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Impacts of publicly funded health insurance for adults on children's academic achievement

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Abstract

Publicly funded adult health insurance through the Affordable Care Act (ACA) has had positive effects on low-income adults. We examine whether the ACA's Medicaid expansions influenced child development and family functioning in low-income households. We use a difference-in-differences framework that exploits cross-state policy variation and focus on children in low-income families from a nationally representative, longitudinal sample followed from kindergarten to fifth grade. The ACA Medicaid expansions improved children's reading test scores by ~2% (0.04 SD). Potential mechanisms for these effects within families are more time spent reading at home, less parental help with homework, and eating dinner together. We find no effects for children's math test scores or socioemotional skill development.

KEYWORDS

academic achievement, Affordable Care Act, health insurance, low-income, Medicaid, socioemotional skills

JEL CLASSIFICATION

J13, I13, I18

1 | INTRODUCTION

One of the largest expansions to the social safety net in recent years was increased public funding for adult health insurance coverage with the passage of the Patient Protection and

Affordable Care Act (ACA) in 2010. As part of the law, federal funds were provided to states to expand Medicaid coverage to nonelderly, non-disabled adults—including parents—with incomes below 138% of the federal poverty line (FPL). As a result, uninsurance rates among parents dropped from 18% in 2013 to 11% in 2017 (Haley et al., 2019).

The effect of the Medicaid expansions on adults has been studied extensively, with evidence that the expansions improved adults' physical and mental health, economic stability, and housing and food security (see Glied et al., 2020, Mazurenko et al., 2018, and Soni et al., 2020 for reviews). Although coverage was not expanded for children, theoretical and empirical evidence suggests that health insurance coverage for parents may have positive benefits for children's academic and socioemotional development through multiple mechanisms, including reductions in parenting stress and more consistent family routines (Burak, 2019; Gassman-Pines & Hill, 2013; Morrissey, 2012). Further, increased awareness of children's eligibility for health insurance coverage and access to health care for children may influence children's well-being (Cohodes et al., 2016; De La Mata, 2012; Qureshi & Gangopadhyaya, 2021).

In this study, we address two related questions. First, did the ACA's Medicaid expansions to low-income adults, which included parents, affect children's academic achievement and socio-emotional skill development? Second, did any impacts on child development occur through changes in family functioning? To answer these questions, we use longitudinal data on a representative sample of children from the 2010 to 2011 Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K:2011). We study a subsample of households in which adults likely became eligible for Medicaid based upon pre-Medicaid expansion household income. We then compare children in states that expanded Medicaid to states that did not expand Medicaid using a difference-in-differences (DD) research design. With longitudinal data, we are able to adjust for within-household factors, isolating the effects of Medicaid expansion. We focus on broad domains of children's academic achievement and socioemotional skill development, covering reading and math achievement, the ability to relate with adults and peers (social skills), and mental health symptoms (externalizing and internalizing behaviors). To identify potential mechanisms through which adult eligibility for health insurance from the expansions may have influenced child development, we also examine family functioning, with measures of parenting behaviors and routines. The results provide the first piece of evidence on the extent to which expansions in publicly funded health insurance for adults may extend to children's development during middle childhood.

We find the ACA Medicaid expansions improved children's reading test scores by ~2% within 2 years of expansion. We find no significant effects for children's math test scores or socioemotional skills. Potential mechanisms for these effects are increases in the amount of time children spend reading at home, by about 14%, and frequency of eating dinner as a family, by about 2.5%. We also find reductions in how frequently parents helped their children with homework every week (about 8%). Results are robust to a variety of sensitivity analyses. For example, among a sample of children from high-income households, we find no significant effects on academic achievement. We also examine a more precise subset of households in states that expanded—those between each state's pre-ACA parental eligibility income thresholds and 138% FPL—and the impacts are larger. These findings suggest that most of the effects are coming from parents themselves gaining Medicaid eligibility rather than "childless adults" (such as non-custodial parents or other adults in a child's life).

We make several contributions to the literature. First, we examine the causal impact of public health insurance for low-income adults on children's academic and socioemotional development. By studying changes in children's academic achievement and socioemotional skill development between states that expanded Medicaid through the ACA and those that did not in a nationally representative sample, we are able to identify plausibly causal effects through the quasi-experimental nature of the expansion implementation. Second, by exploiting longitudinal data on children and their families, we adjust for time-invariant, child- and family-level factors that have not been accounted for in the prior literature on health insurance expansions due to past data limitations. Third, we limit the analytic sample to children in households most likely to be affected by the public health insurance expansions based on pre-ACA household income. Finally, we explore several potential mechanisms by examining parenting behaviors and routines. In sum, this study adds to the literature examining the role of policies beyond traditional education policies on child development and the literature on the effects of the ACA Medicaid expansions.

2 | BACKGROUND

2.1 | Impacts of the ACA Medicaid expansions on adults

Robust empirical evidence has documented the positive impacts of the ACA Medicaid expansions on adults across two domains of well-being that may indirectly benefit children. First, the ACA Medicaid expansions improved adults' health. For example, the expansion increased adults' health insurance coverage, access to healthcare, and preventive healthcare (Courtemanche et al., 2017; Johnston et al., 2018; Kaestner et al., 2017; McMorrow et al., 2017; Miller & Wherry, 2017; Simon et al., 2017; Sommers et al., 2015; Soni et al., 2020; Wehby & Lyu, 2018; Wherry & Miller, 2016). Although the effects on self-assessed health and health behaviors are mixed (Cotti et al., 2019; Courtemanche et al., 2018a, 2018b, 2019; McMorrow et al., 2017; Simon et al., 2017; Sommers et al., 2015), mortality has declined, driven by fewer disease-related and other health conditions amenable to gaining health insurance such as diabetes (Borgschulte & Vogler, 2020; Goldin et al., 2021; Miller, Johnson, et al., 2021; Sommers et al., 2012). The expansions were also linked with improvements in behavioral health and health care utilization, documented by greater use of substance abuse treatments (Grooms & Ortega, 2019; Maclean & Saloner, 2019; Meinhofer & Witman, 2018), and reductions in both violent and property crime (He & Barkowski, 2020; Vogler, 2020). Though most of the literature focuses on adults without dependent children, gaining access to health insurance among parents has reduced parents' psychological distress (McMorrow et al., 2017) and improved parents' self-assessed health (Gopalan et al., 2022).

Second, a growing literature has demonstrated substantial effects of the ACA Medicaid expansions on the economic well-being of low-income adults (Glied et al., 2020). For example, the expansions reduced out-of-pocket medical expenses (Abramowitz, 2020), medical bills (Miller, Hu, et al., 2021), and debt (Brevoort et al., 2017). The expansions were also found to improve child support payments (Bullinger, 2021), suggesting that even for "childless adults" (i.e., those without dependent children, but who may be responsible for paying child support) gaining health insurance may have affected children. Finally, the ACA Medicaid expansions improved housing and food security (Allen et al., 2019; Himmelstein, 2019; Zewde et al., 2019). These improvements in financial well-being have been documented among low-income parents, in particular (Lombardi et al., 2022; McMorrow et al., 2017; Wisk et al., 2020). Taken together, these studies show that low-income households, including those with children, have benefited economically from the Medicaid expansions.

2.2 | Mechanisms linking parental health and financial well-being to children's development

Theoretical models posit that improvements to parents' health and economic well-being may indirectly influence children through reduced parenting stress, increased parenting time, and more consistent family routines (Becker, 1993; Bradley & Corwyn, 2004; Conger et al., 1997; Fiese & Schwartz, 2008; Yeung et al., 2002). For example, a higher family income improves families' ability to buffer stressful or unexpected situations, create routines, spend time with children, and navigate family relationships (Bradley & Corwyn, 2004; Corak, 2013; Fiese & Schwartz, 2008; Yeung et al., 2002). Parents' physical and psychological health also have indirect benefits for children's development in that the choices parents make regarding their childrearing are in part determined by their own health (Case & Paxson, 2002). If parents are more stressed, anxious, or depressed they may be more likely to exhibit less sensitive, warm, or consistent parenting practices, thereby adversely impacting children's development (Conger et al., 1997). Indeed, there is a strong evidence base linking social policies, including the Earned Income Tax Credit, food assistance, public health insurance, and childcare subsidies, to child development through family functioning and income (Burak, 2019; Gassman-Pines & Hill, 2013). Furthermore, recent research has found that the ACA Medicaid expansions have increased time spent on household production, including childcare (Soni & Morrissey, 2022), highlighting how public health insurance eligibility can influence parental time use.

In addition to these pathways, there is evidence that Medicaid expansions for adults spillover onto children's health insurance coverage through increased awareness of children's eligibility for Medicaid coverage. For example, Medicaid expansions for adults during the 1990s and early 2000s substantially increased Medicaid enrollment among children (Hamersma et al., 2019). More recently, in addition to parents gaining coverage through the ACA Medicaid expansions, health insurance coverage of low-income children increased (Hudson & Moriya, 2017) and children's uninsurance rates dropped (Ugwi et al., 2019). These "welcome mat" effects are the result of spillovers from parents who became newly eligible for Medicaid under the ACA and then enroll their children in Medicaid coverage as well.

On this note, Medicaid coverage for children has both short- and long-term benefits for those children. In the short-term, children benefit through increased preventative health care (De La Mata, 2012), including vaccines (Joyce & Racine, 2005), and access to mental and behavioral health care. As one example with distinct implications for academic performance, children without health insurance coverage are less likely to be diagnosed with attention-deficit/hyperactivity disorder (ADHD) and receive proper ADHD treatment, suggesting unmet treatment needs (Morgan et al., 2013). Relative to children with private health insurance, children with Medicaid are more likely to be diagnosed with ADHD potentially suggesting that Medicaid coverage may facilitate medical care and lead to ADHD diagnosis and treatment (Morrill, 2018).

There is also a growing literature providing evidence of long-term impacts on children, extending to children's educational and economic outcomes in adulthood. For example, Medicaid access during childhood has had long-run improvements on schooling (Cohodes et al., 2016), mortality (Goodman-Bacon, 2017), health (Boudreaux et al., 2016), and wages (Brown et al., 2015), all measured in adulthood. The benefits have even extended to these children's offspring in the form of healthier birth outcomes (East et al., 2019). Given this research on the long-term effects, there are also likely short-run effects on children's development that are understudied.

In sum, there are multiple pathways through which adult health insurance may influence children's academic achievement and socioemotional functioning. Drawing upon the robust literature finding positive impacts on adults, combined with theoretical and empirical evidence on the mechanisms through which social policy may influence children (Burak, 2019; Gassman-Pines & Hill, 2013), parental insurance eligibility may affect children through child receipt of health insurance and changes in family functioning.

3 | METHODS

3.1 | Data

Data come from the 2010 to 2011 Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K:2011). Sponsored by the National Center for Educational Statistics (NCES), the ECLS-K:2011 is a nationally representative sample of children who attended kindergarten in the United States during the 2010–2011 academic year. From 90 groups of counties, 950 public and private schools were selected for inclusion in the ECLS-K sample. From these schools, ~18,170 kindergarten students were enrolled in the study. Data were collected on children, their families, and their teachers in the fall and spring of kindergarten (2010–2011), first grade (2011–2012), second grade (2012–2013), and then annually each spring through fifth grade (2016) for a total of nine waves of data collection. However, in Waves 3 (fall 2011) and 5 (fall 2012), only a subset of children (about one-third of the full sample, also referred to as the fall subsample) were interviewed. We do not include data from those waves to ensure consistency across our longitudinal sample. In all, we use data from seven waves that follow the full sample of children. Children were ~5.5 years old at the first data collection.

3.2 | Sample

The analytic sample is comprised of children from low-income families who were eligible for the direct child assessments, had complete data on household income and the outcomes variables, and did not move across state lines during the study period (see Figure S1 for details on the sample construction). Briefly, in the spring of 2013, which was 1 year prior to the ACA Medicaid expansions, parents reported their household income level and household size from the prior year. We limit the sample to children in households with incomes below 138% of the FPL[1] before the ACA to obtain a sample of those likely to have become newly eligible for Medicaid through the ACA expansions. We drop a small number of children ($n = 30$) that move across states to ensure that exposure to state-level health insurance expansions was captured accurately in the longitudinal models. We also make sample exclusions to account for missing values on key variables (household income, state identifiers), and use sampling weights to account for the complex survey design and non-response over the waves. The analytic sample

[1]Household income is reported as 18 separate categories in the ECLS-K:2011 (increments of $5000 up to $75,001). Therefore, we manually construct an estimated household income as a percent of FPL for each child in the survey. To do so, we use reported household income and household size during Wave 5 (spring 2013, reporting on calendar year 2012 income), the midpoints of each income category, and 2012 poverty guidelines.

consists of about 2500 children across models. Thus, the results are largely generalizable to children in low-income households who attended kindergarten in the United States in fall 2010.[2]

3.3 | Measures

3.3.1 | Children's academic achievement

Children's academic achievement was assessed at each wave using standardized assessments of children's reading and math achievement. Based on the 2009 NAEP Reading Framework, the reading assessment was an untimed item response theory (IRT)-scaled assessment with strong psychometric properties ($\alpha_{avg} = .95$) capturing children's basic reading skills, such as letter recognition, and more advanced skills in vocabulary knowledge and reading comprehension (Tourangeau et al., 2018). Children's math achievement was a measure of conceptual knowledge, procedural knowledge, and problem-solving, capturing children's understanding of numerical properties and operations, measurement, spatial and geometry skills, data and statistical analysis, and algebraic knowledge. The assessment was based on the 1996 NAEP Mathematics Frameworks and, similar to the reading assessment was an untimed, IRT-scaled assessment with excellent psychometric properties ($\alpha_{avg} = .93$; Tourangeau et al., 2018).

3.3.2 | Children's socioemotional skills

Children's socioemotional skills were assessed at each wave using teacher reports on questionnaire items adapted from the Social Skills Rating System (SSRS), a commonly used and validated set of measures assessing children's externalizing problems, internalizing problems, and social skills (Gresham & Elliott, 1990). Teachers responded to each item on a 4-point Likert scale (*0 = never* to *3 = very often*). Within each construct, items were averaged to create a composite. Higher values indicated greater social skills ($\alpha_{avg} = .85$), externalizing problems ($\alpha_{avg} = .80$), and internalizing problems ($\alpha_{avg} = .75$).

3.3.3 | Family functioning

We use three measures to assess aspects of family functioning that have been shown in prior research to be related to children's development within low-income families (Becker, 1993; Bradley & Corwyn, 2004; Conger et al., 1997; Duncan et al., 2019; Elliott & Bachman, 2018; Hill & Tyson, 2009; Longo et al., 2017; Sénéchal & LeFevre, 2002; Votruba-Drzal, 2006). At each wave, parents reported the number of minutes per week their child spent reading outside of school, number of days per week they eat dinner with their child, ranging from 0 to 7, and the number of times per week parents helped them with their homework (*1 = Never; 2 = Less than*

[2]It is important to note that the full ECLS-K:2011 sample is nationally-representative of kindergarteners in fall 2010 (i.e., Wave 1). However, inclusions/exclusions in the analytical sample construction and attrition across waves, in our low-income sample might limit the generalizability. For example, we observe a slight over-representation of Hispanic children (e.g., they form 47% of our low-income, analytical sample compared to the estimate from the 2013 American Community Survey in which 37% of the children aged 3–10 from comparable low-income households are predicted to be Hispanic).

once a week; 3 = 1–2 times a week; 4 = 3–4 times a week; 5 = 5 or more times a week).[3] We converted the categorical homework help variable to a continuous scale by imputing the mid-point of the provided category for each wave (*0 = Never; 0.5 = Less than once a week; 1.5 = 1–2 times a week; 3.5 = 3–4 times a week; and 5 = 5 or more times a week*). For ease of interpretation, we created a binary measure to capture eating dinner together (*1 = 4 or more days a week; 0 = Fewer than 4 days a week*).[4]

3.3.4 | Child and family characteristics

When relevant, we consider individual-level and family-level covariates; specifically, indicators for children's sex and race/ethnicity, children's age in months, age in years of the oldest parent, and indicators for a high school degree among at least one parent. Because we primarily rely on models that included child-fixed effects, however, we omit all time-invariant characteristics from the final model specifications. Descriptive statistics of selected time-invariant child and family characteristics in our analytic sample are shown in Table 1 to contextualize the nature of the sample.

3.3.5 | State characteristics

Finally, we include time-varying characteristics of states that may differentially affect our key outcome measures in households across states and may also be correlated with state decisions to expand Medicaid. For example, there are differences in the post-2010 economic recovery across states that may be correlated with both Medicaid expansion and child development. We include the following characteristics: state unemployment rates, state Earned Income Tax Credit (EITC) rates, state minimum wages, and the maximum temporary assistance for needy family (TANF) and Supplemental Nutrition Assistance Program (SNAP) combined benefits for a family of three at the state-year level.

3.4 | Analytical approach

The ACA originally required all states to expand Medicaid. However, in 2012, the Supreme Court allowed states to opt-out of this requirement. By the end of 2015, 31 states plus Washington, D.C. had expanded Medicaid, with most states expanding in 2014. Due to ECLS-K:2011's clustered sampling framework, there were no children sampled from 10 states. Twenty-five expansion states and 16 non-expansion states remain. As is standard in DD analyses, we code the expansion status (0 vs. 1) at the state-level depending on the timing of expansion. Most states expanded in 2014 and are coded as 1 in Waves 5 (spring 2014), 6 (spring 2015) and 7 (spring 2016). States that expanded after 2014 are coded as 1 only in those relevant waves. For example, Montana expanded

[3]Measures of family functioning described in Section 3.3.3 are not consistently asked across the seven waves we use for this study in ECLS-K. For example, "reading minutes" is not collected in Waves 1 and 2; "parental help with homework" is not collected in waves 1, 2, and 5. Because these are measured consistently in at least two pre- and two post-expansion waves, we include them in our analysis.

[4]Results on the continuous measure are similar and available from the authors on request.

TABLE 1 Descriptive statistics of children in low-income households (<138% FPL)

	All states			Non-expansion states	Expansion states
	N[a]	Mean	*SD*	Mean	Mean
Academic outcomes					
Reading scores	26,300	94.782	31.251	93.755	95.765
Math scores	26,280	75.618	32.209	74.224	76.953
Socioemotional outcomes					
Externalizing problems	23,680	1.711	0.648	1.709	1.713
Internalizing problems	23,440	1.593	0.548	1.577	1.609
Social skills	23,110	3.018	0.665	3.030	3.005
Family functioning					
# of minutes reading outside school	16,320	23.274	16.680	23.093	23.449
# times/week parent helps with homework	13,180	2.929	1.599	2.940	2.919
# of days/week parent eats dinner with child	16,510	5.765	1.818	5.744	5.787
Family and child characteristics					
Male	26,900	0.514	0.499	0.522	0.506
Black	26,900	0.159	0.366	0.226	0.096
Hispanic	26,900	0.466	0.498	0.430	0.500
White	26,900	0.252	0.434	0.265	0.239
Child age (in months)	26,900	96.723	22.506	96.514	96.922
Parent age (in years)	26,900	32.067	7.752	31.696	32.474
Parent has high school diploma or more	26,900	0.328	0.469	0.331	0.323
Time-varying state characteristics					
Unemployment rate	26,900	7.331	2.163	6.849	7.789
EITC rate	26,900	0.073	0.154	0.020	0.123
TANF/SNAP max. benefits for family of 3 ($)	26,900	942.504	183.460	809.002	1069.16
Minimum wage	26,900	7.615	0.792	7.208	8.002

Note: Means and SDs are unweighted. The difference between expansion and non-expansion states is statistically significant at $p < .05$ for all variables except externalizing problems, reading time outside school, and eating dinner together.
[a]Sample sizes (in child-years) are rounded to the nearest 10 as per data set guidelines.

only in 2015, so is coded as 1 only in Waves 6 (spring 2015) and 7 (spring 2016). Table S1 shows details of states' expansion decisions and our coding schematic.

We use the variation in the ACA Medicaid expansions to identify the effect of adult Medicaid eligibility on children's academic achievement and socioemotional skills, and families' functioning. We estimate a series of difference-in-differences models, in which we compared the developmental trajectory of each child and family outcome before the Medicaid expansion (fall 2010 through spring 2013, when children entered kindergarten through the spring of second grade) and after the expansion in January 2014 (spring 2014 through spring 2016, when children were in third through fifth grades) between the expansion and non-expansion states. Specifically, we estimate the following baseline model:

$$Y_{ist} = \beta_0 + \beta_1 Expansion_{st} + \alpha_i + \gamma_t + \delta_s + \lambda' X_i + \eta Z_{st} + \varepsilon_{ist}, \tag{1}$$

where Y is the child or family outcome. $Expansion_{st}$ is a binary variable equal to 1 if child i lives in state s that expanded Medicaid during time t, and zero otherwise. The parameter of interest is β_1, which represents the effect of the ACA Medicaid expansion. Although some states expanded before 2014, early expanders are treated as if they expanded in 2014 since there is evidence of a welcome mat effect in 2014 (Courtemanche et al., 2016; Frean et al., 2017) and some of these states only partially expanded early (Sommers et al., 2013). Models include child and wave fixed effects, and the time-varying state-level covariates described earlier. Including a child fixed effect captures all time-invariant factors related to a child's development, such as constant family characteristics and unobservable features. Because the analytic sample only included children who did not move across states during the study period, state fixed effects (δ_s) and all time-invariant child- and family-characteristics (X_i) were subsumed by the child fixed effects, (α_i), in these models. All statistical analyses were weighted to adjust for sampling procedures, nonresponse, differential attrition, and standard errors were clustered at the state level (Bertrand et al., 2004).

The main identification assumption is that, absent the ACA Medicaid expansions for low-income adults, outcomes for children and families in both the expansion and non-expansion states would have continued the same trends despite differing average levels. Figure S2 shows the raw trends in the outcomes by expansion state status. Event study analyses allow us to test for this common trends assumption before the expansion and examine potential dynamic effects following the expansion. The event studies shown in Figure 1 document no significant difference between expansion and non-expansion states in pre-expansion trends, with the exception of internalizing behaviors.

4 | RESULTS

4.1 | Descriptive statistics

Table 1 presents descriptive statistics of the analytic sample including the number of observations, means, and standard deviations for the key variables. Summary statistics are pooled across all waves for the roughly 2500 children included in the analytic sample. The last two columns compare the mean between states that expanded Medicaid versus those that did not. Children from low-income households in states that expanded Medicaid, on average, had higher math and reading scores, fewer internalizing problems, and greater social skills in comparison to children in states that did not expand Medicaid. Differences in levels across these groups of states before the ACA expansions were implemented are not a problem for the difference-in-differences approach we employ, as this approach relies on changes in *trends* across these two groups to isolate the effects of the policy.

4.2 | Impact of the ACA Medicaid expansions on children and families

The primary goal of this study is to examine whether public health insurance eligibility among low-income adults influenced child academic achievement and socioemotional skills and family

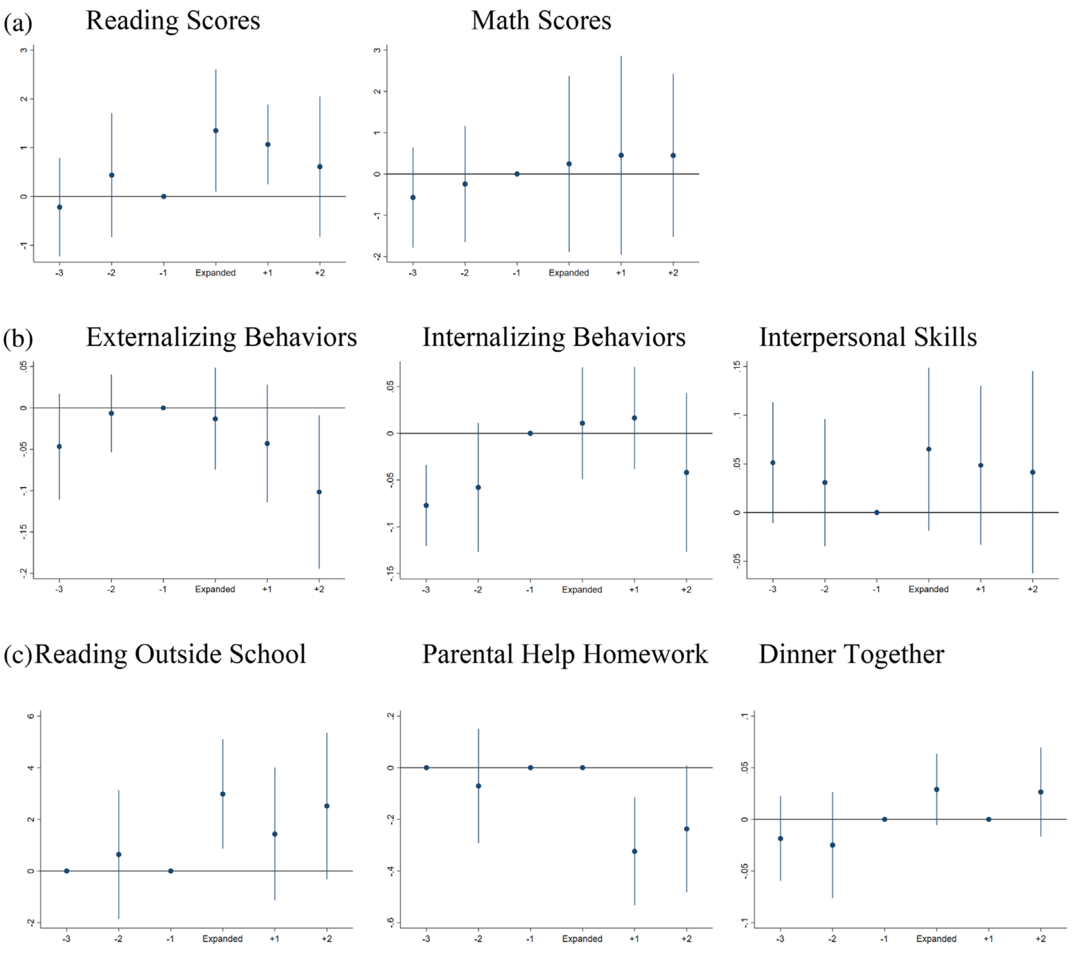

FIGURE 1 Event study graphs. Each bar represents the 95% confidence internal (constructed with standard errors clustered at the state level), and the center of the bar represents the point estimate. The coefficient for the group "−1" (i.e., the 1 year prior to the Medicaid expansion) is normalized to zero. Similarly, coefficients for years in which the outcome is not measured in the sample is also reported as zero. Sample is limited to children in households with incomes below 138% FPL. Across all outcomes, we observe that the pre-treatment coefficients are not statistically significant either individually or jointly ($p > .10$ for F-test on lags across all outcomes except "internalizing behaviors") at conventional levels [Color figure can be viewed at wileyonlinelibrary.com]

functioning. The main results are presented in Table 2 with each column of each panel corresponding to a different OLS regression. We report the coefficients of interest, the standard errors, means of the dependent variables, number of observations (child-year and child-level), and the R-squared (within-child). The coefficients in columns (1), (3), and (5) provide the baseline results across the main outcomes of interest, without adding state-level time varying characteristics. The DD estimate is positive and statistically significant for reading scores implying improvements in reading scores among children as a result of the ACA Medicaid expansions for low-income adults. The DD estimate is positive, but not statistically significant at conventional levels, for math scores.

TABLE 2 Impact of the ACA Medicaid expansion on child development and family functioning among children from low-income households (<138% FPL)

	Reading scores		Math scores	
A. Academic outcomes	**(1)**	**(2)**	**(3)**	**(4)**
Expansion	1.167*	1.151~	0.527	0.111
	(0.523)	(0.582)	(1.093)	(1.090)
Mean of DV	50.84	50.84	31.38	31.38
Time varying state covariates	No	Yes	No	Yes
Observations (child-year)	17,070	17,070	17,060	17,060
Observations (child)	2520	2520	2520	2520
R-squared	.929	.929	.937	.937

	Externalizing problems		Internalizing problems		Social skills	
B. Socioemotional outcomes	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Expansion	0.018	0.007	0.028	0.023	0.033	0.028
	(0.025)	(0.028)	(0.020)	(0.024)	(0.033)	(0.035)
Mean of DV	1.65	1.65	1.50	1.50	2.90	2.90
Time varying state covariates	No	Yes	No	Yes	No	Yes
Observations (child-year)	15,440	15,440	15,290	15,290	15,080	15,080
Observations (child)	2500	2500	2500	2500	2500	2500
R-squared	.012	.012	.016	.016	.011	.011

	Reading outside school		Parental help with homework		Dinner together (4 days or more in a week)	
C. Family functioning	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Expansion	2.436**	2.405**	−0.217*	−0.267*	0.047***	0.048**
	(0.708)	(0.826)	(0.087)	(0.108)	(0.011)	(0.014)
Mean of DV	17.92	17.92	3.347	3.347	0.887	0.887
Time varying state covariates	No	Yes	No	Yes	No	Yes
Observations (child-year)	11,580	11,580	9300	9300	11,390	11,390
Observations (child)	2520	2520	2520	2520	2530	2530
R-squared	.065	.066	.151	.152	.007	.007

Note: Each column of each panel corresponds to a different OLS regression model. Each model includes wave and child fixed effects and sampling weights. Expansion represents β_1 from Equation (1), and measures the average effect of the Medicaid expansions after it took place. Mean of each dependent variable (DV) provides the within-child average of the DV after controlling for just wave fixed effects. Heteroscedasticity-robust standard errors, in parentheses, are clustered at the state level. Sample sizes are rounded to the nearest 10 as per data set guidelines.

~$p < .10$;

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

As shown in columns (2), (4), and (6), these results are also robust to the inclusion of state-level time-varying controls. We provide the mean within-child (across waves) for each outcome of interest in the second row to contextualize the relative effect sizes. Perhaps not surprisingly, the magnitude of the effect sizes is small but meaningful. Specifically, reading scores increased by about 1.151 scaled points ($p = .055$). Relative to the mean of 50.84, this increase represents an improvement of about 2.3%. In terms of standardized effect sizes that is more common in the education literature, this translates to 0.04 standard deviations (*SD*s).

Panel B depicts the DD estimates for children's socioemotional outcomes. Though the estimates are all positive, we observe no significant effects of the ACA Medicaid expansions on social skills or externalizing and internalizing problems among children from low-income households, regardless of the inclusion of state covariates.

Panel C presents results for various measures of family functioning, which we hypothesize are potential mechanisms through which parental health insurance eligibility may influence children's development. We note that these measures are important independent of their potential relation with child development and are therefore their own contribution to the literature. Overall, these results show significant improvements in family functioning and routines as a result of the ACA Medicaid expansions. Specifically, columns (2) and (6) show that children in low-income households read about 2.41 more minutes per week outside of school (∼13.4%)[5] and were 4.8 percentage points more likely to eat dinner with their families on 4 or more days per week (∼5%). On the other hand, in column (4) we also observe small, but statistically significant, decreases in how frequently parents helped their children with homework every week (∼~8%), a point we return to in the discussion.

We next conduct three sets of subsample analyses to examine heterogeneity in treatment effects by race/ethnicity, high/low income within the sample of low-income households, and parental marital status (e.g., not married vs. married) for our primary academic outcomes of interest (see Table 3). We find that the effect on children's reading scores is primarily driven by Black children and children from households with incomes below the median income (∼$17,500 prior to expansion in 2014) in our analytic sample. We also observe an improvement in math scores among Black children. These results suggest that the benefits of health insurance expansions on children's academic achievement might be reaching more vulnerable subgroups of children, even among those from low-income families. In other words, our results are likely generalizable within race/ethnicity subgroups in the low-income sample. That said, we interpret these results with caution due to small sample sizes (results on other outcome variables show similar heterogenous effects, although imprecise, and are available from the authors on request).

5 | PLACEBO CHECK

The ACA Medicaid expansions affect adult health insurance access among low-income households in states that expanded their programs. Therefore, our main results are limited to low-income households that should be eligible for Medicaid based on their reported household income and family size. We would not expect Medicaid expansions to affect high-income households in the states that expanded versus those that did not. Therefore, we present analogous DD estimates from Equation (1) among children residing in households with annual household

[5]About 5% of the analytical sample reported 0 reading minutes per week outside school. So we also examined the effects on the extensive margin (whether the Medicaid expansions increased the number of children who read outside school at all) and intensive margin (whether the Medicaid expansion increased the minutes among those who already read outside school) separately. We find that the positive significant effect is driven almost entirely by intensive margin (DD coefficient of 2.40, $p = .006$) rather than the extensive margin (DD coefficient of .013, $p = .242$), which is unsurprising given the low number of children reporting 0 min of reading outside school.

TABLE 3 Heterogenous treatment effects on primary outcomes among children from low-income households (<138% FPL)

	A. Reading scores			B. Math scores		
A. By race/ethnicity	**White (1)**	**Black (2)**	**Hispanic (3)**	**White (1)**	**Black (2)**	**Hispanic (3)**
Expansion	−0.103	2.161*	1.070	−1.243	2.972*	−1.110
	(1.020)	(0.956)	(0.758)	(1.117)	(1.185)	(1.066)
Mean of DV	51.77	50.34	48.36	33.43	29.57	28.99
R-squared	.934	.925	.930	.943	.929	.940
Observations (child-year)	4380	2350	8410	4370	2360	8420
Observations (child)	640	350	1250	640	350	1250

B. By marital status	**Not Married (1)**	**Married (2)**	**Not Married (1)**	**Married (2)**
Expansion	1.460	0.738	2.038~	−1.134
	(0.883)	(0.670)	(1.051)	(1.078)
Mean of DV	50.68	49.81	31.21	30.87
R-squared	.919	.928	.926	.938
Observations (child-year)	4780	12,290	4780	12,270
Observations (child)	1110	1110	1110	1110

C. By income	**Below median income (1)**	**Above median income (2)**	**Below median income (1)**	**Above median income (2)**
Expansion	1.801**	0.425	0.825	−1.069
	(0.628)	(0.802)	(1.250)	(0.987)
Mean of DV	49.16	50.97	29.70	32.30
R-squared	.925	.933	.931	.944
Observations (child-year)	8610	8460	8600	8450
Observations (child)	1270	1250	1270	1250

Note: Each column of each panel corresponds to a different OLS regression model. Expansion represents β_1 from Equation (1), and measures the average effect of the Medicaid expansions after it took place. The regressions also include wave, child fixed effects, state-level covariates, and are weighted by sampling weights. Heteroscedasticity-robust standard errors, in parentheses, are clustered at the state level. Mean of each dependent variable (DV) provides the within-child average of the DV after controlling for just wave fixed effects. To economize on space, we report these heterogenous effects only for our primary outcomes of interest (math and reading scores). Analogous results for all other outcomes are available from the authors on request. Sample sizes are rounded to the nearest 10 as per data set guidelines.

$^{\sim}p < .10$;

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

income greater than $50,000 (roughly equivalent to 400% FPL) in spring 2013. As seen in Table 4, we did not observe any statistically significant effects for any outcomes except for parents helping with homework in this high-income sub-sample. Further, many of the estimates are negative. This placebo check gives us additional confidence in our results on reading scores, reading outside of school, and eating dinner together.

TABLE 4 Impact of the ACA Medicaid expansion on child development and family functioning among children from high-income households (> $50,000 annual household income)

A. Academic outcomes	Reading scores (1)	Math scores (2)	
Expansion	0.410	0.026	
	(0.519)	(0.662)	
Mean of DV	73.21	54.92	
Observations (child-year)	27,190	27,190	
Observations (child)	5760	5760	
R-squared	.908	.934	
B. Socioemotional outcomes	**Externalizing problems (1)**	**Internalizing problems (2)**	**Social skills (3)**
Expansion	−0.000	−0.001	−0.005
	(0.016)	(0.012)	(0.019)
Mean of DV	1.541	1.445	3.250
Observations (child-year)	25,390	25,340	25,220
Observations (child)	5600	5600	5610
R-squared	.016	.008	.001
C. Family functioning	**Reading outside school (1)**	**Parental help with homework (2)**	**Dinner together (4 days or more in a week) (3)**
Expansion	−0.235	−0.188*	−0.013
	(0.577)	(0.086)	(0.016)
Mean of DV	17.93	3.180	0.887
Observations (child-year)	22,730	18,190	22,250
Observations (child)	5590	5590	5690
R-squared	.111	.176	.013

Note: Each column of each panel corresponds to a different OLS regression model. Each model includes wave and child fixed effects, state-level covariates, and sampling weights. Expansion represents β_1 from Equation (1), estimated for sub-sample of higher-income (> $50,000 annual household income) households only, and measures the average effect of the Medicaid expansions after it took place. Mean of each dependent variable (DV) provides the within-child average of the DV after controlling for just wave fixed effects. Heteroscedasticity-robust standard errors, in parentheses, are clustered at the state level. Sample sizes are rounded to the nearest 10 as per data set guidelines.

$^{\sim}p < .10$;

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

6 | PARENTAL ELIGIBILITY PRE-ACA

In our main models, we define treatment status to include states that expanded Medicaid to low-income adults through the ACA. Prior to the ACA, however, states had different income thresholds for low-income *parents*, meaning that the generosity of the ACA Medicaid expansions varied across states. For example, in Arizona, parents whose household income was less than 106% of the FPL were eligible for Medicaid in 2011. In Oregon, only parents whose household income was less than 40% of the FPL were eligible for Medicaid in 2011. Both states expanded their Medicaid programs under the ACA, and all adults whose household income was less than 138% of the FPL became newly-eligible in 2014. The expansion likely affected a larger proportion of families in Oregon than in Arizona. Alternatively, some states had income eligibility thresholds for parents above 138% FPL, and actually lowered their thresholds to meet the 138% level (e.g., Illinois).

To more precisely capture these nuances in parental eligibility, in this robustness check, we redefine treatment status. Specifically, we estimate the following model using the sample of children from low-income households (<138% FPL) but only include those children whose parents would have been *newly* eligible. In other words, we drop children whose parents were likely eligible for Medicaid based on pre-ACA income thresholds, even in expansion states:

$$Y_{ist} = \beta_0 + \beta_1 Expansion_{st} * ParentElig_{is} + \alpha_i + \gamma_t + \delta_s + \lambda' X_i + \eta Z_{st} + \varepsilon_{ist}, \tag{2}$$

Where $ParentElig_{is}$ equals 1 if child i lives in a household with a household income between state s's pre-ACA parental income eligibility threshold and 138% FPL (calculated using parental income eligibility in 2011; this variable is not time-varying).[6] The control group consists of children in low-income households (<138% FPL) that reside in states that did not expand Medicaid through the ACA. All other elements remain the same as in Equation (1). Essentially, this analysis aims to isolate treatment effects on child and family outcomes on children whose parents were *most* likely to be newly eligible under ACA, and on whom we would expect the effects to be tighter. We also show the raw trends in the various outcomes for these different groups across the waves separately (see Figure S3).

In Table 5, we present estimates from Equation (2). We find larger and more precisely estimated effects on our primary academic outcomes of interest. For example, in this analysis, we find an improvement in reading scores of about 3% compared with ~2% in the main model, increases in time spent reading of 16% compared with 13.4%, and increases in the likelihood of eating dinner together 4 days or more per week by 6% compared with 5%. Effects on parental help with homework are directionally similar but imprecise. This robustness check gives us further confidence in our results on reading scores and family functioning. In other words, children whose parents were most likely to have gained eligibility for Medicaid under the ACA seem to show the largest effects on reading scores, indicating the importance of parents gaining health insurance rather than other adults in a child's life. However, as described earlier, because "welcome mat" effects have been documented for children in households that were eligible for Medicaid before the ACA, we believe that the estimates from the baseline DD specification provides a better estimate of magnitude of the intent-to-treat effects on child development and family functioning.

7 | SENSITIVITY CHECKS

To assess the robustness of our results, we perform a variety of sensitivity checks. These include (1) examining the role of staggered timing of treatment adoption using Goodman-Bacon decompositions (Goodman-Bacon, 2017); (2) excluding child-fixed effects; (3) adjusting for whether

[6]Table S2 shows each expansion state's parental income eligibility threshold in 2011.

TABLE 5 Impact of the ACA Medicaid expansions on child development and family functioning among children from low-income households (<138% FPL)—Focus on new parental eligibility expansions only

	Reading scores		Math scores	
A. Academic outcomes	**(1)**	**(2)**	**(3)**	**(4)**
Expansion	1.637*	1.528*	−0.120	−0.124
	(0.786)	(0.720)	(1.118)	(1.076)
Mean of DV	51.47	51.47	32.07	32.07
Time varying state covariates	No	Yes	No	Yes
Observations (child-year)	8200	8200	8220	8220
Observations (child)	1220	1220	1220	1220
R-squared	.929	.929	.937	.937

	Externalizing problems		Internalizing problems		Social skills	
B. Socioemotional outcomes	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Expansion	0.027	0.022	−0.004	0.003	0.018	0.002
	(0.031)	(0.031)	(0.034)	(0.033)	(0.044)	(0.044)
Mean of DV	1.62	1.62	1.51	1.51	2.91	2.91
Time varying state covariates	No	Yes	No	Yes	No	Yes
Observations (child-year)	7640	7640	7570	7570	7460	7460
Observations (child)	1210	1210	1210	1210	1210	1210
R-squared	.019	.019	.008	.008	.014	.015

	Reading outside school		Parental help with homework		Dinner together (4 or more days in a week)	
C. Family functioning	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Expansion	1.948~	2.898*	−0.145	−0.163	0.061**	0.059*
	(1.109)	(1.154)	(0.129)	(0.164)	(0.019)	(0.026)
Mean of DV	17.73	17.73	3.250	3.250	0.889	0.889
Time varying state covariates	No	Yes	No	Yes	No	Yes
Observations (child-year)	5630	5630	4520	4520	5510	5510
Observations (child)	1210	1210	1210	1210	1220	1220
R-squared	.065	.066	.156	.158	.009	.010

Note: Each column of each panel corresponds to a different OLS regression model. Each model includes wave and child fixed effects and sampling weights. Expansion represents β from Equation (2), and measures the average effect of the Medicaid expansions after it took place. Mean of each dependent variable (DV) provides the within-child average of the DV after controlling for just wave fixed effects. Heteroscedasticity-robust standard errors, in parentheses, are clustered at the state level. Sample sizes are rounded to the nearest 10 as per data set guidelines.

~$p < .10$;

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

states adopted Common Core Standards (a broad-based curricular reform adopted by certain states between 2011 and 2015, [CCS]); (4) excluding sampling weights; (5) including time-varying characteristics such as children and parental age; and (6) adjusting for multiple hypothesis testing using a sharpened q-value estimate; and (7) adjusting for a small number of clusters using a wild bootstrap clustered *p*-value.[7]

First, we examine if the staggered timing of the Medicaid expansions across states affects the robustness of our baseline results. In our analytic sample, we have three different expansion timings—most states (21) expanded in 2014 or earlier,[8] three states (Indiana, New Hampshire, and Pennsylvania) expanded in 2015, and one state (Montana) expanded in 2016 (see Table S1). We do not expect earlier treatment cohorts to influence heavily in comparisons (by acting as controls) to later treatment cohorts due to the low number of late treatment states in our analytical sample. Further, we have a large sample of "never treated" cohorts; so, we do not expect this to be issue.

Nevertheless, following past ACA literature on this topic (Miller, Johnson, et al., 2021), we include the results from the Goodman-Bacon decomposition that essentially examines all 2 × 2 DD analysis independently (Goodman-Bacon, 2021). The decomposition provides weights and coefficients to isolate the effect from treatment timing variation ("Earlier Group Treatment" vs. "Later Group Control" and "Later Group Treatment" vs. "Earlier Group Control") and from comparisons of "Treatment" versus "Never Treated" (see Figure S4). We find that 93.5% of our DD estimate of reading scores can be attributed to comparisons of children from treated and never treated states (i.e., weight attributed to closed triangles in the figure). In other words, only 6%–7% is attributable to comparisons of children with states with differential treatment timing (summing weights across the x's). These decomposition results increase our confidence that staggered timing of treatment adoption does not play a strong role in our analysis.

Second, because we have longitudinal data and can follow the same child pre- and post-expansion, we included child-fixed effects (in addition to wave fixed effects) in our baseline models. In this robustness check, as is standard in most DD analysis that includes aggregated and or repeated, cross-section data, we include state and wave fixed effects in lieu of child fixed effects. Our results are robust; indeed, the magnitude of the DD coefficient is slightly larger and more precise (see panel A of Tables S3 and S4).

Third, the assumptions of a difference-in-differences model would be violated if children from low-income families experienced other policies or macro-level changes to their environment between 2010 and 2016 that might be correlated with states' decisions to expand Medicaid under the ACA and affect their outcomes. Given a potential overlap between states expanding Medicaid under the ACA and states adopting CCS, we include a variable that accounts for the adoption of CCS at the state-year level. Figure S5 shows a map of states that adopted CCS and the timing of adoption.[9] Panel B of Tables S3 and S4 shows the results are similar to the main

[7]Wild cluster bootstrap *p*-values are only recommended if there are very few clusters, especially treatment clusters, in the analytical sample. With 25 expansion states (i.e., treatment clusters) and 16 non-expansion states in our sample (i.e., control clusters), cluster robust standard errors are valid for inference. Nevertheless, we also report wild cluster bootstrapped *p*-values created using "boottest" command in STATA from 1000 replications which provides more conservative standard errors for inference in Table S7 (Cameron & Miller, 2015).

[8]Michigan expanded in April 2014, and we code it as having expanded in 2014 onwards.

[9]We use a measure of CCS "adoption" at the state-year level based on data from the National Conference of State Legislatures. More recent research, however, shows how implementation of these standards was uneven and lagged over multiple years both within and across states.

results offering additional evidence that the observed effects are from Medicaid expansions rather than other policy changes.

Finally, we test the sensitivity of the results to several analytical considerations. For example, the results are also robust to omitting sampling weights, as shown in panel C of Tables S3 and S4. The results are also robust to including child and parental age, as shown in panel D of Tables S3 and S4. In Table S5 we present adjusted *p*-values for multiple hypothesis testing and wild clustered bootstrap *p*-values from 1000 replications. Despite less precision, these results are substantively similar to our main results.

8 | DISCUSSION

In this paper, we examine the short-term effect of expanding public funding for adult health insurance coverage on children's development and families' functioning. We use a nationally representative sample of children in low-income households with direct observations of psychometrically validated children's math and reading achievement and parents' reports of families' functioning. These data allow us to investigate both impacts on children's development and family-level mechanisms through which these impacts may occur. Additionally, we pair child-level, longitudinal data with a difference-in-differences framework exploiting cross-state policy variation to uncover quasi-experimental effects of adult Medicaid eligibility on child development and family functioning, net of time-invariant child-specific factors, a novel feature of this study.

We find that expansions of adult eligibility for publicly funded health insurance positively influence low-income children's reading scores. Specifically, the ACA Medicaid expansions improve children's reading scores by about 2.3% (or a standardized effect size of roughly 0.04 *SD*s). We find no evidence that the expansions influence children's math or socioemotional skills, as assessed in the domains of social skills, externalizing problems, and internalizing problems. Among the measures of family functioning, we find that the Medicaid expansions increase parental reports of time spent reading by children outside of school and eating dinner together. Results also suggest that the Medicaid expansions decrease the frequency with which parents help their children with homework. Taken together, results suggest that the improvements in children's reading scores may have been due to improvements in families' functioning. It is also likely that the increases in reading scores are a result of a combination of these mechanisms, in addition to other unobserved mechanisms. For example, we are unable to empirically test whether children are more likely to obtain medical diagnosis and treatment for various developmental or learning disorders, such as ADHD, which may aid in improving children's functioning. Below, we contextualize these results in more detail.

8.1 | Adult health insurance expansions and children's development

The improvements in reading scores are modest, but meaningful (about 2.3% or roughly 0.04 *SD*s on reading scores). This effect size is not surprising given that children were in late elementary school when these skills were assessed following the expansion. To put this observed effect size in context, the median effect size on standardized reading scores from educational interventions evaluated rigorously using randomized control trials for students in grades 3–5 ranges between 0.09 and 0.11 *SD*s (Kraft, 2020). We would expect health policy spillovers on educational outcomes to be smaller in magnitude. When compared with limited past literature on the educational effects of similar health policy interventions, we find that our results are smaller in magnitude, but consistent with hypotheses. For example, Levine and Schanzenbach (2009) note that a 50-percentage point increase in public health insurance eligibility at birth improved children's reading test scores (pooled fourth and eighth grade test scores) by 0.09 *SD*s. We would expect the estimates in this study to be smaller as we are evaluating parents' health insurance eligibility expansion (which increased by roughly 34 percentage points on average in expansion states [see McMorrow et al., 2017])[10] spillovers on children, rather than children's own insurance access. Indeed, the most comparable study to ours finds very similar effect sizes of parental Medicaid eligibility expansions on reading scores for children in Iowa (Wehby, 2022). Further, children in our study were in third grade when most insurance expansions that we evaluate occurred; health insurance eligibility at birth is likely to have larger effects.

We do not detect any statistically significant impacts of the Medicaid expansions on children's math or socioemotional skills. There are several potential explanations for these differential results. In relation to math scores, it is plausible that any impacts had not yet emerged since language and reading skills can promote subsequent math skill performance (Bailey et al., 2020). Sustained exposure to health insurance and improved healthcare access over longer time periods may also result in larger and emergent effects on long-term child outcomes.

Additionally, while there is robust evidence of the importance of the home environment on math achievement prior to and at school entry at older ages (Elliott & Bachman, 2018), the quality of school math instruction has been found to be the most consistent predictor of math gains relative to children's home environments among older children (Bachman et al., 2015; Jacob, 2005). In contrast, children's reading abilities continue to be associated with qualities of the home environment through elementary school (Jacob, 2005; Sénéchal & LeFevre, 2002). Indeed, earlier work examining the effect of children's health insurance coverage through expansions in Medicaid and the State Children's Health Insurance Program (SCHIP) (Levine & Schanzenbach, 2009) and in Iowa before and after the ACA (Wehby, 2022) found improvements in reading scores, but no effects for math scores.

We also hypothesized that the ACA Medicaid expansions would have positive implications for children's socioemotional development. However, we find no differences in teacher-reported socioemotional skills between children from expansion versus non-expansion states. It is possible that any changes in children's socioemotional functioning were not captured by these measures or by teacher reports (vs. parent or self-report). Nonetheless, we measured socioemotional functioning across three domains (social skills, externalizing problems, and internalizing problems).

[10]Because our data do not have measures on parents' actual health insurance status, we are unable to examine the first-stage effect of the ACA expansions on the actual take-up of insurance among parents in our sample. The best comparable estimate of this first-stage effect is from McMorrow et al. (2017). They find that among low-income parents, Medicaid/CHIP insurance rates went up by roughly 11.8 percentage points in the first year (2015) after expansion among expansion states. A back-of-the-envelope calculation of the treatment on the treated (TOT) effect of 6 percentage points (translates to 13% relative change on a mean reading score of 50 points) is plausible. We use the above first-stage estimate of .118 and our DID reading score coefficient of .753 (unweighted DID estimate used here for valid comparisons) to calculate the TOT (0.753/0.118). This illustrates that the effect size estimate for reading is in line with what we might expect from past theoretical and empirical literature.

8.2 | Adult health insurance expansions and family functioning

We also sought to understand potential mechanisms through which the expansions may have influenced children's development. We find that the Medicaid expansions increased time spent reading by children outside of school and families' dinner routines with children, an important predictor of child well-being (Fiese & Schwartz, 2008). Conversely, the Medicaid expansions decreased time spent helping children with homework, a seemingly counterintuitive finding which is supported in the literature. Specifically, research has shown that parental help with homework by early adolescence is either negatively linked with children's achievement, findings reported in a meta-analysis by Hill and Tyson (2009) or at best has neutral associations with children's achievement (Bodovski et al., 2022). Less parental support is a signal of children's growing abilities to independently complete their academic work outside of school without adult assistance (Hill & Tyson, 2009) even among high income families (Yurk Quadlin, 2015). The findings on family functioning provide important evidence that parental eligibility for health insurance improved children's home environments through children from low-income families spending more time reading at home and eating dinner together as a family as well as needing less parental support with homework. These findings are consistent with Soni and Morrissey (2022) who find that the ACA's Medicaid expansion increased the amount of time spent on food preparation, housework, and childcare.

8.3 | Limitations

This study has some limitations. First, there are only three post-expansion waves in our data set, therefore, our results should be interpreted as short-term. Longer-term effects, such as those noted above, require further analysis than these data allow.

Second, in large, national, longitudinal data sets such as the ECLS-K, some attrition across various waves of data collection in inevitable. Of the 18,174 children included in the first wave (fall 2010), about 11,426 children were followed up (and provided valid cognitive math and reading assessments) in the seventh wave (spring 2016; Tourangeau et al., 2018). While non-response adjustments and use of longitudinal weights (and robustness of our results with and without use of the weights) help reduce some bias, one potential limitation most relevant to our analysis is the likelihood of differential attrition in our analytical sample by state expansion status. We include a rough attrition analysis in the Data S1 (see Table S6).[11] While we cannot rule out differential attrition in our sample, especially in the seventh wave of data collection, we believe that the attrition bias makes our DD estimate most likely a *lower bound* of the true treatment effect. We would expect children with a higher likelihood of attrition from the data may have a higher likelihood of lower academic outcomes due to factors correlated with both attrition and academic skills (i.e., family income or parent education). In other words, if children with a higher likelihood of lower academic outcomes in the non-expansion states leave the sample, the average achievement among children in the non-expansion states increases over time (relative to the expansion states) due to sample composition changes.

[11]We report simple chi-square estimates testing differences in the child respondent samples by state's Medicaid expansion status between Wave 1 and Waves 5, 6, and 7 (the post-expansion data waves). We find that the respondent sample proportions by state expansion status between Wave 1 and 5, 6 are statistically insignificant ($p > .05$); however, we note statistically significant differences between Waves 1 and 7 ($p = .001$).

Third, in determining potential mechanisms, we are limited in both frequency and consistency of questions asked in the survey across waves. It would have been ideal, for example, to have consistent measures of parental and child health insurance coverage, parent health care utilization, and more comprehensive measures of parental psychological and physical health, family stress, and family functioning. Unfortunately, these measures were not available in these data or were not measured consistently pre- and post-expansion. There is a critical need for more work that directly measures the mechanisms through which social policy, and publicly funded health insurance, in particular, impacts child development and achievement.

Finally, some of the estimates we observe are imprecisely estimated. We do, however, have enough statistical power to estimate the effect sizes we find in the key outcomes.[12]

9 | CONCLUSIONS AND IMPLICATIONS

The results of this study have several noteworthy policy implications. Although previous work has studied the effect of children's health insurance coverage on children's development, less is known about the effects of parental health insurance coverage on children. Using representative data and quasi-experimental methods, we demonstrate that adult public health insurance eligibility improves children's reading scores. Results also show that the expansions increased time children spent reading outside of school and the frequency of eating dinner together as a family, while reducing time spent by parents helping children with their homework. Taken together, these findings provide important evidence in light of ongoing policy debates regarding changes to the ACA, as well as the precarious nature of the job market and current economy, underscoring the uncertainty of employer-sponsored health care. Understanding the spillover effects of this policy is also important for appropriately documenting the costs and benefits of expanding Medicaid for the states that have not yet expanded their programs and for continuing the investments in the states that have implemented expansions. Finally, there are well-established income-based gaps in children's development (Duncan et al., 2019). Connecting public programs to educational outcomes is crucial to reduce these gaps.

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[12]With a sample of approximately 2500, approximately half in a treatment and half in control group, with an alpha of 0.05, the minimum detectable effect size (MDES) is 0.03 standard deviation units. For example, we detect an effect size of 0.04 SD on reading outcomes, which is larger than the 0.03 MDES we are powered to detect.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Abramowitz, J. (2020) The effect of ACA state Medicaid expansions on medical out-of-pocket expenditures. *Medical Care Research and Review*, 77(1), 19–33.

Allen, H.L., Eliason, E., Zewde, N. & Gross, T. (2019) Can Medicaid expansion prevent housing evictions? *Health Affairs*, 38(9), 1451–1457.

Bachman, H.J., Votruba-Drzal, E., El Nokali, N.E. & Castle Heatly, M. (2015) Opportunities for learning math in elementary school: implications for SES disparities in procedural and conceptual math skills. *American Educational Research Journal*, 52(5), 894–923.

Bailey, D.H., Oh, Y., Farkas, G., Morgan, P. & Hillemeier, M. (2020) Reciprocal effects of reading and mathematics? Beyond the cross-lagged panel model. *Developmental Psychology*, 56(5), 912–921.

Becker, G.S. (1993) *Human capital: a theoretical and empirical analysis, with special reference to education*, 3rd edition. Chicago: University of Chicago Press.

Bertrand, M., Duflo, E. & Mullainathan, S. (2004) How much should we trust differences-in-differences estimates? *The Quarterly Journal of Economics*, 119(1), 249–275.

Bodovski, K., Munoz, I.G. & Apostolescu, R. (2022) Parental help with homework in elementary school: much ado about nothing? *Journal of Research in Childhood Education*, 36, 1–17.

Borgschulte, M. & Vogler, J. (2020) Did the ACA Medicaid expansion save lives? *Journal of Health Economics*, 72, 102333.

Boudreaux, M.H., Golberstein, E. & McAlpine, D.D. (2016) The long-term impacts of Medicaid exposure in early childhood: evidence from the program's origin. *Journal of Health Economics*, 45, 161–175.

Bradley, R.H. & Corwyn, R.F. (2004) Family process investments that matter for child well-being. In: Kalil, A. & DeLeire, T. (Eds.) *Family investments in children: resources and behaviors that promote success*. Mahwah, NJ: Lawrence Erlbaum, pp. 1–32.

Brevoort, K., Grodzicki, D. & Hackmann, M.B. (2017) *Medicaid and financial health*, Vol. No. w24002. National Bureau of Economic Research.

Brown, D.W., Kowalski, A.E. & Lurie, I.Z. (2015) *Medicaid as an investment in children: what is the long-term impact on tax receipts?* (Working Paper No. 20835). National Bureau of Economic Research.

Bullinger, L.R. (2021) Child support and the affordable care act Medicaid expansions. *Journal of Policy Analysis and Management*, 40(1), 42–77.

Burak, E.W. (2019) Parents' and caregivers' health insurance supports children's healthy development. *Society for Research in Child Development Child Evidence Briefs*, 4, 1–2.

Cameron, A.C. & Miller, D.L. (2015) A practitioner's guide to cluster-robust inference. *Journal of Human Resources*, 50(2), 317–372. https://doi.org/10.3368/jhr.50.2.317

Case, A. & Paxson, C. (2002) Parental behavior and child health. *Health Affairs*, 21(2), 164–178.

Cohodes, S.R., Grossman, D.S., Kleiner, S.A. & Lovenheim, M.F. (2016) The effect of child health insurance access on schooling: evidence from public insurance expansions. *Journal of Human Resources*, 51(3), 727–759.

Conger, R.D., Conger, K.J. & Elder, G.H. (1997) Family economic hardship and adolescent adjustment: mediating and moderating processes. In: Duncan, G.J. & Brooks-Gunn, J. (Eds.) *Consequences of growing up poor*. New York: Russell Sage Foundation, pp. 288–310.

Corak, M. (2013) Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic Perspectives*, 27(3), 79–102.

Cotti, C., Nesson, E. & Tefft, N. (2019) Impacts of the ACA Medicaid expansion on health behaviors: evidence from household panel data. *Health Economics*, 28, 219–244.

Courtemanche, C., Marton, J., Ukert, B., Yelowitz, A. & Zapata, D. (2017) Early impacts of the affordable care act on health insurance coverage in Medicaid expansion and non-expansion states. *Journal of Policy Analysis and Management*, 36(1), 178–210.

Courtemanche, C., Marton, J., Ukert, B., Yelowitz, A. & Zapata, D. (2018a) Early effects of the affordable care act on health care access, risky health behaviors, and self-assessed health. *Southern Economic Journal*, 84, 660–691.

Courtemanche, C., Marton, J., Ukert, B., Yelowitz, A. & Zapata, D. (2018b) Effects of the affordable care act on health care access and self-assessed health after 3 years. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 55, 0046958018796361.

Courtemanche, C., Marton, J., Ukert, B., Yelowitz, A. & Zapata, D. (2019) Effects of the affordable care act on health behaviors after 3 years. *Eastern Economic Journal*, 45, 7–33.

Courtemanche, C., Marton, J. & Yelowitz, A. (2016) Who gained insurance coverage in 2014, the first year of full ACA implementation? *Health Economics*, 25(6), 778–784.

De La Mata, D. (2012) The effect of Medicaid eligibility on coverage, utilization, and children's health. *Health Economics*, 21(9), 1061–1079.

Duncan, G., Magnuson, K., Murnane, R. & Votruba-Drzal, E. (2019) Income inequality and the well-being of American families. *Family Relations*, 68(3), 313–325.

East, C.N., Miller, S., Page, M. & Wherry, L.R. (2019) *Multi-generational impacts of childhood access to the safety net: early life exposure to Medicaid and the next generation's health* (Working Paper No. 23810). Cambridge, MA: National Bureau of Economic Research.

Elliott, L. & Bachman, H.J. (2018) How do parents foster young children's math skills? *Child Development Perspectives*, 12(1), 16–21.

Fiese, B.H. & Schwartz, M. (2008) Reclaiming the family table: mealtimes and child health and well-being. *Society for Research in Child Development Social Policy Report*, 22(4), 3–18 .

Frean, M., Gruber, J. & Sommers, B.D. (2017) Premium subsidies, the mandate, and Medicaid expansion: coverage effects of the affordable care act. *Journal of Health Economics*, 53, 72–86.

Gassman-Pines, A. & Hill, Z. (2013) How social safety net programs affect family economic well-being, family functioning, and children's development. *Child Development Perspectives*, 7(3), 172–181.

Glied, S.A., Collins, S.R. & Lin, S. (2020) Did the ACA lower Americans' financial barriers to health care? A review of evidence to determine whether the affordable care act was effective in lowering cost barriers to health insurance coverage and health care. *Health Affairs*, 39(3), 379–386.

Goldin, J., Lurie, I.Z. & McCubbin, J. (2021) Health insurance and mortality: experimental evidence from taxpayer outreach. *The Quarterly Journal of Economics*, 136(1), 1–49.

Goodman-Bacon, A. (2017) Public insurance and mortality: evidence from Medicaid implementation. *Journal of Political Economy*, 126(1), 216–262.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2), 254–277. https://doi.org/10.1016/j.jeconom.2021.03.014

Gopalan, M., Lombardi, C.M. & Bullinger, L.R. (2022) Effects of parental public health insurance eligibility on parent and child health outcomes. *Economics and Human Biology*, 44, 101098.

Gresham, F.M. & Elliott, S.N. (1990) *Social skills rating system: manual*. American Guidance Service.

Grooms, J. & Ortega, A. (2019) Examining Medicaid expansion and the treatment of substance use disorders. *AEA Papers and Proceedings*, 109, 187–192.

Haley, J., Kenney, G.M., Wang, R., Pan, C., Lynch, V. & Buettgens, M. (2019) *Improvements in uninsurance and Medicaid/CHIP participation among children and parents stalled in 2017*. Washington, DC: Urban Institute.

Hamersma, S., Kim, M. & Timpe, B. (2019) The effect of parental Medicaid expansions on children's health insurance coverage. *Contemporary Economic Policy*, 37(2), 297–311.

He, Q. & Barkowski, S. (2020) The effect of health insurance on crime: evidence from the affordable care act Medicaid expansion. *Health Economics*, 29, 261–277.

Hill, N.E. & Tyson, D.F. (2009) Parental involvement in middle school: a meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*, 45(3), 740–763.

Himmelstein, G. (2019) Effect of the affordable care Act's Medicaid expansions on food security, 2010–2016. *American Journal of Public Health*, 109(9), 1243–1248.

Hudson, J.L. & Moriya, A.S. (2017) Medicaid expansion for adults had measurable 'welcome mat' effects on their children. *Health Affairs*, 36(9), 1643–1651.

Jacob, B.A. (2005) Accountability, incentives and behavior: the impact of high-stakes testing in the Chicago public schools. *Journal of Public Economics*, 89(5–6), 761–796.

Johnston, E.M., Strahan, A.E., Joski, P., Dunlop, A.L. & Adams, E.K. (2018) Impacts of the affordable care act's Medicaid expansion on women of reproductive age: differences by parental status and state policies. *Women's Health Issues*, 28(2), 122–129.

Joyce, T. & Racine, A. (2005) CHIP shots: association between the state children's health insurance program and immunization rates. *Pediatrics*, 115(5), e526–e534.

Kaestner, R., Garrett, B., Chen, J., Gangopadhyaya, A. & Fleming, C. (2017) Effects of ACA Medicaid expansions on health insurance coverage and labor supply. *Journal of Policy Analysis and Management*, 36(3), 608–642.

Kraft, M.A. (2020) Interpreting effect sizes of education interventions. *Educational Researcher*, 49(4), 241–253.

Levine, P.B. & Schanzenbach, D. (2009) The impact of children's public health insurance expansions on educational outcomes. In: *Forum for health economics & policy*, Vol. 12. De Gruyter. https://www.degruyter.com/document/doi/10.2202/1558-9544.1137/html

Lombardi, C., Bullinger, L.R. & Gopalan, M. (2022) Better late than never: effects of late ACA Medicaid expansions for parents on family health-related financial well-being. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 59. https://journals.sagepub.com/doi/full/10.1177/00469580221133215

Longo, F., Lombardi, C.M. & Dearing, E. (2017) Family investments in low-income children's achievement and socioemotional functioning. *Developmental Psychology*, 53(12), 2273–2289.

Maclean, J.C. & Saloner, B. (2019) The effect of public insurance expansions on substance use disorder treatment: evidence from the affordable care act. *Journal of Policy Analysis and Management*, 38(2), 366–393.

Mazurenko, O., Balio, C.P., Agarwal, R., Carroll, A.E. & Menachemi, N. (2018) The effects of Medicaid expansion under the ACA: a systematic review. *Health Affairs*, 37(6), 944–950.

McMorrow, S., Gates, J.A., Long, S.K. & Kenney, G.M. (2017) Medicaid expansion increased coverage, improved affordability, and reduced psychological distress for low-income parents. *Health Affairs*, 36(5), 808–818.

Meinhofer, A. & Witman, A.E. (2018) The role of health insurance on treatment for opioid use disorders: evidence from the affordable care act Medicaid expansion. *Journal of Health Economics*, 60, 177–197.

Miller, S., Hu, L., Kaestner, R., Mazumder, B. & Wong, A. (2021) The ACA Medicaid expansion in Michigan and financial health. *Journal of Policy Analysis and Management*, 40(2), 348–375.

Miller, S., Johnson, N. & Wherry, L.R. (2021) Medicaid and mortality: new evidence from linked survey and administrative data. *The Quarterly Journal of Economics*, 136(3), 1783–1829.

Miller, S. & Wherry, L.R. (2017) Health and access to care during the first 2 years of the ACA Medicaid expansions. *New England Journal of Medicine*, 376(10), 947–956.

Morgan, P.L., Staff, J., Hillemeier, M.M., Farkas, G. & Maczuga, S. (2013) Racial and ethnic disparities in ADHD diagnosis from kindergarten to eighth grade. *Pediatrics*, 132(1), 85–93.

Morrill, M.S. (2018) Special education financing and ADHD medications: a bitter pill to swallow. *Journal of Policy Analysis and Management*, 37(2), 384–402.

Morrissey, T.W. (2012) Health reform and child health: Progress, cautions, and future directions. *Child Development Perspectives*, 6(2), 199–205.

Qureshi, J.A. & Gangopadhyaya, A. (2021) Childhood Medicaid eligibility and human capital. *Economics of Education Review*, 82, 102092. Available from: https://doi.org/10.1016/j.econedurev.2021.102092

Sénéchal, M. & LeFevre, J.A. (2002) Parental involvement in the development of children's reading skill: a five-year longitudinal study. *Child Development*, 73(2), 445–460.

Simon, K., Soni, A. & Cawley, J. (2017) The impact of health insurance on preventive care and health behaviors: evidence from the first two years of the ACA Medicaid expansions. *Journal of Policy Analysis and Management*, 36(2), 390–417.

Sommers, B.D., Arntson, E., Kenney, G.M. & Epstein, A.M. (2013) Lessons from early Medicaid expansions under health reform: interviews with Medicaid officials. *Medicare & Medicaid Research Review*, 3(4), a02.

Sommers, B.D., Baicker, K. & Epstein, A.M. (2012) Mortality and access to care among adults after state Medicaid expansions. *New England Journal of Medicine*, 367(11), 1025–1034.

Sommers, B.D., Gunja, M.Z., Finegold, K. & Musco, T. (2015) Changes in self-reported insurance coverage, access to care, and health under the affordable care act. *JAMA*, 314(4), 366–374.

Soni, A. & Morrissey, T. (2022) The effects of Medicaid expansion on home production and childcare. *Southern Economic Journal*, 88(3), 931–950.

Soni, A., Wherry, L.R. & Simon, K.I. (2020) How have ACA insurance expansions affected health outcomes? Findings from the literature. *Health Affairs*, 39(3), 371–378.

Tourangeau, K., Nord, C., Lê, T., Wallner-Allen, K., Vaden-Kiernan, N., Blaker, L. et al. (2018) *Early childhood longitudinal study, kindergarten class of 2010–11 (ECLS-K:2011), user's manual for the ECLS-K:2011*. Washington, DC: National Center for Education Statistics.

Ugwi, P., Lyu, W. & Wehby, G.L. (2019) The effects of the patient protection and affordable care act on children's health coverage. *Medical Care*, 57(2), 115–122.

Vogler, J. (2020) Access to healthcare and criminal behavior: evidence from the ACA Medicaid expansions. *Journal of Policy Analysis and Management*, 39(4), 1166–1213.

Votruba-Drzal, E. (2006) Economic disparities in middle childhood development: does income matter? *Developmental Psychology*, 42, 1154–1167.

Wehby, G.L. (2022) The impact of household health insurance coverage gains on children's achievement in Iowa: evidence from the ACA: study examines the impact of household health insurance coverage on children's achievement. *Health Affairs*, 41(1), 35–43.

Wehby, G.L. & Lyu, W. (2018) The impact of the ACA Medicaid expansions on health insurance coverage through 2015 and coverage disparities by age, race/ethnicity, and gender. *Health Services Research*, 53(2), 1248–1271.

Wherry, L.R. & Miller, S. (2016) Early coverage, access, utilization, and health effects associated with the affordable care act Medicaid expansions: a quasi-experimental study. *Annals of Internal Medicine*, 164(12), 795–803.

Wisk, L.E., Peltz, A. & Galbraith, A.A. (2020) Changes in health care–related financial burden for U.S. families with children associated with the affordable care act. *JAMA Pediatrics*, 174(11), 1032–1040.

Yeung, W.J., Linver, M.R. & Brooks-Gunn, J. (2002) How money matters for young children's development: parental investment and family processes. *Child Development*, 73, 1861–1879.

Yurk Quadlin, N. (2015) When children affect parents: Children's academic performance and parental investment. *Social Science Research*, 52, 671–685.

Zewde, N., Eliason, E., Allen, H. & Gross, T. (2019) The effects of the ACA Medicaid expansion on nationwide home evictions and eviction-court initiations: United States, 2000–2016. *American Journal of Public Health*, 109(10), 1379–1383.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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