

Three Studies on Family Well-Being and Child Support

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## **DEDICATION**

This dissertation is dedicated to single mothers living in poverty in Colombia and the United States who struggle to provide for their children.

## CHAPTER 1: INTRODUCTION

My dissertation examines the effects of child support on the well-being of custodial-mother families. Empirical evidence for a wide range of countries suggests that these families are particularly likely to be living below poverty and that child support plays an important role in directly reducing their income poverty (Bartfeld, 200; Cancian, Meyer and Park, 2003; Cuesta and Meyer, 2014; Hakovirta, 2011; Meyer and Hu, 1999; Nichols-Casebolt, 1986; OECD, 2011). Less is known about the extent to which child support influences outcomes that indirectly affect both the current poverty of custodial-mother families and the future economic well-being of children growing up in these families, especially in less developed countries.

In three related studies, I examine the indirect effects of child support on poverty. In the first study I examine whether child support affects the labor supply of custodial mothers participating in the Temporary Assistance for Needy Families (TANF) program (chapter 2 of this dissertation). I use data from the Wisconsin Child Support Demonstration Evaluation (CSDE), and use its experimental design to evaluate the effects of child support on the likelihood of working for pay and hours worked. Unlike previous nonexperimental research, I do not find any negative effect of child support on the labor supply of custodial mothers. Recent U.S. social welfare policies have focused on increasing both custodial mothers' child support collections and their labor supply. The results suggest that these may be compatible policies; the absence of a negative labor supply effect strengthens the potential antipoverty effectiveness of child support.

In the second and third studies I focus on the associations of child support with outcomes that are likely to affect the economic well-being of children in custodial-mother families as adults. In the second study I use the Colombian Quality of Life Survey to study the role of child support on food insecurity (chapter 3). Multivariate analyses show that families receiving child

support are less likely to experience inadequate consumption of food. This association is particularly concentrated among single-mother families and families headed by younger mothers. Overall, these results suggest that policies that increase child support receipt in less-developed countries like Colombia are likely to decrease food insecurity among custodial-mother families.

In the third study I use the Colombian Longitudinal Survey of Wealth, Income, Labor, and Land (ELCA) to examine the association of child support with child chronic malnutrition (chapter 4). A key difficulty in estimating this association is that those who do and do not receive support may be different in unmeasured ways. I use different approaches in order to minimize this issue, including probit regressions with extensive controls and propensity score matching techniques. Results suggest that child support is negatively associated with chronic malnutrition among young children in urban Colombia. Children who benefit from this transfer are between 8 and 10 percentage points less likely to experience chronic malnutrition.

This dissertation closes in chapter 5 with a summary, implications for policy and practice, and directions for future research. This dissertation demonstrates how child support may influence outcomes that affect current poverty among custodial-mother families in the U.S. as well as outcomes that are associated with future economic well-being of children living in these families in Colombia. Findings highlight the limitations of nonexperimental research for estimating child support effects and the utility of using different approaches to identify causal relationships. This dissertation adds to the substantial evidence on the potential benefits of child support for custodial mother families in the U.S. and the growing literature of this issue in less-developed countries. Finally, these analyses suggest the importance of integrating the child support system into the social safety net of less-developed countries like Colombia. Further



research on the role of child support and its interaction with other policies for low-income families, both in the U.S. and in less-developed countries is warranted.

## **CHAPTER 2: THE EFFECT OF CHILD SUPPORT ON THE LABOR SUPPLY OF CUSTODIAL MOTHERS PARTICIPATING IN TANF**

### 1. Introduction

Custodial-parent families (i.e., families in which the child lives with only one biological parent, including those in which the child lives with a parent and stepparent) in the United States are disproportionately poor relative to two-parent families. The incidence of poverty is particularly high if custodial-parent families are female headed. In 2012, the poverty rate for custodial-mother families was more than four times (40.9%) that of two-parent families (8.9%), and almost twice the poverty rate observed among custodial-father families (22.6%) (United States Census Bureau, 2013).

Because cash assistance has declined dramatically in the last decade, and receipt of child support (i.e., monetary transfers from parents who do not live with their children) is generally small (Cancian, Meyer, & Park, 2003) and irregular (Cancian & Meyer, 2005; Ha, Cancian, & Meyer, 2011; Nepomnyaschy & Garfinkel, 2010) among low-income families, custodial-parents' earnings are instrumental for reducing income poverty among these families. Moreover, as the overarching principle of the U.S. child support system is that both parents have financial responsibility for their biological children (Cancian, Meyer, & Han, 2011; Meyer, 2012), there is an expectation that noncustodial-parent contributions will complement custodial-parent earnings.

Yet, custodial parents' decision to work may differ depending on whether they receive child support. In fact, microeconomic theory suggests that nonlabor income such as child support unambiguously reduces the labor supply of the recipient (e.g., decision to work at all, the number of hours worked, etc.). That is, assuming leisure is a normal good, such that when income increases the demand for leisure will rise, additional income provided by the noncustodial parent will lead the custodial parent to work fewer hours (Killingsworth & Heckman 1986). Yet, this

prediction may not hold in all populations. For instance, child support income may enable low-income, credit-constrained, custodial parents to increase their labor supply by providing resources to overcome limitations to work for pay (e.g., lack of resources to pay for child care, commute to work, or receive job training to improve their employability). Hence, child support may not necessarily reduce custodial parent's labor supply, as predicted by standard microeconomic theory.

The vast majority of previous studies suggest that child support has a small, negative effect on the labor supply of custodial mothers (Graham, 1990; Graham & Beller, 1989; Hu, 1999). However, this research was mostly focused on non-welfare populations<sup>1</sup> and findings may not necessarily reflect the behavioral response of low-income custodial mothers after welfare reform. Moreover, the endogeneity between child support receipt and mothers' labor supply was not fully addressed in this literature. This is a major limitation because unobserved characteristics of custodial mothers may simultaneously affect their child support receipt and participation in the labor market. For instance, mothers who are more motivated or better self-advocates may be more likely to engage in the process of pursuing a child support order and also more likely to be active in the labor market. Motivation, self-advocacy, and other unobserved characteristics that affect child support receipt and labor outcomes may lead to biased estimates of the effects of child support on the labor supply of custodial mothers.

The purpose of this paper is to examine the effect of child support on the labor supply of welfare populations and to determine the extent to which policies that aim to increase child support collections and those that aim to increase custodial mothers' employment are working

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<sup>1</sup> One study examines the effects of child support reforms on female labor supply and welfare dependency before the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA).

against each other. Specific aims are to determine: (1) the extent to which child support receipt reduces the likelihood of working for pay among custodial mothers participating in the Temporary Assistance for Needy Families (TANF) program; and (2) the extent to which child support receipt reduces hours worked among custodial mothers participating in TANF.

Data for these analyses come from the Wisconsin Child Support Demonstration Evaluation (CSDE), which uses an experimental design to evaluate the effects of a full pass-through policy of child support on custodial-mother families participating in TANF. The full pass-through policy allowed custodial mothers to receive all child support paid on behalf of their children. Further, the state disregarded child support income for purposes of calculating TANF benefit amounts.<sup>2</sup> Because participants in the experiment were randomly assigned to one of two pass-through eligibility statuses--receive full amount of child support or not--the CSDE data provide a unique opportunity to estimate the effects of child support by eliminating the bias introduced by self-selection into child support receipt.

The CSDE experimental analyses showed that fathers in the experimental group were more likely to pay child support and to pay larger amounts of support than fathers in the control group. The evaluation also showed that mothers in the experimental group received more support than mothers in the control group; for the population of custodial mothers participating in W-2 during the evaluation, the differences in the average annual amount of child support received were \$142 in 1998 and \$123 in 1999 (among all mothers) and \$482 in 1998 and \$300 in 1999 (among mothers with a pre-participation higher child support history). Among mothers included

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<sup>2</sup>When implemented, these measures were particularly exceptional since custodial parents in most other states received none of the child support paid on behalf of their children, and those states with any pass-through generally limited it to a maximum of \$50 per month. Under current policy, many states still do not distribute most child support to families receiving TANF benefits.

in the survey, the differences were \$92 in 1998 and \$125 in 1999 (among all mothers) and \$396 in 1998 and \$421 in 1999 (among mothers with a pre-participation higher child support history). While the effect of the experiment was fairly small among all mothers, the difference between experimental and control groups was statistically significant and represented an increase of 28% in 1998 and 17% in 1999 in the average amount received by mothers in the control group (Meyer & Cancian, 2001).

Our study extends previous research by taking advantage of the CSDE's random assignment design to explicitly address the endogeneity between child support receipt and custodial mothers' labor supply. We also examine this relationship among a population that has been particularly affected by changes in social welfare policies. At the very least, results from this study may have implications for the child support system. If efforts to increase noncustodial fathers' contributions negatively affect custodial mothers' employment, enforcement policies may be unintentionally discouraging custodial mothers' participation in the labor market. As major reforms have been focused on both increasing custodial mothers' labor supply and child support collections (the 1984 and 1988 amendments to the Social Security Act, and the 1996 Personal Responsibility and Work Opportunity Reconciliation Act [PRWORA]), ignoring the potential effect of child support income on labor supply may reduce the effectiveness of these policies. Alternatively, child support may increase family income without affecting custodial mothers' labor supply.

The remainder of this paper proceeds as follows. Section two describes the policy context in which the CSDE took place. Section three discusses main findings from previous research in this area. Section four describes the data, sample, key measures, and methodological approach.

Section five presents the results. Section six concludes with a discussion of findings in the context of current policy and limitations of the study.

## 2. Policy Context

With the enactment of welfare reform (PRWORA), the United States moved forward with a substantially different approach to assisting low-income families with children. The overarching purpose of PRWORA is to promote self-sufficiency by conditioning cash assistance on parents' participation in the labor market. Hence, participants in the program known nationwide as Temporary Assistance for Needy Families (TANF), are expected to work for pay or meet related program requirements. The Wisconsin TANF program, called W-2, attempts to recreate some features of the job market (cash assistance that does not vary with family size, amount received depends on hours of work) in order to promote employment among participants.

The Wisconsin TANF program included a unique approach to child support for families receiving cash assistance: most custodial mothers in the original W-2 program were allowed to receive all child support paid on behalf of their children and child support income was ignored in the determination of TANF eligibility. This policy was consistent with the W-2 emphasis on replicating the job market. Just as workers' wages are not affected if they receive child support, neither would W-2 cash payments be affected by child support receipt. This policy contrasted with prior Aid to Families with Dependent Children (AFDC) pass-through policy, which allowed for a maximum \$50 child support pass-through and disregard in determining AFDC cash benefits. It was also more generous than the TANF rules adopted by other states, most of which retained the \$50 pass-through and disregard, or eliminated it completely.<sup>3</sup> As a condition for the

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<sup>3</sup> From the Urban Institute Welfare Rules Database, available at <http://anfdata.urban.org/wrd/WRDWelcome.CFM>.

waiver required in order for Wisconsin to implement the full pass-through and disregard, the federal government required an experimental evaluation of the policy.

Wisconsin's approach, and the required evaluation, provided the opportunity to evaluate the effects of child support on a host of individual and family outcomes. In the fall of 1997, both recipients of AFDC transitioning to TANF and new applicants to TANF were randomly assigned to one of two pass-through eligibility statuses. Participants in the experimental group received the full amount of child support paid by the noncustodial parent, while participants in the control group received a partial pass-through of the first \$50 per month, or 41% of the amount paid, whichever was larger. All participants in TANF were placed in one of four tiers of employment: (1) transition, which is provided for those having a disability that limits their capacity to work for pay or who need to care for a child with a disability (work activities for which participants received \$628 per month); (2) community service jobs (public service jobs funded by the state for which participants received \$673 per month); (3) trial jobs (to provide work experience in jobs partially subsidized by the state; participants should be paid at least minimum wage); and (4) case management services (to help find an unsubsidized job for which participants received market wage). The program also included a category of "Caretaker of Newborn" that provided \$673 per month for parents caring for a child younger than 13 weeks.

Our analysis considers mothers' labor supply during the initial experiment. Later, in July of 2002, all custodial parents began to receive the full pass-through of child support. In 2003, with the end of the federal waiver that allowed the experiment, Wisconsin adopted a policy in which custodial parents receiving TANF are no longer able to receive all child support paid on behalf of their children.

### 3. Literature Review

Despite the growing focus on the importance of child support income and mothers' earnings for the economic well-being of low-income, custodial-mother families, a relatively small literature examines the interaction of policies simultaneously encouraging child support collections and mothers' employment. This research has been informed by microeconomic theory. According to the general static model of female labor supply, additional, nonlabor income (such as child support) may lead the custodial mother to make different choices about the number of hours worked for pay and the number of hours devoted to leisure. Assuming leisure is a normal good, that when income increases, the demand for leisure will rise. The prediction of this model is that child support income will unambiguously reduce hours worked (an income effect).

The few earlier studies have considered the effect of child support income on the labor supply of divorced and separated mothers on and off the Aid to Families with Dependent Children (AFDC) program. These studies (Graham & Beller, 1986; Graham & Beller, 1989; Graham, 1990) have been informed by theoretical models of the effects of nonlabor income on the labor supply of participants in public assistance programs (Burtless & Hausman, 1978; Moffitt, 1983, 1986). Given this framework, child support receipt influences mothers' decisions on both AFDC participation and employment, and increases in child support income do not necessarily reduce custodial mothers' employment. Unlike the general static model of female labor supply, the effect of child support on the labor supply of custodial mothers participating in AFDC is ambiguous. Noncustodial fathers' financial contributions may discourage employment but, if these transfers induce mothers to leave welfare, they may also increase mothers' hours devoted to working for pay (Graham & Beller, 1989; Moffitt, 1983, 1986).



Based on multivariate regression analyses and data from the 1979/1982 Current Population Survey (CPS) data, this literature suggests that child support is negatively associated with number of hours worked (Graham & Beller, 1986; Graham & Beller, 1989; Graham, 1990). Yet, comparisons show that child support income has a smaller negative effect on mothers' labor supply than other nonlabor income (Graham & Beller, 1989; Graham, 1990). Estimates of the child support effect among divorced and separated mothers vary from one-third (Graham & Beller, 1989) to half (Graham, 1990) the size of the other nonlabor income effect. Research that examines why the effect of child support should be any different from that of other nonlabor income suggests that the irregularity of noncustodial-parent payments makes child support a risky income source and, as a result, some custodial mothers may use the labor market as a way to reduce the volatility of family income (Graham, 1990).

These studies try to address the endogeneity between child support and labor supply by using extensive controls and adding a term that aims to account for selection into child support receipt. However, because the correction term is estimated using child support predictors, which are also correlated with labor supply, the correction is limited. Fathers' ability and desire to pay support and the state's legal environment have been used as instruments for child support income. These variables are limited as instruments as they are not exogenous to mothers' labor supply. For instance, fathers' desire to pay child support may be influenced by whether mothers are working. Overall, concerns remain regarding the potential bias associated with unobserved characteristics that influence both the decision of pursuing a child support order and the decision of participating in the labor market. Further, regression analyses that include these adjustments provide less precise estimates, limiting the ability to discern the effect of child support on the labor supply of divorced or separated mothers (Graham & Beller, 1989).

Similar findings are observed in the only study that includes a simultaneous equations strategy to examine the effect of child support on custodial mother employment. This approach consists of estimating a series of equations that aim to model the process of participating in the labor market when the mother is eligible for child support receipt. These analyses are based on a sample of mothers who divorced or separated between 1969 and 1987 and were interviewed in the Panel Study of Income Dynamics. Results show a small negative effect of child support on the labor supply of mothers who are not on AFDC (those likely to be better off than a welfare sample) and a positive effect among mothers receiving cash welfare; that is, child support increases hours worked among mothers participating in AFDC (Hu, 1999). While this approach aims to account for the relationship between child support receipt and labor supply, the simultaneous equations model does not address the potential influence of unobserved characteristics of custodial mothers that may affect both.

Previous research is limited in its ability to account for factors that concurrently affect mothers' determination to pursue a child support order and participate in the labor market. Custodial mothers' motivation, self-advocacy, and perceptions about participation in cash welfare programs are among the unobserved factors that may influence both child support and labor supply. The current study is able to take advantage of a randomized experiment to provide more robust estimates. In addition, prior research has excluded never-married mothers. Because these women are more likely to be poor and have been the focus of policies that try to simultaneously increase child support collections and labor supply, it is important to understand the extent to which child support discourages their participation in the labor market, especially after the inception of welfare reform. Our study makes a first contribution to this policy debate.

#### 4. Data, Sample, Methods, and Measures

#### *4.1. Data and Sample*

We use survey and administrative data from the Wisconsin Child Support Demonstration Evaluation (CSDE), which uses an experimental design to evaluate the effects of child support on several outcomes. Custodial mothers transitioning from AFDC to TANF and new entrants to TANF were randomly assigned to experimental and control groups. The experimental group received the full amount paid by the noncustodial father while the control group received a partial pass-through of child support (i.e., up to \$50 per month or 41% of the amount paid, whichever was larger). This study collected three waves of information about the custodial mother, one focal child, and the focal child's noncustodial father. The first wave was collected in the first half of 1999 and focuses on the experiences in 1998. The second wave was collected in the first half of 2000, and looks at the events during 1999. The third wave was limited to one-third of the original survey sample, and focused on the experiences in 2001. As the effects of the experiment may take some time to be observed—because, for example, custodial mothers may make decisions about their labor supply after they observe either a regular pattern of child support payments or an increased amount of child support income--our main analyses are based on labor outcomes at wave 2 (between the last month of 1999 and the first half of 2000), the later of the full sample surveys. The final sample for the study includes 2,085 custodial mothers who were interviewed at both wave 1 (baseline) and wave 2. CSDE data provide comprehensive information on employment history, child support, demographics, and socioeconomic characteristics of the custodial mother and her family.

#### *4.2. Methods*

When randomized experiments are perfectly implemented, the simple comparison between experimental and control groups provides the unbiased causal effect. Although the

experiment in the CSDE was correctly implemented, the technical report of the study indicates that there were some randomly occurring differences in initial characteristics (Cancian, Caspar, & Meyer, 2001). In order to increase the precision of statistical tests and minimize the effects of any chance difference at baseline, we estimated regression-adjusted means rather than simple means.

We begin our analyses by estimating a series of naïve models in which the potential endogeneity between child support receipt and employment is ignored. First, we regress the likelihood of working for pay on child support. We use a probit model as summarized in equation 4.1. The dependent variable is whether the mother is working at wave 2 (between the last month of 1999 and the first half of 2000), and the key independent variable is any child support receipt in 1999 ( $CS_i$ ). The vector  $X_i$  represents the set of control variables, described below (in section 4.3).

$$\Pr(\text{Working} = 1)_i = \beta_0 + \beta_1 CS_i + \beta_2' X_i + e_i \quad (4.1)$$

In the second set of naïve models we estimate the relationship between child support and hours worked. We use a tobit<sup>4</sup> model as summarized in equations 4.2 and 4.3. The dependent variable is the total number of hours worked per week at wave 2, and the key independent variable is, again, any child support receipt in 1999 ( $CS_i$ ). The same vector of control variables used for the estimation of equation 4.1 is included in the estimation of equation 4.2.

$$H_i^* = \beta_0 + \beta_1 CS_i + \beta_2' X_i + e_i \quad (4.2)$$

$$H_i \left\{ \begin{array}{ll} = 0 & \text{if } H_i^* \leq 0 \\ = H_i^* & \text{if } H_i^* > 0 \end{array} \right\} \quad (4.3)$$

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<sup>4</sup> We use a tobit model because a substantial portion of the sample mothers (42.3%) were not working at the second wave and therefore have zero hours of work.

These naïve models provide a context for the analyses that use the experimental variation to identify the effect of child support.

In the first part of the experimental analyses we estimate the effect of child support on the likelihood of working for pay. We use a probit model as summarized in equation 4.4. The dependent variable is whether the mother is working at wave 2, and the key independent variable is the assignment to the experimental group ( $T_i$ ). The vector  $X_i$  represents the set of control variables described in section 4.3. This model specifically addresses aim 1 of the study, to determine the extent to which child support receipt reduces the likelihood of working for pay among custodial mothers participating in TANF.

$$\Pr(\text{Working} = 1)_i = \beta_0 + \beta_1 T_i + \beta_2' X_i + e_i \quad (4.4)$$

In the second set of experimental analyses we estimate the effect of child support on hours worked. We use a tobit model as summarized in equations 4.5 and 4.6. The dependent variable is the total number of hours worked per week at wave 2, and the key independent variable is the assignment to the experimental group ( $T_i$ ). The same vector of control variables used for the estimation of equation 4.4 is included in the estimation of equation 4.5. This set of models specifically addresses aim 2 of the study, to determine the extent to which child support receipt reduces the hours worked among custodial mothers participating in TANF.

$$H_i = \beta_0 + \beta_1 T_i + \beta_2' X_i + e_i \quad (4.5)$$

$$H_i \left\{ \begin{array}{ll} = 0 & \text{if } H_i^* \leq 0 \\ = H_i^* & \text{if } H_i^* > 0 \end{array} \right\} \quad (4.6)$$

We also conducted two sensitivity analyses to see if results change among subgroups of custodial mothers with a higher child support history (i.e., \$1,000 or more of child support was paid on behalf of the mother's children in the year before baseline) or who are more likely to

receive any child support (i.e., custodial mothers who experienced multiple-partner fertility at baseline). Both descriptive and adjusted-regression analyses were weighted to adjust for non-response bias, differential sampling, and differential assignment rates to the experimental and control groups.

#### 4.3. Measures

*Working for pay.* This is a dummy variable indicating whether the custodial mother did any work for pay during the four weeks prior to the survey (excluding work required by TANF).<sup>5</sup> This measure is designed to include both formal and informal employment.

*Hours worked.* This is a continuous measure of the number of hours that the custodial mother usually worked per week, during the four weeks prior to the survey. This measure includes hours worked in all mother's jobs.

*Child support.* This is measured as a dichotomous variable. Mothers who received any amount of child support during 1999 are coded as 1, and 0 otherwise.

*Control variables.* We use the same set of controls for all the regression analyses. Control variables were generally measured in the year before baseline (1998). Custodial mother's history of child support receipt one year before baseline was measured using indicator variables for zero payment (reference category), \$1 to \$999, and \$1,000 or more. Mother's age was measured using indicator variables for 25 years old or younger (reference category), 26 to 30 years old, and 31 years or older. Custodial mother's race was measured using indicator variables for white (reference category), African American, or other. Mother's AFDC history was measured using indicator variables for the number of months the mother had received AFDC transfers 24 months

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<sup>5</sup> Mothers in TANF tiers of trial jobs, community service jobs, and transition jobs were required to work 40, 30, and 28 hours per week, respectively.

before entry to W-2, for 0 months (reference category), 1 to 18 months, or 19 to 24 months. Mother's residency was measured using indicator variables for Milwaukee County, other urban counties, and rural counties (reference category). A series of indicator variables was created to indicate whether the mother was in a W-2 lower tier (transitional job or community service job), a W-2 upper tier (trial jobs partially subsidized by the state and unsubsidized jobs), or at the caretaker of a newborn W-2 tier. The age of the focal child was included using indicator variables for 0 to 2 years old (reference category), 3 to 5 years old, and 6 or older. A series of indicator variables was created in order to indicate whether the custodial mother has less than high school, high school or equivalent, or more than high school (reference category). Noncustodial father's average annual earnings were measured using indicator variables for \$0 to \$15,000 (reference category) and \$15,000 or more. Custodial mother's employment history in the two years before baseline was measured using indicator variables for 0 quarters employed (reference category), 1 to 6 quarters employed, and 7 to 8 quarters employed. The type of case that led to the child support order was measured using indicator variables for paternity case, divorce case, and combination of divorce and paternity (reference category). The number of legal fathers associated with the mother was included using indicator variables for 0 (reference category), 1 father, and 2 or more fathers. Whether a child support order existed before baseline was included as a dichotomous variable (1 = yes). The number of custodial mother's children (natural or adopted) was measured with indicator variables for 1 child (reference category), 2 children, and 3 children or more. Finally, a series of indicator variables account for the period of random assignment.<sup>6</sup>

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<sup>6</sup> Because entrance to W-2 was slower than anticipated, the rate of assignment to the experimental and control groups increased over time. Between September 1997 and March 16, 1998, 20% were assigned to the control group, 20% were assigned to the experimental group,

*Variables to identify subgroups for sensitivity analyses.* Whether the mother had a higher child support history before baseline was coded as a dichotomous variable (1 = \$1,000 or more of child support was paid on behalf of the mother's children in the year before baseline). Multiple-partner fertility at baseline was coded as a dichotomous variable (1 = mother has children by more than one partner).

## 5. Results

### 5.1. *The Naïve Model*

In the naïve model, we examine the relationship between child support and custodial mother labor supply, ignoring the endogeneity between these two variables. We begin by estimating bivariate tests for differences between those mothers who received any child support in 1999 and those mothers who did not receive any child support in the same period. These descriptive statistics suggest that mothers who receive child support are more likely to work (62.5%) than those who do not receive these transfers (53.2%). These analyses also suggest that, on average, custodial mothers receiving child support work three more hours per week than nonrecipients. Other figures in columns 2 and 3 of Table 2.1 show that mothers receiving child support are slightly better off than mothers who do not receive child support.

[TABLE 2.1]

We also estimated a series of regressions to see if the relationships remain after adding the set of control variables described in section 4.3. The first column in Table 2.2 presents results from a probit regression estimating work for pay. The analysis suggests that mothers who

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and the remainder to the experimental group not eligible for the survey (reference category); between March 17, 1998, and May 10, 1998, 30% were assigned to the control group, 30% were assigned to the experimental group, and the remainder to the experimental group not eligible for the survey; and between May 11, 1998, and July 8, 1998, 50% were assigned to the control group and 50% were assigned to the experimental group.



received any child support in 1999 are 6.1 percentage points more likely to work than those who did not. The estimate suggests that the positive “effect” of child support on mother’s participation in the labor market remains even after controlling for observed characteristics. The estimated positive “effect” of child support on hours worked also remains after adding control variables (first two columns of Table 2.3). On average, mothers who received child support are estimated to work between 1.7 to 2.4 hours more per week than those who did not receive child support.

[TABLE 2.2]

[TABLE 2.3]

Findings from the naïve models suggest that child support has a positive and statistically significant relationship with custodial mothers’ labor supply. Of course, these estimates are likely biased, since they are unable to capture differences in unobserved characteristics that may influence both child support receipt and participation in the labor market. Findings from these naïve models are consistent with prior nonexperimental research that has looked at this question for a relatively similar population, participants in the AFDC program who experienced separation or divorce (Hu, 1999).

### *5.2. Experimental Analyses*

In the experimental analyses we take advantage of the random assignment to experimental and control groups to estimate the causal effect of child support on custodial mothers’ labor supply. The final two columns of Table 2.1 show characteristics of our sample by treatment status. About 57% of the full sample was working for pay at wave 2 and, on average, these mothers were working 37 hours per week. Most mothers were young—44% were under 26--and more than half of them were African American (64%). Only 10% of the sample had

more than high school and about half had a child support order at baseline. The majority of mothers were in the lower tier of TANF (state subsidized jobs; 60%), and had received AFDC transfers between 19 to 24 months before transitioning to or enrolling in TANF (56%). Small differences between treatment and control groups were not statistically significant at conventional levels. Overall, custodial mothers in the experimental and control groups are very similar.

In the second column of Table 2.2 we present results of the experimental analysis of the working-for-pay outcome, that is, whether the mother did any work for pay during the four weeks prior to the survey, excluding work required by TANF. The estimate of being in the experimental group (full pass-through of child support payments) is positive but not statistically significantly associated with the likelihood of working for pay. That is, we do not find evidence that child support receipt reduces the likelihood of working for pay among custodial mothers participating in W-2. Marginal effects of control variables are consistent with previous empirical evidence on the determinants of female labor supply. Women with less than high school education are less likely to work for pay than women with more than high school education as well as mothers in lower tiers of TANF (subsidized jobs) and longer history of participation in AFDC at baseline.

Experimental analyses for hours worked are presented in the final two columns of Table 2.3. We present both the marginal effects of the truncated expected value (conditional on  $H > 0$ ), and the marginal effects of the censored expected value (unconditional on  $H > 0$ ). The estimated effect of being in the experimental group on hours worked is not statistically significant for any of the estimates (and the mean of the marginal effect is positive). That is, we do not find

evidence that child support receipt reduces the number or hours worked among custodial mothers participating in TANF.

One explanation of this result is that child support is an uncertain source of income for low-income families and, therefore, custodial mothers do not make decisions about labor supply considering monetary contributions from the noncustodial father. In order to assess whether results may look different among those who might expect more regular child support, we re-estimated our models for two subgroups of custodial mothers: those with a higher child support history (i.e., at least \$1,000 of child support was paid on behalf of the mother's children in the year before baseline), and custodial mothers who experience multiple-partner fertility (MPF) at baseline. Custodial mothers with a higher history of child support may be more likely to receive any support regularly. The total child support income received by custodial mothers experiencing MPF may also be more regular than the child support income received by custodial mothers having children with a single partner. The likelihood of paying any child support is higher for fathers who have children with multiple mothers (Meyer, Cancian, & Cook, 2005), and the probability of receiving child support from any father may be higher than the probability of receiving from one particular father. For either subgroup, the increased regularity in total child support income may influence a custodial mother's decision to work for pay because she may be more likely to include child support income in her decision-making process. If this is the case, child support receipt may be more likely to affect low-income custodial mothers' labor supply in the direction predicted by standard microeconomic theory. However, when we re-estimated models summarized in equations 4.4 and 4.5 for both subgroups of custodial mothers, conclusions remained the same (results available upon request).

## 6. Discussion

The overarching question of this study was whether child support receipt reduces the labor supply of custodial mothers participating in TANF. Our naïve models are consistent with previous analyses for custodial mothers receiving cash welfare. When the endogeneity between child support and labor supply is not accounted for, additional support is positively associated with hours worked (Hu, 1999). However, once we use variation in child support received associated with random assignment to alternative pass-through and disregard policies, there is no discernable relationship with labor supply. In contrast to previous nonexperimental research, we do not find any effect of child support receipt on the likelihood of working for pay or hours worked. It may be that previous analyses confounded child support effects with other unobserved characteristics that affect female labor supply. It is also likely that findings from prior research reflect the behavioral response of custodial mothers relatively better off than our welfare sample. The vast majority of our sample is composed of nonmarital cases (82% with paternity cases) while other studies focused on divorced and separated mothers and explicitly excluded never-married mothers. Moreover, we examine this issue after work-focused welfare reform; it may be that conditioning cash welfare on work participation changed work incentives among low-income mothers.

These findings suggest that efforts to pursue noncustodial fathers' child support contributions and increase the regularity of total income received by custodial mothers are not likely to affect mothers' labor supply. As major reforms to U.S. social welfare policies have been focused on increasing custodial mothers' labor supply and child support collections, our results suggest that implementing these policies simultaneously is not reducing the potential antipoverty effectiveness of child support.

Findings from this study should be interpreted in light of the following limitations. First, results cannot be generalized to all custodial-mother families as child support payments are particularly irregular and small among disadvantaged families like those participating in TANF. As a result, the custodial mother may be more likely to make decisions about labor supply without considering potential monetary contributions from the noncustodial father; small and irregular amounts of child support may actually underscore the importance of working for pay among these women. Second, there is one characteristic of the Wisconsin experiment that may make it a weaker test. Although custodial mothers in the experimental group received on average higher amounts than those in the control group, the difference was small. Hence, while we were able to address selection into child support receipt by taking advantage of the random assignment into experimental and control groups, the actual treatment (child support income) was relatively modest. It is noteworthy, however, that this limited treatment is arguably a strength for a policy-relevant test: low-income women are likely to receive low and irregular payments. Third, by the time the experiment was conducted, Wisconsin had built a relatively strong institutional framework supporting work-focused welfare interventions; this environment may have created unique conditions that strengthen incentives to participate in the labor market and helped to avoid the negative effects of child support income on mothers' employment. It is important to note, though, that most states have adapted to changes introduced by welfare reform. Thus, the Wisconsin experience may be increasingly relevant in other states. Finally, while the experimental variation in child support receipt allows us to avoid bias associated with unmeasured factors that might affect both labor supply and child support, it does not eliminate the potential bias if mothers' labor supply affects fathers' payment of support.

Notwithstanding these considerations, results from this study may have implications for social welfare policies in the United States. Some states have implemented programs aimed at improving the employability of disadvantaged, noncustodial fathers, hoping that these interventions will facilitate child support payments and, therefore, improve the economic well-being of custodial-parent families. Our results suggest that these efforts will not be offset by changes in mothers' employment, even in the context of a full child support pass-through. Policies encouraging child support collections and mothers' employment are not necessarily at cross-purposes; in this regard, efforts to increase the labor supply of both parents are compatible.

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## Tables

Table 2.1. Descriptive statistics, full sample, by any child support received in 1999, and by treatment status

	Full sample	Received any CS in 1999	Did not receive any CS in 1999	Experiment al group	Control group
Working	0.577	0.625	0.532***	0.581	0.572
Hours worked (all)	21.366 (20.801)	22.899 (20.644)	19.952*** (20.855)	21.934 (21.338)	20.791 (20.238)
Hours worked (working)	37.330 (12.640)	36.777 (13.177)	37.934 (12.009)	38.043 (13.280)	36.599 (11.914)
Received CS in 1999	0.48			0.49	0.47
CS received in 1999	819.360 (1518.823)	1708.166 (1814.334)	0.000*** (0.000)	871.681 (1550.154)	766.456 (1485.345)
Assignment 20%	0.894	0.898	0.891	0.891	0.897
Assignment 30%	0.054	0.049	0.059	0.054	0.054
Assignment 50%	0.051	0.052	0.050	0.054	0.048
CS 1yr before BL 0	0.727	0.547	0.893***	0.725	0.730
CS 1yr before BL 1-999	0.158	0.236	0.087***	0.160	0.156
CS 1yr before BL 1,000+	0.114	0.215	0.020***	0.114	0.114
CM Age 25	0.445	0.407	0.479***	0.433	0.456
CM Age 26 to 30	0.175	0.195	0.157**	0.173	0.177
CM Age 31+	0.301	0.295	0.307	0.317	0.285
White	0.266	0.344	0.194***	0.250	0.282
Black	0.636	0.568	0.699***	0.651	0.622
Other	0.094	0.083	0.104	0.091	0.096
Missing race	0.003	0.003	0.004	0.007	0.000*
AFDC receipt before BL 0	0.122	0.111	0.131*	0.123	0.120
AFDC receipt before BL 1_18	0.317	0.299	0.334	0.309	0.324
AFDC receipt before BL 19_24	0.561	0.588	0.535*	0.566	0.555
Milwaukee	0.760	0.688	0.825***	0.777	0.741
Other Urban	0.153	0.190	0.120***	0.139	0.168
Rural	0.087	0.121	0.055***	0.082	0.091
TANF lower tier	0.600	0.542	0.653***	0.585	0.615
TANF upper tier	0.313	0.359	0.270***	0.327	0.298
TANF caretaker	0.087	0.097	0.077	0.087	0.087
Focal child 0 to 2	0.244	0.221	0.266*	0.235	0.253
Focal child 3 to 5	0.261	0.271	0.251	0.260	0.262
Focal child 6+	0.493	0.507	0.481*	0.502	0.485
Missing focal child's age	0.002	0.002	0.001	0.003	0.000
CM education is less than HS	0.511	0.481	0.539**	0.517	0.506
CM education is HS or equivalent	0.387	0.403	0.372	0.377	0.397
CM education is more than HS	0.100	0.114	0.087*	0.104	0.097
Missing CM education	0.001	0.000	0.002	0.002	0.001

NCP earnings \$0 to \$15,000	0.786	0.829	0.745***	0.781	0.790
NCP earnings \$15,000+	0.085	0.141	0.033***	0.085	0.086
CM employment history 0 qtr	0.184	0.144	0.222***	0.184	0.185
CM employment history 1–6 qtr	0.600	0.610	0.590	0.593	0.606
CM employment history 7–8 qtr	0.214	0.244	0.185***	0.219	0.208
Paternity case	0.834	0.785	0.878***	0.833	0.834
Divorce case	0.078	0.086	0.070	0.081	0.075
Missing type of case	0.000	0.000	0.001	0.000	0.001
Combination	0.088	0.127	0.051***	0.084	0.091
Zero legal father	0.239	0.168	0.304***	0.240	0.238
One legal father	0.580	0.549	0.608*	0.580	0.579
Two+ legal father	0.181	0.281	0.089***	0.179	0.183
Missing legal father	0.001	0.002	0.000	0.001	0.000
Order at baseline	0.476	0.637	0.327***	0.475	0.477
One child	0.343	0.283	0.398***	0.345	0.342
Two children	0.287	0.300	0.275	0.277	0.297
Three children	0.370	0.417	0.327***	0.378	0.362
Observations	2,085	1,036	1,049	1,046	1,039

**Notes:** Means (and standard deviations) or proportions presented. Statistical significance of bivariate tests for differences between those custodial mothers who received any child support in 1999 and those mothers who did not receive these transfers in the same period of time, and for differences between those custodial mothers in the experimental group and those in the control group: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 2.2. Working for pay at wave 2: Probit models.

	Naïve model	Experimental model
Received any CS in 1999	0.061* (0.026)	
Experimental Group		0.005 (0.022)
Assignment 30%	-0.036 (0.039)	-0.039 (0.039)
Assignment 50%	-0.005 (0.034)	-0.007 (0.034)
CS 1yr before BL 1-999	-0.020 (0.034)	-0.004 (0.033)
CS 1yr before BL 1,000+	0.085* (0.042)	0.106* (0.041)
CM Age 26 to 30	0.032 (0.034)	0.032 (0.034)
CM Age 31+	-0.075* (0.031)	-0.077* (0.031)
Black	0.005 (0.033)	0.002 (0.033)
Other	-0.036 (0.045)	-0.040 (0.045)
AFDC receipt before BL 1_18	-0.114** (0.036)	-0.113** (0.036)
AFDC receipt before BL 19_24	-0.141*** (0.041)	-0.139*** (0.041)
Milwaukee	0.089* (0.044)	0.083 (0.045)
Other Urban	0.085 (0.045)	0.085 (0.045)
TANF lower tier	-0.159*** (0.025)	-0.160*** (0.025)
TANF caretaker	-0.170*** (0.044)	-0.167*** (0.044)
Focal child 3 to 5	-0.057 (0.036)	-0.059 (0.036)
Focal child 6+	-0.063 (0.037)	-0.067 (0.037)
CM education is less than HS	-0.235*** (0.040)	-0.236*** (0.040)
CM education is HS or equivalent	-0.096* (0.041)	-0.097* (0.041)
NCP earnings \$15,000+	-0.036 (0.042)	-0.023 (0.042)

CM employment history 1–6 qtr	0.100*** (0.030)	0.105*** (0.030)
CM employment history 7–8 qtr	0.190*** (0.037)	0.199*** (0.037)
Paternity case	0.016 (0.043)	0.012 (0.043)
Divorce case	0.002 (0.056)	-0.002 (0.056)
One legal father	0.041 (0.031)	0.041 (0.031)
Two+ legal father	0.036 (0.043)	0.049 (0.042)
Order at baseline	-0.027 (0.028)	-0.017 (0.028)
Two children	-0.021 (0.030)	-0.020 (0.030)
Three children	-0.000 (0.033)	0.003 (0.033)
<hr/> Total Observations	<hr/> 2,085	<hr/> 2,085

**Notes:** Marginal effects (and standard errors) presented. Statistical significance: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 2.3. Hours worked at wave 2: Tobit models.

	Naïve model		Experimental analyses	
	Conditional expected value (H > 0)	Unconditional expected value	Conditional expected value (H > 0)	Unconditional expected value
Received any CS in 1999	1.686*	2.404*		
	(0.836)	(1.193)		
Experimental group			0.632	0.901
			(0.734)	(1.047)
Assignment 30%	-0.308	-0.440	-0.368	-0.525
	(1.257)	(1.793)	(1.260)	(1.797)
Assignment 50%	-0.151	-0.215	-0.236	-0.337
	(1.030)	(1.469)	(1.033)	(1.473)
CS 1yr before BL 1-999	-0.827	-1.180	-0.415	-0.592
	(1.130)	(1.612)	(1.103)	(1.574)
CS 1yr before BL 1,000+	2.193	3.127	2.764*	3.942*
	(1.275)	(1.818)	(1.243)	(1.773)
CM Age 26 to 30	1.363	1.944	1.356	1.934
	(1.063)	(1.516)	(1.061)	(1.514)
CM Age 31+	-2.356*	-3.360*	-2.434*	-3.471*
	(1.046)	(1.493)	(1.048)	(1.494)
Black	0.949	1.354	0.807	1.151
	(1.038)	(1.480)	(1.039)	(1.482)
Other	0.053	0.076	-0.079	-0.113
	(1.510)	(2.154)	(1.512)	(2.157)
AFDC receipt before BL 1_18	-3.217**	-4.589**	-3.177**	-4.531**
	(1.070)	(1.525)	(1.073)	(1.530)
AFDC receipt before BL 19_24	-4.465***	-6.368***	-4.370***	-6.233***
	(1.274)	(1.817)	(1.273)	(1.816)
Milwaukee	2.644	3.771	2.423	3.456
	(1.403)	(2.001)	(1.408)	(2.008)
Other Urban	2.558	3.649	2.543	3.627
	(1.382)	(1.971)	(1.390)	(1.983)
TANF lower tier	-5.263***	-7.507***	-5.269***	-7.515***
	(0.804)	(1.147)	(0.804)	(1.147)
TANF caretaker	-5.536***	-7.897***	-5.450***	-7.774***
	(1.339)	(1.909)	(1.342)	(1.914)
Focal child 3 to 5	-1.799	-2.565	-1.904	-2.716
	(1.151)	(1.642)	(1.148)	(1.637)
Focal child 6+	-2.322*	-3.312*	-2.469*	-3.521*
	(1.174)	(1.674)	(1.170)	(1.669)

CM education is less than HS	-7.225*** (1.144)	-10.305*** (1.632)	-7.267*** (1.146)	-10.365*** (1.634)
CM education is HS or equivalent	-2.541* (1.111)	-3.624* (1.584)	-2.578* (1.113)	-3.678* (1.588)
NCP earnings \$15,000+	-0.282 (1.362)	-0.402 (1.942)	0.078 (1.362)	0.111 (1.942)
CM employment history 1-6 qtr	3.579** (1.141)	5.105** (1.628)	3.722** (1.137)	5.308** (1.622)
CM employment history 7-8 qtr	6.045*** (1.276)	8.621*** (1.820)	6.285*** (1.268)	8.965*** (1.808)
Paternity case	-0.173 (1.465)	-0.247 (2.089)	-0.260 (1.462)	-0.372 (2.085)
Divorce case	-1.281 (1.852)	-1.826 (2.641)	-1.431 (1.847)	-2.041 (2.635)
One legal father	1.172 (1.045)	1.671 (1.491)	1.166 (1.043)	1.663 (1.488)
Two+ legal father	1.386 (1.420)	1.977 (2.025)	1.742 (1.415)	2.485 (2.018)
Order at baseline	-0.955 (0.945)	-1.362 (1.348)	-0.693 (0.936)	-0.988 (1.335)
Two children	-0.986 (0.999)	-1.407 (1.425)	-0.940 (1.001)	-1.341 (1.427)
Three children	0.390 (1.092)	0.557 (1.558)	0.452 (1.093)	0.645 (1.559)
Total Observations	2,085	2,085	2,085	2,085

**Notes:** Marginal effects (and standard errors) presented. Statistical significance: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

### **CHAPTER 3: CHILD SUPPORT AND FOOD INSECURITY AMONG CUSTODIAL-MOTHER FAMILIES IN COLOMBIA**

#### 1. Introduction

Noncustodial fathers' financial contributions, more generally known as child support, reduce income poverty among custodial-mother families (that is, families in which the children's father is alive but not living with the children and their mother) in a wide range of countries (Bartfeld, 2000; Cancian, Meyer, & Park, 2003; Cuesta & Meyer, 2014; Harkovita, 2011; Meyer & Hu, 1999; Nichols-Casebolt, 1986; OECD, 2011). Less is known about the role of child support in avoiding material hardship, especially in the context of less-developed nations. While child support receipt may increase a family's financial resources, this additional income may not necessarily reduce the inadequate consumption of very basic goods, such as food and housing. In fact, research conducted in developed countries shows that associations between material hardship and income and material hardship and poverty status are weaker than would be expected (Cancian & Meyer, 2004; Mayer & Jenks, 1989; Nepomnyaschy & Garfinkel, 2011; Sullivan, Turner, & Danziger, 2008).

Various reasons may explain the modest association between these constructs. Income is a limited measure of economic well-being; in fact, access to in-kind resources or credit may lead to different living standards among families with the same incomes (Beverly, 2001). Also, even if families have incomes above the poverty threshold (and therefore are considered not poor), physical and mental health issues or alcohol and drug problems may affect parents' ability to manage resources (Heflin, Corcoran, & Siefert, 2007; Nepomnyaschy & Garfinkel, 2011). Overall, material hardship and income poverty are better considered as alternative conceptions of poverty (Beverly, 2001) rather than substitutes for each other. Examining the role of child support income on material hardship expands prior knowledge on the antipoverty effectiveness



of child support by looking at a conceptually different approach to poverty. Because poverty is a multidimensional phenomenon that cannot be fully explained with the single dimension of income, this analysis is instrumental in understanding the economic well-being of custodial-mother families.

Food insecurity, considered one of the more severe and potentially harmful experiences of material hardship (Miller, Nepomnyaschy, Lara Ibarra & Garasky, 2013; Nepomnyaschy, Miller, Garasky & Nanda, 2014), is highly prevalent in Colombia. According to the National Survey of Nutritional Status (ENSIN for the Spanish acronym), 42.7% of Colombian households experienced some level of food insecurity in 2010. Of the poorest households in the country, 60.1% experienced inadequate food consumption in the same year (Profamilia, 2011b). Empirical evidence also shows that food insecurity is more prevalent in female-headed households than male-headed households (Alvarez-Uribe, Estrada-Restrepo, & Fonseca-Centeno, 2010), and single-mother families are more likely to experience food insecurity than two-parent families (Isanaka, Mora-Plazas, Lopez-Arana, Baylin, & Villamor, 2007).

The purpose of this paper is to examine food insecurity experiences among custodial-mother families in Colombia and the extent to which child support receipt is helping to prevent these circumstances. Specific aims are: (1) to calculate the percentage of custodial-mother families experiencing overall food insecurity and different levels of this hardship, (2) to estimate the association between child support income and food insecurity, and (3) to examine whether the association of child support income with food insecurity varies by family structure and custodial mother's age.

I study the case of Colombia for two main reasons. First, it has experienced substantial family changes over the last few decades (Cuesta and Meyer, 2014; Esteve, Lesthaeghe &

Lopez-Gay, 2012; Profamilia, 2011a) and aggregate figures suggest that in Colombia both female-headed households and single-parent families are among the highest in Latin America (Cerrutti & Binstock, 2009; ECLAC, 2004). These demographic changes along with very little extant research on their concomitant child support issues make Colombia an interesting case study. Another reason I chose Colombia is because it has a unique dataset that facilitates the systematic identification of custodial-mother families and provides key information to measure food insecurity. Specifically, I am able to calculate the Latin American and Caribbean Scale to Measure Food Security (ELCSA for the Spanish acronym), adapted and validated for Colombia.

This study extends prior research through several avenues. First, examining the association between child support and food insecurity in Colombia provides an alternative perspective on poverty experienced by custodial-mother families in less developed countries. As discussed above, poverty is not a one-dimensional construct and, therefore, using an alternative assessment is particularly important to improve our current understanding of the economic well-being of these families. Literature on this topic is scarce and, to the best of my knowledge, there is no research that looks at these issues in the context of nations like Colombia. Second, findings from this study can help to enhance child support policies. Specifically, if there is a high incidence of food insecurity among custodial-mother families, children in these families would be facing issues that, at least in theory, could be addressed by the child support system; findings from this study could initiate a debate on the purposes of the child support system and specific ways in which it is falling short. These results could also highlight the need for collaboration between the child support system and government agencies in charge of nutritional programs and health care provision.

The remainder of this paper proceeds as follows. Section 2 describes the Colombian child support system. Section 3 discusses findings from prior research and hypotheses of the role that child support income may have in the food insecurity experiences of custodial-mother families in Colombia. Section 4 presents data, sample, methods, and measures, and section 5 describes results. In section 6 I discuss findings, limitations, and conclusions of the study.

## 2. The Colombian Child Support System

Colombia has a child support system (CSS) that comprises three main actors: the judicial system, a government agency called the National Institute of Family Well-being (NIFW), and local governments. These actors intervene in different circumstances and sometimes cooperate to get child support arrangements in place. When parents get divorced, child support arrangements are made through legal divorce proceedings. If there is a nonmarital birth or parental separation, the CSS intervention depends entirely on the custodial parent's initiative to pursue a child support order. However, parents can make a private agreement that—at least in theory—is enforceable by the CSS. If there is no private agreement, the custodial parent may either sue the noncustodial parent or request support from the NIFW.

Four major tasks describe the Colombian CSS's operation: (1) request for intervention, (2) order establishment and revision, (3) collection and distribution of payments, and (4) enforcement (Cuesta and Meyer, 2012). The first task, request for intervention, should be initiated by the custodial parent at a local NIFW agency or family court. The CSS begins the process of locating the absent parent and, if needed, paternity is established. Overall, the process through the NIFW is meant to be less adversarial than the judicial procedure. All services provided through NIFW are free of cost while the costs of legal counseling and representation in court are incurred by the custodial parent.

With respect to the second task, order establishment and revision, the CSS promotes parents' agreement on the amount and type of support. If parents agree, the amount and characteristics of support (e.g., type, regularity, etc.) become enforceable by the CSS. If parents disagree, the NIFW officer is authorized to set up an administrative order (as is the family judge if the custodial parent goes to court). The Colombian child support system does not have guidelines for the amount of support except that it cannot be higher than 50 % of the noncustodial parent's monthly wage. As a result, the NIFW staff and family judges have a lot of discretion when establishing child support orders.

The third task, collection and distribution of payments, depends primarily on the parents and no intervention of a public agency is expected. Wage withholding may occur if the custodial parent sues the noncustodial parent and the family judge determines that such procedure should be granted. In this case, the employer forwards payments to the judicial system and the judicial system issues a check that the custodial parent retrieves at the court office. The fourth task, enforcement, occurs only if the custodial parent sues the noncustodial parent. The system itself does not initiate any action against the noncustodial parent unless it is requested by the custodial parent. Penalties for noncompliance include prison sentences and loss of parental rights.

The Colombian child support system shares several characteristics of systems in developed countries. For instance, it has a combination of judicial and government actors that provide services to custodial parents and there are some penalties for noncompliance with child support orders. The Colombian system also encourages private agreements among parents, which is one key feature of the most recent reforms in countries like the United Kingdom and Australia (Cuesta and Meyer, 2014). Of course there are some differences between the Colombian system and schemes in developed countries. For example, some procedures are more

standardized in developed countries and do not require much action from the custodial parent (e.g., wage withholding, monitoring payments). Many developed countries also have large scale enforcement programs while Colombia relies mostly on custodial parent agency and self-advocacy. It is also worth noting that the child support system receives less policy attention in Colombia than in many developed countries.

### 3. Literature Review

#### *3.1. Theoretical Perspectives*

Child support income may reduce food insecurity through different avenues. The most obvious mechanism is by increasing a family's income and, therefore, providing additional resources to facilitate the adequate consumption of food. An influential qualitative study conducted by Edin and Lein (1997) describes ways in which noncustodial fathers' contributions may help custodial-mother families to avoid material hardship experiences in the United States. Holding other factors constant, child support income may directly increase financial resources to buy food, clothing, and pay rent and utilities, or it may allow mothers to reallocate resources that they would have spent on those items (Edin & Lein, 1997; Garasky & Stewart, 2007; Nepomnyaschy & Garfinkel, 2011). However, the literature for a wide range of countries shows that receipt rates of child support are generally low (Cuesta & Meyer, 2012; Hakovirta, 2011; Skinner & Davidson, 2009) and families receiving these transfers usually get small amounts of support (Cancian, Meyer, & Park, 2003). In Colombia, only one in four families eligible for child support receives these transfers (Cuesta & Meyer, 2012) and the mean amount received is \$36 per month (Cuesta & Meyer, 2014). These conditions may limit the potential of child support to prevent food insecurity among custodial-mother families in Colombia.

Another theoretical approach suggests that child support income may reduce food insecurity by facilitating accountability on how resources are spent. Specifically, custodial mothers may be more inclined to spend noncustodial fathers' transfers on items like food than they would have been spending other types of income on the same item (Del Boca & Flinn, 1994; Garasky & Stewart, 2007; Nepomnyaschy & Garfinkel, 2011; Nepomnyaschy, Miller, Garasky & Nanda, 2014). This can be particularly relevant if the father keeps contact with his children and sees their living conditions and overall well-being; this process, also known as monitoring (Seltzer, 1994), may create incentives to invest child support in consumption of basic goods and services for children (Garasky & Stewart, 2007). Yet, others argue that it is also likely that noncustodial father's visitation may increase family's hardships by discouraging searches for outside support (e.g., accessing a food pantry); these authors suggest that stigma associated with welfare receipt and the noncustodial father's sense of being financially responsible for their children may be some of the drivers of this behavior (Coe & Hill, 1998; Garasky & Stewart, 2007; Stewart, 2003). The possibility that noncustodial father's visitation entails consuming family resources could also increase food insecurity (Garasky & Stewart, 2007; Stevens, 2010). Nepomnyaschy & Garfinkel (2011), and Nepomnyaschy, Miller, Garasky & Nanda (2014) also suggest that child support receipt may increase this hardship if child support income discourages contributions from other family members, relatives, or even friends. However, as these authors discuss, this is highly unlikely as noncustodial fathers' payments would need to be large enough to offset contributions from other individuals.

### *3.2. Empirical Evidence*

To the best of my knowledge, there is no quantitative study that looks at the association between child support income and food insecurity in Colombia or any other developing country.

Some studies for Colombia show that food insecurity is highly prevalent (Profamilia, 2011b), especially among female-headed households (Alvarez-Uribe, Estrada-Restrepo, & Fonseca-Centeno, 2010). One study that focuses on Bogotá, the capital of Colombia, also shows that single-parent families are more likely to experience food insecurity than two-parent families (Isanaka, Mora-Plazas, Lopez-Arana, Baylin, & Villamor, 2007). Yet, none of these studies examine the prevalence of food insecurity among custodial-mother families nationwide and the extent to which child support may help to prevent these experiences.

Studies that look at this issue in developed countries are very scarce and the vast majority of published, quantitative research focuses on the United States. Overall, this literature shows that child support income does not have a consistently significantly negative association with food insecurity (Garasky and Stewart, 2007; Nepomnyaschy and Garfinkel, 2011; Nepomnyaschy, Miller, Garasky & Nanda, 2014). Nepomnyaschy, Miller, Garasky & Nanda (2014) explore potential explanations for this result, including the irregularity of child support payments among low-income families and the fact that recipients of public assistance (e.g., cash welfare or food vouchers) may not receive the full amount of child support paid on behalf of their children, if any. These supplementary analyses show no consistent evidence on whether regularity of payments matters for child support income to prevent food insecurity. Also, their main findings do not change after controlling for public assistance receipt; while child support income was negatively associated with food insecurity, findings were not always significant in alternative specifications.

Recent empirical evidence suggests that child support income reduces income poverty among custodial-mother families (Cuesta & Meyer, 2014). If additional income provides opportunities to either buy food or to reallocate custodial-mother's income to do so, we may

expect child support to be negatively associated with food insecurity in Colombia. Moreover, child support may have a stronger association with food insecurity in Colombia than in the United States. First, if food insecurity levels are high in developing countries, any income source may have stronger effects. Second, in the majority of U.S. states, child support payments are fully withheld from recipients of cash welfare in order to recoup costs. In contrast, the Colombian CSS does not have a systematic interaction with the country's public assistance scheme, so child support income may have a stronger negative and statistically significant association with food insecurity in Colombia than in the United States. On the other hand, there is also evidence that child support receipt is particularly low (28% of custodial-mother families in 2008) and amounts received relatively small (mean \$36 per month) in Colombia (Cuesta & Meyer, 2014), suggesting that child support income may not be enough to help custodial-mother families avoid food insecurity experiences. Further research is needed in order to better understand the association between child support income and food insecurity in less developed countries like Colombia.

Multivariate analyses of this paper include standard sociodemographic factors associated with the inadequate consumption of food (e.g., custodial mother's education, age, and employment; number of children in the family; whether the family lives in a rural or urban area) and other income sources that may also influence food insecurity experiences (e.g., earnings, government transfers). One proxy of noncustodial father's contact with his young children is included as well. While this paper focuses on child support income, including other types of noncustodial father's contributions is instrumental to provide more robust estimates of the association between child support income and food insecurity.



## 4. Data, Sample, Measures, and Methods

### *4.1.Data*

I use the 2008 Quality of Life Survey (QLS), a nationally representative household survey that is run by the Colombian National Department of Statistics (DANE for the Spanish acronym). It was conducted about every other year between 1997 and 2008. In 2009, the QLS became an annual survey that has some special modules conducted every other year (e.g., food insecurity, social mobility). In addition to standard information on family demography, the 2008 QLS provides necessary items to calculate the Latin American and Caribbean Scale to Measure Food Security (ELCSA for the Spanish acronym), which can be used to examine food insecurity among custodial-mother families in Colombia. The survey also includes two questions on child support (receipt and amount received). Even though there is information on food insecurity in the 2012 QLS, this version does not include data on noncustodial father's physical contact with his young children. Hence, I use the 2008 data in order to include a key measure of father involvement in my analyses. The QLS is based on a multistage probability sample. In 2008, 13,611 households (50,542 individuals) participated in the survey.

### *4.2.Sample*

In this study I use the sample of custodial-mother families constructed by Cuesta and Meyer (2014) using the 2008 QLS. Custodial-mother families are defined as a group of at least two persons residing together, at least one of whom is a child (i.e., from 0 to 17 years old) and one who is that child's mother (who is at least 18 years old). Families also include the spouse or cohabiting partner of the mother, any half- or step-siblings of the child, and any children of the spouse/partner. The QLS has data for each child on whether the father and mother are in the household, who they are, and, if they are not in the household, whether they are alive. I used the

responses to these questions to create families within households and to determine whether any family was a custodial-mother family (that is, there was a child living with his mother whose father was alive but lived elsewhere). This procedure provides a sample of 3,359 custodial-mother families, 2,616 who are single-mother families (an unpartnered mother and her children) and 743 who are repartnered-mother families (that is, families in which there is a mother, a mother's spouse/partner, and at least one child who is the mother's child but not the spouse/partner's child).

#### *4.3.Measures*

*Food insecurity.* This hardship is observed at the household level. In order to determine whether a household experienced low, moderate, or severe food insecurity, I use the Latin American and Caribbean Scale to Measure Food Security (ELCSA for the Spanish acronym), adapted and validated for Colombia. The 2008 QLS includes questions needed to measure the 15 items included in ELCSA. Specifically, households were asked whether, due to lack of money, they experienced any of the following events, 30 days prior to the survey: (1) running out of food; (2) an adult did not have access to a healthy diet; (3) an adult did not have breakfast, lunch, or dinner; (4) an adult could not vary food; (5) an adult ate less than he/she is used to; (6) an adult felt hungry or complained of being hungry but could not buy more food; (7) an adult had only one meal in the day; (8) an adult went to bed hungry; (9) a child did not have access to a healthy diet; (10) a child could not vary food; (11) a child ate less than he/she is used to; (12) an adult had to serve less food to a child; (13) a child complained of being hungry but could not buy more food; (14) a child went to bed hungry; and (15) a child had only one meal or did not have any meal in the day. Following the ELCSA protocol, households were assigned one point for each event they experienced. A household's overall score (0 to 15 points) for the scale was then

calculated by summing the scores on the individual items. Households were classified as food secure if they got 0 points (households show no or minimal evidence of food insecurity); minimally food insecure if they got 1 to 6 points (households worrying about running out of food and adjusting food quality and variety, but not reducing quantities of food intake below normal levels); moderately food insecure if they got 7 to 11 points (households in which adults skip or cut the size of their own meals and reduce their food intake below normal levels to provide for their children); and severely food insecure if they got 12 to 15 points (households in which both adults and children reduce food intake and experience hunger). In addition to examining these levels of food insecurity, I construct a dichotomous measure for experiencing any level of food insecurity.

*Child support income.* It is measured as a continuous variable that reflects the amount of support received by the custodial-mother family in the month prior to the survey. This value includes both formal (with a legal order) and informal (without a legal order) child support. Along with other sources of income described below, child support income is included in the multivariate analyses as the logarithm of the amount converted to U.S. dollars (1,920 Colombian pesos = 1 U.S. dollar as of May 19, 2014). In the model that includes income variables as dichotomous measures, this variable is coded as 1 if the custodial-mother family received any amount of child support in the month prior to the survey.

*Labor income.* It is measured as a continuous variable that includes wages or earnings received in the month prior to the survey, from all jobs held by all family members who were employed or self-employed at the time of the survey. In the model that includes income variables as dichotomous measures, this variable is coded as 1 if the custodial-mother family received any labor income in the month prior to the survey.

*Other income.* It is measured as a continuous variable that reflects other sources of income such as pensions, support from others, and rental income received in the month prior to the survey, from all family members. In the model that includes income variables as dichotomous measures, this variable is coded as 1 if the custodial-mother family received any amount of other transfers in the month prior to the survey.

*Government transfers.* It is measured as a continuous variable that includes items such as conditional cash transfers, unemployment subsidies, emergency support, and subsidies for the elderly. Because this information is reported at the household level, I estimate the amount per custodial-mother family. For this calculation, I assume that transfers are distributed equally across household members and then sum these per capita transfers across the members of the custodial-mother family. Because this information is reported for the 12 months prior to the survey, I divide the year amount by 12 to approximate a monthly amount per family. In the model that includes income variables as dichotomous measures, this variable is coded as 1 if the custodial-mother family received any government transfers during the 12 months prior to the survey.

*Noncustodial father's contact with his young children.* This variable is measured as a dichotomous variable. Families in which at least one child under 5 years old has a noncustodial father who usually does any of the following activities with the child are coded as 1, and 0 otherwise. The activities are: (1) sing or read stories, (2) go to the park, (3) play sports, (4) do artistic activities, (5) have at least one meal per day together, and (6) do homework together.

*Other covariates associated with food insecurity.* I also included dichotomous measures for the following characteristics: family type (single-mother family = 1); number of children in the family (one child, two children, and three children or more; one child as a reference

category); custodial mother's age (less than 30, between 30 and 40, and more than 40 years old; the latter as a reference category); custodial mother's education (less than high school, high school, and more than high school; the latter as a reference category); mother's status in the labor market (employed = 1); mother's self-reported health status (very good and good = 1); whether the household is located in urban or rural area (urban = 1); whether the family lives in a multi-family household (yes = 1); and whether the family lives in a household that experienced any of the following economic losses between 2004 and 2008: (1) head of the household job loss, (2) spouse or partner's head of the household job loss, (3) other member of the household lost his/her job, (4) family business went out of business, or (5) other important economic loss.

#### *4.4. Methods*

I address aim 1—to calculate the percentage of custodial-mother families experiencing food insecurity—by conducting descriptive analyses for the full sample of families. I calculate the percentage of custodial-mother families experiencing different levels of food insecurity, as described above. In order to address the second aim, I use a series of probit regressions to estimate the relationship between child support and the likelihood of experiencing food insecurity. When examining this relationship, I estimate one model that includes income variables as dichotomous measures and another model that includes income variables as continuous measures. The purpose of these analyses is to explore whether the amount matters or only whether something is received. I use Akaike's Information Criterion (AIC) and the Schwarz's Information Criterion (BIC) to determine the best fitted model. For all analyses I use the strategy of adding control variables progressively. The first specification includes only child support income. In the second model I add other sources of income. In the final model I include variables generally associated with food insecurity. The second and third models help examine

whether any estimated relationship between child support and food insecurity remains when other variables are controlled. In order to address the third specific aim of the study I estimate the association between child support and food insecurity by subcategories of family structure (single-mother family and repartnered-mother family) and custodial mother's age (from 18 to 29, 30 to 40, or 41 or more years old).

## 5. Results

### *5.1.Descriptive Analyses*

Table 3.1 presents the frequency of overall food insecurity as well as different levels of this hardship among custodial-mother families in Colombia. My analyses show that 57.3% of these families experienced food insecurity 30 days prior to the 2008 QLS. Some variation on the extent of food insecurity is observed. Of all custodial-mother families in the sample, 13.3% experienced severe food insecurity (adults and children reduced food intake and experienced hunger), and 16.2% experienced moderate food insecurity (adults skipped or cut the size of their own meals and reduced their food intake below normal levels to provide for their children). Families receiving child support are less likely to experience this type of hardship than those who do not benefit from these transfers, especially if they are facing moderate and severe episodes of food insecurity. These differences between recipients and nonrecipients of child support are statistically significant.

[TABLE 3.1]

### *5.2.Multivariate Analyses*

Table 3.2 shows probit regressions in which income variables are included as dichotomous measures. Results suggest that there is a statistical association between child support receipt and experiencing food insecurity. However, this relationship weakens

dramatically (in size and statistical significance) once I include other factors related to food insecurity more generally. Table 3.3 presents probit regressions in which income variables are included as continuous measures. This analysis shows a negative, statistically significant association between child support income and experiencing inadequate consumption of food, even after including other variables related to food insecurity. Descriptive analyses also show a high standard deviation (\$ 211) of mean amounts (\$ 132) among those who actually received child support. Taken together, these analyses suggest that the amount received is important, not merely whether something is received. That is, being a recipient of child support may not make a substantial difference for family's food security if the amount paid is negligible. Because Akaike's Information Criterion (AIC) and the Schwarz's Information Criterion (BIC) analyses support the preference for including child support (and other income variables) as continuous measures, analysis by subcategories of family structure and custodial mother's age are conducted using continuous measures of income.

[TABLE 3.2]

Results presented in Table 3.3 suggest that child support income is negatively associated with food insecurity. The marginal effect of child support income is nearly identical after adding other sources of income (Model 2), and smaller after adding other variables associated with food insecurity (Model 3), but the association between this type of support and food insecurity remains negative and statistically significant across different specifications. Also, while the negative association between earnings and food insecurity is larger than the negative association between child support and food insecurity, analyses show no statistically significant differences between these two marginal effects. The positive and statistically significant association between government transfers and food insecurity probably reflects reverse causality; that is, custodial-

mother families experiencing food insecurity are more likely to receive public assistance than those who do not face inadequate consumption of food.

[TABLE 3.3]

My analyses also show that a child's contact with the noncustodial father has a negative association with food insecurity. This result, along with the marginal effect of the child support income variable, suggests that noncustodial fathers' contributions (represented in cash and time spent with young children) may help to avoid inadequate consumption of food among custodial-mother families in Colombia. Marginal effects for covariates theoretically associated with food insecurity coincide with prior empirical research in this area: custodial mothers with more education and good health are less likely to experience inadequate consumption of basic goods and services (and marginal effects are statistically significant) than custodial mothers with less education and poor health. There is no association between mother's age and food insecurity or between mother's employment and food insecurity. In regards to family structure, I did not find any association between being a single-parent family or living in a multi-family household and experiencing food insecurity. However, the families with two or more children examined in this study are more likely to face episodes of food insecurity. Having an economic loss in the 4 years prior to the survey is positively related with food insecurity at the time of the 2008 QLS, while residing in an urban area reduces the likelihood of experiencing inadequate consumption of food.

Finally, Table 3.4 shows probit regressions by subgroups. These results indicate that the association between child support income and food insecurity is most heavily concentrated among single-mother families and families whose mother is 18 to 29 years old.

[TABLE 3.4]



## 6. Discussion

My analyses suggest that child support income may help to prevent food insecurity in Colombia. In contrast, previous evidence for the United States does not show a consistently significantly negative association between noncustodial father's financial contributions and the inadequate consumption of food (Garasky & Stewart, 2007; Nepomnyaschy & Garfinkel, 2011; Nepomnyaschy, Miller, Garasky & Nanda, 2014). Although my study is not strictly comparable with research conducted for the United States, one potential explanation for these differences is related to the lack of systematic interaction between the Colombian child support system and the country's public assistance scheme. Specifically, the absence of welfare-cost-recoupment policies in Colombia may strengthen the potential of child support income to prevent food insecurity among recipients of cash welfare, which most likely are those at greater risk of this hardship.

Findings from this study should be interpreted in light of the following limitations. First, and foremost, I am unable to estimate the causal effect of child support on food insecurity. My analyses suggest that noncustodial fathers' financial contributions are negatively associated with food insecurity but I cannot test whether this result is driven by unobserved differences between families receiving and not receiving child support income. Nevertheless, causal analysis was not the goal of this paper, and future research on this topic should take advantage of an instrumental variable or other identification strategies that may help to estimate the causal effect of child support on food insecurity.

A second limitation of the study is that I am relying on household-level reports of food insecurity. If we believe that households with multiple families pool resources, this is probably a minor issue as one can assume that decisions on food security would affect all families in the

household equally. It is also important to note that only 16% of custodial-mother families in the sample live in a multi-family household and all multivariate analyses include a dichotomous measure of this status to try to address this issue.

A third type of limitation has to do with the measurement of key constructs. The measure of child support received covers only the previous month, and if child support is irregular, a one-month window may not be an accurate representation of the typical pattern. Unfortunately, the QLS does not include any questions about the regularity of support. Also, I include only one proxy of mother's ability to avoid food insecurity (e.g., self-reported health status). Other aspects such as mother's cognitive ability and mother's impulsivity have been found to be associated with food insecurity experiences in developed countries like the United States.

Despite these limitations, this study provides an important first look at the food insecurity experiences of custodial-mother families in Colombia and the role that child support may play in avoiding these events. Findings suggest that noncustodial fathers' financial contributions help custodial-mother families to escape food insecurity in this country. Those receiving child support are less likely to face episodes of food scarcity or hunger and this association is particularly important for single-mother families and families whose mothers are 18 to 29 years old. Because food security is such an important factor for human development, these results suggest that child support may play a key role in family well-being beyond the obvious, mechanical increase of total family income. Of course mother's earnings are also helping these families to avoid food insecurity, but there is no statistical difference between the marginal effects of child support income and earnings on food insecurity, suggesting that both custodial mother's earnings and noncustodial father's financial contributions are instrumental in preventing these events.

This study suggests that policies that increase child support receipt in less-developed countries like Colombia are likely to decrease food insecurity among custodial-mother families. Policy-makers might consider any child support policies in use in developed countries that have been found to be associated with increase receipt to see if they might be applicable to developing countries. These results also highlight the need for collaboration between government agencies in charge of nutritional programs and the health care system and the child support scheme.

Finally, this study also has implications for future research. The association between food insecurity and child support needs to be further explored with data that provide information on the type (formal vs. informal; cash vs. in-kind) and regularity of support, and that use longitudinal data, instrumental variables or other identification strategies. These types of analyses will allow us to have more certainty in determining policy recommendations. Research on the relationship between child support and other measures of material hardship, including unmet medical need or housing problems due to lack of income, also need to be studied. Some exploratory analyses with the 2008 QLS show that 13% of custodial-mother families live near a sewer or garbage dump, which may be an indication of other material hardships such as inadequate or substandard housing. Unfortunately, the QLS does not include good measures of these constructs. Other material hardship experiences need to be examined with different data.

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## Tables

Table 3.1. Frequency of food insecurity among custodial-mother families in Colombia. Unweighted.

	Full Sample	Received CS	Do Not Received CS	
Overall food insecurity	0.573	0.511	0.593	***
Food secure	0.427	0.489	0.407	***
Low food insecurity	0.273	0.265	0.276	
Moderate food insecurity	0.162	0.136	0.170	*
Severe food insecurity	0.133	0.104	0.143	**
Observations	3,359	839	2,520	

Source: Author's calculations based on 2008 QLS, DANE, Colombia.

Notes: Proportions presented. Statistical significance of bivariate tests for differences between those families receiving child support and those families not receiving these transfers: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .



Table 3.2. Regressions on overall food insecurity. Probit model results. Income variables as dichotomous measures.

	Model 1	Model 2	Model 3
Received child support	-0.081*** (0.019)	-0.086*** (0.019)	-0.040* (0.019)
Received earnings		-0.082*** (0.018)	0.031 (0.029)
Received other transfers		-0.000** (0.000)	-0.000* (0.000)
Received government transfers		0.227*** (0.017)	0.137*** (0.017)
Young child contact with noncustodial father			-0.073** (0.023)
Custodial mother is 30 to 40 years old			-0.051* (0.020)
Custodial mother is more than 40 years old			-0.018 (0.021)
Custodial mother did not complete high school			0.209*** (0.026)
Custodial mother completed high school			0.117*** (0.029)
Custodial mother is working			-0.086*** (0.026)
Custodial mother is in good health			-0.156*** (0.017)
Single-parent family			0.091*** (0.025)
Two children			0.053** (0.019)
Three children			0.151*** (0.023)
Family lives in a multi-family household			0.037 (0.022)
Economic loss between 2004 and 2008			0.176*** (0.018)
Family lives in urban area			-0.068*** (0.017)
Total Observations	3,359	3,359	3,359

Source: Author's calculations based on 2008 QLS, DANE, Colombia.

Notes: Marginal effects (and standard errors) presented. Statistical significance: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 3.3. Regressions on overall food insecurity. Probit model results. Income variables as continuous measures.

	Model 1	Model 2	Model 3
Log (Child support income)	-0.151*** (0.022)	-0.150*** (0.021)	-0.090*** (0.021)
Log (earnings)		-0.167*** (0.010)	-0.142*** (0.015)
Log (other income)		-0.061* (0.025)	-0.060* (0.025)
Log (government transfers)		0.568*** (0.080)	0.318*** (0.077)
Young child contact with noncustodial father			-0.081*** (0.022)
Custodial mother is 30 to 40 years old			-0.031 (0.020)
Custodial mother is more than 40 years old			0.003 (0.021)
Custodial mother did not complete high school			0.135*** (0.027)
Custodial mother completed high school			0.050 (0.030)
Custodial mother is working			0.034 (0.020)
Custodial mother is in good health			-0.134*** (0.017)
Single-parent family			-0.030 (0.025)
Two children			0.058** (0.019)
Three children			0.154*** (0.023)
Family lives in a multi-family household			0.037 (0.021)
Economic loss between 2004 and 2008			0.168*** (0.018)
Family lives in urban area			-0.040* (0.017)
Total Observations	3,359	3,359	3,359

Source: Author's calculations based on 2008 QLS, DANE, Colombia.

Notes: Marginal effects (and standard errors) presented. Statistical significance: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 3.4. Regressions on overall food insecurity. Probit model results: subgroup analyses by family structure and custodial mother's age.

	Family Structure		Custodial Mother's Age		
	Single-Mother Families	Repartnered-Mother Families	18-29	30-40	40+
Log (child support income)	-0.090*** (0.022)	0.037 (0.096)	-0.159*** (0.042)	-0.065 (0.034)	-0.069 (0.036)
Proportion of sample	0.78	0.22	0.38	0.35	0.27
Total Observations	2,616	743	1,276	1,174	909

Source: Author's calculations based on 2008 QLS, DANE, Colombia.

Notes: Marginal effects (and standard errors) presented. Models adjusted for all of covariates in Table 2 (except dichotomous variable of single-parent family for family structure models, and dummies of mother's age for age models). Statistical significance: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## **CHAPTER 4: CHILD SUPPORT AND CHRONIC MALNUTRITION AMONG YOUNG CHILDREN IN URBAN COLOMBIA**

### 1. Introduction

Child support, defined as an economic transfer from a noncustodial parent—usually the father—to a custodial parent, is associated with lower poverty rates among custodial-mother families (that is, families in which there is at least one child whose father is alive but not living with the child) in a wide range of countries (Bartfeld, 2000; Cancian, Meyer, & Park, 2003; Cuesta & Meyer, 2014; Harkovita, 2011; Meyer & Hu, 1999; Nichols-Casebolt, 1986; OECD, 2011). Less is known about the extent to which this monetary transfer has distinct associations with child well-being, especially in less-developed countries. Child support may have a distinct relationship with child well-being by increasing incentives to spend family income on children (Knox, 1996), influencing family dynamics in beneficial ways (Argys, Peters, Brooks-Gunn, & Smith, 1998; Knox, 1996; Nepomnyaschy, Magnuson, & Berger, 2012) or simply helping to avoid stigma in the way that cash welfare does (Knox, 1996).

Prior research has shown that child support is positively associated with some measures of child well-being, especially schooling completion (Graham, Beller, & Hernandez, 1994; Knox & Bane, 1994), and academic achievement (Argys, Peters, Brooks-Gunn, & Smith, 1998; Knox, 1996; Nepomnyaschy, Magnuson, & Berger, 2012; McLanahan, Seltzer, Hanson, & Thomson, 1994; Tamis-LeMonda & Cabrera, 1999; Yoshikawa, 1999), net of other factors also related to educational outcomes. Yet, the vast majority of these studies focuses on the United States and less is known about these relationships in less-developed nations. While significant family changes worldwide increasingly highlight the importance of child support research, differences in policies and other contextual factors make previous studies for the United States not

particularly useful in understanding the likely effects of child support policy in developing countries.

Moreover, while there has been some research on the role of child support on children's educational outcomes, the association of this monetary transfer with other dimensions of child well-being such as nutritional status has not been as investigated. Because healthy growth is a key predictor of well-being in adulthood (Hoddinott et al., 2008; Strauss & Thomas, 1998; World Health Organization, 1997) that is partially determined by income (World Health Organization, 1986; Smith & Haddad, 2000), studying the association of child support with nutritional status can provide a better understanding of the potential benefits of noncustodial fathers' monetary contributions to their children's current and long-term well-being. This is particularly important in the context of less-developed countries, where child malnutrition remains high and disproportionately affects children in disadvantaged families.

The purpose of this study is to improve our current knowledge by examining the role of child support in the nutritional status of young children in urban Colombia. Although Colombia has seen a significant decline in child malnutrition over the last two decades, the percentage of children affected by this phenomenon, and especially chronic malnutrition (also known in the literature as *stunting* or *shortness*), remains high. Malnutrition indicators as defined by the World Health Organization and widely used across countries show that, in 2010, of all Colombian children aged 0 to 5, 13.2% were experiencing chronic malnutrition and 30.2% were at risk of growth retardation (ICBF, 2011). The same analyses also show that, in Colombia, chronic malnutrition disproportionately affects indigenous children (29.5%), children living in poverty (27.3%), and children whose mother has less than a high school education (49.8%) (ICBF, 2011).

Colombia is also one of the countries in Latin America that has experienced the most significant family changes (Esteve, Lesthaeghe, & López-Gay 2012), especially among families with children. Between 1997 and 2008, a relatively short period, the percentage of two-parent families decreased by nine percentage points (from 68% to 59%) while the proportion of custodial-mother families increased by eight percentage points (from 28% to 36%) (Cuesta & Meyer, 2014). These dramatic family changes along with the prevalence of child malnutrition and very little extant research on concomitant child support issues make Colombia an interesting case study for developing countries. Colombia also has a longitudinal study that enables the systematic identification of custodial-parent families and includes key variables to conduct this analysis (i.e., characteristics of families and children; children's anthropometric measures; and child support receipt).

Specific aims of this study are: (1) to calculate the proportion of children in custodial-mother families who are experiencing chronic malnutrition and different levels of this type of child malnutrition; (2) to estimate the association of receipt of any child support with chronic malnutrition; and (3) to examine the potential causal effects of child support on chronic malnutrition. Data for these analyses come from the Colombian Longitudinal Survey of Wealth, Income, Labor and Land (ELCA for the Spanish acronym). Because previous research for Colombia shows that poverty reduces the likelihood of having good nutritional status (Profamilia, 2011), and that child support receipt is associated with lower levels of food insecurity (Cuesta, 2014), I hypothesize that child support may help to break the link between pre-child support income poverty and child malnutrition; that is, children aged 0 to 5 who are eligible for child support and do receive this monetary transfer are less likely to experience chronic malnutrition.

The remainder of this paper proceeds as follows. Section 2 describes the Colombian child support system. Section 3 discusses the theoretical approach to the analysis of the association between child support and child malnutrition and findings from prior related research. Section 4 presents data, sample, methods, and measures, and section 5 describes results. In section 6 I discuss findings, limitations, and conclusions of the study as well as directions for further research.

## 2. The Colombian Child Support System

Colombia has a child support system (CSS) that involves three main actors: the judicial system, a government agency called the National Institute of Family Well-Being (NIFW), and local governments. These actors intervene in different circumstances and sometimes cooperate to get child support arrangements in place. When parents get divorced, child support arrangements are made through legal divorce proceedings. If there is a nonmarital birth or unmarried parents separate, the CSS intervention depends entirely on the custodial parent's initiative to pursue a child support order. However, parents can make a private agreement that—at least in theory—is enforceable by the CSS. If there is no private agreement, the custodial parent may either sue the noncustodial parent or request support from the NIFW.

Four major tasks describe the Colombian CSS's operation: (1) request for intervention, (2) order establishment and revision, (3) collection and distribution of payments, and (4) enforcement (Cuesta & Meyer, 2012). The request for intervention should be initiated by the custodial parent at a local NIFW agency or family court. The CSS begins the process of locating the absent parent and, if needed, paternity is established. Overall, the process through the NIFW is meant to be free of cost for parents as well as less adversarial than the judicial procedure.

On order establishment and revision, the CSS promotes parents' agreement on the amount and type of support. If parents agree, the amount and characteristics of support (e.g., type, regularity, etc.) become enforceable by the CSS. If parents disagree, the NIFW officer is authorized to set up an administrative order (as is the family judge if the custodial parent goes to court). The Colombian child support system does not have guidelines for the amount of support except that it cannot be higher than 50 % of the noncustodial parent's monthly wage. As a result, the NIFW staff and family judges have a lot of discretion when establishing child support orders. The noncustodial parent's payments can be required to be made in cash, in-kind, or a combination of both.

The third task, collection and distribution of payments, depends mainly on the parents and no intervention of a public agency is expected. Wage withholding may occur if the custodial parent sues the noncustodial parent and the family judge determines that such procedure should be granted. In this case, the employer forwards payments to the judicial system and the judicial system issues a check that the custodial parent retrieves at the court office. The fourth task, enforcement, occurs only if the custodial parent sues the noncustodial parent. The system itself does not initiate any action against the noncustodial parent unless it is requested by the custodial parent. Penalties for noncompliance include prison sentences and loss of parental rights.

Like some schemes in developed countries, the Colombian child support system provides services to custodial parents and enforces penalties for noncompliance with child support orders. The Colombian system also encourages private agreements among parents, which is an important part of recent reforms in countries like the United Kingdom and Australia (Cuesta & Meyer, 2014). Some key characteristics of schemes in developed countries that are not present in the Colombian system include standardization of procedures such as wage withholding and



monitoring of payments. Many developed countries also have large-scale enforcement programs, while Colombia relies mostly on custodial parent agency and self-advocacy. It is also worth noting that the child support system receives less policy attention in Colombia than in many developed countries.

### 3. Literature Review

#### *3.1. Theoretical Approach*

Child malnutrition in developing countries. Both biological and socioeconomic factors determine child nutritional status (World Health Organization, 1986; Smith & Haddad, 2000). In order to discuss the different paths in which child support may be associated with child malnutrition, I used the framework of Smith and Haddad (2000) to explain this phenomenon in developing countries. Under this perspective, there are three set of factors that may affect child malnutrition: basic determinants, underlying determinants, and immediate determinants. Basic determinants include all potential resources available to a country or community and political and socioeconomic factors that influence the way in which these resources are used. Underlying determinants happen at the household level and include resources for food security (e.g., food production, household income, cash transfers, in-kind transfers), resources for adequate care for children and mothers (e.g., mother's control of resources, mental and physical status, knowledge and beliefs), and a proper health environment (e.g., adequate sanitation, health care availability). Finally, immediate determinants, which occur at the child level, include dietary intake and health status (Smith & Haddad, 2000).

Child malnutrition and child support. The theoretical perspective proposed by Smith and Haddad suggests that child support may influence child malnutrition through different avenues. First, a noncustodial father's monetary transfers may provide additional resources that can

improve a household's access to food security and a healthy environment. While Smith and Haddad's approach does not propose a distinct association of child malnutrition and child support, other theoretical perspectives suggest that this relationship may be different from the association of child malnutrition with other income sources; therefore, even controlling for total income, receipt of child support may be associated with child malnutrition. Specifically, child support may facilitate accountability on how resources are spent, which ultimately may increase custodial mothers' incentives to use noncustodial fathers' transfers on child-rearing expenses (Del Boca & Flinn, 1994; Garasky & Stewart, 2007; Nepomnyaschy & Garfinkel, 2011; Nepomnyaschy, Miller, Garasky & Nanda, 2014), and more specifically, on food and child health care purchases. This mechanism may be particularly relevant if the noncustodial father keeps contact with his children and sees their living conditions and overall well-being, a process that is also known in the literature as *monitoring* (Seltzer, 1994).

A second avenue by which child support may affect child malnutrition is through influencing adequate care for children. Smith and Haddad (2000) propose that these practices are determined by the caregiver's control of economic resources, autonomy in decision making, mental and physical status, and knowledge and beliefs. Hence, a noncustodial father's monetary transfers may be associated with child malnutrition by influencing family dynamics differently than other income sources and ultimately affecting the adequate care for children. This process may occur through different mechanisms. For instance, child support may either exacerbate or alleviate conflict between parents. When noncustodial father payments are the result of an adversarial process, child support may increase conflict between parents (McLanahan et al., 1994), which in turn may affect custodial mother's mental health and ability to provide adequate care for her children. Conversely, child support payments may decrease parental conflict and

enhance both parents' effectiveness as parents (Knox, 1996). Another mechanism through which child support may affect adequate care for children is through a noncustodial father's own resources for care (e.g., knowledge, beliefs, control of his own economic resources). More specifically, child support may influence a custodial mother's facilitation of father's involvement with his children, also known in the literature as *gatekeeping* (De Luccie, 1995), especially when the child is young (Carlson, McLanahan & Brooks-Gunn, 2008).

### *3.2. Empirical Evidence*

To the best of my knowledge, there is no empirical study that has examined the association between child support and child malnutrition in Colombia or any other developing country. Yet, research on the role of child support in Colombia as well as related literature on the effects of conditional cash transfers on child malnutrition provide some insights on the expected association between child support and child malnutrition.

In Colombia, child support is a very important source of income for the custodial-mother families living in poverty who receive it. In 2008, 62% of the total income of these families came from noncustodial fathers' monetary transfers (Cuesta & Meyer, 2014). This research also shows that child support reduces income poverty among custodial-mother families, especially among those who receive this transfer. In 2008, 9% of all custodial mother families and 32% of those receiving child support were brought out of poverty by a noncustodial father's monetary contributions (Cuesta & Meyer, 2014). If child malnutrition disproportionately affects families living in poverty and child support is an important source of income for custodial-mother families living in poverty, child support may help to prevent child malnutrition by providing resources for food security. Recent evidence supports this hypothesis: an increase in child

support income is associated with a decline in the chance of experiencing food insecurity, net of other income sources and factors associated with this material hardship (Cuesta, 2014).

Yet, this literature also shows that child support receipt in Colombia is not particularly common (28% of custodial-mother families received support in 2008) and amounts received are relatively small (averaging \$36 per month). This research also suggests that disadvantaged families are less likely to receive noncustodial fathers' monetary contributions than more advantaged custodial mothers. Families in which the custodial mother is remarried, separated, or divorced are more likely to receive child support than those whose mother has not been married; those families in which the custodial mother has higher education are also more likely to receive child support than those in which the mother has high school education or less (Cuesta & Meyer, 2012). If receipt rates are relatively low and those who receive this transfer are the least disadvantaged, the potential benefits of child support on child nutritional status may be limited because those who are more likely to experience malnutrition are the least likely to receive child support.

Other cash transfers that aim at improving child well-being may also influence chronic malnutrition and should be considered in these analyses. Specifically, custodial-mother families living in poverty are eligible for the conditional cash transfers (CCTs) program, which includes a subsidy for families who have children under 5 years old conditioned on utilization of health care services (e.g., vaccination, periodic medical check-ups). While there is no published research that looks at the interaction of child support and CCT on child malnutrition, quasi-experimental analyses suggests that CCT alone reduced the probability of being chronically malnourished by 0.069; this effect is only observed among children below 24 months of age (Attanasio et al., 2005).

Finally, very little is known about other mechanisms in which a noncustodial father's contributions affect child malnutrition. For example, child support payments might exacerbate conflict between parents, or, because the Colombian child support system discourages adversarial processes, might lessen conflict. These mechanisms should be further investigated along with the interaction of child support and conditional cash transfers.

### *3.3. Contributions of This Study*

This study is the first of which I am aware to examine the association between child support and child malnutrition in a developing country. It provides an important pioneering look at the prevalence of chronic malnutrition among children in custodial-mother families and the potential role that child support may play in preventing this issue. Findings from this study extend our current understanding of the role of child support on child well-being in developing countries. These analyses also have implications for policy as these results may highlight the importance of integrating the child support system into the social safety net of developing countries like Colombia. The next section describes the methodological approach.

## 4. Data, Sample, Measures, and Methods

### *4.1. Data*

I use the Colombian Longitudinal Survey of Wealth, Income, Labor and Land (ELCA for the Spanish acronym). ELCA was launched in 2010 and households will be followed for at least 10 years and interviewed every three years regarding aspects such as employment, income, property ownership, education, health, and family composition. ELCA provides anthropometric measures (height and weight) of children under 5 years old. The first wave was collected in the spring of 2010, and the second wave was collected in the spring of 2013. The ELCA sample is probabilistic, stratified, and comprises 10,800 households (6,000 in urban areas and 4,800 in

rural areas). It is representative of the national socioeconomic strata one through four (the highest socioeconomic strata in Colombia is six, and households in strata five and six were not included in the sampling frame for the survey<sup>7</sup>), and all five geographical areas of Colombia. The response rate of the first wave was 91% ( $N = 5,446$ ) in the urban areas and 98% ( $N = 4,718$ ) in the rural areas. In the second wave, the response rate was 84% ( $N = 4,430$ ) in urban areas and 97% ( $N = 4,581$ ) in rural areas.

#### *4.2. Sample*

Although the ELCA has respondents throughout Colombia, I include only those in urban areas in order to have a more focused analysis. The current sample is drawn from wave 2 in order to understand the most recent association between child support and child malnutrition.<sup>8</sup> The ELCA has data for each child on whether the father and mother are in the household, who they are, and, if they are not in the household, whether they are alive. I used the responses to these questions to create families within households and to determine whether any family was a custodial-parent family. This procedure provides a sample of 3,833 families with minor children (< 18 years old). Because the focus of this study is on custodial-mother families, I eliminated two-parent families (1,905); single-father families (96); repartnered-father families (65); ‘blended’ families (9, those in which both the mother and the father are custodial parents); and families in which the absent parent of all children in the family was dead (134). After these exclusions, my final sample of custodial-mother families included 1,624 cases, 1,265 of which are single-mother families (an unpartnered mother and her children), and 359 of which are

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<sup>7</sup> The vast majority of households in Colombia belong to Strata 1 through 4. According to the Quality of Life Survey, 97% of households were in strata 1 through 4 in 2003 (Alzate, 2006).

<sup>8</sup> Future work may use both waves of data, exploiting the longitudinal design and providing the possibility of fixed-effects analysis.

repartnered-mother families (a mother, a mother's spouse/partner, and at least one child who is the mother's child but not the spouse's/partner's child).<sup>9</sup> Because my unit of analysis is the child and the outcome that I use to examine nutritional status is only relevant for children aged 0 to 5 years old who are eligible for child support (i.e., children who have a noncustodial father), my final analytic sample has 499 children,<sup>10</sup> 443 who live in single-mother families and 56 who live in repartnered-mother families.

#### 4.3. Measures

Chronic malnutrition. This phenomenon (also known as *stunting* or *shortness*) involves slowing in skeletal growth and is frequently associated with poor overall economic conditions, chronic or repeated infections, as well as inadequate nutrient intake (World Health Organization, 1986). Anthropometry is widely accepted as the most useful approach for measuring children's nutritional status (World Health Organization, 1986), hence, I calculate four different measures of chronic malnutrition using height-for-age z-scores. These standardized measures are based on standard cut-off points that classify children by status (Colombian Ministry of Social Protection, 2010; World Health Organization, 2006). Table 4.1 presents my approach: I first differentiate those with any chronic malnutrition, and then show frequencies by severity, that is, the number with low, moderate, or severe chronic malnutrition. In multivariate analyses I combine categories into one dichotomous measure because *any* chronic malnutrition can have serious consequences on child well-being (ICBF, 2011; World Health Organization, 2006).

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<sup>9</sup> Custodial-father families are excluded from these analyses because their prevalence is very low and the vast majority of them do not receive child support in Colombia (Cuesta & Meyer, 2014).

<sup>10</sup> There are 633 children ages 0 to 5 years old in my final sample of custodial-mother families. I exclude five cases that do not have anthropometric measures because the mother refused to have her children's weight and height collected. I also exclude 129 children who were living with both of their parents, even though they were living in a custodial-mother family (i.e., there was another child in the family who lived with their mother and not their father).

[TABLE 4.1]

Child support. I use a dichotomous measure of child support. The dichotomous variable indicates whether the family was living in a household that received any child support during the year before the survey.<sup>11</sup> This amount includes both in-kind and cash support as well as formal (with a legal order) and informal (without a legal order) child support.

Income. I use a continuous measure of total household income, which includes: earnings, pensions, rental income, dividends, income support, and other income (including child support). This information was reported for a typical month. In order to create an annual measure of household income, which is needed to be consistent with the child support dichotomous measure, I multiply the household monthly income by 12. In multivariate analyses this amount is converted to purchasing power parities (PPP) U.S. dollars (2012 International Monetary Fund's Implied PPP exchange rate: 1,351 Colombian pesos = 1 U.S. dollar) and included as the logarithm of this amount.

Control variables. Multivariate analyses include factors that may be associated with child malnutrition as discussed in section 2 and are available in ELCA. A proxy of sociocultural environment and political and economic structure was measured with area of residence using indicator variables for Atlantic zone (reference category), East zone, Central zone, Pacific zone, and Bogotá (capital of Colombia). Underlying factors related to resources for food security were measured with household income (as described above), one indicator variable for whether the child lives in a household that received conditional cash transfers the year prior to the survey (1

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<sup>11</sup> The precise question is: during the last 12 months, has someone in this household RECEIVED monetary aids or aids in kind from any of the following sources? a. relatives or friends who live in Colombia, b. relatives or friends who live abroad, c. child support, d. international agencies (e.g., PMA, UNICEF), e. NGO's, f. church or other religious organizations, and g. other people or institutions that have not been mentioned above.



= yes), and one indicator variable for whether the child participates in any nursery program (1 = yes). Resources for care were measured with mother's education using indicator variables for less than high school education (reference category), high school education, more than high school education, and missing; mother's age using indicator variables for 18 to 29 years old (reference category), 30 to 40 years old, and 41 or more years old; number of child's siblings using indicator variables for none, one, and two or more (reference category); and whether the child is living in a repartnered-mother family (1 = yes). Resources for health services were measured using a dichotomous measure of whether the child had regular check-ups the year before the survey (1 = yes). Immediate factors associated with child malnutrition were measured using different characteristics of the child, including an indicator of whether the child is a male (1 = yes); indicator variables for whether the child is black, white, mixed ethnicity, or other ethnicity (reference category); one indicator variable of whether the child had low birth weight (1 = yes); and one indicator variable of whether the child was breastfed (1 = yes). Two additional measures were included to potentially capture other resources for care. Noncustodial father's education including indicators for less than high school (reference category), high school, more than high school, unknown, and missing; and noncustodial father's employer including indicators for private employer (reference category), government, self-employment, day laborer, and unknown.

#### *4.4. Methods*

I first conduct descriptive analyses to calculate the proportion of children in custodial-mother families who are experiencing chronic malnutrition and different levels of this phenomenon (specific aim 1). I then use a series of probit regressions to estimate the association between child support and any chronic malnutrition (specific aim 2). Because the key

independent variable is any child support receipt (rather than the amount),<sup>12</sup> and because I include the amount of child support received in total income, this is a test of whether child support has a different relationship to malnutrition than other sources of income.<sup>13</sup> Put another way, I am testing whether child support is associated with child malnutrition, holding income constant.<sup>14</sup>

In these analyses I use the strategy of adding controls progressively. The first model is a regression of any chronic malnutrition at the time of the survey on any child support receipt during the year before the survey. This analysis serves as the baseline for other regressions. The second model adds factors associated with child malnutrition discussed in section 2 and available in ELCA. The purpose of this analysis is to examine whether the association between child support and chronic malnutrition remains after other predictors of child malnutrition are included. The third model adds resources for care from the noncustodial father's perspective. The intent of this model is to see whether the association of child support and chronic malnutrition changes when the noncustodial father's education and employment are included. These characteristics may be a proxy for the noncustodial father's ability to see his children's living conditions (e.g., availability and schedule flexibility; knowledge and beliefs) and ability to monitor expenditures as discussed in the literature review. Because the unit of analysis is a child, and some custodial-mother families have more than one child in the sample, standard errors are clustered by family in order to address the non-independence of some observations and potential

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<sup>12</sup> In this chapter I focus on receiving any child support; future work will explore the amount.

<sup>13</sup> Alternative approaches could also be used that would consider more explicitly the amount of child support; these are left for future research.

<sup>14</sup> In the future I will explore whether child support associations are broader, considering its relationship with income as well as being a type of income.

heteroskedasticity that may arise because unobservable characteristics may be correlated at that level.

Finally, in order to examine potential causal effects of child support on chronic malnutrition (specific aim 3), I use two complementary propensity score matching (PSM) approaches. For both of these approaches, the first step is to estimate the propensity to receive the treatment (i.e., child support receipt). These propensity scores come from a probit model in which the dichotomous measure of child support is regressed on any control variable that is predictive of child support receipt and related to chronic malnutrition. Because the ultimate purpose of these estimations is to provide the most comparable sample of children, models that include anything that may be confounded with the effect of child support on chronic malnutrition are generally preferred to models that rely on a small set of covariates (Gibson-Davis & Foster, 2006; Heckman, Ichimura & Todd, 1997; Heckman, Ichimura & Todd, 1998). Yet, models that include a larger set of covariates may make it more difficult to obtain the area of overlap between the propensity scores (known in this literature as the *common support area*) (Black & Smith, 2004; Smith & Todd, 2005), which is precisely the main advantage of PSM over standard regression analyses. In order to address these trade-offs, I conduct two estimations, one with a small set of covariates, and one with a longer set. The small set of covariates includes characteristics associated with child support receipt in Colombia (household's income; custodial mother's age, education, and marital status [Cuesta & Meyer, 2012]);<sup>15</sup> and characteristics of the child (sex, ethnicity, number of siblings, low birth weight, participation in nursery programs, breastfed); and the family (participation in conditional cash transfer programs, zone of residency)

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<sup>15</sup> Future research may incorporate additional variables that could be related to child support receipt. For example, child support may be less likely if the custodial mother has had a child with a new partner.

that may be potential confounders of the association between child support and child chronic malnutrition. The estimation with the longer set of controls include all of these covariates as well as noncustodial father's characteristics that may be associated with both child support receipt and child chronic malnutrition (i.e., noncustodial father's education and type of employment).

In the first PSM approach, I use the propensity scores obtained with the longer set of predictors to create a one-to-one matched sample of children (i.e., a child who did not receive child support can only be matched with one child who did receive child support). I use the propensity scores from the longer set of predictors because they provide the most comparable cases. I then use this matched sample to re-estimate probit models as described above. The main advantage of this approach is that analyses for a subset of children who are more similar in their observed characteristics produce less biased estimates of the association between child support and chronic malnutrition; it also has the advantage that results are easily comparable with standard probit regressions. The disadvantage of this strategy is that the smaller sample reduces the precision of the estimates of potential effects.

In order to address this issue, I complement these analyses with a second PSM approach. I use the propensity scores obtained with small and longer sets of predictors, and different matching techniques (i.e., nearest-neighbor and kernel) to estimate the potential causal effect of child support on child chronic malnutrition. This approach allows for several non-treated cases (children who did not receive child support) to be matched to a single treated case (children who did receive child support), resulting in a larger sample of cases and increased precision of my estimates. Because these different matching techniques result in those who did and did not receive support being matched on many characteristics, a simple comparison of the chronic malnutrition rate of those with and without support can provide the potential causal effect

(Rosenbaum & Rubin, 1983; Heckman, Ichimura & Todd, 1998). Standard errors for this approach are based on 500 bootstrapped replications. Illustration of the area of overlap between the propensity scores and statistical tests examining the balance between treated and non-treated cases are also conducted and discussed.

I use the Leuven and Sianesi (2003) algorithm available in Stata 13 to obtain the matched sample for the first PSM approach and to conduct all analyses for the second PSM approach.

## 5. Results

### *5.1. Descriptive Analyses*

Table 4.2 presents the frequency of chronic malnutrition among children aged 0 to 5 in custodial-mother families, overall and then separately by any child support receipt. These analyses show that 39.7% of children in these families are experiencing any chronic malnutrition at the time that ELCA's second wave was collected (spring of 2013). Of all children in my sample, 27.9% experienced low chronic malnutrition and 11.8% experienced moderate chronic malnutrition. Children living in households who received any child support in the year before the survey were less likely to be chronically malnourished than those who did not receive any support. Specifically, children who received child support were 11.4 percentage points less likely to experience any chronic malnutrition. While this difference is statistically significant for any chronic malnutrition and for low or severe chronic malnutrition, the association may be driven by differences in the characteristics of those who received and did not receive child support that also determine child nutritional status.

[TABLE 4.2]

Table 4.3 presents some characteristics of the sample by any chronic malnutrition. Overall, as expected, children with any chronic malnutrition are more disadvantaged than those

who were not experiencing any level of growth retardation at the time of the survey. For example, children with any chronic malnutrition are more likely to live in households with lower incomes, to have mothers with less education, and to live with more siblings. The chronically malnourished are more likely to be boys than girls. Not surprisingly, malnourished children are more likely to have had low weight at birth. The chronically malnourished are more likely to be older, which may be a reflection of a cumulative process or it may be that any sign of this phenomenon is easier to detect at older ages (World Health Organization, 1986; Soysa & Waterlow, 1981).

[TABLE 4.3]

### *5.2. Multivariate Analyses*

Table 4.4 presents probit regressions on any chronic malnutrition for the full sample. These analyses show that child support receipt has a negative and statistically significant association with chronic malnutrition. The marginal effect of any child support receipt is smaller after adding other variables associated with child malnutrition (Model 2) and other resources for care from the noncustodial father (Model 3), but remains marginally statistically significant ( $p < 0.10$ ). These estimates suggest that children who benefit from child support transfers are 8 percentage points less likely to experience growth retardation, net of other factors associated with malnutrition. Other characteristics theoretically related with child malnutrition show expected associations. Children whose mother is less educated are more likely to be chronically malnourished as are those who have two or more siblings. As expected, children who had low birth weight are more likely to experience chronic malnutrition. These analyses also suggest that infants are less likely to experience chronic malnutrition than older children. Because stunting is a process that may not be evident for some years, these results may reflect the difficulty of

ascertaining a significant degree of stunting at earlier years rather than higher risk among older children. Children whose noncustodial father is a day laborer are more likely to be chronically malnourished than those whose father works for a private employer. Because noncustodial fathers working as day laborers are likely to have less autonomy over their work schedule and the number of hours worked, this finding may suggest that the process of monitoring is potentially important for preventing child malnutrition. It may also be that children from these fathers are relatively more disadvantaged than children whose father works for a private employer. No association was observed between child chronic malnutrition and noncustodial fathers' education.

[TABLE 4.4]

Although Table 4.4 shows that child support receipt is associated with a lowered likelihood of chronic malnutrition, a concern is that those with and without receipt may be different in other ways so that they are not really comparable. As described above, I use two propensity score matching approaches to try to make these groups balanced. These approaches use equations that estimate the propensity to receive support, shown in Appendix Tables A-1 (longer set of controls) and A-3 (small set of controls). Results are generally consistent with previous research on factors associated with child support receipt in Colombia (Cuesta & Meyer, 2012). For instance, mothers who are less educated are less likely to receive child support than those who completed more than a high school education.

In the first PSM approach I use propensity scores from the longer model to perform a one-to-one matching technique with no replacement (Leuven & Sianesi 2003) and obtain a matched sample of children. This means I discard children who did not receive child support that are not sufficiently comparable to those who did receive a noncustodial father's support.

Appendix Figure A-1 shows that there is a substantial difference in the propensity to receive support between those children who actually received support and those who did not. Using the nearest neighbor matching method to eliminate cases that received child support but who do not have a match results in a sample of 386 children. Appendix Figure A-2 shows distributions of propensity scores after the matching and Appendix Table A-2 shows that the two groups are then equivalent on all characteristics tested.

[TABLE 4.5]

Table 4.5 presents probit regressions on any chronic malnutrition for this matched sample. In these analyses, the association between child support and chronic malnutrition becomes more negative and is now statistically significant at 5%. Children who received child support transfers in the year prior to the survey are 10 percentage points less likely to experience growth retardation than those who did not (Model 3). Other factors such as number of siblings and child's low weight at birth and age remain statistically significant. These results suggest that restricting analyses among children who have a comparable peer in the sample (at least on observed characteristics) is important to understand the extent to which child support is associated with chronic malnutrition. Probit regressions with the full sample include children whose probability of child support receipt is at the extremes of the distribution, which ultimately means some of these children are not comparable to others in the sample. In the end, the estimated association in probit regressions may be biased. Unfortunately, using the matched sample reduces the number of cases included in the analyses, which means the estimates are less precise. In order to address this issue I complement these analyses with another propensity score matching approach.



In the second PSM approach I use two matching techniques to estimate the potential causal effect of child support on chronic malnutrition. I use 10-nearest neighbors matching (i.e., comparing a treated case with 10 non-treated cases that have the nearest propensity score to the treated case) and kernel matching (i.e., comparing a treated case with the weighted average score of all non-treated cases within a certain distance; I use a 0.06 bandwidth as suggested by Black & Smith, 2004) with replacement. Both small and longer sets of controls in the propensity equation results in matches for the vast majority of cases (494). The two matching techniques within each set of control variables both provide matched samples (Appendix Tables A-4 and A-5 show tests of balance on observable characteristics).

Table 4.6 presents difference in chronic malnutrition rates between treated and non-treated children, using the variety of matched samples that result from nearest-neighbor and kernel matching techniques. This table shows that the association between child support and chronic malnutrition depends somewhat on model specification. Although all estimates yield a negative estimate, indicating that child support receipt is associated with a decrease in the likelihood of being chronically malnourished, and the magnitude of the estimates is similar to the other models, the results are marginally statistically significant for estimates with kernel matching and not statistically significant with the 10-nearest neighbor method.

[TABLE 4.6]

## 6. Discussion

Child support is a potentially important source of income for custodial-mother families in Colombia, especially those living in poverty. Prior evidence suggests that this transfer is associated with lower poverty rates (Cuesta & Meyer, 2014) and a lower probability of experiencing food insecurity (Cuesta, 2014) among custodial-mother families. The increase in

income associated with child support receipt can be expected to improve aspects of child well-being that are sensitive to income. But, less is known about the extent to which receipt of child support is associated with child well-being beyond its effect as income. This article extends previous research by examining the association between receipt of child support and chronic malnutrition, a problem that remains high in Colombia and disproportionately affects children in disadvantaged families.

I use probit models with extensive controls to estimate this association. Additionally, I use propensity score matching techniques to explore potential causal effects of child support on chronic malnutrition. While this approach cannot be considered a definite test of causality, it has the advantage of estimating the association between chronic malnutrition and receipt of child support for children who are more comparable. My analyses show that children who receive any child support in the year before anthropometric measures were taken are between 8 and 10 percentage points less likely to experience chronic malnutrition at the time of the survey. All of these estimates except for those that use a 10-nearest neighbor matching technique are statistically significant.

While all methods used in these analyses have advantages and disadvantages, it is important to highlight the robustness of the negative association between child support and chronic malnutrition to alternative specifications. The statistical precision of the probit models is limited by the lack of common support, which ultimately means that some children who systematically differ from other children in the sample may be introducing bias to these estimates. On the other hand, the smaller sample that is used for analyses with the matched sample produce larger standard errors, making the least biased estimates much less precise.

When considering which estimates may provide a better approximation of the true association between child support and chronic malnutrition, it is important to assess the extent of the selection bias. This is likely to be a key issue in Colombia as the child support system does not initiate any action until the custodial parent requests the intervention of the National Institute of Family Well-being or a family court. This is problematic because only those mothers who are better advocates for their children or simply more motivated to pursue a child support order are those who are more likely to receive a noncustodial father's monetary contributions. At the same time, mothers who are better advocates and more motivated are likely to have better access to more resources for providing adequate care and food security for their children, which ultimately also affects child nutritional status. It is also important to note that there are multiple parts to selection (e.g., whether to pursue an order, whether an order is given, whether any child support is paid, and whether the custodial parent takes action if there is less than full payment) and very little is known about these various steps in Colombia. The inability to control for custodial mother's unobserved characteristics that are associated with both child support and chronic malnutrition is the main limitation of this study.

Another limitation is that I am unable to include more direct measures of father involvement such as visitation. While noncustodial fathers' education and employment are potentially related to the ability to care for children, a more direct measure of this construct might provide a better understanding of the association between noncustodial fathers' resources for care and child malnutrition. Current analyses suggest that a noncustodial father's education is not related with chronic malnutrition, which may simply mean that child support is already capturing this association. The positive association between noncustodial father's employment (day laborer) and chronic malnutrition suggests that the process of monitoring is potentially

important for preventing child malnutrition. It may also be that children of day laborers are relatively more disadvantaged than children whose father works for a private employer. Future research on custodial-mother families in developing countries should further investigate the implications of noncustodial fathers' involvement for child well-being.

A third limitation of this study is that chronic malnutrition could take more than a year to develop and even if conditions improve dramatically, it may not be ameliorated within a year; thus, measuring child support (and income) only in the prior year is a limitation.

This study has implications for policy and future research. Colombia has made efforts to expand and improve programs that aim at promoting child well-being. In 2011, the conditional cash transfer program became an entitlement for the poorest families in the country and is now serving 2.6 million families in Colombia (approximately 20% of all families in the country and 74% of all families living in poverty). More recently, nursery programs targeted to low-income families have implemented training programs to improve care provision for 1.1 million children. This study shows that child support has the potential to complement these efforts. While more research is warranted, findings from this study suggest that child support may play a key role in reducing chronic malnutrition of children in custodial-mother families. Yet the current potential of child support is limited because child support receipt is very low in Colombia. Identifying strategies to increase collections is instrumental to expanding the positive influence of child support income, although child support may have different effects on families not currently receiving it. Research to understand the specific concerns that prevent custodial mothers from seeking child support is warranted.

Future research should also investigate the extent to which the association between child support and chronic malnutrition is causal. An extension of this study could include fixed effects

analyses to adjust for unobserved time-invariant characteristics of families and children. The variation in the amount of child support received by custodial-mother families during different periods could be useful to examine causal effects as well. This type of analysis does not test for the effect of child support between recipients compared with nonrecipients but rather whether there is an association between greater amounts of child support and chronic malnutrition.

Another area for future research is the extent to which the association between child support and chronic malnutrition varies by type of support (cash vs. in-kind) and child support arrangement (adversarial vs. non-adversarial) as well as the specific ways in which child support and conditional cash transfer programs interact to serve low-income custodial mother families. These analyses will provide more certainty in determining future policy action.

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## Tables

Table 4.1. Indicators of chronic malnutrition.

Indicator	Z-score	Cut-off points
<b>Chronic malnutrition</b>		
Any		Z-score < -1 SD
Low	Height-for-age	Z-score $\geq$ -2 SD and Z-score < -1 SD
Moderate		Z-score < -2 SD
Severe		Z-score < -3 SD

Source: Colombian Ministry of Social Protection (2010) and World Health Organization (2006).

Table 4.2. Frequency of chronic malnutrition among children aged 0 to 5 in custodial-mother families by any child support receipt.

	Full sample	Received any CS	Did not receive any CS	
Any chronic malnutrition	0.397	0.328	0.442	*
Low chronic malnutrition	0.279	0.237	0.306	+
Moderate chronic malnutrition	0.118	0.091	0.136	
Severe chronic malnutrition	0.026	0.005	0.040	*
Observations	499	198	301	

Notes: Proportions presented. Statistical significance of bivariate tests for differences between those children who live in households who received any child support 12 months before the survey and those who did not: +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 4.3. Characteristics of the sample by any chronic malnutrition.

	Full sample	Any chronic malnutrition	No chronic malnutrition	
<b>Child support</b>				
Any child support received over last 12 months	0.397	0.328	0.442	*
Child support amount received over last 12 months (In PPP \$)	927.798	777.999	1001.007	+
	(950.354)	(838.918)	(995.107)	
<b>Basic determinants</b>				
Living in Atlantic zone	0.287	0.308	0.272	
Living in East zone	0.222	0.192	0.243	
Living in Central zone	0.202	0.212	0.196	
Living in Pacific zone	0.154	0.141	0.163	
Living in Bogota	0.134	0.146	0.126	
<b>Underlying determinants</b>				
Household annual income (In PPP \$)	10250.074	9464.464	10766.854	+
	(7798.471)	(6663.544)	(8433.366)	
Child participates in nursery program	0.561	0.646	0.505	**
Child's household received CCT over last 12 months	0.433	0.475	0.405	
Custodial mother has less than HS education	0.134	0.187	0.100	**
Custodial mother has HS education	0.517	0.535	0.505	
Custodial mother has more than high school education	0.240	0.167	0.289	**
Custodial mother education is missing	0.108	0.111	0.106	
Custodial mother is 18-29 years old	0.717	0.727	0.711	
Custodial mother is 30-40 years old	0.244	0.232	0.252	
Custodial mother is 41 or more years old	0.038	0.040	0.037	
Child has no siblings	0.481	0.404	0.532	**
Child has one sibling	0.293	0.288	0.296	
Child has two or more siblings	0.226	0.308	0.173	***
Child lives in a repartnered-mother family	0.112	0.167	0.076	**
Other custodial-mother family in the household	0.094	0.111	0.083	
<b>Immediate determinants</b>				
Child is male	0.523	0.576	0.488	+
Child is black	0.054	0.061	0.050	
Child is white	0.240	0.263	0.226	
Child is mixed ethnicity	0.325	0.283	0.352	
Child is other ethnicity	0.381	0.394	0.372	
Child had low weight at birth	0.086	0.131	0.056	**
Child had regular check-ups over last 12 months	0.852	0.879	0.834	
Child was breastfed	0.934	0.934	0.934	
Child is under 12 months old	0.160	0.066	0.223	***
Child is 12 to 35 months old	0.311	0.323	0.302	
Child is from 36 to 60 months old	0.529	0.611	0.475	**
Observations	499	198	301	

Notes: Means (and standard deviations) or proportions presented. Statistical significance of bivariate tests for differences between those children experiencing any chronic malnutrition and those children who do not: +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 4.4. Probit regressions on any chronic malnutrition. Full sample results.

	Model 1		Model 2		Model 3	
Any CS received over last 12 months	-0.114 *		-0.077 +		-0.076 +	
	(0.046)		(0.044)		(0.045)	
<b>Underlying determinants</b>						
Log (Household annual income)			-0.015		-0.018	
			(0.027)		(0.028)	
Child participates in nursery program			0.053		0.060	
			(0.052)		(0.052)	
Child's household received CCT over last 12 months			-0.005		-0.011	
			(0.047)		(0.048)	
Custodial mother has HS education			-0.094		-0.082	
			(0.074)		(0.076)	
Custodial mother has more than HS education			-0.177 *		-0.167 +	
			(0.086)		(0.088)	
Custodial mother is 30-40 years old			-0.079		-0.091 +	
			(0.051)		(0.051)	
Custodial mother is 41 or more years old			-0.070		-0.070	
			(0.103)		(0.107)	
Child has no siblings			-0.134 *		-0.140 *	
			(0.063)		(0.064)	
Child has one sibling			-0.084		-0.088	
			(0.065)		(0.066)	
Child lives in a repartnered-mother family			0.116		0.098	
			(0.078)		(0.080)	
Other custodial-mother family in HH			0.124 +		0.113	
			(0.074)		(0.076)	
<b>Immediate determinants</b>						
Child is male			0.056		0.061	
			(0.043)		(0.043)	
Child is black			0.023		0.014	
			(0.098)		(0.098)	
Child is white			0.029		0.028	
			(0.059)		(0.059)	
Child is mixed ethnicity			-0.063		-0.069	
			(0.050)		(0.051)	
Child had low weight at birth			0.236 **		0.245 **	
			(0.075)		(0.075)	
Child had regular check-ups over last 12 months			0.098		0.098	
			(0.061)		(0.061)	
Child was breastfed			0.022		0.025	
			(0.083)		(0.083)	
Child is under 12 months old			-0.268 ***		-0.268 ***	
			(0.072)		(0.074)	
Child is 12 to 35 months old			-0.018		-0.015	
			(0.049)		(0.049)	
<b>Other resources for care</b>						

Noncustodial father's education is HS			-0.016 (0.053)	
Noncustodial father's education is more than HS			0.043 (0.072)	
Noncustodial father's education is unknown			-0.005 (0.065)	
Noncustodial father works for the government			0.011 (0.079)	
Noncustodial father is self-employed			0.050 (0.055)	
Noncustodial father is a day laborer			0.181 (0.098)	+
Noncustodial father employment is unknown			0.045 (0.064)	
<hr/>				
Total Observations	499	499	499	

Notes: Marginal effects (and standard errors) presented. These analyses also control for residential area and whether parents' education was missing. Statistical significance: + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 4.5. Probit regressions on any chronic malnutrition. Matched sample results.

	Model 1		Model 2		Model 3	
Any CS received over last 12 months	-0.118	*	-0.101	*	-0.105	*
	(0.050)		(0.045)		(0.045)	
<b>Underlying determinants</b>						
Log (Household annual income)			-0.000		-0.009	
			(0.032)		(0.033)	
Child participates in nursery program			0.061		0.070	
			(0.063)		(0.063)	
Child's household received CCT over last 12months			-0.019		-0.022	
			(0.053)		(0.053)	
Custodial mother has HS education			-0.030		-0.013	
			(0.078)		(0.079)	
Custodial mother has more than HS education			-0.097		-0.090	
			(0.092)		(0.093)	
Custodial mother is 30-40 years old			-0.094	+	-0.110	*
			(0.056)		(0.055)	
Custodial mother is 41 or more years old			0.040		0.044	
			(0.108)		(0.112)	
Child has no siblings			-0.207	**	-0.211	**
			(0.064)		(0.066)	
Child has one sibling			-0.161	*	-0.161	*
			(0.068)		(0.069)	
Child lives in a repartnered-mother family			0.206	*	0.183	+
			(0.098)		(0.101)	
Other custodial-mother family in the HH			0.135	+	0.111	
			(0.078)		(0.083)	
<b>Immediate determinants</b>						
Child is a male			0.072		0.079	+
			(0.047)		(0.047)	
Child is black			-0.014		-0.061	
			(0.105)		(0.104)	
Child is white			0.014		0.007	
			(0.063)		(0.063)	
Child is mixed ethnicity			-0.094	+	-0.108	+
			(0.057)		(0.057)	
Child had low weight at birth			0.328	***	0.341	***
			(0.075)		(0.075)	
Child had regular check-ups over last 12 months			0.123	*	0.126	*
			(0.062)		(0.062)	
Child was breastfed			-0.014		-0.006	
			(0.098)		(0.095)	
Child is under 12 months old			-0.217	**	-0.211	**
			(0.081)		(0.081)	
Child is 12-35 months old			-0.058		-0.053	
			(0.058)		(0.058)	
<b>Other resources for care</b>						



Noncustodial father's education is HS			-0.031 (0.059)	
Noncustodial father's education is more than HS			0.078 (0.078)	
Noncustodial father's education is unknown			0.018 (0.073)	
Noncustodial father works for the government			0.016 (0.081)	
Noncustodial father is self-employed			0.041 (0.058)	
Noncustodial father is a day laborer			0.193 (0.100)	+
Noncustodial father employment is unknown			0.092 (0.081)	
<hr/>				
Total Observations	386	386	386	

Notes: Marginal effects (and standard errors) presented. These analyses also control for residential area and whether parents' education was missing. Statistical significance: +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Table 4.6. Difference in any chronic malnutrition by matching estimators.

		Difference		SE	On support	Off support
Small set of controls						
	10-nearest neighbors	-0.078		0.0538	494	5
	Kernel	-0.090	+	0.0482	494	5
Large set of controls						
	10-nearest neighbors	-0.093		0.0578	494	5
	Kernel	-0.085	+	0.0508	494	5

Notes: Treatment is received any child support in the 12 months prior to the survey. The standard errors are bootstrapped 500 times. Statistical significance: +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## Appendices

Table A-1. Probit regression: Predicted likelihood of any child support receipt during 12 months prior to the survey. Large set of controls.

	Coefficient	Std. err.	<i>P</i> > <i>z</i>
Log (Household annual income)	0.07	0.08	0.42
Child participates in nursery program	0.24	0.16	0.14
Child's household received CCT over last 12 months	0.09	0.14	0.51
Custodial mother has HS education	0.20	0.22	0.35
Custodial mother has more than HS education	0.24	0.25	0.35
Custodial mother is 30-40 years old	0.32	0.15	0.04
Custodial mother is 41 or more years old	0.43	0.32	0.19
Child has no siblings	-0.19	0.18	0.30
Child has one sibling	-0.29	0.19	0.12
Child lives in a repartnered-mother family	-0.59	0.24	0.02
Other custodial-mother family in HH	0.42	0.22	0.05
Child is male	-0.25	0.13	0.05
Child is black	0.78	0.30	0.01
Child is white	0.25	0.17	0.13
Child is mixed ethnicity	0.30	0.15	0.05
Child had low weight at birth	-0.16	0.22	0.49
Child had regular check-ups over last 12 months	-0.37	0.18	0.04
Child was breastfed	-0.02	0.26	0.95
Child is under 12 months old	0.12	0.22	0.58
Child is 12 to 35 months old	-0.02	0.16	0.91
Noncustodial father's education is HS	-0.08	0.16	0.60
Noncustodial father's education is more than HS	0.09	0.20	0.66
Noncustodial father's education is unknown	-0.20	0.20	0.32
Noncustodial father works for the government	0.27	0.23	0.24
Noncustodial father is self-employed	-0.08	0.16	0.61
Noncustodial father is a day laborer	-0.12	0.29	0.68
Noncustodial father employment is unknown	-0.59	0.20	0.00
Constant	-0.72	0.81	0.37

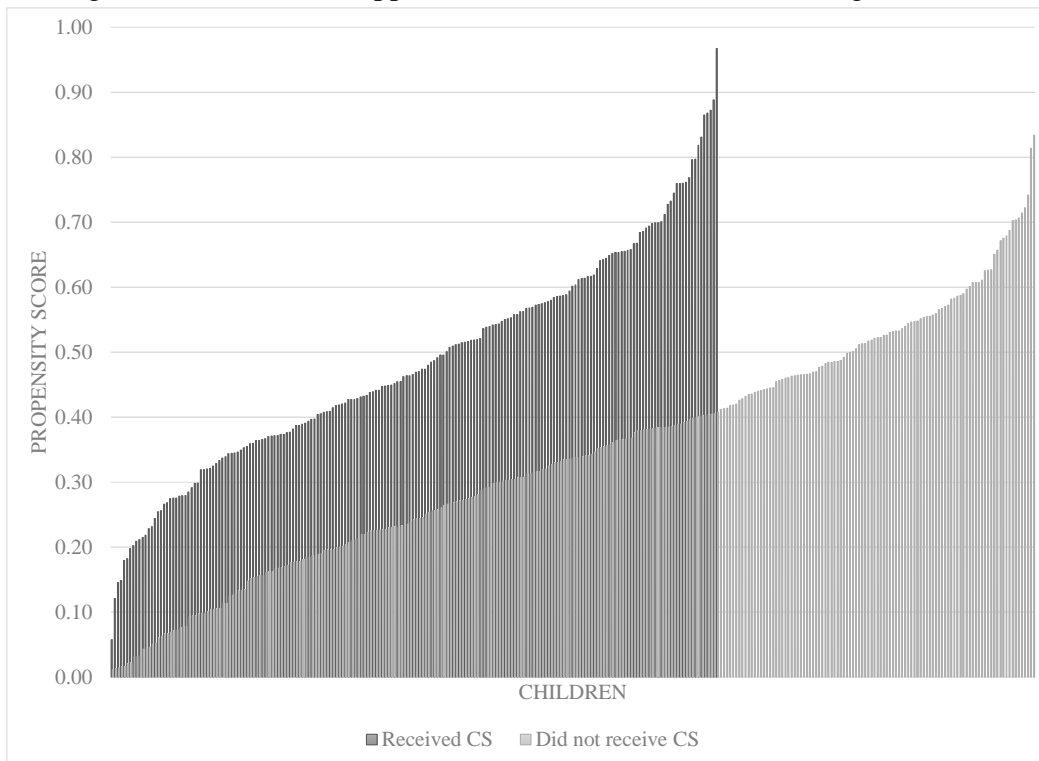
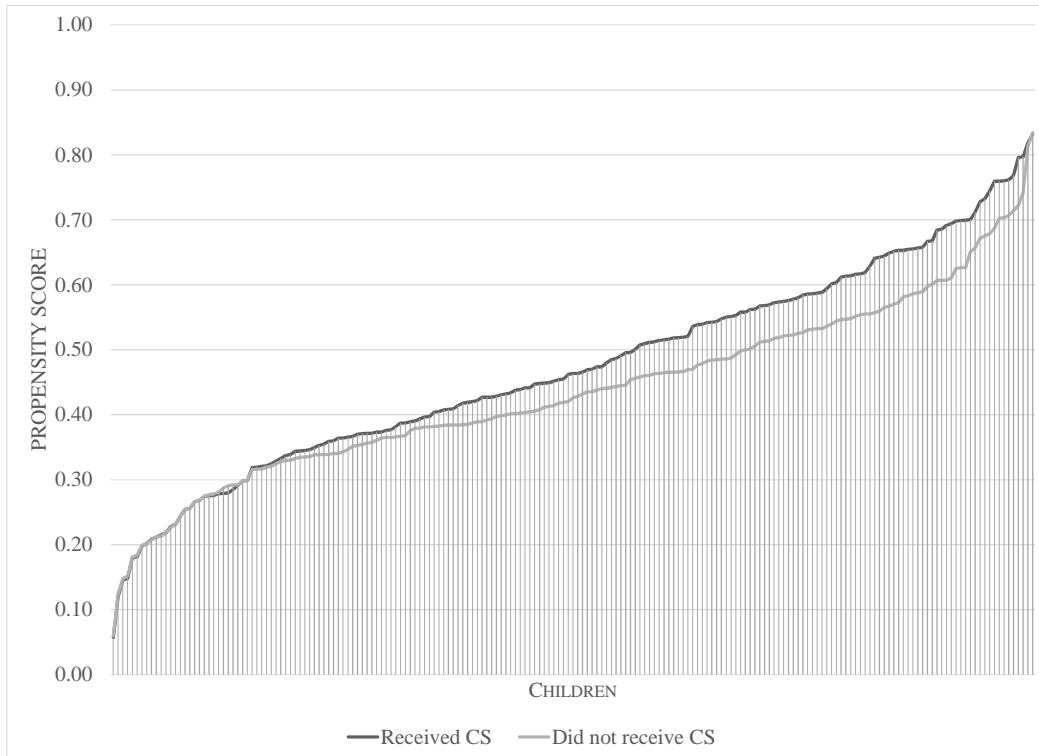
Figure A-1. Common support area before one-to-one matching ( $N = 499$ )Figure A-2. Common support area after one-to-one matching ( $N = 386$ )

Table A-2. Tests of balance on observed covariates. One-to-one matched sample.

Variables	Mean		t-test	
	Treated	Control	t	$P > t$
Log (Household annual income)	8.99	9.04	-0.62	0.53
Child participates in nursery program	0.60	0.57	0.62	0.54
Child's household received CCT over last 12 months	0.44	0.46	-0.31	0.76
Custodial mother has HS education	0.49	0.49	0.10	0.92
Custodial mother has more than HS education	0.26	0.26	-0.12	0.91
Custodial mother education is missing	0.12	0.11	0.47	0.64
Custodial mother is 30-40 years old	0.28	0.23	1.16	0.25
Custodial mother is 41 or more years old	0.05	0.04	0.51	0.61
Child has no siblings	0.50	0.53	-0.71	0.48
Child has one sibling	0.27	0.26	0.23	0.82
Child lives in a repartnered-mother family	0.05	0.06	-0.46	0.65
Other custodial-mother family in HH	0.11	0.10	0.49	0.62
Child is male	0.46	0.52	-1.12	0.26
Child is black	0.06	0.05	0.44	0.66
Child is white	0.25	0.26	-0.35	0.73
Child is mixed ethnicity	0.35	0.31	0.86	0.39
Child had low weight at birth	0.08	0.10	-0.53	0.60
Child had regular check-ups over last 12 months	0.82	0.84	-0.54	0.59
Child was breastfed	0.93	0.94	-0.42	0.67
Child is under 12 months old	0.17	0.17	0.00	1.00
Child is 12 to 35 months old	0.28	0.28	-0.11	0.91
Living in East zone	0.25	0.25	-0.12	0.91
Living in Central zone	0.21	0.21	0.00	1.00
Living in Pacific zone	0.13	0.12	0.46	0.65
Living in Bogota	0.12	0.11	0.31	0.75
Noncustodial father's education is HS	0.31	0.32	-0.33	0.74
Noncustodial father's education is more than HS	0.18	0.16	0.54	0.59
Noncustodial father's education is unknown	0.12	0.15	-0.74	0.46
Noncustodial father's education is missing	0.01	0.00	1.00	0.32
Noncustodial father works for the government	0.11	0.09	0.68	0.50
Noncustodial father is self-employed	0.28	0.27	0.11	0.91
Noncustodial father is a day laborer	0.07	0.07	0.20	0.84
Noncustodial father employment is unknown	0.12	0.13	-0.30	0.76

Table A-3. Probit regression: Predicted likelihood of any child support receipt during 12 months prior to the survey. Small set of controls.

	Coefficient	Std. err.	$P > z$
Log (Household annual income)	0.03	0.08	0.68
Child participates in nursery program	0.23	0.16	0.15
Child's household received CCT over last 12 months	0.08	0.14	0.55
Custodial mother has less than HS education	-0.28	0.24	0.25
Custodial mother has HS education	-0.08	0.16	0.59
Custodial mother is 30-40 years old	0.32	0.15	0.03
Custodial mother is 41 or more years old	0.39	0.32	0.22
Child has no siblings	-0.10	0.18	0.56
Child has one sibling	-0.24	0.18	0.19
Child lives in a repartnered-mother family	-0.82	0.22	0.00
Other custodial-mother family in HH	0.36	0.21	0.08
Child is male	-0.29	0.12	0.02
Child is black	0.66	0.28	0.02
Child is white	0.20	0.16	0.23
Child is mixed ethnicity	0.22	0.15	0.13
Child had low weight at birth	-0.16	0.22	0.45
Child had regular check-ups over last 12 months	-0.37	0.17	0.03
Child was breastfed	0.06	0.25	0.81
Child is under 12 months old	0.11	0.21	0.62
Child is 12 to 35 months old	-0.08	0.16	0.60
Constant	-0.34	0.82	0.68

Table A-4. Tests of balance on observed characteristics. 10-nearest-neighbors and kernel matched samples. Small set of controls.

Variables	Nearest-neighbors				Kernel			
	Mean		t-test		Mean		t-test	
	Treated	Control	t	$P > t$	Treated	Control	t	$P > t$
Log (Household annual income)	8.99	8.99	-0.02	0.99	8.99	9.02	-0.38	0.71
Child participates in nursery program	0.60	0.61	-0.21	0.84	0.60	0.60	0.03	0.98
Child's household received CCT over last 12 months	0.44	0.45	-0.38	0.71	0.44	0.45	-0.28	0.78
Custodial mother has less than HS education	0.12	0.12	-0.12	0.90	0.12	0.13	-0.36	0.72
Custodial mother has HS education	0.50	0.49	0.15	0.88	0.50	0.48	0.37	0.71
Custodial mother education is missing	0.12	0.13	-0.27	0.79	0.12	0.13	-0.07	0.94
Custodial mother is 30-40 years old	0.28	0.27	0.12	0.90	0.28	0.27	0.27	0.79
Custodial mother is 41 or more years old	0.05	0.05	-0.35	0.73	0.05	0.05	-0.29	0.78
Child has no siblings	0.50	0.51	-0.16	0.87	0.50	0.52	-0.39	0.70
Child has one sibling	0.27	0.27	0.03	0.97	0.27	0.27	0.17	0.87
Child lives in a repartnered-mother family	0.05	0.04	0.15	0.88	0.05	0.05	-0.13	0.90
Other custodial-mother family in HH	0.11	0.09	0.83	0.41	0.11	0.10	0.44	0.66
Child is male	0.46	0.46	-0.01	0.99	0.46	0.45	0.11	0.91
Child is black	0.06	0.06	0.15	0.88	0.06	0.07	-0.28	0.78
Child is white	0.25	0.24	0.11	0.92	0.25	0.24	0.23	0.82
Child is mixed ethnicity	0.35	0.36	-0.16	0.87	0.35	0.35	0.12	0.90
Child had low weight at birth	0.08	0.09	-0.34	0.73	0.08	0.09	-0.30	0.77
Child had regular check-ups over last 12 months	0.82	0.84	-0.60	0.55	0.82	0.82	-0.15	0.88
Child was breastfed	0.93	0.95	-0.51	0.61	0.93	0.94	-0.33	0.74
Child is under 12 months old	0.17	0.16	0.12	0.90	0.17	0.16	0.24	0.81
Child is 12 to 35 months old	0.28	0.26	0.35	0.72	0.28	0.29	-0.16	0.88
Living in East zone	0.24	0.25	-0.08	0.93	0.24	0.25	-0.25	0.80
Living in Central zone	0.21	0.22	-0.10	0.92	0.21	0.21	0.12	0.90
Living in Pacific zone	0.13	0.12	0.30	0.76	0.13	0.13	0.26	0.79
Living in Bogota	0.13	0.11	0.51	0.61	0.13	0.13	0.05	0.96

Table A-5. Tests of balance on observed characteristics. 10-Nearest-neighbors and kernel matched samples. Longer set of controls.

Variable	Nearest-neighbors				Kernel			
	Mean		t-test		Mean		t-test	
	Treated	Control	t	$P > t$	Treated	Control	t	$P > t$
Log (Household annual income)	8.99	9.06	-0.95	0.34	8.99	9.03	-0.55	0.58
Child participates in nursery program	0.60	0.58	0.49	0.63	0.60	0.59	0.31	0.76
Child's household received CCT over last 12 months	0.44	0.45	-0.23	0.81	0.44	0.46	-0.33	0.74
Custodial mother has less than HS education	0.12	0.14	-0.52	0.60	0.12	0.14	-0.58	0.56
Custodial mother has HS education	0.49	0.47	0.41	0.69	0.49	0.47	0.36	0.72
Custodial mother education is missing	0.12	0.12	0.05	0.96	0.12	0.12	0.17	0.87
Custodial mother is 30-40 years old	0.28	0.26	0.57	0.57	0.28	0.28	0.07	0.94
Custodial mother is 41 or more years old	0.05	0.06	-0.39	0.70	0.05	0.05	-0.15	0.88
Child has no siblings	0.50	0.52	-0.42	0.68	0.50	0.51	-0.21	0.83
Child has one sibling	0.27	0.26	0.10	0.92	0.27	0.26	0.28	0.78
Child lives in a repartnered-mother family	0.05	0.04	0.38	0.71	0.05	0.04	0.10	0.92
Other custodial-mother family in HH	0.11	0.11	0.02	0.99	0.11	0.11	0.18	0.86
Child is male	0.46	0.47	-0.20	0.84	0.46	0.47	-0.17	0.87
Child is black	0.06	0.05	0.33	0.75	0.06	0.06	0.29	0.77
Child is white	0.25	0.26	-0.31	0.75	0.25	0.26	-0.25	0.80
Child is mixed ethnicity	0.35	0.32	0.60	0.55	0.35	0.33	0.39	0.70
Child had low weight at birth	0.08	0.09	-0.34	0.73	0.08	0.09	-0.16	0.87
Child had regular check-ups over last 12 months	0.82	0.84	-0.68	0.50	0.82	0.83	-0.42	0.67
Child was breastfed	0.93	0.95	-0.62	0.54	0.93	0.95	-0.53	0.60
Child is under 12 months old	0.17	0.18	-0.30	0.77	0.17	0.16	0.07	0.95
Child is 12 to 35 months old	0.28	0.28	0.06	0.96	0.28	0.28	-0.01	0.99
Living in East zone	0.25	0.27	-0.38	0.70	0.28	0.28	0.03	0.98
Living in Central zone	0.21	0.22	-0.11	0.91	0.25	0.25	-0.06	0.95
Living in Pacific zone	0.13	0.11	0.70	0.49	0.21	0.22	-0.19	0.85
Living in Bogota	0.12	0.12	0.20	0.84	0.12	0.12	0.02	0.99
Noncustodial father's education is less than HS	0.38	0.37	0.33	0.75	0.38	0.38	0.08	0.94



Noncustodial father's education is HS	0.31	0.30	0.03	0.97	0.31	0.30	0.14	0.89
Noncustodial father's education is unknown	0.12	0.14	-0.51	0.61	0.12	0.14	-0.33	0.74
Noncustodial father's education is missing	0.01	0.00	0.41	0.68	0.01	0.00	0.24	0.81
Noncustodial father works for the government	0.11	0.12	-0.35	0.73	0.11	0.11	0.03	0.98
Noncustodial father is self-employed	0.28	0.27	0.20	0.84	0.28	0.28	-0.09	0.93
Noncustodial father is a day laborer	0.07	0.06	0.51	0.61	0.07	0.07	0.21	0.84
Noncustodial father employment is unknown	0.12	0.12	0.22	0.83	0.12	0.11	0.41	0.68

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## CHAPTER 5: CONCLUSION

This dissertation examined the potential benefits of noncustodial fathers' monetary contributions for family well-being from an international perspective. In three related studies, I study the effect of child support on mother's labor supply in the United States, and the association of child support with family food insecurity and child chronic malnutrition in Colombia. I use experimental, quasi-experimental, and nonexperimental approaches to examine these issues using longitudinal and cross-sectional survey data from both countries. Findings may enrich debates on child support policy in developed countries such as the United States, and prompt further research on this issue in developing countries such as Colombia. These analyses also improve our current understanding of the role of child support policy in family well-being.

In my first study, using data from a randomized control experiment conducted in the state of Wisconsin, I find that child support does not have any negative effect on the likelihood of working for pay or hours worked among custodial mothers participating in the Temporary Assistance for Needy Families (TANF) program. This finding has methodological and substantive implications for research in this area. First, it suggests that prior nonexperimental research may have confounded child support effects with other unobserved characteristics that affect female labor supply. It also highlights the importance of examining this issue among different subgroups of the population. Prior research had focused on non-welfare samples and my analyses suggest that labor supply responses to child support transfers may differ by socioeconomic status. From the substantive perspective, my dissertation shows that policies focused on increasing custodial mothers' labor supply and child support collections are not working against each other. Put another way, my findings suggest that child support receipt among families receiving welfare does not reduce custodial mothers' labor supply, which could

increase poverty risk. These findings add to other evidence on the potential benefits of child support for custodial-mother families in the United States.

In my second and third studies, I focus on the associations of child support with aspects of child well-being in Colombia. Despite significant family changes that show a growing proportion of custodial-mother families as well as the overrepresentation of these families among the most disadvantaged populations in developing countries, the literature on the role of child support in these countries is scant. My dissertation makes a contribution to this field by examining the associations between child support and food insecurity and child support and child chronic malnutrition in Colombia. I use the Colombian Quality of Life survey to estimate the association between child support and family food insecurity, and find that those families who receive this transfer are less likely to experience episodes of food scarcity or hunger than families who do not. I also find that this association is heavily concentrated among single-mother families and families whose mothers are 18 to 29 years old. In my third and final paper I use the Colombian Longitudinal Survey of Wealth, Income, Labor and Land to estimate the association between child support and chronic malnutrition of children in urban Colombia. I find a negative and statistically significant association between child support receipt and chronic malnutrition. Children in households that received any child support in the year before anthropometric measures were taken are between 8 and 10 percentage points less likely to experience any chronic malnutrition. This finding is consistently negative across different specifications though size and statistical significance depend on methodological approach. These analyses along with those on food insecurity suggest that child support may have potential benefits for custodial mother families in Colombia, especially those living in poverty.

Findings from these analyses should be interpreted in light of the following limitations. First, analyses on the effects of child support on a custodial mother's labor supply are specific to the context of Wisconsin and cannot be generalized to other states or custodial mothers. Another limitation of these analyses is that the actual treatment (difference in the child support amount received by the experimental group versus the amount received by the control group) is relatively modest. While this is likely a policy-relevant test on the labor supply effects of child support, it raises questions about the extent to which this finding would stay the same under different payment regimes. Further research on this area should look at this issue in the context of other states and in more recent periods. The main limitations on the analyses of the association between child support and food insecurity and child support and chronic malnutrition rest on the inability to control for unobserved characteristics that may be related to both child support and these outcomes. This issue not only has implications for the analyses of associations between these constructs but also limits the opportunity to estimate the causal effect of child support on child well-being. Future research in this area could use fixed effects models and dosage-response analyses to try to control for time-invariant unobserved characteristics and ultimately obtain a better estimate of the potential causal effect of child support on child well-being in Colombia. Taken together, limitations from these studies highlight the importance of taking advantage of different quantitative approaches to examine associations and causal effects of child support policies.

This dissertation has implications for policy and practice as well. Policies that try to increase child support collections and mothers' labor supply are probably compatible and likely to improve the economic well-being of custodial mother families in the United States. This finding also assures that social work practice efforts to identify all income sources of clients and

to help them to pursue noncustodial fathers' contributions will not have unintended negative consequences on a custodial-mother families' economic well-being. While contexts are different, these findings also suggest that integrating the child support system into the social safety net of developing countries like Colombia has the potential of increasing custodial-mother families' economic prospects. As of today, the child support system remains disconnected from the social safety net and does not receive the policy attention that it deserves. Findings on the association between child support and food insecurity and child support and chronic malnutrition also call for strategies to increase child support receipt in developing countries like Colombia.

Future research on this area should focus on understanding the most recent association between child support and custodial mothers' labor supply in the United States as well as other potential effects of child support on custodial mothers' well-being. While child support is meant to be spent on children expenditures, child support payments have the indirect consequence of liberating a mother's time and resources, which may affect a mother's ability to increase her education, improve her health status, and ultimately improve the quality and quantity of resources for care available for children in custodial-mother families. The scarce literature on the role of child support in family well-being in developing countries like Colombia offers the opportunity for developing a new research agenda that improves our understanding of these issues in those contexts and, more generally, our current knowledge of international approaches to child and family policy.