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

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Abstract

Debt is now a substantial aspect of family finances. Yet, research on how household debt is linked with child development has been limited. We use data from the National Longitudinal Survey of Youth 1979 cohort and hierarchical linear models to estimate associations of amounts and types of parental debt (home, education, auto, unsecured/uncollateralized) with child socioemotional well-being. We find that unsecured debt is associated with growth in child behavior problems, 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.

Keywords Household debt · Child well-being · Hierarchical linear models · National Longitudinal Survey of Youth · Unsecured debt

Introduction

Over the last half-century, inflation-adjusted household debt has increased dramatically in the United States and 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 has

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indicated that debt is associated with key demographic indicators of fertility and family formation, and it may contribute to social disparities by race/ethnicity and educational attainment (Addo 2014; Houle and Addo 2018; Min and Taylor 2018). Thus, differences in levels and effects of household debt have the potential to contribute to "diverging destinies" (McLanahan 2004) in life trajectories by race and socioeconomic status (SES). 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 and Lavrakas 2000). An expansive literature has documented that limited socioeconomic resources—low income, lack of wealth, poverty, and economic hardship—are negatively associated with child development (Aber et al. 1997; Bradley and Corwyn 2002; Brooks-Gunn and Duncan 1997; McLoyd 1998; Shanks 2007; Strochschein 2005). Recent evidence suggests that these associations may be causal (Akee et al. 2010; Costello et al. 2003; Dahl and Lochner 2012; Duncan et al. 2011; Milligan and 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 of parental debt (home, education, auto, unsecured/uncollateralized) 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 interrogated how debt affects borrowers' well-being; our work examines whether debt may spill over 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 and Houle 2016; Berger et al. 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 and 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 SES (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 twentieth century, spurred in part by increased access to credit and growth of credit markets 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 debt (e.g., credit card, utility, medical, unpaid bills), mortgages, and student loan debt (Ryan et al. 2011; Xiao and Yao 2011a, 2011b). High levels of debt threaten financial security and leave households vulnerable to declines in income and asset values (Board of Governers of the Federal Reserve System 2017; Dynan and 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/uncollateralized debt is more expensive than secured debt. Cost and magnitude are also linked in that higher cost debt compounds more quickly.

We posit that agency, magnitude, and cost are key interrelated aspects of debt accumulation that tend to vary by SES. For example, Shah et al. (2010) suggested that having insufficient funds to meet basic needs encourages borrowing, even at a high cost. Moreover, because low-SES households frequently lack insurance against adverse events, they are disproportionately likely to borrow in response to economic shocks, often using a high-cost mechanism (Barr 2012; Sullivan 2008). Adverse health events, for example, are associated with increased unsecured debt among disadvantaged (but not advantaged) households (Babiarz et al. 2012). These factors imply that high-SES households exercise greater agency in borrowing than do 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 (e.g., 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 (Collins et al. 2009). At the same time, however, unsecured debt—including medical debt—is a primary cause of bankruptcy (Miller 2011; Sullivan et al. 2000).

Rising debt has implications for economic stability by race and SES, particularly considering differences in agency, cost, and magnitude between advantaged and disadvantaged groups. Although access to credit has increased for all U.S. 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 and Charron-Chénier 2017; Williams et al. 2005). Most notably, however, expanded access to unsecured/uncollateralized credit has been linked to particularly large and disproportionate growth in debt burden for low-SES and minority households (Bird et al. 1999; Durkin 2000; Houle 2014b; Wagmiller 2003). Despite evidence suggesting that low-SES and minority households, on average, have less absolute debt than their more advantaged counterparts, the former 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 and Lavrakas 2000; 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 et al. 2016; Houle 2014a; Houle and Addo 2018).

Why families borrow also varies considerably by race and SES. 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 et al. 2011; Leicht and Fitzgerald 2014; Mishel et al. 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 an investment strategy (Dwyer et al. 2011, 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 among debt, inequality, and well-being, and whether debt may exacerbate adverse outcomes associated with social disadvantage (Carr and Jayadev 2015). Disparities in debt amounts and characteristics by race and SES also highlight the importance of examining specific *types* of debt as well as 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 well-being is grounded in social stress theory (Pearlin 1989) and the family stress model (Conger and 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 well-being in turn leads to poorer family functioning, including greater intrafamilial conflict. Borrowing facilitates the acquisition of resources to respond to adverse financial shocks, smooth consumption, purchase high-cost necessities, and make long-term investments (Dynan and Kohn 2007). As such, taking on debt has the potential to 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, when used for immediate consumption (rather than investment), and when 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 directly through consumption, and indirectly through its influence on parental stress and functioning (Simons et al. 1994). Economic stress is associated with the use of unproductive coping strategies and making decisions that incur high future costs (Lea et al. 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 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 et al. 1995; Eamon 2000; Eamon and Zuehl 2001; Goosby 2007; McLeod and Shanahan 1993; Mistry et al. 2002; Pachter et al. 2006; Strochschein 2005; Tracy et al. 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 and Berger 2017; McCloud and Dwyer 2011; 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 earlier), the former may experience greater stress from their debt burdens.

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

One potential reason for these inconsistent findings is that many studies have focused either on overall debt or 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

(e.g., 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 et al. (2016), for example, found that increases in unsecured 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) used NLSY79 data and ordinary least squares (OLS) 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 considered only average differences in child behavior problems at different levels of debt. It did 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 and best understood and analyzed via a developmental approach to behavioral trajectories rather than by snapshots of behavior at given points in time (Costello and Angold 2000; Kraemer et al. 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 estimated associations of particular types of debt with children's average behavior problems, overall, we separately consider associations of debt with internalizing and externalizing behaviors, and we 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 and 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 et al. 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 5–14, 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 nonfamilial relationships growing in importance over time. Consistent with this notion, empirical evidence has indicated that younger children are particularly sensitive to family economic disadvantage and its influences on the caregiving environment (Magnuson and Votruba-Drzal 2009; Shonkoff and 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 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 and Hayes 1986). As such, links between debt and child socioemotional well-being are generally 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 et al. 2005). Thus, associations between debt and internalizing behavior problems are expected to be larger in magnitude for girls, 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 earlier. 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, 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. Household debt, SES, life events, parental functioning, and child well-being 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 have relied 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 et al. 2013). Only a handful of studies have used more sophisticated identification strategies (Bridges and Disney 2010; Gathergood 2012; Keese and Schmitz 2014; Leung and Lau 2017; Walsemann et al. 2015). Yet, all but one focused on adult outcomes, few used data from the United States, and most have other important methodological limitations (Richardson et al. 2013). Our HLM strategy, described in the Empirical Strategy section, 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 household debt and its association with changes in child socioemotional well-being over time, our study improves on prior work that examined debt at a single point in time, and better captures the debt accumulation and repayment processes that may be consequential for well-being (Sun and 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 14–21 in 1979 and has followed them 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 1986–2008, 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 and Kohn 2007; Federal Reserve Board 2007).

We limit our sample to children aged 5–15, ages at which the socioemotional well-being measure (behavior problems index) on which we focus was administered to their mothers. We identify 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-impute 15 data sets using the *ice* command in Stata 15.[1] We organize 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.

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[1] We replaced missing values for ages 5-6 debt with debt at ages 3–4 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.

Measures

Socioemotional Well-being

Children's internalizing and externalizing behavior problems scores on the behavioral problems index (BPI) (Peterson and Zill 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-standardize children's raw scores on these measures in three-month child age intervals to have a mean of 0 and standard deviation (SD) of 1 such that in our HLM analyses, we model BPI scores in age-standardized 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. Auto debt includes loans for the purchase of a vehicle. Unsecured debt includes all other types of debt, such as credit card (bank or store) 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 were 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 was differentiated from other types of unsecured debt in the NLSY79 in 2004 and 2008, accounting for approximately two-thirds of all unsecured debt in those years.

We apply a 98th percentile top code to each debt amount and adjust 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 et al. 2015).

Covariates

We use two categories of covariates: time-invariant and time-varying. Time-invariant characteristics include measures assessed at age 5 or younger, including the mother's race/ethnicity (black, Hispanic, or white/other race (reference group)); mother's nativity

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[2] The BPI consists of 10 internalizing behavior problems items for children ages 4–11, 6 internalizing behavior problems items for children aged 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 aged 12 and above.

status; mother's age; household size; number of children in the household; mother's academic aptitude (age-standardized Armed Forces Qualifying Test score in 1980); number of fights mother had at work or school (a proxy for impulsivity, measured in 1980); mother's locus of control (measured in 1979; range = 4–16; z score);[3] mother's self-esteem (measured in 1980; range = 6–30; z score);[4] and mother's percentile scores on the cognitive stimulation and emotional support subscales of the HOME assessment of the quality of the caregiving environment (measured at ages 3–4; z score). Other measures are focal child's 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); mother's educational attainment (less than a high school diploma, high school diploma (reference group), some college, four-year college degree or more); percentage 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 use HLM (Raudenbush and Bryk 2002) to simultaneously estimate children's initial levels of behavior problems at ages 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) is estimated as a continuous linear parameter. The models take the following form:

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

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 ages 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

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

$$BP_{1i} = B_{t0} + B_{t1}DEBT_{ti} + B_{t3}TICONTS_{0i} + B_{t4}TVCONTS_{ti} + E_{1i}. \qquad (1b)$$

Equation (1a) indicates that the initial level (BP_{0i}) of behavior problems is a function of ages 5–6 measures of initial education, home, auto, and unsecured debt ($DEBT_{-1i}$); intercept controls (measured at baseline; $ICONTS_{0i}$); lagged (ages 3–4) measures of parental cognitive stimulation and emotional support ($PARENT_{-1i}$); and a random error

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[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/-disapproval. It was measured in the NLSY in 1980 using the Rosenberg Self-Esteem Scale.

term (E_{0i}). As indicated by Eq. (1b), the subsequent linear slope (BP_{1i}) in behavior problems is a function of debt at ages 5–6 through 13–14 ($DEBT_{ti}$), time-invariant slope controls ($TICONTS_{0i}$), time-varying slope controls ($TVCONTS_{ti}$), and a random error term (E_{1i}). The key parameter of interest is B_{t1}, 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 cluster the standard errors to adjust for nonindependent observations (intracluster correlation) of siblings.

We estimate two additive versions of the model. In addition to the initial (ages 5–6) and concurrent debt measures, Model 1 includes an extensive set of time-invariant intercept controls measured at ages 5–6 or before and a parsimonious set of exogenous slope controls (child's age and mother's race/ethnicity). Model 2 adds lagged (ages 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, percentage of 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 mother's race/ethnicity, mother's education (which we conceptualize as a relatively time-stable proxy measure of SES), and child's 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 ages 5–6. They are subject to omitted variable bias due to unmeasured factors associated with both household debt and child socioemotional well-being. The within-child (slope) estimates compare children with 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 as 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 to 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 identified only for those children who experienced 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 5–8) and later (ages 9–14) stages of middle childhood. The second also estimates the lagged effect of debt in the earlier period (ages 5–8) on behavior problems in the later period (ages 9–14), which provides insight into whether the effect of debt on child behavior problems in the earlier period exacerbates, remains constant, grows less, 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 ages 5–6 to 13–14 are shown in Fig. 1. On average, internalizing and externalizing behavior problems declined slightly (by about 0.01SD each) and each type of debt increased 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 children ages 5–6 and 13–14, whereas the proportion with education, home, and auto debt increased. On the whole, families had a mean of $58,000 in total debt when children were aged 5–6 and nearly $62,000 in total debt when they were aged 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 for 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 Table A1, online appendix) reveal that children in families that had any debt had lower average internalizing and externalizing behavior problems scores than those in families that did not have debt. This is also true by whether families had 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 nondebtor families also differ on a host of characteristics (see Table A2, online appendix). Families with any household debt are generally more socioeconomically advantaged 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 non-working 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 and 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 take this approach in our HLM analyses, for which we present results in the next section.

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[5] Median amounts of education, home, auto, and unsecured debt were 0 at each child age.

Table 1 Descriptive statistics, socioemotional well-being and household debt at child ages 5–6 and 13–14

	Full Sample	Ages 5–6	Ages 13–14	t Test
Socioemotional Well-being				
Internalizing problems index	0.0000	0.0068	–0.0039	
	(0.9992)	(1.002)	(1.00)	
Externalizing problems index	0.0000	0.0041	–0.0038	
	(0.9993)	(1.003)	(0.997)	
Household Debt				
% with debt	73.0	73.4	73.1	
Total debt (2013 $s)	58,645	57,634	61,682	**
	(93,839)	(87,031)	(99,656)	
% with education debt	2.4	2.2	3.0	
Total education debt (2013 $s)	273	221	325	*
	(2,731)	(2,291)	(2,968)	
% with home debt	43.6	43.4	45.0	
Total home debt (2013 $s)	48,983	48,524	51,120	*
	(88,850)	(82,360)	(94,085)	
% with auto debt	41.0	40.9	41.8	
Total auto debt (2013 $s)	5,553	5,173	5,997	***
	(10,090)	(9,497)	(10,695)	
% with unsecured debt	37.5	38.3	37.2	
Total unsecured debt (2013 $s)	3,837	3,717	4,239	*
	(14,244)	(13,006)	(16,655)	
Number of Observations	36,984	7,874	6,264	

Notes: Data are based on 36,984 child-year observations of 10,175 children. Percentages or means (with standard deviations in parentheses) are presented. Bivariate mean differences are assessed using *t* tests. Internalizing and externalizing behavior problems index scores have been age standardized in the three-month intervals to have a mean of 0 and standard deviation of 1 within the full analysis sample.

*p < .05; **p < .01; ***p < .001

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 aged 5–6 with their (initial) levels of internalizing or externalizing behavior problems at ages 5–6. Home debt at ages 5–6 is associated with fewer initial externalizing behavior problems in Model 1 but not in any of the other models. Auto debt at ages 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 ages 5–6 is associated with greater behavior problems at ages 5–6 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 we find 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 ages 5–6 is associated with
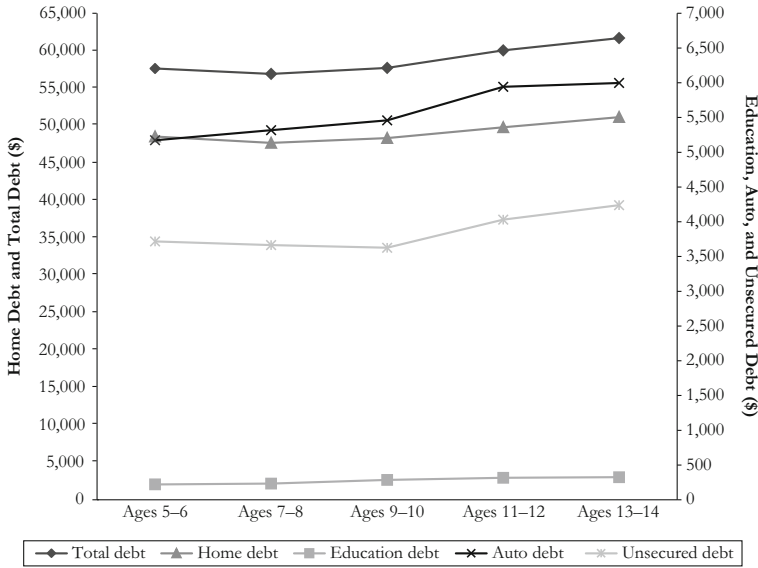
Fig. 1 Household debt trajectories, by child age. Debt is in constant 2013 dollars.

greater initial levels of child behavior problems at ages 5–6 and that increases in unsecured debt over time are associated with increases in child behavior problems over time.[6]

The intercept coefficients are interpreted as the SD difference in behavior problems at ages 5–6 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. These coefficients are multiplied by 8 to ascertain the total change in behavior problems over the eight-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 aged 5–6 ($3,717), when their own child was aged 5–6, and incurred $522 in additional unsecured debt by the time their child was ages 13–14, such that their unsecured debt was then equal the mean amount of unsecured debt ($4,239) for sample families when children were ages 13–14. Compared with a child whose family had no debt throughout the observation period, the child would have 0.22 SD greater externalizing behavior problems at ages 5–6 (0.027 × ln(3,717)). The child would then experience a yearly increase of 0.031 SD (0.005 × ln(522)) in externalizing behavior problems, for a total increase of 0.25 SD (8 × 0.031) between ages 5–6 and 13–14. This would result in a total of 0.47 SD greater externalizing behavior problems at ages 13–14 (0.22 + 0.25). These effects are large and are larger than the coefficients for family income (see Table A3, online appendix), which has been the focus of prior research on

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[6] Results for the covariates are available in Table A3 (online appendix).

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
Intercept				
Education debt (ln), ages 5–6	0.006	0.008	0.023	0.028
	(0.028)	(0.029)	(0.028)	(0.029)
Home debt (ln), ages 5–6	–0.008	–0.003	–0.013**	–0.007
	(0.005)	(0.005)	(0.005)	(0.005)
Auto debt (ln), ages 5–6	–0.015*	–0.012	–0.013	–0.010
	(0.007)	(0.007)	(0.007)	(0.007)
Unsecured debt (ln), ages 5–6	0.024**	0.022**	0.030***	0.027***
	(0.008)	(0.008)	(0.008)	(0.008)
Slope				
Child age	0.008*	0.015*	–0.001	0.012
	(0.004)	(0.007)	(0.004)	(0.007)
Education debt (ln)	–0.002	–0.003	–0.004	–0.005
	(0.003)	(0.003)	(0.003)	(0.003)
Home debt (ln)	–0.000	–0.001	0.000	–0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Auto debt (ln)	0.001	0.001	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Unsecured debt (ln)	0.003**	0.003**	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(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

Notes: Data are based on 36,984 biennial child-wave observations of 9,305 children. Behavior problems are modeled in standard deviation units. *Intercept controls* include mother's race/ethnicity, mother's marital status, mother's baseline education, mother is U.S.-born, mother's age, family income (ln), percentage of weeks mother was unemployed in the last year, family size, number of children in the household, family owns its home, child is male, child had low birth weight, child is disabled, mother's academic aptitude in 1980, mother's number of fights at work or school in 1980, mother's self-esteem in 1980, and mother's locus of control in 1979. *Exogenous slope controls* are child's 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), percentage of weeks mother was unemployed in the last year, and family owns its home. All models control for year of observation. Standard errors, adjusted for intracluster correlation of siblings, are shown in parentheses.

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

child well-being. Moreover, Blau (1999: table 1, OLS results), for example, estimated that $10,000 greater annual income is associated with 0.06 to 0.12 SD fewer child behavior problems and that $10,000 greater permanent income is associated with 0.16 to 0.21 SD fewer behavior problems.
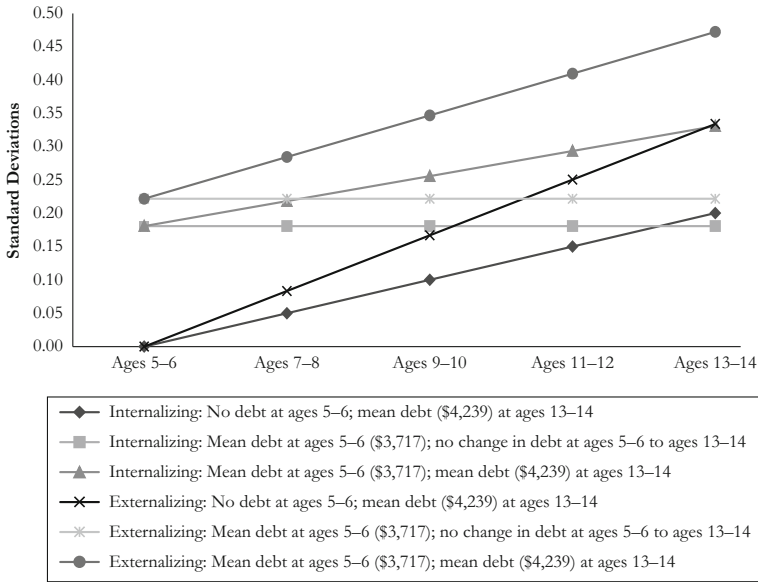
Fig. 2 Trajectories in unsecured debt and child behavior problems from ages 5–6 to 13–14: select scenarios using standard HLM estimates. Data are based on estimates of internalizing and externalizing behavior problems for unsecured debt from Model 2 in Table 2. The reference group is children whose families had zero unsecured debt at any point between ages 5–6 and 13–14.

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 with 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 (ages 5–8) and a later period (ages 9–14)—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 are not. Moreover, the early and late period slope estimates significantly differ from each other for unsecured debt in all models, although not for any of the other types of debt in any model. The early period slope estimates for unsecured debt are about eight times greater in magnitude than the later period estimates for internalizing behavior problems and about three 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, decreases, or exacerbates over time. Specifically, we examine the lagged effect of debt at ages 5–8 on child behavior problems at ages 9–14. The lagged effects are statistically nonsignificant and close to 0 in magnitude, with the exception that we find a lagged effect of

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

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

Table 3 (continued)

	Internalizing Behavior Problems		Externalizing Behavior Problems	
	Model 1 Slope Variation: Early vs. Late	Model 2 Slope Variation: Early vs. Late With Lagged Early Effect	Model 1 Slope Variation: Early vs. Late	Model 2 Slope Variation: Early vs. Late With Lagged Early Effect
Unsecured debt (ln) ages 5–8	0.016***a	0.016***a	0.015***a	0.016***a
	(0.004)	(0.005)	(0.004)	(0.005)
Unsecured debt (ln) ages 9–14	0.002*	0.002*	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Unsecured debt (ln) at ages 5–8, effect at ages 9–14		–0.000		0.000
		(0.001)		(0.001)

Notes: Data are based on 36,984 biennial child-wave observations of 9,305 children. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see notes to Table 2). Standard errors, adjusted for intracluster correlation of siblings, are shown in parentheses.

[a] Significantly different from ages 9–14 ($p < .05$).

*$p < .05$; **$p < .01$; ***$p < .001$

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 declines 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 aged 5–6 but experienced an increase of $3,664 in unsecured debt by the time the child was aged 7–8, bringing them to the sample mean for unsecured debt. Then, the family accumulated no additional debt when the child was between ages 7–8 and 13–14. Compared with a child whose family had no unsecured debt throughout the period, their child would have equivalent externalizing behavior problems at ages 5–6 but would experience an increase of 0.25 SD ($0.015 \times \ln(3{,}664)$) in externalizing behavior problems between ages 5–6 and 7–8. The child's behavior problems would then remain 0.25 SD greater than those of a child with no family debt, neither exacerbating nor declining over time, through ages 13–14. Again, this is a large effect.
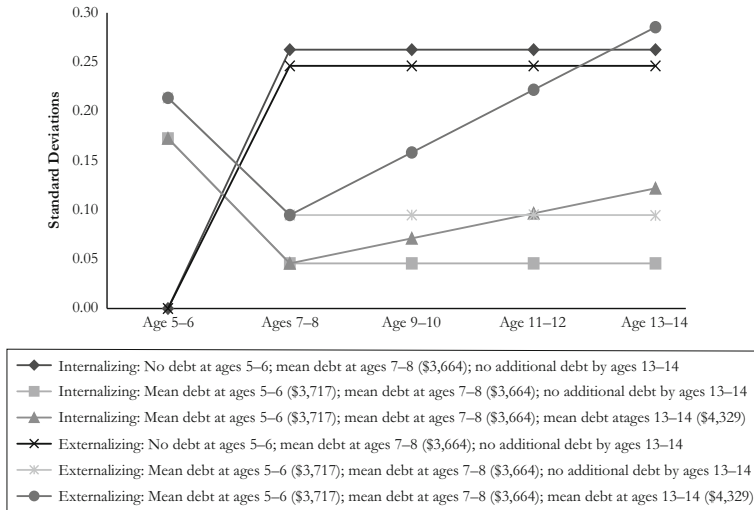
Fig. 3 Trajectories in unsecured debt and child behavior problems from ages 5–6 to 13–14: select scenarios using piecewise HLM estimates. Data are based on estimates of internalizing and externalizing behavior problems for unsecured debt from Model 1 in Table 3. The reference group is children whose families had zero unsecured debt at any point between ages 5–6 and 13–14.

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

Results of subgroup analyses are shown in Tables 4, 5, and 6. (Descriptive statistics for each type of debt for each subgroup are available in Table A4 of the online appendix.) We examine subgroup differences by race/ethnicity (Table 4), maternal education (Table 5), and child sex (Table 6), employing standard HLM estimation models that include the full set of intercept and slope controls (consistent with Model 2 in Table 2). We focus our discussion on the slope coefficients because 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 (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 (Table 5).[7] Finally, we examine whether associations of debt with child ssocioemotional well-being differ for boys and girls (Table 6). We find

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[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 Table A6 (online appendix).

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
Intercept						
Education debt (ln), ages 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), ages 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), ages 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), ages 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)
Slope						
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	

Notes: Data are based on 36,984 biennial child-wave observations of 9,305 children. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see notes to Table 2). Standard errors, adjusted for intracluster correlation of siblings, are shown in parentheses.

[a] Significantly different from white ($p < .05$; z test for equality of coefficients).

$*p < .05$; $**p < .01$; $***p < .001$

only one statistically significant difference: greater education debt is 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]

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[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, particularly 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 found no significant variation in associations of unsecured debt with child behavior problems by homeowner status (see Table A5, online appendix).

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
Intercept				
Education debt (ln; $1,000s), ages 5–6	0.016 (0.077)	0.045 (0.076)	0.009 (0.031)	0.023 (0.030)
Home debt (ln; $1,000s), ages 5–6	–0.011 (0.007)	–0.015* (0.007)	0.007[a] (0.007)	0.003[a] (0.007)
Auto debt (ln; $1,000s), ages 5–6	–0.012 (0.010)	–0.010 (0.010)	–0.013 (0.009)	–0.011 (0.009)
Unsecured debt (ln; $1,000s), ages 5–6	0.033** (0.012)	0.034** (0.012)	0.013 (0.010)	0.023* (0.011)
Slope				
Child age	0.014 (0.009)	0.011 (0.009)	–0.024 (0.111)	–0.084 (0.119)
Education debt (ln; $1,000s)	–0.005 (0.010)	–0.000 (0.010)	–0.001 (0.003)	–0.003 (0.003)
Home debt (ln; $1,000s)	–0.001 (0.001)	0.000 (0.001)	–0.001 (0.001)	–0.001 (0.001)
Auto debt (ln; $1,000s)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Unsecured debt (ln; $1,000s)	0.003* (0.001)	0.007*** (0.001)	0.002 (0.001)	0.003*[a] (0.001)
Child-Wave Observations	24,040		12,944	

Notes: Data are based on 36,984 biennial child-wave observations of 9,305 children. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see notes to Table 2). Standard errors, adjusted for intracluster correlation of siblings, are shown in parentheses.

[a] Significantly different from high school or less ($p < .05$; z test for equality of coefficients).

*$p < .05$; **$p < .01$; ***$p < .001$

Discussion

Despite that debt has now become a common aspect of U.S. household finances, there is scant 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 considered these links. Berger and Houle (2016), using regression models with child-specific fixed effects, found the same pattern of associations. However, their empirical strategy considered 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

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
Intercept				
Education debt (ln), ages 5–6	0.029 (0.039)	0.049 (0.044)	–0.013 (0.035)	0.004 (0.033)
Home debt (ln), ages 5–6	–0.005 (0.007)	–0.009 (0.007)	–0.002 (0.007)	–0.004 (0.006)
Auto debt (ln), ages 5–6	–0.016 (0.009)	–0.013 (0.010)	–0.008 (0.009)	–0.006 (0.009)
Unsecured debt (ln), ages 5–6	0.020 (0.012)	0.031** (0.012)	0.025* (0.011)	0.024* (0.011)
Slope				
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	

Notes: Data are based on 36,984 biennial child-wave observations of 9,305 children. Behavior problems are modeled in standard deviation units. Models include all controls intercept and slope controls (see notes to Table 2). Standard errors, adjusted for intracluster correlation of siblings, are shown in parentheses.

[a] Significantly different from male ($p < .05$; z test for equality of coefficients).

*$p < .05$; **$p < .01$; ***$p < .001$

suggest that previous studies' mixed findings regarding the impact of debt on mental health and socioemotional well-being, including those of Berger and Houle, may be biased downward, in part because these studies did not consider how debt is associated with trajectories of well-being over time. That is, although 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 have underestimated the association between unsecured debt and well-being if it did 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 5–8), relative to the latter part (ages 9–14), and remain relatively stable over time;

that is, such increases in behavior problems associated with increased debt at younger ages appear to persist. This finding is consistent with prior research demonstrating that economic resources tend to have a larger influence on younger than on older children's development, potentially reflecting that younger children are particularly sensitive to the family environment (Magnuson and Votruba-Drzal 2009; Shonkoff and Phillips 2000). Somewhat surprisingly, we find 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 lead us to expect stronger overall associations among boys, who tend to be particularly sensitive to changes in the family environment (Zaslow and 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-SES 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 and 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 and Stabile 2006, 2009; Fletcher 2010; Fletcher and Wolfe 2008; McLeod and 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 has suggested little evidence for systematic bias in borrower reports of debt when compared with lender reports (Brown et al. 2011). Second, our measures of both debt and children's behavior problems are 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 of these key components and mechanisms is crucial 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 (Campbell 2010; Dynan 2009; Hyman 2011). Although the Great 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 Great Recession or the subsequent period. 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. 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 well-being, 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 and Jayadev 2015; Seamster and 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 et al. 2010, 2015; Magnuson and Votruba-Drzal 2009; Magnuson et al. 2012). Future research should seek to understand the contexts and mechanisms linking unsecured debt to child behavior problems as well as 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.

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