The Earned Income Tax Credit and Short-Term Changes in Parents’ Time Investments in Children

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Abstract
This study examined whether the addition of household resources via the receipt of the U.S. Earned Income Tax Credit (EITC) affects short-term patterns of parents’ time investments in children, including time spent engaged with children and in activities related to their education. Using difference-in-differences analyses that exploit seasonal variation in federal EITC outlays with nationally representative time-diary data from the 2003 to 2017 American Time Use Survey-Current Population Survey (ATUS-CPS; N = 61,355) merged with state-level data from the University of Kentucky Center for Poverty Research (UKCPR) National Welfare Database, I estimate the plausibly causal effects of predicted EITC receipt on various measures of parents’ time investments in their children. I examine parents’ time spent directly engaged with children in enriching activities like play and reading and in activities related to children’s education among a low-socioeconomic sample (parents with less than a college degree). I find few associations between monthly federal EITC outlays and immediate changes in parents’ time investments, although there was evidence that greater EITC outlays predicted small increases in mothers’ time spent reading with or to children, particularly among mothers with young children, but also small decreases in fathers’ time spent in activities with children, particularly school-age children. Findings suggest that increases in household resources, even relatively small and annual increases, may have short-term effects on parent–child interactions and time use.

Keywords Parent–child time · Time use · EITC

Introduction
Growing up in a poor or low-income home has substantial and lasting effects on children’s short- and long-term outcomes (Duncan et al., 2017a, b). Lower-income families have fewer resources to help children thrive, including access to educational materials, health care, or high-quality education. Research demonstrates that there are wide and growing income gaps in spending on children and access to educational and other resources (Duncan et al., 2017a, b; Kornrich & Furstenberg, 2013). Further, there are socioeconomic gaps in patterns of parents’ engagement and time spent together in developmental or enriching activities with their children (Bassok et al., 2016; Kalil et al., 2016).

Both disparities in physical resources as well as in time may underlie income disparities in achievement and health. Research indicates that additional income improves children’s achievement (e.g., Bastian & Michelmore, 2018; Duncan et al., 2011), but how changes in income affect the time parents and children spend together and the activities in which they engage—here, referred to parent–child time—remains largely unexplored. One exception is Bastian and Lochner (2020) who exploited time and state variation in the Earned Income Tax Credit (EITC) maximum benefit amounts. The EITC is one of the nation’s largest anti-poverty programs, providing refundable tax credits to low-income, employed individuals and households. Unlike other social programs that require potentially burdensome paper or online applications, the EITC is available to eligible individuals who file taxes, enhancing participation and reducing stigma (Cherlin, 2014). The increased resources from tax credits may allow parents to purchase goods or services that save time or outsource tasks and reduce financial stress. Bastian and Lochner find evidence that the EITC increases mothers’ work time while reducing mothers’
time with children; importantly, though, “investment” time, or time spent in activities related to children’s education and health, was not reduced. Outstanding questions remain, however, including: does an influx of resources (via the EITC refund) result in immediate changes in whether and how parents and children spend their time together? Further, previous research demonstrates that parents’ time investments in children by gender, family structure, and the age of their children (Kalil et al., 2012, 2014; McDonnell et al., 2019; Reich, 2014), but how changes in parents’ time investments in response to an increase in household resources vary by family characteristics remains unexplored. An examination of these short-term changes in time use is needed to better understand family functioning, well-being, and anti-poverty policies in the context of high and increasing levels of income instability, particularly among low-income households (Board of Governors, 2020). Further, understanding both the long- and short-term changes in time use in response to an increase in household resources can inform the administration of the EITC and other tax credits and social programs, which may seek to maximize benefits for children and parents.

This study examines whether the addition of money via the receipt of the federal EITC, typically received as once-a-year lump-sum refunds, changes short-term patterns of parents’ time investments in children, particularly in education-related activities. Further, this study examines heterogeneity in these time investments by parent gender, marital status, and child age. Previous work finds long-term effects of the EITC on mothers’ total time with children (Bastian & Lochner, 2020), but the short-term effects and how they vary with family characteristics—important to inform theory and policy—have not been investigated. The once-a-year influx of household resources may have temporary effects on time use, particularly in the time parents spend directly interacting with children or in time investments in children’s education. On the other hand, the small amount relative to household needs and the once-a-year nature of the EITC may have no effects on parents’ time investments in children. Using a quasi-experimental difference-in-differences (DD) approach that exploits seasonal variation in the federal EITC program with nationally representative time-diary data from the 2003 to 2017 waves of the American Time Use Survey-Current Population Survey (ATUS-CPS), this study estimates the plausibly causal short-term effects of EITC receipt on the quantity and quality of parents’ time investments in their children.

**Theoretical Approaches to Income and Time**

Income gaps in achievement and development emerge prior to elementary school and persist through K-12 education, influencing life-long economic trajectories and perpetuating social, economic, and health inequalities across generations (Reardon, 2011; Reardon & Portilla, 2016; Shonkoff & Garner, 2012). Household production theory suggests that children from low-income families lag behind their peers because their parents have fewer resources—both time and money—to invest in them (Becker, 1993). Indeed, recent research suggests that among families with children under age 12, more than two-thirds of parental investments in children—inclusive of goods and services, market child care, and parental time—are parental time investments (Caucutt et al., 2020). Likewise, biopsychosocial ecological theory asserts that children’s development occurs through a series of proximal processes via which an individual interacts with their environment, particularly with their primary caregivers (Bronfenbrenner & Morris, 2006), interactions which necessitate parent–child time and engagement.

Income allows for improved household physical resources, including stable and higher-quality housing, food, and educational materials such as books and toys, which may improve achievement and health. Higher income may also improve achievement or health by changing where and how children spend their time, such as allowing parents to purchase more and higher-quality goods and services for children, such as child care, health care, and educational and enrichment activities. An increase in resources may also change the amount and quality of time parents spend with their children in that parents can have more funds to outsource time-consuming domestic tasks they may otherwise do themselves, such as cooking or cleaning (found to save time; Craig et al., 2016), or to purchase time-saving items like reliable cars or washing machines. Further, higher-wage jobs are more likely to have benefits including paid sick and family leave relative to low-wage jobs (U.S. Bureau of Labor Statistics, 2020), and the lack of paid leave has been shown to be a barrier for parental involvement in children’s school (Murray et al., 2014). Moreover, a higher budget constraint may reduce financial stress and improve parents’ emotional valence and bandwidth.

Most parents report enjoying spending time with their children and wish they spent more time with their children (Milkie et al., 2004). While on average mothers spend more time with children, fathers report wanting to spend more time and experience less stress when they do (McDonnell et al., 2019; Nomaguchi, 2009). Therefore, time with children may be considered a normal good such that increased income could lead to parents and children spending more time together directly engaged with each other, which may lead to benefits for children. A growing body of research documents associations between parents’ time investments in their children, particularly in certain developmental or enriching activities such as reading to children or helping with homework, and children’s outcomes. One study estimates that a one standard deviation increase in the number of
days mothers spend reading to children increases children’s reading achievement by 0.80 standard deviations (Price & Kalil, 2019). Early maternal time investments appear to be particularly important to children’s cognitive outcomes, with effects declining with child age (Bono et al., 2016), although research also suggests adolescents’ time use patterns relate to their academic outcomes (Wolf et al., 2015). Notably, this research focuses on maternal time, whereas paternal time investments and parent differences are less studied. Further, single parents have half the amount of possible time with children relative to a two-parent household (a 24-h vs. a 48-h time constraint), potentially limiting the effect of an influx of household resources on time use.

Alternatively, patterns of time use and behavior may be difficult to change even in the context of increased income. Routines and rituals in childhood, such as family meal times, provide a predictable structure that can help guide a children’s behavior and emotional regulation, and are in turn associated with children’s social, academic, and language development (Everhart & Fiese, 2007; Ferretti & Bub, 2017). It is possible that only large, sustained changes in household resources or income would be adequate for creating sustained, large behavior changes. Notably, too, changes in routines, even in response to developmentally appropriate and predictable events (e.g., entering kindergarten) can induce stress for children and parents alike (Decaro & Worthman, 2011).

Gaps in Parents’ Time Investments in Children’s Education

The literature shows wide socioeconomic (SES) gaps in both the quality and quantity of time parents spend interacting with children, with much of this literature focusing on gaps by parent education rather than household income (Caucutt et al., 2020; England & Srivastava, 2013; GerShenson, 2013; Kalil et al., 2012; Vinopal & Gershenson, 2017). Over the last few decades, mother–child and father–child time has increased, and SES gaps in developmental or enriching activities have narrowed, but some gaps in young children’s experiences, including parental engagement with children, persist (Bassok et al., 2016; Prickett & Augustine, 2021). Evidence suggests that while some gaps by parental education in parent-young child activities such as visiting libraries have narrowed over the past quarter-century, others, such as reading to children or teaching them numbers, have increased (Kalil et al., 2016). Household income, while highly correlated with parental education and associated with children’s achievement (Davis-Kean, 2005), may serve a distinct role in changing parent–child engagement by providing resources to purchase time-saving measures, or by purchasing activities children do without their parents (e.g., tutoring or summer camp).

Among employed parents, work hours constitute a substantial use of time. Although employed mothers average less total time with their children, research suggests they prioritize developmentally enriching activities with their children (Hsin & Felfe, 2014). For example, despite dramatic increases in labor force participation since the 1960s, mothers show little average reduction in their time spent engaged with children such that their primary activity involved directly interacting with children (Bianchi, 2000). This trend may also vary with SES, however. More educated parents both work more and spend more time with their children (Guryan et al., 2008). Likewise, research in Australia finds that, among lower-income families, but not higher-income families, parents’ long work hours reduced four- and five-year olds’ exposure to language-building activities (Brown et al., 2007).

One critical question for research and policy is whether changes in household resources, specifically income, leads to changes in achievement via changes in parent engagement in activities with their children, or if other correlates of income and wealth underlie these variations (Mayer, 1997). For example, prior research has attempted to estimate the causal effects of income on children’s achievement using within-child fixed effects models to relate changes in income to changes in children’s home environments and outcomes. In general, findings suggest that increased income improves levels of cognitive stimulation in the home (Votruba-Drzal, 2003) and children’s academic outcomes (Dearing et al., 2001; Morrissey et al., 2014).

Other experimental or quasi-experimental research adds to the evidence that additional income improves children’s achievement and health (Bitler et al., 2018, for a review). For example, using social welfare experiments, Duncan and colleagues found that a $1000 increase in annual income predicted a five to six percent of a standard deviation increase in same-year measures of preschool children’s achievement (Duncan et al., 2011).

The Earned Income Tax Credit and Parent–Child Time

Created in 1975 and expanded several times since, the EITC in the United States is designed to supplement the incomes of workers, and provides greater benefits to individuals with children (Marr et al., 2015). Since the 1996 welfare reform that shifted cash welfare to state block grants with time-limited benefits and work requirements, contributing to a dramatic decrease in program participation and an increase in labor market activity (Schoeni & Blank, 2000), the EITC, as well as other in-work tax credits, has played an increasingly important role in supporting low-income households (Hoyes & Schanzenbach, 2018). Importantly, the EITC is by definition limited to individuals and households with
earnings, thus eligibility and reach are different from other safety net programs such as the Supplemental Nutrition Program (SNAP; formerly known as food stamps). In 2016, over 27 million eligible workers and their families received more than $67 billion in EITC benefits, with the average benefit amount of $2455. Further, EITC benefits are disbursed as tax refunds after filing—a check that many American households receive, unlike SNAP benefits, for example—increasing participation and reducing stigma (Cherlin, 2014). The Internal Revenue Service (IRS) estimates that about 79% of all eligible taxpayers receive the EITC. The EITC has been shown to increase household income and financial well-being (Jones & Michelmore, 2018), particularly among single-mother households between 75 and 150 percent of the federal poverty line ($15,585–$31,170 for a family of three in 2018; Hoynes & Patel, 2018).

Most EITC recipients receive their benefits as a lump sum after filing their tax return, which can be done any time after receiving a W-2 (employee wage statement, received by January 31) and refunds are disbursed within six weeks. More than half of EITC receivers file their taxes before February 15 (Maag et al., 2016), and nearly all EITC refund disbursements occur in either February or March (Aladangady et al., 2018; Goodman-Bacon & McGranahan, 2008; Rehkopf et al., 2014). IRS data on federal EITC outlays (in millions of $) by month from 2003 through 2017 indicate that the vast majority (approximately 85% each year) of outlays are disbursed in the first three months of the year.

Multiple studies have investigated the impacts of income supplements like the EITC for family well-being (e.g., Hoynes et al., 2015). Higher disbursements from the EITC have been linked to improved birth outcomes (Hamad & Rehkopf, 2015; Hoynes et al., 2015), improved child achievement (Dahl & Lochner, 2012), increased likelihood of college enrollment (Manoli & Turner, 2018), short-term improvements in child behavior, home quality scores (Hamad & Rehkopf, 2016), and food security (Batra et al., 2021). Research on the EITC also finds some evidence of positive effects on adults (particularly mothers’) physical and mental health (Gangopadhyaya et al., 2020; Lenhart, 2019), and that receipt of the EITC during childhood has sustained, positive effects on long-term educational attainment and economic outcomes (Bastian & Michelmore, 2018).

The EITC’s seasonal variation has been used to investigate its short-term effects on a range of health outcomes (Batra et al., 2021; Hamad et al., 2018; Rehkopf et al., 2014) finding that, in the short-term, adults eligible to receive large EITC refunds ($1000 or more) reported less food insecurity, smoking, and exposure to smoke, and a greater likelihood of trying to lose weight (but also some worse metabolic outcomes for women) during tax season relative to the summer months, compared to an EITC-ineligible control group (Rehkopf et al., 2014). Among children, EITC disbursements predict short-term improvements in physician-reported overall health (Hamad et al., 2018). However, other health behaviors, health outcomes, and achievement test scores among adults and children examined appear to be unaffected in the short-term by EITC receipt (Batra et al., 2021; Hamad et al., 2018; Rehkopf et al., 2014). It is possible that the outcomes found to change in the short-term are sensitive to household resource levels and short-term reductions in financial stress (e.g., food security, smoking), whereas routine behaviors and outcomes like achievement or physical health require higher thresholds for income changes or more sustained changes.

There are several pathways via which EITC may increase parents’ time investments in children, which may underlie some of the changes in health and well-being. Paying bills and the purchase of durable goods, such as vehicles, are common uses for EITC refunds (Goodman-Bacon & McGranahan, 2008; Mendenhall et al., 2012). More recent research indicates that EITC receivers also increase their food, grocery, and restaurant spending following refund disbursements (Aladangady et al., 2018; Lenhart, 2019). Improved vehicle access and time spent at restaurants may reduce time spent in transportation or household production and reduce stress, which in turn may provide for more time with children. Further, while in the long-term the EITC may serve as a work incentive and increases labor market activity among single mothers (Athreya et al., 2014; Bastian & Lochner, 2020; Meyer & Rosenbaum, 2001), receipt of the EITC may serve as a temporary disincentive for work because it reduces the immediate need for resources, particularly for women and especially those who are married (LaLumia, 2013; Yang, 2017), again leading to more time with children.

Alternatively, it is possible that EITC refunds do not have any effects or decrease parents’ time investments in children in the short term. Previous research exploiting the timing of government transfers, military wage payments, and lottery winnings as inflows of household resources have found increased rates of substance abuse, drug-related hospitalizations, and mortality, but also improvements in mental health, in the days or weeks following receipt (Apouey & Clark, 2015; Evans & Moore, 2011). Increased disposable income may lead to more time and resources spent on socialization. Further, recent work from the EITC suggests mothers’ increased work hours come in part at the expense of total time with children (though not investment or enriching

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1 https://www.eitr.cvs.gov/EITC-Central/eitcstats
2 Until 2010, EITC recipients had the option to receive their credit across paychecks through the year. Utilization of this option never exceeded 2 percent of recipients. See https://www.brookings.edu/wp-content/uploads/2016/07/HoltPeriodicPaymentEITC121515.pdf
3 See https://fiscal.treasury.gov/reports-statements/mts/previous.html
mother–child time) (Bastian & Lochner, 2020). Moreover, it is possible that parents use the extra resources for leisure and other activities that do not involve spending time with children (e.g., socializing).

Little research, however, has examined how the EITC affects time use within a family. One exception is Bastian and Lochner (2020), who examined the effects of EITC benefit amounts on mothers’ time use. Using variation in the maximum credit amount stemming from state EITC program from 2003 to 2018 and the 2009 federal benefit increase for large families, they found that, as expected, mothers, especially unmarried mothers, increased their labor force participation and work hours and reduced their leisure and home production time. In particular, mothers’ total time with children decreased by about 1.6 h per week, largely explained by decreased time in home production with children (e.g., cooking or cleaning while children are present). There were small and insignificant effects on investment time (e.g., reading to children, helping with homework), and decreases in health investments such as taking the children for medical care, which may be explained by a reduced need for health care stemming from previously-identified improvements in children’s health from the EITC (Braga et al., 2020; Hoynes et al., 2015).

The more immediate or short-term effects of increased household resources on parents’ time investments in children remain largely unexplored, however. Short-term changes in household resources are important to understand, given the growing prevalence of economic instability, particularly among low-income households and those of color (Helfin & Morrissey, 2021; Morris et al., 2015; Morrissey et al., 2020; Wolf et al., 2014), as well as the administration of numerous social programs including the EITC. A small but growing body of research finds negative consequences of instability for family and child well-being (Hardy, 2014; Hill et al., 2013; Wolf & Morrissey, 2017), with some research suggesting that even positive income changes may be associated with poorer adolescent behavior (Gennetian et al., 2015). Moreover, the COVID-19 pandemic and its associated economic crisis has led to millions of lost jobs and income (Board of Governors, 2020; Gassman-Pines & Gennetian, 2020; Parker et al., 2020), and emerging research suggests negative impacts on parenting (Kalil et al., 2020). Understanding how an increase in household resources affects short-term family functioning, including parent–child activities and time together, can inform the policy conversations surrounding the recovery.

Several household characteristics may affect if and how income affects parents’ time investments in children. First, female and male time use patterns differ, particularly among parents (Craig & Mullan, 2010; Reich, 2014). Research indicates fathers spend more time engaged in play with their children, whereas mothers spend more time in caregiving, nurturing, and educational activities (Kalil et al., 2013). Children in households with two biological resident parents experience much greater levels of parent engagement compared to their peers (Kalil et al., 2014), and EITC refunds may affect parent–child time more strongly in single-mother households. Finally, the extra income from the EITC may affect parents’ time more so in parents with young children, given how time-intensive caring for young children is (Kalil et al., 2012).

The Current Study

Despite the large public investments in the EITC and that households with children constitute the major beneficiaries, we know little about if and how the EITC affects parents’ time investments in children. Given the established connections between income during childhood and later health and achievement, examining how programs that increase income affect family dynamics is important for theory and policies. This study addresses these gaps in the literature by examining the plausibly causal short-term impacts of EITC receipt on the quantity and quality of time parents and their children spent together in a range of activities. I use a difference-in-differences (DD) approach with nationally representative time diary data from the 2003 to 2017 waves of the ATUS, exploiting seasonal variation in federal EITC outlays. Specifically, I compare time with children among parents lacking a college degree—likely to be eligible for EITC benefits—to those with a college degree who are unlikely to receive EITC benefits. I examine effects separately for both mothers and fathers and examine heterogeneity by mothers’ marital status and age of youngest children. I examine the following research questions:

1. How does EITC receipt affect parents’ time investments in children in the short-term? I hypothesize that the EITC will lead to few or no short-term changes in the total time parents and children spend together, but increases in educationally enriching parent–child activities.
2. Do the [expected] short-term effects of EITC receipt on parents’ time investments in children vary by parent gender, child age, and family structure? I hypothesize that short-term changes in children’s time with mothers, among parents with younger children, and in single-parent families will be larger than those with fathers, parents with school-age children, and in married households.

The investigation of how a lump-sum tax refund can shed light on how changes or expansions to the EITC may affect family functioning, as well as provide research insights into the relationships between time use and financial resources.
Given the large role that the EITC and other tax credits play in the nation’s anti-poverty policy, understanding the more immediate impacts that resources have for family functioning is timely for research and policy.

Materials and Methods

Data and Sample

This study used three data sources. The cross-sectional, annual ATUS, administered by the Bureau of Labor Statistics (BLS), collects a 24-hr retrospective time diary from one individual age 15 or older per household from a randomly selected subsample of households included in the CPS. ATUS respondents are interviewed one time about how they spent their time the previous day. Data are collected on respondents’ primary activity, where they were, and with whom. The ATUS is publicly available via the BLS and the Integrated Public Use Microdata Series (IPUMS) (Hofferth et al., 2018). Second, the CPS is a cross-sectional, nationally representative survey that provides information on all household members. The ATUS-CPS linked data are well suited for this study because time diaries are the ideal instruments with which to measure parent–child engagement (Juster & Stafford, 1991). Finally, the ATUS-CPS data were merged with which to measure parent–child engagement (Juster & et al., 2018). Second, the CPS is a cross-sectional, nationally representative survey that provides information on all household members. The ATUS-CPS linked data are well suited for this study because time diaries are the ideal instruments with which to measure parent–child engagement (Juster & Stafford, 1991). Finally, the ATUS-CPS data were merged using state and year identifiers to the UKCPR National Welfare Database, a publicly available dataset containing annual state-level information on a state economic and political characteristics from 1980 through 2017 (UKCPR, 2018). This study controls for state poverty rate and whether the state had its own EITC.

Information on the presence and age of children in the household allows the sample to be restricted to respondents with one or more of their own children under 18 years of age living in the household. Of the total 192,221 respondents in the ATUS-CPS from 2003 to 2017, a total of 61,355 respondents (36,406 mothers and 24,949 fathers) lived with one or more of his/her children under age 18 and had non-missing data on independent and dependent variables. This subsample served as the primary analytic sample.

Dependent Variables

The outcome of interest (dependent variable) is parents’ time spent with their children, which was operationalized in several ways. First, BLS-constructed aggregate measures of total time spent with all own household children; total secondary childcare time with all own household children (a subset of total time with children); and the total primary and secondary time spent with family (inclusive of time spent with children and with other family members, including a spouse or other relatives) were used as dependent variables (Cronbach’s alpha = 0.87). These measures excluded working time, sleep time, and all activities for which the “who” was not recorded. See Table 1 for a description of the main dependent variables.

Second, the ATUS detailed activity codes were used to decompose the aggregate measure of time spent with children into time spent in activities that may be particularly beneficial for children’s development. First, an index of enrichment time was created, summing the total amount of time spent: reading with children, engaged in sport or non-sport play or arts, helping children with homework, attending activities and events with children, and talking with children. Enriching time represents a sum of these activities as primary activities (i.e., talking with a child while preparing food would not be included). Second, the BLS-constructed aggregate variable of activities related to children’s education, which included: helping with or reviewing children’s homework, attending PTA meetings or school open house, home schooling, and meeting with children’s teachers or other educators, was included as a dependent variable. Whereas the enrichment time index includes only activities in which the respondent spent time directly with the child, the child’s education-related activities variable included activities in which a child may or may not be present. As with enrichment time, time spent in activities related to children’s education represent the respondent’s primary activity.

Given that the budget constraint for time is 24 hr in one day, changes in time use in one type of activity necessitates changes in one or other activities. Because previous work has shown that the EITC affects household food and vehicle spending and labor activity (Aladangady et al., 2018; Chetty et al., 2013; Goodman-Bacon & McGranahan, 2008; LaLumia, 2013), and theoretically may also affect leisure, measures of time spent in the following activities served as dependent variables in sensitivity analyses: doing housework; in leisure; sleeping; socializing; and working.

For each of these measures of total time with children, with family, and engagement in specific activities with children or in other activities, both the continuous measures of minutes per day spent in the activity and a binary measure of whether the parent engaged in that activity at all that day were used as dependent variables. The binary variables representing any time spent in a specific activity were used for two reasons. First, specific time use activities frequently

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4 See https://www.bls.gov/tus/atusuersguide.pdf.

5 For more information, see: http://www.ukcpr.org/data.

6 The binary measures for any sleeping or any eating/drinking were not examined as nearly 100% of respondents did so at any point on the day about which they were interviewed.
have many zero values, which drive down means. Although unlike other types of dependent variables with skewed distributions, linear regression can still be used for variables with multiple zeros in time use, as—for most common activities—a value of zero represents no time spent that day engaged in the activity, not a censored value or a true zero of no time ever spent in that activity. For example, an individual may not do any laundry on the sample day, but this does not mean that the individual never does laundry (Stewart, 2013). Second, the examination of the binary variable sheds light on whether the additional household income entices parents who would not otherwise engage in an activity to spend some time engaged in it, in addition to the continuous measure analysis showing whether on average time spent in the activity increased. For example, it is likely important to development and parent–child relationships for a parent to spend some time playing with a young child, but it is questionable whether 12 min a day spent playing is more beneficial than 10 min a day.

### Analytic Plan

A difference-in-differences (DD) approach (Angrist & Pischke, 2009) was used, exploiting the seasonal variation in receipt of EITC refunds and respondent education. EITC receipt is not reported in the CPS or ATUS, and EITC participation (and reports of participation) may be endogenous to time use. Thus, the main independent variable is monthly federal outlays (measured in millions of U.S. dollars) for the EITC as reported by the IRS. Presumably, EITC participants should be more likely to receive, and receive higher benefit levels, in the months during which federal outlays are higher compared to those months of lower outlays. In every year from 2003 to 2017, more than half of all annual EITC outlays occurred in February, and about 85% in the first three months of the year. Notably, February does not include a major holiday or a period during which children are beginning or ending a school year.

If the extra household resources provided by the ETC has immediate or short-term effects on time use patterns, they would likely occur in the months during which EITC outlays are high. Because household income is endogenous to EITC receipt and time use, I use parent education—having a four-year college degree or not—as a proxy for EITC receipt, with the expectation that lower-educated respondents are much more likely to receive the EITC. Formally, this is operationalized by estimating the following equation:

\[
Y_i = \beta_0 + \beta_1 \text{Outlays}_i + \beta_2 \text{LDeg}_i + \delta(\text{Outlays}_i \times \text{Deg}_i) + \beta_3 X_i + \alpha + \lambda + \gamma + \mu
\]

where \(i\) represents the respondent. \(Y\) represents a measure of respondent time use. \(\text{Outlays}\) is a continuous variable representing federal EITC outlays during the month and year.
in which the respondent was interviewed. \( LDeg \) represents a binary indicator for whether respondent \( i \) has less than a four-year college degree or more, and zero if more. \( X \) represents a vector of covariates: respondent marital status, age, race/ethnicity; number of children in the household; age of youngest child; whether the household was located in a metropolitan area; state poverty rate; and whether the state had its own EITC. \( \alpha \) represents state fixed effects; \( \gamma \) represents year fixed effects\(^7\); and \( \upsilon \) is idiosyncratic error.

The parameter of interest is \( \delta \), which represents the intent-to-treat (ITT) effect of EITC refunds on short-term time use. Because I lack information on EITC receipt, this study estimates the ITT effect instead of the treatment-on-the-treated (TOT) effect. The use of estimated vs. actual EITC receipt is likely to lead the reported standard errors to be biased toward zero; however, that not all those eligible (approximately 79%) for EITC receive the credit would tend to bias the coefficient estimates toward zero. Estimated vs. reported EITC receipt also limits endogeneity bias regarding selection into EITC participation and provides a more policy-relevant estimate given that full participation in any public program, even one easily applied for such as via filing taxes, is highly unlikely.

Standard errors are clustered at the state level and all descriptive and regression models use ATUS recommended weights. Regression models were run separately by mothers and fathers. Heterogeneous effects were tested by running separate models for parents with young (0–5 years) vs. school-age (6–17 years) children in the household (as defined by the youngest child in the household), and for married and unmarried mothers (given the small number of unmarried fathers living with their children in the sample). Supplemental analyses examined weekend and weekday time use and types of time use other than childcare.

## Results

### Descriptive Results

Weighted descriptive statistics on the background variables for the sample (\( N=61,355 \)) are provided in Table 2. About two-thirds of parents had less than a college degree. Sample parents lived with about two children, the youngest of whom was 6 years old, on average. About 13% of sample mothers identified as Black, 21 percent reported their ethnicity as Hispanic, and nearly three-quarters (74%) were married. More than 90 percent of fathers were married, and only 8% identified as Black. About three-quarters of parents lived in metropolitan areas and two-fifths lived in states that had their own EITC programs, in addition to the federal program.

One assumption of DD analyses is that the treatment and control groups follow parallel trends in the dependent variables in the pre-event period. Appendix Fig. 1 displays the seasonal trends of this time were generally similar across the course of the year compared to less-educated mothers, but the seasonal trends of this time were generally similar across the time period.

### Main Effects

Table 3 shows the results from the regression models examining the effects of the EITC outlays on measures of parents’ total time spent with their children and family members and in enriching activities with children and activities related to children’s education, separately for mothers and fathers. Panel A shows results for all mothers. The parameter of interest, the interaction between EITC outlays and mother’s education, is in general small and insignificant, suggesting that the EITC has no immediate or short-term effects on mother–child or mother-family time. Interestingly, EITC outlays were associated with less time spent in child-related educational activities, suggesting that mothers across the educational spectrum spent less time in child education-related activities during the first few months

\(^7\) Main models were also run including month of interview fixed effects, showing substantively similar patterns of results.
of the year relative to other months. Mothers with less than a college degree spent more secondary time with their children, more time with family, but less time in enriching activities than mothers with college degrees. Panels B and C of Table 3 display the DD results and descriptive means and frequencies for the dependent variables separately for unmarried and married mothers. Again, we see no evidence that EITC outlays have short-term effects on mother–child time use or in child education-related activities. Panel D shows results for all fathers, and like mothers, there is no evidence for short-term effects on fathers’ time with children or in child education-related activities.

Table 4 displays the DD results and descriptive statistics for parents by the age of youngest child, again showing little evidence that the EITC has short-term time use effects. As shown in Panel A, among less-educated mothers whose youngest child is under six years, a $1 million increase in federal EITC outlays was associated with a 0.2 percentage points decrease in the likelihood mothers spent any time in enriching activities with their children. This was the only statistically significant result, and the coefficient is small, representing 0.4% of a standard deviation. There was no evidence that EITC outlays changed these measures of mother–child time use among mothers whose youngest child was school-aged (6–17 years), or fathers’ time.

Although there was little evidence that mothers’ total enriching time changed with EITC outlays, the individual activities included in the index reflect distinct types of time use that may be differentially affected by an increase in household resources. Table 5 shows the DD results for the separate activities included in the enriching time index for all mothers (Panel A), for unmarried mothers (Panel B), and for married mothers (Panel C). Time spent in arts and in sports are excluded from this table, as mothers averaged less than a minute of time in these activities per day. Here, we see that EITC outlays predicted increases in the time spent reading to or with children for all mothers and married mothers lacking a college degree. For unmarried mothers, the interaction coefficient was positive and marginally statistically significant. The effect sizes were small, again about 0.4% of a SD in time spent reading. For all sample mothers, EITC outlays predicted less time in activities and less time attending events with their children among less-educated mothers, again with very small effect sizes (both about 0.4% of a SD).

Table 6 shows the DD results for mothers by the age of their youngest child. As shown in Panel A, mothers lacking a college degree with one or more young children showed a small increase in time spent reading with children of about 0.8% of a SD with EITC outlays, whereas others with older children showed no such increase. EITC outlays were also associated with a statistically significant but small decrease in the time less-educated mothers spent attending events with their children (0.5% of a SD) (Table 6). As shown in Table 7, less-educated fathers, particularly those with school-age children (ages 6–17 years), showed a small decrease in time spent in activities with their children during the months when EITC outlays were high.

Fig. 1 Month-year means of sample mothers’ time use with children by educational attainment, 2003–2017
Table 3  Main difference-in-differences (DD) effects of EITC on the time use of mothers, fathers, and by mothers' marital status (2003–2017)

| Variables | (1) Total time spent with HH children (min) | (2) Total secondary time spent with HH children (min) | (3) Total time spent with family (min) | (4) Time in enriching activities (min) | (5) Time spent in child education-related activities (min) | (6) Any time spent in enriching activities | (7) Any time spent in child education-related activities |
|-----------|---------------------------------------------|-----------------------------------------------------|--------------------------------------|----------------------------------------|--------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------|
| Panel A: all mothers | | | | | | | |
| EITC outlays × less than college degree | 0.106 (0.334) | −0.020 (0.319) | 0.168 (0.335) | −0.107 (0.115) | 0.0001 (0.048) | −0.001 (0.001) | 0.002 (0.005) |
| EITC outlays | 0.335 (0.239) | 0.218 (0.272) | 0.097 (0.244) | 0.089 (0.067) | −0.117** (0.040) | −0.002 (0.001) | −0.002*** (0.0004) |
| Less than college degree | 7.2497 (4.600) | 18.71*** (4.272) | 19.18*** (4.536) | −7.071*** (1.096) | −0.684 (0.617) | −0.092*** (0.008) | −0.015* (0.006) |
| Sample mean | 373.29 (254.06) | 317.20 (273.89) | 462.07 (259.22) | 41.45 (71.39) | 9.66 (.453) | .157 |
| (SD) or frequency | | | | | | | |
| Observations | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 |
| Panel B: unmarried mothers | | | | | | | |
| EITC outlays × less than college degree | 0.551 (0.692) | 0.513 (0.619) | 0.255 (0.825) | −0.241 (0.180) | −0.035 (0.088) | −0.002 (0.002) | −0.001 (0.001) |
| EITC outlays | 0.193 (0.597) | −0.073 (0.514) | 0.460 (0.676) | 0.127 (0.156) | −0.068 (0.089) | 0.0004 (0.002) | −0.002 (0.001) |
| Less than college degree | 18.65 (12.48) | 11.45 (9.828) | 36.79*** (12.52) | −1.276 (2.249) | −1.420 (0.982) | −0.064** (0.022) | −0.014 (0.011) |
| Sample mean | 338.71 (256.50) | 288.27 (269.09) | 382.28 (262.84) | 34.77 (68.61) | 7.49 (.453) | .157 |
| (SD) or frequency | | | | | | | |
| Observations | 10,973 | 10,973 | 10,973 | 10,973 | 10,973 | 10,973 | 10,973 |
| Panel C: Married mothers | | | | | | | |
| EITC outlays × less than college degree | 0.114 (0.460) | −0.168 (0.386) | −0.064 (0.410) | −0.059 (0.125) | 0.002 (0.057) | −0.001 (0.001) | 0.001 (0.001) |
| EITC outlays | 0.330 (0.275) | 0.221 (0.308) | 0.022 (0.283) | 0.085 (0.067) | −0.129** (0.041) | −0.0002 (0.001) | −0.002*** (0.0004) |
| Less than college degree | 5.028 (4.108) | 19.31*** (3.738) | 14.94** (4.319) | −7.649*** (1.334) | −0.519 (0.662) | −0.093*** (0.009) | −0.016* (0.007) |
| Sample mean | 385.84 (252.00) | 327.70 (274.87) | 491.04 (251.71) | 43.87 (72.22) | 10.45 (.476) | .165 |
| (SD) or frequency | | | | | | | |
| Observations | 25,433 | 25,433 | 25,433 | 25,433 | 25,433 | 25,433 | 25,433 |
| Panel D: all fathers | | | | | | | |
| EITC outlays × less than college degree | 0.292 (0.394) | 0.306 (0.404) | −0.0816 (0.461) | 0.0832 (0.125) | −0.0004 (0.001) | 0.0155 (0.029) | 0.0005 (0.001) |
| EITC outlays | −0.0328 (0.270) | 0.0931 (0.280) | 0.0593 (0.296) | −0.020 (0.080) | −0.0006 (0.001) | −0.077** (0.002) | −0.0016*** (0.0003) |
| Less than college degree | −0.425 (2.834) | 4.665 (3.290) | 6.206 (3.809) | −5.257*** (0.951) | −0.094*** (0.007) | −0.839+ (0.487) | −0.015** (0.004) |
| Sample mean | 262.22 (236.28) | 224.31 (255.78) | 362.66 (260.67) | 29.56 (64.72) | 4.48 (.327) | .078 |
| (SD) or frequency | | | | | | | |
| Observations | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights +p < .10, *p < 0.05, **p < 0.01, ***p < 0.001.
Table 4 Main difference-in-differences (DD) effects of EITC on the time use of mothers by age of youngest child (2003–2017)

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|-----------|-----|-----|-----|-----|-----|-----|-----|
|           | Total time spent with HH children (min) | Total secondary time spent with HH children (min) | Total time spent with family (min) | Time in enriching activities (min) | Time spent in child education-related activities (min) | Any time spent in enriching activities | Any time spent in child education-related activities |
| EITC outlays × less than college degree | −0.055 (0.563) | −0.223 (0.579) | −0.038 (0.599) | −0.096 (0.191) | −0.041 (0.057) | −0.002* (0.001) | −0.001 (0.001) |
| EITC outlays | 0.354 (0.387) | 0.208 (0.447) | 0.175 (0.407) | 0.138 (0.120) | −0.066+ (0.039) | 0.001 (0.001) | −0.002*** (0.0005) |
| Less than college degree | 19.80* (8.578) | 41.12*** (9.236) | 28.58*** (7.699) | −9.127*** (2.261) | 0.007 (0.691) | −0.113*** (0.015) | −0.007 (0.007) |
| Sample mean (SD) or frequency | 466.70 (249.04) | 412.39 (246.96) | 540.52 (251.56) | 57.36 (83.62) | 7.56 (27.38) | .552 (.497) | .135 (.341) |
| Observations | 17,017 | 17,017 | 17,017 | 17,017 | 17,017 | 17,017 | 17,017 |
| EITC outlays × less than college degree | 0.247 (0.331) | 0.374 (0.432) | 0.345 (0.405) | −0.158 (0.121) | 0.046 (0.084) | −0.001 (0.001) | 0.001 (0.001) |
| EITC outlays | 0.305 (0.264) | 0.152 (0.283) | 0.020 (0.336) | 0.059 (0.095) | −0.159** (0.075) | −0.001 (0.001) | −0.003*** (0.001) |
| Less than college degree | −2.378 (3.750) | 0.263 (4.064) | 9.676+ (5.181) | −4.574*** (0.915) | −1.405+ (0.790) | −0.070*** (0.011) | −0.024** (0.008) |
| Sample mean (SD) or frequency | 288.17 (227.28) | 230.46 (268.37) | 390.59 (245.04) | 26.95 (54.10) | 11.57 (35.88) | .364 (.481) | .178 (.383) |
| Observations | 19,389 | 19,389 | 19,389 | 19,389 | 19,389 | 19,389 | 19,389 |
| EITC outlays × less than college degree | 0.754 (0.603) | 0.857 (0.527) | 0.309 (0.608) | 0.348 (0.208) | 0.039 (0.038) | −0.003 (0.001) | 0.005 (0.001) |
| EITC outlays | −0.101 (0.427) | −0.313 (0.436) | −0.143 (0.429) | −0.196+ (0.105) | −0.093*** (0.017) | −0.001 (0.001) | −0.002*** (0.001) |
| Less than college degree | 4.954 (4.902) | 2.525 (5.614) | 5.719 (5.518) | −5.225* (2.131) | 0.756+ (0.436) | −0.106*** (0.013) | 0.001 (0.001) |
| Sample mean (SD) or frequency | 309.64 (243.17) | 277.99 (256.47) | 395.15 (264.64) | 41.66 (76.90) | 3.34 (16.45) | .425 (.494) | .063 (.242) |
| Observations | 11,846 | 11,846 | 11,846 | 11,846 | 11,846 | 11,846 | 11,846 |
| EITC outlays × less than college degree | −0.0853 (0.435) | −0.385 (0.535) | −0.432 (0.624) | −0.149 (0.137) | −0.006 (0.060) | −0.0006 (0.001) | 0.0004 (0.001) |
| EITC outlays | −0.022 (0.294) | 0.353 (0.368) | 0.201 (0.361) | 0.131 (0.101) | −0.068 (0.030) | −0.0003 (0.001) | −0.001** (0.0005) |
| Less than college degree | −6.281+ (3.264) | 3.725 (4.511) | 4.630 (5.159) | −4.962*** (1.128) | −2.334** (0.670) | −0.079*** (0.008) | −0.032*** (0.007) |
| Sample mean (SD) or frequency | 219.33 (221.30) | 175.76 (245.25) | 333.27 (253.47) | 18.62 (48.74) | 5.51 (22.69) | .238 (.426) | .092 (.289) |
| Observations | 13,103 | 13,103 | 13,103 | 13,103 | 13,103 | 13,103 | 13,103 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights

+p < .10, *p < 0.05, **p < 0.01, ***p < 0.001.
Supplemental Analyses

A series of supplemental analyses were conducted. Results are shown in the Appendix. First, because time use typically differs on weekdays and weekends, models were re-run separately for weekday and weekend reported time use among mothers and fathers, again showing no evidence of short-term effects of EITC outlays (Appendix Table 8). Second, because EITC receipt may have differential effects at the intensive and extensive margins, the binary dependent variables of spending any time engaged in a child enrichment activity were included in the DD models for mothers (Appendix Table 9). Similar to the results for the intensive margin (shown in Table 5), there was evidence that EITC outlays predicted an increase in the likelihood that less-educated mothers spent any time reading to or with children, and a decrease in the likelihood they spent any time attending events with children. EITC outlays were associated with a decrease in the likelihood fathers attended any activities with children. All effects were small. Third, because the EITC is designed to incentivize labor force participation and may also affect other forms of time use like household production or leisure, time spent in housework, leisure, sleeping, socializing, and working on the interview day were tested as dependent variables, finding no evidence for short-term or immediate effects on mothers’ or fathers’ time spent in housework, leisure, sleep, socializing, or working (see Appendix Table 10). Finally, the main

Table 5 Difference-in-differences (DD) effects of EITC on mother–child time in enriching activities (2003–2017)

| Variables | (1) Time reading (min) | (2) Time playing (min) | (3) Time helping with HW (min) | (4) Time talking (min) | (5) Time in activities (min) | (6) Time attending events (min) |
|-----------|------------------------|------------------------|-------------------------------|------------------------|-------------------------------|--------------------------------|
| Panel A: all mothers |                        |                        |                               |                        |                               |                                |
| EITC outlays x less than college degree | 0.056* (0.022) | 0.0001 (0.084) | -0.014 (0.037) | -0.026 (0.024) | -0.124* (0.059) | -0.110* (0.045) |
| EITC outlays | -0.050** (0.016) | 0.060 (0.049) | -0.098** (0.031) | -0.006 (0.019) | 0.184*** (0.037) | 0.166*** (0.035) |
| Less than college degree | -1.994*** (0.229) | -2.166* (0.912) | -0.269 (0.351) | -0.222 (0.279) | -3.520*** (0.447) | -2.383*** (0.372) |
| Sample mean (SD) or frequency | 3.41 (12.50) | 20.16 (56.52) | 7.51 (24.48) | 4.92 (18.19) | 11.71 (32.44) | 4.92 (28.11) |
| Observations | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 |
| Panel B: unmarried mothers |                        |                        |                               |                        |                               |                                |
| EITC outlays x less than college degree | 0.066 + (0.039) | -0.110 (0.095) | 0.013 (0.069) | -0.022 (0.052) | -0.163 (0.113) | -0.184 (0.114) |
| EITC outlays | -0.045** (0.016) | 0.057 (0.076) | -0.094 (0.067) | -0.031 (0.036) | 0.212+ (0.109) | 0.231* (0.099) |
| Less than college degree | -0.916*** (0.322) | 1.011 (1.454) | -1.373 (0.850) | 0.570 (0.806) | -2.159* (0.857) | -0.495 (0.758) |
| Sample mean (SD) or frequency | 2.28 (11.62) | 17.50 (55.90) | 6.61 (22.25) | 4.83 (20.14) | 9.04 (26.47) | 2.87 (22.32) |
| Observations | 10,973 | 10,973 | 10,973 | 10,973 | 10,973 | 10,973 |
| Panel C: married mothers |                        |                        |                               |                        |                               |                                |
| EITC outlays x less than college degree | 0.045* (0.018) | 0.051 (0.103) | -0.028 (0.035) | -0.013 (0.024) | -0.116 (0.078) | -0.098+ (0.051) |
| EITC outlays | -0.050** (0.018) | 0.062 (0.055) | -0.103** (0.032) | -0.002 (0.020) | 0.183*** (0.034) | 0.160*** (0.032) |
| Less than college degree | -2.059*** (0.024) | -2.328* (1.075) | -0.065 (0.374) | -0.361 (0.317) | -3.838*** (0.525) | -2.828*** (0.456) |
| Sample mean (SD) or frequency | 3.82 (12.79) | 21.12 (56.72) | 7.84 (25.23) | 4.52 (17.42) | 12.68 (34.30) | 5.66 (29.90) |
| Observations | 25,433 | 25,433 | 25,433 | 25,433 | 25,433 | 25,433 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights. 

+p < .10, *p < 0.05, **p < 0.01, ***p < 0.001.

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associations between monthly federal EITC outlays and the main dependent variables were examined, using models analogous to the main models but without the interaction between EITC outlays and parent education (see Appendix Table 11). The coefficients for monthly EITC outlays are similar to those in the models that include the interaction with parent education (e.g., Tables 2 and 4, Appendix Table 8), such that higher monthly outlays are associated with reductions in parents’ time in child education-related activity. Among mothers, higher EITC outlays were associated with a small increase in total time with children. Seasonal patterns cannot be ruled out in these analyses, however, as these models only show associations and do difference out the seasonal trends from one group of parents relative to another (in this case, educational attainment).

### Falsification Tests

Two falsification tests were conducted. First, to assess whether changes in parents’ time interments in children during tax time was a broader trend not limited to EITC-receivers, analogous models to the main models were run examining the parents’ time investments among high-income respondents ($100,000 or greater annual income) compared to slightly lower high-income respondents ($75,000–$100,000), all of whom should be ineligible for the EITC. Results (not shown; available upon request) showed very few significant interactions between household income and EITC outlays, with two exceptions: among the highest-income mothers, EITC outlays were associated with a small decrease in total time spent with household children, and a small decrease in time spent reading to children. Second, to examine potential seasonal patterns of parents’ time investments, analogous models were tested that replaced Outlays in Eq. 1 with a binary indicator for which 1 = the respondent was interviewed in October and November, months during which EITC receipt is unlikely, and other months were coded as zero. Mothers lacking a college degree showed increases in time spent in child education-related activities and in helping children with

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**Table 6** Difference-in-differences (DD) effects of EITC on mother–child time in enriching activities by age of youngest child (2003–2017)

| Variables | (1) Time reading (min) | (2) Time playing (min) | (3) Time helping with HW (min) | (4) Time talking (min) | (5) Time in activities (min) | (6) Time attending events (min) |
|-----------|-------------------------|------------------------|-------------------------------|----------------------|-----------------------------|-------------------------------|
| Panel A: Mothers with one or more children under age 6 | | | | | | |
| EITC outlays × less than college degree | 0.117** | −0.071 | −0.040 | 0.016 | −0.081 | −0.099* |
| (0.42) | (0.164) | (0.050) | (0.028) | (0.068) | (0.045) | |
| EITC outlays | −0.088** | 0.143 | −0.073*+ | −0.003 | 0.140* | 0.129** |
| (0.028) | (0.100) | (0.038) | (0.024) | (0.055) | (0.037) | |
| Less than college degree | −3.934*** | −4.387* | 0.575 | −0.194 | −2.731*** | −1.148** |
| (0.397) | (1.879) | (0.475) | (0.417) | (0.535) | (0.328) | |
| Sample mean (SD) or frequency | 5.346 | 38.63 | 5.93 | 3.18 | 11.10 | 2.93 |
| (15.14) | (74.63) | (21.33) | (15.76) | (25.55) | (18.70) | |
| Observations | 17,017 | 17,017 | 17,017 | 17,017 | 17,017 | 17,017 |

| Panel B: Mothers whose youngest child is 6–17 years | | | | | | |
| EITC outlays × less than college degree | −0.001 | 0.016 | 0.014 | −0.063 | −0.159 | −0.114 |
| (0.015) | (0.030) | (0.057) | (0.043) | (0.096) | (0.085) | |
| EITC outlays | −0.014 | 0.0004 | −0.118* | −0.012 | 0.224** | 0.197** |
| (0.011) | (0.021) | (0.049) | (0.030) | (0.073) | (0.071) | |
| Less than college degree | −0.335 | 0.267 | −1.140* | −0.109 | −3.882*** | −3.217*** |
| (0.250) | (0.367) | (0.490) | (0.394) | (0.631) | (0.660) | |
| Sample mean (SD) or frequency | 1.65 | 3.33 | 8.94 | 5.90 | 12.27 | 6.73 |
| (9.13) | (20.89) | (26.95) | (20.06) | (37.62) | (34.41) | |
| Observations | 19,389 | 19,389 | 19,389 | 19,389 | 19,389 | 19,389 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights + p < .10, *p < 0.05, **p < 0.01, ***p < 0.001.
homework during these months, likely coinciding with the start of the school year.

**Discussion**

This study sought to examine whether federal Earned Income Tax Credit (EITC) refunds—a once-a-year increase in household resources—affects how parents spend time with their children immediately following or very soon after receipt using a quasi-experimental approach. Despite the scope of the EITC and the importance of parent–child engagement, particularly in enriching activities, and its theoretical relevance in understanding associations between household resources and short-term behavior or time use changes, research to date has not examined the short-term effects of EITC refunds. In general, however, results provide limited evidence that EITC refunds have immediate or short-term effects on mothers’ or fathers’ time with children, in activities related to children’s education, or in other measures of time use with family members, with the exceptions of small increases in reading among mothers.

| Variables | (1) Time reading (min) | (2) Time playing (min) | (3) Time helping with HW (min) | (4) Time talking (min) | (5) Time in activities (min) | (6) Time attending events (min) |
|-----------|------------------------|-----------------------|-------------------------------|-----------------------|-----------------------------|-------------------------------|
| EITC outlays × less than college degree | 0.0180 (0.0185) | 0.144 (0.090) | −0.0228 (0.031) | 0.0107 (0.032) | −0.104* (0.041) | −0.0186 (0.038) |
| EITC outlays | −0.010 (0.014) | −0.0865 (0.053) | −0.0523+ (0.028) | 0.0141 (0.026) | 0.129*** (0.031) | 0.0625* (0.029) |
| Less than college degree | −1.333*** (0.196) | −2.023* (0.821) | −1.391 (0.392) | −0.227 (0.207) | −1.573** (0.453) | −1.314*** (0.402) |
| Sample mean (SD) or frequency | 1.79 (5.48) | 17.36 (54.15) | 3.99 (17.93) | 1.95 (11.49) | 6.93 (28.47) | 3.52 (25.29) |
| Observations | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 |

Panel B: fathers whose youngest child under 6 years

| Variables | (1) Time reading (min) | (2) Time playing (min) | (3) Time helping with HW (min) | (4) Time talking (min) | (5) Time in activities (min) | (6) Time attending events (min) |
|-----------|------------------------|-----------------------|-------------------------------|-----------------------|-----------------------------|-------------------------------|
| EITC outlays × less than college degree | 0.0461 (0.0300) | 0.311 (0.190) | −0.00647 (0.0235) | 0.00426 (0.0219) | −0.0524 (0.0544) | 0.0105 (0.0509) |
| EITC outlays | 0.0279 (0.0215) | −1.63+ (0.0951) | −0.0826*** (0.0167) | 0.000891 (0.0136) | 0.0799* (0.0394) | 0.0499 (0.0345) |
| Less than college degree | −2.306*** (0.390) | −2.998 (1.889) | 0.765+ (0.386) | −0.0674 (0.254) | −0.738 − 0.910* (0.507) | (0.399) |
| Sample mean (SD) or frequency | 2.95 (10.57) | 31.16 (70.87) | 3.00 (14.85) | 1.30 (8.66) | 5.99 (23.88) | 2.13 (19.50) |
| Observations | 11,846 | 11,846 | 11,846 | 11,846 | 11,846 | 11,846 |

Panel C: fathers whose youngest child is 6–17 years

| Variables | (1) Time reading (min) | (2) Time playing (min) | (3) Time helping with HW (min) | (4) Time talking (min) | (5) Time in activities (min) | (6) Time attending events (min) |
|-----------|------------------------|-----------------------|-------------------------------|-----------------------|-----------------------------|-------------------------------|
| EITC outlays × less than college degree | −0.00750 (0.0152) | −0.00189 (0.0559) | −0.0395 (0.0595) | 0.0143 (0.0554) | −0.145* (0.0642) | −0.0416 (0.0576) |
| EITC outlays | 0.00260 (0.0138) | −0.00736 (0.0433) | −0.0292 (0.0499) | 0.0054 (0.0473) | 0.166** (0.0562) | 0.0682 (0.0493) |
| Less than college degree | −0.503*** (0.138) | −0.705 (0.552) | −1.499* (0.579) | −0.291 (0.350) | −2.428** − 1.736* (0.706) | (0.699) |
| Sample mean (SD) or frequency | 0.75 (5.79) | 4.88 (26.71) | 4.87 (20.28) | 2.53 (13.52) | 7.77 (32.04) | 4.77 (29.51) |
| Observations | 13,103 | 13,103 | 13,103 | 13,103 | 13,103 | 13,103 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights. 

*p < .10, **p < .05, ***p < .01, ****p < .001.
and small decreases in attending events or activities with children.

This general lack of effects is consistent with recent research indicating that while growing income inequality is associated with growing inequality in parental financial investments in their children, it is not associated with changes in parental time investments (Bastian & Lochner, 2020; Schneider et al., 2018). Household routines and parent–child engagement and activities may be difficult to change, even in the short-term. This may be particularly true given the size of the EITC refunds, averaging $2,476 in 2019 (National Conference of State Legislatures, 2021), small relative to a family’s financial needs. It is possible that the amount is simply too little to change family routines and behavior, given the average refund relative to the average family’s financial needs. Indeed, recent research has found that Medicaid expansion -- an in-kind source of financial support in the form of health insurance coverage that may lead to large reductions in household health care expenses -- led to increases in home production, including childcare, among low-income individuals (Soni & Morrissey, 2022). Alternatively, it is possible that time with children or in activities related to their education are not viewed as normal goods to be purchased with a larger budget constraint. That is, families use their EITC refunds to purchase physical goods (e.g., food, cars, pay bills) rather than on experiences or changing habits in the short-term.

That said, findings identify a few types of parents’ time investments that were affected by the EITC, all with very small effect sizes. First, EITC outlays predicted a small decrease in the likelihood less-educated mothers with one or more young child (under age 6) spent any time in enriching activities with children, and small decreases in time spent in activities and attending events with children appear to account for these changes. These decreases in time spent in activities or at events with children may reflect parents choosing to spend their EITC refunds on either activities that children and parents do not attend together (e.g., adult-centered events or tutoring related to children), which would not be captured in the ATUS because only adult time is assessed. Thus, this decreased time are not necessarily reflective of overall reductions in children’s event or activity attendance.

A second exception to the largely null effects is that mothers likely to have received the EITC, particularly those with young children, showed a small increase in time spent reading to children. Among mothers with one or more children under age six, this increase represents about 0.8 min a week, or about 3.5 min a month. Given that the early childhood period constitutes a sensitive developmental during which reading and other enrichment activities are particularly impactful (Black et al., 2017; Committee on Integrating the Science of Early Childhood Development Youth, and Families & Press, 2000), an increase in mother–child reading time during this time period, even a small increase, has implications for children’s literacy development. Prior research shows that the number of days mothers read to children and reading to children daily predicts children’s subsequent achievement scores; specifically, an increase of 1 standard deviation in mother–child reading time led to a 0.8 standard deviation increase in measures of children’s achievement (Price & Kalil, 2019). The short-term effect on mother–child reading time in this study was small–0.8% of a standard deviation among parents with young children—and thus could likely only have small benefits for literacy. There may be additional benefits for parents, however, in that time with children, particularly when spent in certain activities, positively affects parents’ emotional well-being (Offer, 2014). Notably, though, the gap in parent–child reading time between mothers with a college degree and those lacking was nearly four minutes a day, after controlling for background characteristics; thus, the short-term, positive, small effect of the EITC does not close this SES disparity, even temporarily. Moreover, these changes were not observed among fathers, which may have implications for theory such that parents may more so specialize along traditional gender lines when the household has more resources. Indeed, other work has found this to some degree, such that the EITC is a temporary disincentive for work for married women in particular (LaLumia, 2013; Yang, 2017).

Importantly, due to the nature of the research design exploiting seasonal variation in EITC outlays, any effects of the EITC identified in this study are by definition short-term and not sustained through the year. Results are suggestive that extra funds or resources have immediate effects on behaviors, providing new directions for research on the mechanisms and implications. Whether any short-term changes in time use are important for children’s developmental outcomes—and why these changes are temporary, rather than stable—remains largely unknown. The mechanisms through which EITC refunds affect reading time, how other safety net policies affect reading time, and the long-term implications of these changes remain important areas for future research. The majority of research has focused on how public policies affect sustained or long-term changes in parent–child activities or in child outcomes, but the field lacks an understanding of how short-term changes in behaviors—and the timing of those changes given children’s age and developmental stage—affect family well-being.

Larger or more sustained changes family resources may have larger effects on time use. For example, the refundable Child Tax Credit (CTC) began in July 2021 and expired in December 2021. The expanded CTC provided a credit that was disbursed monthly, unlike the annual lump sum of the EITC. Pending legislation would re-instate this credit with benefits greater than the EITC; families would be eligible for up to $3,600 per year per child under age five and
$3000 per year per child aged six through 17 years (Prenatal to 3 Policy Center, 2021), compared to the maximum EITC credit of $6,728 for three or more children for the 2021 tax year (IRS, 2021). Comparing the short- and long-term time use changes from the annual EITC to the more temporally disbursed CTC offers several directions for future research, including examining the benefit’s impact on household material hardship, parent financial stress, child health and achievement, and parent–child engagement.

Despite the use of nationally representative data and its quasi-experimental design, this study has several limitations. First, the ATUS-CPS lacks information about actual EITC receipt, or the size of refunds, and thus monthly federal EITC outlays and parent education are used to proxy for EITC eligibility to estimate the ITT effects. Second, longer-term changes in parents’ time investments may underlie some of the previously identified benefits of EITC for child health, but long-term effects cannot be examined in these data due to the stability of the federal EITC over the ATUS time period. Third, the DD approach provides plausibly causal estimates of the effects of a policy change; however, it is possible that seasonal or economic conditions or policy changes other than the EITC differentially affect families’ time use. To the extent that the Great Recession or the policy responses affected respondents in the treatment group more so than control respondents, the results during this period may be biased. Fourth, the ATUS-CPS samples respondents 15 years and older, lacking information on children’s time use, and the sample used here was limited to parents co-residing with their own children under age 18. It may be that receipt of the EITC leads to changes in children’s time use such that children spend more time in activities or at events that do not directly involve parents or changes the time of stepparents or non-residential parents. Moreover, data include only respondents’ primary activity, and cannot assess multitasking. Fifth, the EITC is a unique source of family income. It is possible that the once-a-year influx of funds provided by the EITC produces economic instability in the household, or that EITC recipients anticipate their tax refunds and pre-commit EITC funds before receiving them, smoothing consumption as well as their time use. EITC refund amounts are labor-related income, even if not received like regular paychecks, and thus not exogenous to work or time spent working. Finally, because families with no employed individuals are ineligible for the EITC, the generalizability of findings to other public programs is limited, and may not apply to the time use of non-working, more likely deeply poor, households with children.

**Conclusion**

In sum, this study finds little evidence that EITC receipt has short-term effects on parents’ time with children, with the exceptions of a small increase in mother–child reading time and small decreases in parents’ time spent with children at events or activities. Together with previous work on the longer-term effects of EITC on family time and child outcomes (Bastian & Lochner, 2020), findings suggest that the extra funds provided by the EITC may provide immediate, small benefits in mother–child enriching time, and have lasting effects not captured by analyses of month-to-month trends. As the tax code has been increasingly used to administer social welfare programs in the U.S., together, these results can inform how best to maximize their distribution in relates to its benefits for children and families. More research is needed to better understand the interplay of labor and safety net policies and parents’ time investments in their children, particularly among low-income families in the COVID-19 and recovery era.
Table 8  Difference-in-differences (DD) effects of EITC on the time use of mothers and fathers by weekday and weekend days (2003–2017)

| Variables | (1) Total time with HH children (min) | (2) Total time with family (min) | (3) Enriching time (min) | (4) Any enriching time | (5) Educational time (min) | (6) Any educational time |
|-----------|--------------------------------------|----------------------------------|--------------------------|------------------------|---------------------------|--------------------------|
| Panel A: mothers, weekdays | | | | | | |
| EITC outlays × less than college degree | 0.436 | 0.467 | −0.104 | −0.00150 | 0.0204 | 0.000217 |
|  | (0.404) | (0.451) | (0.141) | (0.000975) | (0.0600) | (0.000682) |
| EITC outlays | 0.0506 | −0.203 | 0.0908 | −0.000295 | −0.165** | −0.00283*** |
|  | (0.293) | (0.315) | (0.0965) | (0.000968) | (0.0556) | (0.000653) |
| Less than college degree | 16.74*** | 31.11*** | −4.281** | −0.0759*** | −0.192 | −0.0101 |
|  | (4.669) | (4.185) | (1.563) | (0.0105) | (0.791) | (0.00859) |
| Observations | 17,987 | 17,987 | 17,987 | 17,987 | 17,987 | 17,987 |
| Panel B: mothers, weekends | | | | | | |
| EITC outlays × less than college degree | −0.364 | −0.106 | −0.116 | −0.00125 | −0.0711 | −0.000305 |
|  | (0.537) | (0.440) | (0.204) | (0.000885) | (0.0581) | (0.000371) |
| EITC outlays | 0.909* | 0.665* | 0.0880 | 0.000285 | 0.0129 | −0.000473 |
|  | (0.356) | (0.314) | (0.128) | (0.000593) | (0.0589) | (0.000417) |
| Less than college degree | −18.98** | −12.88* | −13.92*** | −0.128*** | −1.725*** | −0.0225*** |
|  | (6.283) | (6.170) | (1.662) | (0.00856) | (0.450) | (0.00463) |
| Observations | 18,419 | 18,419 | 18,419 | 18,419 | 18,419 | 18,419 |
| Panel C: fathers, weekdays | | | | | | |
| EITC outlays × less than college degree | 0.273 | −0.190 | 0.0722 | −0.000491 | 0.0210 | 0.000635 |
|  | (0.410) | (0.476) | (0.170) | (0.00140) | (0.0374) | (0.000741) |
| EITC outlays | −0.207 | −0.0978 | −0.0156 | −0.000595 | −0.0994** | −0.00195*** |
|  | (0.334) | (0.318) | (0.0935) | (0.000889) | (0.0328) | (0.000432) |
| Less than college degree | 17.24*** | 28.16*** | −1.174 | −0.0773*** | −0.370 | −0.0127* |
|  | (3.227) | (4.022) | (1.318) | (0.00959) | (0.679) | (0.00620) |
| Observations | 12,308 | 12,308 | 12,308 | 12,308 | 12,308 | 12,308 |
| Panel D: fathers, weekends | | | | | | |
| EITC outlays × less than college degree | −0.286 | −0.615 | 0.0957 | −6.62e−05 | 0.00174 | 0.000158 |
|  | (0.603) | (0.560) | (0.157) | (0.000929) | (0.0527) | (0.000414) |
| EITC outlays | 0.558 | 0.682+ | −0.0469 | −0.000618 | −0.0197 | −0.000507 |
|  | (0.341) | (0.388) | (0.126) | (0.000695) | (0.0486) | (0.000348) |
| Less than college degree | −37.62*** | −39.36*** | −15.39*** | −0.137*** | −2.134*** | −0.0228*** |
|  | (5.980) | (3.856) | (1.673) | (0.00836) | (0.567) | (0.00443) |
| Observations | 12,641 | 12,641 | 12,641 | 12,641 | 12,641 | 12,641 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights + p < .10, * p < .05, ** p < .01, *** p < .001.
Table 9  Difference-in-differences (DD) effects of EITC on any parent–child time in enriching activities (2003–2017)

| Variables | (1) Any time reading | (2) Any time playing | (3) Any time helping with HW | (4) Any time talking | (5) Any time in activities | (6) Any time attending events |
|-----------|----------------------|----------------------|------------------------------|----------------------|-----------------------------|-----------------------------|
| Panel A: mothers |                      |                      |                              |                      |                             |                             |
| EITC outlays × less than college degree | 0.00113* | −0.000592 | 0.000261 | −0.000816 | −0.000388 | −0.00104* |
| (0.000491) | (0.000603) | (0.000468) | (0.000673) | (0.000760) | (0.000461) |
| EITC outlays | −0.00153*** | 0.000730+ | −0.00217*** | 0.000401 | 0.000447 | 0.00153*** |
| (0.000430) | (0.000403) | (0.000427) | (0.000448) | (0.000659) | (0.000354) |
| Less than college degree | −0.0749*** | −0.0340*** | −0.00813 | −0.0283*** | −0.0793*** | −0.0256*** |
| (0.00536) | (0.00645) | (0.00557) | (0.00588) | (0.00822) | (0.00290) |
| Observations | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 |
| Panel B: fathers |                      |                      |                              |                      |                             |                             |
| EITC outlays × less than college degree | 0.000405 | 0.000181 | 0.000142 | −6.87e−05 | −0.00240* | 7.91e−05 |
| (0.000422) | (0.000556) | (0.000562) | (0.000478) | (0.000912) | (0.000339) |
| EITC outlays | −0.000347 | −0.000532 | −0.00132*** | 0.000232 | 0.00170** | 0.000239 |
| (0.000355) | (0.000413) | (0.000300) | (0.000379) | (0.000522) | (0.000278) |
| Less than college degree | −0.0501*** | −0.0389*** | −0.0110* | −0.0147*** | −0.0473*** | −0.0168*** |
| (0.00496) | (0.00603) | (0.00424) | (0.00408) | (0.00761) | (0.00302) |
| Observations | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Table 10  Difference-in-differences (DD) effects of EITC on other categories of parents’ time use (2003–2017)

| Variables | (1) Housework time (min) | (2) Leisure time (min) | (3) Sleep time (min) | (4) Social time (min) | (5) Work time (min) |
|-----------|--------------------------|------------------------|----------------------|-----------------------|---------------------|
| Panel A: mothers |                      |                      |                      |                      |                     |
| EITC outlays × less than college degree | 0.0197 | 0.0543 | −0.223 | −0.0762 | 0.566 |
| (0.111) | (0.276) | (0.183) | (0.0917) | (0.348) |
| EITC outlays | −0.000953 | 0.256 | −0.0112 | 0.0543 | −0.571* |
| (0.0902) | (0.201) | (0.113) | (0.0863) | (0.247) |
| Less than college degree | 17.17*** | 29.40*** | 19.74*** | −4.394** | −42.20*** |
| (1.514) | (2.384) | (1.906) | (1.279) | (4.184) |
| Observations | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 |
| Panel B: fathers |                      |                      |                      |                      |                     |
| EITC outlays × less than college degree | −0.116 | −0.255 | −0.170 | 0.0825 | 0.164 |
| (0.0890) | (0.361) | (0.202) | (0.105) | (0.526) |
| EITC outlays | 0.00615 | −0.174 | −0.116 | 0.0663 | 0.0451 |
| (0.0696) | (0.244) | (0.133) | (0.0549) | (0.275) |
| Less than college degree | 2.234** | 37.09*** | 17.93*** | −5.392*** | −29.73*** |
| (0.784) | (3.440) | (2.964) | (1.275) | (5.234) |
| Observations | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.
Table 11  Main effects of EITC outlays (in millions of $) on the time use of mothers and fathers (2003–2017)

| Variables | (1) Total time with HH children (min) | (2) Total time with family (min) | (3) Enriching time (min) | (4) Any enriching time | (5) Educational time (min) | (6) Any educational time |
|-----------|--------------------------------------|---------------------------------|-------------------------|-----------------------|--------------------------|-------------------------|
| Panel A: mothers | 0.404** | 0.205 | 0.206 | 0.0205 | −0.00103* | −0.117*** |
| EITC outlays | (0.150) | (0.166) | (0.132) | (0.0570) | (0.000464) | (0.0249) | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 |
| Observations | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 |
| Panel B: fathers | 0.150 | 0.285 | 0.00832 | 0.0301 | −0.000838* | −0.0677*** |
| EITC outlays | (0.207) | (0.246) | (0.232) | (0.0634) | (0.000368) | (0.0179) | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 | 36,406 |
| Observations | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 | 24,949 |

Robust standard errors, clustered at the state level, are in parentheses. All models control for respondent age, race/ethnicity, marital status, age of youngest child, number of children under 18 in the household, whether the respondent lived in a metropolitan area, state poverty rate, and whether the state had an EITC, and include year, month, and state fixed effects (not shown). Estimates use ATUS weights + p < .10, *p < 0.05, **p < 0.01, ***p < 0.001.

Appendix

See Appendix Tables 8, 9, 10, 11.

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Declarations

Conflict of interest All authors declare that they have no conflict of interest.

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