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**Spending Response to the Expanded Child Tax Credit:
An Analysis Using U.S. Consumer Expenditure Survey Data**

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Abstract

The Child Tax Credit (CTC) was substantially expanded through the American Rescue Plan Act of 2021. Early studies documented that the expanded CTC reduced poverty and food insufficiency, but there is little research on its impact on household spending, particularly child-related spending. We use data from the Consumer Expenditure Interview Survey and a parameterized difference-in-difference design to examine whether the expanded CTC increased spending overall, in major categories, and on specific items related to children's education and development. Our findings indicate that households used the CTC payments to enhance the well-being of both their children and the entire household. For each $100 of CTC payment, our models show that households spent $44, mainly on housing ($28) and food ($12). In a subset of child-related expenditures, households spent $16 per $100. We also find that the increase in child-related spending was larger for Black-and Hispanic-headed households than for White-headed households.

1. Introduction

The American Rescue Plan Act of 2021 (ARP), enacted in March 2021, significantly expanded the Child Tax Credit (CTC) in three major ways. First, it made the benefit more generous, increasing the maximum benefit size from $2,000 per child to $3,000 per child for children aged 6 to 17 years and $3,600 per child for children aged 0 to 5.[1] Second, it made the benefit "fully refundable," meaning that tax filers were able to receive the full credit regardless of their tax obligation. Third, it allowed households to receive up to half of their full credit in monthly installments delivered from July to December of 2021 with the remainder delivered at tax time in 2022. As a result of the expansions, from July through December 2021, most low- and middle-income households with children in the United States (U.S.) received monthly cash payments of $300 per child under age six and $250 per child between ages of 6 and 17.[2]

Though now expired, the ARP CTC broadened the CTC's reach and role in addressing the economic hardship of low-income households with children. Early studies analyzing the ARP CTC established that the expansion drove the child poverty rate to the lowest rate on record (Creamer et al., 2022; Marr et al., 2021), reduced food insufficiency (Parolin, Ananat, et al., 2023; D. J. Perez-Lopez, 2021), and lowered rates of material hardships (Collyer et al., 2022; Pilkauskas et al., 2022). Findings related to the effect of the 2021 ARP CTC expansion on parental employment are mixed, with some studies not finding evidence of an effect (Ananat et al., 2022; Roll et al., 2022a), and others finding a small decline in employment among certain subgroups of parents and caregivers (Pac & Berger, 2024; Schanzenbach & Strain, 2023).[3] Using data from the Consumer Expenditure Interview Survey (CE), this study adds a new set of outcomes to this body of literature by examining the effects of the CTC expansion on household spending across several domains, including child-related spending.[4]

The family investment model posits that income affects children's well-being and long-term outcomes. As parents receive more income they are able to purchase items and services that enhance their children's development (e.g., book and enriching activities) as well as meet basic needs, for example, alleviating food insufficiency and housing insecurity (Wimer & Wolf, 2020; Yeung et al., 2002). Therefore, determining whether and how households spent the additional income received from the monthly CTC payments is pertinent to evaluating the CTC expansion and its potential effects on

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[1] Before the ARP, eligible children included those under age 17 with a Social Security Number (SSN) who could be claimed as a dependent. Under the ARP, eligible children included those under age 18 with an SSN who could be claimed as a dependent.
[2] Households with qualifying dependents who had previously filed taxes were automatically enrolled to receive the credit while non-filers (typically the lowest income households) had to sign up to receive it using a portal managed by the Internal Revenue Service (IRS). The first monthly payment was distributed to the households of 59.3 million children in July 2021, while the last payment reached 61.2 million children in December 2021 (United States Department of Treasury, 2021).
[3] Curran et al. (2024) provide a comprehensive overview of research looking at the impact of the ARP CTC.
[4] While the CE collects data from consumer units,[4] we use household and consumer unit interchangeably in this study.

children's well-being and development. Policymakers have also raised questions as to how households spent the monthly payments and if CTC payments were spent in ways that did or did not promote children's well-being. There have been investigations into how parents spent the CTC income using survey reports (Karpman et al., 2021; D. Perez-Lopez & Mayol-García, 2021; Pilkauskas et al., 2022; Pilkauskas & Cooney, 2021; Rachidi, 2021; RAPID-EC, 2021; Roll, Chun, et al., 2021; Zippel, 2021), transactional-level data (Wheat et al., 2022; Parolin et al., 2022), and geo-location data tracking visits to different establishments (Parolin et al., 2022). However, to our knowledge, no study has used nationally representative item-level [5] expenditure data to analyze changes in spending on items across a host of different domains, including on food, housing, or child-related spending.

Comprehensive spending data from the CE allow us to examine the spending response to expanded CTC payments across several domains. We harness the CE data to examine the household spending response to modeled, as opposed to reported, monthly payments on (1) major expenditure categories, such as food, housing, alcohol and tobacco, leisure, etc., and (2) child-related spending including that for books, clothing, childcare, computers and tablets, and enrichment activities.

Following many prior studies of policy effects (Currie & Gruber, 1996; Hoynes & Patel, 2018, 2018; Jones et al., 2019; Michelmore & Pilkauskas, 2021; Pilkauskas et al., 2022), we predict how much different households would likely benefit from the policy change based on their characteristics prior to the policy change and incorporate this predicted CTC value into a difference-in-differences framework to identify the expansion's effect on spending across domains.[6] Our identification strategy relies on variation in spending between households who could have potentially received the payments and those who could not *and* on variation in payment size. Our estimates draw on CE data collected in reference to spending in 2021 and 2019. To avoid potential biases arising from differences in spending patterns across household composition and income levels, we restrict our sample to households who have qualifying children and are income eligible for the CTC. We designate all households reporting on spending in 2021 as "potentially treated," while the "non-treated" or "control group" were selected from interviews conducted in reference to 2019. This choice allowed us to control for seasonal spending variation correlated with the period monthly CTC payments were delivered.[7] Our models estimate the difference in spending levels based on payment size for potentially treated households in the treatment period (i.e., the second half of 2021). Our main source of variation in payment sizes comes from the reference quarter for which

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[5] Note that when we refer to "items," we also are referring to child-related services, such as enrichment activities.
[6] It was necessary to impute the value of the CTC because the CE Survey did not collect data on the amount of CTC received.
[7] We considered a model that relies only on the variation in spending between recipients and non-recipients (i.e., a binary treatment), as opposed to one exploiting variation in payment size, but this strategy drops a significant portion of the variation needed to identify the treatment effect across spending subdomains and demographic groups. However, we analyzed total spending for all households in our sample using the binary treatment model and found the results to be consistent with the continuous treatment model.

respondents reported their expenditures (they could have received 1, 2, or 3 months of payments in the quarter), and the fact that the monthly payments for children under age 6 were $50 greater than those for children of ages 6-17.

Our findings suggest that households spent the monthly CTC payments on goods and services known to improve child and household well-being. We find that households spent $44 of each $100 of imputed CTC payment, with the largest portions devoted to housing ($28) and food ($12). This result indicates that households spent most of their benefits to meet basic needs and thereby promote material well-being. We also conduct a separate analysis on a subset of child-related goods and services and find evidence that supports the family investment model, with households spending $16 of each $100 CTC payments on child-related goods and services that directly enhance child development and well-being. We validate our model using a placebo test in which we change the treatment year to 2018—a year when there was no treatment—and keep 2019 as the comparison year. The results of this test show coefficients close to zero and statistically insignificant, reinforcing the conclusion that our main findings are driven by the expanded, monthly CTC, rather than by a spurious correlation or general trend of increased spending in the latter half of the year.

Prior work suggests that non-Hispanic Black children and Hispanic households with children benefitted more from the ARPA CTC expansions than White children (Collyer et al., 2019; Goldin & Michelmore, 2022). We also find that the increase in spending on child-related goods and services was larger for non-Hispanic Black- and Hispanic-headed households, as well as households where the head identified as an 'other' racial group, compared to White-headed households. We estimate a statistically significant $47 increase in child-related spending per $100 in CTC for households with a head identified as non-Hispanic 'other'; a $27 increase for non-Hispanic Black-headed households; a $12 increase for Hispanic-headed households; and an insignificant $10 increase for White-headed households. Taken together, these results suggest that households that benefitted disproportionately from the ARPA CTC expansion allocated a greater share of their CTC income to child-related spending.

2. Background

The 2021 Child Tax Credit Expansion

Prior to the passage of the ARP, the CTC's most recent parameters were established by the Tax Cuts and Jobs Act of 2017 (TCJA). Under the TCJA, tax filers received a maximum CTC of $2,000 per child per year.[8] However, the credit was not fully refundable. It was phased in with earnings, and tax filers claiming dependent children needed to earn a minimum amount to qualify for any benefit, and

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[8] For additional information on the history of the Child Tax Credit see Crandall-Hollick (2021), Crandall-Hollick (2018), and Garfinkel et al. (2016).

higher earnings to qualify for the maximum credit.[9] As a result, one in three children were ineligible for the full benefit value because their parents did not earn enough. Children with single parents, those in rural areas, non-Hispanic Black and Hispanic children, and those in larger households were disproportionately ineligible for the full credit (Collyer et al., 2019; Curran & Collyer, 2020; Goldin & Michelmore, 2022).

The ARP temporarily transformed the CTC into a nearly universal child allowance through three fundamental changes:[10] (1) expanded eligibility, (2) higher credit amounts, and (3) delivery of credit in monthly installments for the second half of 2021. Eligibility was expanded to almost all children, including children in low-income households who were previously excluded, by removing the earnings requirement, and by making the credit fully refundable. Figures 1a and 1b plot the credit amount a household qualified for as a function of adjusted gross income (AGI) according to the TCJA and ARP legislation, respectively. The figures shows that the maximum annual credit amounts were increased from $2,000 per child under the TCJA parameters to $3,000 for children ages 6-17 and $3,600 for children under age 6 under the ARP (Figure 1, panel b).[11] Households with incomes below $112,500 (heads of household) or $150,000 (joint filers) were eligible for the higher ARP maximum credits; above these levels, the credit began to phase out at a rate of 5% per dollar of AGI until reaching the credit amount that households were eligible for under prior law. That is, no household received a smaller credit than they would have under the TCJA, but the highest income households were not eligible for the higher maximum credits ($3,000 or $3,600 per child depending on age). This created a two-step phase out structure depicted in Figure 1b.

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[9] See Curran and Collyer (2020) for details on how much a filer needed to earn to qualify for the full credit.
[10] The changes to the CTC in the ARP follow those outlined in the American Family Act (a bill first introduced in both the Senate and House of Representatives in 2017 and reintroduced in 2019) with one exception: in the AFA, the credit would begin to phase out for heads of household with earnings above $120,000 or and joint filers with Adjusted Gross Incomes (AGI) over $180,000. In the ARP, the credit began to phase out for households with AGIs above $112,500 or $150,000 per year, depending on filing status, but it only phased out until matching the credit values that a household would receive under prior law. This alteration was made because the Biden administration committed to not raising taxes for those with incomes below $400,000 per year
[11] Included within this change is an increase in the qualifying maximum age from 16 to 17.

Figure 1: Child Tax Credit as a Function of AGI and Household Size
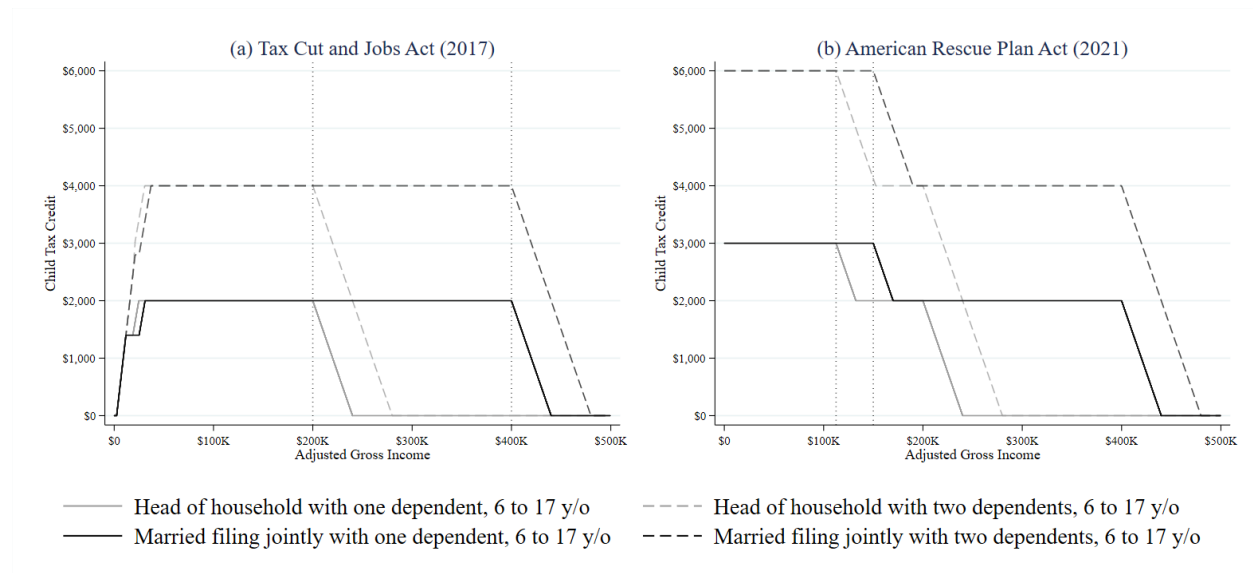
Note: All values are the authors' calculations for households where Adjusted Gross Income is equivalent to earned income. The ARP increased the qualifying age for children from less than 17 years-old to less than 18 years-old. Additionally, the ARP provides a larger credit for children under the age of 6, $3,600 instead of $3,000. Figure (a) also applies to households with children less than 6 years old, and Figure (b) also applies to households with children 17 years old.

Under the ARP, households also received the CTC through advanced, monthly payments. Beginning on July 15, 2021, the IRS delivered the credit in advanced, monthly installments of up to $250 per child 6 to 17 years old or up to $300 per child under the age of 6 years old, for a period of six months.[12] Note that although the ARP expanded eligibility for the CTC, monthly payments did not reach all eligible households. Payments were distributed automatically based on prior-year tax information. Households who did not file taxes in the prior year, presumably due to having an income below the tax-filing threshold, generally needed to register with the Internal Revenue Service (IRS) in order to receive their monthly credit. Data from the U.S. Department of the Treasury (2021) indicate that payments were distributed to 59.3 million children in July and increased steadily until it reached 61.2 children in December.[13] Although data on the number of children eligible for the monthly payments were not publicly available at the time of the study, estimates suggest that the monthly payments reached between roughly 88.5 percent and 91 percent of eligible children (Curran, 2022; Parolin, Collyer, et al., 2021).

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[12] Because the payments began halfway through the year, households received half of the full amount of their credit in 2021 through monthly advanced payments. The remainder of the credit was received when households filed taxes in 2022. Note, children born in 2021 were not eligible for monthly payments. Their households could claim the entirety of the credit at tax time.
[13] U.S. Department of the Treasury issued monthly reports about the disbursement of the advanced CTC payments by state. Use the following link to see the July report: https://home.treasury.gov/system/files/131/Advance-CTC-Payments-Disbursed-July-2021-by-State-07142021.pdf

The link between spending and child outcomes

  Additional income provided through cash transfers like the CTC can be characterized as improving children's long-term outcomes through two channels: family stress and family investments (Wimer & Wolf, 2020). The family stress model posits that economic hardship impairs family functioning and increases parents' stress, undermining parents' mental health and ultimately children's development (Conger & Conger, 2002). Increased income can thus reduce family stress and improve child outcomes. The family investment model posits that increased income allows parents to purchase or invest in various things that enhance child development and well-being and meet children's basic needs (e.g., books, toys, enriching activities, high-quality childcare, or nutritious food) (Duncan et al., 2011; Yeung et al., 2002). Thus, parents' spending on children represents an important pathway to promote children's development and well-being (Jackson & Schneider, 2022; Kaushal et al., 2011; Kornrich & Furstenberg, 2013; Schneider et al., 2018). This study focuses on the family investment model by investigating whether the expanded CTC affected household expenditures, overall, in major categories, such as food and housing, as well as expenditures on children.

Related research

  There are several streams of research that document spending responses to changes in income. Some examine changes in response to tax refunds and rebates (Johnson et al., 2006; Parker et al., 2022; Souleles, 1999), while others focus specifically on the receipt of the Earned Income Tax Credit (Barrow & McGranahan, 2000; Gao et al., 2009; Goodman-Bacon & McGranahan, 2008; Halpern-Meekin et al., 2015), in-kind benefits (Hastings & Shapiro, 2018; Smith et al., 2016; Beatty & Tuttle, 2015), cash transfers (Jones et al., 2019; Najjarrezaparast & Pendakur, 2021; Gregg et al., 2006), the Alaska Permanent Income Dividend (Amorim, 2021), and payments received from the Baby's First Years randomized control trial (Gennetian et al., 2022).

  Research suggests that households with higher liquidity constraints spend a larger share of their tax refunds (Souleles, 1999), and spending from lump-sum payments like tax refunds and the EITC are disproportionately put towards durable goods (Halpern-Meekin et al., 2015; Gao et al., 2009; Goodman-Bacon & McGranahan, 2008; Barrow & McGranahan, 2000; Souleles, 1999), though there is also evidence that these payments increase spending on nondurables like food (McGranahan & Schanzenbach, 2013; Gao et al., 2009; Johnson et al., 2006). While most of these studies do not examine spending specifically on child-related items, Gao et al. (2009) find evidence suggesting that EITC payments increase spending on children's clothing. A narrower body of literature that examines how households spent more regular cash payments found that increases in regular cash payments lead to increased spending on basic needs, childcare and children's goods such as books, toys, and activities for children (Gennetian et al., 2022; Gennetian et al., 2024; Gregg et al., 2006; Jones et al., 2019).

A subset of these previous studies also addresses the question, what share of the additional income transferred to households did they spend in the period when they received it – that is, what was their marginal propensity to consume (more accurately referred to as the marginal propensity to spend), Jones et al. (2009) found that low-income Canadian Child Benefit recipients spent 45% of their benefit on non-durable goods, and Johnson et al. (2006) found that 2001 Income Tax Rebate recipients spent 37% of their rebate on non-durable goods. Looking at the Alaska Permanent Fund, Kueng (2018) found that households spent roughly 25% of the additional receipt on non-durable goods in the quarter when payments were made. More recently, a study analyzing the effects of the 2020 CARES Act found that households spent approximately   46% of their April 2020 stimulus payments within two weeks of receipt, with substantial differences by income: low-income households with low liquidity spent 62% of their payment within two weeks, while higher-income households spent only 35% of their payment during the same period (Karger and Rajan, 2020). A survey of stimulus check recipients by Coibion et al. (2020) found that they spent 40% of their April 2020 stimulus payments by July 2020. In contrast, Parker et al. (2022) found slightly lower spending responses, about 25%, for the first two rounds of stimulus payments within the three-month reference period a payment was received. Altogether, these studies suggest that the marginal propensity to spend is within the range of 25% to 46%.

Several studies have examined how parents and caregivers reported spending the CTC, but to our knowledge, none of these studies has yet documented a causal relationship between CTC payments and households' item-level spending decisions. Studies relying on parents' and caregivers' reports of how they spent their CTC largely find parents reporting spending their monthly CTC payments on food, bills, and other basic household necessities (Karpman et al., 2021; D. Perez-Lopez & Mayol-García, 2021; Pilkauskas et al., 2022; Pilkauskas & Cooney, 2021; Rachidi, 2021; RAPID-EC, 2021; Roll, Chun, et al., 2021; Zippel, 2021). Perez-Lopez & Mayol-García (2021) found households were more likely to report spending their monthly payments on school-related items in September and October of 2021, and those with younger children were more likely to report using the payments to cover childcare costs. These self-report studies, however, may be subject to social desirability bias or other general response biases, which necessitate more causal research designs.

A handful of innovative studies aimed to surpass self-reported information by utilizing novel data. For example, Parolin et al. (2024) used anonymized mobile-location data and debit/credit card data and found that counties benefiting most from the CTC expansion show a greater increase in visits to childcare centers and transactions in grocery stores and health- and personal- care establishments. Wheat et al. (2022) used transaction-level data from JPMorgan Chase account holders and examined spending on durable goods, services, and debt payments. The study found that recipients spent 40% of their July advanced CTC payment (within the range of the MPCs from previous studies), transferred 18% to other

accounts, and used 1% for debt payments. However, these studies are limited in their ability to provide a comprehensive picture of the specific types of goods and services households purchase with the CTC income due to the specific types of spending data utilized.

This study is the first to examine changes in spending patterns across a host of spending categories, and specifically on child-related items, using a causal identification strategy in a population-representative dataset for the full period when the advanced CTC payments were in effect.[14] Further, the detailed CE spending categories are constructed based on item-level spending (as opposed to credit card data or location-level spending which show total, but not item-level spending). This feature allows us to examine changes in spending on specific types of items as opposed to spending in specific places or just spending overall. We are also able to look at heterogenous treatment responses by household income level and the race/ethnicity of the household head, making a unique contribution to the literature of the effects of the CTC expansion.

To build on the previous analysis, this paper refines the findings presented in an earlier working paper (Schild et al., 2023). In that prior work, the main model controlled for variation in expenditures by CU size using the number of adults. In contrast, the principal model in this paper controls for the total number of individuals in the CU. The estimated spending response when using the total number of individuals in the CU is smaller than when using the number of adults. Our previous analysis also included estimates based on both non-inflation-adjusted and inflation-adjusted expenditures, allowing for an exploration of how the CTC helped households maintain a stable standard of living during a period of high inflation. This paper, however, presents results solely using inflation-adjusted expenditures. Finally, the Appendix of this paper includes estimates of the treatment-on-treated spending response.

3. Data and estimation strategy

Consumer Expenditure Interview Survey

This study uses internal, micro-level data from the CE collected between January 2019 and March 2022.[15] The CE is a nationally representative survey sponsored by the U.S. Bureau of Labor Statistics that collects spending, demographics, and other financial information for households living in the U.S.[16] While the CE is composed of two data collections with their own independent samples, an

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[14] Our prior work (Collyer et al., 2022) uses a similar methodology, but was restricted to the first two months, July and August, of when the advanced CTC payments were in effect, which is why the findings are described as "preliminary."

[15] CE Public Use Microdata (PUMD) can be used to reproduce our analysis (U.S. Bureau of Labor Statistics, 2023). The results produced will be similar but will not exactly match due edits made to the PUMD to protect the confidentiality of respondents. In the CE PUMD, income and expenditures are top and bottom coded and the state code maybe recoded or suppressed. Within the data files are flag variables which indicate if a variable is top coded, suppressed, or adjusted in some other way.

[16] As part of the U.S. Bureau of Labor Statistics commitment to producing high quality data, the Division of Consumer Expenditure Surveys conducts a data quality analysis and comparison. The latest report can be found using the following link: https://www.bls.gov/cex/cecomparison.htm.

Interview and a Diary,[17] this study uses data from the Interview only. The CE is a rotating panel of consumer units (CU), which we refer to interchangeably as households, with new CUs added to the survey each month. These CUs are interviewed up to four times at three-month intervals and asked about their demographic characteristics at the time of the interview but spending over the previous three months; we refer to these months as a reference quarter. Given the structure of the survey, we observe expenditures at overlapping three-month intervals (or quarters). For example, data collected in August 2021 refer to expenditures from May to July 2021; data collected in September 2021 refer to expenditures from June to August 2021, and so on.

Spending categories

We analyze changes in outlays, which we refer to as "spending," across nineteen different categories. We use outlays (spending) instead of BLS defined expenditures because outlays are a better reflection of a household's out-of-pocket spending. For categories like food and clothing, a household's outlays are equivalent to their expenditures. In contrast, outlays for categories like housing and transportation are not the same as expenditures. Housing outlays include payments towards mortgage principal, which are not included in expenditures because they are considered an investment. Additionally, the net purchase price of a vehicle is included in expenditures, whereas vehicle outlays include any down payment and loan payments.[18]

Ten of the categories we look at are the major spending categories provided in the CE data: (1) housing and utilities; (2) food; (3) alcohol and tobacco; (4) clothing[19]; (5) transportation; (6) health; (7) leisure; (8) personal care; (9) education and reading; and (10) miscellaneous items. We also use detailed item-level spending reports to construct seven item-specific spending categories that we identify as child-related goods and services: (1) children's clothes[20]; (2) books and toys; (3) computers and tablets; (4) school items; (5) sports items; (6) childcare; and (7) enrichment activities. Note, the categories that make up total child-related spending are not mutually exclusive but overlap with the categories that make up

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[17] See the BLS Consumer Expenditure Surveys website for details: https://stats.bls.gov/cex/

[18] Expenditures consist of transactions costs, including excise and sales taxes, of goods and services acquired during the interview period. Expenditure estimates include expenditures for gifts but exclude purchases or portions of purchases directly assignable to business purposes. Periodic credit or installment payments on goods or services already acquired are also excluded. The full cost of each purchase is recorded, even though full payment may not have been made at the date of purchase. See Glossary: https://www.bls.gov/cex/csxgloss.htm. More information about the differences between expenditures and outlays can be found on the BLS Frequently Ask Questions page (https://www.bls.gov/cex/csxfaqs.htm).

[19] What we refer to as "clothing" is equivalent to what the CE refers to as "apparel and services," which includes more than just expenditures on clothing.

[20] Starting in 2021Q2, the CE Interview Survey stopped asking about clothing expenditures for separate items and implemented a "global" clothing question. An internal review revealed the change in question led to an increase in the mean value of clothing expenditures. We include a year fixed effect in our model specification which will control for any change in spending as a result of the change in question that is correlated with the effect of the advanced CTC payments.

total spending. The remaining two categories are "total spending" and "total child spending," which are simply the sum of spending reported across the ten major spending categories and of spending in the seven child-related spending categories, respectively. Details on the specific purchases included in each spending category are presented in Appendix Tables 1 (major categories) and 2 (child-related categories).

Measure of the Child Tax Credit Advanced Payment

Our method for estimating the spending response to the expanded, monthly CTC payments relies on variation in the total amount of monthly CTC income that households could have received in the reference quarter for which they are reporting spending as part of the CE. We discuss our estimation strategy further in the next section, but here we describe how we impute the CTC payments that households could have received.[21]

CTC payments were determined by the IRS at the tax-unit level. The CE data includes tax unit identifiers; thus, using the number and age of dependents claimed by the tax unit, as well as the tax unit's AGI, we can calculate the annual 2021 CTC for which tax units are eligible.[22] To get the value of the monthly advanced payment, we divide the imputed annual CTC by twelve. If a household contained multiple tax units, the monthly CTC payments for each tax unit were aggregated to yield a household level monthly CTC payment.

Recall that the reference period for the CE Interview is the previous three-month period (or quarter); therefore, we need to convert the monthly advanced payment into a three-month value to get the total CTC income a household could have received during the reference quarter. Importantly, depending on the interview month, households could have received 0, 1, 2, or 3 months of CTC payments during the reference quarter (see Table 1). Therefore, when determining quarterly CTC payments, we multiplied the monthly payment amount by the number of months in the reference quarter during which households could have received payments. For example, July 2021 interviews have a reference quarter covering April to June 2021, and thus contained no months during which advanced payments could have been delivered. The reference period for August 2021 interviews was May through July 2021, thus containing one month when advanced payments were delivered, so the quarterly CTC amount for households interviewed in August was equivalent to one month of monthly CTC payments. The reference quarter for September 2021 interviews contained two months where payments were delivered, so quarterly CTC payment for

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[21] The BLS included two questions in the CE regarding the receipt and use of the CTC between October 2021 and June 2022. These questions were similar to the ones used by the BLS to collect data on Economic Impact Payments, but respondents were not asked the value of advanced CTC payment. See Appendix A for the specific survey questions and a discussion of the responses.

[22] Tax unit level data included in the CE were generated using the National Bureau of Economic Research's TAXSIM model. For more information about the TAXSIM model see Feenberg and Coutts (1993), and for more information about how TAXSIM is used by the BLS see Paulin and Hawk (2015). Although the version of TAXSIM currently used by the BLS (TAXSIM32) imputes annual 2021 CTC payments for tax units in the CE, we chose to calculate these values ourselves because it does not appear that this version of TAXSIM accounts for the increase in qualifying age, from 16 to 17 years old.

households interviewed in September amounted to two monthly payments, and so on. Figure 2 shows the value of the quarterly CTC payment across interview months for a household with one child or two children of varying ages. The depiction shows how the value of the quarterly CTC payment varied both by interview month, the number of children in the household, and the ages of those children (as younger children under age 6 were eligible for larger payments of $300 per month instead of the $250 older children received).

Table 1: Treatment months in reference quarter by interview month

	Interview month								
	Jul-21	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**
Months in	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
reference	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22
quarter	June-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22

Note: The CE Interview asks respondents to report on spending across a three-month reference period (the reference quarter). Table 1 displays the months comprising the reference quarter for CE interviews conducted between July 2021 and March 2022. Months in the reference quarters during which households could have received monthly CTC payments are highlighted in blue.

Figure 2: Quarterly CTC Income for Different Household Types by Child Age and Interview Month
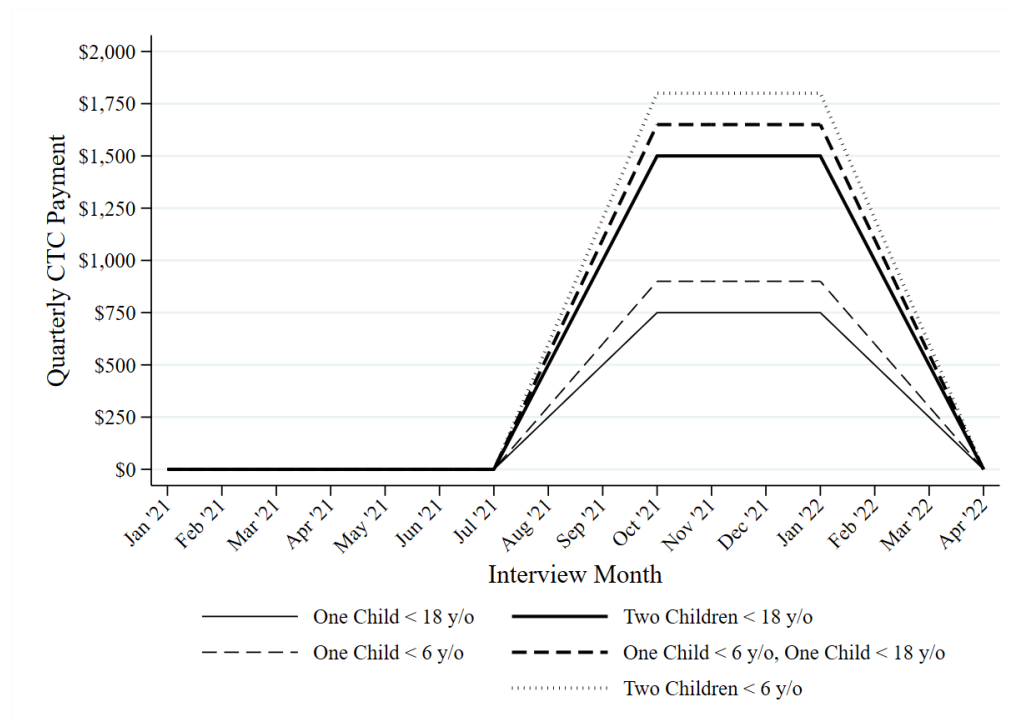
Note: Figure 2 shows the total CTC payment a one-child and two-child household could receive in the reference quarter for which they are reporting spending in the CE based on CE interview month. All values are the authors' calculations.

Our imputations yield an average monthly advanced CTC payment among qualifying households of $485 and median payment is $500. These translate to an average quarterly advanced CTC payment of $1,099 and median payment of $900 within the reference period. Table 2 presents the average and median payments by household income and race/ethnicity of household head. It should be noted these values represent averages based on the amount households qualify for across all households, regardless of whether they reported receiving the payments.[23]

Table 2: Imputed Value of the Advanced Child Tax Credit Payment Eligibility for Qualifying Households

	Monthly Value		Three-Month Reference Quarter		
	Mean	Median	Mean	Median	Num Obs.
All Households	$485	$500	$1,099	$900	3,547
Income Category					
Under $50,000	$530	$500	$1,176	$900	980
$50,000 to $100,000	$509	$500	$1,175	$900	1,067
$100,000 to $150,000	$472	$497	$1,079	$900	1,101
$200,000+	$325	$333	$729	$500	399
Race					
Asian	$439	$470	$968	$800	255
Black	$507	$500	$1,139	$900	375
Hispanic	$520	$500	$1,179	$900	785
Other	$545	$550	$1,241	$1,000	115
White	$467	$431	$1,065	$817	2,017

Note: Values are calculated using only data for households who qualified for the CTC (i.e., imputed CTC > 0) from August 2021 through March 2022 interviews and weighted using the household population weight, FINLWT21. Reference quarter values are not equivalent to 3 monthly payments because there are some reference quarters during which households could have received only one or two payments based on the months in that quarter. See Table 1 for additional details.

Estimation strategy

We use a parameterized difference-in-differences, following many prior studies of policy effects (Currie & Gruber, 1996; Hoynes & Patel, 2018, 2018; Jones et al., 2019; Michelmore & Pilkauskas, 2021; Pilkauskas et al., 2022). We use an imputed measure of how much households could have benefited from the policy expansion (described in the preceding section) and a difference-in-difference framework to estimate the intent-to-treat spending response to the expanded, monthly CTC payments.[24]

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[23] If we restrict the sample to only those who report receipt in the CE, the average and median imputed three-month payment increase to $1,336 and $1,100, respectively.

[24] Although there is no formal test for the parallel trends assumption, we conduct an "eyeball" test be looking at the average outlays by interview month and year for households in our sample. See Figure C1 in Appendix C. Until May, total outlays for 2019 and 2021 appear to follow similar trends. Starting in June the two series begin to diverge, which is two months before we would expect to see any impact of the monthly CTC payments, suggesting there might be some anticipation effects. As the

To estimate the spending response, we use CE data from January 2019 through March 2020 and January 2021 through March 2022. Our sample is limited to households with children who could be considered income-eligible for the 2021 monthly CTC payments.[25] In order to identify "income-eligible" households, we calculate the CTC following the ARPA legislation for all households in our sample (2019/2020 interviews as well as the 2021/2022 interviews). All households with a non-zero CTC value based on these calculations are considered "income-eligible." Under these sample restrictions, households interviewed in 2021 and 2022 represent the potentially treated units, with the pre-treatment period being January 2021 through July 2021 and the treatment period being August 2021 through March 2022. Although an ARPA CTC is calculated for all households in the sample, only households interviewed between August 2021 and March 2022 are considered treated. The control group is represented by households interviewed between January 2019 and March 2020. By using households interviewed in 2019 and early 2020 as our control group, we are also able to control for any seasonal variation in spending that may be correlated with the timing of monthly CTC delivery (e.g., higher levels of spending on back-to-school related items in the fall months.) We use the following equation to estimate the effect of the advanced CTC payments on spending:

$$E_{imy} = \beta_o + \beta_1 QuartCTC_{imy} + \beta_2 X_i + \delta_s + \partial_m + \alpha_y + \rho_a + \varepsilon_{imy} \quad (1)$$

E_{imy} represents quarterly spending for household i interviewed in month m and year y. $QuartCTC_{imy}$ is the quarterly advanced CTC payment that the potentially treated household i could have received during the reference period, which covers spending during the three months prior to the interview month m, as discussed in the preceding section. $QuartCTC_{imy}$ is set to $0 for all households in the control group. For greater ease of interpretation, $QuartCTC_{imy}$ is measured in units of $100. The parameter of interest is β_1, which represents the effect of a $100 increase in imputed CTC benefits on spending. X_i is a vector of household characteristics, including the unit's before-tax income and demographic characteristics of the reference person (age group,[26] race/ethnicity, sex, education). We recognize our study period also coincides with the distribution of the Economic Impact Payments (EIP), specifically the second and third rounds of EIP. Although Parker et al. (2023) shows households spend a small portion of their EIP during the period it is received, there could be lagged spending responses that were out of the scope of their paper. Therefore, included in the vector of household level characteristics is a set of controls, with lags,

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monthly payments begin to phase out at the end of the treatment period, spending for 2021 appears to converge with 2019 spending.

[25] We excluded households without children because their spending patterns differ from those of households with children, which makes them a poor comparison group. Additionally, households that do not qualify for the CTC due to their high income are also excluded from the sample because they may have sufficiently different spending patterns than lower income households that qualify for the CTC, which would make them a poor comparison group as well. 1.8 percent of the sample is dropped due to the income restriction.

[26] Age group defined as 18 to 35, 36 to 50, 51 to 65, and 66 and up.

for the three rounds of EIP.[27] State fixed effects (δ_s) are included to control for state level characteristics or policies that might affect spending. We also include interview month fixed effects (∂_m) to control for seasonal variation as well as interview reference year fixed effects (α_y) to control for variation in spending between 2019 and 2021, including annual changes in spending patterns. To control for the variation in household spending that is correlated with the size of the unit, and in particular the number of children, fixed effects for the size of the household (ρ_α) are also included in the model.

Figure 3 shows the Consumer Price Index for 2019 and 2021 rebased to January of the respective year. Prices for these two years do not follow the same trend. Furthermore, the divergence in the price trends from 2019 and 2021 increased during the same period the advanced CTC payments were delivered. Both higher prices and the additional income from the CTC could lead households to increase their spending. To account for the different trends in prices between 2019 and 2021, we convert the spending data to constant January 2021 dollars using the BLS' Consumer Price Index for All Urban Consumers (CPI-U).

Figure 3: Consumer Price Index Rebased to January of the Respective Year
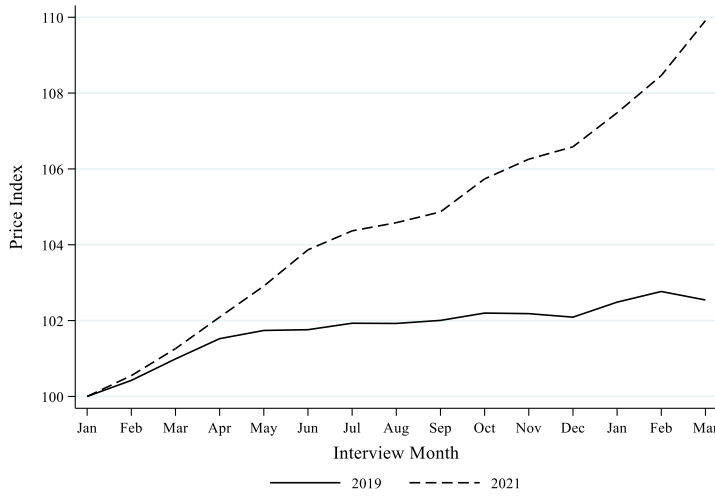
Note: Price index data used to produce this figure comes from the U.S. Bureau of Labor Statistics. The Consumer Price Index for All Urban Consumers (CPI-U) for 2019 and 2021 are rebased January of the respective year.

Further, it is possible that the spending response to the CTC payments varies across households based on their liquidity and baseline income levels, as was found by Wheat et al. (2022). Reports from

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[27] The CE collected data on the receipt, amount, and use of the EIP. See Parker et al. (2023) for more information about the CE EIP questions. A separate dummy variable was created for each of the three rounds of EIP. The dummy variable took a value of one if the household reported receiving an EIP during the reference period, and zero otherwise. One- and two-period lags were created by using responses to the receipt questions from previous interviews in which the household participated. If the household did not have a previous interview for which responses could be drawn, the lags were assumed to be zero.

other survey data (Rachidi, 2021), as well as responses to the CE suggest higher-income households were more likely to save income received from the monthly CTC payments while lower-income households were more likely to spend the payments or use it to pay down debt.[28] For this reason, we separately estimate the spending response by household income level. Since income and liquidity are correlated with race, we also estimate separate spending response by race and ethnicity. We define the following racial/ethnic categories: non-Hispanic Asian, non-Hispanic Black, Hispanic, non-Hispanic other race; and non-Hispanic White.[29]

Our primary estimate is the intent-to-treat effect (ITT), as it captures the effect of the treatment on all eligible households, regardless of actual CTC receipt. Although the CE included questions on CTC payment receipts for part of the study period, we did not use this data in our main analysis because they were first introduced in October 2021, after the CTC payments had already begun. Using these data would require excluding households with a reference period that included CTC payments but did not collect data on receipt (i.e., interviews conducted in August and September). Additionally, there is a notable discrepancy between the CTC take-up rates reported by the CE and the IRS, with the CE estimates being significantly lower.[30] This gap may be attributed to underreporting bias in the survey data, which is a common issue. Relying on this data could introduce endogeneity if the underreporting is correlated with factors that also influence our outcomes. Acknowledging these limitations, we include estimates of the treatment effect on the treated (TOT), or the local average treatment effect, using self-reported information on the CTC receipt with the full sample in the Appendix Tables C3 and C4.

4. Results

Overall

Our analysis reveals that the CTC payments are associated with a notable increase in total spending. A $100 increase in CTC payment received during the reference quarter is associated with a $44 increase in total spending among potential recipients. Figure 4 presents the estimated spending response to the CTC payments across major expenditure categories based on the estimation strategy described in Equation 1.[31] Among the different expenditure categories, the greatest increases in spending are seen in food, particularly food at home, housing, and clothing. For every $100 increase in income, there is an

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[28] See Appendix Table A3 for a discussion of responses to CE questions on use of the advanced monthly CTC payments.

[29] The race and ethnicity of a household was assigned based on responses to the CE in relation to the reference person. See the CE Frequently Asked Questions page for more information about how the reference person is defined (https://www.bls.gov/cex/csxfaqs.htm).

[30] The IRS estimated that by December the CTC reached 61.2 million children (Parolin et al., 2022), whereas the CE receipt variables suggest the CTC only reached 41.5 million children.

[31] For a set of descriptive results showing average changes in spending in 2021 for households with children before and after the rollout of the monthly CTC payments (i.e., before and after the August 2021 interview) and compare these changes to between the same periods in 2019, see Appendix B.

associated increase of $28 in spending on housing, $12 on food, and $5 on clothing. The sum of the spending response to these three categories is slightly more than the spending response for total spending because the some of the categories have a negative spending response. We did not find any significant effect on spending in the other categories we examined, which include alcohol and tobacco, transportation, health, leisure, personal care, education, and miscellaneous spending. These results suggest a majority of the spending response is allocated to necessities.

Figure 4: Estimated effects on spending of a $100 increase in CTC payments during the reference quarter (3-month period) for major expenditure categories among households with children

Note: All results derived from the CE fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, and a fixed effect for the household size, and demographic controls for the household reference person, including age group, race/ethnicity, sex, and education level. We also control for contemporaneous and lagged spending responses to the EIP payments. Estimates are weighted to the national level using the household population weight FINLWT21. Confidence intervals calculated with robust standard errors are represented by the horizontal lines in the chart.

In Figure 5, we present the estimated association between an increase of $100 in CTC payments and changes in spending on child-related items. For every $100 increase in income from the CTC payments during a reference quarter, there is a corresponding $16 increase in spending on child-related items. Notably, spending on childcare ($6) and children's clothing ($5) contribute the most to the

spending response, accounting for 39 and 30 percent of the total child-related spending response, respectively.

Figure 5: Estimated effects on spending of a $100 increase in CTC payments during the reference quarter (3-month period) across child-related expenditure categories among households with children
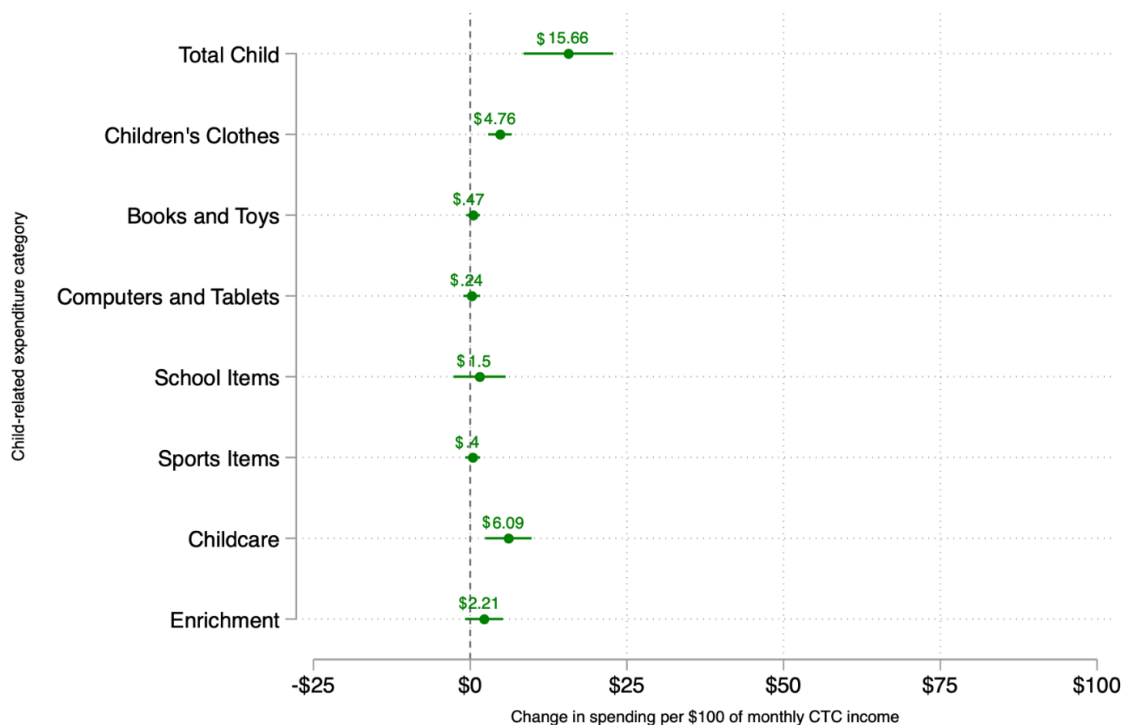

Note: All results derived from the CE fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, a fixed effect for the household size, and demographic controls for the household reference person, including age group, race/ethnicity, sex, and education level. We also control for contemporaneous and lagged spending responses to the EIP payments. Estimates are weighted to the national level using the household population weight FINLWT21. Confidence intervals calculated with robust standard errors are represented by the horizontal lines in the chart.

Results stratified by income level and race/ethnicity

In Table 3, we provide estimates of the spending response across the major CE spending categories for the overall sample as well as estimates stratified by household's before-tax Adjusted Gross Income (AGI), which we refer to as "income" going forward. We split the income distribution into four groups: (1) below $50,000, (2) $50,000 to $100,000, (3) $100,000 to $200,000, and (4) $200,000 or higher. We also include a fifth income group, income below $24,000, which represents the households

that benefited the most from the changes in CTC legislation.[32] The spending response for total outlays appears to increase across the income distribution, with the end points being the exception. However, only the coefficient for households with income under $24,000 is statistically significant. For the lowest-income households, an additional $100 of income from the CTC results in a $52 increase in spending. Looking at the other spending categories in Table 3, clothing is the category with the strongest spending response across the income distribution. Households with income below $100,000 spend about $6 out of every $100 of CTC on clothing. Units with income below $24,000 show a slightly higher spending response, $7 out of every $100 of CTC, but the spending responses across these income groups are not statistically different.

Table 3: Estimated effects on spending of a $100 increase in CTC payments during the reference quarter (3-month period) across major expenditure categories among households with children

| | Overall | Before tax income | | | | |
		Income under $24,000	Income under $50,000	$50,000 - $100,000	$100,000 - $200,000	$200,000 +
Total Outlays	**43.619***	**52.086***	33.213	52.925	56.189	-7.728
	(17.268)	**(25.469)**	(20.225)	(28.137)	(34.421)	(136.592)
Housing	**28.028****	20.745	16.380	30.100	37.021	24.613
	(10.142)	(14.024)	(10.536)	(18.612)	(19.823)	(79.698)
Food	**12.309****	9.845	13.212	**15.651***	9.287	3.009
	(3.992)	(7.036)	(7.174)	**(6.501)**	(6.897)	(20.995)
Food, home	**7.406***	7.967	9.864	8.448	4.900	-8.341
	(3.001)	(5.851)	(5.838)	(4.758)	(4.963)	(16.623)
Food, away	**4.902***	1.878	3.348	7.203	4.387	11.35
	(1.961)	(3.211)	(2.467)	(3.736)	(3.678)	(10.292)
Alcohol and Tobacco	-0.255	0.850	-0.575	0.393	0.041	-2.380
	(0.855)	(1.802)	(1.25)	(1.678)	(1.512)	(3.299)
Clothing	**5.083****	**6.740****	**5.503***	**5.612***	1.307	10.256
	(1.985)	**(2.497)**	**(2.663)**	**(2.392)**	(5.442)	(7.998)
Transport	-2.697	5.334	-3.762	-4.730	5.353	1.311
	(6.246)	(7.890)	(5.767)	(9.721)	(15.481)	(37.493)
Health	-1.474	2.030	-0.602	-1.436	3.030	**-33.885***
	(3.801)	(5.170)	(3.652)	(5.224)	(10.459)	**(16.836)**
Leisure	5.082	5.187	2.879	-1.619	6.093	53.958
	(3.215)	(4.052)	(3.285)	(3.065)	(5.463)	(40.063)
Personal Care	0.589	1.249	0.731	0.161	1.002	-0.329
	(0.418)	(0.785)	(0.595)	(0.594)	(0.886)	(3.074)
Education	-5.016	-0.575	0.207	2.684	-6.48	**-66.143***
	(3.006)	(2.166)	(1.83)	(3.464)	(6.431)	**(29.799)**
Miscellaneous	1.919	0.682	-0.759	6.026	-0.466	1.861
	(1.439)	(1.885)	(1.633)	(3.886)	(1.462)	(6.749)
N	14,365	2,259	4,248	4,439	4,196	1,482

Note: All results derived from the CE Interview fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and

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[32] Under the TCJA, a household needed to have income above *at least* $24,000 in AGI to receive the full benefit of the CTC – households with more than one child needed more income to qualify for the full CTC. Households with income between $2,500 and $24,000 could receive a partial benefit, and households with income below $2,500 did not qualify for any CTC benefit. As part of the ARPA, the minimum income requirement was removed, allowing the lowest-income households to now receive the full benefit of the CTC. See Figure 1.

month fixed effects, a fixed effect for the household size, and demographic controls for the household reference person, including age group, race/ethnicity, sex, and education level. We also control for contemporaneous and lagged spending responses to the EIP payments. Estimates are weighted to the national level using the household weight FINLWT21. Robust standard errors reported in parentheses. ****p<0.001 **p<0.01 *p<0.05.*

Table 4 presents estimates of the spending response across child-related spending categories for the overall sample as well as estimates stratified by before-tax income levels. Similar to the response for total outlays, the effect on child-related total spending appears to increase across the income distribution with the endpoints being the exception. However, unlike the estimates for total spending, the effect on child-related total spending is statistically significant for all income groups except for households with income above $200,000. Households with income below $100,000 increase their child-related spending between $10 and $23 for every $100 of quarterly CTC payments. However, these difference in coefficients are not statistically significant.

Among the subcategories of child-related spending, only children's clothing and childcare show a significant effect. Children's clothing shows the most consistent spending response across the income distribution. All income groups, except households with $100,000 to $200,000, have statistically significant spending response between $5 and $8 for every $100 of quarterly CTC. For households with income below $100,000, spending on child-related clothing appears to be the largest contributor to their overall spending response on child-related outlays. For households with $100,000 to $200,000 in income, childcare appears to be the largest contributor to their overall spending response. For every $100 of additional CTC payment, these households increase their spending on childcare by $13. Overall, the CTC's effects on childcare spending is only significant among the lowest-income group ($5 per $100 in CTC) and those with income between $100,000 and $200,000 ($13 per $100 in CTC). This might reflect the fact that middle-income households are in a uniquely challenging position and face high childcare cost burden as their income is too high to be eligible for public childcare programs (e.g. childcare subsidy, Head Start), but still too low to afford the high-quality childcare with the market price (Hardy & Park, 2022).

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Table 4: Estimated effects on spending of a $100 increase in CTC payments during the reference quarter (3-month period) across child-related goods and services among households with children

	Overall	Income under $24,000	Income under $50,000	$50,000 - $100,000	$100,000 - $200,000	$200,000 +
				Before tax income		
Total Child Outlays	**15.661***	**16.066***	**10.422**	**13.567**	**22.840**	20.909
	(3.656)	**(4.660)**	**(3.367)**	**(4.740)**	**(8.608)**	(32.211)
Children's Clothes	**4.758***	**5.795***	**4.936***	**6.263***	2.200	**7.876***
	(0.957)	**(1.759)**	**(1.492)**	**(1.622)**	(2.088)	**(3.590)**
Books and Toys	0.473	0.737	1.102	0.447	-0.166	1.849
	(0.557)	(1.457)	(0.985)	(0.890)	(1.066)	(2.430)
Computers and Tablets	0.242	0.859	0.949	-0.871	1.203	-0.697
	(0.684)	(0.644)	(0.843)	(1.066)	(1.709)	(3.676)
School Items	1.499	2.219	1.474	4.179	-0.720	-2.501
	(2.121)	(1.314)	(0.977)	(2.804)	(4.859)	(22.729)
Sports Items	0.396	0.494	0.176	0.923	0.480	0.164
	(0.607)	(1.006)	(0.552)	(0.895)	(1.421)	(4.391)
Childcare	**6.086***	**5.180**	2.185	1.800	**12.680**	17.632
	(1.890)	**(2.060)**	(1.385)	(2.381)	**(4.668)**	(13.899)
Enrichment	2.205	0.784	-0.399	0.826	7.163	-3.414
	(1.544)	(1.498)	(1.719)	(1.330)	(4.162)	(10.294)
N	14,365	2,259	4,248	4,439	4,196	1,482

Note: All results derived from the CE fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, a fixed effect for the household size, and demographic controls for the household reference person, including age group, race/ethnicity, sex, and education level. We also control for contemporaneous and lagged spending responses to the EIP payments. Estimates are weighted to the national level using the household population weight FINLWT21. Robust standard errors reported in parentheses. ***$p<0.001$ **$p<0.01$ *$p<0.05$.

Next, we examine how the spending response on general and child-specific categories varies across households based on the race/ethnicity of the household reference person (Tables 5 and 6, respectively). Table 5 shows that the spending response for total outlays is only statistically significant among households with a reference person who identifies as Hispanic. It is possible the low precision of the estimated spending response for units where the head identifies as non-Hispanic Asian, non-Hispanic Black, and non-Hispanic 'other' is a result of the small sample sizes for these groups. This limitation of the data should be considered when interpreting the findings by race/ethnicity.

For every $100 in quarterly CTC payments, Hispanic-headed households increased their total outlays by $69. Like the overall sample, their spending response appears to be largest for necessities, specifically housing, food, and clothing. For every $100 in potential CTC payments among Hispanic-headed units, spending on housing increased by $29; spending on food increased by $18, driven primarily by food away from home ($10); and spending on clothing increased by $10. The only other significant

effect identified when examining results by race/ethnicity was on miscellaneous spending among units with a reference person who identified as non-Hispanic Black ($5).

Table 5: Estimated effects on spending across major expenditure categories of a $100 increase in the CTC payments by race/ethnicity of reference person

| | Overall | Race/ethnicity of household reference person | | | | |
		Asian	Black	Hispanic	Other	White
Total Outlays	**43.619***	72.544	43.476	**69.556****	39.196	29.925
	(17.268)	(84.808)	(37.610)	**(24.106)**	(80.869)	(26.790)
Housing	**28.028****	55.640	18.564	**34.128****	19.383	28.892
	(10.142)	(56.852)	(20.582)	**(12.308)**	(38.088)	(16.423)
Food	**12.309****	31.242	11.332	**17.155***	-18.619	8.668
	(3.992)	(16.613)	(8.647)	**(8.113)**	(18.908)	(5.873)
Food, home	**7.406***	14.300	7.406	6.323	-10.961	6.265
	(3.001)	(12.983)	(6.416)	(5.801)	(14.126)	(4.492)
Food, away	**4.902***	16.942	3.926	**10.832***	-7.658	2.403
	(1.961)	(8.901)	(4.713)	**(4.560)**	(9.139)	(2.609)
Alcohol and Tobacco	-0.255	2.020	0.719	1.212	-3.291	-1.865
	(0.855)	(2.801)	(1.516)	(1.174)	(6.469)	(1.385)
Clothing	**5.083****	10.382	6.617	**10.176****	-3.107	2.500
	(1.985)	(6.679)	(3.850)	**(3.709)**	(7.811)	(3.126)
Transport	-2.697	-27.324	-0.293	5.726	24.579	-7.750
	(6.246)	(30.487)	(9.774)	(10.626)	(34.931)	(10.027)
Health	-1.474	-9.791	-5.171	2.212	-0.545	0.447
	(3.801)	(11.539)	(6.316)	(4.180)	(19.343)	(6.680)
Leisure	5.082	16.361	8.439	4.389	7.462	3.214
	(3.215)	(10.922)	(5.703)	(3.153)	(9.171)	(5.513)
Personal Care	0.589	1.148	1.196	1.063	-1.617	0.096
	(0.418)	(0.979)	(1.647)	(0.695)	(1.802)	(0.471)
Education	-5.016	-10.273	-3.491	**-5.107***	-3.174	-5.883
	(3.006)	(17.107)	(3.533)	**(2.127)**	(12.812)	(5.163)
Miscellaneous	1.919	3.141	**5.303***	-1.399	18.126	1.606
	(1.439)	(8.665)	**(2.491)**	(1.818)	(15.560)	(2.484)
N	14,365	1,073	1,530	3,132	395	8,235

Note: All results derived from the CE fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, a fixed effect for the household size, and demographic controls for the household reference person, including age group, race/ethnicity (in the case of model 1), sex, and education level. We also control for contemporaneous and lagged spending responses to the EIP payments. Estimates are weighted to the national level using the household population weight FINLWT21 Robust standard errors reported in parentheses. *$***p<0.001$ $**p<0.01$ $*p<0.05$.*

Table 6 presents the estimated spending response on child-related outlays by race and ethnicity of the household head. Unlike the general spending categories, the effect of the CTC payments on child-related spending appears to be more diverse. The Hispanic, non-Hispanic Black, and non-Hispanic 'other' groups all show a statistically significant spending response with respect total child outlays, $13, $27, and $41, respectively. Looking at the subcategories among child related spending, the spending response

again seems to be restricted to children's clothing and childcare, as well as enrichment in the case of non-Hispanic Black-headed units. Non-Hispanic Asian households had the lowest spending response on children's clothing, $5, and non-Hispanic Black and Hispanic households increased their spending by $7 and $8, respectively, although these differences are not statistically significant. Both non-Hispanic Black and non-Hispanic 'other' units exhibited statistically significant, but not statistically different, spending responses on childcare, $9 and $27, respectively. While we find a significant increase in child-related outlays for Hispanic-headed households, this result does not appear to be driven by a significant increase in childcare spending. This can be potentially explained by variation in types of childcare use, as Hispanic children are less likely to use center-based care and more likely to rely on parental or relative care than children of any other race and ethnicity (Datta et al., 2022). Non-Hispanic Black households also were shown to increase spending on enrichment by $10 for every $100 in quarterly CTC payments.

Table 6: Estimated effects on child-related spending of a $100 increase in CTC payments during the reference quarter (3-month period) by race/ethnicity of reference person

| | Overall | Race/ethnicity of household head | | | | |
		Asian	Black	Hispanic	Other	White
Total Child Outlays	**15.661***	38.397	**27.326***	**12.797**	**47.184**	9.997
	(3.656)	(19.893)	**(6.686)**	**(4.064)**	**(18.187)**	(6.063)
Children's Clothes	**4.758***	**4.898***	**7.977***	**8.615***	2.680	2.022
	(0.957)	**(2.065)**	**(2.477)**	**(1.955)**	(4.505)	(1.298)
Books and Toys	0.473	3.664	0.145	1.733	0.969	-0.313
	(0.557)	(2.343)	(1.694)	(1.264)	(2.044)	(0.700)
Computers and Tablets	0.242	-1.458	1.142	0.212	-1.676	0.268
	(0.684)	(3.333)	(1.714)	(1.067)	(5.845)	(1.029)
School Items	1.499	0.067	-1.335	-0.242	13.668	2.567
	(2.121)	(5.128)	(2.165)	(1.505)	(9.422)	(3.824)
Sports Items	0.396	7.048	0.005	-0.625	1.971	0.494
	(0.607)	(4.946)	(0.916)	(0.774)	(2.115)	(0.983)
Childcare	**6.086***	15.867	**9.083**	2.366	**27.456**	5.464
	(1.890)	(13.936)	**(3.545)**	(1.936)	**(10.872)**	(3.095)
Enrichment	2.205	8.310	**10.31***	0.737	2.116	-0.505
	(1.544)	(8.524)	**(5.038)**	(1.016)	(3.164)	(2.134)
N	14,365	1,073	1,530	3,132	395	8,235

Note: All results derived from the CE fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects a fixed effect for the household size, and demographic controls for the household reference person, including age group, race/ethnicity (in the case of model 1), sex, and education level. We also control for contemporaneous and lagged spending responses to the EIP payments. Estimates are weighted to the national level using the household population weight FINLWT21. Robust standard errors reported in parentheses. ***p<0.001 **p<0.01 *p<0.05.

Finding statistically significant spending responses for only non-Hispanic Other, Hispanic, and non-Hispanic Black households makes sense when considering the correlation between income and

race/ethnicity. Among the five race/ethnicity groups analyzed, non-Hispanic Other, Hispanic, and non-Hispanic Black households have the lowest average before tax income, $87,000, $71,000, and $68,00, respectively. These average incomes are statistically different from those of the other two groups.[33] As such, non-Hispanic Other, Hispanic, and non-Hispanic Black households are disproportionately represented in the lower income range, where we observed the strongest spending response in results disaggregated by income (Table 4).

Placebo test

To validate our model specification, we ran a series of placebo tests where we estimate our main model in CE data covering a period when households did not benefit from the ARP expansion — 2018 and 2019. Following our main specification, interviews from 2019 were used as the control group, and interviews from 2018 were used as the placebo treatment group. We expect to find no significant spending response by the treatment group because they were not actually subjected to the policy change. We simulated a quarterly CTC payment that households interviewed in August through December of 2018 would have been eligible for if the ARP rule had been in effect (i.e., the placebo). As in our main specification, the pre-treatment period was January through July, and the treatment period was from August through December.[34] The placebo was set to zero for all other households in the sample. If our main results capture a causal effect of the policy change, we expect null and insignificant estimates in spending associated with the placebo CTC payments simulated for households interviewed in the second half of 2018.

Results from the placebo test are presented in Figure 6. Overall, the coefficients are close to zero and statistically insignificant, lending support to the interpretation that our main findings are attributable to the expanded, monthly CTC rather than a spurious correlation or general pattern of increased spending in the second half of the year. The only exception is children's clothing, which shows a statistically significant increase of $2.70 in expenditures over a three-month period during the latter half of 2018. The statistically significant spending response on children's clothing suggests that the effect found using our main specification might not be entirely attributable to the treatment, requiring caution in interpretation. In Appendix C, we also show results from these sensitivity tests by income level (Table C1) and

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[33] The average income (standard error) for the five race/ethnicity groups are: $127,546 ($3,034) for non-Hispanic Asian, $68,424 ($1,534) for non-Hispanic Black, $70,583 ($1,066) for Hispanic, $87,109 ($3,834) for non-Hispanic Other, and $114,420 ($969) for non-Hispanic White. Averages were calculated using households interviewed in 2019/2020 and 2021/2022 with children that are income-eligible for the expanded CTC, weighted using household population weight FINLWT21, and the standard errors were calculated using the 44 replicate weights provided in the CE.

[34] We were unable to include January through March of the following year as part of the treatment period, as we did in our main specification, because it would require treating interviews from January through March of 2019 as both control and placebo.

race/ethnicity (Table C2). Our findings related to these subgroups – that there was a larger spending response among lower-income households, and that Black and Latino-headed households spent a larger share of their payment on child-related goods and services than White-headed households – are not undermined by the results from the placebo tests, which show no significant effects on these outcomes associated with the placebo treatment at any income level or by the race/ethnicity of the household head.

Figure 6: Results from placebo tests: Estimated effects of a $100 increase in CTC payments during the reference quarter (3-month period) in 2019
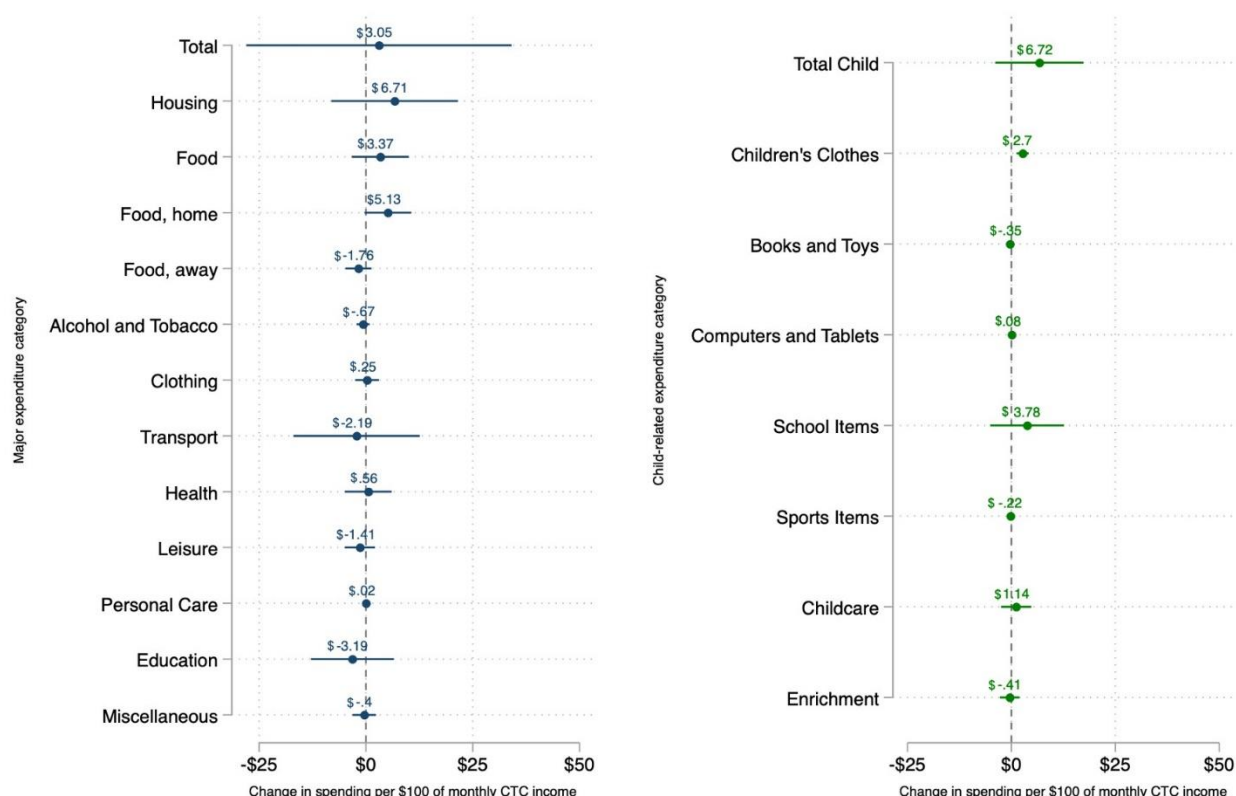
Note: All results derived from the CE Interview fielded from January 2018 to December 2019. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, and a fixed effect for household size, and demographic controls for household reference person, including age group, race/ethnicity (in the case of model 1), sex, and education level. Estimates are weighted to the national level using the household population weight FINLWT21. Confidence intervals calculated with robust standard errors are represented by the horizontal lines in the chart.

5. Conclusion

The 2021 expansion to the federal Child Tax Credit was a historic change to social policy in the United States. For 6 months in 2021, households with children in the United States received monthly

payments akin to child allowances distributed in many other high-income nations (e.g., Canada, Ireland, and the United Kingdom). In this paper, we use a difference-in-difference framework to model how these households might have spent these monthly payments. We exploit the variation in income gains that households received from the monthly payments by age of the children in the household and by time (interview month). We estimated the effect on household spending overall and across several spending domains using data from the Consumer Expenditure Interview Survey with data collected between January 2019 and March 2022.

Our results show a strong positive spending response to the estimated 2021 monthly CTC payments. We find that for each $100 of CTC payments received during the reference quarter, households spent $44, mainly on housing ($28), food ($12), and child-related goods and services ($16). Our estimated overall marginal propensity to spend (also referred to in the literature as marginal propensities to consume or MPC), (44%) is in line with previous finding from the literature that suggests 25-50% of an overall MPC (Coibion et al., 2020; Johnson et al., 2006; Karger and Rajan, 2020; Kueng, 2018; Wheat et al., 2022). Further, for the average monthly CTC payments of $485, households increased monthly spending on total by 4%, housing by 6.2%, food by 6.5%, and child-related goods and services by 20%, on average. Our results are also robust to placebo tests. When testing the validity our model using data from 2018 as a placebo, we find no significant effects of modeled CTC on spending associated with the exception of spending on children's clothing. Taken together, results from our main model and our placebo test suggest households increased spending on necessities like housing and food, as well as child-related goods and service in response to the 2021 ARPA CTC expansion.

We also found the spending response was most prominent for low-income households and households whose reference person identifies as Hispanic or non-Hispanic Black. Notably, these groups were historically more likely to be excluded from the full CTC credit under pre-ARPA structure. Our findings add to the prior studies that show the ARP-CTC disproportionately improved the material and psychological well-being of households with low-income, and Hispanic or non-Hispanic Black-head households (Batra et al., 2023; Cha et al., 2023; Nam and Kwon, 2024; Parolin et al., 2021; Pilkauskas et al., 2022).

Our study contributes primarily to two bodies of literature. First, by using a causal framework, our study complements and builds on many previous studies of the CTC that use direct-reports on how households used the payments (Karpman et al., 2021; D. Perez-Lopez & Mayol-García, 2021; Pilkauskas et al., 2022; Pilkauskas & Cooney, 2021; Rachidi, 2021; RAPID-EC, 2021; Roll, Chun, et al., 2021; Zippel, 2021). Second, much of the other causal evidence on the effects of similar transfers is either based on other countries (Gregg et al., 2006; Jones et al., 2019) or on lump-sum payments to a narrow population, like those from the Alaska Permanent Dividend (Amorim, 2021; Kueng, 2018) or the EITC

(Barrow & McGranahan, 2000; Gao et al., 2009; Goodman-Bacon & McGranahan, 2008; Halpern-Meekin et al., 2015). We add to this body of literature by providing an analysis of the spending response to a child allowance-like policy that reached most households with children the United States, though we note that 2021 was also an atypical year due to the pandemic and responses could be different in more typical economic circumstances.

That said, in the precarious circumstances of 2021, households increased spending on basic needs that promote household wellbeing (food and housing), as well as on child-related items, in response to the expanded ARPA CTC. Our results are in accordance with reports of reduced food insecurity and material hardship in the period when households received the monthly CTC payments (Parolin et al., 2023; Pilkauskas et al., 2022; 2023). The findings on increased child-related spending are in line with the family investment model, where increases in income, in this case from the monthly CTC payments, lead to investment in goods and services associated with child development and household wellbeing. This implies that the monthly CTC likely improved child health and well-being in the short and long run, potentially with greater impacts for low-income and Hispanic and non-Hispanic Black children.

Future avenues of research include studying how household spending changed when the payments were rolled back and if these decreases in spending explain, for example, the higher rates of food insufficiency in 2022 relative to 2021 (Zereyesus et al., 2022). Additionally, it would be of interest to compare changes in spending from the monthly CTC payments to the Economic Impact Payments, and to determine if labeling the CTC payments as specifically payments for children led households to allocate a larger portion of them to child-related goods and services.

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Appendix A. Spending Category Definitions and CE Interview Questions

Appendix Table A1: Major Expenditure Categories

Category	Description
Housing and utility	Shelter cost; utility cost; household operations; house furnishings and equipment
Food	Food at home and away from home (including meals as, and not as, pay)
Alcohol and tobacco	Alcoholic beverages and tobacco and smoking supplies
Clothing	Clothing and footwear for men, women, boys, and girls, and other apparel products and services
Transportation	Cars and trucks, other vehicles, gasoline and motor oil, maintenance and repairs, vehicle insurance, rental, leases, licenses, and public transportations
Health	Health insurance, medical services, prescription drugs, and medical supplies
Leisure	Fees and admissions to entertainment activities, televisions, radios, and sound equipment, pets, toys, and playground equipment, and other entertainment
Personal care	Wigs, hairpieces, or toupees, electric personal care appliances, and personal care services for males and females, including haircuts
Education and reading	Tuition, schoolbooks, supplies, and equipment for college, elementary and high school, day care center, and other schools, and other school-related expenses; newspapers and magazines and books
Miscellaneous	Miscellaneous expenditures including funeral, cash contributions, insurance and pension
Total Expenditure	Total of above

Appendix Table 2: Child-related Expenditure Categories

Category	Description
Children's clothes	Infant and children clothing and footwear
Books and toys	Books and toys including infant furniture and equipment
Computers and tablets	Computers, tablets, digital book readers, and other related software and accessories including CD
School items	School related items including tuition, schoolbooks, supplies, and school lunch
Sports items	Sports item including athletic gear, bicycles, and camping items
Childcare	Babysitting and childcare and day care
Enrichment activities	Enrichment activities and outings including trips club membership tickets to events fees for lessons musical instruments
Total Child Expenditure	Total of above

Child Tax Credit Receipt

In response to the passage of the ARP, the BLS included a module of questions in the Consumer Expenditure Interview Survey asking about the CTC starting with the October 2021 interviews. BLS did not include questions about the expanded CTC in the Diary Survey. The BLS developed CTC questions based on the questions used in earlier modules that were designed to ask about Economic Impact Payments, except no question about the amount of CTC received was included. The CTC questions asked are presented below and focus on receipt and general use:

CHDTXP. The Federal government's 2021 American Rescue Plan included an advanced payment of the Child Tax Credit. Since the first of the (reference month), have (you/you or any members of your household) received a MONTHLY Child Tax Credit payment from the Federal government?

- Yes (go to CHDTXPTH)
- No (go to S20B_END)

CHDTXPTH. How did or will (you/you or any members of your household) use the Child Tax Credit payment?

- Mostly spend it (go to S20B_END)
- Mostly save it (go to S20B_END)
- Mostly use it to pay off debt (go to S20B_END)

Appendix Table A3 shows responses to the two CTC questions for three different cross-sections: by interview month, by income, and by race and ethnicity. The frequencies are derived from the CE fielded from August 2021 through March 2022. The sample for the column reporting the rate of receipt is restricted to only households with at least one child under the age of 18 years old and who does not have a missing value for CHDTXP. The sample for the columns reporting the rates of use is restricted to households who reported receiving an advanced CTC payment (CHDTXP = 1) and who does not have a missing value of CHDTXPH.

Panel A of Table 3A shows the rate of reported receipt and reported use by interview month. The first row of Panel A shows the overall rate of receipt, 59 percent. Rates for August and September are missing because the CTC questions were not included until October 2021 interviews. The rate of receipt in October was 63 percent and grew to 66 percent in January. Reported receipt fell to 58 percent in January and then to 38 percent in March. The overall rate of receipt in the CE is lower than the 79 percent Hamilton et al. (2022) report; however, this receipt rate was restricted to eligible households, rather than all households with children. Data from the Census Bureau Household Pulse Survey (HPS) show about 57 percent of households with children report receiving an advanced CTC payment (Karpman et al., 2021).

Most households that reported receipt reported mostly spending the advanced CTC payment (54 percent) with the remaining households about evenly split between "mostly save" (24 percent) and "mostly use it to pay off debt" (22 percent). The distribution of reported use appears to hold fairly steady across the interview months until the last few interview months. In February, there is a slight increase in the reported rate of using the CTC for spending that is intensified in March. The increase in spending comes from a decrease in both savings and using the CTC to pay off debt, but the rate of savings saw a

bigger decline. These results are in line with what other studies have found (Hamilton et al., 2022; Karpman et al. 2021; Pilkauskas and Cooney, 2021).

Panels B show the rates of reported receipt and use by income. Households with income between $50,000 and $100,000 were slightly more likely to report receipt than households with income below $50,000. Households with income above $200,000 were the least likely to report receipt, which is in line with the phaseout rules for the CTC. Reported rates of using the CTC payment for spending were higher for households with lower income. 62 percent of households with incomes under $50,000 report mostly spending the CTC and only 12 percent reported mostly saving it. In contrast, 56 percent of households with incomes between $50,000 and $100,000 report mostly spending the CTC and the rate of mostly saving it increases to 20 percent. The discrepancy in report usage is even more stark when looking at households with income above $200,000. Only 40 percent report mostly spending the CTC and 47 percent report mostly saving it.

Finally, Panel C shows the rates of receipt and use by race and ethnicity. Non-Hispanic, White households were the most likely to report receiving a CTC payment (61 percent), but this is only slightly more likely than the rate of receipt reported by Hispanic households (60 percent). Non-Hispanic, Black households were the least likely to report receiving a CTC payment, with only 55 percent of these households reporting receipt. Non-Hispanic, Asian and Non-Hispanic, White households were the least likely to report mostly spending the CTC payment, 49 percent and 53 percent respectively. Non-Hispanic, Other and Hispanic households were the most likely to report mostly spending the CTC, 60 percent and 56 percent respectively. Non-Hispanic, Black households were the most likely to report using the CTC payment to pay off debt, 27 percent.

Appendix Table A3: Rates of reported receipt and use of the advanced CTC payment

A. Reported receipt and use by interview month

	Reported receipt	Use		
		Mostly spend it	Mostly save it	Mostly use it to pay off debt
Overall	59.72%	53.73%	23.68%	22.59%
August '21	-	-	-	-
September '21	-	-	-	-
October '21	63.06%	52.20%	25.71%	22.09%
November '21	63.50%	53.74%	25.27%	20.99%
December '21	66.84%	53.28%	22.88%	23.84%
January '22	66.21%	51.37%	24.62%	24.01%
February '22	58.64%	54.69%	22.72%	22.59%
March '22	38.76%	60.44%	18.53%	21.03%

B. Reported receipt and use by income

	Reported receipt	Use		
		Mostly spend it	Mostly save it	Mostly use it to pay off debt
Overall	59.72%	53.73%	23.68%	22.59%
Less than $24,000	51.57%	57.93%	12.52%	29.55%
Less than $50,000	57.17%	62.20%	11.74%	26.06%
$50,000 - $100,000	62.35%	55.92%	20.15%	23.93%
$100,000 - $200,000	61.53%	47.91%	31.39%	20.71%
$200,000 +	54.14%	40.04%	46.00%	13.95%

C. Reported receipt and use by race of reference person

	Reported receipt	Use		
		Mostly spend it	Mostly save it	Mostly use it to pay off debt
Overall	59.72%	53.73%	23.68%	22.59%
Asian	51.89%	49.26%	36.91%	13.83%
Black	55.22%	55.00%	17.68%	27.32%
Hispanic	59.65%	56.01%	18.62%	25.37%
Other	56.28%	59.87%	20.16%	19.97%
White	61.87%	52.74%	25.86%	21.40%

Note: Results derived from the CE fielded from August 2021 to March 2022. Estimates are weighted to the national level using household population weight FINLWT21. Values for August and September are not reported because the questions were not asked during these interview months. The sample used for the "Reported receipt" column is limited to households with children under the age of 18 years old and whose value was not missing. About 4 percent of the sample across all interview months have a missing value for receipt, not including August or September. The sample used for the "Use" columns is limited to households who reported receiving the CTC (CHDTXP = 1) and whose value was not missing. About 1 percent of the sample across all interview months have a missing value for reported use, not including August or September.

Appendix B. Descriptive results

        Our descriptive findings show that spending among households with children was higher in the period when they could have received the monthly CTC payments compared to prior periods. Table B1 shows the average three-month expenditures for consumer units with children under age 18 across our expenditure categories of focus. We present results for 2021 and 2019, and we disaggregate average expenditures within each year into two periods. '2021' is defined as interviews conducted in January 2021 through March 2022, and '2019' is defined as interviews conducted in January 2019 through March 2020. Period 1 includes data from CE interviews conducted before August and period 2 includes data from interviews conducted in August or later. In 2021, period 2 is period during which households could receive their monthly CTC payments. Data from 2019 serves as a helpful reference for what might have happened between these periods in the absence of the CTC payments. Overall, the results show increases in spending among consumer units with children in 2021 between period 1 and 2 across all expenditure categories, and our "naïve diff-in-diff (final column of Table B1), shows that most of these increases were larger than what was observed in 2019. These results show a difference in spending between these two periods in 2021 that differs from 2019 patterns. However, they do not control for several other factors that could affect spending, which we deal address by estimating effects with our main model, and in our sensitivity analysis (i.e., the role of inflation).

Table B1: Change in spending between pre and post for households with children (naïve first difference)

	2019			**2021**			
	Period 1 Jan '19 to Jul '19 Interviews	**Period 2** Aug '19 to Mar '20 Interviews	*Diff*	**Period 1** Jan '21to July '21 Interviews	**Period 2** Aug '21to Mar '22 Interviews	*Diff*	*Naïve diff-in-diff*
Major categories							
Total outlays	$15,270	$15,237	-$33	$16,340	$17,309	$969	$1,002
Food	$6,525	$6,404	-$120	$7,014	$7,299	$286	$406
Food at home	$2,753	$2,763	$10	$3,034	$3,285	$251	$241
Housing	$1,911	$1,911	$0	$2,213	$2,283	$70	$70
Alcohol & tobacco	$842	$852	$10	$820	$1,002	$181	$171
Clothing	$190	$207	$18	$203	$234	$31	$13
Transportation	$429	$470	$41	$493	$611	$118	$77
Health	$2,853	$2,827	-$26	$2,828	$3,065	$237	$263
Leisure	$1,196	$1,189	-$8	$1,296	$1,265	-$31	-$23
Personal care	$770	$764	-$5	$873	$909	$37	$42
Education	$109	$105	-$4	$108	$120	$11	$15
Misc.	$311	$390	$79	$343	$374	$31	-$48
Child-rel. spending							
Total child spending	$1,126	$1,186	$60	$1,165	$1,308	$143	$83
Children's clothes	$165	$197	$32	$210	$285	$75	$43
Books and toys	$66	$67	$0	$87	$95	$8	$7
Computers and tablets	$64	$64	$0	$87	$102	$15	$15
School items	$186	$196	$10	$193	$202	$8	-$2
Sports items	$50	$53	$4	$90	$85	-$4	-$8
Childcare	$326	$341	$15	$253	$283	$29	$15
Enrichment	$269	$268	-$1	$245	$256	$11	$12
N	3,606	3,876		3,336	3,547		

Note*:* Average spending amounts derived from the CE fielded from January 2019 to March 2020 and from January 2021 to March 2022. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month, and weighted using household population weight FINLWT21.

Figure C1. Average three-month total expenditures by interview year and month among households with children who would be eligible for the ARPA CTC
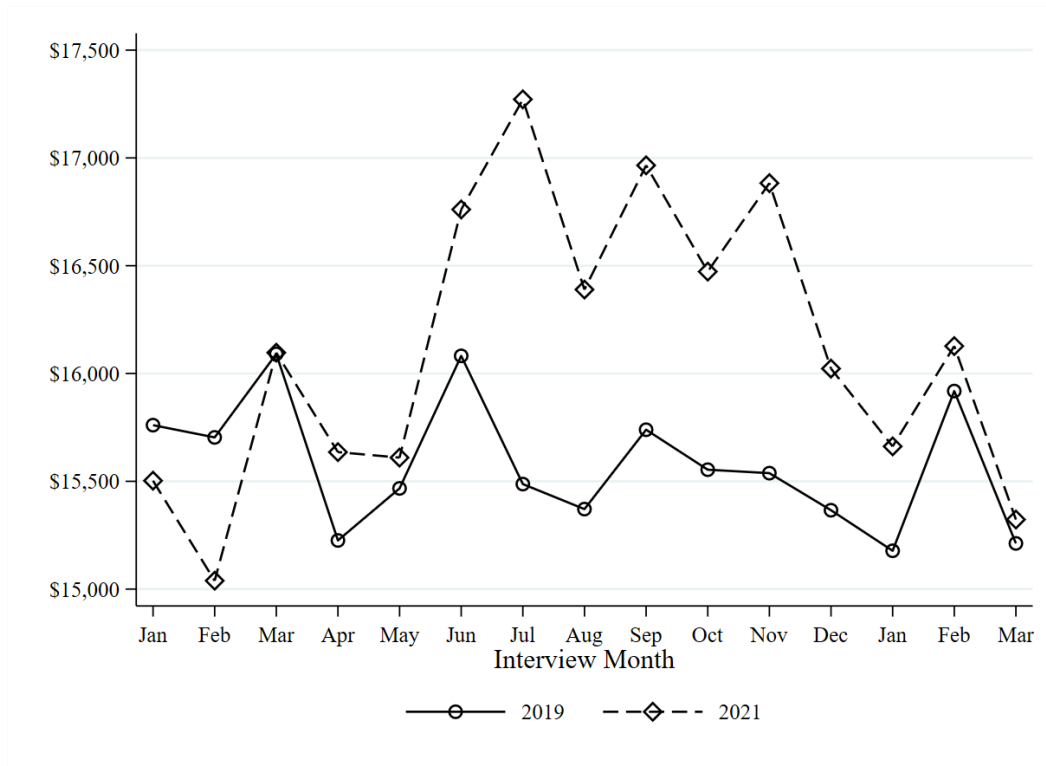
Note: The data used to produce Figure C1 come from the Consumer Expenditure Interview Survey. Values represent the average three-month total spending among households with children who would be eligible for the ARPA CTC and are weighted to the national level using household population weight FINLWT21. Spending data is inflation adjusted to January 2021 dollars. All values are authors' calculations.

Table C1: Placebo Test, Estimated effects on spending of a $100 increase in CTC payments during the reference quarter across expenditure categories among households with children, by household income

	Overall	Before tax income				
		Income under $24,000	Income under $50,000	$50,000 - $100,000	$100,000 - $200,000	$200,000 +
Total	3.049	26.562	11.077	-8.939	13.124	161.265
	(15.840)	(23.170)	(18.663)	(21.212)	(39.245)	(217.909)
Housing	6.711	-0.179	3.105	-12.578	20.643	242.903
	(7.569)	(8.663)	(7.935)	(8.835)	(19.268)	(125.278)
Food	3.368	10.316	0.310	9.714	2.935	8.404
	(3.404)	(8.115)	(4.271)	(5.958)	(6.867)	(26.281)
Food, home	5.132	10.070	1.937	9.761	5.833	-0.438
	(2.801)	(7.631)	(3.536)	(5.372)	(5.031)	(16.849)
Food, away	-1.764	0.246	-1.627	-0.047	-2.898	8.842
	(1.548)	(2.090)	(1.709)	(2.567)	(3.688)	(16.770)
Alcohol and Tobacco	-0.668	1.838	1.818	-0.758	-2.086	**-11.484***
	(0.787)	(1.960)	(1.496)	(1.222)	(1.208)	**(5.046)**
Clothing	0.251	4.100	1.764	3.422	-6.950	8.163
	(1.416)	(2.288)	(1.970)	(1.969)	(3.574)	(15.065)
Transport	-2.191	13.959	3.694	-6.028	-2.144	10.577
	(7.544)	(16.345)	(11.995)	(10.940)	(12.976)	(96.737)
Health	0.555	-0.957	1.451	1.217	-0.330	-10.481
	(2.794)	(3.031)	(2.623)	(4.124)	(7.646)	(22.612)
Leisure	-1.410	1.079	-0.145	-0.151	-5.788	3.205
	(1.800)	(1.717)	(1.568)	(2.416)	(4.673)	(24.393)
Personal Care	0.015	0.254	-0.256	-0.181	1.345	-2.869
	(0.383)	(0.440)	(0.498)	(0.532)	(0.963)	(2.704)
Education	-3.186	-4.226	**-4.984***	-2.232	9.493	-87.108
	(4.943)	(2.307)	**(1.872)**	(6.560)	(14.724)	(62.239)
Miscellaneous	-0.396	0.378	4.320	-1.364	**-3.993***	-0.044
	(1.398)	(1.093)	(3.579)	(1.163)	**(1.521)**	(15.515)
Total Child	6.722	**8.426***	4.675	5.347	11.797	-24.788
	(5.407)	**(3.419)**	(3.083)	(6.188)	(17.046)	(64.754)
Children's Clothes	**2.701***	**3.590***	**2.996***	**4.051***	-0.572	7.607
	(0.752)	**(1.792)**	**(1.470)**	**(1.092)**	(1.378)	(4.534)
Books and Toys	-0.347	-0.808	0.067	0.114	-1.333	0.105
	(0.292)	(0.418)	(0.403)	(0.414)	(0.750)	(2.169)
Computers and Tablets	0.083	0.008	0.219	0.625	-1.687	5.805
	(0.463)	(0.493)	(0.415)	(0.890)	(0.930)	(5.207)
School Items	3.779	0.963	-0.540	3.444	11.234	-32.195
	(4.539)	(1.016)	(1.009)	(5.457)	(14.438)	(55.363)
Sports Items	-0.223	-0.600	**-0.921***	0.316	-1.079	2.915
	(0.376)	(0.523)	**(0.370)**	(0.526)	(0.930)	(4.497)
Childcare	1.143	4.860	**3.914***	**-4.058***	5.810	-3.829
	(1.857)	(2.507)	**(1.987)**	**(1.880)**	(5.425)	(22.733)
Enrichment	-0.414	0.412	-1.060	0.856	-0.575	-5.196
	(1.195)	(0.655)	(0.572)	(1.465)	(3.338)	(16.63)
N	12,618	2,238	4,155	4,033	3,354	1,076

Note: All results derived from the CE fielded from January 2018 to December 2019. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, and a fixed effect for number of people in the household, and demographic controls for household reference person, including age group, race/ethnicity (in the case of model 1), sex, and education level. Estimates are weighted to the national level using household population weight FINLWT21 Robust standard errors reported in parentheses. ****p<0.001 **p<0.01 *p<0.05.*

Table C2: Placebo Test, Estimated effects on spending of a $100 increase in CTC payments during the reference quarter across expenditure categories among households with children by race/ethnicity of household head

| | Overall | Race/ethnicity of household reference person | | | | |
		Asian	Black	Hispanic	Other	White
Total	3.049	**-228.372***	9.236	9.977	**298.249***	-1.928
	(15.840)	**(115.515)**	(30.915)	(21.974)	**(139.025)**	(24.510)
Housing	6.711	-37.610	23.011	2.202	80.928	4.675
	(7.569)	(56.039)	(15.904)	(9.435)	(44.177)	(11.872)
Food	3.368	-28.517	-9.073	3.480	**81.799***	4.880
	(3.404)	(16.989)	(7.812)	(7.925)	**(41.38)**	(4.228)
Food, home	5.132	-15.875	-5.780	6.378	40.757	5.744
	(2.801)	(11.496)	(6.284)	(7.385)	(21.534)	(3.188)
Food, away	-1.764	-12.642	-3.293	-2.898	41.042	-0.865
	(1.548)	(9.558)	(3.099)	(2.671)	(22.560)	(2.284)
Alcohol and Tobacco	-0.668	2.837	-2.061	-0.667	-0.115	-0.376
	(0.787)	(2.390)	(1.292)	(0.781)	(8.001)	(1.33)
Clothing	0.251	8.880	4.623	1.608	3.908	-2.008
	(1.416)	(8.491)	(5.309)	(2.047)	(14.651)	(1.847)
Transport	-2.191	-123.054	0.873	9.440	24.31	-1.655
	(7.544)	(80.700)	(10.198)	(16.452)	(51.168)	(9.766)
Health	0.555	6.543	-3.838	-1.160	33.889	0.520
	(2.794)	(10.541)	(5.399)	(3.425)	(21.197)	(4.481)
Leisure	-1.410	-15.826	-3.565	0.071	**36.490****	-2.265
	(1.800)	(16.241)	(2.741)	(2.133)	**(13.991)**	(2.848)
Personal Care	0.015	-0.837	-0.075	0.123	0.191	0.126
	(0.383)	(1.279)	(1.715)	(0.474)	(1.924)	(0.447)
Education	-3.186	**-57.904***	-2.394	**-4.970***	19.560	-2.688
	(4.943)	**(23.712)**	(4.821)	**(2.124)**	(21.488)	(8.876)
Miscellaneous	-0.396	17.117	1.735	-0.150	17.290	**-3.136****
	(1.398)	(19.519)	(5.110)	(0.947)	(19.695)	**(1.181)**
Total Child	6.722	-27.241	10.044	1.189	38.931	6.578
	(5.407)	(23.192)	(7.511)	(3.579)	(32.755)	(9.489)
Children's Clothes	**2.701*****	4.293	5.532	1.886	7.319	**2.014***
	(0.752)	(2.923)	(3.328)	(1.195)	(9.035)	**(0.803)**
Books and Toys	-0.347	0.963	**-1.420***	-0.302	4.671	-0.302
	(0.292)	(1.206)	**(0.692)**	(0.531)	(3.607)	(0.423)
Computers and Tablets	0.083	0.068	1.010	0.589	-0.427	-0.392
	(0.463)	(2.617)	(1.285)	(0.949)	(1.894)	(0.595)
School Items	3.779	**-23.631***	-1.253	-0.142	16.818	6.774
	(4.539)	**(11.766)**	(2.798)	(1.009)	(18.731)	(8.326)
Sports Items	-0.223	0.608	-0.728	-0.512	5.413	-0.381
	(0.376)	(1.460)	(0.729)	(0.353)	(3.822)	(0.629)
Childcare	1.143	2.339	7.734	0.801	-6.502	-1.081
	(1.857)	(11.516)	(4.59)	(2.166)	(13.878)	(2.903)
Enrichment	-0.414	-11.881	-0.831	-1.132	11.638	-0.053
	(1.195)	(14.583)	(1.204)	(1.340)	(8.426)	(1.873)
N	12,618	848	1,385	2,862	285	7,238

Note: All results derived from the CE fielded from January 2018 to December 2019. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, and a fixed effect for number of people in the household, and demographic controls for household reference person, including age group, race/ethnicity (in the case of model 1), sex, and education level. Estimates are weighted to the national level using FINLWT21 Robust standard errors reported in parentheses. ****p<0.001 **p<0.01 *p<0.05.*

Table C3 shows the treatment effects for major and child-related expenditure categories using four different model specifications. The first column provides the results from our main analysis, which are discussed in the main text of the paper. The second column presents results from the same model as our main analysis but excludes observations from August and September – interviews conducted during the period when CTC payments were distributed but before the receipt question was added to the CE. The third column presents estimates for the treatment-on-treated effect, where the imputed CTC payment is interacted with an indicator for payment receipt. Therefore, only CUs that reported receiving a CTC payment during the reference period are considered treated. Finally, the fourth column presents results from a two-stage least squares model. In the first stage, the imputed CTC payment is regressed on reported receipt, and in the second stage, the predicted CTC payments from the first stage are used to estimate the treatment effect.

Table C3: Treatment on treated results, Estimated effects on spending of a $100 increase in CTC payments during the reference quarter across expenditure categories among households with children, by household income

	Overall	Restricted Sample	Received	Received 2SLS
Total	**43.619***	34.190	**33.558***	47.623
	(17.268)	(17.804)	**(16.614)**	(24.635)
Housing	**28.028****	**25.934****	14.351	**36.124***
	(10.142)	**(10.435)**	(9.183)	**(14.534)**
Food	**12.309****	**10.551****	7.651	**14.697***
	(3.992)	**(4.158)**	(4.118)	**(5.79)**
Food, home	**7.406***	5.056	4.871	7.042
	(3.001)	(3.097)	(3.183)	(4.288)
Food, away	**4.902***	**5.495*****	2.780	**7.654****
	(1.961)	**(2.038)**	(1.86)	**(2.866)**
Alcohol and Tobacco	-0.255	-0.587	-0.578	-0.817
	(0.855)	(0.883)	(0.872)	(1.226)
Clothing	**5.083****	**4.342***	2.167	**6.048***
	(1.985)	**(2.132)**	(2.194)	**(2.953)**
Transport	-2.697	-2.160	-1.028	-1.823
	(6.246)	(6.529)	(0.288)	(0.597)
Health	-1.474	-0.970	-2.265	-4.745
	(3.801)	(4.047)	(0.203)	(0.469)
Leisure	5.082	0.798	-1.103	-2.502
	(3.215)	(2.541)	(0.39)	(0.941)
Personal Care	0.589	0.494	1.158	-3.009
	(0.418)	(0.433)	(6.297)	(9.069)
Education	-5.016	-5.602	-0.966	-3.196
	(3.006)	(3.167)	(5.39)	(7.761)
Miscellaneous	1.919	1.342	2.124	0.188
	(1.439)	(1.507)	(2.784)	(4.143)
Total Child	**15.661*****	**13.926*****	**15.077*****	**19.398*****
	(3.656)	**(3.831)**	**(3.802)**	**(5.249)**
Children's Clothes	**4.758*****	**4.243*****	**3.241****	**5.910*****
	(0.957)	**(1.009)**	**(1.04)**	**(1.407)**
Books and Toys	0.473	0.483	0.612	0.672
	(0.557)	(0.588)	(0.608)	(0.816)
Computers and Tablets	0.242	0.082	0.069	0.114
	(0.684)	(0.7)	(0.674)	(0.972)
School Items	1.499	1.143	2.861	1.593
	(2.121)	(2.237)	(2.184)	(3.104)
Sports Items	0.396	0.559	0.757	0.779
	(0.607)	(0.616)	(0.657)	(0.855)
Childcare	**6.086*****	**5.393*****	**3.837***	**7.511****
	(1.89)	**(1.941)**	**(1.842)**	**(2.697)**
Enrichment	2.205	2.024	3.700*	2.820
	(1.544)	(1.66)	(1.695)	(2.285)
N	14,365	12,486	12,486	12,486

Note: All results derived from the CE fielded from January 2018 to December 2019. The sample is limited to households with children who would qualify for a monthly CTC payment (i.e., imputed CTC > 0), regardless of interview month. The estimated effect, coefficient from the regression model, represents the change in spending by domain associated with a $100 increase in quarterly income assumed to be from the CTC. All models include state, year, and month fixed effects, and a fixed effect for number of people in the household, and demographic controls for household reference person, including age group, race/ethnicity (in the case of model 1), sex, and education level. Estimates are weighted to the national level using FINLWT21 Robust standard errors reported in parentheses. *$***p<0.001$ $**p<0.01$ $*p<0.05$.*