

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Social Science Research

journal homepage: [www.elsevier.com/locate/ssresearch](http://www.elsevier.com/locate/ssresearch)

# Children with disabilities and trajectories of parents' unsecured debt across the life course



Jason N. Houle <sup>a,\*</sup>, Lawrence Berger <sup>b</sup>

<sup>a</sup> Dartmouth College, USA

<sup>b</sup> University of Wisconsin-Madison, USA

## ARTICLE INFO

### Article history:

Received 11 December 2015

Received in revised form 31 August 2016

Accepted 28 October 2016

Available online 31 October 2016

## ABSTRACT

Prior research shows that having a child with a disability is economically burdensome for parents but we know little about whether this burden extends to unsecured debt. In this study, we examine the link between having a child with a disability that manifests between birth and age 4 and subsequent trajectories in unsecured household debt. We have three key findings. First, we find that having a child with an early-life disabling health condition is associated with a substantial increase in indebtedness in the years immediately following the child's birth, and that this association persists net of a range of potential confounders. Second, we find that parents do not quickly repay this debt, such that parents of a child with a disabling health condition have different trajectories of unsecured debt across the life course than do parents of children without a disabling health condition. Third, we find that the association between early-life child disability and debt is stronger for more severe conditions, such as those that require ongoing medical treatment. The results of this study are informative for understanding an important aspect of economic functioning—indebtedness—for parents of children with disabilities, as well as the causes and correlates of rising unsecured debt in the U.S.

© 2016 Elsevier Inc. All rights reserved.

## 1. Introduction

Rising levels of consumer debt in the United States have generated scholarly and public concern about the link between rising debt and population health. To date, much of this discussion has focused on debt as a stigmatizing financial stressor that undermines physical and mental health (Drentea, 2000; Drentea and Lavrakas, 2000; Drentea and Reynolds, 2015; Dwyer et al., 2011; Keese and Schmitz, 2011). But while there is a long tradition of research on the recursive relationship between social status and health across the life course (Adler and Ostrove, 1999; Haas, 2006; Palloni, 2006), scant research on the association between debt and health has considered whether debilitating health problems increase indebtedness. In this paper, we ask how having a child with an early-life disability that manifests by age 4 is associated with trajectories of parents' unsecured debt (i.e., debt that is not linked to an asset or investment in human capital) across the parents' life course.

In the United States, it is difficult for individuals and families to financially cope with debilitating health problems (Hacker, 2008; Sullivan, 2008). This is particularly true for families who have a child with a disability, where costs include not only medical treatment, but also child care and other services. Thus, not surprisingly, a long line of research shows that having a

\* Corresponding author. 6104 Silsby Hall, Room 111, Dept of Sociology, Dartmouth College, Hanover, NH 03755, USA.

E-mail address: [jason.houle@dartmouth.edu](mailto:jason.houle@dartmouth.edu) (J.N. Houle).

child with disabling or debilitating health conditions is associated with declines in family socioeconomic status (income, employment), and that this disadvantage accumulates across the life course (see Hogan, 2012). More recently, scholars have argued that debt is an important and distinct marker of family socioeconomic status (Drentea, 2000), and yet little is known about the link between child disability and debt. In a context of rising access to credit, it seems plausible that many families likely have little choice but to take on debt—either directly through credit card debt, or indirectly due to medical bills, which may pile up and accrue high interest rates (Hacker, 2008; Sullivan et al., 2000). However, no research to our knowledge has examined how having a child with a disability influences levels and trajectories of unsecured debt across the parental life course. As rising unsecured debt has increasingly come to substitute for shrinking public benefits (Sullivan et al., 1999, Sullivan et al., 2000), addressing this question is critical to understanding the dynamics of inequality and health in the United States.

In this paper, we draw from insights from the Life Course Perspective (Elder, 1985; Elder et al., 2004), and ask how having a child with an early-life disabling condition is associated with trajectories of unsecured debt across the life course. Our focus on trajectories of debt—rather than debt at a single point in time—allows us to interrogate key theoretical assumptions of competing perspectives on the role of debt in the United States. On the one hand, access to credit—and debt—can provide parents with an economic lifeline from which to draw in the event of an unexpected health shock such as having a child with a disability. If this debt is then easily repaid, it can be a valuable resource for those whose finances are otherwise strained. On the other hand, having a child with a disability may perpetually increase the need for credit and lead to higher debt burdens across the life course—both because high interest rates and fees on unsecured debt make it difficult to pay down the balance, particularly for those who can only afford the minimum monthly payment, and because having a child with a disability creates long-term, rather than short-term expenses. This is particularly worrisome because high indebtedness that continues into older ages diminishes the accumulation of assets, and can delay retirement (Mann, 2011). To address these questions, we use nationally representative, longitudinal data from the National Longitudinal Study of Youth 1979-cohort (NLSY-79) and the Children of the NLSY-79 (CNLSY-79), and hierarchical linear models (HLM) to examine the effects of both the presence and severity of early-life childhood disability on trajectories of parents' unsecured debt across over the course of the child's childhood.

## 2. Background

The Life Course Perspective stresses the importance of examining lives as they unfold in historical time and social context, and provides a useful framework for understanding the economic consequences of having a child with disability. Over the past several decades, legislation such as the Americans with Disabilities Act (ADA) and the Individuals with Disabilities Education Act (IDEA) has sought to improve the lives of children with disabilities. However, families of children with a disability continue to struggle with the economic burden of care (Hogan, 2012) in a social context where medical costs are high, and the social safety net has gradually contracted. For example, average out-of-pocket medical expenses have increased steadily over the past several decades (Paez et al., 2009), and the parents of children with disabilities pay thousands more per year in health care expenditures than parents whose children do not have disability (Newacheck et al., 2004). Moreover, changes in the social safety net have also created economic challenges for families with disabled children. Historically, social safety net programs such as SSI have buffered the economic impact of children's disabilities (Lukemeyer et al., 2000). However, the Personal Responsibility and Work Opportunity Act of 1996 (PRWORA) set stringent work requirements to attain some welfare benefits, and reduced the number of disabled children eligible for SSI and Medicaid, thereby exacerbating the economic consequences of having a child with a disability (Lukemeyer et al., 2000).

In this context, prior research shows that parents who care for children with disabilities face a double economic disadvantage. First, parents struggle with the high costs of medical care, treatment and rehabilitation for their children, and often have difficulty accessing quality medical care (Rogers and Hogan, 2003). Some estimates show that parents of children with disabilities spend upwards of \$5000 per year in out of pocket medical expenses (see Stabile and Allin, 2012 for review). Second, having a child with a disability is also associated with missed work, lowered employment and lost wages (Brandon and Hogan, 2004; Hogan, 2012; Stabile and Allin, 2012), due primarily to time constraints and caregiving needs. This is especially true for mothers, who bear a greater share of caregiving responsibility than fathers (Hogan, 2012). Whereas estimates vary, some studies suggest that having a child with a disability reduces mothers' odds of employment by 15 percentage points and, among the employed, reduces work hours by fifteen hours per month (Stabile and Allin, 2012). Having a child with disability is also associated with an increased risk of housing instability and homelessness (Curtis et al., 2010, Curtis et al., 2013). Parents of children with disabilities are therefore often caught in a vicious economic cycle of high costs and lost income: they are faced with expensive rehabilitation, treatment, and care services, and also often have to forgo income in order to provide care. For example, mothers of disabled children are both more likely to fall into poverty and less able to leave poverty and exit welfare than mothers of children without a disability (Brandon and Hogan, 2004).

### 2.1. Debt and child disability

Although previous research demonstrates the socioeconomic consequences of children's disabilities for parents, no research has examined whether and how children's disabilities may influence parental debt accrual. This is particularly important given that unsecured debt, or debt that is not tied to assets—such as, credit card debt, debt owed to financial

institutions banks, payday lending, and medical debt—has risen dramatically over the past several decades (Campbell and Hercowitz, 2009, 2010; Maki, 2002).

The rise in unsecured debt has been linked to structural and institutional changes, such as the massive deregulation of the financial sector over the past thirty years. Deregulation has increased the supply of credit available to consumers by giving banks more power to control interest rates, aggressively market loans to households that previously did not have access to credit, and create new credit instruments (Campbell, 2010; Campbell and Hercowitz, 2009). These changes transformed the credit industry from being largely based on low interest non-revolving credit, to being based on non-collateralized revolving credit, where consumers are charged high interest rates for carrying their balances forward (Campbell, 2010; Hyman, 2011). The rise of unsecured debt is often framed as part of a neoliberal sea change whereby financial and economic risks have shifted away from institutions and onto the shoulders of individuals and families (Hacker, 2008). Moreover, as social services and benefits have been cut back in recent decades, families have turned to credit to make ends meet and supplement stagnating incomes (Campbell, 2010; Leicht and Fitzgerald, 2007; Mishel et al., 2007). These changes have simultaneously increased the profitability of credit for banks and financial institutions while making debt much harder to repay for the average American family; as such the proportion of families with unsecured debt and average debt burdens have increased substantially over the past few decades (DeBelle, 2004; Pearce, 1985). For this reason, we hypothesize that parents who are struggling financially with a child that has a disabling health condition may turn to debt meet their child's needs.

The severity of a child's disability may also be an important factor for debt accumulation. Children with more severe disabilities—such as physical and sensory limitations—require more expensive and greater quantities of medical treatment and more intensive caregiving than children with less severe disabilities (Stabile and Allin, 2012). Greater disability severity is also associated with a greater need for caregiving in the home, which leads many parents (particularly mothers) to forgo full-time employment. As a result, the economic consequences of child disability described above tend to be larger, and more dire, for families who have children with more severe disabilities (see Anderson et al., 2007 for review). We expect that the increased financial strain that results from having a child with a severe disability will, in turn, be associated with greater debt accrual. Moreover, if the effect of child disability on debt is causal—and not due to unobserved differences between families—we would expect to see a dose response relation, such that more severe disabilities are associated with greater debt. As such, examining the severity of children's disabilities also provides a sort of falsification test for the effect of disability on debt.

## 2.2. Disability and debt: competing perspectives

Rising access to credit raises important questions about the economic vulnerability of families with disabled children. On the one hand, access to credit (the ability to take on debt) might provide a valuable resource for families of children with disabilities that are strapped for cash or have inadequate resources to cover their children's needs. On the other hand, families that borrow to help make ends meet may struggle to keep up with payments in a way that leads them to carry high debt burdens across their life course.

Access to credit is commonly thought to provide liquidity to households in times of need. Research in economics has long focused on “health shocks”—ostensibly random or otherwise unforeseen discrete health events that alter household consumption patterns. These scholars theorize that such shocks increase budget constraints as families divert resources to deal with them (Babiarz et al., 2013). Families are subsequently expected to eventually adjust their consumption to fit their new budget constraint (Smith, 1999). As such, access to credit provides a much needed source of liquidity in the event of a health shock, which can then be repaid once a family has adjusted its consumption patterns to its new conditions. Implicit in this perspective is that access to credit is a safety net—a valuable short-term resource for families in need that can be drawn from, then repaid (Sullivan, 2008). This perspective suggests that unsecured debt would increase following the birth of a child with a disability, but would subsequently be repaid such that household debt would return to earlier levels shortly thereafter.

In contrast, however, the Life Course Perspective suggests that debilitating and disabling health conditions cannot be viewed as discrete events or shocks that families can financially adjust to. Rather, they represent chronic strains that vary in severity and may have lasting impacts on the lives of parents and children alike. In the language of the Life Course Perspective, events—such as having a child with a disability—can alter life course trajectories and pathways, potentially inducing long-, rather than short-term effects (Elder et al., 2004). There is ample evidence that suggests that having a child with a disability may permanently alter life course pathways, and, thereby, have long-term impacts on debt accumulation. Having a child with an early-life disability may be particularly difficult given that, in contrast to many adulthood disabilities, which progress in a predictable fashion as people age, childhood disabilities are much more unpredictable and, often, sudden. Hogan (2012:10) describes the lives of families of children with disabilities as “constantly changing” and characterized by unpredictable conditions and trajectories that may either diminish or worsen over time. Moreover, the needs of children—and thus the expectations of parents—are constantly in flux with changes in developmental stage and related tasks. For example, children's capabilities and needs are likely to change as they age and enter new social settings, such as school. In such circumstances, it is often difficult for parents to plot a predictable and stable life course. These factors suggest that children's disabling conditions may not best be conceptualized as discrete health shocks, but rather as lifelong processes, such that the economic struggles associated with child disability are unlikely to be brief, but rather lasting. As such, parents may repeatedly borrow in order to juggle family finances as the child ages and requires different types of care and support. This, coupled with the fact that unsecured debt often carries high interest rates and is difficult to repay, suggests that debt levels may not return to pre-disability levels but, instead, will remain high as the child ages. In sum, the Life Course Perspective leads us to predict

that having a child with an early-life disability will be associated with increased unsecured debt shortly following the child's birth, and that this debt will remain high over time. These associations should be greater in magnitude and longer in duration when children have more severe disabilities.

### 3. The current study

A long literature points to adverse economic consequences of having a child with a disability, particularly in the form of lost wages and reduced employment. However, the rise of access to credit in the latter half of the 20th century raises important questions about the consequences of having a child with a disability for mothers' accumulation of debt, and whether this debt is a resource or a burden. Existing research that links children's disability to declines in socioeconomic status has yet to examine parental indebtedness despite that access to credit and debt have become essential to understanding socioeconomic inequality in the U.S. in the 21st century (Drentea, 2000; Drentea and Lavrakas, 2000; Leicht and Fitzgerald, 2007). Indeed, a small but growing literature suggests that debt is integral to understanding patterns of social stratification and mobility in the U.S., particularly given that debt has been transformed from a marker of privilege to a marker of need over the past several decades as it has become harder for the average American family to repay (Campbell, 2010; Houle, 2014; Leicht and Fitzgerald, 2007; Mishel et al., 2007). As such, we build on the literature on childhood disability and ask three key research questions:

1. Is having a young child with a disabling condition related to a subsequent increase in unsecured household debt?
2. Is there a dose-response relation between the severity of young children's disabilities and parental debt accumulation?
3. If childhood disability is associated with rising debt, is this increase temporary, such that debt can be paid back in a relatively short period of time and return to earlier levels? Or, is the increase chronic, such that the rise in debt persists across the life course?

### 4. Data and methods

#### 4.1. Data

Data for this study were drawn from two primary data sources: The National Longitudinal Study of Youth (1979 cohort (NLSY-79)), and the Children of the NLSY-79 (C-NLSY79), collected by the Bureau of Labor Statistics (BLS). The NLSY-79 is based on a nationally representative sample of 12,686 young men and women who were between the ages of 14 and 22 in 1979. Respondents were interviewed annually until 1994, and have been interviewed biannually ever since. In 1986, when a cohort of women in the sample was between the ages of 21 and 28, the BLS began following the biological children of those who were mothers, known as the C-NLSY79. The C-NLSY79 includes mother reports on children's characteristics and well-being, as well as child reports once they are old enough to respond to the survey. The C-NLSY79 has been conducted biannually since 1986, providing a wealth of longitudinal data on the wellbeing of 11,504 children born to NLSY-79 mothers.

From the full sample of 12,686 NLSY-79 respondents, 6283 of whom were women, we limited our analyses to the 4931 NLSY-79 women who participated in the C-NLSY. We observed mothers and their children annually from 1986 to 1994, and biennially from 1994 to 2008 for a potential maximum of 16 waves (representing a 22 year time span) per respondent. However, debt data were not collected in 1991, 2002, or 2006. We therefore excluded those years from our analysis. We restructured the data into a child-wave format, keeping only children who were born in 1985 or later so that we would have debt and early-life disability data on all analysis sample children. This resulted in a total of 57,526 child-wave observations of 6361 children born to 3551 mothers. We then further limited our analyses to children who were first observed prior to age 4, leaving 45,809 child-wave observations of 4186 children born to 2879 mothers, and dropped all waves in which a given child was not observed, resulting in a sample of 41,263 child-wave observations of 4178 children born to 2876 mothers. We arranged our data as a synthetic cohort such that the intercept is estimated at the first wave at which a child is observed between birth and age 4, and time is scaled in one-year child-age intervals.<sup>1</sup> To account for missing data, we use multiple imputation using the ICE command in Stata 14.0 (Royston, 2005). Multiple imputation is a more efficient and less biased strategy for missing data than listwise deletion (Lee and Carin, 2010). The procedure iteratively replaces missing values on all variables with predictions based on random draws from the posterior distributions of parameters observed in the sample, creating multiple complete datasets (Allison, 2001). We average results across 15 imputation samples and account for random

<sup>1</sup> Specifically, we examine differences in household debt at age 4 and per-year changes in household debt thereafter between children diagnosed with an early-life disability and other children. Notably, whereas the unit of analysis is the child, such that we are able to precisely examine the timing at which household debt should be affected by the presence of a child with an early life disability, debt is measured at the household, not child, level. Had we opted to make the mother (or household) the unit of analysis, we would not be able to estimate the initial difference (intercept) and subsequent trajectory (slope) in debt associated with early childhood disability as cleanly given that some mothers have multiple children at different times; doing so necessitates a synthetic cohort strategy.

variation across samples to calculate standard errors (Royston, 2005). The multiply-imputed results presented here are similar to results using listwise deletion.

## 4.2. Measures

### 4.2.1. Unsecured debt

Unsecured debt is the sum total of all debts that are owed by respondents to banks, stores, hospitals, and other institutions and are not tied to an asset (like a home or car). From 1985 onward (with the exception of 1991, 2002, and 2006), respondents were asked a series of questions on their debts and assets, including the amount of unsecured debts owed to banks (i.e. credit cards), stores, hospitals, and other institutions. Beginning in 2004, respondents were asked separate questions about (1) the amount of credit card debt owed; and (2) debt owed to other institutions, such as banks, stores, and hospitals. For those years, these two items were summed to create a comparable measure of unsecured debt across survey waves. We applied a consistent 2 percent top code to each debt item across surveys, and adjusted for inflation using the Consumer Price Index Research Series (Bureau of Labor Statistics (2010); Stewart and Reed, 1999), such that we report debt in constant 2013 dollars. Because debt is highly right-skewed, has a large number of zero values, and violates the homoscedasticity assumption of regression models, we use an inverse hyperbolic sine (IHS) transformation of debt in all models (Friedline et al., 2015).<sup>2</sup> The IHS transformation has previously been used for analyses of unsecured debt, allows for inclusion of zero values, and coefficients can be easily interpreted in real dollar values (Shaefer et al., 2013).

### 4.2.2. Early-life child disability

In this paper, we define disability as a debilitating health condition that limits a child's ability to participate in social roles and activities. At each survey wave, the NLSY asks mothers if their child has a health condition that limits school attendance/work, limits play activities, or requires a doctor, use of medicine, or special equipment. We used this information from survey waves in which the child was less than four years old to construct measures of disability that manifested in the early years of life (prior to age 4). We focused on early-life disabilities because conditions that manifest at a young age tend to have greater consequences for development than those that manifest later (Hogan et al., 1997; Stabile and Allin, 2012), and also tend to be more severe. In addition, disabilities that occur very early in life are less endogenous to debt than disabilities that occur later in a child's life. Indeed, many who have written on early life children's disability note that for many families it is an exogenous (and perhaps random) shock, whereas a disability diagnosis later in childhood may be less random (Curtis et al., 2010, Curtis et al., 2013). Thus our findings for early-life disability may be less biased than would be the case were we to focus on disabilities that occur later in childhood.

We constructed several measures of early-life disability. First, we constructed a simple indicator (1 = yes) that a child had a disabling condition by age 4. Second, we constructed a measure of whether the child had a disability that required medical care (a doctor, medicine, or special equipment), which we define as a major disability. Third, we constructed a measure of whether the child had a disability that did not require medical care, which we define as a minor disability. In our modeling strategy, this variable was time invariant. However, in alternative model specifications we allowed disability to vary over time (to account for recovery), or limited our analyses to disabilities that were consistently reported across childhood, and the results were substantively similar.

### 4.2.3. Covariates

Because having a child with an early-life disability and household debt may be endogenously determined by a joint set of characteristics and circumstances, we adjusted for a host of potential confounding factors in our analyses. Specifically, in predicting the initial debt level (intercept in the HLM analyses described below), we used an extensive set of covariates, measured in the first wave at which the child was observed (between ages 0 and 4), including a lagged measure of the amount of unsecured household debt in 1985, the mother's race (black, other race, white [reference group]), nativity status, educational attainment (less than a high school degree, high school degree, some college, four-year college degree or more [reference group]), marital status (married [reference group], divorced/separated, widowed, never married), age at first birth, family income, current age, weeks unemployed in the prior year, spouse/partner's employment status (no spouse/partner [reference group], spouse/partner unemployed, spouse/partner part-time employed, spouse/partner full-time employed), number of children in the household, mother has a health condition that limits her ability to work, family owns its home, net worth (IHS transformed), family has health insurance, child sex, and child age. As a robustness check, we added controls for whether the family received Supplemental Security Income (SSI), AFDC, or food stamps at the first wave in which the child was observed. We did not include these variables in our primary model because they are likely to be endogenously determined with child disability. We used a more parsimonious set of exogenous controls when predicting unsecured debt trajectories (slope) as a function of early-life child disability. These included the mother's race/ethnicity, nativity, educational attainment, and age at first birth.

<sup>2</sup> Results are similar when using the natural logarithm of debt.



### 4.3. Analysis strategy

We used HLM (Raudenbush and Bryk, 1992) to estimate both levels of parents' unsecured debt (intercept) and changes over time in debt (slope) as a function of early-life childhood disability status and the covariates described above. These models provide allowed us to simultaneously estimate initial differences (intercepts) in household unsecured debt (at child age 4), as well as differences in trajectories in household unsecured debt over time that are associated early childhood disability. The models took the form:

$$Y_{ti} = P_{0i} + P_{1i}TIME_{ti} + E_{ti} \quad (1)$$

where the IHS transformed unsecured debt outcome ( $Y$ ) reported by parent  $i$  at interview  $t$  is estimated as a function of the initial level of debt at approximately child age 4 ( $P_{0i}$ ), a slope that varies as a linear function of time (child age, scale as a per-year change) and an individual error term ( $E_{ti}$ ). Equation (1) can be reduced to:

$$P_{0i} = B_{00} + B_{01}CHILDDISAB_{0i} + B_{02}FULLCOVS_{0i} + E_{0i} \quad (1a)$$

$$P_{1i} = B_{10} + B_{11}CHILDDISAB_{0i} + B_{13}TSCOVARS_{0i} + E_{1i} \quad (1b)$$

where IHS transformed debt ( $P_{0i}$ ) was predicted as a function of early-life child disability status ( $CHILDDISAB_{0i}$ ), the full set of covariates ( $FULLCOVS$ ) and a random error term ( $E_{0i}$ ). We allow the slope of debt ( $P_{1i}$ ) to vary as a function of early child disability status ( $CHILDDISAB_{0i}$ ) and select time stable characteristics ( $TSCOVARS$ , which includes race, nativity, education at baseline, and maternal age at first birth), and a random error term ( $E_{1i}$ ). This framework allowed us to examine how unsecured debt levels differ for families with children with early-life disabilities and those without, as well as how trajectories of unsecured debt vary over time as a function of child early-life disability. Because our data were arranged as a synthetic cohort, the intercept coefficients are interpreted as the amount of unsecured debt the family had in the wave the child was first observed (in 1986 or later, and when the child was less than four years old). The slope coefficients can be roughly interpreted as the percent change in unsecured debt in a given year that is associated with a child having an early-life disability (Friedline et al., 2015). In other words, the AGE variable was scaled such that the coefficient represents a per year rate of change in unsecured debt over time (slope). Finally, we adjusted our standard errors for intracluster correlation among siblings (within household) to account for the fact that some sample children are siblings.

## 5. Results

Descriptive statistics for the full sample and by child disability status are presented in Table 1. These figures are based on child-wave observations. On the whole, 13.1% of children were reported as having an early-life disability. Approximately 7.4% of children had a disability that required medical care, and 6.1% had a disability that did not require medical care. These estimates are consistent with national estimates of child disability in the U.S. (Hogan et al., 1997).

The average level of unsecured debt in the sample was \$4370 with a standard deviation of \$15,703. Importantly, parents with a disabled child were significantly more likely to have unsecured debt (44.7% vs. 42.4%), and on average reported \$315 more debt than parents without a disabled child (the difference was non-significant for mean differences in real dollars, but significant for the HIS transformed debt variable). Although a \$300 difference is substantively small in size, this bivariate mean difference may reflect a range of individual differences between mothers with and without children with an early-life disability.

Parents with and without a child with an early life disability differ on a host of background characteristics. Supporting a long line of research on socioeconomic status, race, and child disability, we find that disabled children tend to be less advantaged than their counterparts. On average, their families have lower incomes and net worth, and are less likely to own a home; their parents are also less likely to be full-time employed. These families are also more likely to be headed by a single parent and to receive SSI or other social welfare program benefits. They are disproportionately likely to be black and parents therein are disproportionately likely to have a health limitation of their own. These differences are particularly important given that higher socioeconomic status (SES) and more advantaged individuals and families tend to carry higher unsecured debt balances than their less advantaged counterparts, particularly during the observation period for our study (Bricker et al., 2012). Thus, these differences may suppress the association between having a child with an early-life disability and unsecured debt. We adjusted for these characteristics in our HLM analyses.

### 5.1. HLM results

Our first set of HLM results are presented in Table 2. We show results from 4 models. Model 1 included only the intercept and slope estimates, with no controls. We adjusted the intercept estimate for the extensive set of baseline characteristics (Model 2), adjusted the slope estimate for the more parsimonious set of baseline characteristics (Model 3), and further adjusted the intercept estimate for receipt of SSI and other welfare receipt in the initial observation period (Model 4). Again, we included SSI and welfare receipt separately as receipt of benefits may be a mechanism, rather than a confounder in the

**Table 1**  
Descriptive statistics.

|  | Full sample         | Child does not have early-life disability | Child has early-life disability | t-test |
|--|---------------------|---|---------------------------------|--------|
| <b>Child disability</b>                  |                     |   |                                 |        |
| Child has early-life disability          | 0.131               |   |                                 |        |
| Disability requires medical treatment    | 0.074               |   |                                 |        |
| Disability requires no med treatment     | 0.061               |   |                                 |        |
| <b>Unsecured debt</b>                    |                     |   |                                 |        |
| Any unsecured debt                       | 0.427               | 0.424                                     | 0.447                           | **     |
| Amount of unsecured debt (2013 \$s)      | 4369.5<br>(15703.2) | 4328.29<br>(15620.2)                      | 4643.69<br>(16243.2)            |        |
| Unsecured debt (IHS transformed)         | 3.50<br>(4.53)      | 3.45<br>(4.52)                            | 3.79<br>(4.59)                  | ***    |
| <b>Mother's characteristics</b>          |                     |   |                                 |        |
| <i>Mother's race/Ethnicity</i>           |                     |   |                                 |        |
| White                                    | 0.683               | 0.688                                     | 0.654                           | ***    |
| Black                                    | 0.249               | 0.244                                     | 0.282                           | ***    |
| Other race/Ethnicity                     | 0.068               | 0.069                                     | 0.065                           |        |
| Mother was U.S. Born (1 = yes)           | 0.920               | 0.917                                     | 0.936                           | ***    |
| <i>Mother's educational attainment</i>   |                     |   |                                 |        |
| Less than a HS degree                    | 0.177               | 0.182                                     | 0.143                           | ***    |
| HS degree                                | 0.445               | 0.443                                     | 0.458                           | *      |
| Some college                             | 0.227               | 0.225                                     | 0.243                           | **     |
| Four-year college degree or more         | 0.151               | 0.150                                     | 0.156                           |        |
| <i>Mother's marital status</i>           |                     |   |                                 |        |
| Divorced or separated                    | 0.217               | 0.215                                     | 0.229                           |        |
| Widowed                                  | 0.029               | 0.029                                     | 0.029                           |        |
| Never married                            | 0.126               | 0.122                                     | 0.155                           | ***    |
| Married                                  | 0.628               | 0.634                                     | 0.588                           | ***    |
| Mother has a health limitation (1 = yes) | 0.097               | 0.092                                     | 0.135                           | ***    |
| Mother's age at birth of first child     | 22.72<br>(4.11)     | 22.69<br>(4.13)                           | 22.96<br>(3.97)                 | ***    |
| Mother's age                             | 34.95<br>(6.49)     | 34.96<br>(6.51)                           | 34.97<br>(6.41)                 |        |
| Mother's weeks unemployed (past year)    | 2.848<br>(12.2)     | 2.79<br>(12.2)                            | 3.23<br>(12.5)                  | *      |
| <b>Household characteristics</b>         |                     |   |                                 |        |
| Number of children in the household      | 2.287<br>(1.21)     | 2.30<br>(1.21)                            | 2.21<br>(1.17)                  | ***    |
| Family owns home (1 = yes)               | 0.563               | 0.569                                     | 0.518                           | ***    |
| Net worth (2013 thousands of \$)         | 143.61<br>(374.1)   | 146.87<br>(378.1)                         | 121.94<br>(346.1)               | ***    |
| Family income (2013 thousands of \$)     | 66.51<br>(125.8)    | 67.27<br>(127.0)                          | 61.471<br>(116.8)               | ***    |
| Family has health insurance (1 = yes)    | 0.866               | 0.863                                     | 0.885                           | ***    |
| Unsecured debt in 1985 (2013 \$s)        | 2537.43<br>(9808.5) | 2531.33<br>(9769.4)                       | 2577.96<br>(10064.1)            |        |
| <i>Spouse/Partner employment</i>         |                     |   |                                 |        |
| No Sp/partner in household               | 0.296               | 0.288                                     | 0.344                           | ***    |
| Sp/partner not employed                  | 0.012               | 0.012                                     | 0.011                           |        |
| Sp/partner employed part-time            | 0.074               | 0.074                                     | 0.072                           |        |
| Sp/partner employed full-time            | 0.619               | 0.626                                     | 0.573                           | ***    |
| Family receives SSI (1 = yes)            | 0.052               | 0.048                                     | 0.085                           | ***    |
| Family receives other welfare (1 = yes)  | 0.165               | 0.159                                     | 0.209                           | ***    |
| <b>Child characteristics</b>             |                     |   |                                 |        |
| Child age (years)                        | 8.49<br>(5.93)      | 8.50<br>(5.94)                            | 8.42<br>(5.87)                  |        |
| Child sex (1 = Male; 0 = Female)         | 0.519               | 0.516                                     | 0.542                           | *      |
| Observations                             | 41,263              | 35,857                                    | 5406                            |        |

Note: 41,263 child-wave observations of 4178 children born to 2876 mothers. Means (and standard deviations) or proportions shown.  
\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

association between child disability and debt. Because the dependent variable (unsecured debt) is IHS transformed, it can—like a logged dependent variable—be interpreted in terms of percent difference in initial levels of unsecured debt (intercept estimates) and per-year percent change in unsecured debt (slope estimates) (Friedline et al., 2015). To interpret the disability coefficients in real dollars, we take the beta coefficient for children's disability and multiply it by the square root of the squared mean of unsecured debt in real dollars (shown in Table 1) plus one ( $\sqrt{y^2 + 1} * \beta_x$ ) (see Shaefer et al., 2013:673, footnote 11).

In Model 1 of Table 2, we find that parents who have a child with an early-life disability have approximately 34.6% more unsecured debt when the child is approximately 4-years old than parents who do not have a child with an early life disability.

**Table 2**  
Summary of HLM results for early-life child disability and unsecured debt.

|   | Model 1             | Model 2              | Model 3              | Model 4             |
|---|---------------------|----------------------|----------------------|---------------------|
| <i>Intercept estimates</i>                                      |                     |                      |                      |                     |
| Child has early-life disability                                 | 0.346*<br>(0.158)   | 0.336*<br>(0.149)    | 0.335*<br>(0.148)    | 0.359*<br>(0.146)   |
| <i>Mother's characteristics</i>                                 |                     |                      |                      |                     |
| <i>Mother's race (white = referent)</i>                         |                     |                      |                      |                     |
| Black   |                     | −0.233<br>(0.129)    | −0.517***<br>(0.155) | −0.463**<br>(0.150) |
| Other race/Ethnicity  |                     | −0.115<br>(0.191)    | −0.294<br>(0.229)    | −0.264<br>(0.228)   |
| Mother was US born (1 = yes)                                    |                     | 0.490**<br>(0.173)   | 0.539*<br>(0.232)    | 0.556*<br>(0.231)   |
| <i>Mother's education (college degree or more = referent)</i>   |                     |                      |                      |                     |
| Less than a HS degree   |                     | −0.737***<br>(0.210) | −0.814**<br>(0.258)  | −0.715**<br>(0.264) |
| HS degree   |                     | −0.020<br>(0.150)    | −0.069<br>(0.204)    | −0.039<br>(0.203)   |
| Some college  |                     | 0.336*<br>(0.153)    | 0.400<br>(0.210)     | 0.396<br>(0.209)    |
| <i>Mother's marital status (married = referent)</i>             |                     |                      |                      |                     |
| Divorced or separated   |                     | −0.557*<br>(0.251)   | −0.546*<br>(0.246)   | −0.519*<br>(0.250)  |
| Widowed   |                     | −0.928<br>(0.531)    | −0.922<br>(0.521)    | −0.932<br>(0.521)   |
| Never married   |                     | −0.953***<br>(0.263) | −0.892***<br>(0.267) | −0.830**<br>(0.273) |
| Mother has a health limitation (1 = yes)                        |                     | 0.743***<br>(0.160)  | 0.729***<br>(0.160)  | 0.760***<br>(0.165) |
| Mother's age at birth of first child                            |                     | −0.030<br>(0.016)    | −0.008<br>(0.020)    | −0.011<br>(0.020)   |
| Mother's age  |                     | −0.045**<br>(0.017)  | −0.048**<br>(0.017)  | −0.049**<br>(0.017) |
| Mother's weeks unemployed (past year)                           |                     | 0.011<br>(0.023)     | 0.011<br>(0.023)     | 0.011<br>(0.023)    |
| <i>Household characteristics</i>                                |                     |                      |                      |                     |
| Number of children in the household                             |                     | −0.022<br>(0.040)    | −0.002<br>(0.041)    | 0.014<br>(0.041)    |
| Family owns home (1 = yes)                                      |                     | 0.025<br>(0.169)     | 0.015<br>(0.167)     | −0.016<br>(0.164)   |
| Net worth (2010 dollars; IHS transformed)                       |                     | −0.042<br>(0.036)    | −0.043<br>(0.035)    | −0.043<br>(0.036)   |
| Family income (2010 \$s; IHS transformed)                       |                     | −0.071<br>(0.052)    | −0.072<br>(0.052)    | −0.071<br>(0.052)   |
| Family has health insurance (1 = yes)                           |                     | 0.007<br>(0.305)     | 0.013<br>(0.305)     | 0.035<br>(0.308)    |
| Unsecured debt in 1985 (LN; 2010 \$s)                           |                     | 0.180***<br>(0.012)  | 0.181***<br>(0.012)  | 0.180***<br>(0.012) |
| <i>Spouse/Partner employment (referent = no spouse/partner)</i> |                     |                      |                      |                     |
| Sp/partner not employed   |                     | −0.211<br>(0.259)    | −0.171<br>(0.258)    | −0.126<br>(0.259)   |
| Sp/partner employed part-time                                   |                     | 0.165<br>(0.172)     | 0.168<br>(0.172)     | 0.155<br>(0.172)    |
| Sp/partner employed full-time                                   |                     | 0.222<br>(0.155)     | 0.220<br>(0.154)     | 0.177<br>(0.155)    |
| SSI receipt   |                     |                      |                      | 0.083<br>(0.147)    |
| Other welfare receipt   |                     |                      |                      | −0.445**<br>(0.160) |
| <i>Child characteristics</i>                                    |                     |                      |                      |                     |
| Child age (years)   |                     | 0.069<br>(0.079)     | 0.065<br>(0.079)     | 0.061<br>(0.079)    |
| Child sex (1 = Male; 0 = Female)                                |                     | 0.075<br>(0.069)     | 0.076<br>(0.069)     | 0.079<br>(0.069)    |
| <i>Slope estimates</i>  |                     |                      |                      |                     |
| Child age   | −0.017**<br>(0.006) | −0.038<br>(0.077)    | 0.035<br>(0.089)     | 0.037<br>(0.090)    |
| Child has early-life disability                                 | −0.000<br>(0.013)   | −0.004<br>(0.013)    | −0.004<br>(0.013)    | −0.006<br>(0.013)   |
| Mother is black   |                     |                      | 0.040**<br>(0.012)   | 0.038**<br>(0.013)  |

(continued on next page)



Table 2 (continued)

|   | Model 1             | Model 2             | Model 3             | Model 4             |
|---|---------------------|---------------------|---------------------|---------------------|
| Mother is another race/ethnicity                      |                     |                     | 0.027<br>(0.020)    | 0.026<br>(0.020)    |
| Mother was US born                                    |                     |                     | -0.007<br>(0.021)   | -0.008<br>(0.021)   |
| Mother has less than a high school degree             |                     |                     | 0.009<br>(0.021)    | 0.004<br>(0.021)    |
| Mother has a high school degree                       |                     |                     | 0.007<br>(0.018)    | 0.005<br>(0.017)    |
| Mother has some college                               |                     |                     | -0.010<br>(0.018)   | -0.011<br>(0.018)   |
| Mother's age at birth of first child                  |                     |                     | -0.003*<br>(0.002)  | -0.003*<br>(0.002)  |
| Constant  | 3.548***<br>(0.066) | 5.600***<br>(0.692) | 5.172***<br>(0.750) | 5.266***<br>(0.741) |
| Covariates included                                   |                     |                     |                     |                     |
| Primary intercept controls                            | No                  | Yes                 | Yes                 | Yes                 |
| Slope controls  | No                  | No                  | Yes                 | Yes                 |
| SSI and other welfare Receipt controlled in intercept | No                  | No                  | No                  | Yes                 |

Note: 41,263 child-wave observations of 4178 children born to 2876 mothers. HLM intercept and slope coefficients (and standard errors) presented. Standard errors are adjusted for intraclass correlation among children of the same mother.

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

The coefficient is robust to the addition of the controls in models 2 through 4, suggesting that parents who have a child with a disability report considerably more debt than those who do not have a child with a disability. On the other hand, across all models, the early-life child disability slope coefficient is small in magnitude and not statistically significant. These results suggest that having a child with an early-life disability is associated with considerably more debt in the first four years of the child's life and that this debt gap does not significantly decline over time.

Put in real dollar figures, the estimates from model 4 suggest that parents with a child with an early-life disability take on \$1568 more unsecured debt within the first four years of the child's life. Moreover, because the slope estimate for child disability (time\*disability) is small and nonsignificant, this suggests that this difference persists for several decades, as a large negative slope coefficient would suggest that parents of disabled children are repaying debt quickly. For example, according to the model estimates, we predict that families with a child with a disability would still have \$1044 more unsecured debt when their child is twenty years old. This suggests that families are not taking on debt when they have a child with a disability and then quickly paying it off. Rather, their elevated debt levels remain high for quite some time.

In Table 3, we disaggregate disability into those that require medical care (major) and those that do not require care (minor). The pattern of results is consistent with that for all early-life disabilities, although the estimates are larger in magnitude for major disabilities, and the coefficient for minor disability is not statistically significant at standard levels. Results from Model 4 indicate that families with a child with an early-life disability have nearly 48% greater unsecured debt between the child's birth and age 4. The non-significant time\*disability interaction is substantively small in size and again shows that debt does not reduce faster for families who have a child with major or minor disability than their counterparts. Put into real dollars, families who have a child with a disability that requires medical treatment report \$2115 more unsecured debt than families without a child with a disability. As their child ages, we find little evidence that these parents pay down this debt to have comparable levels of debt as parents who do not have a child with a disability. Twenty years after they are first observed in our sample (when the child is 20 years old), parents of a child with a major disability still report \$1783 more unsecured debt. Effectively, families who have a child with an early life disability have elevated levels of debt for several decades that follow. Importantly, we also find that a child with a disability that does not require medical treatment is not associated with a significant increase in unsecured debt. This suggests that severity of disability, and the high expenses of medical treatment, are key mechanisms underlying the association between children's disability and debt.

## 5.2. Supplementary analyses

We conducted several additional analyses to check the robustness of our results and test different model specifications. Specifically, we tested whether the association between disability and debt varied by socioeconomic status (income, employment), family structure, and race, but found no consistent evidence that the association between debt and disability varied by these characteristics. In addition, we tested whether the association of interest changed after PRWORA of 1996, given that prior research suggests that the dismantling of the social safety net has contributed to the rise in debt and made it harder for families to pay their bills (Leicht and Fitzgerald, 2007). Again, we found no evidence for this, though we would note that given the small number of children with disability in our sample, and that many of the children in the sample are born before 1997, this study may lack the statistical power to detect such relationships. We also tested for nonlinearities in the slope term, but adding higher order polynomial terms did not improve model fit (and these terms were not significant). Finally, whereas we were primarily interested in early life disability, we also considered disability that occurred at any stage of

**Table 3**  
Summary of HLM results for early-life child disability requiring medical care and unsecured debt.

|  | Model 1             | Model 2             | Model 3             | Model 4             |
|--|---------------------|---------------------|---------------------|---------------------|
| <i>Intercept estimates</i>                             |                     |                     |                     |                     |
| Child has early-life disability requiring medical care | 0.579**<br>(0.196)  | 0.460*<br>(0.187)   | 0.459*<br>(0.186)   | 0.484**<br>(0.186)  |
| Child has Early-life disability (no care required)     | 0.086<br>(0.225)    | 0.165<br>(0.209)    | 0.161<br>(0.209)    | 0.177<br>(0.206)    |
| <i>Slope estimates</i>                                 |                     |                     |                     |                     |
| Child age  | −0.017**<br>(0.006) | −0.037<br>(0.077)   | 0.037<br>(0.089)    | 0.039<br>(0.090)    |
| Child has early-life disability requiring medical care | 0.001<br>(0.018)    | −0.003<br>(0.018)   | −0.002<br>(0.018)   | −0.004<br>(0.018)   |
| Child has early-life disability (no care required)     | 0.002<br>(0.019)    | −0.003<br>(0.018)   | −0.002<br>(0.018)   | −0.004<br>(0.018)   |
| Constant   | 3.544***<br>(0.067) | 5.614***<br>(0.691) | 5.185***<br>(0.750) | 5.279***<br>(0.741) |
| Covariates included                                    |                     |                     |                     |                     |
| Primary intercept controls                             | No                  | Yes                 | Yes                 | Yes                 |
| Slope controls   | No                  | No                  | Yes                 | Yes                 |
| SSI and other welfare receipt controlled in intercept  | No                  | No                  | No                  | Yes                 |

Note: 41,263 child-wave observations of 4178 children born to 2876 mothers. HLM intercept and slope coefficients (and standard errors) presented. Standard errors are adjusted for intracluster correlation among children of the same mother. Intercept and slope controls are identical to those shown in Table 2.

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

life, such as disabilities that occurred after the age of 4. Our results for disability at any age (whether included as a time-invariant or a time-varying predictor) were substantively identical to the results presented here. Moreover, results that considered only persistent disabilities—disabilities that emerged in early life but were reported in the majority of survey waves following the initial report—were similar to the results presented here, though the magnitude of the association was somewhat larger.

## 6. Discussion

A long literature suggests that parents who have a child with a disability are disproportionately likely to get trapped in a vicious cycle of economic disadvantage: they leave work or cut back on hours in order to care for their child, forgoing income and diminishing their wealth accumulation. The expenses associated with having a child with a disability also leads many families to devote a considerable share of their income toward care for their child (Hogan, 2012; Rogers and Hogan, 2003; Stabile and Allin, 2012). Moreover, in an era of rising access to credit, parents with a disabled child may also take on debt to help bridge the gap between a flagging social safety net and the high costs of care. In this paper, we interrogate this question and explore the relationship between having child with an early life disability and mothers' trajectories of unsecured debt across the life course.

We have three key findings. First, we find that having a child with an early-life disability is associated with a substantial increase in indebtedness in the years immediately following the birth, and that this association persists net of a range of potential confounders. This suggests that families are indeed taking on debt to bridge the gap between their own resources and the high costs of caring for their child. Importantly, unlike other forms of debt (such as student loan or home mortgage debt) unsecured debt is not helping these families build assets or human capital; instead it is simply helping them make ends meet and must be paid back at relatively high interest rates.

Second, we find that the association between early-life child disability and debt is stronger for more severe disabilities, such as those that require ongoing medical treatment. This provides indirect support for the notion that the link between child disability and debt is partially driven by the high cost of care, as more severe disabilities will require more intensive care. Importantly, though the magnitude of our coefficients are large, it is possible that the results we observe here are conservative, in part because parents of children with disability tend to be more socioeconomically disadvantaged, and socioeconomically disadvantaged groups have less access to credit than more advantaged groups over this time period. Unmeasured differences in socioeconomic status likely suppress observed differences indebtedness by child disability status.

Third, we find that parents of children with disability do not quickly repay this debt. Rather, parents of a child with an early-life disability have elevated debt levels across the life span. As such, it seems that the economic struggles associated with child disability are unlikely to be brief, but rather lasting. Thus, we find that debt is not a valuable short-term resource for families that is drawn and then easily repaid (Sullivan, 2008), but is instead a resource that families are unable to repay (either due to payment issues or because they need to take on more debt) for several decades following the birth of a child with disability.

These findings have important implications for understanding socioeconomic consequences of children's disabilities, and socioeconomic consequences in health more generally, particularly in an era of rising access to credit and debt. First, the

consequences of children's disability for debt are likely to disproportionately affect minority and disadvantaged families in ways that may maintain or exacerbate existing social inequalities. Socioeconomic and racial disparities in child disability are wide (Braveman et al., 2010; Halfon et al., 2012) and these disparities have not improved over time (Halfon et al., 2012). Thus, because the economic and social burdens of children's disability falls disproportionately on disadvantaged and minority families, it may be leading these families to rack up disproportionately more unsecured debt, which can create an array of financial burdens as these families need to divert an ever-increasing share of their household income toward servicing that debt. Supporting this notion, increases in unsecured debt burden over the past two decades have been concentrated among the socially disadvantaged (Bird et al., 1999; Houle, 2014; Mann, 2009). As such, it seems likely that debt may be a mechanism by which socioeconomic disadvantages associated with children's disabilities compound and accumulate across the life course. Future research should further examine whether child disability exacerbates racial and socioeconomic disparities in debt, and (using larger samples) test for heterogeneity in the effects of health conditions on debt by race and SES.

Second, the acquisition of debt is not benign, and carrying high levels of debt for long periods of time is a financial stressor that has been linked to a range of negative well-being outcomes among adults, including diminished physical health (Drentea and Lavrakas, 2000; Sweet et al., 2013), mental health (Berger et al., 2016; Drentea, 2000; Drentea and Reynolds, 2015; Fitch et al., 2011), and relationship instability (Dew, 2011). Recent research also shows that parent's debt has consequences for children's well-being, such that increases in unsecured debt in a household is associated with increases in children's behavioral problems and internalizing symptoms (Berger and Houle, 2016). Given that parents with disabled parents are more likely to experience parenting stress (Dyson, 1997; Hauser-Cram et al., 2001) emotional strains (Olsson and Hwang, 2001; Sen and Yurtsever, 2007), and high rates of relationship instability and marital dissolution (Hartley et al., 2010; Hodapp and Krasner, 1994; Hogan, 2012; Mauldon, 1992), debt is likely to exacerbate the high levels of family stress experienced by both parents and children in these families. Taken together, our and related research suggests that rising debt may be central to understanding processes of cumulative disadvantage in 20th and 21st United States for families with disabled children. Future research should continue to examine the linkages between health and debt from a life course perspective, and examine the acquisition of debt over time, rather than rely on single point in time estimates. Moreover, given that many have hypothesized that the declining social safety net is linked with rising debt (Leicht and Fitzgerald, 2007), future research should examine whether the impact of illness on indebtedness varies across policy regimes.

This study is the first to our knowledge to demonstrate an association between having a child with a disabling health condition and trajectories of mothers' unsecured debt, but it is not without limitations. Most notably, although we control for a range of characteristics that may confound the association between child health and debt—including a lagged measure of unsecured debt—omitted variable bias remains an issue and raise important threats to any causal interpretation. We also lack measures of the mechanisms that may link child disability and debt, including out-of-pocket medical expenditures. Although it is beyond the scope of this study, future research should interrogate the mechanisms linking health and debt outcomes. In addition, although we have detailed debt data that spans several decades, our measure of debt is limited in two key ways. First, debt is self-reported, and thus measurement error is a concern. But while the accuracy of self-reported debt data is a serious concern, recent evidence suggests that borrower self-reports and official lender (credit) reports are extremely similar (Brown et al., 2011). Moreover, measurement error in self-reported debt will only bias our estimates if it is systematic in ways that are associated with child disability. Second, we are unable to distinguish between different types of unsecured debt—such as medical debt, credit card debt, payday loans, or other types of installment loans. It is not clear how this may bias the findings. However, this lack of specificity partly reflects changes in debt and credit (e.g., the rise of payday lending) across historical time. Finally, we are unable to measure child disability with as much detail as we would like. While we are able to identify broad classes of childhood disability (severe physical, severe mental, learning disabilities, etc.), we unfortunately lack the statistical power to include these classes in our HLM analyses. Future research using larger samples should continue to interrogate how debt may vary across disability subtypes.

Despite these limitations, this study builds on prior research on economic consequences of children's disabilities by considering the role of debt in the lives in families of children with early-life disabilities. In an era of expanding access to credit and an array of credit instruments—including credit cards, payday lending, and other credit lines—parents of children with disabling health conditions may be increasingly using debt to help make ends meet when caring for their children. Debt is what Dwyer and colleagues have referred to as a “double-edged sword” (Dwyer et al., 2011). On the one hand debt provides a valuable resource for these mothers in the face of a failing social safety net. But on the other, it also creates new burdens as unsecured debt carries high interest rates and must be repaid and delays other investments and asset accumulation. Indeed, we find little evidence that parents are taking on debt and then quickly paying it off—instead, their debt levels remain elevated at least one to two decades after having a child with a disability. As such, it seems likely that in the late 20th century United States, debt plays an important role in this cycle of economic disadvantage: parents of children with early-life disabilities borrow to make ends meet, then struggle to pay down that debt for years to come. Future research should continue to interrogate the role of debt in the lives of families with children, and explore the potential economic and social consequences of rising debt.

## References

- Adler, N.E., Ostrove, J.M., 1999. Socioeconomic status and health: what we know and what we don't. *Ann. N. Y. Acad. Sci.* 896, 3–15.
- Allison, P.D., 2001. *Missing Data*. Sage Publications, Thousand Oaks, CA.

- Anderson, D., Dumont, S., Jacobs, P., Azzaria, L., 2007. The personal costs of caring for a child with a disability: a review of the literature. *Public Health Rep.* 122, 3–16.
- Babiarz, P., Widdows, R., Yilmazer, T., 2013. Borrowing to cope with adverse health events: liquidity constraints, insurance coverage, and unsecured debt. *Health Econ.* 22, 1177–1198.
- Berger, L.M., Collins, J.M., Cuesta, L., 2016. Household debt and adult depression in the United States. *J. Fam. Econ. Issues* 37, 42–57.
- Berger, L.M., Houle, J.N., 2016. Parental debt and child well-being. *Pediatrics* 137, 1–8.
- Bird, E.J., Hagstrom, P.A., Wild, R., 1999. Credit card debts of the poor: high and rising. *J. Policy Analysis Manag.* 18, 125–133.
- Brandon, P., Hogan, D., 2004. Impediments to mothers leaving welfare: the role of maternal and child disability. *Popul. Res. Policy Rev.* 23, 419–436.
- Braveman, P.A., Cubbin, C., Egerter, S., Williams, D.R., Pamuk, E., 2010. Socioeconomic disparities in health in the United States: what the patterns tell us. *Am. J. Public Health* 100, S186–S196.
- Bricker, J., Kennickell, A.B., Moore, K.B., Sabelhaus, J., 2012. Changes in U.S. Family finances from 2007 to 2010: evidence from the survey of consumer finances. *Fed. Reserve Bull.* 98.
- Brown, M., Haughwout, A., Lee, D., van der Klaauw, W., 2011. Do We Know What We Owe? A Comparison of Borrower- and Lender-Reported Consumer Data. Federal Reserve Bank of New York Staff Reports, p. 523.
- Bureau of Labor Statistics, 2010. Updated CPI-u-rs, All Items and All Items Less Food and Energy, 1978–2009, Washington, D.C.
- Campbell, J., 2010. Neoliberalism in crisis: regulatory roots of the U.S. financial meltdown. *Res. Sociol. Organ.* 30B, 65–101.
- Campbell, J.R., Hercowitz, Z., 2009. Welfare implications of the transition to high household debt. *J. Monetary Econ.* 56, 1–16.
- Campbell, J.R., Hercowitz, Z., 2010. Interest rates following financial re-regulation. *Econ. Perspect.* 34, 2–13.
- Curtis, M.A., Corman, H., Noonan, K., Reichman, N.E., 2010. Effects of child health on housing in the urban U.S. *Soc. Sci. Med.* 71, 2049–2056.
- Curtis, M.A., Corman, H., Noonan, K., Reichman, N.E., 2013. Life shocks and homelessness. *Demography* 50, 2227–2253.
- Debelles, G., 2004. Macroeconomic Implications of Rising Household Debt. Bank for International Settlements Working Paper Series, No 153.
- Dew, J., 2011. The association between consumer debt and the likelihood of divorce. *J. Fam. Econ. Issues* 32, 554–565.
- Drentea, P., 2000. Age, debt and anxiety. *J. Health Soc. Behav.* 41, 437–450.
- Drentea, P., Lavrakas, P.J., 2000. Over the limit: the association among health, race, and debt. *Soc. Sci. Med.* 50, 517–529.
- Drentea, P., Reynolds, J.R., 2015. Where does debt fit in the stress process model? *Soc. Ment. Health* 5, 16–32.
- Dwyer, R.E., McCloud, L., Hodson, R., 2011. Youth debt, mastery, and self-esteem: class-stratified effects of indebtedness on self-concept. *Soc. Sci. Res.* 40, 727–741.
- Dyson, L.L., 1997. Fathers and mothers of school-age children with developmental disabilities: parental stress, family functioning, and social support. *Am. J. Ment. Retard.* 102, 267–279.
- Elder, G.H., 1985. *Life Course Dynamics: Trajectories and Transitions, 1968–1980*. Cornell University Press, Ithaca, NY.
- Elder, G.H., Johnson, M.K., Crosnoe, R., 2004. The emergence and development of life course theory. In: Mortimer, J., Shanahan, M. (Eds.), *Handbook of the Life Course*. Springer, New York, pp. 3–22.
- Fitch, C., Hamilton, S., Bassett, P., Davey, R., 2011. The relationship between personal debt and mental health: a systematic review. *Ment. Health Rev.* 16, 153–166.
- Friedline, T., Masa, R.D., Chowa, G.A., 2015. Transforming wealth: using the inverse hyperbolic sine (IHS) and splines to predict youth's math achievement. *Soc. Sci. Res.* 49, 264–287.
- Haas, S.A., 2006. Health selection and the process of social stratification: the effect of childhood health on socioeconomic attainment. *J. Health Soc. Behav.* 47 (4), 339–354.
- Hacker, J.S., 2008. *The Great Risk Shift: the New Economic Insecurity and the Decline of the American Dream*. Oxford University Press, Oxford.
- Halfon, N., Houtrow, A., Larson, K., Newacheck, P.W., 2012. The changing landscape of disability in childhood. *Future Child.* 22, 13–42.
- Hartley, S.L., Barker, E.T., Seltzer, M.M., Floyd, F., Greenberg, J., Orsmond, G., Bolt, D., 2010. The relative risk and timing of divorce in families of children with an autism spectrum disorder. *J. Fam. Psychol.* 24, 449–457.
- Hauser-Cram, P., Warfield, M.E., Shonkoff, J.P., Krauss, M.W., 2001. *Children with Disabilities: a Longitudinal Study of Child Development and Parent Well-being*. Wiley, New York.
- Hodapp, R.M., Krasner, D.V., 1994. Families of children with disabilities: findings from a national sample of eighth-grade students. *Exceptionality A Special Educ. J.* 5, 71–81.
- Hogan, D., 2012. *Family Consequences of Children's Disabilities*. Russell Sage Foundation, New York.
- Hogan, D., Msall, M.E., Rogers, M.L., Avery, R.C., 1997. Improved disability population estimates of functional limitation among american children aged 5–17. *Maternal Child Health J.* 1, 203–216.
- Houle, J.N., 2014. A generation indebted: young adult debt across three cohorts. *Soc. Probl.* 61, 1–18.
- Hyman, L., 2011. *Debtor Nation: the History of America in Red Ink*. Princeton University Press, Princeton.
- Keese, M., Schmitz, H., 2011. Broke, Ill, and Obese: the Effect of Household Debt on Health. Social Science Research Network, Working Paper SOEP paper # 350.
- Lee, K., Carin, J., 2010. Multiple imputation for missing data: fully conditional specification versus multivariate normal imputation. *Am. J. Epidemiol.* 171, 624–632.
- Leicht, K.T., Fitzgerald, S.T., 2007. *Postindustrial Peasants: the Illusion of Middle-class Prosperity*. Worth Publishers, New York.
- Lukemeyer, A., Meyers, M.K., Smeeding, T., 2000. Expensive children in poor families: out-of-pocket expenditures for the care of disabled and chronically ill children in welfare families. *J. Marriage Fam.* 62, 399–415.
- Maki, D.M., 2002. The growth of consumer credit and the household debt service burden. In: Durkin, T.A., Staten, M.E. (Eds.), *The Impact of Public Policy on Consumer Credit*. Kluwer Academic, Norwell.
- Mann, A., 2011. The effect of late-life debt use on retirement decisions. *Soc. Sci. Res.* 40, 1623–1637.
- Mann, R.J., 2009. Patterns of credit card use among low- and moderate-income households. In: Blank, R.M., Barr, M.S. (Eds.), *Insufficient Funds: Savings, Assets, Credit, and Banking Among Low Income Households*. Russell Sage, New York, pp. 257–284.
- Mauldon, J., 1992. Children's risk of experiencing divorce and remarriage: do disabled children destabilize marriages? *Popul. Stud.* 46, 349–362.
- Mishel, L., Bernstein, J., Allegretto, S., 2007. *The State of Working America 2006–2007*. ILR Press, Ithaca, NY.
- Newacheck, P.W., Inkelas, M., Kim, S.E., 2004. Health services use and health care expenditures for children with disabilities. *Pediatrics* 114, 79–85.
- Olsson, M., Hwang, C., 2001. Depression in mothers and father of children with intellectual disability. *J. Intellect. Disabil. Res.* 45, 535–543.
- Paez, K.A., Zhao, L., Hwang, W., 2009. Rising out-of-pocket spending for chronic conditions: a ten-year trend. *Health Aff.* 28, 15–25.
- Palloni, A., 2006. Reproducing inequalities: luck, wallets, and the enduring effects of childhood health. *Demography* 43, 587–615.
- Pearce, D.K., 1985. Rising household debt in perspective. *Econ. Perspect.* 70, July/August, 3–17.
- Raudenbush, S.W., Bryk, A.S., 1992. *Hierarchical Linear Models: Applications and Data Analysis Methods*. Sage, Newbury Park, CA.
- Rogers, M.L., Hogan, D., 2003. Families with children with disabilities: the key role of rehabilitation. *J. Marriage Fam.* 65, 818–833.
- Royston, P., 2005. Multiple imputation of missing values: update of ice. *Stata J.* 5, 527–536.
- Sen, E., Yurtsever, S., 2007. Difficulties experienced by families with disabled children. *J. Specialists Pediatr. Nurs.* 12, 238–252.
- Shaefer, L., Song, X., Shanks, T.R.W., 2013. Do single mothers in the United States use the earned income tax credit to reduce unsecured debt? *Rev. Econ. Househ.* 11, 659–680.
- Smith, J.P., 1999. Healthy bodies and thick wallets: the dual relation between health and economic status. *J. Econ. Perspect.* 13, 144–166.
- Stabile, M., Allin, S., 2012. The economic costs of childhood disability. *Future Child.* 22, 65–96.
- Stewart, K.J., Reed, S.B., 1999. Consumer Price Index Research Series Using Current Methods, 1978–98. *Monthly Labor Review* June, 29–38.

- Sullivan, J.X., 2008. Borrowing during unemployment: unsecured debt as a safety net. *J. Hum. Resour.* 43, 383–412.
- Sullivan, T.A., Warren, E., Westbrook, J.L., 1999. *As We Forgive Our Debtors: Bankruptcy and Consumer Credit in America*. Beard Books, Washington, D.C.
- Sullivan, T.A., Warren, E., Westbrook, J.L., 2000. *The Fragile Middle Class: Americans in Debt*. Yale University Press, New Haven.
- Sweet, E., Nandi, A., Adam, E.K., McDade, T.W., 2013. The high price of debt: household financial debt and its impact on mental and physical health. *Soc. Sci. Med.* 91, 94–100.