

Rising Household Debt and Children's Socioemotional Well-Being Trajectories

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Forthcoming in *Demography*

Note: We are grateful for research support from the Institute for Research on Poverty at the University of Wisconsin-Madison.

ABSTRACT

Debt is now a substantial aspect of family finances. Yet, there has been limited research on how household debt is linked with child development. We use data from the National Longitudinal Survey of Youth 1979 cohort and Hierarchical Linear Models to estimate associations of amounts and types (home, education, auto, unsecured/uncollateralized) of parental debt with child socioemotional well-being. We find that unsecured debt is associated with growth in child behavior problems over time, whereas this is not the case for other forms of debt. Moreover, the association of unsecured debt with child behavior problems varies by child age and socioeconomic status with younger children and children from less advantaged families experiencing larger associations of unsecured debt with greater behavior problems.

INTRODUCTION

Over the last half century, inflation adjusted household debt has increased dramatically in the United States. It has also become more difficult for the average American family to repay (Campbell, 2010; Hyman, 2011). These trends have generated widespread concern and have been highlighted as an important area of focus for social science research (National Science Foundation, 2011). Moreover, recent research indicates that debt is associated with key demographic indicators of fertility and family formation, and may contribute to social disparities by race/ethnicity and educational attainment (Addo, 2014; Houle & Addo, 2018; Min & Taylor, 2018). Thus, differences in levels and effects of household debt have the potential contribute to “diverging destinies” (McLanahan, 2004) in life trajectories by race and socioeconomic status. Although demographers have long examined how changes in economic and social conditions have impacted the family unit (Furstenberg, 2014), surprisingly little research has examined the implications of rising debt for family well-being.

The ability to borrow is a crucial resource for investing in human capital, purchasing goods and services, and smoothing consumption. For some families, access to credit (and resulting debt) provides opportunities for investments that improve economic and social well-being. For others, repaying debt (or pressure to do so) may result in stress and reduced consumption, which may, in turn, affect individual and family functioning and well-being (Drentea, 2000; Drentea & Lavrakas, 2000). An expansive literature documents that limited socioeconomic resources—low income, lack of wealth, poverty, and economic hardship—are negatively associated with child development (Aber, Bennett, Conley, & Li, 1997; Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997; McLoyd, 1998; Shanks, 2007; Strochschein, 2005). Recent evidence suggests that these associations may be causal (Akee, Copeland, Keeler,

Angold, & Costello, 2010; Costello, Compton, Keeler, & Angold, 2003; Dahl & Lochner, 2012; Duncan, Morris, & Rodrigues, 2011; Milligan & Stabile, 2009). Despite the growing importance of debt for family finances, however, little is known about the potential link between debt and child well-being, or whether debt may exacerbate social and economic disparities therein.

In this study, we use data from the National Longitudinal Survey of Youth 1979 cohort (NLSY79) linked to the Children of the NLSY79 (C-NLSY) and Hierarchical Linear Models (HLM) to estimate associations of trajectories in amounts of specific types (home, education, auto, unsecured/uncollateralized) of parental debt with trajectories in child socioemotional well-being (behavior problems), net of a host of selection factors. Our research extends prior work in several ways. First, previous research primarily interrogates how debt affects borrowers' well-being; our work examines whether debt may spillover to affect their children's well-being. Second, rather than focusing on overall household debt, consistent with more recent studies, we focus on specific types of household debt, which have been shown to have differential associations with well-being (Addo, 2014; Berger, Collins, & Cuesta, 2016; Berger & Houle, 2016). Third, our analyses estimate associations between trajectories in household debt and trajectories in children's socioemotional well-being; prior work has largely focused on average (point-in-time) differences in well-being as a function of differences in family debt levels. Focusing on developmental trajectories is important given documented differences in children's developmental needs and sensitivity to environmental stress at different stages of childhood (Zaslow & Hayes, 1986). Moreover, by leveraging both between- and within-child variation in debt and socioemotional well-being over time, our HLM strategy more rigorously accounts for selection bias than has been possible in prior studies. Finally, we examine potential heterogeneity in associations by race/ethnicity and socioeconomic status (using maternal education as a proxy

thereof), as well as child age and sex. Examining such heterogeneity may have key implications for understanding whether household debt contributes to ongoing and intergenerational transmission of inequality.

BACKGROUND AND CONCEPTUAL FRAMEWORK

Household debt has grown sharply in the United States throughout the latter half of the 20th century, spurred in part by increased access to credit and growth of credit products that made debt easier to take on and more difficult to repay for the average American household (Campbell, 2010; Hyman, 2011). Between 1962 and 2008, the median household debt-to-income ratio rose from 0.1 to 0.6 and aggregate household debt rose from about 60% to about 120% of aggregate household income (Dynan, 2009). This trend reflects growth in unsecured (uncollateralized, e.g., credit card, utility, medical, unpaid bills), mortgage, and student loan debt (Ryan, Trumbull, & Tufano, 2011; Xiao & Yao, 2011a, 2011b). High levels of debt threaten financial security and leave households vulnerable to declines in income and asset values (Board of Governors of the Federal Reserve System, 2017; Dynan & Kohn, 2007; Federal Reserve Bank of New York, 2017).

Debt Accumulation: Patterns and Characteristics

There is considerable variation in why households accrue debt, the amount(s) and type(s) they take on, the costs and repayment conditions they face, and their ability to repay it. Three aspects of debt are particularly relevant: *agency in borrowing, magnitude, and cost*. *Agency* reflects the degree to which one's economic choice set is constrained. We use "agency" to connote the degree to which particular types or amounts of debt are acquired by deliberate intention with "forward-directed planning" (Bandura, 2001:7), versus in reaction to limited options through which to meet a need. *Magnitude* indicates amount of debt, both in absolute

terms and relative to one's economic resources; it has implications for whether debt can be repaid (without undue hardship) in the expected time frame. *Cost* comprises total charges and fees incurred during the full period over which debt is repaid. Cost is closely linked to type of debt; notably, unsecured debt is more expensive than secured debt. Cost and magnitude are also linked in that higher cost debt is compounded more quickly.

We posit that agency, magnitude, and cost are key, interrelated aspects of debt accumulation that tend to vary by SES. For example, research suggests that having insufficient funds to meet basic needs encourages borrowing, even at high-cost (Shah, Mullainathan, & Shafir, 2012). Moreover, because low-SES households frequently lack insurance against adverse events, they are disproportionately likely borrow in response to economic shocks, often using a high cost mechanism (Barr, 2012; J. X. Sullivan, 2008). Adverse health events, for example, are associated with increased unsecured debt among disadvantaged but not advantaged households (Babiarz, Widdows, & Yilmazer, 2013). These factors imply that high-SES households exercise greater agency in borrowing than their lower-SES counterparts.

Magnitude and cost are closely related to type of debt. Home and education loans, for example, often involve a large principal amount, but have lower interest rates and compound at a slower rate than unsecured debt. Home and education loans are also generally used to invest in assets or human capital. By contrast, unsecured debt is often used for immediate consumption and costs considerably more if not paid off quickly. Unsecured borrowing can help individuals establish a credit record, which can aid them in subsequently accessing lower-cost loans and other goods and services (rental units) that depend on credit checks; behavioral evidence also suggests that individuals may be more motivated to repay a loan with a regular repayment schedule than to save regularly to purchase a big-ticket item in the future (Collins, Morduch,

Rutherford, & Ruthven, 2010). At the same time, however, unsecured debt, including medical debt, is a primary cause of bankruptcy (Miller, 2011; T. A. Sullivan, Warren, & Westbrook, 2000).

Rising debt has implications for economic stability by race and socioeconomic status, particularly considering differences in agency, cost, and magnitude between advantaged and disadvantaged groups. While access to credit has increased for all population groups in recent decades, socioeconomically disadvantaged populations and populations of color are disproportionately likely to have access only to high cost (subprime) credit instruments that feature high interest rates and fees in each domain of borrowing, including home, education, and auto, as well as unsecured loans (Seamster & Charron-Chénier, 2017; Williams, Nesiba, & McConnell, 2005). Most notably, however, expanded access to unsecured credit (loans that do not require collateral) has been linked to particularly large and disproportionate growth in debt burden for low-SES and minority households (Bird, Hagstrom, & Wild, 1999; Durkin, 2000; Houle, 2014b; Wagmiller, 2003). While evidence suggest that low-SES and minority households have less absolute debt, on average, than their more advantaged counterparts, these households are disproportionately likely to accrue high cost, short-term unsecured debt and, given limited income and assets, their relative debt burden tends to be large in magnitude and difficult to repay (Bird et al., 1999; Drentea & Lavrakas, 2000; T. A. Sullivan, 2012; Williams et al., 2005). Evidence also indicates that low SES and black young adults take on more student loan debt to pursue postsecondary education, and have more difficulty repaying that debt, than their more advantaged counterparts (Addo, Houle, & Simon, 2016; Houle, 2014a; Houle & Addo, 2018).

Why families borrow also varies considerably by race and socioeconomic status. Lower-SES families that have experienced stagnating wages have increasingly borrowed to maintain

their standard of living, and many struggle to meet current expenses while paying down debt (Campbell, 2010; Dwyer, McCloud, & Hodson, 2011; Leicht & Fitzgerald, 2014; Mishel, Berstein, & Allegretto, 2007). That disadvantaged households use higher cost credit, often to meet basic needs, whereas affluent households tend to borrow (often through lower-cost mechanisms) as a convenience or investment strategy (Dwyer et al., 2011; Dwyer, McCloud, & Hodson, 2012; Sullivan et al., 2000), underscores that more advantaged households exercise greater agency in borrowing, can borrow at lower cost, and face fewer barriers to repaying debt. These disparities raise important questions about potential linkages between debt, inequality, and well-being, and whether debt may exacerbate adverse outcomes associated with social disadvantage (Carr & Jayadev, 2015). They also highlight the importance of both examining specific types of debt and separately estimating associations of debt with well-being for population groups with greater and lesser social and economic advantage.

Debt and Child Well-Being: Theory, Research, and Potential Heterogeneity in Associations by Race/Ethnicity and SES

Our conceptual framework for considering links between parental debt and children's wellbeing is grounded in Social Stress Theory (Pearlin, 1989) and the Family Stress Model (Conger & Elder, 1994; Conger et al., 1990)—hereafter “stress theory.” In general, stress theory elucidates that scarcity and instability in resources are likely to result in economic and related pressure and, thereby, greater levels of stress, anxiety, and depression. Poorer socioemotional wellbeing, in turn, leads to poorer family functioning, including greater intra-familial conflict. Borrowing facilitates the acquisition of resources to respond to adverse financial shocks, smooth consumption, purchase high-cost necessities, and make long-term investments (Dyner & Kohn, 2007). As such, taking on debt has the potential to both increase access to material resources and

relieve economic pressure and associated stress, particularly over the short term, and when incurred with considerable agency and at manageable magnitude and cost. Because debt must eventually be repaid, however, indebtedness also has the potential to limit (future) consumption and to increase economic hardship and related stress, particularly over the long term, and when used for immediate consumption (rather than investment) and incurred at high magnitude and/or cost. In short, indebtedness may positively or negatively influence adult well-being by affecting consumption (access to goods and services) and economic pressure.

Parental debt may influence child well-being both directly, through consumption, and indirectly, through its influence on parental stress and functioning (Simons, Whitbeck, Melby, & Wu, 1994). Economic stress is associated with the use of unproductive coping strategies and with making decisions that incur high future costs (Lea, Mewse, & Wrapson, 2012; Shah et al., 2012). Moreover, debt-related stress may preoccupy parents, reducing the time, attention, and quality of activities they devote to children. Parents may also increase their work hours in order to repay debt. Economic hardship and stress are associated with poorer parental mental health, harsher parenting, and lower-quality parent-child relationships and caregiving environments, which are, in turn, associated with poorer child socioemotional development (Berger, 2007; Bolger, Patterson, Thompson, & Kupersmidt, 1995; Eamon, 2000; Eamon & Zuehl, 2001; Goosby, 2007; McLeod & Shanahan, 1993; Mistry, Vandewater, Huston, & McLoyd, 2002; Pachter, Auinger, Palmer, & Weitzman, 2006; Strochschein, 2005; Tracy, Zimmerman, Galea, McCauley, & Vander Stoep, 2008).

Links between indebtedness and child well-being may be stronger among disadvantaged and minority families than among more advantaged families. For example, debt incurred in response to traumatic events, or borrowed out of need rather than investment—conditions that

disproportionately pertain to borrowing among disadvantaged families—is thought to be particularly stress-inducing (Houle & Berger, 2017; McCloud & Dwyer, 2011; T. A. Sullivan et al., 2000). More generally, because low-SES and minority families frequently borrow with less agency and at greater cost than their more advantaged counterparts (as noted above), they may experience greater stress from their debt burdens.

Previous research on debt and well-being has primarily focused on adults, and findings have been mixed. A small body of research indicates that debt is associated with financial stress and worries (Drentea, 2000; Norvilitis et al., 2006; Worthington, 2006), diminished physical and mental health (Bridges & Disney, 2010; S. Brown, Taylor, & Price, 2005; Drentea, 2000; Drentea & Lavrakas, 2000; Drentea & Reynolds, 2012; Jenkins et al., 2008; Keese & Schmitz, 2014; Reading & Reynolds, 2001; Turunen & Hiilamo, 2014; Walsemann, Gee, & Gentile, 2015), poorer marital quality, and relationship strain (Dew, 2007, 2008). However, other studies find positive or null associations between debt and well-being (Dew, 2007; Dwyer et al., 2011; Keese & Schmitz, 2014).

One potential reason for these inconsistent findings is that many studies focus either on overall debt or on only one type of debt, rather than considering all types of debt simultaneously. This is of concern both because some types of debt are fungible (families can pay off credit card debt with home equity loans) and because (typically low cost) debt used for asset or human capital investment may positively influence well-being, whereas (high cost) unsecured debt may adversely influence well-being, particularly over time. Berger and colleagues (2016), for example, find that increases in unsecured, but not secured, debt are associated with increases in depressive symptoms over time.

A second potential explanation is that (particular types of) debt may have heterogeneous

associations with well-being for advantaged and disadvantage groups. As such, results may vary by the characteristics of study samples. Furthermore, heterogeneous associations may be obfuscated when advantaged and disadvantaged groups are analyzed together. For example, home debt owed by an advantaged family and characterized by prime loan terms may have a different association with well-being than home debt owed by a disadvantaged family and characterized by subprime terms. Likewise, education debt owed by individuals who obtained a postsecondary degree from a reputable institution may have a different association with well-being than education debt owed by individuals who never obtained a degree or who obtained a degree that did not lead to increased employment or earnings.

Only one study to date has examined the association between debt and child well-being. Berger and Houle (2016) use NLSY79 data and ordinary least squares regressions with individual fixed-effects to estimate average differences in child behavior problems when children's families are observed with varying types and levels of debt. Findings suggest that greater overall debt is associated with fewer child behavior problems. Analyses of particular types of debt, however, yielded a more nuanced set of associations, revealing that higher mortgage and education debt are associated with fewer child behavior problems, whereas higher levels of unsecured debt are associated with greater child behavior problems.

We use NLSY79 data to examine how the consequences of debt may extend beyond the borrowers themselves to influence their children's well-being. We extend Berger and Houle's (2016) work in several ways. First, the prior study considers only average differences in child behavior problems at different levels of debt. It does not address how trajectories in parental debt may be associated with trajectories in child development. This is particularly important given that child behavior is dynamic in nature and best understood and analyzed via a developmental

approach to behavioral trajectories, rather than by snapshots of behavior at given points in time (Costello & Angold, 2000; Kraemer, Yesavage, Taylor, & Kupfer, 2000). We explicitly consider how changes in household debt are associated with trajectories of children's socioemotional well-being over the course of middle childhood through early adolescence.

Second, whereas the prior study estimates associations of (particular types of) debt with behavior problems for children, on average, we separately consider associations of debt with internalizing and externalizing behaviors, and also examine potential heterogeneity in these associations by child age and sex. These are important considerations given documented differences in children's developmental needs and sensitivity and reactions to environmental stressors at different points in childhood and by sex (Zaslow & Hayes, 1986). For example, prior research suggests that economic resources are more closely linked to externalizing behavior problems than to internalizing behavior problems because externalizing behavior problems are more responsive to changes in the family and caregiving environment (Dearing, McCartney, & Taylor, 2006). Thus, associations of debt with externalizing behavior problems are expected to be relatively larger in magnitude than those with internalizing behavior problems.

Our empirical analyses focus on ages 5 through 14, which spans middle childhood and early adolescence. Key developmental tasks during middle childhood include an increased sense of independence and a growing ability to understand social contexts outside the family and to reflect on one's own actions. Early adolescence is further characterized by rapid growth in autonomy and independence (from the family), and increased awareness of social comparisons and competition with peers. Successful engagement in these tasks is important for socioemotional well-being, including social competence and self-esteem (Eccles, 1999). Notably, the family environment tends to be more developmentally salient in the earlier period of

this age range, with non-familial relationships growing in importance over time. Consistent with this notion, empirical evidence indicates that younger children are particularly sensitive to family economic disadvantage and its influences on the caregiving environment (Magnuson & Votruba-Drzal, 2009; Shonkoff & Phillips, 2000). As such, household debt may be more closely associated with child development earlier in childhood, when children are more sensitive to the family environment, than in later childhood and adolescence.

Associations of debt with child socioemotional well-being may also differ by child sex. Girls and boys tend to respond differently to family context and changes therein, with (young) boys being particularly sensitive to the family environment (Zaslow & Hayes, 1986). As such, links between debt and child socioemotional wellbeing, in general, are expected to be larger in magnitude for boys than for girls. In addition, normative socioemotional trajectories vary by sex, with girls experiencing higher levels of internalizing behavior problems (and growth in internalizing behavior problems over time), and boys experiencing higher levels of externalizing behavior problems (Leve, Kim, & Pears, 2005). Thus, associations between debt and internalizing behavior problems are expected to be larger in magnitude for girls than boys, whereas associations with externalizing behavior problems are expected to be larger for boys.

Third, consistent with Berger and Houle (2016), we consider multiple types of debt. Based our conceptual framework and their empirical results, we expect to find adverse associations of unsecured debt, but not necessarily secured debt (home, education, and auto loans), with children's socioemotional well-being trajectories. We also expand their work to consider potential heterogeneity in associations between debt and well-being, which may vary by factors associated with debt accumulation, type(s) of debt, and social disadvantage, as discussed above. As such, adverse associations between debt and socioemotional child well-being are

expected to be stronger for families of color and low SES families.

Finally, it is important to recognize that identifying unbiased effects of debt on child well-being is complicated because households that accrue debt—and particular types thereof—likely differ from those that do not in ways that are correlated with children’s development. SES, life events, parental functioning, and child well-being, and may be endogenously (jointly) determined by similar characteristics, events, and processes. For example, some families may consume beyond their basic needs and the level that their income will support, which may have implications for both indebtedness and child development. Most existing studies rely on standard regression-based identification strategies that adjust only for a limited number of observable characteristics, leaving estimates particularly vulnerable to selection bias. In addition, debt and well-being are frequently measured simultaneously, making it impossible to rule out reverse causality (Richardson, Elliott, & Roberts, 2013). Only a handful of studies have used more sophisticated identification strategies (Bridges & Disney, 2010; Gathergood, 2012; Keese & Schmitz, 2014; Leung & Lau, 2017; Walsemann et al., 2015). Yet, all but one have focused on adult outcomes, few use data from the United States, and most have other important methodological limitations (Richardson et al., 2013). Our HLM strategy, described below, reduces selection bias via the inclusion of an extensive set of controls and by leveraging both between- and within-child variation to estimate associations of trajectories in educational, home, auto, and unsecured debt with trajectories in child internalizing and externalizing behavior problems. As such, our approach allows us to better capture both between-child differences in family debt at a point in time and within-child changes in family debt over time. By examining within-child changes in debt and its association with changes in child socioemotional well-being over time, our study improves on prior work that examines debt at a single point-in-time, and

better captures the debt accumulation and repayment processes that may be consequential for well-being (Sun & Houle, 2018).

DATA AND METHODS

Data

Our data are drawn from the NLSY79 and C-NLSY79. The NLSY79 is a population-based panel study that began with a nationally representative sample of youth aged 14 to 21 in 1979, and has followed them ever since. The C-NLSY79, which was first fielded in 1986 and has been conducted biennially thereafter, follows the children of the women in the initial NLSY79 sample. We use data spanning 1986 to 2008, excluding 2002 and 2006 because information on household debt was not collected in those years. Notably, this roughly two-decade period leading to the Great Recession was characterized by rapid growth in household debt, including home, education, and unsecured debt (Dynan & Kohn, 2007; Federal Reserve Board, 2007).

We limit our sample to children age 5 to 15, ages at which the socioemotional well-being measure (Behavior Problems Index) on which we focus was administered to their mothers. We identified 36,984 child-year observations of 10,175 children and their mothers that met these criteria in the C-NLS79. To address missing data on the covariates, we multiply-imputed 15 datasets using the *ice* command in Stata 15.¹ We organized our data as a synthetic age cohort in which children are observed biennially at ages 5-6, 7-8, 9-10, 11-12, and 13-14, such that our data are arranged (and time is assessed) by child age, rather than by survey year.

Measures

¹ We replaced missing values for age 5-6 debt with age 3-4 debt if available. Also, we estimated our models using only the (complete case) sample with no missing data. Results (available upon request) were consistent with those presented here.

Socioemotional Well-being. Children's internalizing and externalizing behavior problems scores on the Behavioral Problems Index (BPI; Zill & Peterson, 1986) were used to assess socioemotional well-being. The BPI is a widely used measure of child socioemotional development and has consistently demonstrated favorable psychometric properties (Zill, 1990). It was completed by children's mothers during the C-NLSY79 interview. It consists of a list of age-appropriate potential behavior problems for which mothers are asked to indicate whether the problem is often, sometimes, or not true of their child.² Internalizing behavior problems consist of anxious/depressed, dependent, and withdrawn behaviors. Externalizing behavior problems consist of antisocial, headstrong, hyperactive, and peer problem behaviors. We age-standardized children's raw scores on these measures in three-month child age intervals to have a mean of 0 and standard deviation of 1 such that, in our HLM analyses, we model BPI scores in age-standardized standard deviation (SD) units.

Household Debt. Our analyses focus on four types of household debt. Education debt consists of money owed for student loans. Home debt is the total of all mortgage or home equity loans owed. Auto debt includes loans for the purchase of a vehicle. Unsecured debt includes all other types of debt, such as credit (bank or store) card debt; money owed to businesses, individuals, or banks (including auto and payday loans); and medical debt. Notably, these measures are designed to assess carried debt—respondents are specifically asked to report the total balance still owed after their most recent payment. Unfortunately, our data do not allow us to assess unsecured debt in distinct categories (e.g., medical, payday loan, auto-title loan, friends and family, and credit card). However, credit card debt is differentiated from other types of

² The BPI consists of 10 internalizing behavior problems items for children ages 4-11, 6 internalizing behavior problems items for children age 12 and above, 18 externalizing behavior problems items for children ages 4-5, 20 externalizing behavior problems items for children ages 6-11, and 19 externalizing behavior problems items for children age 12 and above.

unsecured debt in the NLSY79 in 2004 and 2008. It accounted for approximately two-thirds of all unsecured debt in those years.

We applied a 98th percentile top code to each debt amount and adjusted for inflation, such that debt is in constant 2013 dollars. In our HLM analyses, we model the natural logarithm of thousands of dollars of debt (plus a constant to account for 0 debt values) because debt is highly right-skewed (Berger et al., 2016). Findings are consistent when using other transformations of debt, such as the inverse hyperbolic sine transformation (Friedline, Masa, & Chowa, 2015).

Covariates. We utilized two categories of covariates. Time-invariant characteristics include measures assessed at age 5 or before, including the mother's race/ethnicity (black, Hispanic, white/other race [reference group]), nativity status, age, household size, number of children in the household, academic aptitude (age-standardized Armed Forces Qualifying Test score in 1980), number of fights at work or school (a proxy for impulsivity, measured in 1980), locus of control (measured in 1979; range=4-16; z-score),³ self-esteem (measured in 1980; range= 6-30; z-score),⁴ and percentile scores on the cognitive stimulation and emotional support subscales of the HOME assessment of the quality of the caregiving environment (measured at age 3-4; z-score), as well as focal child sex, whether the focal child was born with a low birth weight, and whether the focal child is disabled. Time-varying characteristics include measures of mother's marital status, household income (natural logarithm; 2013 dollars), educational attainment (less than a high school degree, high school degree [reference group], some college,

³ Locus of control refers to extent to which individuals believe they have control over their lives through their own behaviors versus their lives being determined by their environment. It was measured in the NLSY in 1979 using the Rotter Internal-External Locus of Control Scale.

⁴ Self-esteem refers to an individual's level of self-approval or disapproval. It was measured in the NLSY in 1980 using the Rosenberg Self-Esteem Scale.

four-year college degree or more), the percent of weeks the mother was unemployed in the last year, and homeownership. All models also control for year of observation (year fixed effects).

Empirical Strategy

We used HLM (Raudenbush & Bryk, 1992) to simultaneously estimate children's initial levels of behavior problems at age 5-6 (intercepts) and changes in their behavior problems between ages 5-6 and 13-14 (slopes) as a function of particular types of household debt. In our primary models, the behavior problems trajectory (slope) was estimated as a continuous linear parameter. The models took the following form:

$$BP_{ti} = BP_{0i} + BP_{1i}AGE_{ti} + E_{ti}, \quad (1)$$

where the behavior problems outcome (BP) experienced by child i at interview t is estimated as a function of the initial level of behavior problems at age 5-6 (BP_{0i}), a slope that varies as a function of time and is measured by the focal child's age (BP_{1i}), and an individual error term (E_{ti}). The AGE variable is scaled such that the resulting coefficient represents a *per year* change in the slope. Equation (1) can be reduced to:

$$BP_{0i} = B_{00} + B_{01}DEBT_{0i} + B_{02}ICONTS_{0i} + B_{03}PARENT_{.1i} + E_{0i} \quad (1a)$$

$$BP_{1i} = B_{10} + B_{11}DEBT_{1i} + B_{13}TICONTS_{0i} + B_{14}TVCONTS_{1i} + E_{1i} \quad (1b).$$

Equation (1a) indicates that the initial level (BP_{0i}) of behavior problems is a function of age 5-6 measures of initial education, home, auto, and unsecured debt ($DEBT_{.1i}$), intercept controls (measured at baseline; $ICONTS_{0i}$), lagged (age 3-4) measures of parental cognitive stimulation and emotional support ($PARENT_{.1i}$), and a random error term (E_{0i}). As indicated by Equation (1b), the subsequent linear slope (BP_{1i}) in behavior problems is a function of debt at ages 5-6 through 13-14 ($DEBT_{1i}$), time-invariant slope controls ($TICONTS_{0i}$), time-varying slope controls ($TVCONTS_{1i}$), and a random error term (E_{1i}). The key parameter of interest is B_{11} , which

represents the *per year* difference in the rate of change in behavior problems between child ages 5-6 and 13-14 that is associated with a change in the amount of each type of debt. We clustered the standard errors to adjust for non-independent observations (intra-cluster correlation) of siblings.

We estimated two additive versions of the model. In addition to the initial (age 5-6) and concurrent debt measures, Model 1 includes an extensive set of time-invariant intercept controls measured at age 5-6 or before and a parsimonious set of exogenous slope controls (child age and mother's race/ethnicity). Model 2 adds lagged (age 3-4) measures of parental cognitive stimulation and emotional support to the intercept controls as well as potentially endogenous slope controls (mother's marital status, mother's education, family income, percent weeks mother was unemployed in the last year, and family owns its home), each of which may be jointly determined with debt and children's behavior problems. We estimate these models for the full sample and for separate (stratified) subsamples defined by maternal race/ethnicity, maternal education (which we conceptualize as a relatively time-stable proxy measure of SES), and child sex.

A key strength of the HLM approach is that both within- and between-child variation are used to identify associations for the slope estimates and that initial levels of the child behavior problems are taken into account. The between-child (intercepts) estimates compare behavior problems among children with different levels of household debt at age 5-6. They are subject to omitted variable bias due to unmeasured factors that are associated with both household debt and child socioemotional wellbeing. The within-child (slope) estimates compare children to themselves at different levels of debt over time. As such, the slope coefficients are not subject to bias from time-invariant (observed or unobserved) factors, so long as they also have time-

invariant effects. They may, however, be biased by the omission of unobserved time-varying factors or by persistent factors that have time-varying effects. In contrast, because the intercept estimates are identified only by between-child variance, they are subject to bias due time-variant or time-invariant omitted factors. Moreover, because they are point-in-time estimates, they do not reflect changes in debt over time within families (and, by association, potential repayment stresses), which are reflected in the slope estimates. For this reason, we primarily focus the discussion of our results on associations of household debt with trajectories (slopes) in child behavior problems rather than differences in initial levels of household debt.

HLM has several advantages over a fixed-effects regression approach, which also leverages within-child variation. Most notably, the fixed-effects approach compares average differences in the outcome for the same child when observed with different levels of household debt. Moreover, the models are only identified for children who experience variation in debt levels over time. In contrast, HLM allows us to estimate associations of both levels and change in debt over time. The slope estimates represent *rates of change* in behavior problems *over time* that are associated with variation in household debt. HLM also offers the flexibility to examine whether these associations are linear throughout childhood or vary by child age. Given a large literature documenting stronger associations of economic hardship with child development in the earlier years of childhood, we also estimate two specifications of piecewise HLM analyses. The first allows the slope parameter to differ between the earlier (ages 5 to 8) and later (ages 9 to 14) stages of middle childhood. The second also estimates the lagged effect of debt in the earlier period (ages 5 to 8) on behavior problems in the later period (ages 9 to 14), which provides insight into whether the effect of debt on child behavior problems in the earlier period exacerbates, remains constant, or fades out over time.

Results

Descriptive Statistics

Descriptive statistics for behavior problems and debt type for the full sample (averaged across all ages) and at child ages 5-6 and 13-14 are presented in Table 1. Trajectories in mean household debt from child age 5-6 to 13-14 are shown in Figure 1. On average, internalizing and externalizing behavior problems decline slightly (by about .01 SDs each), and each type of debt increases, between these ages. Approximately 73% of sample families had some debt, with 2%, 44%, 41%, and 38% holding education, home, auto, and unsecured debt, respectively. The proportion of families with total debt and unsecured debt declined slightly between child age 5-6 and 13-14, whereas the proportion with education debt, home debt, and auto debt increased. On the whole, families had a mean of \$58,000 in total debt when children were age 5-6 and nearly \$62,000 in total debt when they were age 13-14, an increase of about 7% in total debt. Median amounts of total debt (not shown in Table 1) were considerably lower, at \$14,153 and \$17,118 at child ages 5-6 and 13-14, respectively, although median total debt increased by more than 21% during this period.⁵ Additional descriptive statistics (see Appendix Table A1) reveal that children in families that have (any) debt have lower average internalizing and externalizing behavior problems scores than those in families that do not have debt. This is also true by whether families have any education, home, and auto debt. Children in families with any unsecured debt, however, exhibit greater average behavior problems than those in families with no unsecured debt.

Debtor and non-debtor families also differ on a host of characteristics (see Appendix Table A2). Families with any household debt are generally more socioeconomically advantaged

⁵ Median amounts of education, home, auto, and unsecured debt were zero at each child-age point.

than those with no household debt. They are disproportionately likely to be white, U.S. born, married, homeowners, and more highly educated. They exhibit greater academic aptitudes and higher levels of self-esteem and reported fewer nonworking weeks. Families with debt also provide greater cognitive stimulation and emotional support to children. These differences likely reflect that more advantaged individuals in this cohort have greater access to credit and are therefore more likely to take on debt. At the same time, families with debt are disproportionately likely to have a disabled child (Houle & Berger, 2017). Such differences highlight the importance of adjusting for a range of characteristics that may influence associations between debt and child socioemotional well-being. We took this approach in our HLM analyses, for which we present results below.

Full-Sample HLM Results

Our HLM results for the full sample are presented in Table 2. The intercept coefficients indicate no association of parental education debt when children were age 5-6 with their (initial) levels of internalizing or externalizing behavior problems at age 5-6. Home debt at age 5-6 is associated with fewer initial externalizing behavior problems in Model 1, but not in any of the other models, and auto debt at age 5-6 is associated with fewer initial internalizing behavior problems in Model 1, but in none of the other models. Most notably, unsecured debt at age 5-6 is associated with greater age 5-6 behavior problems in all models. Turning to the slope coefficients, we find no associations of education, home, or auto debt with children's behavior problems trajectories, but that an increase in unsecured debt is associated with increased internalizing and externalizing behavior problems over time. Taken together, these findings suggest both that parental unsecured debt at child age 5-6 is associated with greater initial levels

of child behavior problems at age 5-6, and that increases in unsecured debt over time are associated with increases over time in child behavior problems.⁶

The intercept coefficients are interpreted as the SD difference in age 5-6 behavior problems that is associated with a 1 log-point difference in debt. The slope coefficients are interpreted as the per-year SD change in behavior problems that is associated with a 1 log-point change in debt between child ages 5-6 and 13-14. They are multiplied by 8 to ascertain the total change in behavior problems over the 8-year period from ages 5-6 to 13-14. Figure 2 graphically presents trajectories in unsecured debt and child behavior problems for select scenarios based on the unsecured debt estimates from Model 2 in Table 2. The reference group for each scenario is a child whose family had no unsecured debt when they were ages 5-6 through 13-14. Consider for example, the scenario for externalizing behavior problems in which a family had the mean amount of unsecured debt for sample families when children were age 5-6 (\$3,717), when their child was age 5-6, and incurred \$522 in additional unsecured debt by the time their child was age 13-14, such that their unsecured debt was then equal the mean amount of unsecured debt (\$4,239) for sample families when children were age 13-14. Compared to a child whose family had no debt throughout the observation period, the child would have .22 SDs greater externalizing behavior problems at age 5-6 ($.027 * \ln(3717)$). The child would then experience a yearly increase of .031 SDs ($.005 * \ln(522)$) in externalizing behavior problems, for a total increase of .25 SDs ($8 * .031$) between ages 5-6 and 13-14. This would result in a total of .47 SDs greater externalizing behavior problems at age 13-14 ($.22 + .25$). These are large effects, and comparably larger than the coefficients for family income (see Appendix Table A3), which has been the focus of prior research on child well-being. Moreover, Blau (1999; see OLS results in

⁶ Results for the covariates are available in Appendix Table A3.

Table 1), for example, estimates that \$10,000 greater annual income is associated with .06 to .12 SDs fewer child behavior problems and that \$10,000 greater permanent income is associated with .16 to .21 SDs fewer behavior problems.

HLM Results: Does the Association between Debt and Socioemotional Well-Being Vary by Child Age?

Table 3 presents results from piecewise HLM analyses in which we allow the slope parameters to vary by child age. These models include the full set of controls and are thus comparable to Model 2 in Table 2, with the exception that they allow the effects of debt to vary by age. The first model divides child age into two periods, an early period (age 5 to 8) and a later period (age 9 to 14), and estimates separate slopes for each. In each model, the early and late period estimates for unsecured debt are jointly significant, while those for all other types of debt not. Moreover, the early and late period slope estimates significantly differ from each other for unsecured debt in all models, though not for any of the other types of debt in any model. The early period slope estimates for unsecured debt are about 8 times greater in magnitude than the later period estimates for internalizing behavior problems and about 3 times greater in magnitude for externalizing behavior problems, indicating that the association of unsecured debt with child behavior problems is considerably larger in the earlier than later years of middle childhood.

The second piecewise model assesses whether the association of early debt with behavior problems remains constant, fades, or exacerbates over time. Specifically, we examine the lagged effect of debt at ages 5-8 on child behavior problems from age 9-14. The lagged effects are statistically nonsignificant and close to zero in magnitude, with the exception that we find a lagged effect of education debt at ages 5-8 with increased externalizing behavior problems at ages 5-9, despite that the concurrent association of educational debt with externalizing behavior

problems at each period of childhood is negative. Of particular note, the estimates indicate that the significant association of greater unsecured debt with greater internalizing and externalizing behavior problems at ages 5-8 neither exacerbates nor fades out at ages 9-14.

Figure 3 graphically presents trajectories in unsecured debt and child behavior problems for select scenarios based on the unsecured debt estimates from Model 2 in Table 3. Again, the intercept estimates on the table are interpreted as the SD difference in behavior problems associated with a 1 log-point difference in unsecured debt and the slope estimates are interpreted as the per-year SD difference associated with a 1 log-point change in debt. The total slope effect for the earlier period (ages 5-6 to 7-8), then, is computed by multiplying the slope coefficient by 2; the later period slope coefficient is multiplied by 6 to compute the total slope effect between ages 9-10 and 13-14. Consider a family that had no unsecured debt when their child was age 5-6, but experienced an increase of \$3,664 in unsecured debt by the time the child was age 7-8, bringing them to the sample mean for unsecured debt, then accumulated no additional debt when the child was between ages 7-8 and 13-14. Compared to a child whose family had no unsecured debt throughout the period, their child would have equivalent externalizing behavior problems at age 5-6, but would experience an increase of .25 SDs ($.015 * \ln(3664)$) in externalizing behavior problems between ages 5-6 and 7-8. The child's behavior problems would then remain .25 SDs greater than those of a child with no family debt, neither exacerbating nor fading out, through age 13-14. Again, this is a large effect.

HLM Results: Is There Heterogeneity in the Association between Debt and Child Socioemotional Well-Being?

Results of subgroup analyses are shown in Tables 4 through 6 (descriptive statistics for each type of debt for each of the subgroups are available in Appendix Table A4). We examined

subgroup differences by race/ethnicity (Table 4), maternal education (Table 5), and child sex (Table 6), employing standard HLM estimation models that included the full set of intercept and slope controls (consistent with Model 2 in Table 2). We focus our discussion on the slope coefficients, as they are less subject to selection bias than the intercept estimates and represent trajectories in child well-being, rather than between-child differences. In models stratified by race/ethnicity (Table 4) we find that unsecured debt has a significantly larger association with greater externalizing behavior problems in black families than white families and that the magnitude of association in black families is about double that for white families. For maternal education (Table 5; a proxy for SES), we find that the association between unsecured debt and greater behavior problems is more than twice as large for children in families in which the mother has a high school or less education than in which she has greater educational attainment.⁷ Finally, we examined whether associations of debt with child socio-emotional well-being differ for boys and girls (Table 6). We found only one statistically significant difference: greater education debt was associated with fewer internalizing and externalizing behavior problems for boys, but not for girls. In addition, it is notable that the coefficient for unsecured debt and externalizing behavior problems is (about 50%) larger for boys than girls, although this difference is nonsignificant.⁸

Discussion

Despite that debt has now become a common aspect of household finances, there is scant

⁷ We also estimated separate models by concurrent marital status (married vs. unmarried). We found few significant differences in associations of debt with behavior problems by marital status. These results are available in Appendix Table A6.

⁸ As an additional robustness test, we also examined whether there was heterogeneity in associations of debt with child socioemotional well-being by family homeownership status given that different types of debt may be fungible, and particularly so for homeowners who are able borrow on their home in lieu of taking on, or in order to pay back higher cost unsecured debt. We find no significant variation in associations of unsecured debt with child behavior problems by homeowner status (see Appendix Table A5).

evidence about how various types and levels of debt may be associated with child well-being. Our primary finding that unsecured debt is associated with increased behavior problems is consistent with that from the only other study of which we are aware that considers these links. Berger and Houle (2016), using regression models with child-specific fixed effects, find the same pattern of associations. However, their empirical strategy considers only average differences in child behavior problems at different levels of debt, whereas we consider how, on average, trajectories in household debt are associated with trajectories in child behavior problems. We also separately consider internalizing and externalizing (rather than total) behavior problems, finding links between unsecured debt and each. Thus, our findings provide greater insight into the interplay between debt and child socioemotional development over time. They also suggest that previous mixed findings regarding the impact of debt on mental health and socioemotional well-being, including those of Berger and Houle, may be biased downwards, in part because they do not consider how debt is associated with trajectories of well-being over time. That is, while greater debt is associated with worse child socioemotional well-being at a given point in time, the magnitude of association appears to increase over time, as demonstrated by our slope coefficients. Thus, previous research may underestimate the association between unsecured debt and well-being if it does not consider that the burden of repayment and financial stress associated with such debt plays out over time.

A second key finding is that associations of unsecured debt with child socioemotional well-being tend to be largest in the earlier part of middle childhood (ages 5 to 8), relative to the latter part (ages 9 to 14), and remain relatively stable over time; that is, such increases in behavior problems associated with increased debt at younger ages appear to persist. This is consistent with prior research demonstrating that economic resources tend to have a larger

influence on younger than older children's development, potentially reflecting that younger children are particularly sensitive to the family environment (Magnuson & Votruba-Drzal, 2009; Shonkoff & Phillips, 2000). Somewhat surprisingly, we found no differences in associations of debt with internalizing or externalizing behavior problems by child sex. This stands in contrast to existing theory and prior evidence that led us to expect stronger overall associations among boys, who tend to be particularly sensitive to changes in the family environment (Zaslow & Hayes, 1986), as well as relatively larger associations between debt and externalizing behavior among boys, and between debt and internalizing behavior among girls (Leve et al., 2005). Future research should further examine potential age and sex differentials in this area.

Our third key finding is that the adverse associations of unsecured debt with child socioemotional well-being were particularly large in magnitude for children in black and lower SES families (as approximated by maternal educational attainment). That unsecured debt appears to have a more detrimental influence on socioemotional well-being for children in black families than white families and for children in lower- than higher-SES families raises the concern that rising unsecured debt in recent decades may have exacerbated racial and socioeconomic disparities in child well-being (Bolger et al., 1995; Eamon, 2000, 2001; Goosby, 2007; McLeod & Shanahan, 1993, 1996; Mistry et al., 2002; Pachter et al., 2006). As such, we find support for scholarly notions that debt may be an important resource for future investment for advantaged families, but less so for disadvantaged families, who tend to borrow with less agency, greater relative magnitude, and at greater cost (Dwyer et al., 2011, 2012; Sullivan et al., 2000). These differential aspects of indebtedness by race and SES may indicate that unsecured debt is particularly stress inducing among less-advantaged families. Importantly, because poor socioemotional development during childhood may lead to adverse outcomes throughout the life

course, in terms of health and mental health, socioeconomic well-being, and social mobility (Currie & Stabile, 1999, 2006; Fletcher, 2010; Fletcher & Wolfe, 2008; McLeod & Fettes, 2007), rising debt may contribute to growing intergenerational inequality. Future research should explore these issues in greater depth. It should also examine the potential mechanisms linking unsecured debt and child well-being, including parental functioning, parenting behaviors, and the quality of children's caregiving environments.

Our analyses have several limitations that should be considered in evaluating our results. First, our debt measures are self-reported, rather than based on administrative (lender) data, and thus measurement error is a concern. However, recent research suggests little evidence for systematic bias in borrower reports of debt when compared to lender reports (Brown et al., 2011). Second, our measures of both debt and children's behavior problems were drawn solely from mothers' reports. To the extent that there are systematic differences in mothers' *reporting* of children's behavior problems by their level of debt, rather than differences in actual behavior problems by level of household debt, our results will be biased. Third, our data do not include measures of two key components of debt, agency and cost, nor the key mechanisms hypothesized to link debt and child well-being, namely consumption and stress. Further exploring the role these key components and mechanisms are crucial subjects for future research. Fourth, our analyses focus on the roughly two-decade period leading up to the Great Recession. This period was characterized by rapid growth in all forms of debt. While the recession was characterized by declines in debt as a result of less credit availability, reduced consumer spending, and debt release through bankruptcy, debt levels are once again rising (Federal Reserve Bank of New York, 2018; Federal Reserve Board, 2018). Our synthetic age-cohort analyses control for year fixed effects, which adjust for time trends during the period of observation. However, we caution

that our results cannot be assumed to generalize to the period of or subsequent to the Great Recession. Considering associations of debt with child well-being during these periods is ripe for future research. Finally, despite that our analyses leverage both between-child and within-child variation and adjust for initial between-child differences in behavior problems when estimating within child trajectories in behavior problems as a function of trajectories in household debt, we cannot be sure that our estimates are causal in nature. Indeed, our intercept estimates are subject to bias due to unobserved time varying and time invariant factors, whereas our slope estimates are subject to bias due to time varying unobserved factors or time constant unobserved factors with time varying effects. Of particular concern, we are unable to observe parental health shocks that may have coincided with or led to indebtedness and also influenced child socioemotional well-being.

Despite these limitations, our analyses provide the most rigorous evidence to date regarding links between household debt and child development. Our findings suggest that debt is adversely associated with child socioemotional wellbeing, particularly for children in socially and economically disadvantaged families. That we find large associations of increased unsecured debt with increases in child behavior problems over time, particularly for disadvantaged children, is cause for concern given growing evidence of high and increasing levels of unsecured debt among disadvantaged families (Carr & Jayadev, 2015; Seamster & Charron-Chénier, 2017), coupled with the fact that children in disadvantaged families are already at risk for poor developmental outcomes throughout the life course (Duncan, Magnuson, & Votruba-Drzal, 2015; Duncan, Ziol-Guest, & Kalil, 2010; Magnuson & Votruba-Drzal, 2009; Magnuson, Waldfogel, & Washbrook, 2012). Future research should seek to understand the contexts and mechanisms linking unsecured debt to child behavior problems, and whether rising debt may

exacerbate social disparities in well-being. Promising lines of inquiry include examining associations of unsecured debt with both consumption and parental psychosocial functioning in areas such as stress, anxiety, and parenting behaviors, each of which may influence subsequent child well-being.

Table 1. Descriptive Statistics, socioemotional wellbeing and household debt at child ages 5-6 and 13-14

	Full Sample	Age 5-6	Age 13-14	t-test
<i>Socioemotional well-being:</i>				
Internalizing problems index (z-score)	.0000 (.9992)	.0068 (1.002)	-.0039 (1.00)	
Externalizing problems index (z-score)	.0000 (.9993)	.0041 (1.003)	-.0038 (.997)	
<i>Household debt:</i>				
% with debt	73.0%	73.4%	73.1%	
Total debt (2013 \$s)	58645 (93839)	57634 (87031)	61682 (99656)	**
% with education debt	2.4%	2.2%	3.0%	
Total education debt (2013 \$s)	273 (2731)	221 (2291)	325 (2968)	*
% with home debt	43.6%	43.4%	45.0%	
Total home debt (2013 \$s)	48983 (88850)	48524 (82360)	51120 (94085)	*
% with auto debt	41.0%	40.9%	41.8%	
Total auto debt (2013 \$s)	5553 (10090)	5173 (9497)	5997 (10695)	***
% with unsecured debt	37.5%	38.3%	37.2%	
Total unsecured debt (2013 \$s)	3837 (14244)	3717 (13006)	4239 (16655)	*
Observations	36,984	7,874	6,264	

Note. 36,984 child-year observations of 10,175 children. Percent of households with debt and mean amount of debt (and standard deviation) presented. Bivariate mean differences assessed using t-tests.

* p<.05, ** p<.01, *** p<.001.

Table 2. HLM results for associations of household debt with child behavior problems

	Internalizing Behavior Problems		Externalizing Behavior Problems	
	Model 1	Model 2	Model 1	Model 2
<i>Intercept:</i>				
Education debt (ln), age 5-6	0.006 (0.028)	0.008 (0.029)	0.023 (0.028)	0.028 (0.029)
Home debt (ln), age 5-6	-0.008 (0.005)	-0.003 (0.005)	-0.013** (0.005)	-0.007 (0.005)
Auto debt (ln), age 5-6	-0.015* (0.007)	-0.012 (0.007)	-0.013 (0.007)	-0.010 (0.007)
Unsecured debt (ln), age 5-6	0.024** (0.008)	0.022** (0.008)	0.030*** (0.008)	0.027*** (0.008)
<i>Slope:</i>				
Child age	0.008* (0.004)	0.015* (0.007)	-0.001 (0.004)	0.012 (0.007)
Education debt (ln)	-0.002 (0.003)	-0.003 (0.003)	-0.004 (0.003)	-0.005 (0.003)
Home debt (ln)	-0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)
Auto debt (ln)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)
Unsecured debt (ln)	0.003** (0.001)	0.003** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Intercept controls	yes	yes	yes	yes
Exogenous slope controls	yes	yes	yes	yes
Parenting intercept controls		yes		yes
Endogenous slope controls		yes		yes

Note: 36,984 biennial child-wave observations of 9,305 children. Coefficients and standard errors from HLM models are presented. Behavior problems are modeled in standard deviation units. *Intercept controls* include mother's race/ethnicity, mother's marital status, baseline education, mother is U.S. born, mother's age, family income (ln), percent weeks mother was unemployed in the last year, family size, number of children in the household, family owns its home, child is male, child born low birth weight, child disabled, mothers academic aptitude in 1980, mothers' number of fights in 1980, mother's self-esteem in 1980, and mother's locus of control in 1979. *Exogenous slope controls* are child age and mother's race/ethnicity. *Parenting intercept controls* include cognitive stimulation and emotional support. *Endogenous slope controls* include mother's marital status, mother's education, family income (ln), percent weeks mother was unemployed in the last year, and family owns its home. All models control for year of observation. Standard errors are adjusted for intra-cluster correlation of siblings.

* p<.05, ** p<.01, *** p<.001.

Table 3. Piecewise HLM results for associations of household debt with child behavior problems, concurrent effects

	Internalizing Behavior Problems		Externalizing Behavior Problems	
	Model 1	Model 2	Model 1	Model 2
	Slope Variation: Early vs. Late	Slope Variation: Early vs. Late with Lagged Early Effect	Slope Variation: Early vs. Late	Slope Variation: Early vs. Late with Lagged Early Effect
<i>Intercept:</i>				
Education debt (ln), age 5-6	0.010 (0.028)	0.007 (0.029)	0.029 (0.028)	0.023 (0.029)
Home debt (ln), age 5-6	-0.003 (0.005)	-0.003 (0.005)	-0.007 (0.005)	-0.007 (0.005)
Auto debt (ln), age 5-6	-0.012 (0.007)	-0.012 (0.007)	-0.010 (0.007)	-0.009 (0.007)
Unsecured debt (ln), age 5-6	0.021** (0.008)	0.021** (0.008)	0.026** (0.008)	0.026** (0.008)
<i>Slope:</i>				
Child age 7-8	0.017 (0.023)	0.018 (0.023)	0.014 (0.021)	0.014 (0.022)
Child age 9-10	0.041 (0.030)	0.042 (0.031)	0.030 (0.030)	0.030 (0.030)
Child age 11-12	0.084 (0.044)	0.085 (0.044)	0.063 (0.044)	0.063 (0.044)
Child age 13-14	0.128* (0.058)	0.129* (0.059)	0.105 (0.059)	0.105 (0.059)
Education debt (ln) age 5-8	-0.024* (0.011)	-0.018 (0.013)	-0.018 (0.013)	-0.004 (0.014)
Education debt (ln) age 9-14	-0.002 (0.003)	-0.003 (0.003)	-0.004 (0.003)	-0.005 (0.003)
Education debt (ln) at age 5-8, effect at age 9-14		0.006 (0.006)		0.012* (0.005)
Home debt (ln) age 5-8	-0.001 (0.002)	-0.001 (0.002)	-0.003 (0.002)	-0.003 (0.002)
Home debt (ln) age 9-14	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Home debt (ln) at age 5-8, effect at age 9-14		-0.000 (0.001)		0.000 (0.001)
Auto debt (ln) age 5-8	-0.002 (0.004)	-0.003 (0.004)	0.001 (0.003)	-0.001 (0.004)
Auto debt (ln) age 9-14	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)
Auto debt (ln) at age 5-8, effect at age 9-14		-0.001 (0.001)		-0.001 (0.001)
Unsecured debt (ln) age 5-8	0.016*** ^a (0.004)	0.016*** ^a (0.005)	0.015*** ^a (0.004)	0.016*** ^a (0.005)
Unsecured debt (ln) age 9-14	0.002* (0.001)	0.002* (0.001)	0.005*** (0.001)	0.005*** (0.001)
Unsecured debt (ln) at age 5-8, effect at age 9-14		-0.000 (0.001)		0.000 (0.001)

Note: 36,984 biennial child-wave observations of 9,305 children. Coefficients and standard errors from piecewise HLM models are presented. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see note to Table 2). Standard errors are adjusted for intra-cluster correlation of siblings.

^aSignificantly different from age 9-14 (p<.05).

* p<.05, ** p<.01, *** p<.001.

Table 4. HLM results for associations of household debt with child behavior problems, by race

	White		Black		Hispanic	
	Internalizing Behavior Problems	Externalizing Behavior Problems	Internalizing Behavior Problems	Externalizing Behavior Problems	Internalizing Behavior Problems	Externalizing Behavior Problems
<i>Intercept:</i>						
Education debt (ln), age 5-6	-0.017 (0.039)	0.019 (0.043)	0.042 (0.057)	0.023 (0.052)	0.021 (0.048)	0.041 (0.052)
Home debt (ln), age 5-6	-0.003 (0.007)	-0.009 (0.007)	0.007 (0.011)	-0.006 (0.010)	-0.021* (0.009)	-0.011 (0.010)
Auto debt (ln), age 5-6	-0.006 (0.009)	-0.000 (0.009)	-0.011 (0.016)	-0.023 (0.016)	-0.027 (0.014)	-0.022 (0.015)
Unsecured debt (ln), age 5-6	0.022* (0.011)	0.027* (0.011)	0.048** (0.017)	0.042* (0.018)	0.007 (0.017)	0.020 (0.018)
<i>Slope:</i>						
Child age	0.015 (0.018)	0.016 (0.022)	-0.010 (0.008)	0.014 (0.008)	0.014 (0.014)	0.019 (0.014)
Education debt (ln)	-0.003 (0.004)	-0.007 (0.004)	-0.002 (0.004)	-0.005 (0.004)	-0.002 (0.008)	0.002 (0.008)
Home debt (ln)	-0.003* (0.001)	-0.002 (0.001)	0.000 (0.002)	0.001 (0.002)	0.001 ^a (0.002)	0.000 (0.002)
Auto debt (ln)	0.002 (0.001)	0.001 (0.001)	-0.003 ^a (0.002)	-0.002 (0.002)	0.004* (0.002)	0.002 (0.002)
Unsecured debt (ln)	0.002 (0.001)	0.004*** (0.001)	0.003 (0.002)	0.008*** ^a (0.002)	0.003 (0.002)	0.004 (0.002)
Child-wave observations	17,732		11,537		7,715	

Note: 36,984 biennial child-wave observations of 9,305 children. Coefficients and standard errors from HLM models are presented. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see note to Table 2). Standard errors are adjusted for intra-cluster correlation of siblings.

* p<.05, ** p<.01, *** p<.001.

^aSignificantly different from white (p<.05; z-test for equality of coefficients).

Table 5. HLM results for associations of household debt with child behavior problems, by maternal education

	High School or Less		More than High School	
	Internalizing Behavior Problems	Externalizing Behavior Problems	Internalizing Behavior Problems	Externalizing Behavior Problems
<i>Intercept:</i>				
Education debt (ln; \$1000s), age 5-6	0.016 (0.077)	0.045 (0.076)	0.009 (0.031)	0.023 (0.030)
Home debt (ln; \$1000s), age 5-6	-0.011 (0.007)	-0.015* (0.007)	0.007 ^a (0.007)	0.003 ^a (0.007)
Auto debt (ln; \$1000s), age 5-6	-0.012 (0.010)	-0.010 (0.010)	-0.013 (0.009)	-0.011 (0.009)
Unsecured debt (ln; \$1000s), age 5-6	0.033** (0.012)	0.034** (0.012)	0.013 (0.010)	0.023* (0.011)
<i>Slope:</i>				
Child age	0.014 (0.009)	0.011 (0.009)	-0.024 (0.111)	-0.084 (0.119)
Education debt (ln; \$1000s)	-0.005 (0.010)	-0.000 (0.010)	-0.001 (0.003)	-0.003 (0.003)
Home debt (ln; \$1000s)	-0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Auto debt (ln; \$1000s)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Unsecured debt (ln; \$1000s)	0.003* (0.001)	0.007*** (0.001)	0.002 (0.001)	0.003* ^a (0.001)
Child-wave observations	24,040		12,944	

Note: 36,984 biennial child-wave observations of 9,305 children. Coefficients and standard errors from HLM models are presented. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see note to Table 2). Standard errors are adjusted for intra-cluster correlation of siblings.

* p<.05, ** p<.01, *** p<.001.

^aSignificantly different from high school or less (p<.05; z-test for equality of coefficients).

Table 6. HLM results for associations of household debt with child behavior problems, by child sex

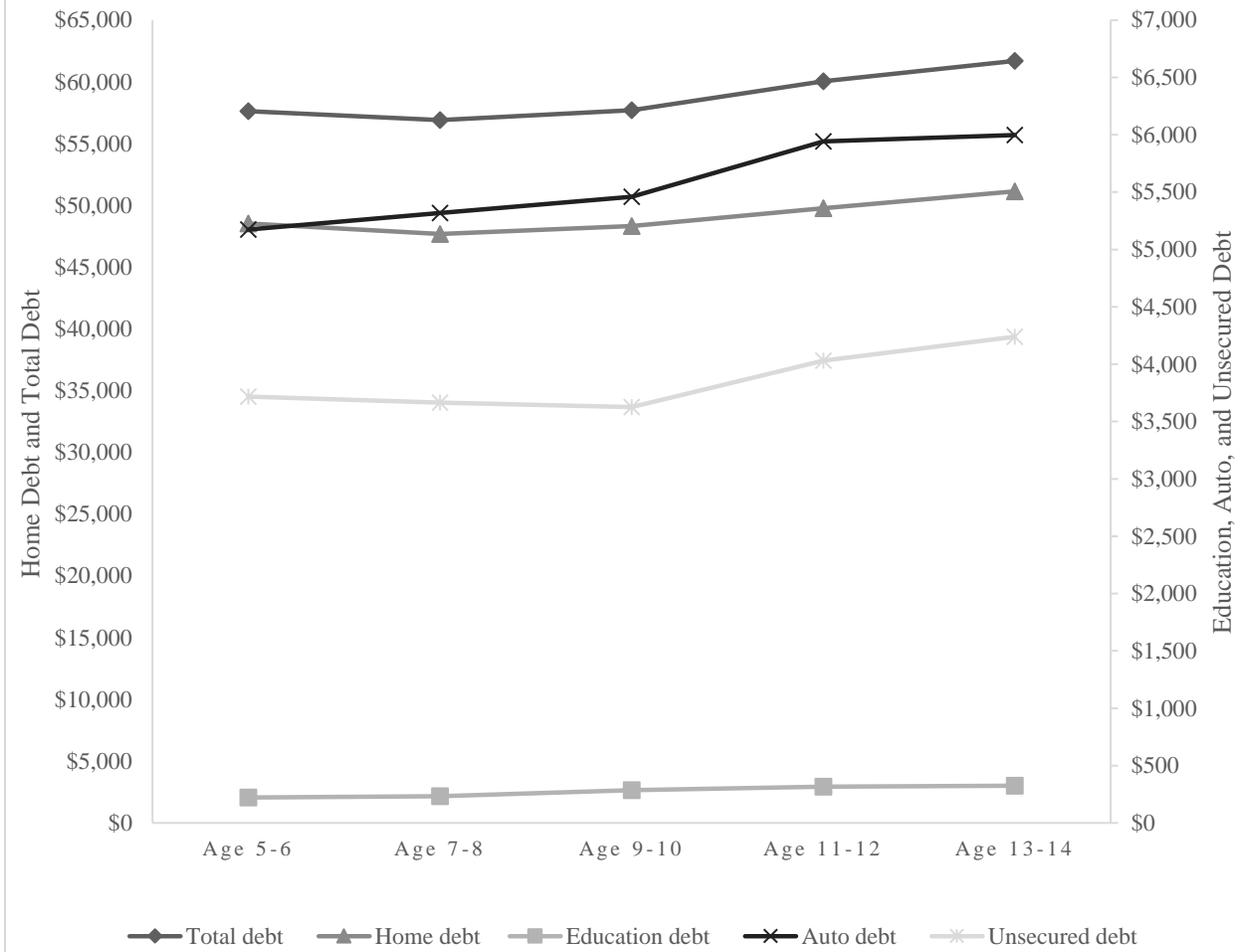
	Male		Female	
	Internalizing Behavior Problems	Externalizing Behavior Problems	Internalizing Behavior Problems	Externalizing Behavior Problems
<i>Intercept:</i>				
Education debt (ln), age 5-6	0.029 (0.039)	0.049 (0.044)	-0.013 (0.035)	0.004 (0.033)
Home debt (ln), age 5-6	-0.005 (0.007)	-0.009 (0.007)	-0.002 (0.007)	-0.004 (0.006)
Auto debt (ln), age 5-6	-0.016 (0.009)	-0.013 (0.010)	-0.008 (0.009)	-0.006 (0.009)
Unsecured debt (ln), age 5-6	0.020 (0.012)	0.031** (0.012)	0.025* (0.011)	0.024* (0.011)
<i>Slope:</i>				
Child age	0.011 (0.010)	0.011 (0.009)	0.018 (0.011)	0.012 (0.010)
Education debt (ln)	-0.008* (0.004)	-0.012** (0.004)	0.002 ^a (0.004)	0.003 ^a (0.004)
Home debt (ln)	-0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Auto debt (ln)	0.002 (0.001)	-0.000 (0.001)	0.000 (0.001)	0.001 (0.001)
Unsecured debt (ln)	0.003 (0.001)	0.006*** (0.001)	0.003* (0.001)	0.004*** (0.001)
Child-wave observations	18,898		18,086	

Note: 36,984 biennial child-wave observations of 9,305 children. Coefficients and standard errors from HLM models are presented. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see note to Table 2). Standard errors are adjusted for intra-cluster correlation of siblings.

* p<.05, ** p<.01, *** p<.001.

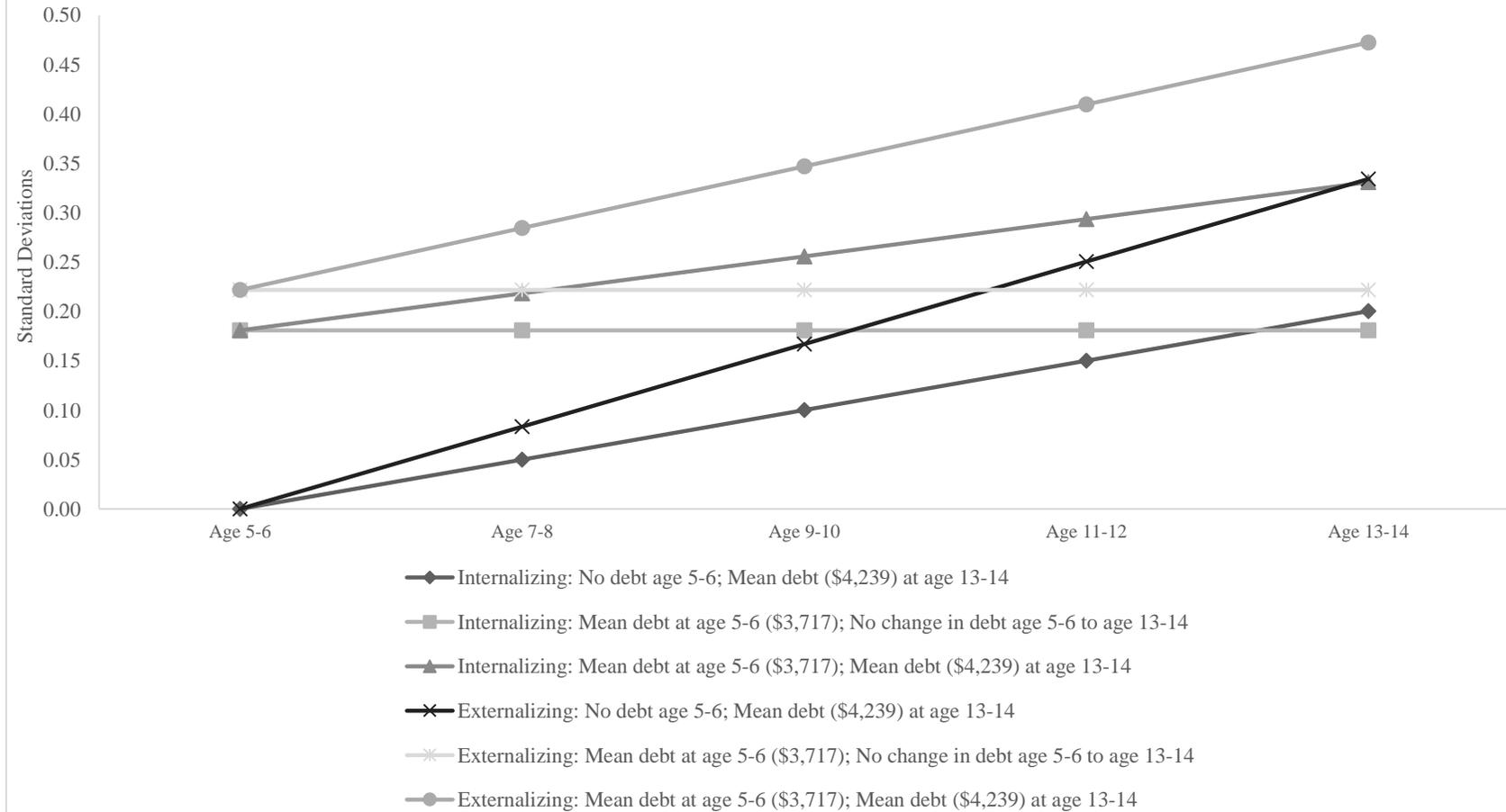
^aSignificantly different from male (p<.05; z-test for equality of coefficients).

Figure 1. Household debt trajectories by child age



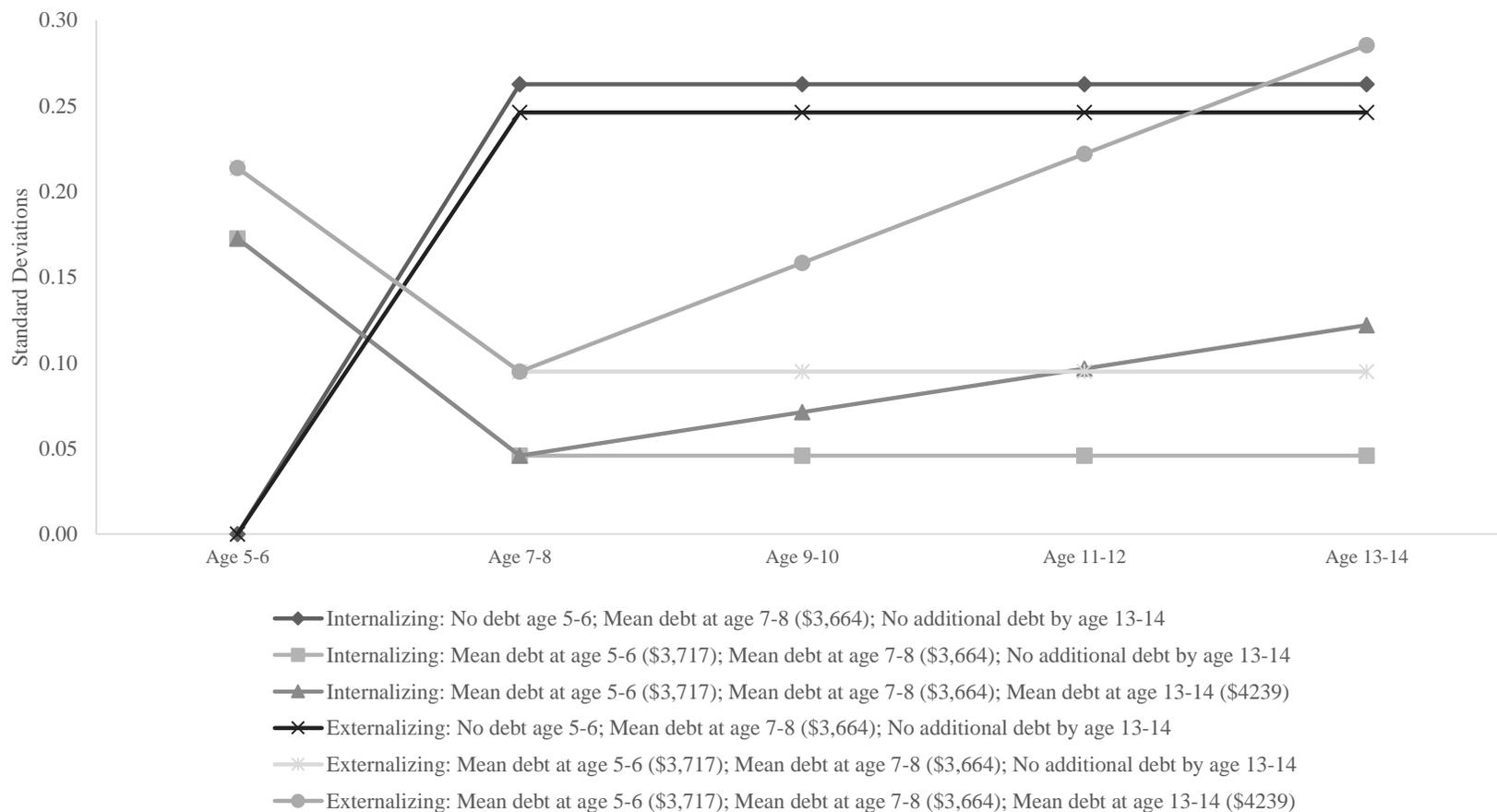
Note. Debt is in constant 2013 dollars.

Figure 2. Trajectories in Unsecured Debt and Child Behavior Problems from Ages 5-6 to 13-14, Select Scenarios Using Standard HLM Estimates



Note. Based on internalizing and externalizing behavior problems estimates for unsecured debt from Model 2 in Table 2. Reference group is children whose families had zero unsecured debt at any point between ages 5-6 and 13-14.

Figure 3. Trajectories in Unsecured Debt and Child Behavior Problems from Ages 5-6 to 13-14, Select Scenarios Using Piecewise HLM Estimates



Note. Based on internalizing and externalizing behavior problems estimates for unsecured debt from Model 1 in Table 3. Reference group is children whose families had zero unsecured debt at any point between ages 5-6 and 13-14.

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