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Child Care Subsidies, Maternal Well-Being, and Child-Parent Interactions: Evidence from Three Nationally Representative Datasets

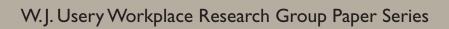Chris Herbst
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Child Care Subsidies, Maternal Well-Being, and Child-Parent Interactions:
Evidence from Three Nationally Representative Datasets

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Abstract

A complete account of the U.S. child care subsidy system requires an understanding of its implications for both parental and child well-being. Although the effects of child care subsidies on maternal employment and child development have been recently studied, many other dimensions of family well-being have received little attention. This paper attempts to fill this gap by examining the impact of child care subsidy receipt on maternal health and the quality of child-parent interactions. The empirical analyses use data from three nationally representative surveys, providing access to numerous measures of family well-being. In addition, we attempt to handle the possibility of non-random selection into subsidy receipt by using several identification strategies both within and across the surveys. Our results consistently indicate that child care subsidies are associated with worse maternal health and poorer interactions between parents and their children. In particular, subsidized mothers report lower levels of overall health and are more likely to show symptoms consistent with anxiety, depression, and parenting stress. Such mothers also reveal more psychological and physical aggression toward their children and are more likely to utilize spanking as a disciplinary tool. Together, these findings suggest that work-based public policies aimed at economically disadvantaged mothers may ultimately undermine family well-being.

I. Introduction

The primary funding stream for child care assistance in the United States is the Child Care and Development Fund (CCDF), a program that was established alongside the passage of welfare reform in 1996.[1] A key feature of the CCDF is the substantial flexibility granted to state authorities in the design and administration of the subsidy system. In exchange for this increased flexibility, however, CCDF rules stipulate that funds can only be used to defray child care expenses for parents engaged in a state-defined work activity, which includes paid employment, job training, and education.[2] The creation of an employment-based child care subsidy system represents an important shift in the U.S.'s approach to early care and education policy, but one that is reflected throughout much of the contemporary social safety net. Indeed, since its creation in 1996, CCDF child care subsidies have become an increasingly important policy tool aimed at raising work levels among economically disadvantaged women with young children.

A full account of the U.S. child care subsidy system requires a thorough understanding of the ways in which subsidies influence both parents and their children. With respect to parents, the most heavily studied outcome is employment, which is not surprising in light of the CCDF's work mandate. Accordingly, a large number of studies have consistently found large, positive effects of child care subsidy receipt on parental employment (e.g., Blau & Tekin, 2007; Herbst, 2010a; Tekin, 2005; 2007a; 2007b) as well as participation in education and job training (Herbst & Tekin, 2011a).

Although it is well-established that child care subsidies have been effective at moving low-skilled women into the labor force, there are growing concerns over the implications of employment-based subsidies for child and maternal *well-being*. (e.g., Adams & Rohacek, 2002; Blau, 2001; Herbst & Tekin, 2010a; 2010b). Regarding child well-being, these concerns appear to find support

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[1] As of FY 2009, approximately $9.1 billion in combined federal and state funds were spent through the CCDF to assist more than 1.6 million children ever month living in 953,400 families (Administration for Children and Families, 2011).
[2] For example, in exchange for this increased flexibility, states were required to engage specified percentages of their caseloads in welfare-to-work activities, or face financial penalties.

across several strands of the empirical literature. First, a large body of work consistently finds that, by itself, early and later maternal employment leads to small reductions in children's cognitive ability (e.g., Brooks-Gunn et al., 2002; James-Burdumy, 2005; Ruhm, 2004; 2008), increases in a number of adverse health outcomes (Morrill, 2011), and increases in childhood obesity (Anderson et al., 2003). Second, a number of papers have studied directly the impact of child care subsidies on preschool-aged children's health and development. This work finds that subsidy receipt lowers cognitive ability test scores, increases a variety of behavior problems, and increases the prevalence of overweight and obesity (Herbst & Tekin, 2010a; 2010b; 2011b; 2012).[3]

In this paper, we turn our attention to the question of whether child care subsidies influence other dimensions of family well-being, namely maternal physical and mental health and the quality of child-parent interactions.[4] We hypothesize that subsidy receipt may affect family well-being through several mechanisms. First, the work requirement embedded in the CCDF forces a shift in mothers' time allocation from non-market activities—including leisure and time spent with children—to formal work. As a result, employment-based child care subsidies increase the opportunity costs associated with leisure, thus making time-intensive well-being investments less likely. Subsidized mothers may therefore participate in fewer recreational activities, spend less time exercising and maintaining a healthy diet, and decrease the utilization of formal medical and mental health services.

Aside from the shift in time allocation, the employment-driven effects of child care subsidies may depend on the characteristics and quality of the jobs in which mothers are engaged. It is possible, for example, that subsidized mothers endure substantial job-related stress because of the

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[3] A few other studies have explored the relationship between subsidy receipt and child development in the U.S. Griffen et al. (2010) and Johnson (2010) both use the ECLS-B and uncover somewhat conflicting results. The former study finds negative effects of subsidy receipt on cognitive skills, while the latter finds neutral effects. Zanoni (2010) uses data from the Chicago Public School system (specifically, third-graders for the years 2006-2007 and 2007-2010) and finds negative, albeit imprecisely estimated, effects.
[4] For expositional ease, we hereafter refer to the two clusters of outcomes explored in this study—maternal well-being and child-parent interactions—using the phrase "family well-being."

inaccessibility of reliable transportation, presence of hazardous work conditions, or unpredictable and non-standard work schedules. On the other hand, mothers may also move into family-friendly work environments with access to high-quality health insurance options, paid family and medical leave, and on-site child care arrangements. The existing empirical evidence, however, suggests that parents receiving subsidies work disproportionately in low-wage occupations that offer few training opportunities and benefits (Berger & Black, 1992; Danziger et al., 2004; Davis & Jefferys, 2007; Ha, 2009; Okuyama & Weber, 2001). Furthermore, a related literature on welfare reform shows that the introduction of Temporary Assistance to Needy Families (TANF) led to reductions in health insurance coverage and health care utilization among single mothers (Bitler et al., 2005). Given that many subsidy recipients were influenced by the TANF reforms, it plausible that they too experienced such declines.

Second, child care subsidies may affect family well-being through changes in income and consumption. Insofar as the receipt of a subsidy represents a positive income shock, such assistance is predicted to alter the mix of health-related goods and services purchased. These changes can have conflicting effects on family well-being. On the one hand, subsidy-induced increases in income may increase unhealthy activities if these are normal goods. For example, mothers' expenditures on alcohol and cigarettes could increase, and families may invest fewer resources in the home production of meals. Conversely, subsidy-induced increases in income are predicted to increase investments in personal growth and allow mothers to purchase household technologies that reduce stress and promote healthy lifestyles. Income gains may also encourage a shift away from the consumption of inexpensive calorie-dense foods (e.g., fast food) and sedentary activities (e.g., television) and toward the consumption of health-promoting foods, including fresh fruits and vegetables.

Finally, employment-based child care subsidies may reduce or fundamentally alter the nature

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and quantity of maternal time with children (Baker, et al., 2008). Children are likely to spend fewer hours per day in parental care and more hours in the care of a child care provider. Depending on the relative productivity of maternal care, this environmental shift could, by itself, have implications for child and maternal well-being. In addition, a range of parenting behaviors—from nurturance and emotional receptivity to disciplinary practices—may change, especially in the short-run, as subsidized women with little employment experience adjust to the dual demands of paid work and childrearing. In addition, several aspects of the home environment could change in ways that affect the quality of maternal interactions with the child. Meal- and bed-times might fluctuate and the types of activities that structure parent-child interactions (e.g., playing, reading, or watching television) could shift as mothers adjust to volatile work schedules or experience the physical and psychological effects of working.

Despite these important and varied mechanisms, previous research on the impact of maternal employment or child care subsidy programs on family well-being remains surprisingly sparse. A recent paper by Chatterji et al. (2011) uses the NICHD Study of Early Child Care to examine the impact of early maternal work on maternal health and parenting quality. It finds that maternal work intensity is negatively correlated with self-reported health and positively correlated with depressive symptoms and parenting stress, although the results vary somewhat when more stringent controls for selection are applied. Perhaps the most relevant paper to the current study is Baker et al.'s (2008) evaluation of Quebec's child care subsidy program (i.e., the so-called $5-per-day program). Consistent with studies of the U.S. subsidy system, this program generated a large increase in maternal employment and had mostly negative effects on child well-being. The paper also finds that parents experienced poorer health, an increase in hostile parenting, and a reduction in relationship satisfaction following the implementation of the subsidy reforms.

This paper provides the first evidence on the implications of the U.S. child care subsidy system for family well-being. A key innovation of the paper is that we draw upon three nationally representative datasets to conduct the analyses: Fragile Families and Child Well-Being Study (FFCW), Kindergarten cohort of the Early Childhood Longitudinal Study (ECLS-K), and the DDB Needham Life Style Survey. Together, these surveys provide us with a rich set of outcomes on maternal health and child-parent interactions, some of which are virtually identical across the surveys. Our outcomes focus on mothers' self-reported health status, measures of anxiety and depression caseness, parenting stress and behaviors, and a measure of global subjective well-being. Combining complementary information on family well-being using a multi-dataset strategy should add both breadth and depth to our understanding of the influence of child care subsidies on family well-being. Another innovation of the paper is the use of different empirical strategies both within and across the surveys to identify the impact of child care subsidies on family well-being. In addition to simple ordinary least squares regressions, we attempt to deal with the potential endogeneity of subsidy receipt through the use of value-added models, a unique instrumental variables strategy, and exploiting program eligibility rules to create treatment and comparison groups. Thus, a finding of similar subsidy-effects across each survey and empirical method should bolster our confidence in the results.

Our findings consistently show that child care subsidies are associated with reductions in maternal physical and mental health and poorer interactions between parents and children. For example, subsidy receipt lowers the likelihood that a mother reports being in "very good" or "excellent" health and increases the likelihood of showing symptoms consistent with anxiety, depression, and parenting stress. Subsidized mothers also reveal more psychological and physical aggression toward their children, and are more likely to utilize spanking as a disciplinary tool. Overall, our findings suggest that public policies aimed at increasing the employment of low-skilled

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mothers may undermine their health and have negative implications for the parent-child relationship. Such findings are broadly consistent with those in Herbst and Tekin (2010a; 2010b; 2011b; 2012), which find that child care subsidies have detrimental effects on *child well-being*. In the final section of the paper, we discuss the possibility that one of the mechanisms through which subsidy policy may influence child well-being is through changes in maternal well-being and other facets of the home environment. This would appear to be highly plausible in light of the new evidence presented in this paper.

II. Data and Measures

Data Sources

We draw upon three nationally representative datasets to explore the relationship between child care subsidies and family well-being.

*Fragile Families and Child Well-Being Study (FFCW)***:** The FFCW is a longitudinal birth cohort survey of approximately 5,000 children born between 1998 and 2000 in 20 medium to large U.S. cities (Reichman et al., 2001). Parents included in the FFCW were first interviewed at the time of the focal child's birth (baseline), with follow-up telephone interviews occurring when the child reached approximately 12 (one-year follow-up), 36 (three-year follow-up), and 60 months (five-year follow-up) of age. Included in these core surveys are questions regarding family formation, labor market and child care experiences, as well as an array of items tapping child and parental well-being. In addition to these periodic telephone interviews, the FFCW contains two "in-home" surveys (at 36 and 60 months) of parents and the focal child. These modules were designed to obtain detailed information on the home environment, parenting approaches, the nature of parent-child interactions, and the child's cognitive and behavioral development.[5] A unique characteristic of the FFCW is that

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[5] For extensive information on the core and in-home surveys, see http://www.fragilefamilies.princeton.edu/documentation.asp.

it provides an oversample of non-marital births, an advantageous quality given that approximately two-thirds of families receiving child care subsidies are headed by a single mother (Herbst, 2008a).[6]

Our FFCW analyses rely primarily on the 36-month core and in-home surveys, in which the maternal well-being and child-parent outcomes were measured and parents were asked about the focal child's current child care arrangements. In auxiliary analyses, we draw upon the 12-month survey—which also inquired about child care use—to explore the impact of the timing and intensity of subsidy receipt on family well-being. Of the full FFCW sample (N=4,898), our analyses rely on a subset of 3,100 children and parents, although the number of observations varies depending on the availability of data for each parental outcome. We make exclusions from the sample if the parent did not complete an interview during each of the first three waves of data collection (889 cases), the parent or child did not complete any component of the three-year in-home module (856 cases), the child did not reside with the mother at the time of the 12- or 36-month follow-up (31 cases), and data on child care subsidy receipt were missing at 12- or 36-month follow-up (22 cases).[7] Rates of item non-response on the remaining child and maternal variables are quite low, and we retain these observations by imputing zeros for the missing values and creating dummy variables to control for the possibility of non-random imputation.

Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K): The ECLS-K is a nationally representative survey of approximately 21,000 children who entered kindergarten in the fall of 1998.[8] Children in the sample are followed through the end of eighth grade, with parent and child interviews administered in the fall and spring of kindergarten (1998 and 1999) and the spring of

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[6] As discussed in Reichman et al. (2001), the original FFCW design intended to have a total sample of 4,700 births, with 3,600 (or approximately 75 percent) of those births to unmarried women.

[7] Some papers using the FFCW drop cases for at least two additional reasons. First, there are 109 cases in the original sample that have valid survey data but no weights, as these cases were not randomly sampled. All of these observations were omitted from our analysis sample because of the other sample criteria used. Second, cases from the pilot cities (Austin and Oakland) are sometimes dropped because some of the child/parental well-being measures are not standardized across the pilot and remaining cities (due to changes in the survey). We retain the cases from the pilot cities in our analysis sample, and ensure that our outcomes measures are not affected by such changes. In addition, we include in all models a dummy variable that equals unity if a child/mother was sampled in a pilot city.

[8] This discussion is based on that found in Herbst & Tekin (2010a; 2010b).

first (2000), third (2002), fifth (2004), and eighth (2007) grade. Over 20 children per school from over 1,200 public and private schools are included in the sample.

The ECLS-K analyses draw on the fall and spring of kindergarten waves of data collection, in which survey items inquiring about family well-being (spring of kindergarten) and child care arrangements (fall of kindergarten) are available. Our analysis sample retains children living with an unmarried biological mother or female guardian (related or unrelated) at the start of kindergarten. We focus on unmarried mothers because, as previously stated, this group constitutes a large majority of eligible subsidy recipients (Herbst, 2008a).[9] Exclusions from the sample are made if the child or parent is missing information on all of the outcome variables (2,236 cases) or the entire fall of kindergarten parent interview (740 cases), the questions regarding child care subsidy receipt (35 cases), and census tract identifiers (2,256 cases). We exclude an additional 12,607 children who do not meet our requirements for residence with an unmarried mother. The resulting analysis sample includes 3,378 children and their parents.[10]

DDB Needham Life Style Survey: Each year since 1975, the advertising agency DDB Needham commissions Market Facts, a commercial polling firm, to conduct the Life Style Survey on a sample of approximately 3,500 Americans. The Life Style Survey covers a remarkably diverse set of topics, ranging from consumer behavior and product preferences to recreational activities and political attitudes. Importantly for our purposes, the survey has consistently included a battery of questions about self-reported quality-of-life, and in particular, a standard question tapping global life satisfaction. These data, along with detailed information on respondents' demographic characteristics, labor market status, and state of residence, provide us with a unique opportunity to

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[9] In particular, children in our sample live with (1) a biological mother only, (2) a biological mother and a partner "father," (3) an unmarried adoptive mother who may or may not be living with a partner "father," and (4) or an unrelated, unmarried guardian who may or may not be living with a partner "father."

[10] Additional deletions are made because the mother reported a nonsensical age (6 cases), or information from parent interview could not be merged with the geographic variables (2 cases).

further study the relationship between child care subsidy policy and maternal well-being.[11]

Between 1975 and 1985, the Life Style Survey included only married individuals, which is problematic for a study of child care subsidy recipients, most of whom are single mothers. To maintain consistency in the sampling frame, we begin the observation period in 1986. We create the analysis sample by pooling cross-sections of Life Style Surveys between 1986 and 2004 and retaining unmarried women (never married, separated, divorced, and widowed) ages 18 to 45 irrespective of the presence of children in the household. Single mothers are defined as such if they have at least one child ages 0 to17. As explained in more detail in the next section, our identification strategy relies in part on the differential policy treatment of single mothers (who are eligible to receive a subsidy) and single childless women (who are ineligible to receive a subsidy). Our analytic strategy further distinguishes between single mothers with children of different ages. In particular, CCDF rules stipulate than an eligible child must be under age 13. Therefore, single mothers with children ages 0 to 12 comprise the policy treatment group, while those with children ages 13 to 17 comprise the comparison group. Our final analysis sample includes 5,669 unmarried women, of which 2,594 have at least one child in the household.

These datasets have several complementary qualities that make them advantageous for undertaking the current analysis. First, the datasets together provide a rich set of outcomes, which allows us to examine multiple dimensions of family well-being. As will be discussed in more detail below, our outcomes range from self-reported global health and happiness to domain-specific measures of anxiety, depression, and child-parent interactions. Furthermore, many of the outcomes found in the FFCW are identical to those in the ECLS-K. Thus, a finding of consistent subsidy-effects across the outcomes common to both surveys provides a powerful robustness check on the

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[11] For introductions to and detailed descriptions of the Life Style survey, please refer to Putnam (2000), Putnam and Yonish (1999), Groeneman (1994), and Herbst (2011). This is a proprietary data archive, although the 1975-1998 surveys are freely available on Robert Putnam's (2000) *Bowling Alone* website.

relationship between subsidy receipt and family well-being. Second, using these datasets together allows us to explore family well-being at multiple points during children's preschool- and school-age years. The FFCW, for example, measures subsidy receipt when children are 12 and 36 months old, while the ECLS-K measures subsidy receipt in the year before children enter kindergarten. The Life Style Survey, on the other hand, provides information on maternal well-being until children reach age 17. Therefore, we are able to examine whether subsidy receipt differentially affects family well-being throughout periods in which mothers return to work after childbirth, children spend a growing share of time in non-parental care, and after they enter formal school. Finally, these datasets allow us to explore both short- and longer-run consequences of subsidy receipt. In particular, whereas the FFCW and Life Style Survey outcomes are measured contemporaneously with subsidy receipt, the ECLS-K outcomes are measured approximately one to two years after the reference period for receiving a subsidy.[12] Given the finding in Herbst and Tekin (2010) that subsidies have attenuating effects on child well-being, it is important to examine this issue for other dimensions of family well-being.

Measures of Child Care Subsidy Receipt

The key independent variable in the FFCW and ECLS-K is a binary indicator that equals unity if a given parent's focal child is coded as receiving a child care subsidy. In the FFCW, parents during the three-year follow-up were asked whether the focal child is currently receiving non-parental child care on a regular basis (i.e., occurring at least one day per week during the previous month). Parents answering affirmatively were then asked a series of questions about specific child care arrangements as well as whether they received help paying for child care expenses. Specifically, parents were asked the following: "Does any person or any agency give you money, a voucher, or a scholarship to help pay for child care?" Seven choices were presented to parents, and we code those

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[12] Subsidy receipt in the ECLS-K is measured during the year prior to kindergarten, while data on the maternal outcomes are collected (and apply to) the spring of kindergarten.

selecting "government agency" as receiving a child care subsidy. Approximately 14 percent of FFCW children are coded as receiving subsidized care at the 36-month follow-up.

In the ECLS-K, subsidy receipt is measured in the year prior to the child's entry into kindergarten. Specifically, during the fall of kindergarten interview, parents were asked about non-parental child care arrangements utilized throughout the previous 12 months. For each arrangement, a set of follow-up questions were then directed at parents to ascertain whether any help was received in paying for child care expenses. Specifically, parents were asked the following: "Did any of the following people or organizations help to pay for this … provider to care for {CHILD} the year before {he/she} started kindergarten?" Four choices were then presented to parents, and we code those answering "a social service agency or welfare office" as receiving a child care subsidy. Approximately 13 percent of children in the ECLS-K analysis sample are coded as receiving a child care subsidy in the year prior to kindergarten entry.

We take a different approach to measuring child care subsidies in the Life Style Survey, since it does not ask explicitly about child care arrangements or help paying for care. We parameterize changes to child care subsidy policy through a state-level variable capturing total federal and state expenditures through the CCDF. In particular, we express this variable as a ratio of federal and state CCDF spending (and its predecessor programs) to the number of children ages 0 to 12 in a given state and year.[13] We then merge this aggregate information on subsidy expenditures with the Life Style Survey over the period 1986 to 2004. Total spending (per child ages 0 to 12) through the CCDF and its predecessor programs grew from zero dollars in 1986 to approximately $65 in 1996 and $176 in 2004. Such a measure has been used extensively in previous work to proxy both the generosity of states' subsidy systems and the likelihood that a given low-income family will receive

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[13] Congress repealed three Title IV-A programs, and along with money from the Child Care and Development Block Grant (CCDBG), consolidated these funding streams to create the CCDF in 1996. These programs were called Aid to Families with Dependent Children Child Care (AFDC-CC), Transitional Child Care (TCC), and At Risk Child Care (ARCC). The first two programs were created by the Family Support Act of 1988, and the third was created by the Omnibus Budget Reconciliation Act of 1990. Our subsidy variable includes expenditures through these pre-CCDF funding steams as well as the CCDF itself beginning in 1997.

child care assistance through the CCDF (e.g., Fang & Keane, 2004; Herbst, 2008b; Meyer & Rosenbaum, 2001; Washbrook et al., 2011). As expected, this work consistently finds that an increase in the generosity of states' CCDF spending is associated with an increase in single mothers' labor supply and a reduction in welfare participation rates.

Family Well-Being Outcomes

Together, the FFCW, ECLS-K, and Life Style Survey provide us with 14 measures of family well-being, with nine of these outcomes coming from the FFCW, four coming from the ECLS-K, and one coming from the Life Style Survey. About half of these measures deal directly with maternal well-being, while the other half focus on the quality of parental interactions with children. Tables 1 and 2 provide detailed descriptions of the FFCW and ECLS-K family well-being outcomes, respectively, and show summary statistics for each measure across subsidized and unsubsidized children. Below is a brief overview of the outcomes explored in this analysis.

The first four outcomes in Table 1 focus on maternal physical and mental health. We first examine self-reported overall health status through a binary indicator that equals unity if a given mother stated that she is in "very good" or "excellent." health[14] We then examine two dimensions of mental health—anxiety and depression—as measured by the Short Form of the Composite International Diagnostic Interview (CIDI-SF) (Nelson et al., 1998). We create a binary indicator for each that equals unity if, based on responses to several individual items, a given mother meets the clinical criteria for Generalized Anxiety Disorder or a Major Depressive Episode.[15] The mental health outcomes are particularly important for our purposes, given that previous work has found them to be influenced by maternal employment (Chatterji et al., 2011) and to influence child well-being

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[14] Specifically, the questionnaire item, as it appears in the 36-month follow-up, is: "In general, how is your health? Would you say it is (1) excellent, (2) very good, (3) good, (4) fair, or (5) poor?"

[15] Examples of the individual items assessing Generalized Anxiety Disorder include whether the mother felt excessively worried, tense, or anxious; was restless or on edge; was more irritable than usual; had tense, sore or aching muscles; and had trouble falling asleep or staying asleep. Examples of the individual items assessing a Major Depressive Episode include whether the mother felt sad, blue, or depressed; lost interesting in things; felt more tired than usual; had trouble concentrating; and felt worthless.

(NICHD, 1999). The final outcome in this cluster is a measure of parenting stress, based on four (four-point) items from the Panel Study of Income Dynamics' Child Development Supplement. Once again, this aspect of maternal well-being is found to be affected by employment (Chatterji et al., 2011) and to have implications particularly for children's behavioral outcomes (Barry et al., 2005).

The remaining outcomes in Table 1 capture various dimensions of the quality of the child-parent relationship. We first examine two outcomes related to maternal nurturance—responsive and sensitive parenting—both of which are drawn from subscales of the Home Observation for Measurement of the Environment (HOME), a widely used interviewer-based evaluation of the quality of the home environment. We express both outcomes as binary indicators that equal unity if a given mother is found to be "fully responsive" or "fully sensitive" to the child. The next two outcomes measure, respectively, psychological and physical aggression toward the child. Based on five items each from the Conflict Tactics Rating Scale (CTRS), these measures capture harsh disciplinary practices used by parents. The individual items inquire about the frequency (within the previous 12 months) of various parental actions toward the child, and we create continuous measures of psychological and physical aggression by summing over the individual categories. The final indicator of child-parent interactions is a binary indicator that equals unity if the mother reported spanking the child in the month prior to the interview. The use of spanking is an important dimension of parents' overall disciplinary approach, and there is some evidence that it is correlated with both maternal employment (MacKenzie et al., 2011; Berger, 2007) and children's behavioral development (Gershoff, 2002). In addition, given the strong correlation between spanking and the measures of psychological and physical aggression (0.31 and 0.40, respectively), a pattern of consistent effects across both sets of outcomes should bolster confidence in the results.

Table 2 provides a description of the family well-being outcomes included in the ECLS-K. As previously stated, these outcomes correspond to those found in the FFCW, and thus offer a unique opportunity to check the consistency of the estimated subsidy-effects across two independently drawn samples. A few points, however, are worth mentioning. The index of maternal anxiety is based on five items tapping the frequency during the previous week that respondents felt unusually "bothered by things," experienced restless sleep, had trouble focusing, felt fearful, and felt that everything was an effort. Many of the individual items in this index are similar to those found in the CIDI-SF—thus there is likely to be overlap between the FFCW and ECLS-K anxiety measures—but it should be noted that there is insufficient documentation in the ECLS-K to confirm that these items are drawn from the CIDI-SF. The index of maternal depression is based on the Center for Epidemiologic Studies Depression Scale (CES-D), a widely used psychiatric tool for assessing depressive moods and somatic problems. The full scale is based on 20 items measuring the number of times in the previous week that respondents felt "lonely," "sad," or "depressed" or "could not shake off the blues."[16] The measure used in this study is based on a sub-set of seven items.

The summary statistics presented in Tables 1 and 2 reveal that family well-being appears to be greater among the unsubsidized than the subsidized sample across the FFCW and ECLS-K. For example, mothers of unsubsidized children are in better overall health than those of subsidized children. Such mothers also reveal lower levels of anxiety and depression, and score lower on the measure of parenting stress. The measures of parent-child interactions displayed in Table 1 are consistent with these maternal health outcomes. In particular, mothers of unsubsidized children are more responsive and sensitive, and display less psychological and physical aggression. Consistent with this, we find that spanking is not used as frequently in unsubsidized families. Indeed, the

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[16] The full scale includes the following response categories: rarely or none of the time (less than 1 day); some or a little of the time (1-2 days); occasionally or a moderate amount of time (3-4 days); and most of all of the time (5-7 days). Although the set-set of items included in the ECLS-K retains the identical number of response categories, it does not include the number of days tied to each category.

proportion of mothers who reportedly spanked their child in the previous month is 8.5 percentage points lower when the child care is unsubsidized (52.9 percent compared to 61.4 percent).

The well-being outcome drawn from the Life Style Survey is a standard questionnaire item intended to measure respondents' life satisfaction: "I am very satisfied with the way things are going in my life these days." As previously discussed, this item measures global subjective well-being, in that it reflects an averaging of quality-of-life evaluations over multiple life domains (Fischer, 2009; Kahneman & Deaton, 2010; Kahneman et al., 1997).[17] Respondents are asked to indicate the direction and intensity of their agreement with this statement on a scale of one ("definitely disagree") to six ("definitely agree").[18] Survey-based measures of subjective well-being generally elicit views on the cognitive—or "remembered"—dimensions of one's happiness or life satisfaction as a whole, as opposed to emotional well-being—or the instantaneous feelings of happiness, sadness, and other affectations in one's short-run experiences (Kahneman & Krueger, 2006). Such measures are gaining considerable traction in policy research, as they have been used to study the well-being effects of cigarette taxes (Gruber & Mullainathan, 2005), welfare reform (Herbst, 2010), macro-economic conditions (Wolfers, 2003), and unemployment insurance (Di Tella et al., 2003).

Not surprisingly, the Life Style Survey reveals that single mothers score lower, on average, than single childless women on the measure of self-reported life satisfaction (3.24 compared to 3.65). Interestingly, whereas both groups of women are about equally represented in the top life satisfaction category (8.0 percent compared to 9.1 percent), single mothers are far more likely to be in the bottom well-being category (18.6 percent compared to 11.7 percent). This suggests that the overall life satisfaction gap between single mothers and single childless women is driven by the higher

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[17] This measure is similar to other subjective well-being measures used in the happiness literature. Perhaps the most widely used measure comes from the General Social Survey, which, since the early-1970s, has been asking survey respondents the following: ''Taken all together, how would you say things are these days—would you say that you are (3) very happy, (2) pretty happy, or (1) not too happy?'' In addition, the Eurobarometer survey asks respondents: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, and not at all satisfied with the life you lead?"

[18] The full set of responses is the following: 1 (definitely disagree), 2 (generally disagree), 3 (moderately disagree), 4 (moderately agree), 5 (generally agree), and 6 (definitely agree).

prevalence of extreme unhappiness rather than the lower prevalence of extreme happiness among single mothers.

III. Empirical Implementation and Results

In this section, we describe sequentially the empirical framework and results from the FFCW, ECLS-K, and Life Style Survey samples.

Fragile Families and Child Well-Being Study (FFCW)

We begin by considering the following baseline model for the relationship between child care subsidy receipt and family well-being:

$$(1) \qquad Y_{is} = \alpha + \gamma S_{is} + \mathbf{X'}\beta + \mathbf{P'}\varphi + \eta_s + \varepsilon_{is},$$

where Y_{is} is one of the family well-being outcomes for family (i.e., mother) i in living in state s, and S_{is} is a binary indictor of subsidy receipt. The $\mathbf{X'}$ represents a vector of family characteristics, including maternal age, race and ethnicity, marital status, educational attainment, PPVT score, pre-birth work experience; the presence of other children in the household; the presence of grandparents in the household; and family income at the 12-month interview.[19] Also included are controls for the focal child's gender, age, and low birth weight status. The $\mathbf{P'}$ represents a rich set of census tract characteristics that may be correlated with subsidy receipt and family well-being, including median household income, racial and ethnic composition, percent foreign born, gender composition, percent of female-headed households, educational attainment and employment status, percent of households receiving public assistance, neighborhood vacancy rate, and percent of housing units without phone service. We also include a set of state fixed effects, η_s, which accounts for time-invariant differences across states in macro-economic economic conditions as well as social policies aimed at low-income

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[19] Summary statistics for the control variables included in the analyses of the FFCW, ECLS-K, and DDB Needham Life Style are presented in Appendix Tables 1, 2, and 3, respectively. We show the summary statistics by subsidy receipt status for the first two samples, and separately for single mothers and single women without children for the Life Style Survey.

families.[20]   Finally, all models include a set of year-of-interview dummy variables, quarter-of-interview dummy variables, interactions between the two, and an FFCW pilot city dummy variable. The temporal survey design controls account for within-wave annual and seasonal shocks to the demand for child care subsidies that may affect family well-being, while the pilot city dummy accounts for changes to the survey design and administration after the FFCW was implemented in the pilot cities.[21]   The coefficient of interest in (1) is γ, which captures the average effect of child care subsidy receipt on family well-being conditional on a rich set of maternal and child characteristics, as well as the neighborhood and the state policy and economic environment.

An important concern in estimating (1) is the potential endogeneity of subsidy receipt. This is likely because subsidy recipients may differ from non-recipients in ways that are correlated with the measures of family well-being. While some of the differences between recipient and non-recipient families can be accounted for by the control variables in (1), other differences are unobserved or difficult to measure. For example, parents who place a higher value on market work may be more likely to seek and accept a child care subsidy. If these parents are also more resilient to stress and depression or in better physical health, then they might attain higher levels of family well-being even in the absence of a child care subsidy. On the other hand, it is possible that parents who experience difficulties adjusting to the responsibilities of parenthood may increase their effort to obtain child care assistance. In both cases, a failure to account for the unobserved differences

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[20] Note that we control for state fixed effects instead of city fixed effects because information on city-of-residence is available only for the baseline survey (i.e., the year focal child was born). State of residence, on the other hand, is available in all survey waves. Given that many FFCW participants moved in between the baseline survey and the three-year follow-up, including city-of-birth fixed effects are less relevant to the economic and social policy environment in which families reside at the time of the three-year follow-up. Nevertheless, in robustness checks, we estimate (1) with the city-of-birth fixed effects instead of the state fixed effects, and the results are virtually identical to those reported here.

[21] The 36-month follow-up was conducted over a period of three years, 2001 to 2003. In addition, interviewing took place in each month throughout this period, including June, July, and August, when the demand for child care is likely to be quite different. In robustness checks, we estimate (1) without the temporal survey design controls, and the results are very similar to those reported here. Regarding the pilot cities, the two cities are Austin and Oakland. Some studies remove from the analysis sample children born in the pilot cities, given that the survey design and administration was altered in a few domains following its implementation in the pilot cities. It was decided in this study to retain the pilot city children because they comprise a non-trivial fraction of the final analysis sample (approximately 13 percent). In addition, we were careful to ensure that the outcomes examined in this study are comparable across the pilot and non-pilot cities. We also estimated the models with the pilot city children omitted, and the results are very similar to those reported here. Nevertheless, we incorporate in all models a pilot city dummy variable to control for any remaining unobserved survey differences between the pilot and non-pilot cities.

between recipients and non-recipients that are correlated with family well-being will lead to biased estimates of the impact of child care subsidy policy.

To guard against omitted variable bias, we begin by adding clusters of control variables to (1) and observing the extent to which the coefficient on subsidy receipt changes. Results from this exercise are presented in columns (1) through (5) of Table 3. Specifically, column (1) presents the coefficient on subsidy receipt from a specification that includes only the survey design controls, while columns (2) and (3) add the maternal and child characteristics, respectively. Columns (4) and (5) add, respectively, the census tract controls and state fixed effects. We then estimate a value-added model, as shown in column (6), that regresses measures of family well-being on contemporaneous child care subsidy receipt, contemporaneous family covariates, and a lagged measure of family well-being. We utilize the lagged outcomes from the 12-month interview to implement this analysis. In principle, lagged outcomes capture the unobserved determinants of family well-being as well as unobserved endowments contributing to maternal health (Todd & Wolpin, 2003). In our application, these variables would account for baseline differences in family well-being across subsidy recipients and non-recipients up to and including the period in which the lagged measures are taken (i.e., 12-month interview). Given that subsidy receipt is measured at the 36-month interview, the lagged outcomes will not capture unobserved shocks to family well-being in between the two interview dates. However, we attempt to proxy the risk of a well-being shock by including in the value-added models a rich set of observable maternal and child controls. Note that lagged dependent variables are available for only a subset of four well-being outcomes: self-reported health, anxiety and depression caseness, and spanking.

As shown in Table 3, adding controls incrementally appears to attenuate the coefficient on subsidy receipt. Nevertheless, the estimated effect of child care subsidies remains statistically significant across seven of the nine family well-being models in the fullest specification [column

(5)]. Generally speaking, the estimates provide consistent evidence that subsidy receipt is associated with reductions in family well-being. The one exception is responsive parenting, which appears to be positively associated with subsidy receipt. Looking first at the maternal health outcomes in column (5), we find that subsidized mothers are 4.6 percentage points less likely to report being in "very good" or "excellent" overall health. Given that 62.1 percent of non-recipients are in "very good" or "excellent" health, the coefficient on subsidy receipt translates to a 7.4 percent reduction in health. Similarly, child care subsidies are associated with increases in the prevalence of depression caseness and increases in the index of parenting stress. The implied effect sizes for these outcomes are 19.5 percent and 3.1 percent (0.10 standard deviations), respectively. Although subsidized mothers appear to be less anxious than their unsubsidized counterparts, the coefficient is not statistically significant. The outcomes relating to child-parent interactions also imply a worsening of family well-being. In particular, we find that subsidized mothers are more psychologically and physically aggressive with their children and are more likely to engage in spanking. Acts of psychological aggression increase 11.6 percent (0.14 standard deviations), while those regarding physical aggression rise 13.3 percent (0.11 standard deviations). Consistent with this pattern, we find that the use of spanking among subsidized mothers is 8.3 percent higher.[22]

Results from the value-added models [column (6)] also suggest that child care subsidies are negatively associated with family well-being. Estimates in the first and third rows imply that subsidy receipt is associated with a 13.7 percent decrease in the likelihood of being in "very good" or "excellent" health and a 32.7 percent increase in the likelihood of depression caseness. Both estimates are larger in magnitude than those in column (5), suggesting that subsidy receipt is

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[22] It is important to point out that the FFCW analyses are conducted on a sample of married and unmarried mothers. In robustness checks, we estimate (1) on the sub-set of single mothers to be consistent with the construction of the ECLS-K and Life Style Survey samples. Our results are virtually identical to those discussed in the text. If anything, the results point to larger negative effects of subsidy receipt.

positively correlated with baseline maternal health.[23] It is plausible, for example, that healthier mothers self-select into subsidy receipt or that program administrators give priority to the most employable parents. Finally, we find that, conditional on baseline spanking behavior, subsidized mothers are no more likely to spank their children. Unfortunately, lagged dependent variables are not available for the other measures of child-parent interactions. Nevertheless, if maternal spanking behavior is representative of the broader child-parent relationship, such results could be viewed as encouraging evidence that child care subsidies do not necessarily have a negative influence on the quality of the relationship between mothers and their children.

Finally, we conduct a simple extension to the above analyses by exploiting the fact that information on subsidy receipt is collected in two periods: during the 12- and 36-month interviews. This allows us to examine the timing and intensity of subsidy receipt as it relates to family well-being. We estimate a regression model analogous to (1), replacing the dummy variable for subsidy receipt at 36-months with a set of dummies indicating subsidy receipt at 12-months only, subsidy receipt at 36-months only, and subsidy receipt at both 12- and 36-months. The omitted (or comparison) category includes children who never received a subsidy between birth and the 36-month interview. As shown in Table 4, the results suggest that more recent and more intensive subsidy use is associated with larger declines in family well-being. Of the nine outcomes explored in the FFCW, four of them are significantly affected (negatively) if the child received subsidized care at 12- and 36-months. Another two outcomes (depression caseness and parenting stress) are affected only if the child is currently receiving a subsidy (36-months). Indeed, with the exception of psychological and physical aggression the results in column (1) imply that the effects of child care subsidies do not persist as long as families utilize them for short periods.

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[23] An indirect piece of evidence to support this is that the pre-birth employment rate among subsidy recipients is higher than that among non-recipients (73.8 percent compared to 68.4 percent).

Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K)

Our next set of results comes from an analysis of the ECLS-K. We begin with a simple reduced form model to explore the relationship between subsidy receipt in the year before kindergarten entry and family well-being in the spring of kindergarten. To make the ECLS-K results more comparable to those from the FFCW, we make an attempt to include an analogous set of control variables in the regression model. Formally, the equation is specified as follows:

(2) $Y_{is} = \alpha + \gamma S_{is} + \mathbf{X'}\beta + \mathbf{P'}\varphi + \eta_s + \varepsilon_{is},$

where Y_{ist} is one of the family well-being outcomes for family i in state s, and S_{is} is a binary indicator of child care subsidy receipt in the year prior to kindergarten. The vector given by $\mathbf{X'}$ contains a number of family characteristics, including maternal age, race and ethnicity, educational attainment, early work experience, the number of other children in the household, and total household size. The child characteristics include gender, age, premature birth status, low birth weight status, the presence of a disability, and a binary indicator for whether the child is a first-time kindergartner. The $\mathbf{P'}$ represents a set of census tract and local school characteristics, including median household income, population density, racial and ethnic composition, percent foreign born, the age composition of children living in female-headed households, percent ages 65 and over, percent female, percent of children in the focal child's school who are eligible to receive free school lunches, and dummy variables indicating whether the child attends a majority-minority school and whether the school receives Title I funding.

As discussed in Section II, the family well-being outcomes included in the ECLS-K focus on maternal health and are very similar to those available in the FFCW. Columns (1) through (4) of Table 5 provide the ordinary least squares (OLS) estimates of the effect of subsidy receipt on maternal health. Column (1) includes only the binary indicator of subsidy receipt, while columns (2) and (3) add the maternal and child characteristics, respectively, and column (4) adds the census tract

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controls. Consistent with the story emerging from the FFCW, we find that subsidy receipt is associated with reductions in maternal health. Moreover, the subsidy estimates generally decrease little in magnitude and remain statistically significant as the control variables are added incrementally. Looking at the estimates in column (4), the most comprehensive OLS specification, we find that subsidy receipt is associated with a 7.8 percentage point decrease in the likelihood that a mother reports being in "very good" or "excellent" health. Given that 59.1 percent of non-recipients are in "very good" or "excellent" health, the coefficient on subsidy receipt translates to a 13.2 percent reduction in overall health. Subsidized mothers also score higher on the indexes of anxiety (0.05 standard deviations) and depression (0.11 standard deviations), and such women exhibit higher levels of parenting stress (0.11 standard deviations).

While these results provide additional evidence that subsidy receipt is associated with reduced maternal health, concerns remain over the presence of unobserved heterogeneity. To improve the causal interpretation of γ in (2), we utilize an instrumental variables (IV) strategy to identify the impact of subsidy receipt. The IV strategy requires at least one variable that satisfies two conditions. First, it should be correlated with the potentially endogenous variable—in this case, subsidy receipt. Second, it should be uncorrelated with the outcome of interest—in this case, family well-being—expect through its relationship with subsidy receipt. Our proposed instrumental variable is based on the approximate *distance* that parents must travel from home to reach the nearest public social service agency that administers the subsidy application and benefits procedures.

As discussed in detail elsewhere (e.g., see Herbst & Tekin, 2010b; 2012), this strategy was implemented by creating a database containing the precise location (building number, street name, city, state, and zip code) of virtually every public social service agency in the U.S. The database includes only those agencies involved in eligibility and benefit determination for CCDF child care subsidies. Armed with addresses of approximately 3,600 social service agencies, the next step

involved geocoding the location of each office by assigning a latitude and longitude coordinate to each. In the final step, we calculated the Euclidean (or as-the-crow-flies) distance (in miles) between the location of social service agencies and the centroid (or geographic center) of the census tract in which ECLS-K families reside. The distance measure is based on families' census tract because residential addresses are not available in the ECLS-K. Furthermore, given that states' child care subsidy programs are administered primarily at the county-level, we use families' county of residence as the geographic boundary for calculating the distances.[24]

Regarding the first identifying criterion, there are several reasons to expect a negative relationship to emerge between families' travel distance to social service agencies and child care subsidy receipt.[25] First, low-income families already face significant work- and child care-related costs due to the limitations of public transportation systems and low car ownership rates (Allard, 2009; Berube & Raphael, 2005; Ong, 2002). Indeed, Edin & Lein (1997) find that single mothers' commute time to work is approximately 10 hours per week, on average, and Michelson (1985) shows that mothers' daily trip from home to the child care provider increases total commute time by 28 percent. Consistent with this finding, low-income working mothers emphasize the importance of locating child care services close to home or work (Henly & Lyons, 2000). Subsidy-related trips to social service agencies therefore represent an additional layer of child care and work costs that are expected to reduce the likelihood of applying for and receiving such assistance.

Furthermore, the travel distance to a social service agency can influence subsidy utilization at multiple stages of families' interaction with the subsidy system. Generally speaking, parents either voluntarily make or are required to make one or multiple personal visits to an agency. Of particular

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[24] Please refer to Appendix A in Herbst and Tekin (2010b; 2012) for a detailed description of the process for creating the distance-based instrumental variable.
[25] It should be noted that distance-based measures have been shown to be correlated with the utilization of welfare benefits (Allard et al., 2003), Head Start (Neidell & Waldfogel, 2009), medical care (Nemet & Bailey, 2000; McCellan et al., 1994), and college education (Card, 1995).

importance are policies regarding eligibility recertification. The time-limited nature of child care subsidies—usually lasting three to 12 months—implies that parents need to restart the eligibility process every few months to avoid benefit termination. Arranging these visits can be difficult for low-income parents because they typically lack reliable automobile transportation and experience frequent job turnover and seasonal or irregular work schedules (Holzer & Martinson, 2006; Layzer & Burstein, 2007; Ong, 2002; Waller, 2005). Together, the above considerations appear to have strong empirical support: previous work by Herbst and Tekin (2010b; 2012) shows that low-income families' travel distance is in fact negatively correlated with child care subsidy utilization.

The plausibility of the distance measure as an identifying instrument also hinges on whether it can validly be excluded from (2). A key concern is that low-income parents may choose to live near a social service agency in order to increase the ease of accessing benefits. In addition, these agencies might locate in low-income neighborhoods so as to be close to potential clients. If the location decisions of parents and agencies are either indirectly correlated with maternal health (e.g., through strong preferences to work or make well-being investments) or related to other local demographic and economic determinants of well-being (e.g., through the close proximity of social service agencies to community resources that influence well-being), our exclusion restriction would be invalidated.

Herbst and Tekin (2010b; 2012) discuss in detail a number of reasons why families' travel distance should not be directly related to family well-being. First, previous empirical work finds that individuals do not Tiebout sort geographically in order to access public benefits (Rhode & Strumpf, 2003). This is especially plausible in the case of child care subsidies, given that these benefits serve only a small percentage of eligible families and are heavily rationed by local administrators. It is therefore unlikely that low-income families would use the geographic accessibility of child care subsidies as a reason for selecting one residential location over another. Endogenous location among

social service agencies is also unlikely to be problematic. Allard (2009) finds that agency location choices are constrained in such a way as to reduce their ability to relocate quickly in response to changes in the geographic distribution of low-income families. Indeed, our ad hoc analysis of the agencies in our database overwhelmingly confirms that most had been at their current address for at least several years.

Nevertheless, we take a number of steps to empirically control for the neighborhood characteristics that are likely to be correlated with location preferences and family well-being. We include in (2) a set of controls for the neighborhood environment in which ECLS-K families reside. These census tract variables include the log of median household income; log of population density; percent non-Hispanic white; percent foreign born; percent ages 65 and over; percent female; and percent ages 0-2, 3-5, 6-11, 12-13, 14, and 15-17 in female-headed households. We also include a set of school-level variables to further account for the desirability of residential locations, and to proxy the availability and quality of other public services. The school variables include the percent of children in school who are eligible for free lunches, a dummy variable indicating whether a majority of children in school are racial/ethnic minorities, and a dummy variable indicating whether the school receives Title I funding. In addition, we add controls for the neighborhood environment in which social service agencies are located: log of median household income, log of population density, percent non-Hispanic white, percent foreign born, percent ages 65 and over, percent female, percent of households receiving welfare, and percent of employed females ages 16 and over. These variables control for the unobserved determinants of agency location decisions that may be correlated with the distance parents must travel to apply for child care subsidies. Finally, our models include state fixed effects to account for permanent demographic, economic, and social policy differences across states that may influence subsidy utilization and family well-being.[26]

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[26] In an attempt to provide further support for the validity of travel distance as an instrument, Herbst and Tekin (2010b; 2012) examine

Adopting the distance measure as an instrument imposes the assumption that the distance-subsidy receipt relationship is identical across all jurisdictions. However, this assumption is unlikely to hold for various reasons. As explained in Herbst and Tekin (2010b, 2012), the spatial accessibility of social service agencies may exhibit substantial variation across urban and rural jurisdictions, older versus newly developed jurisdictions, or areas with different topographies (e.g., land-locked, mountainous, or other physical barriers). In addition, the accessibility of social service agencies likely depends on the extent to which local roads and highways are developed as well as the availability of public transportation. It is also the case that local agencies are assigned to serve different geographic areas. For example, in many states there is one agency available per county, while in others a single agency is assigned to serve individuals from multiple counties (e.g., Washington). Together, these insights suggest that it is unrealistic to constrain the relationship between travel distance and subsidy receipt to be identical for families across all jurisdictions, as that would likely mask substantial cross-jurisdiction variation in the accessibility of social service agencies. Following Herbst and Tekin (2010b, 2012), our IV strategy therefore permits the travel distance-child care subsidy relationship to differ across families' county of residence. This approach also allows us to leverage more power in the first-stage equation, producing a p-value on the set of travel distance-county interactions substantially lower than 0.01.

Results from the IV analysis are presented in column (5) of Table 5. These estimates continue to suggest that child care subsidies are detrimental to family well-being. In fact, the coefficient on subsidy receipt is statistically significant in every model. We find that subsidies

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the distribution of child and maternal characteristics across the quartiles of the travel distance. A simple comparison suggests that families living near social service agencies do in fact possess different characteristics than those living farther away. For example, the travel distance is negatively correlated with WIC participation, being white, educational attainment, and low-SES. However, once we condition on median household income and population density alone, differences in these characteristics across the distance distribution become statistically insignificant. Furthermore, Herbst and Tekin (2010b) conduct a falsification test in which they generate a predicted probability of subsidy receipt for women who are unlikely to be eligible for a subsidy (i.e., two-parent families in the top two quintiles of the SES distribution), using the parameter estimates from their first-stage subsidy receipt equation. Then they show that predicted subsidy receipt has no meaningful impact on the developmental outcomes of high-SES two-parent families.

substantially lower the likelihood that a mother reports being in "very good" or "excellent" health. The marginal effect translates to a reduction in self-reported health of nearly 36 percent. Subsidy receipt also leads to increased scores on the indexes of anxiety, depression, and parenting stress. In particular, subsidized mothers score 11.5 percent (0.37 standard deviations), 12.7 percent (0.40 standard deviations), and 13.3 percent (0.47 standard deviations) higher, respectively, on these measures than their unsubsidized counterparts. A comparison between the OLS and IV results displayed in columns (5) and (6) show that the IV estimates are considerably larger in magnitude than those obtained from OLS. Assuming that our identification strategy is plausible, this finding is consistent with several explanations. First, measurement error in the ECLS-K child care subsidy variable could lead to downward bias in the OLS estimates. Second, this pattern is indicative of positive selection into child care subsidy receipt. For example, local subsidy administrators may ration benefits according to specific parent and child characteristics. In doing so, caseworkers may deliberately target healthier or more employable parents to maximize the return on public investments (Herbst & Tekin, 2010b). It is also noteworthy that this pattern is consistent with that emerging in the FFCW, in which the coefficient on subsidy receipt tends to increase when the lagged dependent variables are included in the model.

DDB Needham Life Style Survey

Armed with individual-level survey data on subjective well-being merged with state-level CCDF expenditures over the period 1986 to 2004, our final empirical analysis examines the relationship between the generosity of states' child care subsidy regimes and self-reported life satisfaction. Specifically, we estimate versions of the following reduced form regression model:

(3) $Y^*_{ist} = \varphi_t + \gamma_1 S_{ist} + \mathbf{X'}_{ist}\beta + \mathbf{P'}_{st}\varphi + \eta_s + (\eta_s \times \text{time trend}) + \varepsilon_{ist}$,

where i indexes individuals, s indexes states, t indexes years, and Y^* is a continuous latent representation of the ith respondent's life satisfaction score, Y. Given the ordered nature of the

response categories in *Y*, we estimate (3) using an ordered probit, which standardizes the measure of life satisfaction conditional on the right-hand-side variables. The *S* represents the sum of federal and state expenditures through the CCDF per child ages 0 to 12 (/100), and the vector given by **X'** captures several observable demographic controls, including age, race and ethnicity, marital status, the presence of children ages 0 to 17 in the household ("has kids"), and educational attainment. The **P'** represents a number of state-level social policy and economic controls, including separate dummy variables for the implementation of welfare waivers and TANF, maximum AFDC/TANF benefits for a three-person family, maximum Child Tax Credit, unemployment rate, (log of) per capita income, and (log of) population density. Note that (3) omits controls for employment status and household income, as these are likely to be endogenous. Inclusion of these variables also complicates the interpretation of the estimated effect of CCDF expenditures, given that child care subsidies are expected work through the impact on individuals' employment status and income.

Also included in (3) are controls for state- and year-specific unobserved heterogeneity that may be correlated with states' CCDF spending decisions and individuals' subjective well-being. Although the model includes a number of explicit controls for social policy reforms and economic conditions, there likely remain unobserved differences between states or years that determine the generosity of child care assistance policies. Therefore, we introduce a vector of state fixed effects, η_s, to account for permanent differences across states that may confound the estimated effect of CCDF spending. We also add a set of year dummy variables, φ_t, to account for time-varying national shocks (e.g., nationwide business cycles, natural disasters, or changes in federal legislation) or changing national attitudes regarding the role of the social safety net (e.g., increased public support for work-conditioned programs). Finally, we experiment with state-specific linear time trends to purge the model of within-state unobservables that are trending over time and which might follow a

time path similar to that of states' CCDF spending (e.g., locally evolving social and political attitudes toward welfare recipients).

The coefficient of interest in (3) is γ_1, which returns the estimated effect on life satisfaction of a \$100 increase in CCDF spending per child ages 0 to 12. Given that the ordered probit coefficients represent standardized changes in the dependent variable (conditional on the covariates), the coefficient on CCDF spending can be interpreted as the standard-deviation change in life satisfaction due to a \$100 increase in per-child CCDF expenditures. We also report marginal effects (evaluated at the covariate means) associated with the likelihood of definitely agreeing and definitely disagreeing with the life satisfaction statement. These effects capture changes in life satisfaction at the top (most satisfied) and bottom (least satisfied) ends of the distribution. All regressions provide robust standard errors, clustered by the state-year.

Identification of γ_1 comes from multiple sources. First, there is substantial year-to-year variation in child care spending. Prior to 1991, for example, funding for child care assistance did not exist. Given that our analysis begins in 1986, we use the years 1986 to 1990—the pre-reform period—to leverage variation in child care funding. Expenditures then grew rapidly beginning in the early-1990s and again in the mid- to late-1990s because of the establishment of new funding sources, thus generating additional year-to-year variation in subsidy generosity. Second, given that our dataset includes single mothers (who are eligible to receive child care assistance) *and* single childless women (who are ineligible to receive child care assistance), we rely on the differential policy treatment of women with and without children to identify the impact of CCDF spending. Note that using single childless women as a comparison group in combination with the availability of pre-reform survey data makes our identification strategy tantamount to the difference-in-differences framework used throughout much of the welfare reform literature (e.g., Bitler et al., 2005; Kaushal & Kaestner, 2001; Meyer & Rosenbaum, 2001). A final source of identifying variation takes advantage

of the CCDF's rules for determining the age-eligibility of children who can receive assistance. In particular, to be eligible for a subsidy a family must have a child between the ages of 0 and 12. Given that our dataset includes women with children ages 0 to 17, those whose *youngest* child is over age 12 are ineligible to receive assistance. This eligibility rule therefore creates another potentially exogenous source of variation that is used to identify to impact of CCDF spending.

Table 6 presents the ordered probit coefficients and marginal effects on the CCDF spending variable. The coefficients in column (1) come from a model that includes only the demographic and state policy controls, while columns (2) through (4) add, respectively, the state and year fixed effects, state-specific time trends, and interactions between the "has kids" variable and several other demographic covariates. It appears that progressively adding controls has little effect on the CCDF spending coefficients. Consistent with the results from the FFCW and ECLS-K, it appears that an increase in child care assistance funding is associated with a reduction in subjective well-being. The raw ordered probit coefficient in column (4) implies that a $100 increase in per-child CCDF spending lowers self-reported life satisfaction by 0.08 standard deviations. Translated into marginal effects, the coefficient implies a 1.2 percentage point decrease in the likelihood of being in the top well-being category ("definitely agree") and a 1.8 percentage point increase in the likelihood of being in the bottom well-being category ("definitely disagree"). Given that eight percent of single mothers are in the top life satisfaction category and 18.6 percent are in the bottom category, the marginal effects imply well-being reductions of about 15 percent and 10 percent, respectively.

The remaining results in Table 6 are based on stratified samples of low-income [column (5)] and high-income [column (6)] women.[27] If the main results are in fact due to child care subsidy policy, then we expect the results from the more disadvantaged sample to be similar to (or larger

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[27] For the purposes of this analysis, low-income is defined to include women whose real total household income is at or below the sample median ($29,939), while high-income is defined to include women whose real total household income is above the sample median. We experimented with several other cut-offs, and the results are similar to those discussed here.

than) than the main results, while those from the less disadvantaged sample should be smaller in magnitude. As shown by the ordered probit coefficients in columns (5) and (6), we find strong support for this proposition. For low-income single mothers, the estimated effect of CCDF spending is nearly twice as large as that from the full sample and eight times larger than that from the high-income sample. The marginal effects imply large reductions in life satisfaction: a $100 increase in per-child CCDF spending reduces the likelihood of being in the top well-being category by 26 percent and increases the likelihood of being in bottom well-being by 19 percent.

IV. Conclusion

In the 15 years since the passage of welfare reform legislation, child care subsidies have played a central role in public efforts to reduce welfare dependency and increase employment among disadvantaged women with children. The consensus from early research on subsidy policy is that it has been largely successful at accomplishing this goal. More recent work, however, has begun to focus on the implications of subsidy receipt for the non-market well-being of children and families. These studies are motivated by growing concerns that a policy regime focused disproportionately on employment may have unintended consequences for family well-being. Consistent with these concerns, a number of studies from Herbst and Tekin (2010a; 2010b; 2011b; 2012) and others (e.g., Griffen et al., 2010) find that subsidized children tend to fare worse cognitively and behaviorally and are more likely to experience poor physical health than their unsubsidized counterparts.

In this paper, we consider two additional domains of family well-being: maternal health and the quality of interactions between parents and children. To do so, we draw upon three nationally representative datasets, which together provide a rich set of outcomes in these domains. Our results are consistent across the outcome domains, all three datasets, and empirical strategies with and between the datasets: child care subsidies are associated with decreased maternal health and appear to lead to poorer interactions between parents and their children. Indeed, subsidized mothers are less

likely to report being healthy overall, are more likely to exhibit symptoms consistent with anxiety and depression, and score higher on measures of parenting stress. In addition, subsidized mothers tend to engage in more psychologically and physically harmful interactions with their children and are more likely to utilize spanking as a method of discipline. Together, these findings indicate that policies to promote parental employment without considering the manner in which this transition occurs is likely to come at the expense of family well-being.

The findings in this paper are certainly interesting in their own right, but they may also shed light on the negative effects that subsidies appear to have on child well-being. In particular, Herbst and Tekin (2010a; 2010b; 2011b; 2012) focus on maternal employment and various CCDF design features (that reduce incentives to purchase high-quality child care) to explain the negative relationship between subsidy receipt and child well-being. Results in this study, however, suggest that changes in *maternal well-being* could be a third mechanism through which subsidy receipt influences children. Indeed, there is a vast literature in psychology that discusses the dynamic interplay between child and parental well-being and, in particular, the role played by mothers in shaping the health and achievement arc of children (e.g., National Research Council, 2000). The home environment established by parents as well as specific parenting behaviors regarding nurturance, communication, and discipline are found to consistently influence children's health and development (Anderson et al., 2011; Bornstein, 2002). Parental health markers—including anxiety, stress, and depression levels—are also known to be strongly correlated with cognitive and behavioral well-being, primarily because these markers have implications for the amount of quality time parents spend with their children (Barry et al., 2005; NICHD Early Child Care Research Network, 1999). Therefore, insofar as child care subsidies reduce maternal health and lead to worse parent-child interactions, these changes in the family environment could be partially responsible for the negative effects on children.

Although the above discussion is plausible, there remains much for future research to examine regarding the "black box" of child care subsidy-effects. We end by pointing out a few avenues that may contribute to the ongoing scholarly and policy discussion. First, research is needed on the extent to which subsidies have implications for the health-related behaviors of parents and children. For example, it would be beneficial to explore changes in health insurance status, the frequency of wellness check-ups, and the attainment of health screenings following the receipt of a child care subsidy. Future work should also focus on children's physical activity and eating patterns both inside and outside the child care environment, with an emphasis on whether children are meeting the daily requirements for exercise and fruit and vegetable consumption. Second, it might be useful to understand how child care subsidies redistribute maternal time allocation beyond the obvious investments in paid work. In particular, issues such as quality time with children, time spent preparing meals, and time spent engaged in well-being-enhancing activities could help to explain not only the findings in this study but also those related to children's health and development.

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Table 1: Description of Maternal Well-Being and Child-Parent Interaction Outcomes
Fragile Families and Child Well-Being Study, Three-Year Follow-Up

Outcome	Brief Description	Outcome Range	Mean (*SD*): Full Sample	Mean (*SD*): Subsidy Recipients	Mean (*SD*): Non-Recipients
Overall Health	=1 if mother's self-reported overall health status is "very good" or "excellent"	0-1	0.611 (0.488)	0.552 (0.498)	0.621 (0.485)
Anxiety	=1 if mother meets clinical "caseness" criteria for Generalized Anxiety Disorder, based on the Composite International Diagnostic Interview	0-1	0.051 (0.219)	0.046 (0.210)	0.051 (0.221)
Depression	=1 if mother meets clinical "caseness" criteria for a Major Depressive Episode, based on the Composite International Diagnostic Interview	0-1	0.216 (0.411)	0.279 (0.449)	0.205 (0.404)
Parenting Stress	Continuous index (derived from 4 items, each measured on a 4-point scale) determining whether mother believes parenting is harder than initially thought, feels worn out/trapped, based on the PSID-Child Development Supplement Aggravation in Parenting Scale	4-16	9.00 (2.68)	9.26 (2.61)	8.96 (2.69)
Responsive Parenting	=1 if mother is fully responsive to child (e.g., vocalized to, praised, and kissed/caressed child), based on 6 interviewer-observed dichotomous items drawn from the Home Observation for Measurement of the Environment	0-1	0.592 (0.492)	0.589 (0.493)	0.592 (0.492)
Sensitive Parenting	=1 if mother is fully sensitive to child (e.g., did not shout at, scold, or slap child) based on 5 interviewer-observed dichotomous items drawn from the Home Observation for Measurement of the Environment	0-1	0.765 (0.424)	0.698 (0.460)	0.776 (0.417)
Psychological Aggression	Continuous index of frequency (within previous 12 months) that the mother shouted/yelled at, threatened to spank, or cursed at child; called child dumb/lazy; or threatened to send child away, based on 5 items from the Conflict Tactics Rating Scale	0-125	25.26 (19.77)	30.43 (21.34)	24.44 (19.39)
Physical Aggression	Continuous index of frequency (within previous 12 months) that the mother shook or hit/spanked/slapped/pinched child, based on 5 items from the Conflict Tactics Rating Scale	0-100	15.74 (18.36)	19.97 (20.26)	15.05 (17.95)
Spanked	=1 if mother spanked the child in the last month	0-1	0.541 (0.498)	0.614 (0.487)	0.529 (0.499)

Notes: All outcomes are drawn from the three-year follow-up of the Fragile Families and Child Well-Being Study. The stratification by subsidy receipt status is based on a survey item in the three-year follow-up inquiring about current child care subsidy participation. The number of observations varies across each outcome measure.

Table 2: Description of Maternal Well-Being Outcomes
Early Child Longitudinal Study—Kindergarten Cohort, Spring of Kindergarten

Outcome	Brief Description	Outcome Range	Mean (*SD*): Full Sample	Mean (*SD*): Subsidy Recipients	Mean (*SD*): Non-Recipients
Overall Health	=1 if mother's self-reported overall health status is "very good" or "excellent"	0-1	0.580 (0.494)	0.505 (0.501)	0.591 (0.492)
Anxiety	Continuous index based on 5 items (each measured on a 4-point scale) measuring the extent to which the mother (in the previous week) felt unusually bothered by things, had trouble focusing, felt fearful, had restless sleep, and felt that everything was an effort	5-20	8.41 (2.87)	8.66 (2.81)	8.37 (2.88)
Depression	Continuous index based on 7 items (each measured on a 4-point scale) measuring the extent to which the mother (in the previous week) had a poor appetite, could not shake off the blues, felt depressed, talked less than usual, felt lonely or sad, and could not get going	7-28	10.60 (3.97)	11.02 (4.12)	10.53 (3.95)
Parenting Stress	Continuous index (derived from 7 items, each measured on a 4-point scale) determining whether mother believes parenting is harder than initially thought, feels worn out, often feels angry with child, etc., based on the PSID-Child Development Supplement Aggravation in Parenting Scale	7-28	11.68 (3.62)	12.04 (3.51)	11.63 (3.63)

Notes: All outcomes are drawn from the spring of kindergarten wave of data collection in the Early Childhood Longitudinal Study—Kindergarten Cohort. The stratification by subsidy receipt status is based on a survey item in the fall of kindergarten survey inquiring about subsidy participation in the year prior to kindergarten entry.

Table 3: Estimates of the Impact of Child Care Subsidies on Maternal Well-Being and Child-Parent Interactions
Fragile Families and Child Well-Being Study, Three-Year Follow-Up

Outcome	N	(1)	(2)	(3)	(4)	(5)	(6)
Overall Health	3,100	-0.069***	-0.055**	-0.054**	-0.054**	-0.046*	-0.085**
		(0.026)	(0.026)	(0.026)	(0.026)	(0.027)	(0.042)
Anxiety	3,098	-0.005	-0.010	-0.011	-0.011	-0.013	-0.019
		(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.015)
Depression	3,098	0.074***	0.048**	0.048**	0.050**	0.040*	0.067*
		(0.023)	(0.024)	(0.024)	(0.024)	(0.024)	(0.036)
Parenting Stress	3,080	0.307**	0.335**	0.320**	0.322**	0.276*	--
		(0.137)	(0.142)	(0.142)	(0.143)	(0.145)	
Responsive Parenting	1,965	-0.006	0.041	0.042	0.043	0.051*	--
		(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	
Sensitive Parenting	1,967	-0.073**	-0.030	-0.027	-0.019	-0.015	--
		(0.029)	(0.029)	(0.029)	(0.029)	(0.028)	
Psychological Aggression	3,034	5.819***	3.254***	3.038***	2.914***	2.830**	--
		(1.106)	(1.125)	(1.125)	(1.132)	(1.144)	
Physical Aggression	3,012	4.712**	2.253**	1.999*	2.018*	1.998*	--
		(1.046)	(1.056)	(1.063)	(1.068)	(1.086)	
Spanked	3,096	0.082***	0.047*	0.043*	0.042	0.044*	0.029
		(0.025)	(0.026)	(0.026)	(0.026)	(0.026)	(0.043)
Survey design controls		Y	Y	Y	Y	Y	Y
Maternal controls		N	Y	Y	Y	Y	Y
Child controls		N	N	Y	Y	Y	Y
Neighborhood controls		N	N	N	Y	Y	Y
State fixed effects		N	N	N	N	Y	Y
Lagged dependent variable		N	N	N	N	N	Y

Source: Authors' analysis of the Fragile Families and Child Well-Being Study, Three-Year Follow-Up

Notes: Each cell contains the coefficient on child care subsidy receipt, at 36 months, and robust standard errors (in parentheses). All maternal and child-parent interaction outcomes are measured at 36 months. See Table 1 for a detailed description of each maternal and child-parent interaction outcome. See the text for a list of variables included in each regression. The survey design controls include dummy variables for the FFCW pilot cities, year-of-interview, quarter-of-interview, and interactions between the latter two. The number of observations in the lagged dependent variable models is 1,812; 1,807; 1,809; and 1,810, respectively. * $p<0.10$, ** $p<0.05$ and *** $p<0.01$.

Table 4: Effects of the Timing and Intensity of Child Care Subsidy Receipt
Fragile Families and Child Well-Being Study, Three-Year Follow-Up

Outcome	Subsidy Receipt at 12 Months Only	Subsidy Receipt at 36 Months Only	Subsidy Receipt at 12 and 36 Months
Overall Health	-0.041	-0.039	-0.070*
	(0.044)	(0.032)	(0.042)
Anxiety	0.023	-0.007	-0.018
	(0.024)	(0.014)	(0.018)
Depression	0.008	0.046*	0.030
	(0.037)	(0.028)	(0.038)
Parenting Stress	-0.149	0.362**	0.074
	(0.246)	(0.174)	(0.228)
Responsive Parenting	0.034	0.019	0.120**
	(0.046)	(0.037)	(0.047)
Sensitive Parenting	0.094**	0.011	-0.039
	(0.038)	(0.033)	(0.048)
Psychological Aggression	4.841***	1.968	5.672***
	(1.850)	(1.343)	(1.877)
Physical Aggression	3.682**	1.258	4.329**
	(1.726)	(1.292)	(1.750)
Spanked	0.024	0.015	0.104***
	(0.041)	(0.032)	(0.040)

Source: Authors' analysis of the Fragile Families and Child Well-Being Study, Three-Year Follow-Up

Notes: Each cell contains the coefficient on child care subsidy receipt, measured at different survey waves, and robust standard error (in parentheses). All maternal and child-parent-interaction outcomes are measured at 36 months. The subsidy coefficient in the first column is based on a dummy variable that equals unity if a child received a subsidy at the 12-month follow-up only. The subsidy coefficient in the second column is based on a dummy variable that equals unity if a child received a subsidy at the 36-month follow-up only. Each row represents a different model that includes all three dummy variables (the omitted category is no subsidy receipt). The subsidy coefficient in the third column is based on a dummy variable that equals unity if a child received a subsidy at the 12- and 36-month follow-up. See Table 1 for a detailed description of each maternal and child-parent interaction outcome. See the text for a list of variables included in each regression. * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table 5: OLS and 2SLS Estimates of the Impact of Child Care Subsidies on Maternal Well-Being
Early Childhood Longitudinal Study—Kindergarten Cohort, Spring of Kindergarten

Outcome	N	(1)	(2)	(3)	(4)	(5)
Overall Health	3,378	-0.087***	-0.088***	-0.085***	-0.078***	-0.211**
		(0.025)	(0.026)	(0.026)	(0.026)	(0.099)
Anxiety	3,338	0.290**	0.196	0.170	0.132	0.959*
		(0.143)	(0.146)	(0.146)	(0.147)	(0.525)
Depression	3,342	0.485**	0.430**	0.393*	0.365*	1.339*
		(0.209)	(0.211)	(0.210)	(0.212)	(0.709)
Parenting Stress	3,348	0.411**	0.401**	0.378**	0.352*	1.551**
		(0.180)	(0.182)	(0.182)	(0.183)	(0.789)
Estimation method		OLS	OLS	OLS	OLS	2SLS
Maternal controls		N	Y	Y	Y	Y
Child controls		N	N	Y	Y	Y
Family neighborhood controls		N	N	N	Y	Y
Agency neighborhood controls		N	N	N	N	Y
State fixed effects		N	N	N	N	Y

Source: Authors' analysis of the Early Childhood Longitudinal Study—Kindergarten Cohort, Spring of Kindergarten

Notes: Each cell contains the coefficient on child care subsidy receipt, measured during the year prior to kindergarten entry, and the standard error (in parentheses). Robust standard errors are reported in columns (1) through (4), while clustered standard errors (at the census tract-level) are reported in column (5). All maternal outcomes are measured in the spring of kindergarten. See Table 2 for a detailed description of each maternal and child-parent interaction outcome. See the text for a list of variables included in each regression. County-by-travel distance interactions are used as the identifying instruments in column (5). * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$.

Table 6: Ordered Probit Estimates of the Impact of CCDF Expenditures on Self-Reported Life Satisfaction
DDB Needham Life Style Survey, 1986-2004
Dependent Variable: "I am very satisfied with the way things are going in my life these days"

Variable	(1)	(2)	(3)	(4)	(5)	(6)
CCDF Spending per	-0.089**	-0.081**	-0.082**	-0.082**	-0.158***	-0.021
Child Ages 0 to 12	(0.037)	(0.039)	(0.040)	(0.040)	(0.059)	(0.057)
$\partial y/\partial x$: "Definitely Agree"	-0.013**	-0.012**	-0.012**	-0.012**	-0.021***	-0.003
	(0.005)	(0.005)	(0.006)	(0.006)	(0.008)	(0.008)
$\partial y/\partial x$: "Definitely Disagree"	0.020**	0.018**	0.018**	0.018**	0.043***	0.003
	(0.008)	(0.008)	(0.009)	(0.009)	(0.016)	(0.009)
Demographic controls	Y	Y	Y	Y	Y	Y
State controls	Y	Y	Y	Y	Y	Y
State fixed effects	N	Y	Y	Y	Y	Y
Period fixed effects	N	Y	Y	Y	Y	Y
State-specific time trends	N	N	Y	Y	Y	Y
Interactions with "has kids"	N	N	N	Y	Y	Y
Analysis sample	Full	Full	Full	Full	Low-inc	High-inc
Number of observations	5,628	5,628	5,628	5,628	2,686	2,942

Source: Authors' analysis of the DDB Needham Life Style Survey, 1986-2004

Notes: All models are estimated using an ordered probit regression. Each cell in the top row contains the coefficient (and standard error, in parentheses) associated with the total federal and state CCDF spending per child ages 0 to12. Standard errors are adjusted for state-year clustering. The dependent variable is based on the statement: "I am very satisfied with the way things are going in my life these days." Responses categories are: 6=definitely agree, 5=generally agree, 4=moderately agree, 3=moderately disagree, 2=generally disagree, and 1=definitely disagree. The figures in the next two rows are the marginal effects (evaluated at the mean of each covariate) associated with the probability of "definitely agreeing" and "definitely disagreeing" with the life satisfaction statement. The demographic covariates include age, race and ethnicity, educational attainment, and marital status. The state controls include separate dummy variables for welfare waivers and TANF, AFDC/TANF benefits, maximum child tax credit, unemployment rate, (log of) per capita income, and (log of) population density. Dummy variables are also included to account for missing data on the demographic controls. The low-income sub-sample includes individuals whose household income is at or below the sample median ($29,939). The high-income sub-sample includes individuals whose household income is above the sample median. * $p<0.10$, ** $p<0.05$ and *** $p<0.01$.

Appendix Table 1: Summary Statistics for the FFCW Analysis Sample

Variable	(1) Subsidy Recipients	(2) Non-Recipients
Mother's age (years)	22.96	25.42
	(4.77)	(6.12)
White (%)	0.092	0.245
	(0.289)	(0.430)
Black (%)	0.709	0.447
	(0.454)	(0.497)
Hispanic (%)	0.166	0.271
	(0.372)	(0.444)
Other race/ethnicity (%)	0.032	0.035
	(0.177)	(0.185)
Married at birth (%)	0.055	0.277
	(0.229)	(0.447)
Less than high school (%)	0.331	0.332
	(0.471)	(0.471)
High school (%)	0.388	0.294
	(0.488)	(0.455)
Some college (%)	0.266	0.246
	(0.442)	(0.431)
B.A.+ (%)	0.013	0.125
	(0.117)	(0.331)
Mother's PPVT score	87.64	90.12
	(10.22)	(12.66)
No other children (%)	0.280	0.345
	(0.449)	(0.475)
One other child (%)	0.335	0.305
	(0.472)	(0.460)
Two or more other children (%)	0.384	0.348
	(0.486)	(0.476)
Grandmother is in household (%)	0.326	0.234
	(0.469)	(0.423)
Grandfather is in household (%)	0.101	0.113
	(0.302)	(0.316)
Mother worked before birth (%)	0.738	0.684
	(0.440)	(0.464)
Household income at 12-months ($)	20,241	33,275
	(20,401)	(37,429)
Child is a boy (%)	0.588	0.512
	(0.492)	(0.499)
Child's age (months)	35.54	35.50
	(2.08)	(2.38)
Low birth weight (%)	0.103	0.094
	(0.304)	(0.293)

Source: Authors' analysis of the Fragile Families and Child Well-Being Study, Three-Year Follow-Up
Notes: Standard deviations are in parentheses.

Appendix Table 2: Summary Statistics for the ECLS-K Analysis Sample

Variable	(1) Subsidy Recipients	(2) Non-Recipients
Mother's age (years)	30.48	33.45
	(7.28)	(6.49)
White (%)	0.418	0.613
	(0.493)	(0.487)
Black (%)	0.359	0.136
	(0.480)	(0.343)
Hispanic (%)	0.154	0.164
	(0.361)	(0.370)
Other race/ethnicity (%)	0.067	0.085
	(0.250)	(0.279)
Less than high school (%)	0.166	0.139
	(0.373)	(0.346)
High school (%)	0.405	0.298
	(0.491)	(0.457)
Some college (%)	0.364	0.312
	(0.481)	(0.463)
B.A.+ (%)	0.062	0.248
	(0.241)	(0.432)
No other children (%)	0.212	0.171
	(0.409)	(0.377)
One other child (%)	0.354	0.430
	(0.478)	(0.495)
Two or more other children (%)	0.432	0.398
	(0.495)	(0.489)
Household size (number)	4.395	4.523
	(1.642)	(1.390)
Mother worked after childbirth (%)	0.880	0.732
	(0.324)	(0.442)
Child is a boy (%)	0.488	0.507
	(0.500)	(0.499)
Child's age (months)	68.26	68.45
	(4.26)	(4.44)
Premature birth (%)	0.184	0.168
	(0.387)	(0.374)
Low birth weight (%)	0.060	0.058
	(0.239)	(0.234)
First-time kindergartner (%)	0.949	0.953
	(0.220)	(0.209)
Disabled (%)	0.207	0.136
	(0.405)	(0.343)

Source: Authors' analysis of the Early Childhood Longitudinal Study—Kindergarten Cohort, Spring of Kindergarten
Notes: Standard deviations are in parentheses.

Appendix Table 3: Summary Statistics for the DDB Needham
Life Style Survey Analysis Sample

Variable	(1) Single Mothers	(2) Single Women Without Children
Age (years)	32.70	33.12
	(6.81)	(7.44)
White (%)	0.605	0.784
	(0.488)	(0.410)
Black (%)	0.308	0.143
	(0.461)	(0.350)
Other race/ethnicity (%)	0.085	0.071
	(0.280)	(0.258)
Less than high school (%)	0.092	0.031
	(0.289)	(0.174)
High school (%)	0.352	0.225
	(0.477)	(0.417)
Some college (%)	0.412	0.365
	(0.492)	(0.481)
B.A.+ (%)	0.143	0.377
	(0.350)	(0.484)
Never married (%)	0.366	0.683
	(0.482)	(0.465)
Divorced (%)	0.437	0.248
	(0.496)	(0.432)
Separated (%)	0.147	0.044
	(0.354)	(0.205)
Widowed (%)	0.047	0.024
	(0.213)	(0.153)

Source: Authors' analysis of the DDB Needham Life Style Survey, 1986-2004
Notes: Standard deviations are in parentheses.