



Munich Personal RePEc Archive

Child Disability, Children's Time with Mother and Maternal Employment

Mahmud, Mir

University at Albany

1 April 2016

Online at <https://mpra.ub.uni-muenchen.de/72816/>
MPRA Paper No. 72816, posted 10 Aug 2016 08:33 UTC

Child Disability, Children's Time with Mother and Maternal Employment

Mir Nahid Mahmud
Department of Economics

Contents

| | |
|---|----|
| Introduction..... | 1 |
| Background..... | 3 |
| Children, their health and Mother’s Employment..... | 3 |
| Endogeneity of Child Disability and Maternal Employment | 6 |
| Theoretical Motivation..... | 8 |
| Econometric Model and Related Issues..... | 10 |
| Data..... | 11 |
| Disability Definition..... | 13 |
| Descriptive Statistics..... | 14 |
| Regression Results | 17 |
| Labor Force Participation | 17 |
| Weekly Working Hours | 20 |
| Children's Time with Mother:..... | 21 |
| Conclusion | 24 |
| Reference..... | a |
| Appendix: Exhibits | i |

Introduction

The presence of a child with poor health poses a different set of challenges on maternal labor market outcomes. Wives often are regarded as the primary caregiver for the children in the household; they may also share the secondary earning responsibility. Therefore, a mother would participate in the labor market by weighing her reservation wage with the wage offered by the market. Having children with poor health or disabling health conditions not only increases the financial burden of the family but also complicates the child care arrangements. Children with chronic physical or mental disability may require exceptional care arrangements, which may be hard to find or costly. Besides frequent doctor visits for therapeutic services, prolonged hospitalization may need a working mother to look for jobs with flexible hours. When these factors are augmented with the reservation wage, mothers of disabled children may choose either not to join the labor force or work less to accommodate the needs of disabled children.

Care for children with chronic and disabling conditions can impose substantial costs on the family. Since health insurance is often tied to employment, at least one of the parents needs to have continuous labor market involvement. The situation could be dire for single mothers, who in the absence or insufficiency of public support, may be forced to remain in the labor market even in the presence of a disabled child. This is also true for families where the primary earning male does not earn enough or do not get insurance through his employer. Single or married women may decide to join labor market or increase working hours when financial demand outweighs other considerations. When two opposing factors – need for care and financial resources – would intersect, labor market outcome of a mother with a disabled child would remain inconclusive.

Some recent studies have investigated maternal employment impacts relating to child health. Results vary considerably. Earlier studies, for example, Salkever (1982) found a large negative effects for low-income two-parent families while non-white, female-headed families with similar or lower income levels show no significant impact. On the other hand, the bulk of recent studies concludes that single mothers are more likely to suffer due to the presence of a disabled child (Powers, 2001, 2003). Close inspection suggests that both direction and magnitude of maternal labor supply effects are sensitive to two factors: difference in the definition of the child disability and potential endogeneity between maternal employment and child health. The measure of poor child health

primarily depends on the availability of information in the survey. To highlight the differences in definitions used in the literature, we may outline a few. One study by Corcnan, Noonan and Reichman (2005) used “low birth weight” as the criterion for poor health; Another study examined how the effect of “child development” could be detrimental to maternal work behaviors (Frijters et al., 2009). Powers (2003a) formulated different disability definitions based on activity limitations or difficulty to perform school work, to segregate the sample of children by health in SIPP data. Using 2000 US census, Wasi, den Berg and Buchmueller (2012) constructed a disability definition similar to that of Powers (2003a). A recent study used the information contained in Danish register-based population of children to identify those with ADHD and examined its effects on parents’ relationship stability and labor market activity in the long run (Kvist et al., 2013). Gould (2004) utilized information about diagnosed health conditions of children in PSID data. She consulted with physicians to identify time-intensive illness — conditions that require substantial amount time for care. The differences in disability definition not only contribute to the differences in findings ; it also makes it difficult to compare the results. In this paper, we defined child disability following the framework provided by International Classification of Functioning, Disability and Health-Child and Youth Version (ICF-CY) developed by World Health Organization. We test if the labor market responsiveness of mothers is sensitive to this change in disability definition.

Most studies treat child-disability as an exogenous variable. However, endogeneity could be prevalent here since unobservable factors could affect both the disability of the child and the labor market outcome. On the other hand, the reverse causality could also be at play as maternal employment could negatively affect children’s health. Endogeneity could arise as measure of child disability is based on parent-reported information rather than actual diagnosis. Very few studies provide a correction for potential endogeneity of child disability due to lack of suitable instruments. Powers (2001) considered the possibility of bias in parent’s report of child’s disability which could be jointly determined with work activity and proposed a procedure to cure bias arising from parent’s report of child disability. To correct the reporting bias, she used information about the presence of specific health impairments as an instrument. The estimates from the two-stage least squares were found still to be statistically significant while the magnitude of the estimate was considerably lower. Another study used the left-handedness as identification for child’s development delay (Frijters et al., 2009). However the IV estimates were found to be inflated than the OLS estimates. PSID-CDS provides information about specific health conditions along with parent-reported health status. We

have adopted a similar approach as Powers (2001) to in defining child disability to correct reporting bias.

We have found that changes in disability definition changes maternal labor market responsiveness to child's disability status greatly. For Single mothers, neither labor force participation nor average weekly hours is affected when they have a child with disability. Married mothers with higher level of education also show no responsiveness to child health status. We find that weekly working hours of married mothers with lower educational attainment increases despite the presence of sick children in the family. This result is quite the opposite as the current literature suggests. We expanded our analysis by reviewing the time use diary of these children and found that maternal time engagement is sacrificed for sick children when mother is employed. Non-maternal time engagement for the sick children during a weekday was found to be higher which supports our findings.

Background

Children, their health and Mother's Employment

Should the labor market outcomes be different between women with children and the women who are childless? Most studies, theoretical and empirical, provide evidence of a negative relationship between the number of children and female employment outcomes. Women with the kids usually are different from the women who are childless by some observed attributes. In general, mothers share the responsibility of bearing and raising the children at a disproportionate ratio. Interruptions in continuous employment due to maternity-related absence may cause some degree of atrophy in the job-specific skills which might result in delayed job tenure. There are not many government policies to support the childcare needs of the working mothers in the US. When the childcare cost primarily falls on the family, the labor market outcomes are greatly affected. The recent scholarship provides evidence that most women return to their prior employment when a generous maternity leave is available (Waldfogel, 1998). Evidence from other industrialized countries also suggests that a more generous paid maternity leave is found to contribute to lower wage differential between women with children and those who are childless. Employment patterns of woman with children and those who are childless remains significantly different even after controlling for human capital and socio-demographic factors. One hypothesis suggests that the differential can be attributed to the potential endogeneity of the fertility and labor market behavior. In response to correct the bias, several instruments – sex compositions of first two children, twin births, and infertility – have been

used that are believed to change the supply of children exogenously. Most of these studies resulted in reduced but negative causal relationship between the number of children and mother's employment.

The current study focuses the differences in the labor market outcomes of mothers with disabled children are compared to that of mothers with the healthy child. Women without children, hence, cannot be used as a reference group in this context. On many accounts, mothers with healthy children and those with disabled children are expected to be similar. For example, both groups of mothers are supposed to devote substantial amount of time and financial resources to care for their child, regardless of their health status. However, disabling health conditions potentially changes the time and financial burden of raising children. Differences in cost of raising a disabled child compared to the cost of raising a healthy child could provide a distinction to motivate different aptitude and preference towards labor market activity. A body of empirical research emerged to investigate the estimate the cost of raising a disabled child. It appears, in general, that the economic cost of raising a disabled child, due to their exceptional health conditions, could be substantially larger. Stabile and Allin (2012) estimated the approximate average annual cost per family with children with disabilities to be \$10,830. Their calculation includes direct cost, out of pocket expenditure for medical and therapeutic services, and indirect costs arising from reduced working hours and forgone labor earnings. Their estimate for government support — through increased SSI, increased TANF, special education, increased Medicaid — is estimated to be another \$19,702. Significant variation is found in the literature which calculates the cost of child disability to families. Methodological variation, difference in the definition of child disability and variation in study sample can be attributed to the significant variation in the cost measures. Both direct and indirect cost has potential labor market implications. Large out of pocket financial burden is expected to generate positive labor market response; while generous government support tends to erode some of the positive effects.

A major consequence of raising children with disabilities is the magnitude and nature of the time burden. Child disabilities require specific tasks regarding the scheduling and visiting doctors and therapeutic services. Children with disabilities are also greatly dependent on others for personal care. Usually, mothers shoulder the child care responsibility primarily. In a two-parent family, fathers share some of the childcare responsibilities. Given the increased and unpredictable nature of the

time burden of raising a child with poor health, mothers' labor market presence might be at risk without flexibility in the workplace. Very few empirical evidence exists that uses time use data to measure the time burden of caring for sick children. The amount of time mother spent in household work (Breslau, 1983) or time mother spends for leisure activities, personal care or socialization (Brandon, 2007) have been the focus of existing research. In this study, we provide an account of time engagement of mothers of disabled children. However, our measure of time use comes from the children's time use diary, unlike traditional time diary studies that are based on the time use diary of the mother.

While the direct costs are easy to ascertain, there remains several other cost elements that are difficult to quantify. For example, Poor health of child possibly worsens mental health of parents, especially that of the primary caregiver. There is a growing literature that focuses on the mental health effects of caring for children with disabilities. Caring for the child with disabilities could be intrinsically rewarding for mothers while the possibility of experiencing depression or stress cannot be dismissed. The literature, in general, finds conclusive evidence of detrimental mental and physical well-being for mothers raising disabled children (Dillon-Wallace, McDonagh, & Fordham, 2014; Miodrag, Burke, Tanner-Smith, & Hodapp, 2015). Labor market engagement, despite caring for sick children, potentially provides respite for mothers and improves overall well-being (Morris, 2014).

The combined effect of raising children with disabilities is ambiguous as reflected in the literature. If time burden for caring a sick child dominates the financial burden, then the labor market effect will be negative. On the other hand, mothers may have to increase labor supply to raise an expensive child due to the financial burden related to child health. Interplay of the other individual and familial attributes contribute to the great diversity of results in the literature. Some earlier studies found a strong negative association between child disability and maternal employment for low-income married women; for single women the relationship was largely insignificant or very small (Breslau, Salkever, & Staruch, 1982; Kimmel, 1998; Salkever, 1982). Findings from recent studies suggest that single mothers are more vulnerable and experience a stronger negative shock in the presence of a disable child (Powers, 2001, 2003; Wasi et al., 2012). Labor market responsiveness of married mothers could be less responsive towards increasing child care costs for two reasons: One, husbands who are the often regarded as the primary breadwinner could increase labor supply to cover any

additional financial expenses ; Two, such families would value the quality of child care more than the single parent family (Connelly, 1992). There is a hypothesis that the stronger negative effect for the single mothers could result from the fact that their level of human capital is lower (Wasi, den Berg and Buchmueller 2012). Single parent families, being more disadvantaged economically, would be eligible for mean-tested benefits. Therefore, a single mother could decrease work to qualify for such benefits. These tendencies should result in a stronger negative association between child disability and maternal labor supply for single mothers. However, recent changes in welfare policies (for example PRWORA), are designed to increase labor market participation. Such shifts in policy environment could force mothers to engage more in labor market activities despite having disabled child in the family. The differences in findings can primarily attributed to two factors: endogeneity of child disability, measurement of child disability. We already discussed the great divergence in the definition of child disability. The following section addresses the issue of endogeneity of child disability and maternal labor market outcome, how it could contribute to the differences in findings and the related attempts to correct the bias.

Endogeneity of Child Disability and Maternal Employment

Most studies treat child health variables as exogenous to labor market behavior of the mother. Very few studies consider the possibility of endogeneity explicitly and adopt estimation strategies to correct for the bias. Since the definition of child health variable is different, the range of identifying variables are also diverse. Powers (2001) postulated that parent's report about the disability of the child could be jointly determined with their work effort. She utilizes the information on specific impairments or conditions as instruments for child disability status. She compares estimates from two-stage estimates with one-stage regression. Although the estimates remain significantly negative in both specifications, she concludes that estimates that do not account for the possibility of bias, may overstate the effect of disability on mother's labor market outcome.

Frijters et al (2009) also considered the possibility that both poor child development and mother's work behavior could be correlated with unobservable characteristics. Reverse causality- maternal employment negatively affecting child development, could also be at play. To control for the bias due to endogeneity, they exploited a natural experiment- allocation of handedness to identify exogenous variation in child development. The estimate from two stage least squares is approximately three times the size of the estimate from OLS specification. They believe that the

difference could be arising from the evidence of adverse effect maternal labor force engagement on the child development.

Another study (Corcnan et al., 2005), also explicitly tested if endogeneity could bias the result. They suggested two identifiers – the number of adoption agencies per 10000 women in the city where the child was born and the presence of a level III neonatal intensive care unit in the hospital where the child was born. Their measure of child health either low birth weight or mother's report of any physical disability at a follow-up interview or inability of the child to walk or crawl when child was at least 12 months old. However they found that the error term in the labor supply and child health equations are uncorrelated. Hence they only provided estimates from single equation model.

While the success of instrumental-variable estimation largely depends on the validity of the assumptions, another strategy to counter the endogeneity is to use the panel structure of the data to remove the time-invariant unobserved heterogeneity. Powers (2000) and Yamauchi (2012) are among those who adopted this approach. Panel structure also allows to examine the dynamic and long-term effects of child health on mother's work. Yamauchi (2012) made an interesting claim: the difference between short term (cross-sectional) estimates and long-term (longitudinal) estimates may indicate the degree of bias arising from endogeneity. For the kids (children aged 4-8 years) cohort, the cross-sectional estimate is significantly negative; while no longitudinal relationship was found between long-term child health problem and maternal work effort. On the other hand, for the Baby Cohort (children aged 0- 4 years) both cross-sectional and longitudinal estimates are negative and statistically significant. Based on author's hypothesis, issue of endogeneity could be more severe for mothers of older children (K cohort). However, the differences in findings for the older kids cohort may reflect the flexibility that Parents of older kids may have in terms of child-care availability and arrangements.

In sum, we observe that labor market responsiveness of child disability varies widely when different disability definitions and estimation strategy are adopted. The literature features a shift in labor market sensitivity for single mothers when earlier studies found stronger negative shock for married mothers from the low socio-economic background; estimates from recent studies are opposite. The mechanism – policy changes – that have contributed to the shift remained unresolved. Very few studies compare the differences between short term and long term effect of child disability. We

attempt to examine the sensitivity of estimates to changes in disability definition. In future, we would like to compare the cross-sectional estimates with longitudinal estimates.

Theoretical Motivation

The labor supply equation can be derived from the traditional neoclassical model of household utility maximization by incorporating leisure (L) as a normal commodity into the utility function (U). Here, X represents the composite commodity priced at p . In addition to the standard budget constraint this model also includes another resource constraint to define how total available time is allocated between leisure and paid work. First order condition with respect to leisure says that marginal utility of one additional hour of leisure consumed is equal to the hourly wage rate that is forgone. First order conditions can be solved jointly to find household's Marshallian demand function for leisure and other goods. V is the unearned income.

$$U = U(L, X)$$

$$s.t. \quad pX = wH + V$$

$$H + L = T$$

First order condition with respect to leisure says that marginal utility of one additional hour of leisure consumed is equal to the hourly wage rate that is forgone. First order conditions can be solved jointly to find household's Marshallian demand function for leisure and other goods. This model provides a labor supply equation as a function of price index, p and wage rate, w :

$$H = F(p, w)$$

Becker (1965) remains the foundational modeling framework for the analysis of household resource and time allocation. Becker (1965) uniquely incorporates time as an input with other purchased goods for the production of commodities from which household ultimately derives utility. This production technology distinguishes the utilization or allocation of non-working hours for varied purposes in contrast to the earlier framework where the only opportunity cost of time spent as leisure happened to be forgone earnings. In Becker's model forgone earnings has to be weighed against the marginal productivity of home hours used for the production of various

commodities. The outcome of the model is the demand function for purchased inputs and demand function.

In this construct, the child's health (CH) can be included as a commodity. The production of child's health, given an initial endowment, would be a function of time allocation from parents T_{CH} and other purchased goods and services, for example, medical care, child care, etc.

$$\max U(Z, CH)$$

$$s. t. Z = Z(X, T_z)$$

$$CH = G(M, T_{CH}; H_0, \gamma)$$

Here, γ represents the efficiency of the production technology of child health. T_z, T_{CH} – denotes combined hours of work provided by household head and wife for the production of Z and CH , respectively. Time and resource constraints are as follows:

$$p_x X + p_m M = wH + V$$

$$H + T_z + T_{CH} = T$$

The following Lagrangian equation can be solved to derive parental labor supply function :

$$L = U(Z(X, T_z), G(M, T_{CH}; H_0, \gamma)) + \lambda (wT + V - p_x X - p_m M - wT_z - wT_{CH})$$

Parental labor supply function takes the following general form:

$$H = T - T_z - T_{CH} = F(w, p_m, p_x, V, \gamma, H_0)$$

In a more detailed setup, we can distinguish between hours supplied by wife and husband. Similarly, the efficiency parameter attached to child health production plays a critical role if there is comparative advantage between wife and husband. This model is powerful to deduce several implications of a health shock for the child. For example, if child has an exogenous health shock, then the parental labor supply would be affected.

Now the opportunity cost of forgone wages has to be weighed against the marginal gain in child health improvement. The efficiency parameter could be a function of educational attainment of the parent. The higher the level of education, the higher is the opportunity cost of caring for child. On the other hand, an educated parent could be more efficient in caring for their sick child, hence the marginal gain in child health could be higher. Hence, occurrence of a child health shock and its interplay with the efficiency parameter of parental care in child health production, is very complex. Therefore the direction in which child disability affects the parental labor supply function is ambiguous.¹

Econometric Model and Related Issues

Labor Supply equation derived from the model can be written in the following form:

$$H = H(w, V, Z)$$

Where w denotes wage rate, V denotes non-labor income and Z denotes vector of other variables, for example, price of other commodities, preference for work etc. The first difficulty for estimating the model arises from the notion that wages could be endogenous because unobservable factors could affect the wage rate that the individual commands and also the hours of work that he supplies. We can formulate the wage equation as follows:

$$w = w(X)$$

Labor supply equation has to be estimated using structural equation approach. In the structural equation method, the wage equation is identified if vector X includes a set of variables which could be excluded from vector Z . It is very difficult to find variables that affect wage rate but uncorrelated with actual supply of working hours. The alternative is to assume $X=Z$ and estimate the reduced form equation:

$$H = H(X, Z, V)$$

¹ Similar conclusion can be reached following the interpretation of Salkever (1982) which assumes that production of child health uses maternal time input more intensively, hence labor supply response of any child health problem could affect maternal labor supply more negatively compared to its effect on fathers' labor supply.

Frequently in literature, labor supply equations are estimated using the reduced form method. Reduced form technique does not require any restriction. But the disadvantage of using reduced form equation is that we will not be able to estimate the wage elasticity. Since our main goal is to understand if child disability variable is related to the labor supply, we rely on reduced form equation method.

Estimating the hours of work equation using ordinary least square method will also provide a biased estimate as it neglects the participation decision. It is incorrect to assume the hours of work to be zero for those who do not participate in the labor market. Including the Heckit selection bias term along with other explanatory variables can overcome the selectivity bias (Heckman, 1979). Another alternative is to integrate the participation and the observed hours of work equation using Tobit model. We adopt the latter approach in this study.

Furthermore, any relationship between child disability and maternal employment variables cannot be termed as causal because of two reasons: First reason, the unobserved factors like unmeasured maternal psychopathological factors could be related not only to the incidence and severity of child disability but also could affect the labor market outcomes. As a result, the error term would be correlated with the child disability variable. Second reason, reverse causality could bias the estimates. Labor market engagement (or lack of thereof) can contribute to the mental health of the mother which could be instrumental for the child disability status. Sometimes, child disability could worsen if the mother has to divide her time between caring for child and market activity. One can also argue that loss of job could increase the stress level of the mother, hence, could worsen child disability. Taking care of the disable child could also prove to be stressful and affect the mental health of the caregiver, which will affect labor market outcomes inevitably. The solution to overcoming the endogeneity is to devise suitable instrument variable. However, it is a daunting task — as evident in the literature — to propose appropriate instrument variable for child disability. Therefore, the regression results in this study imply association rather than causation.

Data

Panel Study of Income Dynamics (PSID) is a longitudinal survey that provides rich information on socioeconomic, demographic and health variables about individuals living in the nationally representative households since 1968. PSID originally started with an equal probability sample of

approximately 3000 households and an additional sub-sample of 2000 low-income families. The number of families in the PSID has grown over the last four decades as family members of the original PSID families branched out and formed new families. PSID has been conducted annually between 1968 and 1996 and biennially from 1997 to present. In 1997, PSID supplemented its main data with additional information regarding children aging between 0 to 12 years and their parents — the Child Development Supplement (PSID-CDS). The survey identified approximately 2700 families with children aging less than 13 years to be eligible for the interview. Final survey could collect information for 3563 children from 2394 families. As we restrict our sample to primary caregivers who are biological mothers to these children only, our sample of PSID kids reduces to 3250 children. Our unit of analysis for regression is biological mothers of these children. We have 602 single mothers and 1454 married mothers. Depending on the missing information for regression model, single mothers' analytic sample reduces to 595; final analytic sample for married mothers consist of 1302 women.

PSID-CDS contains comprehensive accounting of the child's health, cognitive and behavioral development measures along with other socio-demographic information like age, race, and ethnicity. CDS questionnaire includes queries regarding child's limitation in age appropriate activities or difficulties in attending school and doing school work. These questions are responded by the primary caregiver. Primary caregiver also supplies information regarding 28 different illness or medical conditions that the child has ever been diagnosed with. To integrate child's health information with mother's labor market outcomes, socio-demographic characteristics (age, race, educational attainment, family structure, household income, state residency) we consult PSID core module. Data on how child spends their time in weekday is combined from the Time Use Diary module of CDS². Information related to the policy variables like maximum AFDC allowance across different states, percentage of people with AFDC allowance across states are collected from U.S. House of Representatives (1996). From the same source unemployment rate across different states in 1996 is also collected. We include these variables to reflect the policy and macroeconomic environment across different states.

² Detail account of the time use module is presented in the section on children's time with mother.

Disability Definition

Disability is a complex phenomenon which cannot be readily identifiable. Medical model of disability used to define disability in the context of pathology of diseases or health conditions. A collective intelligence has grown over the past decade to acknowledge the importance of interaction between diagnosis of individual's pathology and the environment — both social and physical. Merely the diagnosis of a disease is no longer sufficient for identification of disability. One of the most commonly used model of disability is developed by S Nagi (Nagi, 1965; Nagi, 1976). The key elements in Nagi's framework are active pathology of a disease or medical condition, impairment and functional limitation. Disability ,in this model, is defined as the interaction between an individual's physical or mental impairment due to some illness and the extent and degree of functional limitation it causes in the societal context. Absent is a strict mapping between functional limitation and disability in Nagi's model. Later, Verbrugge and Jette (1994) elaborated Nagi's disablement model where disability is defined by the inability or difficulty to perform a broad range of role behaviors that are relevant in most people's daily lives³. In order to define disability in terms of Nagi's model, we need detailed information about the functional limitation in performing various activities which is not available for children participating in PSID-CDS. In PSID-CDS, information only about broad identification of existence of functional limitation is provided by primary caregiver.

International Classification of Functioning, Disability and Health, version for children and Youth (ICF-CY, 2007) developed by World Health Organization (WHO) can be used to formulate child disability in order to appeal universal application. However, child health questions in PSID-CDS are not perfectly aligned with the ICF-CY framework. We follow ICF-CY framework closely for construction of child disability definition. The First domain of ICF-CY is impairment. Impairment is defined as the problems regarding body function or body structure in the socially acceptable standard. Primary qualifier for impairment is the presence and degree of severity of a disease or health condition. PSID-CDS contains information about presence of several health conditions. However, the extents of severity of any of these conditions are not available. We can map these conditions into deviations or loss of body function (vision, speech, hearing difficulty). Another condition — orthopedic impairment — can be linked to problems regarding body structure. We

³ Dimensions are: Basic Activities of Daily Living (BADL), Instrumental Activities of Daily Living (IADL), Paid or Unpaid Role Activities, Social Activities and Leisure Activities.

can expand the notion of body function to include psychological conditions: emotional disturbance, mental retardation, autism, learning disability, hyperactivity or ADHD. Presence of any of these conditions, by our definition, is the primary qualifier for the categorization as impairment.

The other key components of ICF-CY are activity limitation and participation restriction. Activity limitation refers to the inability or difficulty to perform age appropriate and socially expected tasks including, but not limited to, self-care, mobility, communication, education, and play and leisure activities. Participation restriction on the other hand involves problems for children to engage in life situations like attending school, doing school work etc. It is very challenging to measure or identify the presence or degree of severity of activity limitation and participation restriction. In the absence of ideal qualifiers for activity limitation and participation restriction, we rely on the response of the primary caregiver with regards to the questions that asks whether child have any physical or mental condition that limit or prevent their ability to do usual childhood activities (play) or attend school or to do school work. Affirmative answers to any of these questions can be used as a proxy for activity limitation and participation restriction. Children, who currently are in special education, are also categorized as having participation restriction. One caveat of PSID-CDS study is that the affirmative answer to any of the questions is not supplemented by additional questions regarding the health conditions that are responsible for the limitation. The presence or absence of health condition question is asked to everyone. Hence we cannot map the health conditions that attributes to activity limitation or participation restriction. Such mapping is very complex since similar conditions may or may not lead to similar limitations or restriction; similar activity limitation or restriction can be attributed to various health limitations.

According to the ICF-CY framework, disability is an umbrella term covering all these aspects: impairment, activity limitation and participation restriction. In our study, we adopt this approach to define the composite index of child disability.

Descriptive Statistics

If a child is identified to have any of the medical conditions — developmental delay, learning disability, autism, ADHD, mental retardation or emotional disturbance, we categorize them as a child with a mental impairment. A caveat of this approach is that we have no information about the degree of severity since any physiological or pathological test was not carried out for the child by

CDS. The incidence of any of the conditions — speech, vision or hearing difficulty, the orthopedic impairment would qualify a child as having a physical impairment. Parents also report if their child faces any difficulty to perform a daily activity or school work — we identify them with participation restriction or activity limitation. Kids who are now in special education are also included in this category.

Table 1 reports the number of kids in each of these categories; In Table 2, we look at the age and gender distribution for each of the categories. The probability of being identified (or to be reported by their parents) with any medical condition becomes larger for older children since many of the symptoms associated with disability are not manifested until a certain age. Besides, parents also lack the knowledge to relate symptoms with child disability because of inexperience. Like other surveys, PSID-CDS do not provide the data on the actual diagnosis time period. Table 2 also reveals that boys are more prone to being identified with any of the conditions than girls. Overall, we find 10 percent child with mental impairment; 14 percent kids have physical impairment. Approximately 5 percent child is reported to have difficulty with daily activity or school work. Another 5 percent participate in special education hence are categorized in the same group. In sum, approximately 24 percent children are identified by the composite measure of disability. We have applied child specific weight to estimate the standard error.

The composite measure of disability in our study is larger than other measures in the literature. For example, Wasi et al. (2012) report around 12 percent single mothers with a child having disability. While we identify approximately 30 percent single mothers with a disable child. Both measures not only are based on different definitions but also considers different time horizon in estimating the prevalence of child disability. As noted previously, Wasi et al. (2012) define disability based on parent's report about the activity limitation in daily tasks or self-care or difficulty to perform school work.⁴ While our definition includes the parents report of activity limitation, participation restriction with incidence of specific health condition and enrollment in special education. On the other hand, Gould (2004) segments 14 percent single mothers with child having "time intensive illness"; while 45 percent of the single mothers were categorized to have a child with "unpredictable illness". Therefore, our definition is more aligned with Gould's findings as

⁴ When we apply the same definition as Wasi et al (2000), the prevalence of child disability is similar.

they both originate from the PSID-CDS and adopts Disability definition based on information of the diagnosed health conditions.

In Table 3, we examine if there exists significant differences between single mothers — with and without disable kids — in terms of various measurable demographic and family level characteristics. Female heads with a disable child are slightly older than their counterpart. Over 50 percent of the single mothers of disable child are non-white. Significant difference appears in educational measures between two groups of mother. Approximately 75 percent single mothers of disable child have a high school degree or less. On the other hand, approximately 55 percent of the mothers with a healthy child have high school degree or less. The family structure of the female head varies considerably by child's health status. Total number of children in the female-headed household with a disable child is higher than that in a household with a healthy child. On the other hand, 45 percent of single mothers has a child below age 5, in comparison 53 percent of single mothers of healthy child has a child under the age 5 in their family.

When we compare the labor market outcomes between these two groups of mothers, we find no significant difference in participation rate or weekly working hours. This stands in sharp contrast to the labor market measures reported by Powers (2001) based on Current Population Survey 1992 where Labor force participation rate of the single mothers with a disable child is about 10 percent lower than that of single mothers without disable child. Apart from the difference in time, changes in disability definition could be responsible for these differences. But we find considerable difference in labor earnings and wage rate where single mothers of disable child appear to lag behind their counterpart.

Table 4 represents the comparison for married mothers. Married mothers are living in a male-headed household either as married wives or cohabiting as a female partner. Mothers of a disable child contrast mothers without a disabled child in terms of key attributes and labor market outcomes. Mothers of sick children are little older than their counterpart. Approximately 20 percent mothers with a sick child are non-white; while the proportion of non-white among mothers of a healthy child is about 17 percent. No significant difference can be seen regarding the average years of schooling, but decomposition of education variable reveals contrast. Approximately 60 percent mothers of a healthy child are categorized as having "more than high school degree"; only 48 percent mothers of a disabled child belong to this education category. Mothers of disabled children

also report having health limitation to participate in the labor market in little higher proportion. The family composition shows differences as households with a disabled child have more children than families with a healthy child. Approximately 60 percent of the families with a healthy child report to have a child younger than five years ; While about 40 percent families with disabled children have a child in that age category. We find similar findings in labor market attributes for mothers of disabled children who appear to participate in the workforce in greater proportion, work longer hours while earning less.

Mothers of disabled children are not very different from the group of mothers of healthy children. They are slightly older, less educated and little more disadvantaged in socioeconomic status. However, the labor market participation and weekly working hours are not statistically different. The gap in human capital is reflected in the wage differential. Mothers of sick children may have to compensate by working more to meet the additional financial burden. The following section presents the regression results to confirm the findings from descriptive analysis.

Regression Results

Labor Force Participation

The probability that a mother will work or not (positive weekly work hours) can be estimated using logit model. The specification for the probability of working includes maternal demographic characteristics (age, age squared, years of education, race, health status), family characteristics (total number of kids in the family, age structure of the children in the family and child health status variables). We also include the economic conditions of the state (unemployment rate of the state) and state specific welfare policy variable (maximum AFDC allowance, the percentage of families in the state with benefit) to address any variation across states in these measures which are argued to generate work disincentives.

Along with age we have included age squared in the empirical equation to capture the effect of experience on labor market participation. Second order polynomial of age variable is rescaled to avoid computational problem. “Other income” variable is computed as the difference between total family incomes — combined income from every possible source by family members — and the labor income of the mother. We also transformed “other income” to natural logarithm. For the

specifications for the married mothers labor supply equation, we also include husband's age, education, health and husband's labor market outcomes. We defined mothers' years of schooling into three categories — less than high school, high school degree and more than high school degree. To capture any differences in labor market participation among mothers from difference ethnicity, we have included a dummy variable which takes a value of 1 if mother is non-white. PSID provides information about self-assessed health status variable for the respondents. We include two measures of self-assessed health of the mother — if mother thinks her health to be fair or poor (health status), and if mother identifies herself to have physical or medical conditions that limit her ability to participate in the labor market (health limitation). Three child status related variables are included in the estimated equation — total number of children in the family, whether a child under age of 5 resides in the family and lastly, child health status variable. In model 1, composite child disability variable is included that takes a value of 1 when child is associated with either impairment or activity limitation. In model 2, child disability variable distinguished all children (and their families) into four groups: children with no impairment or activity limitation, children with impairment only, children with activity limitation or participation restriction only, and children with the combination of both impairment and activity or participation restriction. The last group is called to have severe disability.

In Table 5, we present the regression coefficients and their standard errors from the employment participation equation for the single mothers. They regression coefficients indicate the change in log of odd ratio when the associated variable changes. In both specifications, mother's education, mother's own health, race, other income, age composition of the child in the family and total number of children are found to be significant predictors of mother's labor market participation. State public assistance or economic variables are not found to be statistically significant. The main purpose of this study is to determine if child health variables are associated negatively with mother's labor force participation. Neither composite measure of child disability nor detailed measure of child disability, are found to be statistically significant.

Closer inspection of the single mother population reveals that in terms of key determinants of labor market participation — education, own health status, family composition in terms of number of child by age — no statistically significant difference exist between mothers with a healthy child and mothers with a disable child. For example, 43 percent mothers of healthy child have a high school degree; in comparison, 41 percent mothers of disable child holds a high school degree.

Approximately 12 percent mothers of disable child report to have a physical or mental health condition that limits their ability to participate in the labor force; 11 percent mothers of healthy child, report such health limitation. Total number of children in the family for both the groups is also not statistically different. Presence of young child below 5 years old gives single mothers of disable child in slight advantage as 54 percent of these mothers have a young child compared to 59 percent of single mothers of healthy child has a young child in the family. Another important factor in explaining the result is the growth of female labor force participation due to 1996 welfare reform and expansion of earned income tax credit, increase in Medicaid and child care. Blank (2002), reports that these reforms resulted in single mother's employment rate from about 57 percent in 1994 to almost 75 percent in 2000. Our study period coincides with these transition phase.

The coefficients of logit are not as meaningful as the average marginal effects that can be calculated from them. In Table 6 we display the results based on these average marginal effects. Average marginal effect for the child disability variable is computed by calculating the predicted probability of maternal employment twice: once where along with other covariates assuming reference value, the child disability variable is one; the other value of the predicted probability assumes the child disability variable to be zero while other covariates remains unchanged. The difference between these two predicted probabilities is then averaged over the entire regression sample to arrive at the average marginal effect from the child disability variable.

Regression results for the married mothers' labor force participation equation are presented in Table 7 and Table 8. Along with the covariates used in the model for a single mother, husband's age, education, health limitation variables are included. Husband's labor market-related variables are not included as other income will capture the labor market earnings of the spouse. Important determinants of married mother's employment probability are education level, own health, the number of child in the family and their age distribution. Child disability variable does not affect the decision of the married mothers to participate in the labor market.

We analyze mothers of disable child regarding key attributes and find that no statistical difference exists between these groups of mothers. The welfare reforms of 1996 (PRWORA) could also contribute to the growth of married mother's labor market participation. We deploy another composite disability definition, similar to the one used by Wasi et al. (2012) where they found a very small but statistically significant effect on employment probability for single and married mothers

using a large representative sample from US census. Our result does not change when we use the new disability definition. Results are omitted here, can be obtained upon request. We also estimated the models — with both definitions— on several sub-sample of the female population. Child disability does not affect the labor force participation of female population with varying degree of educational attainment. This result is different than what obtained by Wasi et al. (2012) which reports that mothers with less education suffer stronger negative shock due the presence of a child with a disability.

Weekly Working Hours

Next, we turn our attention to the effect of child disability on weekly working hours. Estimating the model for weekly working hours using the sample of working women population would result in the biased estimate. Several models are available to correct the bias when the dependent variable is generated by the censored distribution. We used Tobit model which was first proposed by Tobin (1958). All the variables that are included to model the likelihood of a mother to participate in the labor force, are also included to model the effect on weekly working hours. The first observation from the regression results of the Tobit model is that the factors that affect labor force participation also affects the working hours. This confirms the basic assumption of type-I Tobit model. The key factors in explaining variation in weekly working hours are education level, health limitation, and child status variables. For single mothers, none of the child disability variables are found to be statistically significant. The result is true for women with different educational attainment. Regression results for the married women sample suggest that presence of a disabled child is not associated with weekly working hours. However, when the model is estimated for the married mothers with higher education level, greater than high school degree, it was found that presence of a disable child do not affect their weekly working hours. On the other hand, married mothers with a high school degree or lower level of education respond by working more when they have a child with poor health. The positive effect on the desired weekly working hours (as suggested in Table 15) is statistically significant at 5 percent level. Both measure of disability — composite measure and disaggregated measure — are found to be positively associated with desired working hours. We refer to the results in Table 16, where we estimate the marginal effect of each explanatory variable on expected weekly working hours, given that the married mother was working. It suggests that among the women with low level of education, the expected working hours of a married mother with a disable child is on average 3.8 hours higher than a mother of a healthy child. When a detailed

definition of disability is adopted, we find that both impairment and activity limitation result in an increase in expected working hours.

The results for the working hour regression are similar to the labor force participation equation where we find no effect of child disability on mother's labor outcome variables. The only exception is found for the married mothers with lower human capital who respond by working more when they have a sick child. On the other hand, working hours of married mothers of sick child with higher level of education, are not affected. Careful examination of husband's education variables reveals that women with higher level of education are married to males with higher level of education. The family income excluding labor income of the women, is also significantly higher for the women with higher level of education. Combination of these factors attribute to the differences in labor supply behaviors among married mothers with different level of education. We may conclude that the relationship between child health variable and weekly working hours for married mothers with lower level of education is an association, not causation. The difference in socioeconomic condition may have been responsible for this difference.

Unlike other findings in the literature, this study finds very little evidence of a negative relationship between child disability and maternal employment. On the contrary, married mothers with education level equal or below a high school diploma, who have a child with poor health, are found to respond positively in weekly working hours. To support our result from the regression analysis, we investigate the time use diaries of these children and measure the maternal and non-maternal time engagement on a typical weekday. We expect that children's with poor health have little time engagement with mother, since mothers' employment is not affected. On the other hand, non-maternal time engagement of children with poor health should be greater because of their vulnerability. In the next section, we investigate the time use diaries of the children. Since labor market response of the mothers of disabled children is not found to be different, we look specifically at the time diaries of the children to measure the maternal and non-maternal time engagement with the children on a typical weekday.

Children's Time with Mother:

Children's Time Dairy collects detailed information about different array of activities that children engage throughout one randomly selected weekday and one randomly selected weekend day.

Parental and non-parental involvement during those activities is also recorded. In CDS-I, just over 2900 children completed time diaries. When children are young, primary caregiver (PCG) completed the time diary; older children completed their time diary with the assistance of the PCG.

The Data for the time diary is structured at the activity level: one data record per activity. Individual identifiers for the children are attached to each activity code. There are 131,060 child-activity occurrences recorded in the time diary for CDS-I. 2904 children provided the data. Most child (2832, 97.52 percent) provided information for both – one randomly selected weekday and one randomly selected weekend⁵. In the following analysis, we restrict our focus to weekdays only; implicit is the assumption that children's time with mother is affected during weekdays when mother is employed. For 2874 kids, we have information of their time allocation for weekdays. We merge data on time allocation to the core PSID-CDS to include child and maternal characteristics. 252 children have missing information related to their child and maternal characteristics. Further, we only keep children whose primary caregiver is biological mother which reduces the number of children to 2502.

Duration of the activities can be computed from the start time and end time – both represented as seconds past midnight. At the 4 digit level, there are 365 types of activities (at the 4 digit level) that children can be engaged in. We have categorized the activities into several broad groups: (1) household chores including non-paid childcare to other children, (2) Personal Care, (3) Educational or Professional training which take place either in school or elsewhere, (4) Organizational Activities, (5) Sports and other active leisure, and (6) Passive leisure i.e. time spent in watching TV, playing video games etc. We present maternal time engagement both at the aggregate and disaggregated level.

During the activities, engagement and presence of other family members – mother, father, sibling, grandparents or other non-relative person – are recorded. Numerous engagement combinations can take place when an activity takes place⁶. Since we are primarily interested to investigate the care

⁵ Time diary record for only weekday is available for 42 kids; for another 30 kids time diary information is available only for weekend.

⁶ To measure the parental and non-parental time involvement at the activity level, we have "with whom" dimension of children's activity at several mutually exclusive categories: (1) Mother Only, (2) Father Only, (3) Child is accompanied by both parents during the activity, (4) Mother with other people (relative or non-relative) when father is not present, (5) father with the presence of other people (relative or non-relative) when mother is not present, (6) Child is

burden shared by mother, we restrict our analysis to one type of engagement only – children's time engagement with mother, with or without the presence of other members. We include other members' time involvement in the definition of maternal time engagement because mother being present imply that she is the primary responsible person in this scenario although other people are engaged with the child during the activity. On the contrary, we provide non-maternal time engagement during weekdays to provide evidence of the support mechanism that makes maternal employment possible.

For the following descriptive analysis, our main variable of interest is the total time child spends at various activities when the mother was engaged. Analysis for time allocation at specific categories of activities and maternal time engagement can be carried out in the same manner. In Table 17, child's average time engagement with mother is reviewed for different child level attributes. Our unit of analysis is children while the main variable of interest is the child's aggregate time engagement with mother at various activities. Note that this analysis is unweighted. Younger children receive greater amount of time engagement from mother. Understandable is the demand for care for younger children which reflects higher maternal time engagement; children in the older age bracket are school going, hence requires less time from mother along with their reduced demand for maternal care. What is striking in our findings is that children's with health problems across various definitions have less time engagement with mother. Children with impairment or activity limitation or participation restriction spends about 30 minutes less time with mother compared to children without any health limitations . Over the course of a week, the cumulative time difference can be around 3.5 hours. However, maternal time engagement with children having Behavioral problems is slightly lower than children without such problem. The cumulative time difference over the course of a week is approximately 1.1 hours. This confirms our findings that majority of the mothers of children with disabilities are gainfully employed, hence maternal time-engagement is lower on an average for the children with poor health. This finding suggests that children's time with mother is sacrificed at the expense of market work, with a greater degree when children are in poor health. On an average an employed mother is engaged with their children for around 2.77 hours on a weekday; a mother without employment, spends on an average 3.57 hours with their children. The

accompanied by relative or non-relative when both parents are not present , (7) other various combinations ,and (8) alone - no one else is engaged with the child when child was doing the activity.

cumulative difference over the course of a week could be approximately 8.5 hours. Single mothers on an average spends less time with their children compared to married mothers (see Table 18, 19).

Table 20 , provides analysis by breaking down the aggregate time allocation across different activities. Across all the categorization of poor health, we find that maternal time allocation for sick children is lower in personal care, active leisure and household chores. Children with poor health are expected to be in need of help while performing personal care activities. Table 20 suggests that children with poor health, who are regarded to be in greater need of assistance for taking care of them, receive less maternal time engagement. Table 21 and Table 22 exhibits the maternal time engagement for the children of employed mother and unemployed mother respectively. These tables also suggest that the maternal time engagement is lower for sick kids regardless of the employment status of the mother. However, sick children whose mother is employed receive even lower amount of maternal time allocation.

Table 23 and Table 24 summarize the non-maternal time allocation by children's health for employed mothers and unemployed mothers respectively. These two tables suggest that children with poor health, whose mother is employed, are taken care of by other family members or non-family members. Our broad definition only considers time that child spend without the presence of mother. We find that children with poor health they receive greater non-maternal time engagement which compared to healthy kids. This supports our finding that mothers of sick children are working more and this is made possible by non-maternal time engagement that they receive for their sick children.

Conclusion

Empirical estimates of the effect of child disability on maternal employment vary considerably as the disability definitions are changed. Literature is also constrained by the limited availability of information about presence and severity of health conditions of children. Hence, researchers construct disability index based on the parent-reported health status of the child. In this paper, we construct a Disability definition based on the framework provided by ICF-CY(2007). Disability definition was constructed using the presence of a physician-diagnosed health condition reported by the parents. Powers (2003) who argued that parent's report of the health limitation of the child may be jointly determined by the labor market outcomes of the parents. However, when parents are

asked to report any diagnosis of specific health condition, the report can be assumed to be objective. In the absence of administrative record of the diagnosis of child health, this measure is the closest proxy. We find that child disability variables do not affect the labor force participation of the single mothers or married mothers. However, married mothers' with lower educational attainment increase their weekly work hours despite the presence of a child with either impairment or activity limitation. Weekly labor supply of the married mothers with a greater level of education is not perturbed by the presence of a disabled child.

We extend our analysis to measure the maternal and non-maternal time engagement with sick children. Maternal time engagement during a weekday is lower for the children with poor health. Non-maternal time engagement for the sick children during the weekday is found to be higher than the children with good health. This supports the narrative that children with poor health are vulnerable, they need additional care. This support is provided from non-maternal sources. The financial burden could play a vital role that pushes married mothers of disabled child end up working more when they have a disabled child. Married mothers with lower level of education most likely earn lower wage, hence need to increase working hours to maintain the sick children. Future research can be done to examine the changes in child care responsibility of father when families differ in terms of wives' educational attainment and when they face additional demand for care because of a sick child. Changes in welfare policy, for example PRWORA, could improve the labor market response of mothers of sick child in nontrivial way. Another dimension to improve the current study would be to use longitudinal construct of PSID to estimate fixed effect models which corrects endogeneity. The panel structure will also allow us to examine various static and dynamic measures of labor outcome.

Reference

- Becker, G. (1965). A Theory of the Allocation of Time. *The Economic Journal*, 75(299), 493–517.
- Becker, G. S. (1965). A Theory of the Allocation of Time. *The Economic Journal*, 75(299), 493–517.
<http://doi.org/10.2307/2228949>
- Brandon, P. (2007). Time away from “smelling the roses”: Where do mothers raising children with disabilities find the time to work? *Social Science & Medicine*, 65(4), 667–679.
<http://doi.org/10.1016/j.socscimed.2007.04.007>
- Breslau, N. (1983). Care of Disabled Children and Women’s Time Use. *Medical Care*, 21(6), 620–629.
- Breslau, N., Salkever, D., & Staruch, K. S. (1982). Women’s Labor Force Activity and Responsibilities for Disabled Dependents: A Study of Families with Disabled Children. *Journal of Health and Social Behavior*, 23(2), 169–183. <http://doi.org/10.2307/2136513>
- Connelly, R. (1992). The Effect of Child Care Costs on Married Women’s Labor Force Participation. *The Review of Economics and Statistics*, 74(1), 83–90.
<http://doi.org/10.2307/2109545>
- Corcnan, H., Noonan, K., & Reichman, N. E. (2005). Mothers’ Labor Supply in Fragile Families: The Role of Child Health. *Eastern Economic Journal*, 31(4), 601–616.
- Dillon-Wallace, J. A., McDonagh, S. H., & Fordham, L. A. (2014). How Stable is the Well-Being of Australian Mothers Who Care for Young Children with Special Health Care Needs? *Journal of Child and Family Studies*, 23(7), 1215–1226. <http://doi.org/10.1007/s10826-013-9782-6>
- Frijters, P., Johnston, D. W., Shah, M., & Shields, M. A. (2009). To Work or Not to Work? Child Development and Maternal Labor Supply. *American Economic Journal: Applied Economics*, 1(3), 97–110.

b

- Gould, E. (2004). Decomposing the effects of children's health on mother's labor supply: is it time or money? *Health Economics*, *13*(6), 525–541. <http://doi.org/10.1002/hec.891>
- Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, *47*(1), 153–161. <http://doi.org/10.2307/1912352>
- ICF-CY (Ed.). (2007). *International classification of functioning, disability and health: Children & youth version ; ICF-CY*. Geneva: World Health Organization.
- Kimmel, J. (1998). Child Care Costs as a Barrier to Employment for Single and Married Mothers. *Review of Economics and Statistics*, *80*(2), 287–299. <http://doi.org/10.1162/003465398557384>
- Kvist, A. P., Nielsen, H. S., & Simonsen, M. (2013). The importance of children's ADHD for parents' relationship stability and labor supply. *Social Science & Medicine*, *88*, 30–38. <http://doi.org/10.1016/j.socscimed.2013.04.001>
- Miodrag, N., Burke, M., Tanner-Smith, E., & Hodapp, R. M. (2015). Adverse health in parents of children with disabilities and chronic health conditions: a meta-analysis using the Parenting Stress Index's Health Sub-domain: Adverse health in parents. *Journal of Intellectual Disability Research*, *59*(3), 257–271. <http://doi.org/10.1111/jir.12135>
- Morris, L. A. (2014). The Impact of Work on the Mental Health of Parents of Children with Disabilities: Work and Mental Health. *Family Relations*, *63*(1), 101–121. <http://doi.org/10.1111/fare.12050>
- NAGI, S. (1965). Some conceptual issues in disability and rehabilitation. *Sociology and Rehabilitation*. Retrieved from <http://ci.nii.ac.jp/naid/10021252464/>
- Nagi, S. Z. (1976). An Epidemiology of Disability among Adults in the United States. *The Milbank Memorial Fund Quarterly. Health and Society*, *54*(4), 439–467. <http://doi.org/10.2307/3349677>

- Powers, E. T. (2001). New Estimates of the Impact of Child Disability on Maternal Employment. *The American Economic Review*, *91*(2), 135–139.
- Powers, E. T. (2003a). Children's Health and Maternal Work Activity: Estimates under Alternative Disability Definitions. *The Journal of Human Resources*, *38*(3), 522–556. <http://doi.org/10.2307/1558767>
- Powers, E. T. (2003b). Children's Health and Maternal Work Activity: Estimates under Alternative Disability Definitions. *Journal of Human Resources*, *XXXVIII*(3), 522–556. <http://doi.org/10.3368/jhr.XXXVIII.3.522>
- Salkever, D. S. (1982). Children's Health Problems and Maternal Work Status. *The Journal of Human Resources*, *17*(1), 94–109. <http://doi.org/10.2307/145526>
- Stabile, M., & Allin, S. (2012). The economic costs of childhood disability. *The Future of Children*, *22*(1), 65–96.
- Tobin, J. (1958). Estimation of Relationships for Limited Dependent Variables. *Econometrica*, *26*(1), 24–36. <http://doi.org/10.2307/1907382>
- Verbrugge, L. M., & Jette, A. M. (1994). The disablement process. *Social Science & Medicine*, *38*(1), 1–14. [http://doi.org/10.1016/0277-9536\(94\)90294-1](http://doi.org/10.1016/0277-9536(94)90294-1)
- Waldfoegel, J. (1998). Understanding the “family gap” in pay for women with children. *The Journal of Economic Perspectives*, *12*(1), 137–156.
- Wasi, N., den Berg, B. van, & Buchmueller, T. C. (2012). Heterogeneous effects of child disability on maternal labor supply: Evidence from the 2000 US Census. *Labour Economics*, *19*(1), 139–154. <http://doi.org/10.1016/j.labeco.2011.09.008>

d

Yamauchi, C. (2012). Children's Health and Parental Labour Supply*. *Economic Record*, 88(281), 195–213. <http://doi.org/10.1111/j.1475-4932.2012.00794.x>

Appendix: Exhibits

Table 1: Diagnosed Medical Conditions in PSID-CDS Children

| | Count | Mean | SE |
|----------------------------|-------|-------|-------|
| Mental Impairment | | | |
| Developmental Delay | 102 | 0.032 | 0.004 |
| Learning Disability | 129 | 0.039 | 0.005 |
| Autism | 13 | 0.004 | 0.001 |
| Hyperactivity/ADHD | 166 | 0.045 | 0.005 |
| Retardation | 16 | 0.004 | 0.001 |
| Emotional disturbance | 37 | 0.011 | 0.003 |
| Physical Impairment | | | |
| Speech impairment | 246 | 0.077 | 0.006 |
| Hearing Difficulty | 79 | 0.024 | 0.003 |
| Seeing Difficulty | 63 | 0.019 | 0.004 |
| Orthopedic impairment | 89 | 0.03 | 0.004 |
| In Special Education | 158 | 0.046 | 0.005 |

Table 2 : Age and Gender Distribution of Child Disability

| | Mental Impairment | Physical Impairment | Activity Limitation or Participation Restriction | Disability | Severe BPI |
|------------------------|-------------------|---------------------|--|-------------|-------------|
| Overall | 0.10 | 0.14 | 0.09 | 0.24 | 0.25 |
| Age | | | | | |
| Below 2 Years old | 0.02 | 0.06 | 0.02 | 0.08 | 0.27 |
| Less than 6 Years old | 0.07 | 0.12 | 0.05 | 0.17 | 0.21 |
| Less than 10 Years old | 0.12 | 0.15 | 0.12 | 0.28 | 0.28 |
| Above 10 Years old | 0.16 | 0.18 | 0.14 | 0.32 | 0.28 |
| Gender | | | | | |
| Girl | 0.06 | 0.10 | 0.05 | 0.15 | 0.22 |
| Boy | 0.12 | 0.15 | 0.11 | 0.26 | 0.28 |
| N | 3242 | 3242 | 3242 | 3242 | 2680 |

Table 3: Single Mothers Characteristics

| | With Disability | No Disability |
|--|-----------------|---------------|
|--|-----------------|---------------|

| | Mean | SE | Mean | SE |
|---|-----------|------------|-----------|------------|
| Age | 33.403 | 0.546 | 32.443 | 0.764 |
| Race (Non-White) | 0.537 | 0.052 | 0.479 | 0.056 |
| Education (Years) | 12.119 | 0.145 | 12.666 | 0.220 |
| Less Than High School | 0.183 | 0.027 | 0.165 | 0.039 |
| High School Degree | 0.557 | 0.062 | 0.405 | 0.037 |
| More than High School Degree | 0.260 | 0.056 | 0.431 | 0.056 |
| Health Status | 0.150 | 0.046 | 0.082 | 0.023 |
| Health Limit | 0.040 | 0.018 | 0.106 | 0.027 |
| Mother Smokes | 0.262 | 0.032 | 0.212 | 0.039 |
| Mother Drinks Alcohol | 0.220 | 0.044 | 0.236 | 0.043 |
| Total Number of Children in Family | 2.374 | 0.120 | 1.810 | 0.089 |
| Family Has a Child under 5 | 0.458 | 0.058 | 0.531 | 0.050 |
| Weekly Work Hours 1996 | 38.871 | 1.336 | 37.334 | 0.961 |
| Employed | 0.802 | 0.036 | 0.796 | 0.028 |
| Labor Income 1996 | 13297.871 | 1217.032 | 19046.660 | 2828.343 |
| Wage Rate 1996 | 10.781 | 0.802 | 13.548 | 2.485 |
| North East Region | 0.182 | 0.053 | 0.148 | 0.032 |
| North Central Region | 0.264 | 0.035 | 0.317 | 0.059 |
| Southern Region | 0.488 | 0.054 | 0.354 | 0.048 |
| Western Region | 0.066 | 0.019 | 0.181 | 0.039 |
| Percent of Child with AFDC in the State | 12.035 | 0.352 | 11.400 | 0.380 |
| Maximum AFDC/ TANF Amount in State | 244.350 | 11.952 | 255.914 | 10.058 |
| Unemployment Rate in State | 2.088 | 0.070 | 2.168 | 0.084 |
| N | | 186 | | 416 |

Table 4 : Married Mother Characteristics

| | With Disability | | No Disability | |
|------------------------------|-----------------|-------|---------------|-------|
| | Mean | SE | Mean | SE |
| Age | 35.332 | 0.539 | 34.481 | 0.339 |
| Race (Non-White) | 0.212 | 0.03 | 0.175 | 0.024 |
| Education (Years) | 13.249 | 0.164 | 13.663 | 0.115 |
| Less Than High School | 0.114 | 0.024 | 0.065 | 0.011 |
| High School Degree | 0.402 | 0.055 | 0.352 | 0.022 |
| More than High School Degree | 0.484 | 0.054 | 0.583 | 0.024 |
| Health Status | 0.081 | 0.024 | 0.043 | 0.011 |

| | | | | |
|---|------------|---------|-------------|----------|
| Health Limit | 0.091 | 0.018 | 0.089 | 0.015 |
| Mother Smokes | 0.141 | 0.036 | 0.094 | 0.018 |
| Mother Drinks Alcohol | 0.246 | 0.038 | 0.318 | 0.025 |
| Total Number of Children in Family | 2.348 | 0.073 | 1.986 | 0.052 |
| Family Has a Child under 5 | 0.383 | 0.046 | 0.588 | 0.029 |
| Weekly Work Hours 1996 | 35.236 | 0.973 | 34.128 | 0.749 |
| Employed | 0.801 | 0.025 | 0.762 | 0.018 |
| Labor Income 1996 | 17995.49 | 1920.84 | 22319.77 | 1973.681 |
| Wage Rate 1996 | 11.4 | 0.891 | 18.249 | 3.741 |
| North East Region | 0.279 | 0.034 | 0.209 | 0.04 |
| North Central Region | 0.284 | 0.048 | 0.256 | 0.03 |
| Southern Region | 0.294 | 0.03 | 0.297 | 0.028 |
| Western Region | 0.143 | 0.023 | 0.239 | 0.028 |
| Percent of Child with AFDC in the State | 11.362 | 0.309 | 11.707 | 0.406 |
| Maximum AFDC/ TANF Amount in State | 265.514 | 7.435 | 274.594 | 6.89 |
| Unemployment Rate in State | 2.146 | 0.075 | 2.286 | 0.077 |
| N | 376 | | 1078 | |

Table 5: Labor Market Participation (Single Mother)-Regression Coefficients

| | Model 1 | | Model 2 | |
|--|-------------|-------|-------------|-------|
| | Coefficient | SE | Coefficient | SE |
| Age of the individual | -0.029 | 0.098 | -0.019 | 0.100 |
| Age squared | 0.083 | 0.143 | 0.065 | 0.145 |
| Race dummy (Non-White) | -1.084*** | 0.324 | -1.044** | 0.327 |
| Education Level (Less than High School) | | | | |
| High school | 1.034*** | 0.276 | 1.061*** | 0.277 |
| More than high school | 1.714*** | 0.334 | 1.730*** | 0.335 |
| Health limitation of the individual (Yes) | -1.360*** | 0.355 | -1.341*** | 0.355 |
| Health status of the individual (Fair or Poor) | -0.642 | 0.346 | -0.628 | 0.347 |
| Number of child in the family | -0.296** | 0.105 | -0.297** | 0.106 |
| Whether the family has a child under 5 | -0.691* | 0.297 | -0.742* | 0.303 |
| Other income of the family (Logarithm) | -0.305*** | 0.068 | -0.301*** | 0.068 |
| Max AFDC Benefit Dummy | 0.280 | 0.324 | 0.286 | 0.326 |
| Unemployment Dummy | 0.012 | 0.351 | 0.015 | 0.355 |
| AFDC Percent Dummy | 0.141 | 0.297 | 0.173 | 0.298 |
| Family Has Disable Child (YES) | -0.136 | 0.251 | | |
| Disability of the Child (No Disability) | | | | |

| | | | | |
|---|------------|-------|------------|-------|
| Disability Type (Impairment) | | | -0.070 | 0.318 |
| Disability Type (Activity / Participation Limitation) | | | 0.235 | 0.581 |
| Disability Type (Both/Severe) | | | -0.415 | 0.392 |
| Constant | 4.858** | 1.782 | 4.648* | 1.805 |
| N | 595 | | 595 | |

* p<0.05 , ** p<0.01, *** p<0.001

Table 6 : Labor Market Participation (Single Mother) – Marginal Effects

| | Model 1 | | Model 2 | |
|---|------------|-------|------------|-------|
| | dy/dx | se | dy/dx | se |
| Age of the individual | -0.004 | 0.012 | -0.002 | 0.012 |
| Age squared | 0.010 | 0.018 | 0.008 | 0.018 |
| Race dummy (Non-White) | -0.135*** | 0.039 | -0.130** | 0.040 |
| Education Level (Less than High School) | | | | |
| High school | 0.160*** | 0.044 | 0.163*** | 0.044 |
| More than high school | 0.236*** | 0.045 | 0.238*** | 0.046 |
| Health limitation of the individual (Yes) | -0.170*** | 0.042 | -0.167*** | 0.042 |
| Health status of the individual (Fair or Poor) | -0.080 | 0.043 | -0.078 | 0.043 |
| Number of child in the family | -0.037** | 0.013 | -0.037** | 0.013 |
| Whether the family has a child under 5 | -0.086* | 0.037 | -0.092* | 0.037 |
| Other income of the family (Logarithm) | -0.038*** | 0.008 | -0.038*** | 0.008 |
| Max AFDC Benefit Dummy | 0.035 | 0.040 | 0.036 | 0.040 |
| Unemployment Dummy | 0.001 | 0.044 | 0.002 | 0.044 |
| AFDC Percent Dummy | 0.018 | 0.037 | 0.021 | 0.037 |
| Family Has Disable Child (YES) | -0.017 | 0.031 | | |
| Disability of the Child (No Disability) | | | | |
| Disability Type (Impairment) | | | -0.009 | 0.040 |
| Disability Type (Activity / Participation Limitation) | | | 0.028 | 0.066 |
| Disability Type (Both/Severe) | | | -0.055 | 0.054 |
| N | 595 | | 595 | |

* p<0.05 , ** p<0.01, *** p<0.001

Table 7 : Labor Market Participation (Married Mother)- Regression Coefficients

| | Model 1 | | Model 2 | |
|--|-------------|-------|-------------|-------|
| | Coefficient | SE | Coefficient | SE |
| Age of the individual | -0.009 | 0.089 | -0.010 | 0.089 |
| Age squared | 0.030 | 0.127 | 0.033 | 0.127 |
| Race dummy (Non-White) | 0.128 | 0.169 | 0.117 | 0.170 |
| Education Level (Less than High School) | | | | |
| High school | 1.241*** | 0.242 | 1.221*** | 0.243 |
| More than high school | 1.371*** | 0.266 | 1.367*** | 0.266 |
| Health limitation of the individual (Yes) | -0.486 | 0.258 | -0.515* | 0.258 |
| Health status of the individual (Fair or Poor) | -0.698* | 0.291 | -0.680* | 0.292 |
| Number of child in the family | -0.132 | 0.072 | -0.136 | 0.072 |

| | | | | |
|---|-----------|-------|-----------|-------|
| Whether the family has a child under 5 | -0.823*** | 0.177 | -0.816*** | 0.177 |
| Other income of the family (Logarithm) | -0.226* | 0.096 | -0.216* | 0.096 |
| Max AFDC Benefit Dummy | 0.199 | 0.172 | 0.217 | 0.172 |
| Unemployment Dummy | -0.156 | 0.187 | -0.147 | 0.187 |
| AFDC Percent Dummy | 0.199 | 0.170 | 0.201 | 0.170 |
| Age of the Husband | -0.022 | 0.016 | -0.022 | 0.016 |
| Education Years of Husband | 0.019 | 0.033 | 0.019 | 0.033 |
| Health Limitation of Husband (Yes) | 0.024 | 0.303 | 0.035 | 0.305 |
| Health Status of Husband (Fair or Poor) | -0.133 | 0.288 | -0.159 | 0.289 |
| Family Has Disable Child (YES) | 0.186 | 0.172 | | |
| Disability of the Child (No Disability) | | | | |
| Disability Type (Impairment) | | | 0.029 | 0.203 |
| Disability Type (Activity / Participation Limitation) | | | 0.797 | 0.444 |
| Disability Type (Both/Sever) | | | 0.251 | 0.309 |
| Constant | 3.637* | 1.702 | 3.556* | 1.704 |
| N | 1302 | | 1302 | |

* p<0.05, ** p<0.01, *** p<0.001

Table 8: Labor Market Participation (Married Mother) - Marginal Effect

| | Marginal Effect Model 1 | | Marginal Effect Model 2 | |
|--|----------------------------|-------|----------------------------|-------|
| | dy/dx | se | dy/dx | se |
| Age of the individual | -0.001 | 0.014 | -0.002 | 0.014 |
| Age squared | 0.005 | 0.020 | 0.005 | 0.020 |
| Race dummy (Non-White) | 0.020 | 0.026 | 0.018 | 0.026 |
| Education Level (Less than High School) | | | | |
| High school | 0.246*** | 0.052 | 0.242*** | 0.052 |
| More than high school | 0.266*** | 0.056 | 0.263*** | 0.056 |
| Health limitation of the individual (Yes) | -0.075 | 0.040 | -0.080* | 0.040 |
| Health status of the individual (Fair or Poor) | -0.108* | 0.045 | -0.105* | 0.045 |
| Number of child in the family | -0.021 | 0.011 | -0.021 | 0.011 |
| Whether the family has a child under 5 | -0.128*** | 0.027 | -0.126*** | 0.027 |
| Other income of the family (Logarithm) | -0.035* | 0.015 | -0.033* | 0.015 |
| Max AFDC Benefit Dummy | 0.031 | 0.027 | 0.034 | 0.027 |
| Unemployment Dummy | -0.024 | 0.029 | -0.023 | 0.029 |
| AFDC Percent Dummy | 0.031 | 0.026 | 0.031 | 0.026 |
| Age of the Husband | -0.003 | 0.003 | -0.003 | 0.003 |
| Education Years of Husband | 0.003 | 0.005 | 0.003 | 0.005 |
| Health Limitation of Husband (Yes) | 0.004 | 0.047 | 0.005 | 0.047 |
| Health Status of Husband (Fair or Poor) | -0.021 | 0.045 | -0.025 | 0.045 |
| Family Has Disable Child (YES) | 0.029 | 0.027 | | |
| Disability of the Child (No Disability) | | | | |

| | | |
|---|-------------|-------------|
| Disability Type (Impairment) | 0.005 | 0.032 |
| Disability Type (Activity / Participation Limitation) | 0.103* | 0.046 |
| Disability Type (Both /Severe) | 0.037 | 0.044 |
| N | 1302 | 1302 |

* p<0.05, ** p<0.01, *** p<0.001

Table 9: Regression Results, Weekly Hours, Single Mother

| | Model 1 | | Model 2 | |
|---|-------------|--------|-------------|--------|
| | Coefficient | SE | Coefficient | SE |
| Age of the individual | 0.066 | 0.775 | 0.147 | 0.775 |
| Age squared | 0.187 | 1.129 | 0.052 | 1.128 |
| Race dummy (Non-White) | -7.941*** | 1.977 | -7.791*** | 1.977 |
| Education Level (Less than High School) | | | | |
| High school | 10.703*** | 2.199 | 10.842*** | 2.199 |
| More than high school | 14.592*** | 2.353 | 14.637*** | 2.356 |
| Health limitation of the individual (Yes) | -11.893*** | 2.789 | -11.602*** | 2.790 |
| Health status of the individual (Fair or Poor) | -6.456* | 2.751 | -6.214* | 2.747 |
| Number of child in the family | -2.289** | 0.800 | -2.246** | 0.801 |
| Whether the family has a child under 5 | -4.657* | 1.902 | -5.098** | 1.916 |
| Other income of the family (Logarithm) | -1.395*** | 0.249 | -1.353*** | 0.250 |
| Max AFDC Benefit Dummy | 2.894 | 2.105 | 2.853 | 2.103 |
| Unemployment Dummy | -1.334 | 2.293 | -1.294 | 2.290 |
| AFDC Percent Dummy | 0.465 | 1.973 | 0.783 | 1.977 |
| Family Has Disable Child (YES) | -0.414 | 1.744 | | |
| Disability of the Child (No Disability) | | | | |
| Disability Type (Impairment) | | | 0.455 | 2.144 |
| Disability Type (Activity / Participation Limitation) | | | 3.021 | 3.806 |
| Disability Type (Both/Severe) | | | -4.136 | 2.931 |
| Constant | 36.578** | 13.350 | 34.970** | 13.360 |
| Sigma | 18.756*** | 0.66 | 18.746*** | 0.66 |
| N | 595 | | 595 | |

* p<0.05, ** p<0.01, *** p<0.001

Table 10 : Marginal Effect, Expected Working Hours, Single Mother

| | Marginal Effect Model 1 | | | Marginal Effect Model 2 | | |
|---|----------------------------|-----------|-------|----------------------------|-----------|-------|
| | dy/dx | Std. Err. | z | dy/dx | Std. Err. | z |
| Age of the individual | 0.05 | 0.57 | 0.09 | 0.11 | 0.57 | 0.19 |
| Age squared | 0.14 | 0.82 | 0.17 | 0.04 | 0.83 | 0.05 |
| Race dummy (Non-White) | -5.80 | 1.44 | -4.03 | -5.70 | 1.44 | -3.95 |
| Education Level (Less than High School) | | | | | | |
| High school | 7.21 | 1.42 | 5.08 | 7.31 | 1.42 | 5.15 |
| More than high school | 10.22 | 1.59 | 6.41 | 10.25 | 1.59 | 6.43 |
| Health limitation of the individual (Yes) | -8.69 | 2.03 | -4.28 | -8.48 | 2.04 | -4.17 |
| Health status of the individual (Fair or Poor) | -4.72 | 2.01 | -2.35 | -4.54 | 2.01 | -2.26 |
| Number of child in the family | -1.67 | 0.58 | -2.87 | -1.64 | 0.58 | -2.81 |
| Whether the family has a child under 5 | -3.40 | 1.39 | -2.45 | -3.73 | 1.40 | -2.66 |
| Other income of the family (Logarithm) | -1.02 | 0.18 | -5.64 | -0.99 | 0.18 | -5.46 |
| Max AFDC Benefit Dummy | 2.11 | 1.54 | 1.38 | 2.09 | 1.54 | 1.36 |
| Unemployment Dummy | -0.97 | 1.68 | -0.58 | -0.95 | 1.67 | -0.57 |
| AFDC Percent Dummy | 0.34 | 1.44 | 0.24 | 0.57 | 1.45 | 0.40 |
| Family Has Disable Child (YES) | -0.30 | 1.27 | -0.24 | | | |
| Disability of the Child (No Disability) | | | | | | |
| Disability Type (Impairment) | | | | 0.34 | 1.58 | 0.21 |
| Disability Type (Activity / Participation Limitation) | | | | 2.27 | 2.93 | 0.78 |
| Disability Type (Both/Severe) | | | | -2.92 | 2.01 | -1.46 |

Table 11 : Regression Results, Weekly Hours, Married Mother

| | Model 1 | | Model 2 | |
|--|-------------|-------|-------------|-------|
| | Coefficient | SE | Coefficient | SE |
| Age of the individual | 0.800 | 0.794 | 0.757 | 0.794 |
| Age squared | -1.061 | 1.126 | -0.995 | 1.125 |
| Race dummy (Non-White) | 3.223* | 1.395 | 3.077* | 1.396 |
| Education Level (Less than High School) | | | | |
| High school | 14.410*** | 2.406 | 14.202*** | 2.405 |
| More than high school | 14.903*** | 2.564 | 14.805*** | 2.561 |
| Health limitation of the individual (Yes) | -4.211 | 2.472 | -4.456 | 2.473 |
| Health status of the individual (Fair or Poor) | -7.142* | 2.892 | -6.906* | 2.890 |

| | | | | |
|---|-----------|-------------|-----------|-------------|
| Number of child in the family | -2.173*** | 0.656 | -2.147** | 0.656 |
| Whether the family has a child under 5 | -6.802*** | 1.472 | -6.737*** | 1.470 |
| Other income of the family (Logarithm) | -1.302* | 0.550 | -1.236* | 0.551 |
| Max AFDC Benefit Dummy | 2.617 | 1.462 | 2.747 | 1.463 |
| Unemployment Dummy | -2.344 | 1.609 | -2.315 | 1.607 |
| AFDC Percent Dummy | 1.186 | 1.444 | 1.207 | 1.442 |
| Age of the Husband | -0.230 | 0.146 | -0.229 | 0.146 |
| Education Years of Husband | -0.179 | 0.302 | -0.180 | 0.301 |
| Health Limitation of Husband (Yes) | 2.582 | 2.742 | 2.506 | 2.739 |
| Health Status of Husband (Fair or Poor) | -3.212 | 2.589 | -3.370 | 2.588 |
| Family Has Disable Child (YES) | 2.012 | 1.432 | | |
| Disability of the Child (No Disability) | | | | |
| Disability Type (Impairment) | | | 0.711 | 1.737 |
| Disability Type (Activity / Participation Limitation) | | | 6.870* | 2.959 |
| Disability Type (Both/Severe) | | | 1.654 | 2.586 |
| Constant | 28.433* | 14.319 | 28.398* | 14.295 |
| Sigma | 21.308*** | 0.506 | 21.294*** | 0.505 |
| N | | 1302 | | 1302 |

* p<0.05, ** p<0.01, *** p<0.001

Table 12 : Marginal Effect, Expected Working Hours, Married Mother

| | Marginal Effect Model 1 | | | Marginal Effect Model 2 | | |
|--|----------------------------|-----------|-------|----------------------------|-----------|-------|
| | dy/dx | Std. Err. | z | dy/dx | Std. Err. | z |
| Age of the individual | 0.54 | 0.54 | 1.01 | 0.51 | 0.54 | 0.95 |
| Age squared | -0.72 | 0.76 | -0.94 | -0.68 | 0.76 | -0.88 |
| Race dummy (Non-White) | 2.19 | 0.95 | 2.31 | 2.09 | 0.95 | 2.20 |
| Education Level (Less than High School) | | | | | | |
| High school | 8.63 | 1.30 | 6.67 | 8.52 | 1.30 | 6.56 |
| More than high school | 8.98 | 1.39 | 6.47 | 8.94 | 1.39 | 6.43 |
| Health limitation of the individual (Yes) | -2.86 | 1.68 | -1.70 | -3.03 | 1.68 | -1.80 |
| Health status of the individual (Fair or Poor) | -4.85 | 1.96 | -2.47 | -4.69 | 1.96 | -2.39 |
| Number of child in the family | -1.48 | 0.45 | -3.31 | -1.46 | 0.45 | -3.27 |
| Whether the family has a child under 5 | -4.62 | 1.00 | -4.63 | -4.58 | 1.00 | -4.59 |
| Other income of the family (Logarithm) | -0.88 | 0.37 | -2.37 | -0.84 | 0.37 | -2.24 |
| Max AFDC Benefit Dummy | 1.78 | 0.99 | 1.79 | 1.87 | 0.99 | 1.88 |
| Unemployment Dummy | -1.59 | 1.09 | -1.46 | -1.57 | 1.09 | -1.44 |
| AFDC Percent Dummy | 0.81 | 0.98 | 0.82 | 0.82 | 0.98 | 0.84 |
| Age of the Husband | -0.16 | 0.10 | -1.58 | -0.16 | 0.10 | -1.57 |
| Education Years of Husband | -0.12 | 0.20 | -0.59 | -0.12 | 0.20 | -0.60 |
| Health Limitation of Husband (Yes) | 1.75 | 1.86 | 0.94 | 1.70 | 1.86 | 0.91 |
| Health Status of Husband (Fair or Poor) | -2.18 | 1.76 | -1.24 | -2.29 | 1.76 | -1.30 |
| Family Has Disable Child (YES) | 1.37 | 0.97 | 1.40 | | | |

| | | | |
|---|------|------|------|
| Disability of the Child (No Disability) | | | |
| Disability Type (Impairment) | 0.48 | 1.18 | 0.41 |
| Disability Type (Activity / Participation Limitation) | 4.93 | 2.23 | 2.21 |
| Disability Type (Both/Sever) | 1.13 | 1.79 | 0.63 |

Table 13 : Regression Results, Weekly Hours, Married Mother (Over 12 Years Schooling)

| | Model 1 | | Model 2 | |
|---|-------------|--------|-------------|--------|
| | Coefficient | SE | Coefficient | SE |
| Age of the individual | -0.820 | 1.263 | -0.871 | 1.264 |
| Age squared | 1.480 | 1.737 | 1.572 | 1.738 |
| Race dummy (Non-White) | 4.440* | 1.913 | 4.332* | 1.915 |
| Years of education completed | 0.646 | 0.683 | 0.642 | 0.683 |
| Health limitation of the individual (Yes) | -2.864 | 3.728 | -3.185 | 3.735 |
| Health status of the individual (Fair or Poor) | -0.490 | 4.753 | -0.110 | 4.776 |
| Number of child in the family | -2.097* | 0.888 | -2.027* | 0.899 |
| Whether the family has a child under 5 | -4.316* | 2.026 | -4.209* | 2.026 |
| Other income of the family (Logarithm) | -1.500* | 0.704 | -1.390 | 0.710 |
| Max AFDC Benefit Dummy | 2.400 | 1.968 | 2.445 | 1.970 |
| Unemployment Dummy | -0.824 | 2.137 | -0.815 | 2.135 |
| AFDC Percent Dummy | 0.427 | 1.931 | 0.425 | 1.929 |
| Age of the Husband | -0.159 | 0.218 | -0.172 | 0.218 |
| Education Years of Husband | -1.726*** | 0.460 | -1.723*** | 0.460 |
| Health Status of Husband (Fair or Poor) | 4.736 | 4.033 | 4.468 | 4.035 |
| Health Limitation of Husband (Yes) | -5.035 | 3.594 | -4.886 | 3.608 |
| Family Has Disable Child (YES) | -2.054 | 1.956 | | |
| Disability of the Child (No Disability) | | | | |
| Disability Type (Impairment) | | | -3.184 | 2.292 |
| Disability Type (Activity / Participation Limitation) | | | 2.783 | 4.610 |
| Disability Type (Both/Severe) | | | -1.653 | 3.798 |
| Constant | 78.257*** | 23.326 | 78.040*** | 23.301 |
| sigma | 20.418*** | 0.656 | 20.406*** | 0.656 |
| N | 668 | | 668 | |

* p<0.05, ** p<0.01, *** p<0.001

Table 14 : Marginal Effect, Expected Working Hours, Married Mother (Over 12 Years of Schooling)

| | Marginal Effect Model 1 | | | Marginal Effect Model 2 | | |
|---|----------------------------|-----------|-------|----------------------------|-----------|-------|
| | dy/dx | Std. Err. | z | dy/dx | Std. Err. | z |
| Age of the individual | -0.58 | 0.90 | -0.65 | -0.62 | 0.90 | -0.69 |
| Age squared | 1.05 | 1.23 | 0.85 | 1.12 | 1.23 | 0.90 |
| Race dummy (Non-White) | 3.15 | 1.36 | 2.32 | 3.07 | 1.36 | 2.26 |
| Years of education completed | 0.46 | 0.48 | 0.95 | 0.46 | 0.48 | 0.94 |
| Health limitation of the individual (Yes) | -2.03 | 2.64 | -0.77 | -2.26 | 2.65 | -0.85 |
| Health status of the individual (Fair or Poor) | -0.35 | 3.37 | -0.10 | -0.08 | 3.39 | -0.02 |
| Number of child in the family | -1.49 | 0.63 | -2.36 | -1.44 | 0.64 | -2.26 |
| Whether the family has a child under 5 | -3.06 | 1.44 | -2.13 | -2.99 | 1.44 | -2.08 |
| Other income of the family (Logarithm) | -1.06 | 0.50 | -2.13 | -0.99 | 0.50 | -1.96 |
| Max AFDC Benefit Dummy | 1.70 | 1.40 | 1.22 | 1.74 | 1.40 | 1.24 |
| Unemployment Dummy | -0.58 | 1.52 | -0.39 | -0.58 | 1.52 | -0.38 |
| AFDC Percent Dummy | 0.30 | 1.37 | 0.22 | 0.30 | 1.37 | 0.22 |
| Age of the Husband | -0.11 | 0.15 | -0.73 | -0.12 | 0.15 | -0.79 |
| Education Years of Husband | -1.22 | 0.33 | -3.75 | -1.22 | 0.33 | -3.75 |
| Health Status of Husband (Fair or Poor) | 3.36 | 2.86 | 1.17 | 3.17 | 2.86 | 1.11 |
| Health Limitation of Husband (Yes) | -3.57 | 2.55 | -1.40 | -3.47 | 2.56 | -1.35 |
| Family Has Disable Child (YES) | -1.46 | 1.39 | -1.05 | | | |
| Disability of the Child (No Disability) | | | | | | |
| Disability Type (Impairment) | | | | -2.21 | 1.56 | -1.42 |
| Disability Type (Activity / Participation Limitation) | | | | 2.05 | 3.47 | 0.59 |
| Disability Type (Both/Severe) | | | | -1.17 | 2.64 | -0.44 |

Table 15: Regression Results, Weekly Hours, Married Mother (Under or Equal to 12 Years Schooling)

| | Model 1 | | Model 2 | |
|---|-------------|-------|-------------|-------|
| | Coefficient | SE | Coefficient | SE |
| Age of the individual | 1.816 | 1.140 | 1.735 | 1.137 |
| Age squared | -2.416 | 1.675 | -2.302 | 1.670 |
| Race dummy (Non-White) | 2.406 | 2.139 | 2.142 | 2.147 |
| years of education completed | 2.202** | 0.670 | 2.154** | 0.668 |
| Health limitation of the individual (Yes) | -5.432 | 3.373 | -5.388 | 3.380 |

| | | | | |
|---|-----------|------------|-----------|------------|
| Health status of the individual (Fair or Poor) | -9.853* | 3.844 | -9.519* | 3.849 |
| Number of child in the family | -1.937 | 1.000 | -1.945 | 0.999 |
| Whether the family has a child under 5 | -7.381*** | 2.230 | -7.356** | 2.225 |
| Other income of the family (Logarithm) | -0.793 | 0.868 | -0.785 | 0.867 |
| Max AFDC Benefit Dummy | 2.222 | 2.227 | 2.303 | 2.232 |
| Unemployment Dummy | -2.381 | 2.469 | -2.361 | 2.466 |
| AFDC Percent Dummy | 1.636 | 2.213 | 1.719 | 2.211 |
| Age of the Husband | -0.331 | 0.220 | -0.309 | 0.220 |
| Education Years of Husband | 1.087* | 0.485 | 1.096* | 0.484 |
| Health Status of Husband (Fair or Poor) | 1.133 | 3.872 | 1.054 | 3.871 |
| Health Limitation of Husband (Yes) | -0.463 | 3.773 | -0.833 | 3.786 |
| Family Has Disable Child (YES) | 5.834** | 2.168 | | |
| Disability of the Child (No Disability) | | | | |
| Disability Type (Impairment) | | | 5.628* | 2.721 |
| Disability Type (Activity / Participation Limitation) | | | 9.522* | 4.047 |
| Disability Type (Both/Severe) | | | 3.241 | 3.684 |
| Constant | -20.666 | 21.036 | -19.685 | 20.962 |
| sigma | 21.786*** | 0.786 | 21.785*** | 0.786 |
| N | | 602 | | 602 |

* p<0.05, ** p<0.01, *** p<0.001

Table 16 : Marginal Effect, Expected Working Hours, Married Mother (under or equal to 12 Years of Schooling)

| | Delta-method | | | Delta-method | | |
|--|--------------|-----------|-------|--------------|-----------|-------|
| | dy/dx | Std. Err. | z | dy/dx | Std. Err. | z |
| Age of the individual | 1.18 | 0.74 | 1.59 | 1.13 | 0.74 | 1.53 |
| Age squared | -1.58 | 1.09 | -1.44 | -1.50 | 1.09 | -1.38 |
| Race dummy (Non-White) | 1.57 | 1.39 | 1.12 | 1.40 | 1.40 | 1.00 |
| years of education completed | 1.44 | 0.44 | 3.29 | 1.41 | 0.44 | 3.22 |
| Health limitation of the individual (Yes) | -3.54 | 2.20 | -1.61 | -3.52 | 2.21 | -1.59 |
| Health status of the individual (Fair or Poor) | -6.43 | 2.51 | -2.56 | -6.21 | 2.51 | -2.47 |
| Number of child in the family | -1.26 | 0.65 | -1.93 | -1.27 | 0.65 | -1.95 |
| Whether the family has a child under 5 | -4.81 | 1.45 | -3.32 | -4.80 | 1.45 | -3.31 |
| Other income of the family (Logarithm) | -0.52 | 0.57 | -0.91 | -0.51 | 0.57 | -0.91 |
| Max AFDC Benefit Dummy | 1.45 | 1.45 | 1.00 | 1.50 | 1.46 | 1.03 |
| Unemployment Dummy | -1.55 | 1.61 | -0.96 | -1.54 | 1.61 | -0.96 |
| AFDC Percent Dummy | 1.07 | 1.44 | 0.74 | 1.12 | 1.44 | 0.78 |
| Age of the Husband | -0.22 | 0.14 | -1.51 | -0.20 | 0.14 | -1.40 |
| Education Years of Husband | 0.71 | 0.32 | 2.24 | 0.72 | 0.32 | 2.26 |
| Health Status of Husband (Fair or Poor) | 0.74 | 2.53 | 0.29 | 0.69 | 2.53 | 0.27 |
| Health Limitation of Husband (Yes) | -0.30 | 2.46 | -0.12 | -0.54 | 2.47 | -0.22 |
| Family Has Disable Child (YES) | 3.80 | 1.41 | 2.69 | | | |
| Disability of the Child (No Disability) | | | | | | |

| | | | |
|---|------|------|------|
| Disability Type (Impairment) | 3.76 | 1.88 | 2.00 |
| Disability Type (Activity / Participation Limitation) | 6.59 | 3.00 | 2.20 |
| Disability Type (Both/Severe) | 2.12 | 2.47 | 0.86 |

Table 17: Average Time with Mother by Child Characteristics

| | Mean | SE | N |
|--|-------|-------|------|
| Child Age Categories | | | |
| Between 1 Years to 2 Years | 4.64 | 0.112 | 597 |
| Between 3 Years to 6 Years | 3.105 | 0.081 | 808 |
| Between 7 Years to 10 Years | 2.104 | 0.069 | 804 |
| Between 11 Years to 12 Years | 1.759 | 0.097 | 413 |
| Gender | | | |
| Girl | 3.065 | 0.074 | 1274 |
| Boy | 2.813 | 0.064 | 1348 |
| Impairment | | | |
| No | 3.015 | 0.053 | 2181 |
| Yes | 2.541 | 0.117 | 441 |
| Activity Limitation or participation Restriction | | | |
| No | 2.971 | 0.05 | 2423 |
| Yes | 2.496 | 0.199 | 199 |
| Disability | | | |
| No | 3.021 | 0.054 | 2103 |
| Yes | 2.587 | 0.11 | 519 |
| Severe Behavioral Problem | | | |
| No | 2.464 | 0.056 | 1488 |
| Yes | 2.311 | 0.103 | 480 |

Table 18: Average Time with Mother by Family Characteristics

| | Mean | SD | N |
|---------------------|-------|-------|------|
| Mother's Employment | | | |
| No | 3.576 | 0.109 | 619 |
| Yes | 2.779 | 0.054 | 1938 |
| Father's Employment | | | |
| No | 2.191 | 0.26 | 71 |
| Yes | 2.998 | 0.056 | 1899 |

| | | | |
|------------------------------|-------|-------|------|
| Mother's Education | | | |
| Less than High School Degree | 3.006 | 0.145 | 342 |
| High School Degree | 2.956 | 0.084 | 954 |
| Above High School Degree | 2.902 | 0.065 | 1326 |
| Father's Education | | | |
| Less than High School Degree | 2.785 | 0.155 | 259 |
| High School Degree | 2.863 | 0.091 | 720 |
| Above High School Degree | 2.99 | 0.062 | 1643 |
| Number of Children In Family | | | |
| One Child | 3.799 | 0.119 | 556 |
| Two Children | 2.875 | 0.067 | 1194 |
| More than Two Children | 2.467 | 0.081 | 872 |
| Marital Status of Mother | | | |
| Single Mother | 2.841 | 0.105 | 666 |
| Married Mother | 3.018 | 0.055 | 1891 |

Table 19: Average Time with Mother by Mother's Employment and Child's Health

| | Mother Employed | | | t-Statistic |
|---|-----------------|------|------------|-------------|
| | No | Yes | Difference | |
| Impairment (NO) | 3.65 | 2.86 | 0.79 | 6.4 |
| Impairment (YES) | 3.19 | 2.39 | 0.8 | 2.88 |
| Activity Limitation / Participation Restriction (NO) | 3.64 | 2.81 | 0.83 | 7.17 |
| Activity Limitation / Participation Restriction (YES) | 2.67 | 2.46 | 0.21 | 0.42 |
| Disability (NO) | 3.67 | 2.86 | 0.81 | 6.49 |
| Disability (YES) | 3.16 | 2.46 | 0.7 | 2.66 |
| Severe BPI (NO) | 2.93 | 2.38 | 0.54 | 3.99 |
| Severe BPI (YES) | 2.88 | 2.21 | 0.67 | 2.81 |

Table 20: Maternal Time Allocation by Children's Health

| | Disability | | | | Impairment | | | | Activity Limitation or Participation Restriction | | | |
|---|-------------|-------|------------|-------|-------------|-------|------------|-------|--|-------|------------|-------|
| | No | | Yes | | No | | Yes | | No | | Yes | |
| | Mean | SE | Mean | SE | Mean | SE | Mean | SE | Mean | SE | Mean | SE |
| Aggregate Time Allocation | 3.094 | 0.055 | 2.649 | 0.112 | 3.085 | 0.054 | 2.612 | 0.119 | 3.046 | 0.051 | 2.518 | 0.202 |
| Time Allocation By Activity Type | | | | | | | | | | | | |
| Household Chores | 0.371 | 0.018 | 0.290 | 0.032 | 0.363 | 0.018 | 0.312 | 0.036 | 0.364 | 0.017 | 0.235 | 0.051 |
| Personal Care | 1.128 | 0.024 | 0.908 | 0.049 | 1.118 | 0.024 | 0.915 | 0.056 | 1.104 | 0.022 | 0.838 | 0.101 |
| Educational Activities | 0.247 | 0.012 | 0.287 | 0.028 | 0.251 | 0.012 | 0.273 | 0.025 | 0.250 | 0.011 | 0.317 | 0.054 |
| Organizational Activities | 0.047 | 0.007 | 0.053 | 0.016 | 0.051 | 0.007 | 0.036 | 0.012 | 0.046 | 0.006 | 0.074 | 0.033 |
| Active Leisure | 0.652 | 0.028 | 0.471 | 0.047 | 0.648 | 0.028 | 0.456 | 0.046 | 0.635 | 0.025 | 0.381 | 0.085 |
| Passive Leisure | 0.643 | 0.022 | 0.639 | 0.043 | 0.647 | 0.022 | 0.619 | 0.045 | 0.639 | 0.020 | 0.673 | 0.074 |
| N | 1998 | | 504 | | 2075 | | 427 | | 2307 | | 195 | |

Table 21: Maternal Time Allocation by Children's Health (Employed Mother)

| | Disability | | | | Impairment | | | | Activity Limitation or Participation Restriction | | | |
|---|-------------|-------|------------|-------|-------------|-------|------------|-------|--|-------|------------|-------|
| | No | | Yes | | No | | Yes | | No | | Yes | |
| | Mean | SE | Mean | SE | Mean | SE | Mean | SE | Mean | SE | Mean | SE |
| Aggregate Time Allocation | 2.882 | 0.061 | 2.483 | 0.126 | 2.880 | 0.060 | 2.417 | 0.133 | 2.831 | 0.056 | 2.465 | 0.238 |
| Time Allocation By Activity Type | | | | | | | | | | | | |
| Household Chores | 0.342 | 0.020 | 0.271 | 0.036 | 0.336 | 0.019 | 0.289 | 0.041 | 0.336 | 0.018 | 0.238 | 0.061 |
| Personal Care | 1.070 | 0.028 | 0.893 | 0.060 | 1.064 | 0.028 | 0.889 | 0.070 | 1.049 | 0.026 | 0.867 | 0.125 |
| Educational Activities | 0.247 | 0.013 | 0.283 | 0.032 | 0.253 | 0.014 | 0.263 | 0.026 | 0.248 | 0.012 | 0.327 | 0.067 |
| Organizational Activities | 0.044 | 0.007 | 0.067 | 0.021 | 0.050 | 0.008 | 0.045 | 0.015 | 0.045 | 0.007 | 0.091 | 0.042 |
| Active Leisure | 0.572 | 0.029 | 0.374 | 0.049 | 0.565 | 0.029 | 0.367 | 0.049 | 0.552 | 0.026 | 0.303 | 0.085 |
| Passive Leisure | 0.601 | 0.024 | 0.593 | 0.047 | 0.606 | 0.024 | 0.563 | 0.048 | 0.595 | 0.022 | 0.640 | 0.079 |
| N | 1500 | | 382 | | 1561 | | 321 | | 1727 | | 155 | |

Table 22: Maternal Time Allocation by Children's Health (Unemployed Mother)

| | Disability | | | | Impairment | | | | Activity Limitation or Participation Restriction | | | |
|----------------------------------|------------|-------|------------|-------|------------|-------|-----------|-------|--|-------|-----------|-------|
| | No | | Yes | | No | | Yes | | No | | Yes | |
| | Mean | SE | Mean | SE | Mean | SE | Mean | SE | Mean | SE | Mean | SE |
| Aggregate Time Allocation | 3.712 | 0.122 | 3.227 | 0.255 | 3.690 | 0.120 | 3.267 | 0.270 | 3.683 | 0.114 | 2.715 | 0.365 |
| Time Allocation By Activity Type | | | | | | | | | | | | |
| Household Chores | 0.444 | 0.044 | 0.371 | 0.073 | 0.436 | 0.043 | 0.402 | 0.083 | 0.444 | 0.041 | 0.228 | 0.082 |
| Personal Care | 1.292 | 0.047 | 0.942 | 0.080 | 1.275 | 0.046 | 0.974 | 0.088 | 1.258 | 0.044 | 0.747 | 0.097 |
| Educational Activities | 0.242 | 0.025 | 0.314 | 0.063 | 0.243 | 0.025 | 0.318 | 0.072 | 0.253 | 0.025 | 0.288 | 0.058 |
| Organizational Activities | 0.056 | 0.016 | 0.011 | 0.007 | 0.055 | 0.016 | 0.011 | 0.008 | 0.050 | 0.014 | 0.009 | 0.006 |
| Active Leisure | 0.891 | 0.072 | 0.800 | 0.125 | 0.899 | 0.071 | 0.745 | 0.114 | 0.886 | 0.065 | 0.703 | 0.255 |
| Passive Leisure | 0.776 | 0.050 | 0.788 | 0.103 | 0.771 | 0.049 | 0.817 | 0.114 | 0.781 | 0.046 | 0.739 | 0.190 |
| N | 482 | | 114 | | 497 | | 99 | | 557 | | 39 | |

Table 23: Non-Maternal Time Allocation by Children's Health (Employed Mother)

| | Disability | | | | Impairment | | | | Activity Limitation or Participation Restriction | | | |
|---------------------------|-------------|-------|------------|-------|-------------|-------|------------|-------|--|-------|------------|-------|
| | No | | Yes | | No | | Yes | | No | | Yes | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Aggregate Time Allocation | 8.364 | 0.091 | 9.016 | 0.161 | 8.372 | 0.089 | 9.100 | 0.174 | 8.454 | 0.084 | 8.970 | 0.251 |
| Household Chores | 0.127 | 0.011 | 0.148 | 0.022 | 0.127 | 0.010 | 0.154 | 0.025 | 0.127 | 0.010 | 0.188 | 0.044 |
| Personal Care | 0.491 | 0.019 | 0.344 | 0.026 | 0.482 | 0.018 | 0.362 | 0.029 | 0.472 | 0.017 | 0.343 | 0.048 |
| Educational Activities | 4.859 | 0.099 | 5.640 | 0.181 | 4.885 | 0.096 | 5.663 | 0.198 | 4.944 | 0.091 | 5.835 | 0.273 |
| Organizational Activities | 0.039 | 0.007 | 0.035 | 0.013 | 0.040 | 0.007 | 0.029 | 0.013 | 0.038 | 0.006 | 0.047 | 0.023 |
| Active Leisure | 1.496 | 0.045 | 1.656 | 0.101 | 1.489 | 0.044 | 1.719 | 0.115 | 1.539 | 0.043 | 1.410 | 0.133 |
| Passive Leisure | 0.828 | 0.031 | 0.827 | 0.058 | 0.826 | 0.030 | 0.835 | 0.063 | 0.827 | 0.029 | 0.830 | 0.089 |
| N | 1500 | | 382 | | 1561 | | 321 | | 1727 | | 155 | |

Table 24: Non-Maternal Time Allocation by Children's Health (Unemployed Mother)

| | Disability | | | | Impairment | | | | Activity Limitation or Participation Restriction | | | |
|---------------------------|------------|-------|------------|-------|------------|-------|-----------|-------|--|-------|-----------|-------|
| | No | | Yes | | No | | Yes | | No | | Yes | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Aggregate Time Allocation | 6.926 | 0.172 | 7.817 | 0.319 | 6.996 | 0.169 | 7.604 | 0.346 | 6.965 | 0.159 | 8.974 | 0.388 |
| Household Chores | 0.136 | 0.022 | 0.180 | 0.056 | 0.135 | 0.021 | 0.195 | 0.064 | 0.136 | 0.020 | 0.269 | 0.122 |
| Personal Care | 0.358 | 0.022 | 0.355 | 0.039 | 0.354 | 0.021 | 0.374 | 0.043 | 0.361 | 0.020 | 0.300 | 0.067 |
| Educational Activities | 3.368 | 0.164 | 4.754 | 0.319 | 3.455 | 0.162 | 4.525 | 0.343 | 3.435 | 0.152 | 6.460 | 0.414 |
| Organizational Activities | 0.027 | 0.011 | 0.040 | 0.029 | 0.026 | 0.010 | 0.046 | 0.033 | 0.031 | 0.011 | | |
| Active Leisure | 1.952 | 0.087 | 1.423 | 0.135 | 1.936 | 0.085 | 1.420 | 0.150 | 1.913 | 0.079 | 0.962 | 0.151 |
| Passive Leisure | 1.003 | 0.058 | 1.065 | 0.120 | 1.009 | 0.057 | 1.044 | 0.127 | 1.017 | 0.054 | 0.982 | 0.214 |
| N | 482 | | 114 | | 497 | | 99 | | 557 | | 39 | |

