Public Investments and Class Gaps in Parents' Developmental Expenditures

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Abstract
Families and governments are the primary sources of investment in children, providing access to basic resources and other developmental opportunities. Recent research identifies significant class gaps in parental investments that contribute to high levels of inequality by family income and education. State-level public investments in children and families have the potential to reduce class inequality in children's developmental environments by affecting parents' behavior. Using newly assembled administrative data from 1998-2014, linked to household-level data from the Consumer Expenditure Survey, we examine how public sector investment in income support, health and education is associated with the private expenditures of low and high-SES parents on developmental items for children. Are class gaps in parental investments in children narrower in contexts of higher public investment for children and families? We find that more generous public spending for children and families is associated with significantly narrower class gaps in private parental investments. Moreover, we find that equalization is driven by bottom up increases in low-SES households' developmental spending in response to the progressive state investments of income support and health, and by top down decreases in high-SES households' developmental spending in response to the universal state investment of public education.

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INTRODUCTION

For all children, particularly the 50% of children in the United States who live in low-income families at or below 200% of the poverty line, families and governments are the primary sources of investment in children, providing vital support for basic resources and broader developmental opportunities (Bradbury et al. 2015; Corak et al. 2011; Corak 2013; Waldfogel 2016). The relationship between family socioeconomic status and children's well-being is well-documented and has grown stronger in recent decades (Duncan and Brooks-Gunn 1997; Reardon 2011). Recent research also identifies significant class gaps in parental investments that contribute to high levels of inequality in family environments by income and education. Parents with more income and education invest more resources and developmentally targeted time toward their children (Hao and Yeung 2015; Hernandez-Alava and Popli 2017; Kalil, Ryan and Corey 2012; Pensiero 2011).

While some have called on high-SES parents to consciously change their approach to parenting and reduce private investments of money and time in children (Reeves 2017), actually achieving such a dramatic cultural change is a difficult path to reducing childhood inequalities. Public investments in children and families have the potential to reduce class inequality in children's development both through direct positive effects on children and, potentially, by affecting parents' behavior and practices. By providing a baseline of resources, public investments may free low-income parents to reallocate expenditures from necessities to additional investment goods, including learning items, stimulating activities, housing that may provide access to high-performing public schools, high-quality child care, and nutritious food (Milligan and Stabile 2009; Yeung, Linver and Brooks-Gunn 2002).

Public investments, as an indicator of the strength of the welfare state, may therefore have an equalizing effect on parents' private developmental investments in their children. However, there is very limited evidence on how public investments are associated with inequality in private investments (Gregg, Waldfogel and Washbrook 2006; Halpern-Meekin et al 2015) and inference from existing cross-national research is limited by significant problems of confounding (e.g., Bradbury et al. 2015). The federalist character of the U.S. welfare state provides a valuable opportunity to examine if more generous public investment may narrow class inequalities in private parental investments in children. Just as there is cross-national variation in the strength of welfare states and their effects on poverty and well-being, there is substantial state-level variation in public investments in U.S. children and families, with some states far below and some far above the national average (Billen et al. 2007; Harknett et al. 2003; Isaacs and Edelstein 2017). There is also heterogeneity in generosity over time as the U.S. welfare state has contracted for children relative to older adults, and substantial variation by parental SES as many forms of government investment in children are progressive and targeted (Moffitt 2015). Further, as policy discussions increasingly focus on states as the level at which policies are produced and administered, social scientists face the challenge of understanding how state policy contexts affect inequality in parenting practices and child development, and how changes in state policy provision can reduce inequality.

Using newly assembled administrative data over a period of more than 15 years, linked to household-level data from the Consumer Expenditure Survey, we examine how public sector investment in several domains—income support, health and education—is associated with the private expenditures of low and high-SES parents on developmental items for children. We then examine how these behavioral effects on private investment may combine to reduce socio-

economic inequality in parental expenditures on developmental investments in children. Stated differently, we ask if class gaps in private parental investments in children are narrower in contexts of higher public investment for children and families?

We find that more generous public spending for children and families is associated with significantly narrower class gaps in private parental investments. When total state spending is higher, income and educational gaps in expenditures on developmental items are lower. Next, we disaggregate public investments into those focused on education, health care, and income support. We find that each form of public investment is equalizing in private investment, but that equalization is bottom up (increased spending among lower-SES households) in response to more progressive forms of state investment—income support and health—and top down (decreased spending among high-SES households) in response to the universal state investment of public educational spending on children.

BACKGROUND

The Family as a Contributor to Inequality: Class Variation in Parenting Practices

In an era of high economic inequality and low intergenerational mobility (Piketty and Saez, 2014; Chetty et al., 2017), the institution of the family has received a great deal of attention as a contributor to intergenerational inequality. The reproduction of social inequality begins at a very young age (Jonsson 2010), and the family is a particularly central institution in children's lives: within this context resources are redistributed from parents to children, children's daily activities are managed, and direct care is provided. Parental behavior, in particular, is an important mechanism for reproducing, reinforcing and attenuating class variation among families. While household income, education and wealth indicate the resources available in the home, parents' use

of money and time more directly indicate the allocation of resources (Hao and Yeung 2015). Indeed, parenting practices differ substantially by class, and the strong correlation between parental SES and private developmental investments in children illustrates just how difficult it can be to separate inequality in outcomes from equality of opportunity.

High-income and highly educated parents are better able to allocate resources for children in ways that are highly valued in educational and labor market institutions (Becker and Tomes 1979; Corak 2013; Hao and Yeung 2015). There are pronounced socioeconomic differences in parents' involvement with children's educational activities (Alintas 2016; Bassok et al. 2016; Cheadle 2009; Kalil et al. 2016; Lareau 2002; Pensiero 2011; Ramey and Ramey 2010; Roksa and Potter 2011) and in parents' investments of money on items for children (Kornrich 2016; Kornrich and Furstenberg 2013; Schneider, Hastings and LaBriola 2018), and these gaps appear to be widening over recent decades. Class gaps in private spending on children are manifest in developmental goods (such as books, toys, and games) (Hao and Yeung 2015), as well as in education itself and the "shadow" educational system of classes and tutors (Bray 1999; Park et al. 2016). Higher-SES parents may also be able to spend more to obtain high-quality food and child-care for younger children, though low-SES parents spend a greater share of income on core needs such as food, housing and transportation (Pew 2016; Schneider, Hastings and Labriola 2018). It is also difficult to separate price and quality and, in the case of childcare, parental labor force participation and informal caregiving. Higher-SES parents may also effectively make private parental expenditures by spending more on housing than they otherwise would in order to provide children with access to public schools that parents perceive as providing higher quality (Goldstein and Hastings 2019). While it is difficult to estimate the portion of housing expenses that can be allocated to this school quality motivation as opposed to house size, home features, and

neighborhood amenities, research suggests that a 1 SD increase in school quality is associated with a corresponding increase in housing prices of about 3% (Black and Machin, 2011). While both parental income and education are strong contributors to private parental investments in children, some evidence suggests that education more strongly predicts parental behavior than income (Hao and Yeung 2015; Harding, Morris and Hughes 2015).

The weight of evidence suggests that the resources and content of time available to children are positively associated with their development. Large class gaps in cognitive development exist well before the start of formal schooling, pointing to the importance of parental input and the home environment for children's cognitive and non-cognitive development (Duncan and Magnuson 2011; Hernandez-Alava and Popli 2017; Waldfogel and Washbrook 2011). Indirect evidence for the importance of home environments for child development comes from the seasonal learning literature, which demonstrates that class gaps in achievement widen most over the summer months (Alexander, Entwisle, and Olsen, 2007; Downey, von Hippel, and Broh, 2004), although recent work fails to replicate this longstanding result (von Hippel 2019). Most existing research measuring the content of parental investments focuses on either the presence of particular resources, or on parental time. For example, the presence and quantity of books, games, toys and other learning materials that are developmentally appropriate is strongly related to children's development and educational attainment (Dronkers 1992; Evans et al. 2010; Tamis-LeMonda et al. 2019; Totsika and Sylva 2014). Some research classifies these types of learning materials and child-focused goods, including clothing and furniture, as enrichment items that influence child development both directly and indirectly, through exposure to materials that facilitate the development of cultural capital (Kornrich and Furstenberg 2013; Kornrich 2016). Research linking parental expenditures in particular to children's well-being is scarce. While a large body

of research documents the effects of family economic resources and government cash transfers on child outcomes (e.g., Bitler, Hines and Page 2018; Duncan and Magnuson 2005; Mayer and Leone 1997), it is not clear how patterns of parental spending affect children's well-being. What is clear, though, is that parental expenditures on children are an increasingly unequal form of parental investment alongside time use and family size, two important predictors of children's well-being.

The Role of Public Investments

Children's family environments are influenced not only by private parental investments, but by their embeddedness within political institutions (Brady, Fullerton and Cross 2009; Tilly 1998). Public investments in children and families provide an opportunity to understand the effects of the welfare state on both the social institution of the family and on children's developmental opportunities. While private parental investments exhibit stark inequality along the lines of income and parental education, many forms of public spending are considerably higher for low-income children than for higher income children (Vericker et al., 2012). Such public investments in children and families may then serve to increase equality of opportunity for low-SES children, as well as reduce class gaps in family behavior (Bradbury et al. 2015; Corak, Curtis and Phipps 2011; Corak 2013; Waldfogel 2016). The majority of public spending on children is on education (K-12; Head Start), health (Medicaid; non-Medicaid public health spending) and income support/social services (Temporary Assistance for Needy Families (TANF); the Supplemental Nutrition Assistance Program (SNAP), or food stamps; child care assistance; child welfare; child support enforcement; and earned income tax credits (EITC)). Beyond education spending, five spending and tax programs comprise most spending on children: Medicaid, the EITC, the child tax credit, SNAP and the dependent exemption.

While public spending on children has risen over time, it has grown more slowly than spending on adults, and is declining as a share of the federal budget (Edelstein et al. 2016; Isaacs et al. 2017; Moffitt 2015). In contrast to trends in private investment, however, many forms of public spending are progressive, that is, disproportionately targeted at low-income children (Vericker et al., 2012). This feature of public investments, combined with theory and evidence, suggest that public investments can improve outcomes for low-income children (Bradbury et al. 2015; Corak, Curtis and Phipps 2011; Corak 2013; Solon 2004; Waldfogel 2016). Public investments may improve children's access to resources both outside and inside the home. There are direct positive health and academic effects of a number of child and family-focused investments, including school spending, child tax programs, public preschool, the Nurse-Family Partnership, WIC and school nutrition programs (Jackson 2015; Johnson 2015; Yoshikawa et al. 2013). By directly augmenting resources outside of the home that may foster health and development and targeting that investment to children from low-SES families, public investments may directly reduce class gaps in children's development.

Linking Public Investment to Private Parental Investment: Low-SES Households

It is also possible that some of what we currently consider to be direct effects of programs on children may work through family processes that have not yet been well-examined. While differences in parental spending are often an implied key pathway through which public investment affects children (e.g., Reardon 2011), theoretical and empirical understanding of the relationship between the state and family behavior is very limited. Public investments may reduce class gaps in private parental investments in children by increasing the funds available to lower-SES parents to invest in children, both through direct cash assistance and through the direct provision of necessities that parents would otherwise need to purchase. By providing a baseline of

resources, welfare state investments in children and families may free low-income parents to reallocate expenditures from necessities to additional investment goods (Milligan and Stabile 2009; Yeung, Linver and Brooks-Gunn 2002). While cultural logics of "good parenting" certainly vary significantly over time (Hays 1998; Wrigley 1989) and across groups (Lareau 2003), mounting evidence demonstrates consistent parenting logics by class (Ishizuka 2018) and finds that SES differences in parental investment are in fact largely explained by resource differences (Chin and Phillips, 2004; Bennett et al., 2012). The weight of evidence, then, suggests that class inequality in private parental expenditures is largely explained by differences in material resources and, as such, there is a strong basis for the expectation that public augmentation of the resources of low-SES families might lead to increases in their private parental investments.

This resource-based pathway is perhaps clearest for income security programs such as TANF, SNAP, EITC, and SSI. The targeted nature of these programs efficiently directs resources to those at the greatest risk of poverty and hardship, leading many to argue that these investments are an efficient and essential part of the anti-poverty welfare state (Belsey 1990; Brady and Burroway 2012; Le Grand 1982). Indeed, there is some evidence for increases in child-related expenditures in response to income transfers. A small body of regional and ethnographic evidence suggests that EITC recipients prioritize consumption spending on short-term needs broadly (Romich and Weisner 2000; Smeeding, Phillips and O'Connor 2000) as well as investments in children specifically (Tach et al. 2017). Children exposed to increases in income support benefits in the U.K., for example, experience increased expenditures on books and nutritious food alongside reductions in material hardship (Gregg, Waldfogel and Washbrook 2006). Some qualitative work also demonstrates changes in the content of child-centered spending in response to increased income (Farrell and O'Connor 2003; Halpern-Meekin et al. 2015). The small body of existing

research suggests an important influence of income support programs on both decreasing material hardship and increasing child-centered expenditures. We would thus expect that more generous public income supports would be associated with a narrowing of class-gaps in private parental investments in children, via increased child expenditures among lower-SES households.

Because this form of state support increases households' economic resources, it should have similar effects on many different forms of private parental investment. By reducing material hardship, parents may be better able to increase their investments in children directly, via the presence and quantity of developmentally appropriate books, toys and games for children in the home. State income support should also allow low-SES households to increase less direct forms of investment in their children via higher spending on nutritious food, high-quality childcare and even housing that may provide access to higher quality schooling (Gregg, Waldfogel and Washbrook 2006; Parolin 2021).

Public investments through health care programs such as Medicaid and state children's health insurance programs (CHIP) may play a similar role in increasing family resources, although there is less evidence on this issue. While these programs do not provide the direct cash assistance of income support programs, they are both means-tested and progressive and may replace a threshold of necessary private expenditures on health care (Leininger, Levy and Schanzenbach 2010). In combination, public spending on health care programs may then free-up financial resources for low-SES families that could be deployed for private parental investment in children via expenditures on direct goods for children or indirect investments in children via food, housing, and childcare.

Another key domain of public investment is education spending, including public spending on early childhood education as well as K-12 public education. Like health spending,

some public educational investments are targeted and might provide a baseline of public support that could free-up resources for alternative investments. For instance, expenditures that low-SES families might make on private childcare or pre-school could be displaced by public investments in Head Start or state pre-kindergarten programs, and so made available for other forms of private parental investment in nutritious food, higher-quality housing, or enrichment activities for children.

However, the vast majority of public educational spending is dedicated to elementary and secondary education. Such expenditures at the state level are the combination of federal funds, state funds, and local spending. Thus, unlike public income supports and health care supports, these investments are not targeted by family income. Rather, they fall into the category of "universalist" investments (Skocpol 1991) that are generous and often more politically popular than more targeted programs (Korpi and Le Palme 1998). Some argue that, while universalist investments lack efficiency, their generosity and political effects may lead to a larger redistributional and inequality-narrowing impact than targeted investments (Korpi and Le Palme 1998; Rainwater and Smeeding 2004). It is unclear whether universal child-focused policy is more popular than targeted investments, given evidence showing that public opinion about universal preschool favors a targeted approach (Bobo and Klugel 1993; Greenberg 2018). In the case of educational investments in children, while lower-SES children might directly benefit from higher educational spending being associated with higher quality public schools (LaFortune et al., 2018; Hyman, 2017), the reality is that the overwhelming majority of lower-SES students would attend public schools no matter what the degree of public investment in such schools. Indeed, while private school enrollment rates are over 15% among high income families, low-SES parents enrollment rates in private schools are significantly lower, at just 5% and, as such, there is far less

room on the extensive enrollment margin for low-SES parents to switch from private to public schools in the context of more generous public investment in education (Murnane et al. 2018). Therefore, while we expect that generous public expenditures on health might free-up resources for lower-SES families to invest in children that they might otherwise spend on healthcare, such a dynamic is unlikely for public educational expenditures.

Linking Public Investment to Private Parental Investment: High-SES Households

Higher-SES parents are able to spend more money on developmental goods and enrichment activities for children, and they may also spend more money to obtain high-quality food and child-care for younger children (Hao and Yeung 2015). Higher-SES parents also spend more on housing (Pew 2016), and part of this expenditure may be driven by a goal of providing children with access to public schools that are perceived as higher quality (Lareau and Goyette 2014), in addition to desires about house size, home features, and neighborhood amenities. While we hypothesize that public income and health supports will affect these forms of low-SES parents' private spending through a family resource pathway, we have no such expectation for high-SES parents. In some countries, the system of public provision is set up to be taken up universally. Norway and other Scandinavian welfare states, for example, provide economic and in-kind support for childcare, education and other services to families across the socioeconomic distribution (e.g., Gornick and Myers 2003), and in these countries parental spending on children is less unequal than in the United States (Kornrich, Ruppanner and Lappegard 2019). In contrast, the United States has a more limited welfare state for children, and direct expenditures on income support and health care are generally means-tested (Vericker et al., 2012), though the 2021 expansion of the Child Tax Credit represents a notable exception (Marr et al., 2021). As a result, it is unlikely that

public sector investments in these areas would meaningfully affect the resources of high-SES families.

In contrast, more generous public investment in the educational domain may be more strongly related to child investment among higher-SES parents. Higher educational spending is associated with higher quality public schools (LaFortune et al. 2018; Hyman 2017). This public investment in public schooling may allow households with more income and education to access normally fee-based services through the state, including school-based programs and activities, as well as schooling itself (Buddin et al. 1998; Bosetti and Pyryt 2007). For example, average tuition is $23,000 at non-sectarian private schools and $6,000 at Catholic schools (Murnane et al. 2018). Given private school enrollment rates of 15% among high income families, such substitution on the extensive margin could free up substantial private resources among high-SES families that would otherwise be spent on children's schooling and learning items. The ability of higher-SES families to access generous state education services could allow high-SES parents to reduce enrichment expenditures on their children if they are satisfied with publicly available resources. This pattern would be consistent with evidence in Norway, where more universal state provision of education support for families leads to fairly equal parental expenditures on education and childcare across the income distribution (Kornrich, Ruppanner and Lappegard 2019).

Could more generous public spending on education lead high-SES households to increase spending on private investments such as housing in order to access public schools that they believe provide greater benefits to their children? One set of theories argues that the "arms race" for positional assets will intensify in contexts of high economic inequality, with residential sorting around high-quality schools being a frequently invoked example (Frank 2007; Lareau and Goyette 2014). In response to growing inequality in the distribution of resources, positional

competition may increase and high-SES parents may increase their housing expenditures in order to achieve relatively better-resourced or higher-quality schools. While compelling as a theoretical account, existing empirical evidence is not consistent with this possibility. Instead prior empirical research on positional competition and housing expenditures shows that high-SES families who live in geographic areas with high income inequality are more likely to improve school quality when they move, but are no more likely to increase the share of their income spent on housing expenditures than lower-SES families. Moreover, families who move are no more likely to increase housing expenditures in response to school quality than in response to other amenities (e.g., square footage) (Goldstein and Hastings 2019).

In addition, while theories of positional competition are fundamentally about the phenomenon of growing inequality, it is not clear how the behavior of high-SES parents should change in response to increased levels of state educational spending. If increases in state spending on education are allocated unequally within states, then high-SES parents could increase their housing expenditures in order to access well-resourced schools. But while local educational spending tends to be regressive, both state and federal funds are progressive, such that on net, total educational spending is not stratified by student SES or is weakly progressive (Chingos and Blagg 2017). While school funding is not the entirety of school quality and this does not negate the possibility that regressive local-level dynamics shape forms of parental investment (e.g., housing decisions), increasing public investment levels, rather than increasing inequality, in education at the state level may not lead high-SES parents to spend more on the "child portion" of housing investments than they already do.

Linking Public Investment to Private Parental Investment: Implications for Class Gaps

In aggregate, we expect that more generous public spending across the categories of income support, health care, and education would narrow class-gaps in private parental expenditures on investment in children by increasing the economic resources available to lower-SES parents. We have no such expectation for high-SES parents, since public sector investments in these areas should not meaningfully affect their economic resources. We expect that these inequality-narrowing effects will be most pronounced when public investments are (1) progressive and targeted and/or (2) take the form of cash benefits or replace necessary private expenditures. By this logic, we expect that income support programs may have the strongest equalizing effects on private parental investments in children, followed by public spending on health care. Because we expect progressive state investment in low-SES parents to affect the many forms of private parental investment in a similar direction, our measure of private parental investment (which we explain below focuses on the direct purchase of developmental goods for children) is likely to well approximate the extent to which progressive public investments can close broader class gaps in more indirect private parental investments of food, housing or child care.

In contrast, the potential for generous public spending on educational programs to narrow class gaps in private parental investment is more ambiguous. We do not expect high state spending on education to meaningfully affect the private investments of low-SES parents, meaning that any reduction in class gaps is likely to be driven the expenditures of high-SES parents. Greater provision of resources via the state could lead high-SES parents to decrease some forms of private investment (e.g., developmental goods and activities, tuition), while leading them to maintain or even increase other large forms of investment (e.g., housing). Our measure of private parental

investment may therefore overstate the extent to which state education investments can narrow broader class gaps in more indirect and large private parental investments such as housing.

DATA AND MEASURES

We examine how state-level public spending on children is associated with class gaps in private parental investments in children. To do so, in collaboration with the Urban Institute, we assemble a new unique state-level comprehensive database of public spending on children and merge these data at the state-year level to Consumer Expenditures Survey (CEX) data, which contain detailed measures of financial investments in children, household socio-economic status, and demographic characteristics.

Data: State-Level Public Spending

Despite substantial spending variation that puts some states far below and some far above the national average (Harknett et al. 2003; Isaacs and Edelstein 2017), no existing data source compiles these measures of spending across states and over time. We use a state-by-year database of public spending from federal, state and local sources that spans 1998-2014, aiming to cover the longest period feasible with existing administrative data. The public spending database includes all 50 states and the District of Columbia, drawing on data from the U.S. Census State and Local Government Finance Survey (SLGF), federal agency web sites, the State Funding for Children Database compiled by the Rockefeller Institute of Government (1998-2008), and other sources. The data contain per-child spending at the state-year level in the domains of *education* (e.g., total K-12 spending; Head Start), *income support* (cash/near cash that goes to families and supports spending on basic needs: e.g., Temporary Assistance for Needy Families (TANF), SNAP, child

support enforcement, earned income tax credits (EITC)), *health* (e.g., Medicaid spending on children and families and non-Medicaid public health spending), and *other spending* (e.g., housing, libraries, parks and recreation).[1]

Table 1 lists the programs included in the state-level database, as well as the data sources for each spending program. Spending on public schools (K-12 education) is the largest form of public investment in children, with most of this spending coming from state and local governments. State and local spending on education, for example, varied from $11,625 per child in Vermont to $4,180 per child in Arizona in 2013, even after adjusting for regional price parities (Isaacs and Edelstein 2017). The Medicaid health insurance program, jointly financed by the federal government and the states, represents the second largest form of investment in children after K-12 education (Isaacs et al. 2017). Many states have expanded Medicaid beyond federal minimums for benefit and coverage, leading to wide variation in eligibility levels, service coverage, payment mechanisms and spending per enrollee. Children also benefit from spending on the Children's Health Insurance Program (CHIP) and spending on public health systems. In contrast to public education, which serves children across income groups, Medicaid and other health programs often target toward low- and moderate-income families.

There also are a number of income security and social service programs that support families with children. Some of these are explicitly limited to families with children (i.e., earned income tax credits, the child tax credit, TANF, child support enforcement, the disabled child portion of Supplemental Security Income (SSI), child welfare services, child care assistance). In

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[1] The data were assembled by Julia Isaacs, Erica Greenberg and Eleanor Lauderback working in collaboration with the lead author. 2001 is not included in the database because a manpower crisis surrounding the 2002 Census of Governments led to unavailability of state level estimates in 2001. Therefore, our analytic sample includes 1998-2000, and 2002-2014.

addition, some programs that serve the low-income population have a disproportionate share of child recipients. For example, two-thirds of SNAP benefits go to households with children and, during the most recent recession, SNAP was a primary form of support for children with unemployed parents (Isaacs and Healy 2014). Most of these programs are federal or jointly federal-state programs, and many of them target low-income families.

Data: Consumer Expenditure Survey

To measure private parental investments in children, we link the state database to household-level data from the Consumer Expenditure Survey (CEX) from 1998-2014. The CEX is a nationally representative survey on the income and expenditures of U.S. households. Households in the CEX provide information quarterly about 12 consecutive months. The data are in a household-quarter structure. The start-month for a quarter is determined by the first month of interview, meaning that quarters can span more than one calendar year. In such cases, we assign the quarter to the year during which most of the quarter occurred. Our analytic sample in the CEX consists of households with children ages 0-18, with no parents over the age of 65.

Response rates to the CEX have declined over time. For instance, since 2012, response rates have declined from about 70% to 60% (Hubener et al. 2017). This raises the concern that the CEX might under-represent certain demographic groups. King et al. (2009) compare the CEX to the ACS in terms of demographics and find many statistically significant differences, but few substantively large differences. Similarly, Bee et al. (2012) compare the CEX to the CPS and find little evidence of bias in the demographic composition of respondents to the CEX.

We merge the household-level CEX data with our public expenditures database at the state-year level. State-level identifiers are suppressed by the CEX for some respondents due to privacy concerns related to small within state sample sizes. As a result, state IDs are missing in

approximately 14% of household-years in less populated states. The CEX suppressed these IDs in order to comply with the Census Disclosure Review Board's criterion that geographically identifiable areas must have a population of at least 100,000 in order to be disclosed. Our study period does not include observations from Arkansas, Iowa, Montana, New Mexico, Nebraska, North Dakota, South Dakota, or Wyoming. All other states are represented in the data across multiple years. In addition, the CEX imputes missing values on our other key measures (described in the next section), including income, expenditures, demographic characteristics and work experience items in each survey round.

In supplemental analyses, we examine parental expenditure patterns among missing state-years in the CEX during our study period. Overall, this analysis suggests that, compared to the entire U.S. population, average private spending is slightly lower among missing state-years, as is average income. College-educated parents are better represented in the analytic sample than in the missing state-years. However, the size of income and education gaps in private parental spending is similar in both observed and omitted state-years. State spending is also very slightly higher in the analytic sample than in missing state-years. What then can we draw from these data about the potential for bias? If we had found that state spending was similar in the suppressed state-year observations but that class gaps were much larger, then that might suggest a possible over-estimate of our effects because we would be understating the size of class gaps in parents' developmental expenditures. If we had found that state spending was similar in the suppressed state-year observations, but that class gaps were much smaller, then that might suggest a possible under-estimate of our effects because we would be overstating the size of class gaps in parental expenditures. But, in fact, we find that the class gaps in private spending and the levels of public spending were very similar in the analytic sample and in the suppressed state-year observations,

both for our pooled study period and at the beginning and end years. Taken together, this comparison provides no evidence to suggest that the omission of suppressed state-year observations would bias our estimates.

Measures

Socioeconomic Status. We use two measures of parental SES. First, we measure annual household income ranks (0-25%, 26-75%, 76-90%, 91+%) relative to state-year incomes of adults with children in the CEX, with income adjusted to 2014 dollars using the CPI-U-RS series.[2] We separate incomes in the 76-90th percentiles from the top 10% because of research suggesting that households in the top income decile have unique spending patterns relative to those in lower income groups (Kornrich 2016). Second, we measure parental education using a four-category measure: less than a high school degree, a high school diploma, some college, or a four-year college degree or more. In the case of two-parent families, we take the educational attainment of the parent with the highest attainment.[3] We measure these SES indicators separately in all multivariate analyses.

Public Investments. We measure state-level real spending per-child in 2014 dollars in several domains. We begin by measuring *total spending* relevant to children and families (including education, health, income support and other spending), and then conduct additional analyses by spending domain for education, health and income support. The findings presented here include

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[2] In additional analyses, we estimate models that exclude (a) the top 1% of income and the top 1% of private expenditures, and (b) separately, the bottom 10% of the income and private spending distribution, in order to observe the influence of outliers at the top and bottom of the distribution. These results, shown in Appendix Table 1, are substantively identical.

[3] Results using this measure of education produce highly similar findings to results using a three-category measure (less than high school, high school/some college, or college plus), both with respect to the magnitude of gaps between higher and lower-educated households, and with respect to variation in education gaps across states.

the measures listed in Table 1 and reflect our choice of public spending programs that are either strongly targeted to children or families with children (e.g., SNAP), or that may benefit families with children (e.g., unemployment compensation).[4]

An alternative approach would be to measure state-level benefit generosity (e.g., eligibility) rather than actual expenditures, since families may not claim all benefits to which they are entitled (or may overclaim). However, the primary mechanism by which we expect public expenditures to affect private investments is by increasing the actual amount of household resources and as such, the actual expenditures measure is preferred.

Private Parental Investments. Our focal measure of investment is quarterly spending on developmental items that combines spending on children's furniture, clothing, equipment, recreational equipment, toys, games, arts and crafts, musical equipment, and educational books. This is a per-child, absolute expenditure measure that divides total household expenditures/quarter by the number of children ages 0-18 in the household. In additional analyses, we scale household expenditures on children using a square root scale (household expenditures divided by the square root of the number of children in the household), in order to allow for the possibility that household needs do not grow in a proportional way. Because these results, shown in Appendix Table 2, are substantively equivalent, we proceed with the per-child measure. We inflation adjust expenditures to 2014 dollars using the CPI-U-RS.

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[4] In supplementary analyses, we explore alternative categorizations of each domain that restrict measures to include only spending programs that are strongly targeted to children or families with children, and find similar results. Instead of measuring spending per child, for progressive state spending measures (income support and health) we also measure spending as a share of the number low-income children in each state (for 2000-2014), using data from the Anne E. Casey Foundation Kids Count Data Center on the number of children below 200% of the poverty threshold. Our substantive conclusions remain unchanged about income/education gaps in private parental investment, and bottom-up convergence in this investment as state spending increases.

Our measure of parental investment, while confined to goods for children, provides a useful summary of developmental investment because it captures investment that is not purely consumption. In keeping with existing research on parental financial investments in children, we view this measure as capturing spending on in-home items that could plausibly be related to children's developmental outcomes, given that previous research has linked the presence or absence of these items to children's development (Evans et al. 2010; Kornrich 2016; Totsika and Sylva 2014). In addition, expenditures on these types of developmental enrichment goods should be more proximately related to public investment for lower-SES families than other types of expenditures that are out of reach for the majority of low-SES families and should therefore be less sensitive to more generous state contexts of public investment, such as private school tuition or housing.

However, this measure does not include other forms of parental spending that may, at least in part, constitute private investments in children, such as spending on housing or more nutritious foods. It is certainly plausible, for instance, that some affluent parents may choose housing that requires them to spend more than they would otherwise specifically to access public schools that they believe provide greater benefits to their children. [5] While components of such expenditures are likely to be important aspects of private parental investments, there are significant challenges to estimating what portion of these expenditures can be properly attributed to private parental investment in children as opposed to consumption expenditures by adults. For example, estimating the portion of housing expenditures by parents that might reasonably be allocated to private parental developmental spending would be very difficult. In the context of a

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[5] However, combined, local, state, and federal school funding is not biased by student SES (Chingos and Blagg 2017) and we find no evidence of an association between generosity of public investment in education at the state level and the within-state between-district inequality in educational spending using data from the 2001-2014 Local Education Agency School District survey.

fixed budget constraint, variation in expenditures on housing reflects different needs for space (i.e. square footage), preferences for home-related amenities (i.e. fireplaces, backyards, etc…), proximity to work and other destinations, as well as selection into desired school districts. The large literature in economics on housing valuation and school quality demonstrates just how empirically difficult it is to cleanly estimate the specific willingness to pay for selection into higher school quality as distinct from willingness to pay for these other closely related amenities and to rule out problems of reverse causality. A recent body of work that uses IV and difference-in-differences finds that 1 SD increase in school quality is associated with about a 3% increase in house prices (Black and Machin 2011). However, the literature does not provide a feasible path for decomposing every household's housing expenditures and estimating the portion that can be attributed to school selection. It would clearly be incorrect to include the entire amount of housing expenditures in the dependent variable, yet there is not a clear way to estimate how much of each household's expenditure can reasonably be allocated to private investment in children. It is similarly difficult to imagine disaggregating families' total expenditures on nutritious food or other amenities (e.g., vacations) into the amount that should be directly allocated to child investment.

While we follow all of the existing literature on parental expenditures on children (e.g. Amorin 2019; Hastings and Schneider 2020; Kornrich and Furstenberg 2013; Kornrich 2016; Schneider, Hastings and LaBriola 2018; Ziol-Guest, Kalil and DeLeire 2004) and do not attempt to allocate a portion of housing or food costs to private parental investment, we return to this issue in the concluding section of the paper in order to speculate about how our results might change were we able to do so.

Demographic and State-Level Controls. We include a number of household and state-level control variables in an effort to account for the many factors that co-occur with socioeconomic status, parents' expenditures, and state-level public investments. At the household level, we use CEX data to control for household size, family structure, parental age, the race/ethnicity of each parent, and parental work hours. Longstanding evidence documents the associations among these factors and socioeconomic status, with striking variation in income and parental education by maternal age, family structure and employment status (e.g., McLanahan 2004).

At the state level, we account for factors that may co-vary with the amount of state spending on children and families, drawing on data from the University of Kentucky Poverty Center's State Welfare data base, from the Current Population Survey, and from the Bureau of Labor Statistics to construct a number of state-year measures. Given evidence that state-level spending increases as economic need increases during periods of economic downturn (Brown and Best 2017; Edelstein et al. 2016; Rodgers and Tedin 2006), we control for the unemployment rate and poverty rate. As an indicator of state generosity, we control for the prevailing minimum wage. We measure states' governance structures with a variable indicating whether the governor is a Democrat, as prior research shows that republican control is negatively associated with safety net generosity (i.e. Brown and Best 2017; Scruggs and Hayes 2017; Soss et al. 2011). Finally, we account for state demographic composition with the share of the population without a college degree, that is Black, non-Hispanic, and the share of the population that is Hispanic because prior literature connects demographic composition with spending generosity (i.e. Alesina et al. 2000; Rogers and Tedin 2006; Preuhs 2007; Soss et al. 2011).

Analytic Approach

Much existing research examines variation in the amount and effects of public investments at the country level. A cross-national approach, while valuable, may confound the effects of public spending with unobserved country characteristics that influence spending and family characteristics. We focus on the smaller area of the state for both substantive and methodological reasons. First, it is important to understand the implications of substantial spending variation across U.S. states, given the increasing emphasis on states as the level at which policies are produced and administered. Second, it is more feasible to comprehensively measure and control for detailed variation across states as compared to countries

We use variation in public spending across states and time to describe patterns of public investment across states and years. After presenting exploratory maps that describe levels of state spending on children during our study period, we estimate OLS models that use variation both across and within states to predict private parental investment from household socioeconomic status and total state spending on children. Although these models control for important observed differences across households and states, these estimates may be confounded by correlated unobserved factors. In order to address this possibility, we next estimate models that include state fixed effects to control for state differences correlated with spending and family characteristics (e.g., labor market structure, level of economic need), and year fixed effects to control for time trends shared across states (e.g., recession effects). Variation across states in the strength of the labor market and the demographic composition of the population, such as a larger population of low-income families, could produce a positive relationship between spending and economic need that does not reflect true variation in states' investment in children and families. Including state fixed effects helps to control for these fixed differences across states. In addition, increased

economic need during periods of economic downtown is correlated with increases in spending, particularly from federal sources, in order to support state/local governments working to provide assistance to families (Edelstein et al. 2016). Including year fixed effects helps to separate the effects of spending and government investment from the effects of economic need. In order to more rigorously examine the association between public investment and class inequality in parental investment in children, we use the following model:

$$Y_{ist} = \beta_0 + \beta_1 SES_{ist} + \beta_2 Spend_{s,t-1} + \beta_3 SES_{ist} XSpend_{s,t-1} + \beta_4 X + \mu_s + \theta_t + \varepsilon_{ist}$$

where, for each child i in state s in year t, we model private parental investment in children (Y)—quarterly expenditures on developmental goods—as a function of SES (parental income/education); state spending ($Spend$) in the year prior to the survey wave; the interaction between SES and state spending; the household and state-level controls (X) described above; and state and year fixed effects. We follow Balli and Sorenson (2013)'s suggestion to demean the items in the key interaction terms in fixed-effects models, demeaning public spending measures and household income/parental education before creating interaction terms.

The inclusion of state and year fixed effects means that model identification is based on within-state variation in public spending across years, as well as across-state differences in public spending in a given year. We begin by examining total state spending, examining β_1 and β_3 in order to test hypotheses about the spending of low and high-SES families in different public investment contexts, as well as to examine class gaps in parental spending. To facilitate interpretation, we compute predicted expenditures for each household income rank (0-25, 26-75, 76-90 and 91+). If public investments reduce class gaps in parents' developmental expenditures, we expect the main effect of SES (β_1) to be larger (since it includes those in low public spending state contexts) and the interaction between SES and state spending (β_3) to be smaller (since it includes those in higher

spending state contexts). We would expect that if a lack of economic resources are a key barrier to private expenditures among low-SES parents or if contexts of more generous public spending induce changes in low-SES parents' logics of parenting, then increases in public spending should lead to an increase in expenditures among this group.

The analyses described above use total per-child state-level spending on children and families (on education, income support, health and other spending) as the measure of public investment. Next, we consider whether there is meaningful variation in the relationship between public investments and class gaps in private investments according to the type of public investment. We estimate separate models for income support, health and education spending in order to assess whether the equalizing effects of public investment are more pronounced for progressive and targeted programs than for more universal spending programs such as K-12 education. We also examine whether any narrowing of class gaps in parents' expenditures with increases in public investments is primarily driven by low or high-SES households.

The key assumption of our approach is that other, unmeasured changes in state characteristics did not co-occur with changes in state spending on children. Including state and year fixed effects in the above analyses will reduce bias from stable unobserved differences across states, and from time trends shared across states. The analyses described above will allow us to rigorously describe the relationship between public investments and class gaps in parental behavior, and will clarify mechanisms for reducing inequality by demonstrating whether public investments are related to parenting practices. However, it is important to acknowledge that our estimates are not causal. All of our models include the CEX sampling weights (finlwt21) and adjust the standard errors for clustering at the state-level. Our analytic sample is 118,278 household-quarters.

RESULTS

Describing State Spending Across and Within States

Figures 1 and 2, as well as Table 2, show variation between states in total state spending per child. Table 2 shows that, in 1998, average total spending per child was $15,100. Figure 1 shows that this amount varies substantially by state, and that there is also a strong geographic pattern to state investment in children, with states in the Northeast better represented in the highest spending categories than states in the South and West. For reference, a standard deviation in public expenditure is equivalent to $5,200 per child. In 1998, the difference between the lowest and highest-spending states was 2.5 SD: Utah spent $10,000 per child and New York (the highest-spending state other than DC) spent almost $23,000.

With respect to variation within states over time, Figure 2A shows that states experienced significant changes in spending between 1998 and 2014. Figure 3A shows that the amount of change also varied meaningfully across states: while there was growth in spending in all states during this period, there was also substantial variation across states in the amount of spending growth. Vermont, for example, increased total spending per child by 132% or 4 SD, increasing total per child spending from $15,500 in 1998 to $36,140 in 2014. Georgia, the state with the smallest percentage increase in state spending, increased spending from $14,000 per child in 1998 to $19,300 in 2014—an increase of 1SD. The average spending increase within states was $10,200, or 2SD. By 2014, average total spending per child increased to $25,000 per child (Table 2), and the size of the difference between the highest and lowest-spending state had increased to 4.5 SD ($15,200 in Utah compared to $38,500 in New York).

Breaking up total state spending by spending type shows that much of the variability in total state per-child spending is driven by income support and health programs, as Figures 2B/2C and

Table 2 demonstrate. Per-child spending on income support programs jumped sharply between 2009 and 2010 during the Great Recession (Figure 2B), and then steadily declined through 2014, although 2014 spending levels remained higher than in pre-recession years. Health spending (Figure 2C) increased more steadily through 2014, increasing from an average of $4,600 per child in 1998 to $9,200 per child in 2014.[6] Education spending on children (Figure 2D) also varies across years, but in a less pronounced way, slowly increasing until 2009 and then slightly declining after 2012.

Figures 3A-3D show the percentage point change for each state in total spending, income support spending, health and education spending per child, respectively. Together, these figures provide a relative comparison of the amount of change in public investment, using the scale most appropriate for each form of spending. Increases in income support and health spending (3B and 3C) were fairly widespread throughout the U.S., with substantial increases in spending in states across different regions. Education spending increased substantially in select states during this period, with a more noticeable geographic component. The states that increased spending the most are in the Northeast, with Midwestern and Mid-Atlantic states increasing spending by a moderate amount, and states increasing spending the least generally clustered in the West and South.

State variation in spending, or variation in spending over time, may be especially driven in some states by differing or increasing need among children, as well as variation in the cost of providing services if there is a large number of children living in poverty or with special learning needs. In many cases, however, states with the highest need among children are often lower-

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[6] Much health spending consists of "public health" expenditures on public health administration, public and environmental health activities, and public health treatment and clinics. Limiting the state health spending measure to include only Medicaid and CHIP expenditures yields a much smaller average health spending average, of $730 per child. We include all health spending types in our analyses, since the results are not sensitive to excluding any particular form of health spending that benefits children.

spending states. In other cases, state variation in spending may reflect policy choices at the state level about how much to invest in child and family policy. For example, expanding Medicaid to extend coverage to more children would result in increased health spending in states that prioritized this expansion, such as many states in the Northeast. We rely on this spending variation within and across states to identify the relationship among public investments, socioeconomic status and parental expenditures.

Total State-Level Spending and Inequality in Parents' Developmental Expenditures

To understand how state investments in children are related to inequality in private investments, we begin by plotting the bivariate association between income and our measure of private parental investment—quarterly expenditures on developmental items for children. Figure 4 plots this association separately for three categories of state investment: the bottom 10%, 11-75%, and the 76+ percentiles. The figure shows that income appears to be more strongly associated with private parental investment in low-spending state-years than in the middle or highest spending state-years.

This descriptive plot suggests that income is more strongly predictive of private parental investment in states that do not spend as much on children. However, it is possible that this pattern is driven by unobserved differences between households and states, or across years. To test the hypothesis that state-level public investments reduce class inequality in parents' developmental expenditures, we interact total state spending and household socioeconomic status, and examine their joint association with private parental expenditures. Table 3, Model 1 presents estimates from OLS models that predict private parental investment from household income ranks and total state spending on children. As total state per-child spending increases, income

differences in parents' private expenditures on educational items decrease. Model 2 shows similar results after adding household and state-level control variables. When total state spending is very low, households with incomes in the 26-75 percentile spend $26 more on enrichment expenditures per quarter for each child, or about $104/year, than households with the lowest incomes. Those in the 91st or higher percentile of income spend about $110 more per quarter than those in the bottom 25th percentile of income. For every $1,000 increase in total per-child state spending, however, income gaps decline.

While Model 2 controls for household and state-level variables, it does not include state or year fixed effects that account for unobserved, fixed differences across states, or time-specific events shared across states. The results in Model 3, which focus on total state spending and include state and year fixed effects, are largely similar to those in Model 2. When state spending is very low, income gaps in private parental investment are large. Relative to those in the lowest income 25%, households in the top 10% of the income distribution spending $113 more per quarter on developmental items per child, while those in the 76-90th percentile spend $67 more per quarter. As total state per-child spending increases, income differences in parents' developmental expenditures decrease. For every $1,000 increase in total per-child state spending, for example, the gap in per-child private developmental spending between those in the 76-90% and those in the bottom 25% of household income declines by $4/quarter ($\beta$=-3.57, p<0.05).

In order to understand the magnitude of these relationships and to understand patterns across a more realistic range of total state spending, Figure 5 presents predicted private parental developmental expenditures by household income ranks. These predictions are based on the results in Table 3, Model 3. We show these predictions for different levels of total per-child state spending: 2SD below the mean, 1SD below, at the mean, and 1 and 2SD above the mean. Figure

5 shows that income differences in parental expenditures on developmental goods partially converge when total state spending is high, and that this convergence is driven primarily by increased spending among lower-income households.   The predicted gap in enrichment expenditures between households in the lowest (0-25%) and highest (91+%) income ranks is very large when total state spending is two standard deviations below the mean, with those in the highest income group spending over three times more quarterly on per-child enrichment, or a difference of $156/quarter ($624/year). When total state spending is 2SD above the mean, the predicted income gap narrows to 70%, or $78/quarter ($312/year). Predicted gaps between the highest and lowest-income groups decline by 50% as state spending increases. The predicted increase in private parental expenditures among low-SES households could be substantively meaningful, amounting to 0.14 of a standard deviation in parental expenditures.

For reference, a standard deviation in public expenditure is equivalent to $5,200 per child, and so a 1 SD difference in spending would be the difference between a spending environment like Rhode Island (8th highest spending in 1998) vs. Nevada (#41). 2 SD would be equivalent to the difference between New York (#2) and Indiana (#40). With respect to within-state change, 1 SD would be equivalent to the per-child total spending increase that took place within Alabama between 1998 and 2009, and 2 SD would be equivalent to the increase in California between 1998 and 2011. 4SD would be equivalent to the increase in total per-child spending in Vermont between 1998 and 2014, or to the difference between New York and Utah in 2014.

Table 4, Model 3 shows patterns for parental education gaps in private parental expenditures. Findings for education are consistent with the income differences described above. Relative to those with a college degree or higher, those whose highest level of education is less

than high school spend about $33/child less per quarter on educational items when total state spending is low, those with a high school degree spend about $17/quarter less, and those with some college spend $12/child less per quarter. For each $1000 increase in per-child total state spending, education gaps decline, with the lowest-educated households increasing spending more ($\beta=5.57$ for less than high school; $\beta=3.51$ for high school) than those in higher-educated households. Computing predicted education gaps (Figure 6) reveals a similar and even more pronounced pattern of convergence, compared to household income gaps. Parental expenditure differences between those with a BA and those with less than a high school degree decrease from about 75% (or about $67/child each quarter) when state spending is 2SD below the mean, to 5% (or about $7/child each quarter) when spending is 2SD above the mean, with lower-educated households predicted to spend slightly more. Testing the significance of differences in the predicted margins between the lowest and highest-educated households in high spending state-years shows that these differences are neither statistically significant nor substantively meaningful. For example, a household with less than a high school education is predicted to spend $143/quarter on each child when state spending is 2SD above the mean, compared to $136/quarter for a household with a college degree. This difference of $7/quarter is small in terms of magnitude. In contrast, educational differences in lower-spending state-years are larger, with predicted differences in parental expenditures of $67/quarter between the highest and lowest-educated households (or 0.23 of a standard deviation in parental expenditures). These findings suggest that, while we can conclude that educational differences in private parental investment converge as state investments increase, we cannot claim that lower-educated households spend significantly more than higher-educated households. Rather, high levels of

state spending on children are associated with parity in parental expenditures across educational groups.

These results are consistent with our expectation that more generous public spending directed toward children and families is associated with narrower class gaps in private parental expenditures on developmental investments in children. Moreover, narrowing class gaps in state contexts of higher public investment are driven by disproportionately higher spending among lower-income and lower-educated households, with no increase in expenditures among parents with high levels of income and education. This pattern of results is consistent with the possibility that a key barrier to higher developmental expenditures among low-SES parents is a lack of economic resources.

Are Declining Class Gaps Driven By Progressive Public Investment?

Progressive State Investment. The inequality-narrowing effects of public investment may be especially driven by more progressive and/or targeted spending programs that take the form of cash benefits or replace otherwise necessary private expenditures. Examining variation across forms of state spending provides a way to examine whether the patterns of convergence observed for total state spending are driven by more progressive public investment programs. In contrast to education spending on children, which is dominated by K-12 public education spending serving children across income groups, spending on health and income security programs is more targeted toward low- and moderate-income families. While public investments on income support and health should affect the expenditures of low-SES households, investments in public education may not affect developmental expenditures among low-SES households, and may lead to either decreasing or increasing investment among high-SES households.

Models 4 and 5 in Tables 3 and 4 present estimates of our test that more progressive public investments drive the inequality-narrowing effects of public investment on parents' private developmental expenditures. Table 3, Model 4 shows that, as per-child spending on income support programs at the state level increases, income differences in parents' developmental expenditures significantly decrease. When income support spending is low, households in the top 10% of the income distribution spend $110 more per quarter on developmental items per child than those in the bottom 25%, while those in the 76-90th percentile spend $66 more per quarter. With each $1,000 increase in per-child state income support spending, however, income gaps on private enrichment expenditures decline significantly. Model 5 shows that these results are very similar for the case of state health spending, whereby income differences decline as state-level investments on health programs increase. Figures 7A and 7B present these patterns visually for income support and health spending, respectively. Predicted private expenditure gaps between the highest and lowest-income groups decline from 125% when income support spending is low, to 46% when income support spending is very high (2SD above the mean). The pattern of convergence is similar for health spending, with predicted household income gaps declining from 125% to 75% as health spending on children increases at the state level. Notably, narrowing class gaps as state spending increases are primarily driven by increasing private developmental expenditures among lower-income and lower-educated parents.

Examining parental education instead of household income (Table 4, Models 4 and 5) shows a similar and more pronounced pattern of results, whereby increasing state investments in income support and health programs are associated with increasing expenditures among the lowest-educated households, relative to the highest-educated households. Overall, analyses of progressive public investments suggest that increasing expenditures among low-SES families in

contexts of higher public investment, as well as the resulting declines in class gaps, are driven by the kinds of progressive public investments that are designed to improve access to resources for low-SES families.[7]

Universal Public Investment. In contrast, examining state investments in children's education (largely driven by K-12 education spending) reveals a decline in class gaps that is driven by declining private spending among the highest-SES households, rather than increasing spending among those with lower levels of income and education. Table 3, Model 6 shows that, with one exception, there is no significant variation the relationship between household income and parents' developmental expenditures according to the level of state public investment in education. The lowest income households do not increase private expenditures on their children as states invest more in education. However, higher-income households spend less, and this leads to the partial convergence between income groups shown in Figure 7C. Income gaps decline from a factor of almost two when state education spending is very low, to about 85% as state education spending increases, with declining private expenditures among the highest-income families driving this convergence. Model 6 in Table 4 confirms a similar pattern for parental education gaps.[8]

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[7] As a more direct test of the possibility that targeted support for households increases income in the household, we estimate models predicting household income from state income support spending, including state and year fixed effects. This model, shown in Appendix Table 3, shows a positive association between state income support spending and household income—consistent with the possibility that progressive public investment increases resources available to invest in children's goods.

[8] In supplementary analyses, we examine income gaps in parents' private schooling expenditures, using a measure that includes expenditures on tuition and room and board. We complete this analysis in order to examine the possibility that parents decrease their expenditures on private schooling when states invest more in public education for children. These results, presented in Appendix Table 4, show that, although income gaps in parental spending on tuition are large, these gaps do not change in a statistically significantly way as state spending on children's education increases. Although the interaction term for the highest income rank is not statistically significant, the magnitude of the coefficient is (perhaps surprisingly) positive and consistent with the possibility that higher-income households spend more on tuition as state spending on education increases. Since the overwhelming majority of households have zero or near-zero expenditures on child tuition, it is not surprising state education investments do not affect the schooling choices of lower-SES families.

In sum, these results are consistent with the idea that public investment is effective in narrowing inequality through improvements in resources among low-SES families, and that this is particularly the case when state investment is targeted and progressive: the most targeted forms of investment, income support and health, have the strongest equalizing association with private parental investment through changing behavior at the bottom of the income and educational distributions. In contrast, the more universal investment of education spending does lead to narrowing class gaps, but through decreasing expenditures among the highest-SES households, rather than changing behavior among the lowest income households.[9]

DISCUSSION

Sociologists have long emphasized the role of family resources and investments in generating intergenerational inequality, with recent research identifying significant class gaps in parents' private investments of money and time that are a primary source of investment in children and an important source of inequality by family income and education. At the same time, child and family-focused public policy is motivated by the recognition that both families and governments are the primary sources of investment in children, especially for the 50% of children in low-income households. Public spending indicates the strength of the welfare state for children and families, and theory and evidence suggest that the strength of these investments should be linked to families' private investments in children. Despite this recognition, theoretical and empirical understanding is very limited with respect to how public investments should be associated with inequality in private investments.

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[9] We also examine variation in investments according to the age of children in the household. We estimate the models in Tables 3-4 separately by age of children. Although sample sizes are too small to present coefficient estimates, among each age group (0-5, 6-13, 14-17 and 18) we find a consistent pattern of results.

Our approach relies on the federalist character of the U.S. welfare state and the substantial amount of state-level variation in public spending on children and families that puts some states far below and some far above the national average. This approach yields a dramatic range of state spending to which children and families are exposed. For example, in 1998 the difference between the lowest and highest-spending states was 2.5 SD: Utah spent $10,000 per child and New York (the highest-spending state other than DC) spent almost $23,000. This difference across states only increased over time: by 2014 New York spent 4.5 SD more per child than Utah. During this period, states also varied dramatically in the degree to which they increased their investments in children. For example, while Vermont increased spending by 132% during our study period, Georgia increased spending by 26%. We use this quite significant state spending variation across and within states to test whether more generous public investment in children narrows class inequalities in private parental investment, rigorously controlling for state differences in labor market structure and level of economic need, as well as time trends shared across states, such as the Great Recession.

Using assembled administrative data at the state level over a 16 year period, linked to household-level data on parental expenditures, we find that more generous public spending for children and families is associated with significantly narrower class gaps in private parental investments. When total state spending is higher, income and educational gaps in private parental expenditures on educational items decline meaningfully. In particular, the narrowing income gap in private parental expenditures is driven by increases in expenditures among lower-income and less-educated households. For example, households in the bottom 25% of income are predicted to increase per-child spending on developmental goods from $66/quarter to $106/quarter, or $40/quarter, as state income support increases from very low to very high. Those in the 26-75

income percentiles are predicted to increase per-child developmental expenditures by $48/quarter. Increasing expenditures among low-SES households lead to a decline in the predicted income gap in private expenditures from almost $624/year per child ($156/quarter) when state spending is 2 SD below the mean, to $312/year when state spending is 2 SD above the mean. The increase in private expenditures that we observe among low-SES households when state spending is higher amount to 0.14 of a standard deviation in private developmental expenditures.

We next disaggregate public investments into those focused on income support, health and public education, in order to test whether targeted and/or universalist forms of investment have inequality-narrowing effects. We find that each form of public investment is equalizing in private investment, but that this equalization is driven by different ends of the SES distribution for progressive vs. universal public investments. More progressive forms of state investment—income support and health—are associated with bottom up equalization driven by increased spending among lower-SES households. In contrast, the universal state investment of public educational spending on children is associated with top down equalization, driven by decreased spending among high-SES households.

While we conduct several analyses to assess the robustness of our results, our work is subject to some limitations. First, while we are able to control for many time-varying factors at the household and state levels, it is possible that some state-level differences or period effects are unmeasured in our analyses. In the absence of random assignment or a single policy shock leading to variation in the forms of state spending we examine, we cannot rule out confounding from state-level economic or political factors, and so it is important to emphasize that we have not identified causal estimates of public spending on class gaps in private investments. For example, it is possible that cross-state variation in public spending is generated from parents' orientations to

investment in children, rather than the other way around. Families are not randomly distributed in states, but instead choose their location based on a number of factors, including job opportunities, political climates and a desire to maximize their children's development. It is possible that high public sector investment partially reflects the presence of families who prioritize child investment, both in their own behavior and in their support for state policies and programs. We argue that the benefits of comprehensively measuring the state-context of children's environments outweigh the costs of lacking random assignment. Describing the federalist character of children's welfare state and its links to household processes provides a useful platform on which to build future, quasi-experimental study designs focusing on particular programs.

Second, while we measure parents' private investments, we cannot examine the consequences of those investments for children's development. Prior cross-national research demonstrates that there are wider class gaps in child outcomes in countries where public investments in children and families are larger (Bradbury et al. 2015; Waldfogel 2016). While differences in parental spending are an implied key pathway through which public investment affects child well-being, it is difficult from the existing base of evidence to quantify how much a particular dollar value of parental spending (in contrast to public spending) affects children's outcomes. Understanding this potential pathway of parental investment more systematically is a key goal of this paper, both theoretically and empirically. Nonetheless, one way to think through the potential implications of our results for children's outcomes is to consider prior research on EITC expansions. The EITC is heavily studied—it is among the largest antipoverty programs for children, varies widely across states and time, and is positively linked to children's outcomes (e.g., Bitler, Hines and Page 2018; Schaefer et al. 2018). Federal EITC expansions led to increases in income for families of as much as $900 from 1987 to 1993, for example (Dahl and

Lochner 2012). Studies of these expansions reveal that an increased EITC investment of $1,000—or equivalent to the largest increase under federal expansion—led to an increase in children's reading and math test scores of 6 percent of a standard deviation, with larger effects for lower-income children (Dahl and Lochner 2012). Some studies also rely on state expansions of the federal EITC to examine effects on children's outcomes, finding that the enactment of a state EITC significantly increases child birthweight (Strully 2010).

This evidence, although indirect, is useful in suggesting that increases in public investments on the order of $1,000/child positively affect children's development. Certainly parents do not use all of the supplemental income they receive through EITC on children's developmental goods. However, a small body of evidence suggests that EITC recipients do prioritize spending on short-term needs broadly, and investments in children's items (including books and clothing) specifically (Gao, Kaushal and Waldfogel 2009; Romich and Weisner 2000; Smeeding, Phillips and O'Connor 2000). These studies do not examine these effects of particular financial investments on children's outcomes. Combined with evidence on the positive effects of EITC on children's outcomes, however, they are consistent with the possibility that increased financial investment in children in the family could be a pathway through which increased public investment benefits children's development. The increases in private expenditures that we observe among low-SES households when state spending is higher—amounting to 0.14 of a standard deviation in parental expenditures—may be substantively meaningful. To the extent that expenditures on developmental goods provide an incomplete though useful proxy for parents' ability to provide children with both basic necessities and developmental goods, then the convergence that we observe across income and education groups may make a meaningful difference for children's well-being. However, the implications of these patterns of parental

expenditures for children's outcomes remains to be seen and, to be clear, existing evidence provides little empirical indication one way or another about whether private parental investments serve as a pathway through which public spending affects child well-being. Our findings suggest that it would be valuable to further examine how the combination of public investment and class-narrowing in private investment is related to children's development within the United States. It would also be useful to examine more nuanced types of relative differences in parental investment beyond the absolute expenditure differences we reveal in our work, such as the difference between those who spend nothing and those who spend a non-zero amount on educational goods for their children.

Third, we are limited by the CEX in our measurement of private parental investments. We follow the existing literature in measuring spending on educational goods (e.g. Amorin 2019; Hastings and Schneider 2020; Kornrich and Furstenberg 2013; Kornrich 2016; Schneider, Hastings and LaBriola 2018; Ziol-Guest, Kalil and DeLeire 2004). However, like the existing literature, we are constrained in our ability to measure additional forms of parental investment in children that might yield developmental benefits, such as healthier foods for children, marginal increases in housing expenditures to obtain better neighborhood or school quality, or additional spending on heating or cooling, but that are likely a small part of much larger spending categories (housing, food, utilities) that are not child-specific, but for which the child-specific component cannot be disaggregated in the data.

How might an ability to account for these additional forms of spending change our key conclusions about the role of public investments in structuring class gaps in private parental investments? With respect to our finding that the more progressive state investments in income support and health lead to bottom-up equalization driven by increased spending among lower-SES

households, it is likely that the absolute size of class gaps in private parental investments would be larger in dollar terms, but unlikely that the magnitude of change in the class-gaps would change. Low-SES parents who receive cash and in-kind support from the state should be able to spend more money on nutritious food or even on child-investment related housing expenditures, based on the results of prior research (Gregg, Waldfogel and Washbrook 2006; Parolin 2021). While high-SES parents have the ability to spend much more, it is unlikely that their expenditures on a broader array of items would be altered by progressive state investments, in contrast to the behaviors of low-SES parents. We therefore expect our result that progressive state investment results in narrower class gaps via bottom-up equalization to generalize beyond the goods measured in our analysis, and for the magnitude of equalization driven by low-SES parents to be similar to that estimated here.

How might our other key finding—that the universal investment of public educational spending on children is associated with top-down equalization, driven by decreased spending on developmental goods among high-SES households—change if we were to measure private parental investments more broadly? There are two dynamics to consider – the likely effect of more generous public investment in education on these indirect parental investments and then the implication for class-gaps.

On the former, we expect that a broader measure that allocated some portion of housing expenditures as child investment would yield a similar effect of state education spending on the behavior of low-SES parents. The vast majority of low-SES parents enroll their children in public school and, moreover, the rise of school choice policies and charter schools have made it increasingly feasible for parents to enroll their children in non-neighborhood schools without altering their expenditures on housing (Candipan 2020). In contrast, the housing expenditures of

higher-SES parents could be more impacted by the availability of high-quality schools in the state (aided by higher state spending on education). But, in practice, there is limited evidence for the possibility that high-SES families increase their expenditures on housing to a greater degree than lower-SES parents when they move across school districts or across geographic areas with varying levels of income inequality (Charles and Lundy 2013; Goldstein and Hastings 2019). In addition, any increase in child investment via housing expenditures would be partially offset by a possible decrease in private school tuition expenditures when families secure access to higher-quality public schools.

On the latter, while we have little reason to expect that the child-investment portion of housing expenses would change for high-SES parents in response to increased levels of education spending, or for that matter, that the child-investment portion of food expenses would change either, by excluding these investments from our measure we may over-estimate the degree of top-down reduction in inequality in parental investment. The reason is straightforward: while it is difficult to precisely estimate the amount of these indirect components of parental investment, if they are substantial in size but invariant to levels of public education spending, then they essentially constitute a constant in the denominator of the low-SES/high-SES investment gap. If we were able to account for this constant, then the percent of the gap in private parental investment explained by the top-down process would almost certainly be less than estimated here.

Finally, though we advance existing knowledge by moving from the unit of the country to the smaller unit of the state, there is surely important variation in public investment within states. This is perhaps most pronounced for education spending, where there is considerable intrastate variation. For example, local education funding within states is generally regressive and is disproportionately higher in high-SES districts, while state funding structures generally work to

correct for unequal local spending and tend to be more progressive. Given large variation within as well as across states in patterns of education funding for children, it would be useful in future research to examine processes within states.

Nothwithstanding these limitations, our work has implications for key debates within sociological research. First, family sociologists have assembled a rich qualitative and quantitative literature on class gaps in parenting practices and investments and on the role of different cultural logics, economic constraints, and their interaction in shaping behavior. Our finding that class gaps in private parental expenditures are narrowed when low-SES parents spend more in response to more generous and progressive income support policies aligns with a fairly straightforward resource inequality explanation for class differences in private parental expenditures. Future work could very usefully further examine how resource constraints and cultural contexts interact to shape inequality in private parental investments in children.

Second, sociologists studying processes of stratification and intergenerational inequality have increasingly emphasized the role of not only personal and family characteristics in shaping life outcomes, but also the influence of macroeconomic and political institutions. An increasingly important institution influencing individual action and outcomes is the United States is the local context of the state.   States are increasingly important for regulating behavior and policy (Robertson 2012), and a convincing body of evidence documents state variation in governance and the effects of these contexts on health, psychosocial resources, and even mortality (Montez, Hayward and Wolf 2017; Strully, Rehkoph, and Xuan 2010). Our work adds to the growing body of work demonstrating how state policy contexts can influence not only inequality in health behavior and individual rights, but also in household processes that are related to levels of inequality within the family context.

Third, research on the welfare state has long debated the relative merits of "targeted" vs. "universalist" investments (Korpi and Le Palme 1998; Skocpol 1991). While targeted investments are efficient at reaching those most in need, universalist programs often gain greater political traction and may therefore achieve an even greater impact in reducing inequality because of both their generosity and their likelihood of gaining public support for expansion. In the case of welfare state investment in children, our work shows the benefits of targeted investments for allowing low-resource families to make more similar developmental investments in their children as higher-resource families. The state context of investment appears to shape the household-level context of investment.

Finally, our findings are important in light of the fact that public investments in children are increasingly under threat. The U.S. welfare state for children has contracted for children relative to older adults, particularly among children in the poorest families, even though many forms of government investment in children are progressive and targeted (Moffitt 2015). At the same time, our work demonstrates that investments in disadvantaged families with children are a promising means of reducing the stark divides in parental investment that are of increasing concern for scholars and policymakers concerned about educational opportunity and intergenerational mobility. Our findings are relevant to current debates among researchers and policymakers about the best way to support families via the welfare state, in light of American families' tremendous need for a robust social safety net during the economic crisis produced by the COVID-19 pandemic.

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Table 1: Public Investments in Children and Families, By Spending Category

Education

Elementary and Secondary Education	U.S. Census State and Local Government Finance Survey (SLGF)
Higher education	SLGF
Education subsidies	SLGF
Education services	SLGF
Pell Grants	Pell Grants Annual Reports
Federal Head Start	Urban Institute estimates using data from Head Start Program Facts and Program Information Reports

Income Security

TANF cash assistance	TANF Expenditure Reports
Other cash assistance and social services	SLGF and TANF Expenditure Reports
SNAP	Characteristics of SNAP Households Recipients reports
Social Security	Urban Institute estimates using data from the Social Security Bulletin Annual Statistical Supplement
Federal SSI	Urban Institute estimates using data from the Social Security Bulletin Annual Statistical Supplement and SSI Annual Statistics Report
Federal EITC	IRS SOI Tax Statistics Historic Tables
Child Tax Credit	IRS SOI Tax Statistics Historic Tables
Additional Tax Credit	IRS SOI Tax Statistics Historic Tables
State EITC	Urban Institute estimates using data from the Rockefeller Institute of Government and the University of Kentucky Center for Poverty Research (UKCPR) National Welfare Database
Unemployment compensation	SLGF
Workers compensation	SLGF

Health

Children's Medicaid (<21) and CHIP	Urban Institute estimates using data from RAND, MACPAC (Medicaid and CHIP Payment and Access Commission) and Rockefeller Institute of Government
Public health	SLGF
Residual health spending	SLGF

Other

Housing and community development	SLGF
Libraries	SLGF
Parks and recreation	SLGF

Table 2: Descriptive Characteristics of Analytic Sample: CEX 1998-2014 (N=118,278)

Variable	Total Sample	Income Rank 0-25%	Income Rank 91+%
State Spending			
Mean Total Per-Child Spending (in thousands)			
1998	15.1 (2.9)	15 (2.8)	15.3 (2.8)
2006	20.4 (4.1)	20.2 (4.0)	20.2 (4.0)
2014	25.2 (5.1)	24.5 (5.0)	25 (5.3)
Mean Income Support Spending			
1998	3.1 (0.7)	3.1 (0.7)	3.2 (0.7)
2006	3.8 (0.8)	3.8 (0.7)	3.8 (0.7)
2014	4.7 (0.9)	4.7 (0.8)	4.8 (0.9)
Mean Health Spending			
1998	4.6 (1.3)	4.4 (1.3)	4.5 (1.2)
2006	6.9 (1.8)	6.6 (1.8)	6.5 (1.8)
2014	9.2 (2.3)	8.7 (2.2)	8.9 (2.3)
Mean Education Spending			
1998	5.1 (1.0)	5.2 (1.0)	5.3 (1.1)
2006	6.6 (1.6)	6.8 (1.6)	6.7 (1.5)
2014	7.3 (2.2)	7.1 (2.1)	7.3 (2.3)
Private Investments			
Mean Developmental Expenditures ($/quarter)	131 (291)	103 (207)	211 (513)
Mean Income			
Income Rank 0-25%	19562 (14539)		
Income Rank 26-75%	74455 (23787)		
Income Rank 76-90%	137382 (24061)		
Income Rank 91+%	258122 (94442)		
Parental Education (%)			
Less than HS	10	21	0
HS	21	30	3
Some College	32	31	14
BA+	37	17	83
Household Controls			
Mean Household size	4.08 (1.3)	3.9 (1.4)	4.2 (1.1)
% Male Not Present	22	43.6	3.5
Mean parental age	40.9 (8.6)	39.3 (9.0)	44.7 (7.1)
% Nonwhite parent	19.3	27.3	13.6
Mean Hours worked/week	42.1 (14.8)	35.6 (17.9)	49.8 (11.5)
State Controls			
Mean Minimum wage ($)	6.3 (1.3)	6.1 (1.3)	6.5 (1.3)
% Democrat Governor	44.5	42.6	48.1
% Unemployed	6.2	5.9	6.4
% Poverty	12.8	12.7	12.9
% College degree	28.7	28.2	29.2
% Black	11.7	11.8	11.5
% Hispanic	15.2	15.2	14.9

Standard deviations in parentheses.

Table 3: Relationship between Household Income and Expenditures ($/quarter) on Children, Variation by State Spending: CEX 1998-2014

	(1)	(2)	(3)	(4)	(5)	(6)
	Total State Spending	Total State Spending	Total State Spending	State Income Support Spending	State Health Spending	State Education Spending
Household Income Ranks (ref. <25%)						
Income 26-75%	30.34***	26.15***	27.92***	27.94***	28.45***	27.67***
	(1.89)	(2.33)	(2.21)	(6.14)	(2.30)	(2.19)
Income 76-90%	74.92***	64.50***	66.70***	65.78***	67.50***	66.13***
	(2.64)	(3.51)	(3.51)	(3.44)	(3.48)	(3.50)
Income 91+%	122.99***	109.89***	112.94***	109.99***	113.44***	106.62***
	(2.98)	(8.43)	(8.21)	(7.11)	(8.38)	(7.00)
State Spending	-8.93***	-6.29***	1.12	3.39*	3.78*	-4.70
	(0.23)	(0.83)	(1.40)	(1.70)	(1.98)	(2.54)
Income 26-75% X State Spending	-0.81	-.649	-1.21*	-4.85*	-3.35*	-1.08
	(0.54)	(0.60)	(0.58)	(2.06)	(1.31)	(2.26)
Income 76-90% X State Spending	-3.62***	-2.89*	-3.57**	-11.47**	-8.30*	-10.63*
	(0.77)	(1.10)	(1.11)	(4.01)	(2.59)	(4.98)
Income 91+% X State Spending	-4.42***	-4.33*	-5.34*	-13.47	-11.56*	-25.11***
	(0.88)	(2.02)	(2.10)	(6.99)	(4.56)	(5.47)
Household-level Controls (including education)	no	yes	yes	yes	yes	yes
State Controls	no	yes	yes	yes	yes	yes
State FE	no	no	yes	yes	yes	yes
Year FE	no	no	yes	yes	yes	yes
N	118,278	118,278	118,278	118,278	118,278	118,278

State-clustered standard errors in parentheses. Controls for parental education, other household and state characteristics.

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

Table 4: Relationship between Parental Education and Expenditures ($/quarter) on Children, Variation by State Spending: CEX 1998-2014

	(1)	(2)	(3)	(4)	(5)	(6)
	Total State Spending	Total State Spending	Total State Spending	State Income Support Spending	State Health Spending	State Education Spending
Parental Education (ref. BA or higher)						
No HS	-82.83***	-32.37***	-33.12***	-31.19***	-34.72***	-32.23***
	(0.23)	(4.62)	(4.67)	(4.59)	(4.74)	(4.60)
HS	-60.56***	-26.30***	-26.45***	-25.33***	-27.27***	-26.09***
	(2.23)	(4.12)	(4.11)	(3.95)	(4.25)	(4.04)
Some College	-36.20***	-12.12**	-12.06***	-11.35**	-12.39***	-11.96***
	(1.95)	(3.52)	(3.45)	(3.34)	(3.53)	(3.42)
State Spending	-8.10***	-6.23***	1.01	2.98	3.33	-5.33*
	(0.23)	(0.83)	(1.46)	(6.20)	(2.34)	(2.23)
No HS X State Spending	4.29***	5.24***	5.57***	15.77***	13.44***	22.43***
	(0.84)	(0.84)	(0.83)	(3.12)	(2.08)	(3.67)
HS X State Spending	2.22***	3.16**	3.51**	9.57**	8.10***	15.24***
	(0.64)	(0.94)	(0.97)	(3.21)	(2.32)	(3.95)
Some College X State Spending	0.72	1.45*	1.63*	3.75	3.65*	7.97**
	(0.57)	(0.59)	(0.61)	(2.36)	(2.32)	(2.89)
Household-level Controls (including income)	no	yes	yes	yes	yes	yes
State Controls	no	yes	yes	yes	yes	yes
State FE	no	no	yes	yes	yes	yes
Year FE	no	no	yes	yes	yes	yes
Tests of Coefficient Equality						
Some College X Spending < HS X Spending vs. HS X Spending						
F	9.22	15.92	15.79	10.11	16.58**	11.96
P > F	0.00	0.00	0.00	0.00	0.00	0.00
< HS vs. HS vs. Some College						
F	142.81	42.65	40.46	39.10	42.01	41.50
P > F	0.00	0.00	0.00	0.00	0.00	0.00
N	118,278	118,278	118,278	118,278	118,278	118,278

State-clustered standard errors in parentheses. Controls for income, other household and state characteristics.

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

Appendix Table 1: Relationship between Household Income and Private Parental Expenditures ($/quarter) on Children, Variation by Total State Spending: CEX 1998-2014

	Full Sample	Excluding top 1% of income	Excluding bottom 10% of income
Household Income Ranks (ref. <25%)			
Income 26-75%	27.92***	27.87***	34.08***
	(2.21)	(2.21)	(2.22)
Income 76-90%	66.70***	66.70***	75.08***
	(3.51)	(3.51)	(3.94)
Income 91+%	112.94***	105.00***	113.86***
	(8.21)	(7.22)	(7.27)
Total State Spending	1.12	1.37	2.36
	(1.40)	(1.40)	(1.41)
Income 26-75% X Total State Spending	-1.21*	-1.20*	-2.71***
	(0.58)	(0.55)	(0.63)
Income 76-90% X Total State Spending	-3.57**	-3.56**	-4.92***
	(1.11)	(1.11)	(1.14)
Income 91+% X Total State Spending	-5.34*	-4.50*	-5.87**
	(2.10)	(0.55)	(1.95)
Household-level Controls (including education)	yes	yes	yes
State Controls	yes	yes	yes
State FE	yes	yes	yes
Year FE	yes	yes	yes
N	118,278	116,936	106,514

State-clustered standard errors in parentheses. Controls for parental education, other household and state characteristics.

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

Appendix Table 2: Relationship between Household Income and Expenditures ($/quarter) on Children, Variation by Total State Spending: CEX 1998-2014

	Model 3, Table 3	Square Root Equivalence
Household Income Ranks (ref. <25%)		
Income 26-75%	27.92***	25.75***
	(2.21)	(1.89)
Income 76-90%	66.70***	58.17***
	(3.51)	(2.87)
Income 91+%	112.94***	92.23***
	(8.21)	(6.28)
Total State Spending	1.12	0.809
	(1.40)	(1.25)
Income 26-75% X Total State Spending	-1.21*	-0.89*
	(0.58)	(0.45)
Income 76-90% X Total State Spending	-3.57**	-2.71**
	(1.11)	(0.99)
Income 91+% X Total State Spending	-5.34*	-3.86*
	(2.10)	(1.79)
Household-level Controls (including education)	yes	yes
State Controls	yes	yes
State FE	yes	yes
Year FE	yes	yes
N	118,278	116,735

State-clustered standard errors in parentheses. Controls for parental education, other household and state characteristics.

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

Appendix Table 3: Relationship between State Income Spending and Household Income, CEX 1998-2014

State Income Support Spending	1280.21*
	(660.39)
Household-level Controls (including education)	yes
State Controls	yes
State FE	yes
Year FE	yes
N	118,278

State-clustered standard errors in parentheses. Controls for parental education, other household and state characteristics.
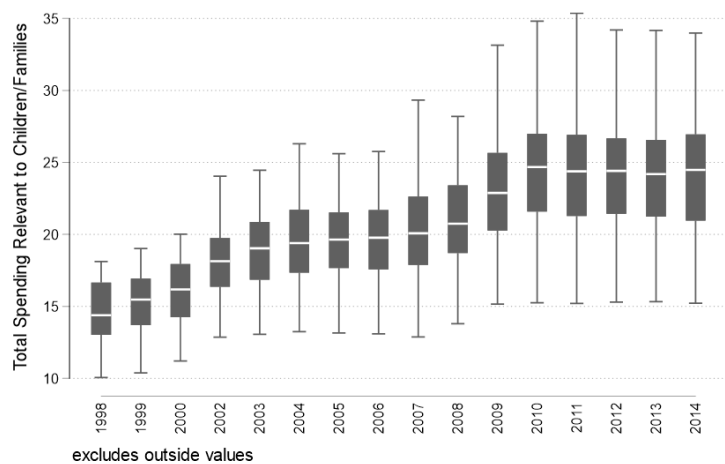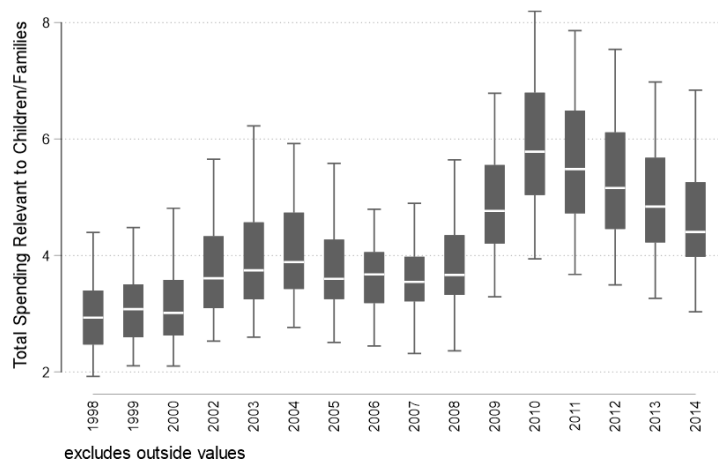
* p<.05, **p<.01, ***p<.001

Appendix Table 4: Relationship between Household Income and Schooling Expenditures ($/quarter) on Children, Variation by State Education Spending: CEX 1998-2014

Household Income Ranks (ref. <25%)	
Income 26-75%	19.45***
	(4.15)
Income 76-90%	84.33***
	(10.56)
Income 91+%	312.61***
	(26.74)
State Education Spending	-3.73
	(6.77)
Income 26-75% X State Education Spending	8.15
	(4.96)
Income 76-90% X State Education Spending	-6.81
	(12.34)
Income 91+% X State Education Spending	25.65
	(35.38)
Household-level Controls (including education)	yes
State Controls	yes
State FE	yes
Year FE	yes
N	118,278

State-clustered standard errors in parentheses. Controls for parental education, other household and state characteristics.

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

Figure 1: Total State Spending/Child (thousands), 1998

17.36 – 31.52
15.60 – 17.36
14.39 – 15.60
13.78 – 14.39
12.58 – 13.78
10.05 – 12.58
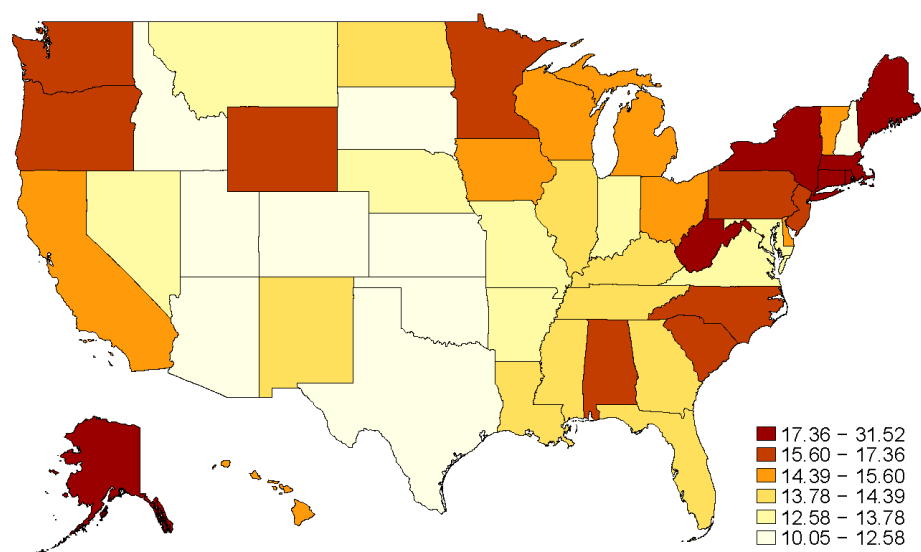
Figure 2: Box Plot of State Public Investment by Year (1998-2014)

2A: Total Spending

excludes outside values

2B: Income Support Spending

excludes outside values

2C: Health Spending

excludes outside values

2D: Education Spending

excludes outside values
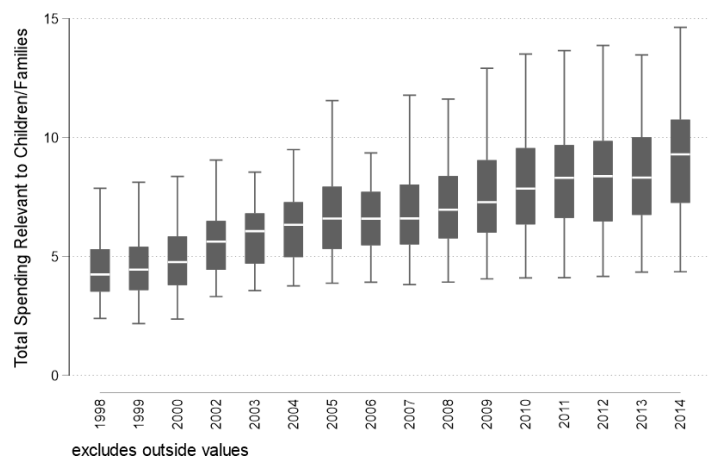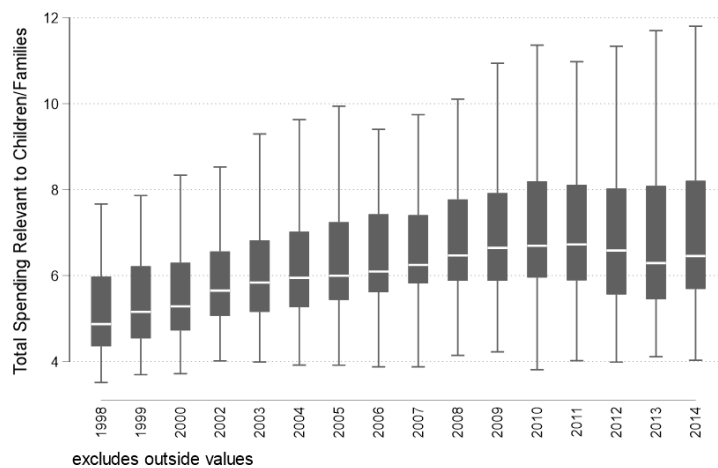
Figure 3: Percentage Point Change in State Spending/Child (thousands), 1998-2014

3A: Total Spending

| 0.79 − 1.32 |
| 0.69 − 0.79 |
| 0.65 − 0.69 |
| 0.61 − 0.65 |
| 0.51 − 0.61 |
| 0.37 − 0.51 |

3C: Health Spending

| 1.39 − 2.16 |
| 1.19 − 1.39 |
| 1.03 − 1.19 |
| 0.88 − 1.03 |
| 0.71 − 0.88 |
| 0.38 − 0.71 |

3B: Income Support Spending

| 0.69 − 1.14 |
| 0.60 − 0.69 |
| 0.54 − 0.60 |
| 0.47 − 0.54 |
| 0.39 − 0.47 |
| 0.10 − 0.39 |

3D: Education Spending

| 0.58 − 1.35 |
| 0.44 − 0.58 |
| 0.36 − 0.44 |
| 0.26 − 0.36 |
| 0.18 − 0.26 |
| 0.01 − 0.18 |
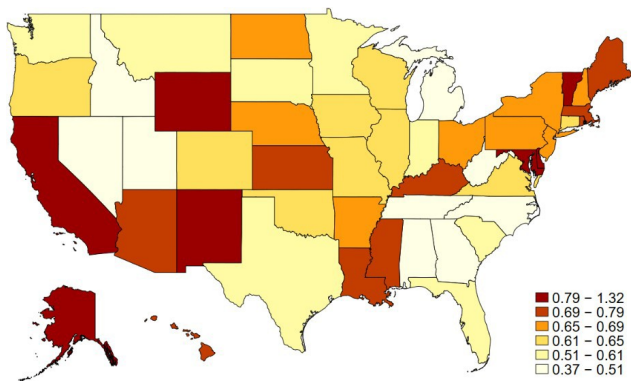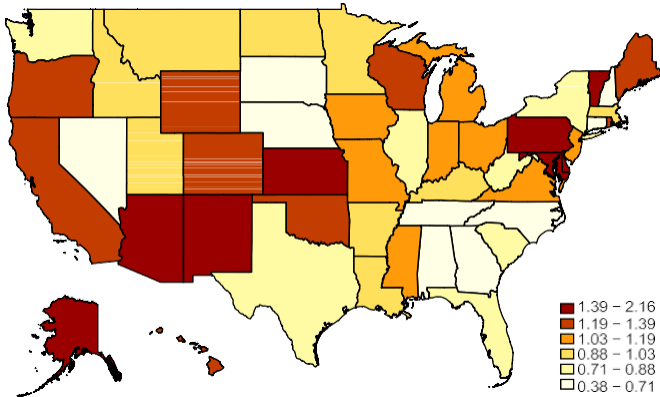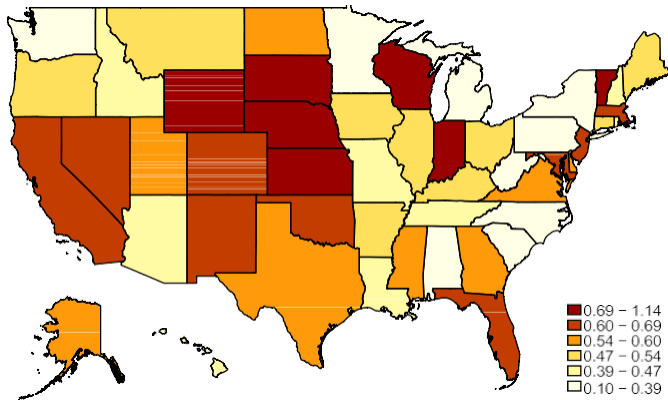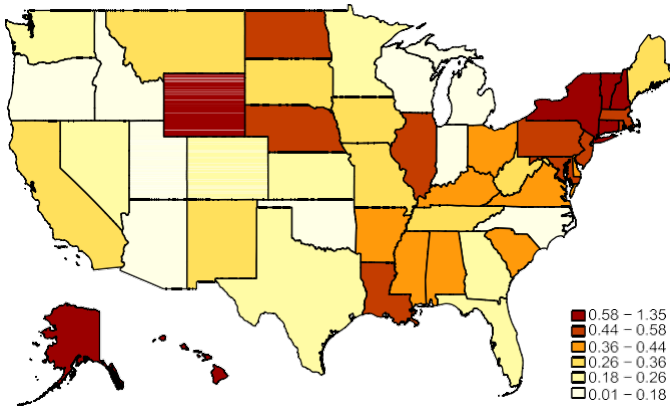
Figure 4: Binned Scatterplot of Relationship between Household Income and Private Parental Spending, by Public Spending
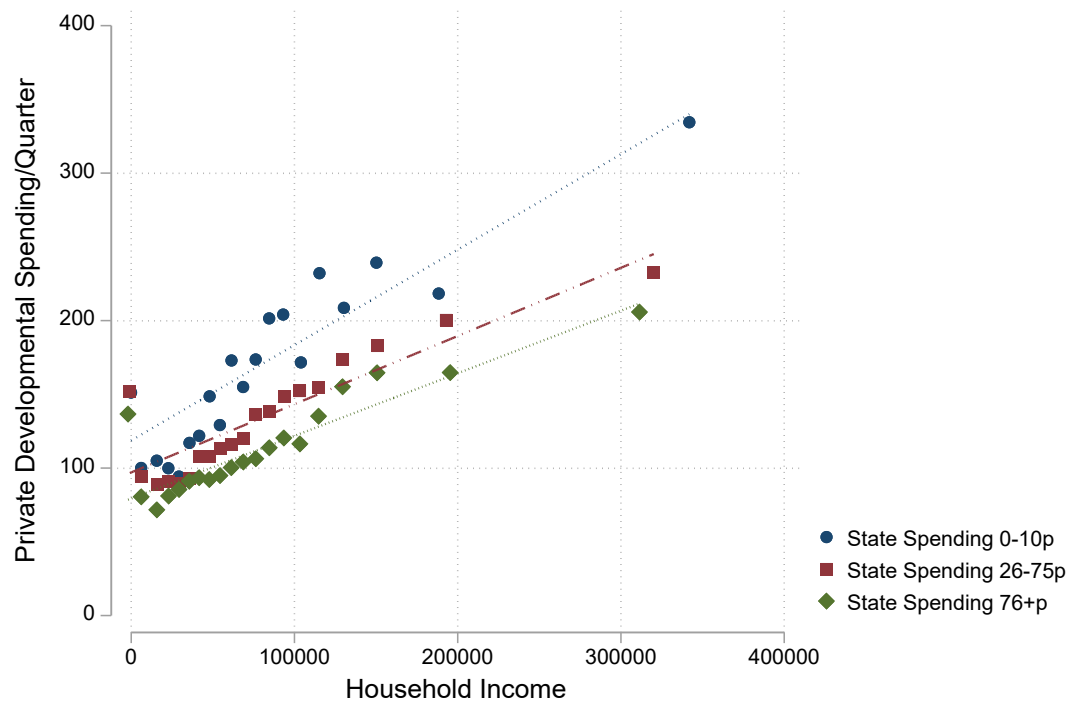
Figure 5: Predicted Household Developmental Expenditures by Household Income and Total State Spending/Child
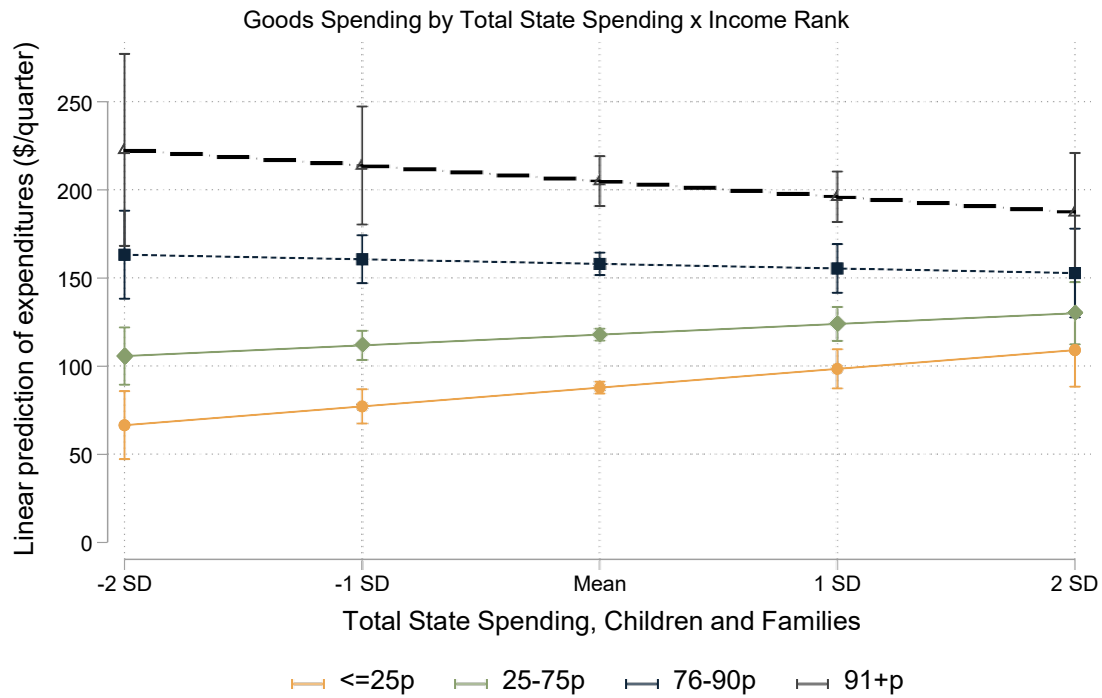

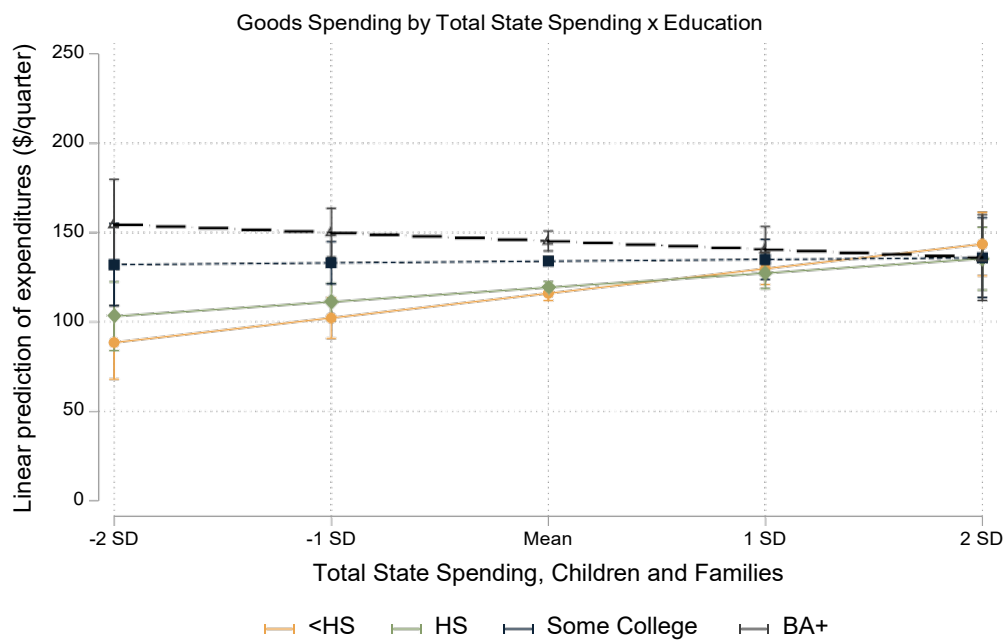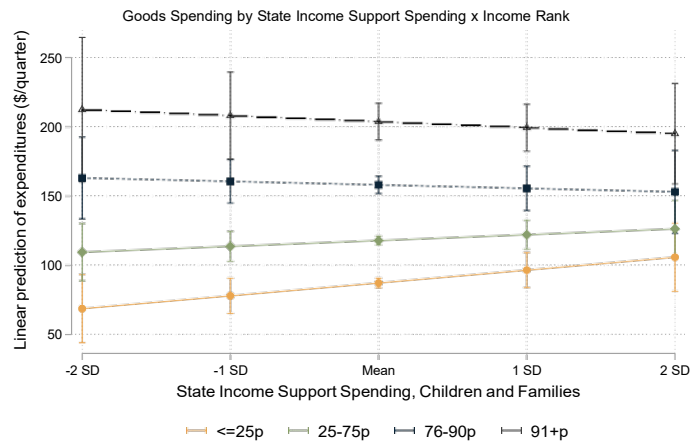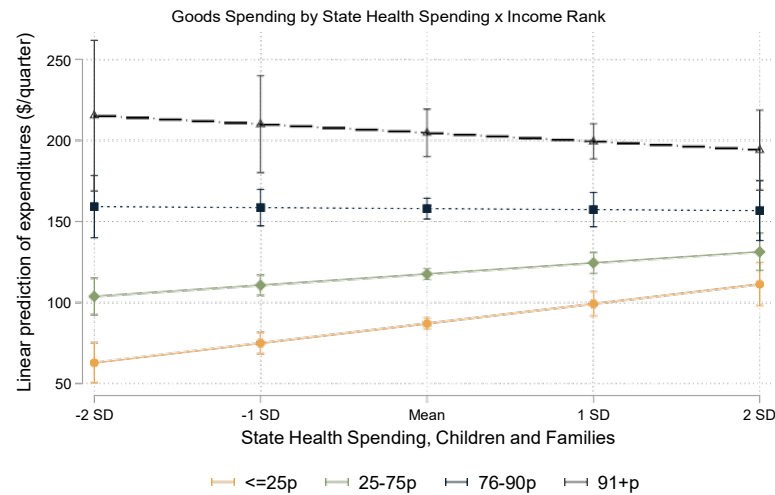**Figure 6: Predicted Household Developmental Expenditures by Parental Education and Total State Spending/Child**

Figure 7: Predicted Household Developmental Expenditures by Household Income and TotalState Spending/Child

A: Income Support Spending

Goods Spending by State Income Support Spending x Income Rank

B: Health Spending

Goods Spending by State Health Spending x Income Rank

C: Education Spending

Goods Spending by State Education Spending x Income Rank