enforcement can be expected to shift all informal support into formal support. If enforcement is effective, such a shift can be expected to increase formal support to the required amount and, as a result, to increase total support. This is particularly clear for fathers who do not voluntarily pay anything. However, if a father's willingness to pay is high and he contributes more than he would be formally required to pay, the establishment of a formal child support obligation can be expected to shift the required portion of the payment from informal to formal support, reducing but not necessarily eliminating informal support. In this case, if he continues to provide the same amount of support, supplementing the formal obligation with informal support, there would be no change in the amount of total support received. However, if he perceives the formal obligation as a maximum and does not supplement the formal obligation, total support would decrease.

There are two other possible scenarios in which the establishment of a formal child support obligation may be accompanied by a short-term decrease in total child support. First, in many cases, the shift from informal to formal support may occur if parents' amicable relationships end or if willingness to pay falls below what the formal obligation would be. Informal support might therefore cease before formal support begins. The lag between application for formal support and receipt of it can be quite lengthy; paternity must be established (if it was not previously established), an order must be obtained, and a payment must be secured on the order. Second, if a father is not yet subject to a formal child support obligation, the mother can use the formal system as a bargaining tool; the desire to avoid an even higher formal obligation induces the father to contribute more informally than he would voluntarily pay (England and Folbre 2002). Once the mother (or the welfare department) initiates the process to obtain a formal award, however, the father no longer has an incentive to voluntarily pay more than that award, and payment can be expected to drop to reflect his original willingness to pay.

In short, theory provides no clear prediction about the short-term effects of strong child support enforcement on total child support payments. However, theory and empirical literature suggest that fathers' willingness to pay declines over time. If this is the case, the gap between the formal obligation and willingness to pay increases over time, and the effect of enforcement on total child support received is likely to increase over time. Thus, the current study examines two additional hypotheses: child support enforcement will become more effective as the child support obligation ages, and total cash support will be higher in states with stronger enforcement regimes.

Although the preceding discussion notes the ample empirical evidence that strong child support enforcement is associated with increases in formal child support payments (Garfinkel and Klawitter 1990; Beller and Graham 1993; Garfinkel and Robins 1994; Meyer et al. 1996; Miller and Garfinkel 1999; Freeman and Waldfogel 2001; Sorensen and Hill 2004; Huang 2010), none of these studies examines the effect of enforcement on informal or in-kind payments and, most important, on total cash support received. Furthermore, because much of the above research analyzes data from samples dominated by previously married parents and those whose cohabiting or romantic relationships ended some time ago, even less is known about the relationship between enforcement and support for unmarried parents with young children. Finally, all of these studies are based on cross-sectional data from samples with a mix of child support obligations (less than 1 year to up to 21 years). None of the previous research focuses on changes in the effectiveness of enforcement as the obligation ages and willingness to pay declines.

The current study contributes to prior literature in several ways. First, it focuses on parents with nonmarital births. Such births now represent 40 percent of all births in the United States and a large and growing proportion of the child support enforcement caseload. Second, this is the first study 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, the study examines the effects of time on the relationship between enforcement and child support outcomes during the first 5 years of the potential child support obligation.

Data and Measures

This research uses data from the Fragile Families and Child Wellbeing Study, which examines the conditions and capabilities of new unwed mothers and fathers as well as the well-being of their children. The baseline data, collected between 1998 and 2000, are from a sample of 4,898 live births (3,711 nonmarital and 1,187 marital) in 75 hospitals in 20 large U.S. cities (15 states).² The data are representative of non-marital births in each of the cities sampled and in all U.S. cities with populations of 200,000 or more. Mothers and fathers were interviewed in the hospital shortly after their child's birth. Follow-up interviews were conducted when the child was 1, 3, and 5 years old. For a detailed discussion of the Fragile Families study design, see Nancy Reichman and colleagues (2001). This article uses data from the first four interview waves. These data hereafter are respectively described as the baseline, 1-year, 3-year, and 5-year surveys.

This study is based on 4,601 repeated observations (2,181 unique observations) of mothers who had nonmarital births, who were not cohabiting with the father of the focal child at each particular wave, who were reinterviewed at least at the 1-year follow-up (most mothers were interviewed at subsequent waves as well), and for whom data are not missing on the dependent variables at each wave. Actual sample sizes for each follow-up wave are 1,414 (1-year survey), 1,535 (3-year survey), and 1,652 (5-year survey).³ The increasing sample sizes reflect the trend that rates of cohabitation among unmarried couples fall 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), these fathers are excluded from the main analyses for two reasons.⁴ First, excluding cohabiting fathers is consistent with most prior studies, which focus on custodial mothers and nonresident fathers. Second, they are excluded because measures of informal cash and in-kind contributions for cohabiting fathers are not compatible with those for noncohabiting fathers.⁵ Approximately 500 observations across all waves (423 unique observations) were dropped because of missing data on the dependent variables. Appendix table A1 compares the analysis sample with the sample dropped for missing data. This comparison reveals that the

²The following 20 cities in 15 states are included in the survey: Oakland, California; San Jose, California; Austin, Texas; Corpus Christi, Texas; San Antonio; Richmond, Virginia; Norfolk, Virginia; Philadelphia; Pittsburgh; Newark, New Jersey; New York City; Nashville; Toledo, Ohio; Milwaukee; Chicago; Indianapolis; Jacksonville, Florida; Baltimore; and Detroit.

³Of the 3,700 unmarried mothers in the baseline sample, 3,293 were reinterviewed at the 1-year follow-up. Of these, 50 percent (approximately 1,600) were not cohabiting with the father at that follow-up. At the 3-year interview, 3,009 mothers who were unmarried at baseline were reinterviewed. Of these, 58 percent (approximately 1,700) were not cohabiting at that point. At the 5-year interview, follow-up interviews were conducted with 2,921 mothers who were unmarried at baseline. Of these, 66 percent (approximately 1,900) were not cohabiting at that time.

⁴Only 18 percent of fathers who were cohabiting with the mother at the 5-year survey have a child support order, and 14 percent made a formal payment in the year prior to the survey.

⁵The cash and noncash contributions of nonresident fathers are explicit and relatively well measured in the data because they involve cross-household transfers. Some contributions by 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 by resident fathers are implicit and arise from sharing such household expenses as rent, utilities, and food. These implicit transfers are more difficult to measure in general and are not well measured in the Fragile Families data.

two samples are similar on all variables except whether the father has children with other mothers (lower for the missing-data sample), difference in parents' ages, difference in parents' education levels (differences are larger in the missing-data sample), fathers' age (the missing-data sample is older), fathers' employment status at the baseline (the percentage reported to be employed is lower in the missing-data sample), fathers' disability (the missing-data sample has higher rates), and age of child (children of parents in the missing-data sample are older).

This study relies solely on mothers' reports about fathers' characteristics and contributions. This choice is a response to a trade-off between two types of potential bias: nonresponse bias due to missing fathers and measurement error due to mothers' underreporting of fathers' contributions. Although the proportion of unwed fathers identified and interviewed in the Fragile Families study is very large compared with the proportions in other national surveys, about 25 percent of fathers in the Fragile Families data were not interviewed at the baseline survey. Compared with fathers interviewed in the Fragile Families baseline survey, those who were not interviewed are much less likely to have cohabited previously or to be romantically involved with the mother at the time of the child's birth. Fathers not interviewed at baseline also are much less likely to exhibit signals of commitment to and involvement with the child (Teitler, Reichman, and Sprachman 2003). Therefore, focusing only on fathers who were interviewed could introduce substantial nonresponse bias. However, mothers may underestimate the level of child support received from the father. This type of bias may be particularly problematic for measuring informal and in-kind support if fathers make direct purchases for children and mothers are unaware of those purchases. In addition, mothers on public assistance may underestimate the amount of formal support from fathers because the support is mostly diverted by the state to recoup welfare costs. In comparing administrative data of formal child support paid with mothers' and fathers' reports of support, prior research finds that mothers underreport and fathers overreport child support payments; however, mothers' reports of support received were closer to the administrative data than were fathers' reports (Schaeffer, Seltzer, and Klawitter 1991). Because of the high response rates for mothers and the lower likelihood of systematic differences between those interviewed and those not interviewed for mothers than for fathers, the current study chooses to focus on mothers' reports. In the 1-year Fragile Families survey, mothers report the amount of child support received (the 1-year survey is the only one for which data are available on fathers' reports of child support paid). These reports are compared with fathers' reports on the amount of support paid. The results suggest that parents' reports of support received are very closely related. For example, 76 percent of mothers and 72 percent of fathers report informal support; 12 percent of mothers and 16 percent of fathers report formal support; and 74 percent of mothers and 87 percent of fathers report in-kind support. If these findings are compared with the main models' estimates of the effect of child support enforcement on contributions, the results from matched samples of mothers' and fathers' reports from the 1-year survey are strikingly similar. Another analysis examines whether mothers' and fathers' reports of formal support differ by whether the mother received welfare, and there is no evidence that mothers on welfare misreport the amount of formal support received.

Outcome Measures

This study measures 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 financial contributions made outside the formal system; total cash support, which is the sum of formal child support and informal cash support; and noncash contributions, which are referred to as in-kind support. Mothers are asked how much formal and informal cash support the father paid in the 12 months prior to the

interview.⁶ Because the amount of formal support that mothers received in that period 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, a measure is created to examine child support received per month of eligibility to receive formal support. It is 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 as 0. To measure informal cash support, the amount reported is divided by the number of months that parents have not been cohabiting (or the entire reporting period for those not cohabiting the entire time). The monthly formal and informal cash results are summed to construct the amount of total cash support received per month.

Mothers are asked how often in the year prior to the interview the father purchased clothes, toys, medicine, food, or anything else for the child. Possible responses include often, sometimes, rarely, or never. Among items that mothers say fathers often purchase, food is the most commonly reported item (22 percent of fathers are said to purchase this often). This is followed by clothes (19 percent), toys (17 percent), medicine (15 percent), and other items (9 percent). For the analyses in this study, mothers' responses of "often" or "sometimes" are combined to create a more inclusive measure of in-kind support received. The proportions of mothers reporting "often" or "sometimes" for each category of in-kind support are 37 percent for purchases of food, 38 percent for purchases of clothes, 39 percent for purchases of toys, 28 percent for purchases of medicine, and 12 percent for purchases of other items. Ideally, a dollar value for measures of in-kind support could be identified, but the structure of the survey questions make this impossible. First, it is not possible to estimate how much of an item was purchased. Second, it is not possible to define the meanings of "often" or "sometimes." A recent study, based on a small qualitative sample with a much more detailed measure of in-kind support, estimates that mothers receive approximately 40 percent of informal support in the form of in-kind support (Kane and Edin 2008). These results suggest that in-kind support is less important to mothers than informal cash support but very much worth considering in future quantitative research. All of the father contribution variables are measured similarly at each of the follow-up surveys (1-year, 3-year, and 5-year).

Child Support Enforcement

In this article, the primary measure of the strength of child support enforcement, based on city-level data from the 2000 census, is a ratio of the proportion of mothers receiving child support to the predicted probability of receiving child support in a given city. This ratio is adjusted for a number of individual- and city-level characteristics. Specifically, a sample of never-married mothers in the 20 cities that are represented in the Fragile Families data is extracted from the 5 percent sample of the Public Use Microdata Samples (PUMS) of the 2000 census. The sample sizes of never-married mothers in the PUMS range from 67 in Corpus Christi, Texas, to 6,999 in New York.⁷ From these data a dichotomous measure is created for whether a mother reports receiving any child support.⁸ When aggregated to the city-level, this measure represents the proportion of unmarried mothers in a given city

⁶Mothers who were not able to provide the exact amount of child support in the first question were then asked a follow-up question that allowed them to estimate support received by choosing one of seven ranges of payments. The analysis assigns the midpoint of the following ranges for these mothers and includes these amounts in the continuous measures of support received: < \$500; \$500–\$1,000; \$1,001–\$2,000; \$2,001–\$3,000; \$3,001–\$4,000; \$4,001–\$5,000; \$5,001–\$10,000; and > \$10,000. Midpoints are assigned to 4 percent of mothers for formal support and to 9 percent of mothers for informal support.

⁷Corpus Christi is an outlier in terms of sample size; the next smallest city sample is for Richmond. That sample has 301 never-married mothers.

⁸The 2000 census did not ask specifically about child support income. The "Other Income" category is used here as a proxy child for support income. If a similar category is created in data from the Survey of Income and Program Participation, child support payments are found to make up over 90 percent of this other income for unmarried mothers. The authors are therefore confident that the Other Income category is an acceptable proxy for the child support income for this group of mothers.

receiving child support; however, the measure may not be a good indicator of the strength of enforcement in that city, since the probability of receiving support may be strongly associated with the demographic composition of the city. For example, cities with high proportions of low-income families will have worse child support outcomes than will cities with high proportions of more advantaged populations, and these differences may be unrelated to the vigor of the child support enforcement system. Similarly, the probability of receiving child support in a given city may be associated with the strength of the labor market in that city. Therefore, the analyses adjust the raw child support payment rate with a number of individual- and city-level characteristics measured in 2000.⁹

Specifically, the dichotomous variable for whether a mother received a child support payment is regressed on indicators for the mother's race and ethnicity, age, education, and nativity (i.e., whether the mother was born in the United States), as well as the number of her children, whether she has a child under age 6, the city poverty rate among families with children younger than age 18, and the city unemployment rate in 2000. This equation is used to predict an aggregate, city-level probability of receiving support. The raw aggregate proportion of mothers receiving support is then divided by this adjusted probability in each city. This ratio is standardized (converted to a z-score) so that a 1-unit change represents a change of 1 standard deviation. Finally, this city-level aggregate measure is merged to the individual-level data by city of mothers' residence.

Measuring child support outcomes as a ratio of actual support to expected child support outcomes is the best single measure of the strength of child support enforcement because this measure encompasses not only the interaction of the strength of child support laws and the fiscal effort to enforce the laws but also the efficacy of city practices and the competence of the city bureaucracy in implementing laws. A state may be a leader in passing child support legislation, but its laws may not actually be 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 use state-level measures of enforcement. Although legislation and expenditures are state-level indicators, laws are implemented locally. Therefore, using city-level indicators of the strength of enforcement captures this local variation in implementation and creates a measure that is more valid than the state indicators used in previous studies. Although this study's measure of child support enforcement is purged of observed variables that could influence child support payments, unobserved differences across cities, rather than the strength of enforcement, may lead to increases in child support payments. For this reason, as a robustness check, a more exogenous measure of the strength of child support enforcement is also examined. That measure is based on state child support policies and state expenditures for child support enforcement.

This alternate measure of enforcement is an interaction of child support policies and state expenditures for child support and is based on the work of Richard Freeman and Jane Waldfogel (2001), which found that policies and expenditures on child support must be considered together. The legislative component measures when a state has enacted laws in seven specific areas. Three of these pertain to paternity establishment: allowing fathers to establish paternity until the child reaches age 18, mandating genetic testing to establish paternity of children born to mothers receiving Temporary Assistance for Needy Families (TANF), and recognizing a father's voluntary acknowledgment of paternity as conclusive. The item also measures when states made universal wage withholding mandatory. Finally, the legislative item assesses when three recent, federally mandated provisions were enacted

⁹These analyses use a measure of whether a mother received child support instead of a measure of the amount received because it is likely that the amount of support will be measured with greater error than whether the mother received support.

by the state: a new-hires directory, license revocation for child support nonpayment, and automation of systems to track child support orders and payments.¹⁰ For each law, the measure captures the year in which the law became effective in the state. The time a given law has been in force is standardized to have a mean of zero and a standard deviation of one. This item is then inverted, so that the longer the law has been in force, the greater the value. The state's total expenditures on child support for 1999 are measured with data reported by the Office of Child Support Enforcement (U.S. Department of Health and Human Services 2001). The expenditures are divided by the 2000 census number of single mothers in the state. Each measure is then divided into quintiles to create a three-level categorical variable. A state in the top two quintiles on both laws and expenditures is coded as 3; a state in the bottom two quintiles on both measures is coded as 1; all other states are coded as 2. Child support outcomes are regressed on this categorical variable. The worst-performing states (coded as 1) and the medium-performing states (coded as 2) together serve as the comparison group.

Appendix table A2 presents the values for the components of the PUMS payment rate ratio (proportion of mothers receiving support to the predicted probability of receiving support) and the measure of the laws-expenditures interaction for the 20 cities in these analyses. Results for the PUMS ratio indicate that Richmond, Toledo, and Newark are the three best-performing cities. Oakland, New York City, and Corpus Christi are the three worst performing. In results for the laws-expenditures interaction, Milwaukee, Pittsburgh, and Philadelphia are estimated to be among the best-performing cities; Nashville, Indianapolis, and New York City are estimated to perform the worst.

Length of Time Parents Have Not Cohabited

As the discussion mentioned previously, the package of support that mothers receive from fathers, as well as the effect of enforcement on this support, can be expected to vary over time. A time-varying measure is therefore created to capture the length of time elapsed between the end of a father's cohabitation with the mother of the focal child and a given interview. For mothers who ever cohabited with the father, this measure is the number of months that parents have not been cohabiting; for mothers who never cohabited with the father, this measure is the age of the child in months.¹¹

Covariates

The analyses include a number of father, mother, and child characteristics that are found in prior research to be associated with fathers' ability and willingness to pay support. Because of the potential endogeneity of these measures with fathers' provision of child support, all variables are taken from the baseline interview at the time of the child's birth.¹² All variables are based on mothers' reports.

¹⁰The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 (U.S. Public Law 104-193) directs states to establish directories of information on newly hired employees (these are used to enforce child support orders). The 1996 law also authorizes states to revoke several types of licenses (driver's, business, professional, and recreational) for nonpayment of child support. Finally, PRWORA requires states to adopt automated case management systems for tracking child support payments.

¹¹The Fragile Families survey does not ask specifically for the date that the parents stopped cohabiting. Instead, the survey asks when the 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, the date they stopped cohabiting is imputed as the midpoint between the wave in which the mother reported cohabiting and the one in which she reported that they were no longer cohabiting. A small number of parents transition from nonresidency back into residency and then back into nonresidency. For these parents, the number of months that they have not been cohabiting is measured as the time elapsed since the last transition into nonresidency, and these parents are assigned an indicator flag that is included in all regressions.

¹²There are two exceptions; questions about the father's multiple-partner fertility and history of incarceration are asked only at the 1-year follow-up survey.

The basic demographic covariates include father's age, race and ethnicity, education, and mother's nativity (i.e., whether she was born in the United States) as a proxy for father's nativity (which is not available from mothers' reports). Prior research suggests that older and more educated fathers will be more able to pay child support (Beller and Graham 1993). The same research finds that the father's ability to pay support is positively associated with being born in the United States and with being white.

A number of other family characteristics are included because they are important predictors of fathers' willingness and ability to pay support: whether the father contributed cash or in-kind support during the pregnancy, whether he visited in the hospital, whether the mother reported at baseline that she wants him involved in the child's life, whether the mother indicated that the father intends to contribute in 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 incarcerated (jail or prison), whether the parents have other children together, and both parents' multiple-partner fertility (i.e., whether either parent has a child with a different partner).¹³ Many of these measures are not captured in other data sets. It is expected that fathers who have other children with this mother, have not been incarcerated, are employed, have no work-limiting disability, visited the child in the hospital, intended to contribute in the future, and contributed resources during the pregnancy and whom the mother wants involved in the child's life will be more able and willing to pay support than will fathers for whom any of these characteristics are not indicated (Beller and Graham 1993; Rangarajan and Gleason 1998; Lewis, Garfinkel, and Gao 2007). There is no clear expectation concerning fathers' multiple-partner fertility. On the one hand, fathers who have children with other mothers may have a larger child support burden and therefore may be less likely to pay than fathers who have no children with other women. There is evidence, however, that fathers are more likely to pay support for new biological children than for previous biological children (Manning and Smock 2000; Manning, Stewart, and Smock 2003). On the other hand, fathers who have a child or children with other women 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 (Meyer, Cancian, and Cook 2005). The analyses also include whether the mother reported receiving either TANF or food stamps at the time of the child's birth. This variable captures the degree of economic disadvantage in the household at the time of the child's birth and reflects the incentives and disincentives for parents to comply with the child support enforcement system (see discussion in the "Previous Research: Theory and Empirical Findings" section).

The analyses include the child's gender because there is some evidence that fathers may be more involved with male children, though findings are inconclusive (Furstenberg et al. 1983; Morgan, Lye, and Condran 1988; Diekmann and Schmidheiny 2004; Lundberg, McLanahan, and Rose 2007). Also included are three measures of the degree of difference in parents' demographic characteristics: the difference in their ages and education levels and whether they are of the same race and ethnicity. It is expected that fathers who are more similar to mothers on these attributes may be more willing to contribute to their children than fathers whose characteristics are less similar to those of mothers (Becker 1981). The unemployment rate in the city and the maximum TANF benefit in the state at the time of the child's birth are included because each may be related to the fathers' ability to pay support as well as to the mothers' need for child support. The city-level unemployment rate ranges

¹³Whether the father visited the child in the hospital at the time of birth signals his commitment to the mother and child, but it may also be a marker of paternity establishment. Ronald Mincy, Irwin Garfinkel, and Lenna Nepomnyaschy (2005) show that 42 percent of nonresident fathers established paternity at the hospital. Because paternity establishment is a prerequisite for formal child support, fathers who visit mothers in the hospital may be much more likely to pay child support than fathers who do not visit.

from 2.4 in Chicago and Nashville to 9.6 in Newark (U.S. Census Bureau 2001). The maximum TANF benefit for a family of three ranges from \$163.00 in Tennessee to \$593.00 in Wisconsin (Rowe and Roberts 2004).¹⁴

Analytic Strategy

The analyses begin by presenting sample characteristics for the unique observations of all mothers ($N = 2,181$) and separately for those who ever cohabited ($N = 1,282$) and never cohabited ($N = 899$) with the father of the focal child. Measures that vary over time (child support receipt, child's age, and number of months that parents have not been cohabiting) are averaged across waves for mothers with multiple observations. Next, the analyses describe changes in fathers' contributions to their children over time. Specifically, the changes in the dollar amounts of formal, informal, and total cash support received per month as the length of time that parents have not been cohabiting (for parents who previously cohabited) increases or as the child grows older (for never-cohabiting parents) are examined. These results are estimated using locally weighted polynomial regressions (lowess, or loess, regressions); each type of father contribution (the dependent variable) is regressed on the number of months that parents have not been cohabiting (the independent variable). Because theory provides no guide as to the functional form of the relationship between contributions and time, the analyses take a nonparametric approach. Lowess regression fits models to localized subsets of the data; greater weight is given to points nearer the point for which a response is being estimated, and smaller weight is given to those farther away. This method allows the function to vary at nearly every point (Cleveland 1979; NIST and SEMATECH 2006).

Next, multivariate regressions are estimated for each type of father contribution on the strength of child support enforcement in the city (and in the state). These analyses control for all previously discussed covariates. Standard errors in all models are adjusted for clustering at the individual level to account for multiple observations across individuals. In supplementary analyses (not shown), standard errors are adjusted for clustering at the city level to account for nonindependence of observations within cities. The results remain unchanged. Because the amounts of informal, formal, and total child support received per month are censored at zero, these analyses use tobit regressions. The results are presented as marginal effects that are conditional on being uncensored and t -statistics. Probit regression is used to estimate the probability of receiving in-kind support. These results are presented as marginal effects evaluated at the means of the independent variables and z -statistics. Because of the potential simultaneity between fathers' formal and informal support contributions, seemingly unrelated regressions that allow for the correlation of error terms between these two outcomes are also estimated (results not shown but available on request). Results are very similar to those in the simple models. Because seemingly unrelated regressions cannot be estimated within a tobit framework and because the standard errors cannot be adjusted for clustering at the individual level, results of the simple models are presented in this article. Finally, interactions of child support enforcement with the respective measures of time for both groups of mothers (ever and never cohabiting with the focal child's father) are analyzed. These estimates attempt to understand whether the effect of enforcement differs over time for the two groups. The results are presented graphically for ease of interpretation.

¹⁴Supplementary analyses substitute state dummies for the maximum TANF benefit. The results remained unchanged.

Findings

Sample Description

Table 1 presents the means of the dependent and independent variables for unique observations of mothers. These results are stratified by whether the parents ever previously cohabited and identify statistically significant differences between the groups. On average, mothers report receiving \$62.00 per month of informal cash support from fathers, but this amount varies substantially by whether parents ever cohabited. Mothers who cohabited previously with the father report receiving \$83.00 per month, and never-cohabiting mothers report receiving only \$32.00 per month. Mothers who cohabited previously also report receiving more monthly formal support (\$41.00) than do never-cohabiting mothers (\$36.00), but this difference is not statistically significant. The total cash support reported by ever-cohabiting mothers (\$123.00 per month) is almost twice that reported by never-cohabiting mothers (\$66.00 per month). Over one-third of all mothers report that they often receive in-kind support (clothes, toys, food, medicine, or other). More than half report that they sometimes or often receive in-kind support. These differences are statistically significant across the two groups of mothers (those who previously cohabited with fathers and those who did not).

At each wave, the majority of mothers (59 percent) report that they previously cohabited with the father of the focal child, and these mothers report that they stopped cohabiting with them 24 months prior to the interview. An overwhelming majority of mothers report that fathers exhibited signs of commitment to them and the child at the time of the child's birth; 77 percent report that fathers contributed money, and 74 percent say that fathers contributed other things during the pregnancy. Mothers report that 70 percent of fathers visited them and the child in the hospital at the birth, and 88 percent indicated in the baseline interview that the father intends to contribute in the future. Notably, 93 percent of mothers reported at the time of the child's birth that they want the father involved in the child's life. Not surprisingly, the values on all of these measures for fathers who previously cohabited with the mother are estimated to be higher than those for fathers who did not. However, even among fathers who never cohabited with the mother, 61 percent are reported to contribute cash during pregnancy, 54 percent are reported to contribute other things, 53 percent are reported to visit the mother and child in the hospital, and 79 percent are reported to have said that they planned to provide for the child in the future. In the baseline interview, 87 percent of mothers indicated that they want these fathers involved in their child's life. Mothers who did not previously cohabit with the father are more likely to report that fathers have children with other mothers (58 percent) than are those who previously cohabited (43 percent). Mothers who never cohabited are reportedly less likely to have other children with this father than are mothers who previously cohabited (21 vs. 34 percent). The proportion of mothers who report having children with other fathers (42 percent of those who previously cohabited; 44 percent of those who never cohabited) does not vary to a statistically significant degree by whether they previously cohabited with the father of the focal child. Surprisingly, parents' differences on race and ethnicity, education, and age do not vary to a statistically significant degree by whether they ever cohabited.

Overall, the mothers in this sample report having children with fathers who are mostly nonwhite (65 percent are non-Hispanic black; 23 percent are Hispanic), are young (76 percent are under 30), and have relatively low levels of education (37 percent have not completed high school). Only 61 percent of the fathers are reported to be employed at the time of the child's birth, and 43 percent are reported to have a prior incarceration spell (jail or prison). Fathers who previously cohabited with the mother are more advantaged on these two measures than those who never cohabited: 68 percent of those who previously cohabited were reported to be employed at baseline, but only 50 percent of those who did not

previously cohabit were reportedly employed then; 38 percent of those who previously cohabited with the mother are reported to have a prior incarceration spell, but 50 percent of never-cohabiters are reported to have a prior incarceration spell. Nearly half of mothers reported at baseline that they received TANF or food stamps, and this does not vary by prior cohabitation status. Finally, at the time of the child's birth, the mothers in our sample faced an average unemployment rate of 5.8 percent and an average maximum state TANF benefit of \$356.00 per month.

Fathers' Contributions to Children over Time

Figures 1 and 2 describe changes in fathers' cash contributions to their young children over time. Figure 1 illustrates contributions reported for fathers who previously cohabited with the mother, and figure 2 shows contributions reported for those who did not previously cohabit. The groups are described separately because their payment patterns and characteristics are so different. The reported amount of informal support received from previously cohabiting fathers drops precipitously in the first 15 months after parents stop cohabiting, but the slope then flattens out, and no further reduction is observed after approximately 45 months of noncohabitation.¹⁵ The amount of formal support increases steadily over time, surpassing the amount of informal support at approximately 36 months after the end of cohabitation. Thus, in the short term, as decreases in informal support outpace increases in formal support, there is a decrease in total support. The results suggest that there is an average lag of 15 months between the time that parents stop cohabiting and the time that a formal support agreement is put in place for mothers who ever cohabited. In the long term, as increases in formal support outpace decreases in informal support, there is an increase in total support received. Within the time period observed, however, the amount of total support received does not come close to its initial high point. The over-time decrease in informal cash support is consistent with theoretical predictions that willingness to pay declines over time. The over-time increase in formal payments suggests that child support enforcement is positively associated with formal child support. The overall trend reflected in 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 first exceeds the legally required amount but then declines steadily to fall below the legally required amount. However, the presence of a child support enforcement system (as indicated by the increase in formal support) appears to be effective enough to halt and even reverse the decline in payments.

For parents who never cohabited, the amount of support in each category is substantially smaller than that for their previously cohabiting counterparts, and there is no precipitous drop in informal support. There is, however, a large increase in formal support, from approximately \$5.00 to \$50.00 per month over time, though the slope of that trajectory levels off at the end. Finally, there is also an upward trajectory for total support received per month.

The results for receipt of in-kind support are not shown but are available from the authors. Among mothers who previously cohabited, the proportion that reports in-kind support declines from nearly 75 percent a few months after parents stop cohabiting to 40 percent at

¹⁵The data for mothers who cohabited previously are also examined within an individual fixed-effects approach to ensure that the drop in informal support is not driven by the composition of mothers in the sample. Mothers who lived with the father for the longest time (with fathers who have the highest willingness to pay support) would have the fewest months of nonresidency and could be overrepresented at the low end of the distribution. Those who lived with the father for the shortest amount of time (with fathers who have the lowest willingness to pay) could be overrepresented at the other end. Individual fixed-effects models focus only on mothers who are in the sample at all three waves and estimate changes only within individuals, holding constant all characteristics within individuals that do not vary over time. The fixed-effects results are very similar to those in fig. 1 and indicate an identically sharp drop-off of informal support after the first few months of nonresidency.

60 months. This pattern is similar to that for informal cash support for this group of mothers. Among those who never cohabited, the percentage reporting in-kind support drops from 47 percent 1 year after the child's birth to approximately 33 percent 5 years after the birth.

In short, several findings are consistent with the hypotheses. First, informal support is much more prevalent in the first few months after parents stop cohabiting than in subsequent months. Second, informal cash and in-kind support decline as willingness to pay declines. Third, formal support increases over time. Fourth, this pattern suggests that child support enforcement may have an increasingly positive effect over time; however, the pattern may also be related to fathers' increased ability to pay support over time. A few studies find evidence that fathers' ability to pay increases over time (Phillips and Garfinkel 1993; Meyer 1995; Percheski and Wildeman 2008; Garfinkel et al. 2009). Thus, an increase in the ability to pay, rather than the effects of enforcement, may be responsible for the growth in total support.

The next section explores the strength of child support enforcement and its relationship with each type of father contribution. The figures generated with nonparametric analyses suggest that the relationship between fathers' contributions and time is nonlinear and appears to be quadratic. The remaining analyses therefore include quadratic terms for measures of time.

Multivariate Analyses

Table 2 examines the city-level measure of child support enforcement and its association with each of four child support outcomes: informal cash support, formal cash support, total cash support, and the probability of receiving in-kind support. The table combines results for parents who cohabited previously with those for parents who never cohabited. However, because the two groups have radically different payment patterns, interactions of the number of months that parents have not been cohabiting (or the age of the child in months for parents who never cohabited) and the squared term with an indicator for whether parents ever or never cohabited are included in these analyses. (Table 3 displays results from separate regressions for the two groups.) Because the child support enforcement measure is converted to a z-score, the coefficient is interpreted as the change in the dependent variable associated with a 1-standard-deviation increase in the PUMS payment ratio.

The second column from table 2 indicates that mothers who live in a city with a child support enforcement regime that is 1 standard deviation above the mean are estimated to receive \$4.42 per month more in formal cash support than mothers who live in a city with a regime that is at the mean, but mothers in these higher-enforcement cities also are estimated to receive \$2.53 less per month in informal cash child support. If the two measures of cash support are combined into a measure of total child support, however, the estimated difference between the increase in formal support and the decrease in informal support shrinks from nearly \$2.00 to a statistically insignificant \$0.18. In short, the results provide very little support for the hypothesis that stronger child support enforcement leads to higher total payments in the first 5 years after a nonmarital birth.

Mothers in strong enforcement cities are also 1.4 percentage points less likely to receive in-kind support than mothers in cities at the mean. As mentioned previously, the dollar amounts of in-kind support cannot be compared with the amount of cash support received; however, it is possible to compare the sizes of these effects. In table 1, 52 percent of mothers report that they sometimes or often receive in-kind support. Thus, this coefficient (−1.4 percentage points) suggests that mothers living in a strong enforcement city are 3 percent less likely to receive in-kind support. However, in table 1, mothers report receiving \$62.00 per month in informal support and \$39.00 per month in formal support. The coefficients for informal support (−2.53) and for formal support (4.42) from table 2 suggest that mothers in

strong enforcement regimes are 4 percent less likely to receive informal cash and 11 percent more likely to receive formal cash support than those living in weak enforcement regimes. Thus, the association of strong enforcement with in-kind support is weaker than its association with informal cash support and much weaker than its association with formal support.

Compared with fathers who cohabited previously, fathers who never cohabited are much less likely to contribute either formal or informal support to their children. This finding highlights again that the two groups are distinct. The results for interactions of the months that parents have not been cohabiting (and the squared term) with whether parents ever previously cohabited are estimated to be statistically significant across the three types of cash support. This confirms 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 the authors), these interactions are evaluated graphically. The results are strikingly similar to the bivariate ones presented in figures 1 and 2.

Results from table 2 show that a number of covariates have statistically significant associations with fathers' informal cash contributions. Fathers who contributed money or other things during the pregnancy and those whom the mother wanted involved in the child's life are estimated to provide more informal cash support. Fathers who were black (as compared to white fathers), had a high school diploma or more than a high school education (as compared to those with less than high school), were 21 years old or older (as compared to those younger than 21), and were employed at baseline (as compared to those not employed) are estimated to provide more informal cash support. Mothers who reported that they had children with other fathers, that the father had children with other mothers, or that the father had a history of incarceration are estimated to receive less informal cash support than those who did not. Finally, mothers living in cities with higher unemployment rates are estimated to receive more informal cash support than those in cities with lower rates.

Only two measures of willingness to pay are found to be statistically significantly related to formal support. The amount of a father's formal support is positively associated with whether he visited the mother in the hospital at the time of the child's birth. It also is positively related to the mother's wish that he be involved in the child's life. However, estimates from a test of joint significance indicate statistically significant associations of all the willingness-to-pay variables with each type of fathers' contribution. As the discussion mentioned previously, the strong relationship between the father's visit in the hospital and the amount of formal support is probably due (in part) to the fact that his hospital visit establishes paternity. A number of demographic characteristics were also statistically significantly associated with provision of formal support. Fathers who are black (as compared to white fathers) or were previously incarcerated (as compared to those who were not) are estimated to provide less formal support. Fathers with a high school diploma, general equivalency diploma (GED), or education beyond high school (as compared to those with less than high school) and those who were employed at baseline (as compared with those unemployed) were estimated to provide more formal support. Finally, mothers who report that they were born in the United States are estimated to receive much more formal support than those who report that they were not.

The predictors of in-kind support are similar to those for informal support, but there are a few notable differences. Black fathers are much more likely to contribute in-kind support (11 percentage points, or 21 percent more) than white fathers; fathers' education is not associated with in-kind support contributions to a statistically significant degree. Only two variables are found to be statistically significant and to operate in the same direction across all four child support outcomes: previous paternal incarceration is negatively associated with

all four types of support, but paternal employment at the baseline is positively associated with all types.

Table 3 presents results from a number of alternate specifications that examine the robustness of the findings regarding the effects of differences in the strength of child support enforcement. Only the child support enforcement coefficients and *t*-values are reported. The first row reproduces results from the previous table (table 2) for ease of comparison. Table 3 disaggregates the results for the two groups of parents (those who cohabited previously and those who never cohabited). Mothers who cohabited previously with the father and who live in strong enforcement cities are estimated to receive \$4.07 less in informal support and \$6.63 more in formal support each month than mothers in cities that have the mean level of enforcement. The result is that mothers in strong enforcement cities receive \$0.76 more in total support, although the difference is not statistically significant. Child support enforcement's respective relationships with formal and informal support appear to be weaker among mothers who never cohabited with the father than they are among mothers who previously cohabited. There is no statistically significant relationship between enforcement and any of the outcomes for this group, though the \$2.76 increase in formal support approaches statistical significance. Results from table 1 show that fathers who never cohabited not only provide less of each type of support but also are less able to pay support than are fathers who previously cohabited; levels of reported prior incarceration are higher, and levels of reported employment at baseline are lower. Results (not shown) also suggest that mothers who never cohabited with the father are more likely than mothers who previously cohabited to report that the father is currently incarcerated at each wave, that she does not know who the father is, or that the father does not know about the child. This pattern of evidence suggests that cities with strong child support enforcement are no more likely than cities with weak child support enforcement to be successful in collecting money from these fathers.

Next, the analyses replicate the prior results with the alternate measure for the strength of enforcement: the interaction of laws and expenditures in the state. Mothers who live in states that are in the top two quintiles on both measures are estimated to receive \$5.95 less in informal support but \$22.03 more in formal support than those in the bottom three quintiles. As with results from the PUMS measure, however, the net effect on total child support (\$7.16 difference) is much less than the difference between the formal and informal coefficients. This \$7.16 amounts to a modest 7 percent difference in total support between the top two and bottom three quintiles, but this difference is not statistically significant. Disaggregating these results for the two groups of parents (ever and never cohabiting) suggests that mothers who previously cohabited and live in strong enforcement states receive \$16.00 more in total support, but the estimated coefficient is not statistically significant. Mothers who never cohabited with the father and live in strong enforcement states receive \$3.00 less in total support, but the estimated coefficient again is not statistically significant.

Next, the analyses examine whether there is an interactive effect between child support enforcement (city- and state-level measures) and the number of months that parents have not been cohabiting on the amount of total cash support received. Figure 3 displays results for the city-level PUMS measure of enforcement, and figure 4 displays results for the state-level measure. The interaction coefficients are presented in appendix table A3. Figures 3 and 4 present the results of separate interactions from regression models that include all previously discussed covariates for those who previously cohabited and those who never did so. The figures show predicted dollar amounts of total cash support received at 12, 24, 36, 48, and 60 months that parents have not been cohabiting (or age of child in months for parents who never cohabited) for mothers living in a city or state with the lowest level of child support

enforcement and for mothers in a city or state with the highest level of enforcement. These points in time are then connected with a line to suggest a trend.

Among previously cohabiting mothers, there is some evidence that as the time that parents have not been cohabiting increases, total support increases more and sooner in high-enforcement cities and states than in low-enforcement cities and states. By the end of the observation period (60 months of no cohabitation), this results in a \$40.00 per month (or 32 percent) difference in total support if the PUMS ratio is used (fig. 3) and a \$70.00 per month (or 56 percent) difference if the state-level measure is used (fig. 4).¹⁶ The corresponding interaction coefficients (from app. table A3) are not statistically significant for either measure of enforcement; however, the coefficients for formal support are jointly significant ($p = .08$) for the PUMS city-level measure and approach statistical significance for the state-level measure ($p = .16$). Among mothers who never cohabited with the father, estimates from both the city- and state-level measures suggest that there is no difference in the amount of support received over time between those living in strong and weak enforcement regimes, though the interaction coefficients for this group (app. table A3) jointly approach statistical significance ($p = .14$) for the city-level measure of enforcement.

In short, a more refined analysis provides some additional support for the hypothesis that stronger child support enforcement leads to higher total payments during the first 5 years after a nonmarital birth. However, the evidence is still quite weak.

Summary and Discussion

This article describes the total package of support (formal, informal, total cash support, and in-kind contributions) that mothers with non-marital births receive from the nonresident fathers of their children. It also estimates the effect of child support enforcement on these contributions.

Informal support from fathers is an important resource for these mothers. Among the mothers who previously cohabited with their child's father, informal support is more prevalent than formal support for approximately 36 months after cohabitation ends; informal support also is more prevalent for 36 months after the birth of the child for mothers who never cohabited with the child's father. Over time, total support declines steeply for the first 15 months after the child's birth (as informal support dramatically declines). It remains stable for some time (as formal support increases) and then begins to increase approximately 45 months after parents stop cohabiting. However, total support never approaches the amount received when parents first stopped their cohabiting relationship. This pattern is consistent with theoretical predictions that willingness to pay child support declines over time, and the pattern also suggests that child support enforcement may have a positive effect on support. However, an increase in fathers' ability to pay support over time may provide an alternative explanation for the upturn in total support. Testing this alternative hypothesis is beyond the scope of the current article but is an important focus for future research.

Consistent with prior research (Furstenberg et al. 1992; Edin 1995; Edin and Lein 1997; Bradshaw and Skinner 2000; Greene and Moore 2000; Miller and Knox 2001; Waller and Plotnick 2001; Pate 2002, 2006; Magnuson 2006; Garasky et al. 2009), findings in this article suggest that informal cash and in-kind support is particularly important in the lives of low-income families. Findings in this article also suggest that informal and formal support act as substitutes, rather than complements, for each other.

¹⁶The predicted mean of total support received per month for previously cohabiting parents who have not been cohabiting for 60 months is \$126.00 if all other variables included in the model are held at their means.

Strong child support enforcement is positively associated with formal support and negatively associated with informal cash support for all mothers in this study. The estimated result of these offsetting effects is that mothers living in strong enforcement regimes receive no more total cash support than those in weak regimes. This finding and the finding that strong enforcement is negatively associated with receipt of in-kind support suggest that mothers living under strong enforcement regimes may actually be worse off than those living in weak regimes. These results are startling and fly in the face of much previous research showing that child support enforcement has positive effects on child support received by mothers. This study's findings confirm the danger of ignoring informal support in these types of analyses. However, the over-time analyses provide some possibility that enforcement may have an increasingly positive effect in the long run.

For mothers who cohabited with the father when the child was born (about half of all unwed mothers), the point estimates suggest that strong enforcement first reduces and then increases total support, but standard errors are large (the enforcement $\times$ time interaction estimates are not statistically significant), and the data do not extend far enough to permit confidence about the long-term outcome. For parents who have never cohabited, strong enforcement states collect no more than weak enforcement states. Fathers who never cohabited with the mother, as compared to those who have cohabited, have a lower ability to pay child support and are more likely to be unaffected by strong child support enforcement.

Follow-up research is necessary to further explore the substitution of formal for informal support and to confirm this study's findings. First, as the discussion suggests above, future quantitative research should incorporate the value of in-kind support. Second, the analysis should be extended in time. In 2 years, the fifth wave of the Fragile Families study will be completed and publicly available. These data will allow the longitudinal analysis to be extended to 9 years after the focal child's birth. Third, this study's indicators of the strength of child support enforcement only vary among 20 cities and 15 states, and they do not vary over time. Finally, measures of fathers' earnings over time should be incorporated to formally test whether increases in total support over time are due to increases in fathers' ability to pay. Thus, it would be very useful to replicate this study using a national data set with policy variation across 50 states and over time. However, reliable measures of informal and in-kind support are limited in national data. Another limitation, inherent in studies trying to identify nonresident fathers with nonmarital births, is that cohabitation status is notoriously ambiguous and difficult to measure (Manning and Smock 2005; Teitler, Reichman, and Koball 2006; Knab and McLanahan 2007). These studies suggest that when, whom, and how one asks about cohabitation status may produce very different answers.

The implications of the findings for child support enforcement policy are somewhat ambiguous. As this study describes above, the federal government has encouraged and mandated states to strengthen child support enforcement for more than a quarter century. On the one hand, this study finds weak evidence that child support enforcement leads to long-term increases in the incomes of mothers and their children. If this is the case, the implication is to stay the course. On the other hand, the evidence is even weaker that states with strong enforcement systems do better than those with weak enforcement systems. If subsequent studies with longer-term follow-up, better measures of enforcement, and controls for fathers' earnings over time indicate that strong 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 is at best a waste of resources and does nothing for children in unmarried families; at worst, it may actually reduce these families' resources. If this is the case, substantial system adjustments should be considered. Further research is necessary before the policy implications become clear.

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Appendix A

Table A1

Comparison of Analysis Sample with Sample of Those Missing Data on Dependent Variables for Unique Observation

	Analysis Sample (<i>N</i> = 2,181)	Missing on Dependent Variables (<i>n</i> = 423)
Parents' relationship:		
Parents never cohabited	.41	.49
Parents ever cohabited	.59	.51
Fathers' commitment or willingness to pay:		
Father contributed money during the pregnancy	.77	.75
Father contributed other things during the pregnancy	.74	.70
Father visited in the hospital	.70	.71
Mother wanted father involved	.93	.91
Father intended to contribute in future	.88	.86
Father has children with other mothers ⁺	.49	.45
Mother has children with other fathers	.43	.44
Parents have other children together	.29	.30
Differences in parents' characteristics:		
Parents are of same race and ethnicity	.86	.86
Father-mother difference in education ^{a, +}	-.03 (.83)	.06 (.89)
Father-mother difference in age ^{a, **}	2.7 (5.0)	2.9 (5.3)
Sociodemographic characteristics:		
Father's race and ethnicity:		
White	.10	.11
Black	.65	.64
Hispanic	.23	.22
Other	.02	.03
Father's education: ⁺		
Did not complete HS	.37	.33
HS diploma or GED	.42	.44
More than HS	.21	.24
Father's age: ^{**}		
< 21	.20	.18
21–30	.56	.54

	Analysis Sample (<i>N</i> = 2,181)	Missing on Dependent Variables (<i>n</i> = 423)
> 30	.24	.28
Father incarcerated previously	.43	.43
Father employed at baseline [*]	.61	.52
Father has disability ^{**}	.07	.10
Mother is U.S. born	.92	.93
Mother received TANF or FS at baseline	.48	.51
Age of child (months) ^{a, *}	37.1 (4.9)	37.8 (4.0)
Male child	.53	.55

Note.—HS = high school; GED = general equivalency diploma; TANF = Temporary Assistance for Needy Families; FS = food stamps. Figures are proportions except where noted. Chi-square tests for categorical variables and *t*-tests for dichotomous and continuous variables were used to calculate statistically significant differences between the samples.

^aFigures are means, and standard errors are in parentheses.

⁺*p* < .10.

^{*}*p* < .05.

^{**}*p* < .01.

Table A2

Components of the City- and State-Level Measures of Enforcement

	City PUMS Payment Rate Ratio			State Laws × Exp. Measure		
	Mothers with Support	Predicted Probability of Support	Standardized PUMS Payment Rate Ratio ^{a,b}	Standardized Laws Index	Exp. per Single Mother (\$)	Laws × Exp. Interaction Categories ^{a,c}
Richmond, VA	.27	.16	3.21	.08	290	2
Toledo, OH	.29	.18	3.09	−.33	627	2
Norfolk, VA	.27	.17	2.76	.08	290	2
Newark, NJ	.19	.14	1.75	−.01	469	2
Milwaukee	.22	.17	1.60	.26	618	3
Pittsburgh	.22	.17	1.60	.09	428	3
Nashville	.21	.18	.67	−.29	215	1
Boston	.17	.15	.55	−.32	336	2
Indianapolis	.21	.20	.37	−.09	172	1
Jacksonville, FL	.19	.19	.08	−.33	300	2
Detroit	.16	.16	.07	−.12	416	2
Baltimore	.15	.16	−.17	−.24	357	2
Philadelphia	.15	.16	−.18	.09	428	3
San Jose, CA	.18	.19	−.28	.32	483	3
San Antonio	.15	.17	−.53	.28	252	2
Chicago	.14	.16	−.56	.23	297	2
Austin, TX	.16	.19	−.59	.28	252	2
Oakland, CA	.14	.16	−.61	.32	483	3
New York	.12	.14	−.69	−.6	254	1

	City PUMS Payment Rate Ratio			State Laws × Exp. Measure		
	Mothers with Support	Predicted Probability of Support	Standardized PUMS Payment Rate Ratio ^{a,b}	Standardized Laws Index	Exp. per Single Mother (\$)	Laws × Exp. Interaction Categories ^{a,c}
Corpus Christi, TX	.15	.18	-.83	.28	252	2

Note.—PUMS = Public Use Microdata Samples from the 2000 census; exp. = child support expenditure.

^a Indicates the final constructed measure used.

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

^c 1 = states in the bottom two quintiles on both measures; 3 = states in the top two quintiles on both measures; 2 = all other states.

Table A3

Interaction of Child Support Enforcement (City- and State-Level Measures) with Months Parents Have Not Been Cohabiting on Three Types of Fathers' Contributions

	Amount of Informal Support	Amount of Formal Support	Amount of Total Support
City-level enforcement measure:			
Ever-cohabiting parents:			
PUMS ratio × months not cohabiting	-.19 (.40)	-.58 ⁺ (1.66)	-.35 (.65)
PUMS ratio × months not cohabiting squared	.01 (.76)	.01 (1.19)	.01 (.95)
Test of joint significance, <i>p</i>	.21	.08	.32
Never-cohabiting parents:			
PUMS ratio × age of child (months)	.36 ⁺ (1.78)	.01 (.04)	.45 (1.55)
PUMS ratio × age of child (months squared)	-.01 ⁺ (1.91)	-.002 (.43)	-.01 ⁺ (1.77)
Test of joint significance, <i>p</i>	.15	.13	.14
State-level enforcement measure:			
Ever-cohabiting parents:			
State measure × months not cohabiting	1.22 (.78)	-2.32 ⁺ (1.86)	-.10 (.05)
State measure × months not cohabiting squared	-.02 (.98)	.03 ⁺ (1.66)	.001 (.05)
Test of joint significance, <i>p</i>	.46	.16	1.00
Never-cohabiting parents:			
State measure × age of child (months)	1.06 (1.42)	.29 (.25)	.58 (.59)
State measure × age of child (months squared)	-.015 (1.54)	-.003 (.22)	-.01 (.76)
Test of joint significance, <i>p</i>	.28	.96	.56

Note.—PUMS = Public Use Microdata Samples from the 2000 census. Figures are marginal effects calculated at the mean of the independent variables from tobit regressions and *t*-statistics in parentheses. Each set of coefficients are from separate regressions that control for all previously discussed variables. Standard errors are adjusted for clustering at the individual level.

⁺ *p* < .10.

Fig. 1. Fathers' contributions by months since stopped cohabiting for ever-cohabiting mothers.
 Note.—Graph is truncated at 65 months because there were very few cases that had more than 65 months of observed data.

Fig. 2.

Fathers' contributions by age of child (months) for never-cohabiting mothers. Note.—The lack of data points prior to 10 months of age and the gaps in data around 30 months of age and around 50 months of age reflect periods of data collection. Interviews were conducted during three periods: when the children were approximately 12 months, 36 months, and 60 months of age. Therefore, there are no data between these periods with child's age on the *X*-axis. Graph is truncated at 65 months because there were very few cases that had more than 65 months of observed data.

Fig. 3.

Interaction of city-level enforcement measure with months father has not lived with child on total support received. Note.—CSE = child support enforcement; cohab = cohabiting. Graph is based on a regression of the amount of total cash support received on the interaction of the city-level child support enforcement measure with length of time that parents have not cohabited (or age of child for those who never cohabited) and all the previously discussed covariates. From this regression, the amounts of total child support received in the strongest enforcement city and in the weakest enforcement city are predicted for five time points: 12, 24, 36, 48, and 60 months. These points were then connected to create a trend line.

Fig. 4.

Interaction of state-level enforcement with months father has not lived with child on total support received. Note.—CSE = child support enforcement; cohab = cohabiting. Graph is based on a regression of the amount of total cash support received on the interaction of the state-level child support enforcement measure with length of time that parents have not cohabited (or age of child for those who never cohabited) and all the previously discussed covariates. From this regression, the amounts of total child support received in the strongest enforcement state and in the weakest enforcement state are predicted for five time points: 12, 24, 36, 48, and 60 months. These points were then connected to create a trend line.

Table 1
 Characteristics and Cohabitation History of Parents since Child's Birth: Unique Observations

Variable	Proportion or Mean (SD)		
	Full Sample	Ever Cohabited	Never Cohabited
<i>N</i>	2,181	1,282	899
Fathers' contributions:			
Informal cash support per month (\$ mean) ***	62 (129)	83 (156)	32 (64)
Formal support per month (\$ mean)	39 (99)	41 (110)	36 (82)
Total cash support per month (\$ mean) ***	99 (158)	123 (185)	66 (101)
Receives any type of in-kind support often ***	.36	.44	.24
Receives any type of in-kind support often or sometimes ***	.52	.61	.40
PUMS payment rate ratio	.51 (1.26)	.52 (1.27)	.49 (1.26)
Parents' relationship:			
Never cohabited	.41		
Ever cohabited	.59		
Months parents have not been cohabiting		24 (8.5)	
Fathers' commitment or willingness to pay:			
Father contributed money during the pregnancy ***	.77	.88	.61
Father contributed other things during the pregnancy ***	.74	.87	.54
Father visited in the hospital ***	.70	.83	.53
Mother wanted father involved ***	.93	.97	.87
Father intended to contribute in future ***	.88	.95	.79
Father has children with other mothers ***	.49	.43	.58
Mother has children with other fathers	.43	.42	.44
Parents have other children together ***	.29	.34	.21
Differences in parents' characteristics:			
Parents are of same race and ethnicity	.86	.86	.86
Mother-father difference in education	-.03 (.85)	-.03 (.84)	-.03 (.86)
Mother-father difference in age (years)	2.7 (5)	2.7 (5)	2.7 (5)
Sociodemographic characteristics:			

Variable	Proportion or Mean (SD)		
	Full Sample	Ever Cohabited	Never Cohabited
Father's race and ethnicity: ***			
White	.10	.12	.06
Black	.65	.60	.71
Hispanic	.23	.26	.20
Other	.02	.02	.03
Father's education: ***			
Did not complete HS	.37	.37	.36
Has HS diploma or GED	.42	.42	.43
Has more than HS	.21	.21	.21
Father's age:			
< 21	.20	.18	.20
21–30	.56	.57	.56
> 30	.24	.25	.24
Father incarcerated previously ***	.43	.38	.50
Father employed at baseline ***	.61	.68	.50
Father has disability	.07	.06	.07
Mother is U.S. born	.92	.91	.93
Mother received TANF or FS at baseline	.48	.48	.48
Age of child (months) ***	37 (4.9)	36 (5.9)	38 (2.1)
Male child ⁺	.53	.51	.55
City and state characteristics:			
MSA unemployment rate at child's birth	.058 (.02)	.058 (.02)	.059 (.02)
Maximum state TANF benefit at child's birth (\$100)	3.56 (1.36)	3.52 (1.36)	3.60 (1.35)

Note.—PUMS = Public Use Microdata Samples from the 2000 census; HS = high school; GED = general equivalency diploma; TANF = Temporary Assistance for Needy Families program; FS = food stamps; MSA = metropolitan statistical area. Unless otherwise specified, results are presented as means, and SDs are enclosed within parentheses. Chi-square tests for categorical variables and *t*-tests for dichotomous and continuous variables were used to calculate statistically significant differences between the ever- and never-cohabiting samples.

⁺ $p < .10$.

 $p < .001$.

Table 2
City-Level Child Support Enforcement and Four Types of Fathers' Contributions

	Informal Support ^a	Formal Support ^a	Total Support ^d	In-Kind Support ^b
Measure of enforcement:				
PUMS city payment ratio	-2.53* (2.31)	4.42** (3.39)	.18 (.13)	-.014* (1.69)
Months parents have not cohabited ^c	-4.66*** (7.44)	2.14** (3.51)	-4.16*** (5.60)	-.005* (1.79)
Months parents have not cohabited squared ^c	.05*** (6.35)	-.01 (.93)	.06*** (6.31)	.0001+ (1.69)
Interaction of time × parents' cohabitation:				
Months parents have not cohabited × never cohabited ^c	-.03** (3.24)	-.02** (2.66)	-.06*** (4.80)	-.001 (.36)
Months parents have not cohabited squared × never cohabited ^c	-.10** (3.57)	-.10** (2.48)	-.14*** (4.96)	.0000 (.26)
Fathers' commitment or willingness to pay:				
Father never cohabited with mother	-21.39* (2.19)	-33.72** (2.95)	-51.03*** (4.17)	.010 (.16)
Father contributed money during pregnancy	22.27*** (5.13)	-.55 (.10)	19.03*** (3.45)	.111** (3.66)
Father contributed other things during pregnancy	6.54+ (1.65)	-4.98 (.98)	.46 (.09)	.090** (3.08)
Father visited mother in the hospital	1.38 (.39)	13.06** (2.87)	12.51* (2.66)	.102*** (4.17)
Mother wanted father involved	14.81* (2.11)	24.83* (2.74)	35.26*** (4.02)	.157** (3.34)
Father intended to contribute in future	5.79 (1.13)	-5.17 (.73)	-.43 (.06)	-.045 (1.22)
Father has children with other mothers	-8.65* (2.70)	-2.36 (.61)	-10.64* (2.63)	-.094*** (4.32)
Mother has children with other fathers	-9.56** (3.11)	-2.45 (.65)	-13.06*** (3.33)	.019 (.88)
Parents have other children together	-.24 (.07)	-2.93 (.72)	-2.33 (.53)	-.017 (.75)
Differences in parents' characteristics:				
Parents are of same race and ethnicity	4.33 (.92)	-2.01 (.39)	2.94 (.51)	.049 (1.62)
Father-mother difference in education	-4.09* (2.08)	-5.02* (2.12)	-9.06*** (3.74)	.019 (1.38)
Father-mother difference in age	-.17 (.50)	-.40 (.94)	-.41 (.98)	-.001 (.58)
Sociodemographic characteristics:				
Father's race and ethnicity:				
White (reference group)				
Black	10.43+ (1.75)	-14.37* (2.54)	-6.06 (.87)	.110** (2.99)
Hispanic	1.51 (.20)	-.06 (.01)	-1.64 (.21)	.016 (.38)

	Informal Support ^d	Formal Support ^d	Total Support ^a	In-Kind Support ^b
Other	3.23 (.24)	-6.66 (.45)	-4.88 (.32)	.143 ⁺ (.194)
Father's education:				
Did not complete HS (reference group)				
HS diploma or GED	7.12* (.207)	14.08** (3.18)	17.74*** (3.98)	-.029 (1.15)
More than HS	13.28* (2.63)	28.66*** (4.83)	37.90*** (5.87)	-.032 (.96)
Father's age:				
< 21 (reference group)				
21-30	6.19 (1.65)	1.78 (.38)	12.18* (2.54)	.023 (.84)
> 30	13.78* (2.62)	6.49 (.93)	22.50*** (3.23)	.049 (1.30)
Father incarcerated previously	-13.41*** (4.20)	-10.37* (2.66)	-19.44*** (4.86)	-.142*** (6.53)
Father employed at baseline	11.67** (3.59)	23.08*** (5.83)	28.35*** (7.24)	.095*** (4.20)
Father has disability	4.48 (.74)	-.47 (.06)	4.10 (.53)	.033 (.78)
Mother is U.S. born	-7.74 (1.28)	27.27** (3.19)	5.55 (.71)	.083* (2.04)
Mother received TANF or FS at baseline	-.83 (.29)	-3.15 (.89)	-4.70 (1.27)	.013 (.62)
Age of child (months)	.08 (.45)	-.50* (2.32)	-.33 (1.46)	-.003** (3.17)
Male child	-3.19 (1.14)	-.57 (.17)	-2.09 (.59)	.003 (.18)
City or state characteristics:				
City unemployment rate at baseline	201.11* (2.60)	-106.52 (1.20)	58.88 (.62)	.551 (1.13)
Maximum state TANF benefit (\$100)	-.41 (.36)	-.41 (.30)	-.70 (.51)	.007 (.96)
Observations	4,601	4,601	4,601	4,521

Note.—PUMS = Public Use Microdata Samples from the 2000 census; HS = high school; GED = general equivalency diploma; TANF = Temporary Assistance for Needy Families program; FS = food stamps. Standard errors are adjusted for clustering at the individual level. Figures in parentheses are *t*-statistics in tobit regressions and *z*-statistics in probit regressions.

^aFigures are marginal effects calculated at the mean of the independent variables from tobit regressions.

^bFigures are marginal effects calculated at the mean of the independent variables from probit regressions.

^cThe child's age in months is entered for parents who never cohabited since the child's birth.

⁺*p* < .10.

**p* < .05.

***p* < .01.

 $p < .001$

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Table 3

Tobit Regressions of Fathers' Contributions Comparing Two Measures of Child Support Enforcement and Two Groups of Parents

	Amount of Informal Support	Amount of Formal Support	Total Support
PUMS city payment ratio:			
All nonresident parents ($N = 4,601$) ^a	-2.53 * (2.31)	4.42 ** (3.39)	.18 (.13)
Ever-cohabiting parents ($n = 2,188$)	-4.07 * (2.12)	6.63 ** (3.33)	.76 (.33)
Never-cohabiting parents ($n = 2,413$)	-1.19 (1.11)	2.76 (1.60)	.15 (.09)
State-level policy measures:			
All nonresident parents ($N = 4,601$)	-5.95 (.92)	22.03 * (2.72)	7.16 (.89)
Ever-cohabiting parents ($n = 2,188$)	2.66 (.24)	28.02 * (2.21)	16.28 (1.19)
Never-cohabiting parents ($n = 2,413$)	-11.70 * (1.69)	16.50 (1.65)	-2.66 (.30)

Note.—PUMS = Public Use Microdata Samples from the 2000 census. Figures are marginal effects calculated at the mean of the independent variables from tobit regressions, and *t*-statistics are in parentheses. Each coefficient is from a separate regression that controls for all previously discussed variables. Standard errors have been adjusted for clustering at the individual level.

^aOriginal results (repeated from table 2).

*
 $p < .05$.

**
 $p < .01$.