The Initial Effects of the Expanded Child Tax Credit on Material Hardship

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Note: The current draft of this Working Paper is based on evidence from the Census Household Pulse Surveys from April 14, 2021 to August 2, 2021. We plan to update these findings in mid-September with additional data from the Census Household Pulse Survey. The findings below may change with the addition of new data in subsequent waves of the Pulse.

Abstract: The transformation of the Child Tax Credit (CTC) into a more generous and inclusive monthly payment marks a historic, albeit temporary, shift in the American welfare state’s treatment of low-income families. To investigate the initial impact of the monthly CTC payments on material hardship among families with children, this study applies a series of difference-in-differences estimates using Census Household Pulse Survey microdata collected from mid-April through early August 2021. Our findings offer three primary conclusions regarding the initial effects of the first monthly CTC payment delivered mid-July 2021. First, the July 2021 CTC payment strongly reduced food insufficiency among low-income households with children. The first monthly CTC payment is associated with an 8-percentage point or, 29 percent, decline in food insufficiency among low-income families. Second, the effects of the first CTC payment on food insufficiency are concentrated among households with annual incomes of less than $35,000. Third, increasing the coverage rate of the CTC is critical for further reducing material hardship. Self-reported receipt suggests the lowest-income households were less likely than higher-income families to receive the first payment. As more children receive the benefit in future months, levels of material hardship may decline further. Even with imperfect coverage, however, our findings suggest that the first CTC payment was largely effective at reducing food insufficiency among low-income families with children.
INTRODUCTION

In March 2021, the United States (U.S.) Congress passed the American Rescue Plan (ARP), which included a large expansion of the Child Tax Credit (CTC). The ARP increased the benefit values of the CTC, removed the earnings requirement and made the benefit fully refundable, and shifted the distribution schedule from a once-per-year payment of the CTC to monthly payments. The first monthly payment was distributed to families of 59.3 million children (around 80 percent of all children in the U.S.) in July 2021 (U.S. Department of Treasury, 2021a). The CTC expansion marks a notable shift in the American welfare state’s treatment of low-income families; however, the program is implemented only for one year and, in the absence of Congressional renewal, will expire in 2022. As such, timely and reliable evidence is critical for informing policymakers, researchers, and the public of the CTC’s impact. This study investigates the effects of the expanded CTC on material hardship among families with children in the initial weeks after the first CTC payment.

A large body of research shows that children who grow up in families with higher incomes perform better across a host of measures of both short- and long-term development and well-being (Brooks-Gunn and Duncan, 1997; Chaudry and Wimer, 2016). And a smaller but growing body of literature attempts to understand whether these relationships are causal, given the fact that lower- and higher-income families may differ on numerous fronts besides income alone. Most of these studies use so-called “natural experiments,” which attempt to identify quasi-random variation in income to see whether that exogenous change predicts changes in important child outcomes. This growing literature is so far consistent in finding that enhanced incomes and reduced poverty causally impact children’s short- and long-term development and well-being (Duncan, Morris and Rodrigues, 2011; Wimer and Wolf, 2020; Garfinkel et al., 2021).
There are two primary channels through which increases in income are thought to impact children’s outcomes (NAS, 2019). The *family stress* channel posits that the absence of resources increases stress, which compromises healthy parenting and other family relationships, resulting in worse child outcomes. The *family resources* channel posits that increased income allows parents to purchase or invest in various things that enhance child development and well-being (e.g., books, toys, enriching activities, academic supports, safer neighborhoods, etc.). Each channel assumes that an increase in income would change aspects of the home environment in the shorter term, and that these effects would accumulate over time into more positive child outcomes.

This study seeks to add to this burgeoning literature by looking at the initial impacts of the CTC, which now extends income support to children historically left out of the full benefit of the credit (Collyer, Harris and Wimer, 2019; Goldin and Michelmore 2020). We apply difference-in-difference estimates to take advantage of (1) the fact that effects of the policy differ between households with children and those without, and (2) that households with children benefit differentially based on the ages of their children, number of children, and pre-reform income levels.

**The Expanded Child Tax Credit**

Since the mid-1990s, the American welfare state has relied more on in-kind transfers, such as benefits from the Supplemental Nutrition Assistance Program (SNAP), and work-conditional transfers, such as benefits from the Earned Income Tax Credit (EITC), relative to cash-based income support (Bauer et al., 2018; Hoynes, 2019; Pac et al., 2017). As a result, share of children in families with very little cash income has grown (Shaefer & Edin, 2013). The lack of cash-based assistance and the comparatively high rate of child poverty sets the U.S. apart from other high-income countries, most of which have some form of child allowance (Curran, 2015; Garfinkel et
The expansion of the CTC thus represents a historic deviation from the direction of the U.S. welfare state throughout the past three decades.

Prior to the expanded CTC, tax filers could receive a maximum CTC of $2,000 per child, per year, but it was not fully refundable. One in three children did not receive the full benefit value because their families did not earn enough to qualify. Children with single parents, those in rural areas, Black and Latino children, and those in larger families were disproportionally ineligible for the full credit (Curran and Collyer, 2020; Collyer, Harris, and Wimer, 2019). Following similar parameters to the American Family Act (a bill first introduced in both the Senate and House of Representatives in 2017 and reintroduced in 2019), the ARP has temporarily transformed the CTC into a nearly-universal child allowance for 2021. Specifically, the ARP includes three fundamental changes to the CTC. First, it makes the CTC available to almost all children, including those in families with the lowest incomes previously excluded, by removing the earnings requirement and making the credit fully refundable. Second, it raises the maximum annual credit amounts to $3,000 for children ages 6-17 and $3,600 for children under age 6. Third, beginning mid-July 2021, it delivers the credit in monthly installments of up to $250 per older child or up to $300 per younger child, for a period of six months.

One challenge facing the introduction of the expanded CTC is that not all eligible children automatically receive the payments. Families who did not file taxes in the prior year, presumably due to having an income below the tax-filing threshold, generally must register with the Internal Revenue Service (IRS) to receive the credit. Families with incomes below the poverty line or who receive certain government benefits are automatically eligible for the credit and do not need to file to receive it. However, families with incomes above the poverty line but below the threshold for the credit may need to file taxes to qualify. The IRS estimates that about 30% of households with incomes below the poverty line do not file taxes, which means that some eligible families may not receive the credit if they do not file their taxes. To address this, the ARP includes provisions to simplify the process of receiving the credit, such as direct deposit of the credit amount into the family's bank account or a credit card, and allowing families to enroll in the credit through a website or app. Additionally, the ARP includes a provision to automatically calculate and send out the credit to eligible families, which could help reduce administrative burden and increase the number of families that receive the benefit.
Revenue Service (IRS) in order to receive benefits. Several estimates suggest that the total number of children in eligible tax units is around 64 to 67 million children (Parolin et al., 2021b), more than the 59.3 million to whom the IRS distributed initial CTC payments to in July 2021. Put differently, the first payment did not reach all eligible families. As we discuss in our Data and Methods section, we take several steps to account for the imperfect coverage of the initial CTC payment when evaluating the policy’s effects on hardship.

Despite the challenge in reaching full coverage, early research suggests the expanded CTC has potential to generate large reductions in child poverty (Center on Poverty and Social Policy, 2021; Marr et al., 2021; Acs and Werner, 2021; Parolin et al., 2021a; Wheaton et al., 2021) and may contribute to reductions in economic hardship (Perez-Lopez, 2021). Thus far, however, it remains unclear whether the expanded CTC has plausibly causal effects. This study investigates that possibility, using household data released in the initial weeks following the first CTC payment, to assess the policy’s effects on material hardship among families with children. We will add to this analysis as the monthly payments continue and more data is available.

**DATA AND METHODS**

*Data Source:* This study uses data from the Census Household Pulse Survey (Pulse). The U.S. Census Bureau introduced the Pulse in April 2020 to begin collecting up-to-date and nationally-representative information on the social and economic wellbeing of households across the U.S. The Census Bureau randomly selects addresses to participate in the Pulse, then sends either an email or a text message to the contact information associated with the household. The message prompts the recipient to participate in a 20-minute online survey asking questions related to education, employment, food security, housing, and more. The data have been used to track trends in material hardship, subjective wellbeing, and other social and economic indicators.
throughout the pandemic (Bitler et al., 2020; Morales et al., 2020; Schanzenbach and Pitts, 2020; Ziliak, 2021; Cai et al., 2020, Twenge and Joiner, 2020). Our particular focus in this analysis centers on the hardship data, but there is potential to use the Pulse data to explore the relationship between the CTC monthly payments and subjective wellbeing (see Appendix E).

We use Pulse data collected between April 14, 2021 (three months before the start of the monthly CTC) through August 2, 2021 (waves 28-34). The first payment of the expanded CTC was delivered to recipients on July 15, 2021, which falls prior to the beginning of Wave 34 of the Pulse (which spans July 21 to August 2, 2021). Our total sample size is 362,963 respondents.

One limitation of the Pulse is that it is conducted online-only (often sent via text message with a link to complete a survey online), which may exclude segments of the population who lack reliable internet connection. We provide descriptive statistics on the respondents in Appendix I. The descriptive statistics show that the Pulse sample closely mirrors population estimates from the U.S. Current Population Survey.

Sample Criteria: We exclude all households in the Pulse who have imputed values of number of children in the household, as error in the imputed values could bias our estimates. In our sample, 1.3 percent (4,576 of 362,963) of all responses featured imputed values of the number of children. Given that the expanded CTC should benefit lower-income households more so than higher-income households, we restrict our primary estimates to households with a 2019 pre-tax income of under $35,000. In subsequent estimates, however, we also display results when assessing the effect of the CTC on all households under $25,000 and at different income bins up to $200,000 in 2019 pre-tax income. We also display subgroup analyses to estimate the effects of the CTC by race and ethnicity.
Receipt of the CTC: As noted, the first payment of the CTC did not reach all children in eligible families. Though the Department of Treasury reports that 59.3 million children (around 80 percent of all children) received the first payment, the Pulse includes its own question of whether the household received the CTC payment (U.S. Department of Treasury, 2021a). We thus begin our Findings section with a descriptive portrait of coverage rates as reported in the Pulse.

Indicators of Material Hardship: Table 1 presents our primary measures of material hardship. Our material hardship indicators include household food insufficiency, difficulty with expenses, and not being caught up on rent or mortgage payments. We operationalize each of these indicators as a binary variable using the criteria described in the right-most column of Table 1. In a parallel exercise, we explore early indications of the relationship between the new CTC monthly payment and three measures of subjective wellbeing, including confidence in paying the rent/mortgage, frequent anxiety, and frequent worrying. These results are included in Appendix E; as the monthly CTC payments continue and more data becomes available, this represents an area for continued investigation. In general, however, we would expect measures of subjective wellbeing to be more sensitive to continued receipt of monthly payments rather than just the first payment, which serves as our treatment effect in the following analyses.
Table 1: Overview of primary hardship indicators

<table>
<thead>
<tr>
<th>Type</th>
<th>Prompt</th>
<th>Qualifying Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household food insufficiency</td>
<td>In the last 7 days, which of these statements best describes the food eaten in your household?</td>
<td>Sometimes or often not enough to eat</td>
</tr>
<tr>
<td>Difficulty with expenses</td>
<td>In the last 7 days, how difficult has it been for your household to pay for usual household expenses, including but not limited to food, rent or mortgage, car payments, medical expenses, student loans, and so on?</td>
<td>Somewhat or very difficult.</td>
</tr>
<tr>
<td>Not caught up on rent [or mortgage]</td>
<td>Is this household currently caught up on rent [or mortgage] payments?</td>
<td>No.</td>
</tr>
</tbody>
</table>

Methods: We estimate difference-in-differences models to assess the effect of the expanded CTC on our outcomes of interest, as defined in Equation (1).

\[ y_i = \beta_1 \text{PostCTC}_i + \beta_2 \text{Treatment}_i + \beta_3 (\text{PostCTC} \times \text{Treatment})_i + \beta_4 X_i + \epsilon_i \]  

(1)

The outcome variable is one of our hardship indicators (separate models for each).

PostCTC is a binary indicator of whether the time of survey occurred after July 15, 2021, the day on which the expanded CTC was first administered. We specify our treatment variable, Treatment, in two separate ways. First, we operationalize a binary treatment indicator measured as whether the household has children (value set to 1) or is childless (value set to 0). Given that our sample is limited to households reporting a 2019 pre-tax income of under $35,000, we assume (but cannot directly test) that the vast majority of households with children in this subsample are eligible to receive the monthly CTC. Childless households, in contrast, do not directly benefit from the reform.

As noted, coverage rates of the CTC among the eligible are imperfect. Given that the Pulse specifically asks whether the family received the CTC payment, we also include an
estimate of the treatment effect on the treated (the effect of the CTC on those who report actually receiving the CTC). In our sample of households with children with 2019 pre-tax income of less than $35,000, 54 percent of households report receiving the first CTC payment.

For our second treatment indicator, we estimate models using a continuous indicator of treatment intensity to capture the fact that the effects of the CTC are likely to vary by age of the children (as families with children under age 6 receive larger monthly benefit values), the number of children in the home, and the relative value of the new CTC benefits compared to what the family likely received from the CTC prior to the reform. We cannot consistently observe the age of each child in a given household in the Pulse, nor do we have information on pre-reform CTC receipt. Thus, we use data from the 2019 U.S. Current Population Survey to estimate the mean pre- and post-reform benefit values for bins defined by the number of adults in the household (ranging from 1 to 10), the number of children in the household (ranging from 0 to 10), and eight category pre-tax income bins (from under $25,000 annually scaling up to more than $200,000 per year). For each bin, we compute the mean pre-reform refundable CTC benefits as observed for each family unit in the CPS ASEC. We simulate the additional post-reform benefits that each family is eligible for (not yet taking into account imperfect coverage in benefit distribution) using detailed policy rules from the CTC reform as specified in the 2021 American Rescue Plan. We subtract the pre-reform benefit value from the post-reform benefit value to create a “net benefit” indicator for each family unit. We then adjust the net benefit indicator for family size using the modified OECD equivalence scale. Finally, we calculate the

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4 Wave 34 of the Pulse does have binary variables of whether children are under 5 or between 5 to 11. Given that the data are not consistently available throughout the waves included in this analysis, however, we cannot use it in our estimations or creation of the treatment indicators.

5 The modified OECD scale begins with a value of 1 for a single adult, then adds 0.5 for each child in the home and 0.3 for each additional adult in the home. Alternative family-size adjustments include the square-root equivalence scale or dividing by a family-size-adjusted poverty-threshold, such as that of the U.S. official poverty measure.
weighted mean of the size-adjusted net benefit value for each of the bins defined above. We then import this value into the Pulse, matching on the number of adults, number of children, and 2019 pre-tax income category of the Pulse respondents. We provide more details and descriptive statistics on the indicator in Appendix B.

In a sensitivity test, we also produce an alternative version of our treatment intensity indicator that matches the July 2021 coverage rate of the CTC – 59.3 million children – as reported by the U.S. Department of Treasury. Specifically, we scale down coverage from all likely-eligible children to match the reported numbers of children receiving the CTC by state, following the procedure in Parolin, Collyer, Curran, and Wimer (2021b). Within each state, we adjust coverage so that it is the lowest-income tax units who are removed first, representing the fact that lower-income tax units are less likely to have filed taxes in the prior year and, thus, are less likely to receive the benefits automatically (Cox, et al., 2021). In our Findings section, we also present observed coverage rates from the Pulse among households with children by income bin; these results corroborate the claim that the lowest-income households with children were less likely to receive the benefit in July 2021. We present the results from our sensitivity tests in Appendix B, but we note that they do not vary meaningfully from the results of our primary analyses.

In Equation (1), we control for the age, sex, and education status of the household head and include wave dummies in each model (captured in vector $X$). In each estimate, $\beta_3$ is our primary coefficient of interest, as it informs us, when using the binary treatment indicator, of whether households with children faced a larger (or smaller) difference in the outcome relative to childless households after the introduction of the CTC.
FINDINGS

Our Findings section proceeds in three parts. First, we discuss reported receipt of the CTC in the Pulse and compare this to administrative reports from the U.S. Department of Treasury. Second, we present descriptive findings on trends in material hardship. Third, we present the results of our difference-in-differences estimates.

Reported Receipt of the Child Tax Credit

As noted, the U.S. Department of Treasury reports that 59.3 million children, or roughly 80 percent of all children, received the first CTC payment in July 2021 (U.S. Department of Treasury, 2021a). Estimates from the Pulse, however, suggest that 65 percent of children were in households that report receiving the initial CTC payment. This is equivalent to approximately 48 million children, or 11 million fewer than the IRS reports. The discrepancy could be due a number of factors: sampling bias in the Pulse, benefit underreporting in the Pulse, overestimation of children served from the Department of Treasury, or general measurement error. Regardless of cause, all results should be interpreted with this discrepancy in mind. Moreover, the coverage rate is likely to increase in subsequent months, considering that the Department of Treasury reported that 1.6 million additional families received the benefit in August relative to July U.S. (Department of Treasury, 2021b).

Figure 1 breaks down reported CTC receipt rates by race and ethnicity (left panel) and 2019 pre-tax income bin (right panel). As noted, 65 percent of all children are in households that report receipt of the first payment of the CTC in the Pulse, including 62 percent of Asian children, 71 percent of Black children, 59 percent of Latino children, and 65 percent of White children. Keep in mind that the sample here is not limited to eligible family units, and that not all
children in the U.S. are eligible; thus, the reported means should be interpreted as general coverage rates and not take-up among the eligible.

Figure 1: Share of children in families receiving the first payment of the Child Tax Credit (self-reported receipt from responses of Census Household Pulse Survey)

The results by income bin (right panel) suggest that families with children that had 2019 pre-tax incomes below $25,000 are less likely than higher-income families to have received the benefit. According to the Pulse data, just over half (55 percent) of children in families with incomes under $25,000 received the first payment. Rates of (self-reported) receipt rise as incomes rise. Among families with earnings between $25,000 to $35,000, more than two-thirds
(68 percent) of children received the benefit in July. Among families with incomes between $75,000 and $100,000, approximately three-quarters (73 percent) of children did.

Given the comparatively low coverage rates among the lowest-income families, it is unlikely that the initial effects of the CTC match the potential effects if coverage were greater, or the future effects assuming that coverage does, indeed, expand. As such, the results below should be interpreted as the immediate effects with imperfect coverage. Presumably, any effects observed in the results below will increase as more families receive the benefit in subsequent months.

**Descriptive Findings**

Figure 2 presents descriptive trends in each of the outcomes for childless households (dashed gray line) and households with children (solid black line) from April 2021 through July 2021. The red vertical line in each figure marks the first payment of the expanded CTC.

Food insufficiency (left panel) is consistently higher for households with children relative to childless households for the entire period considered. From April through to the end of June, both groups see slight increases in food hardship, with childless households reaching 7.2 percent in June compared to 13.4 percent for households with children. After the first payment of the CTC, however, food insufficiency remains relatively stable (7.1 percent) for childless households, but declines to 9.4 percent for households with children. The change from late June to late July marks a 4 percentage point, or 30 percent, decline in food insufficiency for households with children.

The middle panel shows that households with children tend to face much higher rates of difficulty with expenses relative to childless households (in late June 2021, 34.6 percent to 21.6 percent, respectively). After the first payment of the CTC, however, the share of childless households with difficulty with expenses declines to 27.8 percent from 40.2 percent. The change from late June to late July marks a 12.6 percentage point, or 31 percent, decline in the share of households with difficulty with expenses.
households (which do not receive the CTC) reporting difficulty with expenses increases to 23.8 percent, while the share of households with children reporting the same declines to 33.4 percent. Here, however, the decline is more modest relative to food insufficiency: for households with children, the change from late June to late July represents a 1.2 percentage point (3.4 percent) decline.

Figure 2: Trends in hardship for households with and without children (April 14 to August 2, 2021)

Households with children are also more likely to have missed rent or mortgage payments (right panel) over the entire period considered. But for households with children, missed rent or
mortgage payments declined from 11.4 percent to 10.8 percent from late June to late July, while the rate remained stable at 5.2 percent for childless households.

**Estimation Results**

Table 2 presents the results from our difference-in-differences estimates using our binary treatment (which, as described in the prior section, is set to a value of one for households with children) among our subsample of households with pre-tax income of $35,000 or less in 2019.

**Table 2:** Difference-in-differences estimate of effect of expanded CTC on hardship and wellbeing among households with 2019 total pre-tax income below $35,000; **binary treatment**

<table>
<thead>
<tr>
<th></th>
<th>Including Treated &amp; Untreated Households w/ Children</th>
<th>Only Including Treated Households with Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1: Food Insufficiency</td>
<td>2: Difficulty w/ Expenses</td>
</tr>
<tr>
<td>Household with Children</td>
<td>0.06***</td>
<td>0.11***</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Post-July 15</td>
<td>0.05***</td>
<td>0.09***</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Household with Children X</td>
<td>-0.08***</td>
<td>-0.04†</td>
</tr>
<tr>
<td>Post-July 15</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
</tbody>
</table>

Pre-Treatment Mean among HH w/ Children in Subsample

|                              | 0.276                  | 0.594                       | 0.192                          | 0.276                  | 0.594                       | 0.192                          |

Reported CTC Receipt among HH w/ Children in Subsample

|                              | 53.6%                  | 53.7%                       | 54.0%                          | 100%                   | 100%                        | 100%                           |

Observations

|                              | 66,401                 | 66,438                      | 66,020                         | 65,305                 | 65,338                      | 64,933                         |

Note: ‘Treated’ households refer to households with children who report in the Pulse as having received the CTC. All models control for age, education, sex of household head, and wave dummies. Sample limited to respondents in Pulse reporting 2019 pre-tax income of below $35,000. Standard errors in parentheses. † p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001
Our initial analysis, presented in Columns 1 through 3 of Table 2, assumes that all households with children under the $35,000 threshold are eligible to receive the CTC (regardless of whether they actually report receiving the benefit). The secondary analysis, presented in Columns 4 through 6 of Table 2, only considers the households with children who report in the Pulse as having received the first CTC payment (in addition to our control group, childless households). The secondary estimates more accurately represent our treatment effects among the treated.

Consistent with the descriptive trends, our results suggest a significant decline in food insufficiency for households with children relative to childless households pre- versus post- rollout of the monthly CTC (see Column 1, Table 2). Specifically, the results suggest that the intent-to-treat effect amounts to an 8-percentage point decline in food hardship for households with children relative to childless households after the treatment. For context, this effect size is around one-third the pre-treatment mean of food insufficiency among households with children in the sample (pre-treatment mean of 27.6 percent). The effect of the CTC among the treated (families who report receiving the benefit), as shown in Column 4 of Table 2, is a 12-percentage point decline, or 43 percent of the pre-treatment mean of food insufficiency for households with children in the sample. Put simply, the first payment is associated with a substantial decline in food insufficiency among low-income households with children.

Households with children also appear to experience a decline in difficulty with expenses relative to childless households (see Columns 2 and 5 of Table 2); however, the effects are only significant at the 10 percent confidence level. The effect size is also smaller than that of food insufficiency, consistent with the descriptive trends. Specifically, the results suggest that the intent-to-treat effect amounts to a 4-percentage point decline in inability to meet expenses.
roughly 7 percent of the pre-treatment mean (59.4 percent) for this sample. The treatment effect among families reported receipt of the CTC (Column 5, Table 2) is slightly larger at 5 percentage points, or roughly 8 percent of the pre-treatment mean. Though these results are modest in magnitude, it is worth remembering that our analyses follow only one CTC payment.

In contrast, our results suggest that the CTC does not have immediate effects on missed rent or mortgage payments among low-income households with children. This null effect is perhaps unsurprising given evidence that families receiving the benefit are more likely to have spent their payments on food items (Perez-Lopez, 2021), and that as of this writing our results estimate the effects of only one payment.
Table 3 now applies our continuous indicator of treatment intensity for the CTC specifically among households with children. Recall that the treatment intensity indicator captures variation based on pre-tax income and household size (see Appendix B for more details). The findings are consistent with those from Table 2. Looking at food insufficiency, the results suggest that a $100 increase in CTC treatment intensity is associated with a 4-percentage point decline in food insufficiency among families with children (Column 1, Table 3). The effect size grows to 7 percentage points when examining the effect of the CTC on those families who report actually receiving the CTC (Column 4, Table 3). Put differently, a $100 net increase in
CTC benefits (adjusted for family size) is associated with a 7-percentage point, or roughly 25 percent, decline in food insufficiency for low-income families with children who report receiving the CTC.

The effects are again smaller for difficulty with expenses and missed rent or mortgage payments. The intent-to-treat effects suggest that a $100 net increase in CTC benefits is associated with a 2-percentage point (roughly 3 percent) decline in difficulty with expenses (Column 2, Table 3), while the effect among the treated rises to 3 percentage points (roughly 5 percent decline) (Column 5, Table 3).
Figure 3: Estimated effect of CTC on outcome by 2019 pre-tax household income cutoff and treatment specification

Note: Y-axis plots coefficients from interaction of treatment indicator and post-treatment dummy, similar to results from Tables 1 and 2. All models include age, education, sex, and wave dummies. Separate estimates run for each income group displayed on Y-axes.

Recall that the sample in our primary analyses was limited to households with 2019 incomes under $35,000. Figure 3 relaxes that condition and instead visualizes the effect of the CTC across the income distribution. Each point in Figure 3 represents the coefficient from the interaction terms for our binary treatment (black circle) and continuous treatment (gray triangle) when including households with 2019 incomes under $25,000, then between $25,000 to $35,000, $35,000 to $50,000, $50,000 to $100,000, and $100,000 to $200,000. The upper row presents the
intent-to-treat effects, while the lower row presents the effects among families reporting receipt of the CTC.

The findings, in short, demonstrate that the CTC is particularly effective at reducing food insufficiency for households with children with 2019 pre-tax incomes below $25,000 and between $25,000 to $35,000. At higher income bins, the policy has no statistically significant effect. The results are relatively consistent with examining the effects among the treated. These patterns emphasize that the CTC is particularly effective at reducing food hardship among lower-income families.

The middle panels of Figure 3 show a negative point estimate with respect to difficulty in meeting expenses, suggesting the initial CTC payment may reduce this hardship indicator as well. Consistent with the regression estimates, however, the effects are not statistically significant at the 95 percent confidence level. Meanwhile, the null effects of the CTC on missed rent or mortgage payments is consistent across the income distribution.

Figure 4 presents the results by race and ethnicity. We again limit the sample the household heads of the specified race and ethnicity, and then apply the same treatment conditions as in our primary analysis. The upper-left panel suggests that the intent-to-treat effects of the CTC on food insufficiency are primarily channeled among Hispanic and White families. The lower-left panel, however, also finds negative and significant effects for Black families when examining the effects among the treated. This pattern points to two important observations: imperfect receipt among low-income Black families prevented the first payment of the CTC from having stronger effects on Black families in general; however, among Black families who
did receive the benefit, the CTC was effective at reducing food insufficiency.\(^6\) Early evidence from the subsequent round of the Pulse survey suggest that food insufficiency among Black families declines more after the second payment of the CTC relative to the first payment; thus, the effect size may continue to grow as more data become available.\(^7\)

**Figure 4:** Estimated effect of CTC on outcome by race and ethnicity and treatment specification

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\(^6\) Black families report receiving the CTC at a similar rate as other families (see Figure 1) and the effect of the CTC on food hardship among Black families is not significantly different from that of other families. The evidence here nonetheless suggests the effect of the CTC would have been stronger for Black families if more received the CTC.

\(^7\) This evidence is from the summary statistics from Wave 35 of the Pulse survey, which the Census Bureau released on August 25, 2021. The microdata featuring this data are not available at time of writing.

povertycenter.columbia.edu
The middle panels of Figure 4 suggest that the first CTC payment may have contributed to small reductions in difficulty with expenses among families with children; however, the results are generally not statistically significant. The strongest negative point estimate is observed for Hispanic families who received the CTC benefits, but all differences in the estimated effects among racial and ethnic groups are likewise not statistically significant. Finally, the right panels suggest that across race and ethnicity, the first CTC payment did not have immediate effects on missed rent or mortgage payments.

Our results across race and ethnicity suggest that first CTC payment was broadly effective at reducing food insufficiency among low-income Black, Hispanic, and White families who report receiving the CTC. The results also suggest that the reduction effects will continue to grow as more low-income families gain access to the benefits in subsequent months.

**Sensitivity Tests**

A potential threat to our analysis is the effect of seasonality on differential hardship and wellbeing outcomes for households with children relative to childless households. For example, general conditions in July, such as summer vacation for many school-age children, may shape hardship in a way that affects our conclusions. Our read of the evidence suggests that this is unlikely: prior findings suggest that summer vacations tend to worsen food hardship for households with children, given the absence of school meals (Huang, Barnidge, and Kim, 2015). Nonetheless, to test for the effects of seasonality and to add a placebo test to our analysis, we replicate our results using the same months (April through early August) but using the 2020 version of the Pulse. We designate July 15, 2020, as the timing of our treatment and otherwise apply the same treatment specifications as in our primary analysis. The results, presented in Appendix D, show insignificant effects of either treatment for families of any income level.
(Figure D1) and for families of any race and ethnicity (Figure D2). These findings rule out that seasonality is driving our findings and strengthen the likelihood that the expanded CTC is, indeed, responsible for the improved economic conditions of households with children after July 15, 2021.

DISCUSSION & CONCLUSION

The transformation of the Child Tax Credit into a more generous and inclusive monthly payment marks a historic, albeit temporary, shift in the treatment of low-income families with children within the U.S. welfare state. To identify the early impacts of the monthly payments on material hardship, this study applied a series of difference-in-differences estimates using microdata from the Census Household Pulse Survey (Pulse). The findings represent only the initial effects of the first monthly CTC payment delivered mid-July 2021; thus, they should not be interpreted as the final effects of the CTC, particularly given that coverage of the program will likely expand in subsequent months. Nonetheless, our findings from the first payment lead to three primary conclusions.

First, we find that the July 2021 CTC payment strongly reduced food insufficiency among low-income families with children. Specifically, we found that the initial CTC payment was associated with a 12-percentage point, or roughly 43 percent, decline in food insufficiency among low-income families with children (those with 2019 pre-tax incomes of less than $35,000) who received the first CTC payment. Estimates from our treatment intensity indicator suggest that a $100 increase in household size-adjusted CTC benefits is associated with a 7-percentage point, or roughly 25 percent, decline in food insufficiency among this group. These changes mark substantial declines in food hardship. As a result, the share of all low-income families with children (regardless of whether they received the first CTC payment) experiencing food insufficiency...
dropped from 29.8 percent just before the first CTC payment to 20.8 percent after the first payment. For all households with children (regardless of income), the rate of food insufficiency fell from 13.4 percent to 9.4 percent. Our results provide evidence that the first CTC payment has slightly reduced families’ difficulties with affording basic necessities, but the effect size is notably smaller relative to food insufficiency and our findings were generally only statistically significant at the 90-percent confidence level. The first CTC payment did not appear to reduce the share of families who missed a rent or mortgage payment. This is perhaps unsurprising: rent arrears make up a much larger sum than the typical monthly CTC payment (Aurand and Threet, 2021), and most families receiving the CTC payment report spending the benefits on food items (Perez-Lopez, 2021).

Second, we find the effects of the first CTC payment on food insufficiency are concentrated among families with 2019 pre-tax incomes below $35,000; perhaps unsurprisingly, the first payment had little effect on food insufficiency among higher-income groups, as these income groups are less likely to face hardship in the first place. Moreover, the effects on food insufficiency are broadly consistent across low-income White, Black, and Hispanic families with children who received the benefit, though the effects on low-income Asian families were not statistically significant. Notably, the intent-to-treat effects were not statistically significant for low-income Black families, though the treatment effects on the treated were large and significant.

This points to a third important finding in the study: increasing the coverage rate of the CTC is critical for further reducing material hardship. Though the Department of Treasury reports that around 80 percent of children in the U.S. received the first CTC payment, self-reported receipt from the Pulse is closer to 65 percent of all children (U.S. Department of Treasury, 2021a). Notably, the lowest-income families in the Pulse (those reporting 2019 pre-tax incomes of under $25,000) report the lowest receipt rate of the CTC. This aligns with concerns that children in
households who have not filed recent federal taxes – including those in families with very low incomes, disconnected from work or public supports, and/or other challenges – are at greatest risk of missing out on the initial rounds of monthly payments (Cox et al., 2021). We acknowledge, however, that the number of children reached by the monthly payments is likely to increase with time. The US Treasury has already reported the August payment reached 1.6 million more children than did the one for July (US Department of Treasury, 2021b).

As more data are available in future weeks and months, we plan to update our analyses to continue assessing the effects of the monthly CTC payments on material hardship. We anticipate the results in the present analysis provide only a preview of the potential consequences of the CTC expansion. As more children receive the benefit in future months, food hardship, and perhaps other forms of material hardship, may decline further. From the present analysis, we nonetheless conclude that the first payment of the CTC was largely effective at reducing food insufficiency among low-income families with children.
References


APPENDICES

APPENDIX A: Descriptive Statistics and Comparison to CPS ASEC

Table A1: Descriptive statistics in Census Household Pulse Survey compared to the Current Population Survey

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All (April to August 2021)</td>
<td>Before July 15, 2021</td>
</tr>
<tr>
<td>Female</td>
<td>52.2%</td>
<td>52.3%</td>
</tr>
<tr>
<td>No High School Degree</td>
<td>6.6%</td>
<td>6.6%</td>
</tr>
<tr>
<td>College Degree</td>
<td>34.7%</td>
<td>34.8%</td>
</tr>
<tr>
<td>Age</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Married</td>
<td>57.9%</td>
<td>58.0%</td>
</tr>
<tr>
<td>Children in HH (Binary)</td>
<td>36.4%</td>
<td>36.5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15.2%</td>
<td>15.1%</td>
</tr>
<tr>
<td>Black</td>
<td>10.9%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Asian</td>
<td>5.6%</td>
<td>5.5%</td>
</tr>
<tr>
<td>2019 Income: $0-25,000</td>
<td>14.3%</td>
<td>14.1%</td>
</tr>
<tr>
<td>2019 Income: $25,000-100,000</td>
<td>54.5%</td>
<td>54.7%</td>
</tr>
<tr>
<td>2019 Income: $100,000+</td>
<td>31.2%</td>
<td>31.2%</td>
</tr>
</tbody>
</table>

Note: Pulse estimates from all survey respondents in specified month(s). CPS estimates from sample of 18 to 88 year old individuals in ASEC survey (matching the age span of respondents in the Pulse).
APPENDIX B: Continuous Indicator of Treatment Intensity

Our continuous indicator of treatment intensity captures variation in expanded CTC benefits based on age of the children, the number of children in the home, and the relative value of the new CTC benefits compared to what the family likely earned from the existing CTC prior to the reform. As detailed in the manuscript, we use data from the 2019 U.S. Current Population Survey to estimate the mean pre- and post-reform benefit values for bins defined by the number of adults in the household (ranging from 1 to 10), the number of children in the household (ranging from 0 to 10), and eight-category pre-tax income bins (from under $25,000 annually scaling up to more than $200,000 per year). We then import this value into the Pulse, matching on the number of adults, number of children, and 2019 pre-tax income category of the Pulse respondents. Below, we visualize the mean size-adjusted net CTC benefits by income bin and family size.
**Figure B1**: Mean size-adjusted net CTC benefits per month by number of children in household and income bin

Note: Income bins are staggered from (1) under $25,000, (2) $25,000 - $34,999, (3) $35,000 - $49,999, (4) $50,000 - $74,999, (5) $75,000 - $99,999, (6) $100,000 - $149,999, (7) $150,000 - $199,999, and (8) $200,000 or more.
**Figure B2**: Mean size-adjusted net CTC benefits per month by number of children in household and family type among families with 2019 pre-tax income below $35,000
Figure B3: Estimated effect of CTC on outcome by 2019 pre-tax household income cutoff and alternative treatment specification: coverage-adjusted CTC treatment intensity

Note: Y-axis plots coefficients from interaction of treatment indicator and post-treatment dummy, similar to results from Tables 1 and 2. All models include age, education, sex, and wave dummies. Separate estimates run for each income group displayed on Y-axes.
APPENDIX C: Descriptive trends in hardship and wellbeing by number of children

**Figure C1:** Trends in hardship and wellbeing for households with children, by number of children (April 14 to August 2, 2021)

Note: Red vertical line represents first payment of expanded Child Tax Credit. Y-axis for “spending on food for home” differs from other indicators. See Table 1 for definition of each outcome.
APPENDIX D: Placebo and Seasonality Tests

Figure D1: Seasonality test in 2020 sample (April 23-July 21, 2020): Binary treatment set to post-July 15, 2020 and continuous treatment equivalent to primate analysis; estimates by income cutoff

Note: Y-axis plots coefficients from interaction of treatment indicator and post-treatment dummy, similar to results from Tables 1 and 2. All models include age, education, sex, and wave dummies. Separate estimates run for each income group displayed on Y-axes.
Figure D2: Seasonality test in 2020 sample (April 23-July 21, 2020): Binary treatment set to post-July 15, 2020 and continuous treatment equivalent to primate analysis; estimates by race/ethnicity

Note: Y-axis plots coefficients from interaction of treatment indicator and post-treatment dummy, similar to results from Tables 1 and 2. All models include age, education, sex, and wave dummies. Separate estimates run for each income group displayed on Y-axes.
Appendix E: Effects on Subjective Wellbeing

The findings below present an extra set of analyses focused on subjective wellbeing. The indicators are defined as follows:

<table>
<thead>
<tr>
<th>Subjective Wellbeing</th>
<th>How confident are you that your household will be able to pay your next rent or mortgage payment on time? Select only one answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of confidence in paying the rent or mortgage</td>
<td>Not at all or slightly confident.</td>
</tr>
<tr>
<td>Frequent Anxiety or Worrying</td>
<td>Over the last 7 days, how often have you been bothered by the following problems ... Feeling nervous, anxious, or on edge?</td>
</tr>
<tr>
<td>Frequent Worrying</td>
<td>More than half the days or nearly every day.</td>
</tr>
</tbody>
</table>

Over the last 7 days, how often have you been bothered by the following problems ...

Feeling nervous, anxious, or on edge?

Not being able to stop or control worrying?

Figure E1: Estimated effect of CTC on subjective wellbeing by 2019 pre-tax household income cutoff and treatment specification

- Binary Treatment
- Continuous Treatment
Suggested Citation


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