Universiteit Antwerpen

This item is the archived peer-reviewed author-version of:

Extreme child poverty and the role of social policy in the United States

Reference:
Parolin Zachary, Brady David.- Extreme child poverty and the role of social policy in the United States
JOURNAL OF POVERTY AND SOCIAL JUSTICE - ISSN 1759-8273 - 27:1(2019), p. 3-22
Full text (Publisher's DOI): https://doi.org/10.1332/175982718X15451316991601

uantwerpen.be
Institutional repository IRUA

Extreme Child Poverty and the Role of Social Policy in the United States

Zachary Parolin
University of Antwerp

David Brady
University of California, Riverside

Forthcoming in *Journal of Poverty & Social Justice*. Recipient of the 2018 Best Paper Prize from the Foundation for International Studies on Social Security.

November 20, 2018

Abstract: This paper applies improved household income data to reevaluate the levels, trends, composition, and role of social policy in extreme child poverty in the U.S. from 1997-2015. Unlike prior research, we correct for the underreporting of means-tested transfers and incorporate the Supplemental Nutritional Assistance Program (SNAP). Doing so reduces the share of children below $2 per day from about 1.8% to 0.1%. That said, we acknowledge use of survey data omits the estimated 1.3 million homeless children in 2014-2015. We find that three different measures of extreme child poverty have declined since 1997. Unlike prior literature's focus on single motherhood, citizenship status is the more consequential characteristic. Between 58-73% of children in extreme poverty live in households headed by non-citizens. Simulations granting them access to the median SNAP benefit reduce their extreme poverty substantially. Two-way fixed effects models show that higher state-level generosity and take up of SNAP and TANF significantly reduce extreme poverty. Unlike prior research's focus on the decline of TANF, we show SNAP has grown in generosity and take-up. In turn, changes to social policy since 1997 have probably had offsetting effects on extreme child poverty.

Keywords: child poverty, extreme poverty, social policy, welfare reform

Direct correspondence to Zachary Parolin (zachary.parolin@uantwerpen.be). For helpful comments and discussion, the authors are grateful to Liana Fox, Jennifer Laird, Jane Waldfogel, Christopher Wimer, participants of Columbia University's poverty seminar series, and attendees of the 2018 FISS Conference.

Debate has emerged in recent years regarding levels and trends of extreme child poverty in the United States (Jencks 2016, Wilson 2017). Edin and Shaefer (2016) report that 1.5 million households with 3 million children lived on less than $2 per day of cash income in a month in 2011. Moreover, the authors argue that the number of families living in extreme poverty has increased 37 percent between 1996 and 2011. In response, researchers have investigated patterns of extreme poverty using alternative datasets and definitions of household income, offering mixed evidence on whether extreme child poverty is high and/or increasing (Fox et al. 2015, Meyer and Wu 2018, Smith and Chandy 2014, Winship 2016).

This study addresses three primary shortcomings of recent analyses on extreme child poverty. First, most prior analyses have utilized household income data that suffers from the underreporting of means-tested transfers – such as benefits from the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), and Supplemental Security Income (SSI) programs – and/or a conceptualization of income that does not include near-cash transfers, such as SNAP benefits (formerly known as and often referred to as 'food stamps'). Second, prior analyses have not provided a sufficiently comprehensive portrait of the composition of children living in extreme poverty. Third, prior work has not fully analyzed the role of social policy. As such, it remains unclear how the evolution of social assistance policies since the 1996 welfare reform has shaped extreme child poverty.

We use higher quality income data than previous research to describe the levels and trends in extreme child poverty in the U.S. from 1997 to 2015.[1] Specifically, we augment the Annual Social and Economic Supplement of the Current Population Survey (CPS ASEC) with the Urban Institute's Transfer Income Model, Version 3 (TRIM3) microsimulation model while applying the income definition of the Luxembourg Income Study. In doing so, we show

[1] We begin our analysis in 1997 as this is the first year in which TANF was implemented. Our construction of indicators of TANF generosity preclude us from including years prior to TANF.

that income measurement influences estimates of the levels and trends of deep and extreme poverty. When SNAP benefits are counted as household income, for example, we find that levels of extreme poverty among children have *declined* since the mid-1990s and have remained relatively low in recent years. This is true even if SNAP benefits are valued at 50 cents to the dollar. We acknowledge, however, that our estimates from survey data only cover the non-homeless and non-institutionalized population. In 2014-2015, the U.S. Department of Education identified 1.3 million children in public schools as homeless or living in precarious housing situations. Including these children in our counts of extreme poverty would substantially increase our estimates. As national estimates on child homelessness are only available in recent years, it is unclear whether levels of homelessness have increased from 1997 onward, or how these might affect trends in extreme child poverty.

In detailing the composition of households with children living in extreme poverty, we differ from the prior literature's focus on single parenthood as one of the key characteristics of children living in $2 per day poverty (Edin and Shaefer 2018, Fox et al. 2015). Our analyses reveal that the more consequential characteristic is citizenship and nativity status. Between 56 to 73 percent of children in extreme poverty live in a household headed by a non-citizen. Simulations granting them access to the median SNAP or TANF benefit reduces their extreme poverty substantially. By contrast, we find that only about 15 to 30 percent of children in extreme poverty live in single-parent households.

Finally, we move beyond prior analyses in evaluating how social policy changes since the 1996 welfare reform have shaped extreme child poverty. We introduce new indicators of TANF and SNAP take-up, estimating the share of *eligible* households who actually receive the respective benefit in each state-year.[2] We also apply indicators of TANF and SNAP

[2] State governments administer their own TANF programs. Thus, benefit levels and eligibility criteria for cash assistance vary across state and year. SNAP ('food stamp') benefit levels, conversely, are set at the federal level and are consistent across the 48 contiguous United States, but vary by household size and are set at higher levels in Alaska and Hawaii.

generosity, which measure the level of benefits to which the average eligible household is entitled and the income eligibility criteria used to define who can gain access. In a longitudinal state and year fixed effects model, we find that rising SNAP take-up has offset the increases in extreme poverty due to the decline of TANF. Still, the share of children living in extreme poverty would be lower if TANF take-up had not declined since 1997. In turn, changes in social policy since 1997 have probably had offsetting effects on extreme child poverty.

LEVELS & TRENDS IN EXTREME CHILD POVERTY

Several studies have detailed high levels of extreme child poverty after the implementation of TANF in 1996. Most notably, Edin and Schaefer (2015, 2016, 2018) claim that the share of children living with less than $2 per person per day of cash income has increased in the two decades after TANF's introduction. In response, Winship (2016) utilizes the CPS ASEC and a more comprehensive definition of household income to conclude that $2 per day poverty is close to non-existent within the U.S. and has declined since 1993. Using administrative records for 11 states within the Survey of Income & Program Participation (SIPP), Meyer and Wu (2018) similarly find a very small prevalence of $2 per day poverty in 2011. Though these analyses have made important progress in the measurement of extreme poverty, they are unfortunately based on problematic data, definitions of household income that do not align with best practices in poverty literature, and/or an absolute poverty threshold that lacks scientific validity. We address these in turn and discuss how each affects understandings of levels and trends in extreme child poverty.

First, it is now well established that household income data from the CPS ASEC and the SIPP – the two surveys most often used to produce poverty estimates – are generally unreliable at estimating incomes at the very bottom of the income distribution. Plotting the

CPS ASEC data against administrative records, for example, Meyer and Mittag (2015) find that the survey data underestimates the level of SNAP and TANF benefits distributed by around 50 percent each. Similar issues of underreporting have been reported in the SIPP, the dataset Shafer and Edin (2013) use (Meyer and Mittag 2015). In both surveys, underreporting has worsened over time, suggesting that the reported upward trends in extreme poverty could be partially a result of declining quality of survey data. The Urban Institute's TRIM3 offers a series of imputations to address the underreporting of several means-tested transfers including TANF, SNAP, and SSI. As discussed more in the next section, this paper applies these imputations to the CPS ASEC to produce more accurate poverty estimates.

Second, reliable estimates of income poverty should align with best practices in the international income measurement literature. In recent decades, consensus has emerged among poverty and inequality scholars that measures of income should be as comprehensive as possible, incorporating all taxes and transfers (Brady et al. 2018, Duncan and Petersen 2001, Rainwater and Smeeding 2003, Smeeding and Weinberg 2001). Shaefer and Edin's (2015) main results are based on cash income excluding near cash transfers (e.g. SNAP and refundable tax credits). Although Edin and Shafer's (2018) recent revision of their original findings estimates of $2-per-day poverty with TRIM3 imputations, they still exclude SNAP from their income definition.

By contrast, considerable evidence suggests that SNAP carries meaningful value for low-income families. SNAP plays a crucial role in smoothing and stabilizing the consumption of low-income households (Bartfield et al. 2015, Gundersen and Ziliak 2003, Hoynes and Schanzenbach 2009, Shaefer and Guiterrez 2012). Since the 1990s, SNAP receipt has grown substantially as benefit values and eligibility criteria have expanded (Danziger 2010, Moffitt 2015). In turn, analyses of poverty trends that exclude SNAP are bound to overestimate the prevalence of poverty at the bottom of the income distribution.

Finally, the $2 per day poverty threshold that these prior studies apply is not rooted in scientific evidence on standards of individual needs. Instead, it appears to be used primarily for the rhetorical purpose of highlighting the World Bank's metric for global poverty. Even the World Bank measure, however, is detached from any objective needs standards that would justify an absolute poverty threshold. Following the dominant practice in poverty literature, we supplement the $2 per day threshold with two relative poverty thresholds based on median equivalized household income (Brady 2009, Fox et al. 2014, Fox et al. 2015, Rainwater and Smeeding 2003). The first relative threshold sets the poverty line at 10 percent of national median income in each year. The second threshold anchors the poverty line at 10 percent of the median in 1997, the first year in our analysis, and updates the anchored threshold for inflation in each subsequent year.

COMPOSITION OF EXTREME CHILD POVERTY & THE ROLE OF SOCIAL POLICY

Prior research documenting trends in extreme poverty has focused less on the composition of the extreme poor or the role of social policy in shaping patterns of extreme poverty. Sample size issues within the SIPP have hindered reliable empirical analyses of the composition or sources of extreme poverty. Meanwhile, studies utilizing the CPS ASEC have focused primarily on trends using alternative income definitions (Winship 2016) or descriptive analyses of the family structure of the extreme poor using a cash-only income definition (Edin and Shaefer 2018). To the best of our knowledge, no study has moved beyond descriptive evidence to assess how demographic characteristics and policy changes have contributed to changes in extreme child poverty.

Regarding the composition of extreme child poverty, prior research has concentrated primarily on single parenthood (Edin and Shaefer 2018, Fox et al. 2014). Using the CPS ASEC but still excluding SNAP benefits, Edin and Shaefer (2018) document that single-parent households are much more likely than two-parent households to live in extreme

poverty. It remains unclear, however, how the inclusion of SNAP benefits into household income would alter the demographic composition of the extreme poor. Consider that single-parent households are more likely than two-parent households to receive SNAP benefits. Additionally, they are more likely to be affected by adjustments to underreporting of TANF and SNAP. Thus, better data and a more comprehensive definition of income may alter the prevalence of single-parent households among the extreme poor.

Entangled in the debate of *who* is in extreme poverty is the role of social policy. Several scholars suggest that an increase in extreme poverty has resulted from welfare reform, or the introduction of the TANF program in 1996 (Danziger 2010, Moffitt 2015, Shaefer, Edin and Talbert 2015). Since welfare reform, however, SNAP benefits have gradually increased in both benefit value and take-up rate as TANF benefits have declined. From 1998 to 2015, for example, spending on cash assistance from TANF declined from about $13.9 billion to $7.7 billion in nominal terms (Center on Budget & Policy Priorities 2015). During the same timeframe, spending on SNAP benefits has increased from about $16 billion to $69.7 billion in nominal terms (U.S. Department of Agriculture 2017). Despite TANF's decline, the net gain in combined in TANF and SNAP spending on (near-)cash assistance from 1998 to 2015 was more than $47 billion due to the rise of SNAP benefit levels and expansion of eligibility requirements. Despite these simultaneous changes, few empirical studies have measured the relative importance of TANF and SNAP policy changes on levels of extreme child poverty. None, to our best knowledge, has done so longitudinally while using high-quality household income data. As discussed before, we expect that including SNAP in our income definition will alter the level, trends, and composition of extreme child poverty. Given that that rise of SNAP benefits has outpaced the decline of TANF benefits, we also posit that policy changes to SNAP have been more consequential than retrenchment in TANF cash assistance in shaping extreme poverty trends.

DATA & METHODS

We use a modified version of the CPS ASEC to reassess the prevalence and composition of extreme child poverty when SNAP benefits, as well as all other taxes and transfers, are included into measurements of household income. First, we apply the Urban Institute's (2017) TRIM3 microsimulation model to address undercounting of SNAP, TANF, and SSI in the CPS ASEC. As Parolin (2017) demonstrates, the unadjusted CPS ASEC data in 2015 fails to account for around 47 percent of SNAP benefits, 55 percent of TANF benefits, and 12 percent of SSI benefits. In contrast, the TRIM3-adjusted CPS ASEC captures 89 percent of SNAP benefits, 85 percent of TANF benefits, and 98 percent of SSI benefits in 2015. Second, we demonstrate how decisions regarding income measurement substantially affect levels and trends of extreme poverty. Beginning with a cash-only measure of income comparable to Edin and Shaefer (2016), we add SNAP benefits to our income definition (first valued at 50 percent of market value, and then at full value), and then match the disposable household income of the Luxembourg Income Study (LIS 2016), which includes all taxes and transfers and is widely understood to align with best practices in income measurement (Brady 2009, Filauro and Parolin 2018, Rainwater and Smeeding 2003).

The data cover each year from 1997 to 2015 — the first year of TANF implementation to the most recent year for which the augmented income data is available. We exclude pre-TANF years as our indicators of benefit generosity, detailed below, are not available prior to the program's introduction. We limit our sample to children, defined as dependents below the age of 18 who live with one or more adults. This results in a sample size of 1,030,234 children across all years. We first present descriptive statistics on trends in extreme poverty from 1997 to 2015. Second, we summarize the demographic characteristics of children living beneath the poverty lines. Finally, we estimate and analyze our models of the determinants of extreme child poverty.

Estimation Strategy

In estimating the likelihood of poverty, we set a child's poverty status (binary variable) as the dependent variable for each of our analyses. We estimate three models, one for each of our different poverty concepts. As discussed in the prior section, these include: disposable household income below $2 per person per day, below 10 percent of federal median equivalized household income in the given year, and below 10 percent of the 1997 median. We apply the TRIM3 benefit corrections and use the LIS definition of disposable income to measure poverty outcomes. We adjust household incomes using the square root equivalence scale. Note that in their primary findings, Edin and Shaefer (2016) do not equivalize household incomes when measuring $2 per day poverty. In this paper, we follow the common practice in poverty research of equivalizing household incomes. In sensitivity analyses, we re-run our estimates with non-equivalized incomes. The only change is a slight increase in the share of children living below $2 per day in each year. However, the trends, demographic composition, and estimation results are not affected by decisions to equivalize.

Our estimation strategy primarily focuses on differences in TANF and SNAP benefit levels and accessibility across state and year. Specifically, we operationalize the *generosity* of TANF and SNAP benefits and *take-up rates* among eligible households of TANF and SNAP in each state-year as our primary explanatory variables. We use indicators of TANF generosity from Parolin and Luigjes (2018), who construct a variable that measures *generosity* as a combination of the level of benefits to which a household is entitled, as well as the income eligibility criteria used to define who can gain access to the benefit. This marks an improvement over simply applying the maximum TANF benefit level for a family of three in a given state-year, as the maximum benefit does not take into account changes in which income levels are actually eligible for benefits in a given state and year. While TANF generosity is set at the state level and thus varies across state-year, benefit levels and income

eligibility criteria for SNAP are determined by the federal government, meaning that there is little variation across states, but ample variation across year and household size. We depict the evolution of both the mean TANF and SNAP generosity over time in Figure 1. The gradual decline in TANF generosity over time is evident, as is the increase in SNAP generosity, particularly after policy changes to increase benefit levels during the Great Recession.

[INSERT FIGURE 1 ABOUT HERE]

To calculate take-up rates among eligible households for TANF and SNAP, we simply use indicators of eligibility and benefit receipt from the Urban Institute's TRIM3 microsimulations (the same source as the benefit imputations to correct for the underreporting of TANF, SNAP, and SSI). When assessing an individual's eligibility for TANF or SNAP, the TRIM3 simulations take into account income, citizenship status, household structure, categorical eligibility, and ownership of assets. It thus provides perhaps the most accurate representation yet (at least within public survey data) of how many individuals are eligible for a benefit, and how many of those individuals actually receive the benefit.[3] As we primarily evaluate household-level income, we aggregate up from the individual to the household level: if any member in a household is eligible for TANF or SNAP, we deem the household as eligible. For each state-year, we then calculate the share of eligible households that actually receive the respective benefit (TANF or SNAP). To ensure adequate sample sizes, we calculate a three-year rolling average of states' take-up rates. This value for each state-year is merged back into our original dataset to be applied in our estimations of extreme poverty.

[3] The indicator does not take into account individuals who meet income and asset requirements, but are ineligible due to (for example) failure to meet work participation or drug test requirements. These barriers to benefit receipt are implicitly captured in our take-up variable.

Figure 2 highlights the divergence between TANF and SNAP take-up rates. After welfare reform, states have increasingly implemented barriers to TANF access. These include strict lifetime time limits, drug test requirements, work participation and conditionality requirements, and so on. Our measure of take-up implicitly captures the effect of these barriers to benefit access and can help us identify how such barriers (and the declining TANF take-up to which they lead) affect poverty outcomes. In 1997, the average state had a TANF take-up rate of more than 60 percent of income-eligible households. By 2015, this had fallen to 25 percent. Still, large variation exists across states: over 2013 to 2015, California featured a TANF take-up rate of more than 60 percent, while the rate was around 8 percent in Georgia during these years. SNAP take-up, meanwhile, has gradually increased over time with less variance across states.

[INSERT FIGURE 2 ABOUT HERE]

Following prior literature on the determinants of poverty (Brady and Burton 2016, Brady, Finnigan and Hübgen 2017, Laird et al. 2018), we include a variety of individual, household, and state-year controls in our analyses. Individual and household controls include the number of children in the household, the employment status of the household head, education level of the household head, age of the household head, race/ethnicity of the child, household type, a dummy if the two-earner household is a dual-earner family, and dummy variables indicating the nativity of the child and citizenship status of the household head. State-year controls include a state's real GDP per capita, union density, and unemployment rate.

We estimate two-way fixed effects models to focus on how changes in TANF and SNAP policies *within* states from 1997 to 2015 affect poverty. This model focusing on within-state policy changes is specified as follows:

$$y_{istf} = \beta_0 + \beta_1 TANFGen_{stf} + \beta_2 SNAPGen_{stf} + \beta_3 TANFTake_{st} + \beta_4 SNAPTake_{st} + \beta_5 X_i + \beta_6 \alpha_{st} + \delta_s + \gamma_t + \varepsilon_i \quad (1)$$

where *i* indexes individuals, *s* indexes states, *t* indexes years, and *f* indexes the size of the household. Y_{istf} is our binary poverty variable. β_1 and β_2 provide the estimated effects of our TANF and SNAP generosity variables, respectively. β_3 and β_4 estimate the effects of our TANF and SNAP take-up variables. X_i is a vector that contains our individual and household controls, while α_{st} controls for the state-year characteristics described previously. State (δ_s) and year (γ_t) fixed effects control for, respectively, time invariant differences on the outcome variable that vary across state, and national trends or policies that apply across all states but vary by year. We apply robust standard errors clustered at the state level. We perform linear probability models when assessing the effect of the policy parameters on the likelihood of poverty. Results are robust when estimated using logistic regression.

RESULTS

Levels and Trends

We begin by describing the trends in extreme child poverty from 1997 to 2015. To demonstrate the relevance of applying a comprehensive definition of income and using the augmented CPS ASEC data, Figure 3 displays trends in $2 per day poverty before and after TRIM3 corrections and SNAP benefits are included.

[INSERT FIGURE 3 ABOUT HERE]

The headline findings in Shaefer and Edin (2016) most closely resemble the highest of the four lines – the poverty trends without TRIM3 adjustments or SNAP benefits. Estimating $2 per day poverty rates without equivalizing income leads to identical trends, but slightly higher rates than the equivalized estimates that we present. In 2015, the pre-TRIM3, pre-SNAP level of $2 per day poverty was about 1.84 percent of children. When applying TRIM3 adjustments to correct the underreporting of TANF and SSI (though still excluding SNAP benefits), the estimated rate falls to about 1.07 percent of children in 2015, a 42 percent decline. When TRIM3-adjusted SNAP benefits are included at a value of 50 cents to the dollar, the estimated rate of $2 poverty falls from 1.84 percent to about 0.11 percent of children. In other words, adjusting for underreporting and valuing SNAP at 50 percent of its market rate reduces the share of children in extreme poverty by 94 percent (1.73 percentage points). Moreover, Figure 3 shows that this form of extreme poverty has declined since the late 1990s, again in contrast to studies assigning zero value to SNAP benefits.

Applying a complete measure of disposable income (valuing SNAP at 100 percent of its market value and including all taxes and transfers) drops the $2 poverty rate down to about 0.08 percent in 2015, though the difference is not statistically significant from the prior measure. This suggests that the inclusion of SNAP benefits, even when valued at half their market rate, substantially affects levels and trends of $2 per day poverty.

[INSERT FIGURE 4 ABOUT HERE]

Do other measures of 'extreme' poverty exhibit the same trends? Figure 4 depicts trends for each of our three measures using the augmented CPS ASEC and the LIS concept of disposable income. Poverty as defined as 10 percent of the national median incomes appears to have declined between the late 1990s and 2015. In the latter year, an estimated 0.43 percent

lived below 10 percent of the federal median income. Similarly, the anchored threshold at the 1997 median appears to have declined from 1997 onward. In 2015, the anchored estimate was not statistically different from the 10 percent of median estimate in the same year.

Composition

With a more accurate estimate of *how many* children live in extreme poverty, we can now turn toward understanding the characteristics of such children and their households. Table 1 provides a descriptive overview. To ensure that our descriptive data is pulled from an adequate sample size of children, we pool the five latest years of data (2011 to 2015), providing us an unweighted sample of 173 children in $2 per day poverty, 708 beneath 10 percent of the federal median, and 609 below 10 percent of the 1997 median. Confidence intervals at the 95 percent level are presented for all estimations.

Perhaps the most striking finding in Table 1 is the share of children in $2 poverty who were either born outside the U.S. or live in a household headed by a non-citizen. Our estimates show that an estimated 73 percent of children in households with less than $2 per day live in a household headed by a non-citizen. Nearly 60 percent of the children themselves were born outside of the U.S. These facts suggest that ensuring adequate social protection for non-native families may be the most direct way to further reduce levels of extreme poverty.

[INSERT TABLE 1 ABOUT HERE]

In prior analyses of extreme poverty, nativity or citizenship status largely go unmentioned. Fox et al. (2015) measure race and ethnicity, but primarily focus on family structure, such as the prevalence of single motherhood. Similarly, Edin and Shaefer (2016, 2018) focus predominantly on the number of poor children living in single mother

households. Our evidence suggests, however, that only 13.5 percent of children living in $2 per day poverty lived in a single mother household.

This discrepancy between our findings and that of previous work is largely due to our corrections for underreporting and inclusion of SNAP. In Appendix I, we present the same summary statistics of children living in $2 per day poverty, but with the three alternative definitions of household income presented before in Figure 3. When using the TRIM3-adjusted cash-only definition of income (prior to including SNAP benefits), for example, we find that 92 percent of households in $2 per day poverty are estimated to receive some value of SNAP benefits during the year. When we add only half the value of SNAP benefits to household income, the estimated share of poor children living in non-citizen households jumps from 21 to 71 percent, while the share living in single-parent households falls from 55 to 15 percent.

The Role of Social Policy

We now turn to our estimation results to understand how policy changes have affected extreme child poverty. Table 2 shows the results of the state and year fixed effects estimation for each of our three measures of extreme poverty. To ease interpretation, we present X- and Y-standardized coefficients for our state-level variables, including TANF and SNAP generosity and take-up. Thus, the slopes presented in table should be interpreted as the estimated standard deviation increase (or decrease) in poverty rates due to a one standard deviation difference in a state's SNAP take-up, for example. We present all binary household/individual-level variables as Y-standardized coefficients.

The first row of Table 2 shows that higher TANF benefit generosity within a state is associated with reductions in the likelihood of living below 10 percent of federal median income, but has no significant effect on the likelihood of living below the $2 per day

benchmark or the anchored median. TANF take-up among eligible households is similarly negative and significant across the two relative measures, but not for the $2 per day measure. In other words, the observed decline of TANF take-up within states from 1997 to 2015 (while controlling for changes to SNAP) has contributed to increases in the likelihood that a child lives below 10 percent of the yearly or 1997 median. However, Table 2 shows that the observed increase in SNAP take-up among eligible households (while controlling for changes to TANF) has reduced the likelihood that a child lives below each of the three benchmarks of extreme poverty. As a result, the diverging trends in TANF and SNAP have counteracted each other in shaping the likelihood that a child lives in poverty.

[INSERT TABLE 2 ABOUT HERE]

Among individual and household characteristics, we find that children who were born outside of the US or who live in a household headed by a non-citizen are significantly more likely to live in extreme poverty. This aligns with the descriptive statistics presented in Table 1. The results also show that living in a single-mother household actually *reduces* the likelihood of living in $2 poverty, though the effect is insignificant and positive for the other extreme measures. That single motherhood reduces the probability of $2 per day poverty aligns with our descriptive statistics, but stands in direct contrast to the focus of prior extreme poverty analyses. Again, this is primarily due to the inclusion of SNAP.

We can predict a number of counterfactual rates of poverty if certain policy or demographic characteristics were to change. For example, what would be the rate of $2 per day poverty during 2011 to 2015 if TANF or SNAP benefit values matched their 1997 levels? Figure 5 presents these counterfactual results. The estimates include the observed rate of poverty over an average of 2011 to 2015, as well as counterfactual rates of 2011 to 2015 poverty if 1997 TANF/SNAP benefit levels and take-up rates were achieved.

[INSERT FIGURE 5 ABOUT HERE]

For each of the three measures, we see that changes in take-up matter more than changes in benefit generosity in shaping extreme child poverty. If 1997 levels of TANF take-up were achieved, poverty rates below the anchored median would fall from 0.27 percent to an estimated 0.07 percent. For the $2 per day poverty threshold, poverty rates would fall from 0.08 percent to 0.04 percent. Recall, however, that TANF take-up was not statistically significant in the prior estimates for the $2 per day measure. Though it has a large estimated effect size, we cannot conclude with certainty that TANF take-up would affect levels of $2 per day child poverty.

If we had not seen the rise of SNAP take-up from 1997 onward, extreme poverty would likely be significant higher. For our anchored median, for example, reverting to 1997 levels of SNAP take-up would increase extreme child poverty from 0.27 percent to 0.53 percent. We would see similar increases in the share of children living below 10 percent of the annual median income (a rise from 0.31 percent to 0.58 percent) and children living below $2 per day (from 0.08 percent to 0.25 percent). The final bar for each measure of extreme poverty depicts the estimated change if all four of the policy variables were to revert to their 1997 levels. That each is higher than the baseline emphasizes the importance of SNAP in shaping extreme child poverty. The rise in benefit generosity and take-up rates of SNAP from 1997 onward have more than offset the increases in extreme child poverty due to the decline of TANF. Not including SNAP into analyses of extreme child poverty, then, will certainly lead to dramatically different results, as our study shows.

Given that children in households headed by non-citizens appear to be a substantial part of the extreme poor, we can also estimate the effect of extending SNAP benefits to these households. In this simulation, we simply offer the median SNAP benefit during 2011-2015

to each of the non-citizen households living in extreme poverty. In recalculating extreme poverty rates, we see large decreases. The estimated $2 per day poverty rate would drop from 0.08 percent to 0.03 percent – a reduction larger than achieving 1997 levels of TANF take-up. Similarly, extreme child poverty measured at 10 percent of annual median would fall from 0.31 percent to 0.21 percent. Finally, the anchored measure of extreme child poverty would fall from 0.27 to 0.18 percent. Though only a descriptive exercise, the changes in the estimates lead to a firm conclusion. If non-citizens had greater access to social assistance benefits in the U.S., extreme child poverty would be substantially reduced.

Limitations of Survey Data

Two important limitations of this study must be emphasized. First, survey data of household incomes do not generally capture homeless families or individuals in transient housing situations. As such, any attempts to measure extreme poverty using survey data can only provide a lower-bound estimate of the true prevalence. In recent years, the U.S. Department of Education has instructed all public school districts to report on the number of children within its schools living in precarious housing situations. This count includes children who are homeless, doubling up with other families, or residing in hotels/motels due to unstable housing situations. In 2015, more than 1.3 million children across the U.S. were included in this account. It is probable that these same households were excluded from the CPS ASEC. If we assume that many of these households would qualify as living in extreme poverty, then the estimated share of $2 per day poverty would increase up to 1.8 percent of all children.

A second potential limitation is our reliance on imputed benefit adjustments rather than administrative data. The integration of administrative records on SNAP and TANF receipt would be preferable to probability-based imputations in adjusting for benefit underreporting. However, only 13 states share administrative SNAP records, and only for a

small number of years. Thus, administrative data cannot be used to understand trends in extreme poverty across the U.S. from 1997 onward, while the TRIM3-adjusted data can.

A separate but related concern is that TRIM3 may over-impute SNAP benefits to households with zero gross incomes, driving down our $2 poverty estimates. During 2011-2015, for example, Stevens, Fox and Heggeness (2018) find that, according to administrative records, an unknown amount below 5 percent of annual SNAP participation is concentrated among households with zero gross income. Conversely, our TRIM3-adjusted CPS ASEC data suggests that 5.26 percent of SNAP participation is concentrated among zero-income households in those same years. To account for the possibility that the TRIM3-adjusted SNAP allocations overcorrect at the very bottom of the income distribution, we conduct a sensitivity analysis that simulates the share of zero-income households receiving SNAP benefits. We assume that the reported SNAP participation in the unadjusted CPS ASEC is a lower-bound estimate of the true SNAP participation, and that participation in the TRIM3-adjusted CPS ASEC is an upper-bound estimate. For each year, we then calculate the midpoint between the unadjusted and TRIM3-adjusted SNAP participations rates among zero-income households, and remove SNAP benefits from households at zero income (using a random number generator) until participation rates reach the midpoint value. In 2015, for example, the unadjusted participation was 3 percent, the TRIM3-adjusted was 5 percent; thus, we adjust the participation rate to 4 percent.

We then re-estimate all the $2 per day measures. As expected, the share of children living in $2-per-day poverty increases slightly after these adjustments. Using our measure of equivalized disposable household income, the $2 poverty rate increases from 0.08 percent to 0.12 percent over a five-year average of 2011 to 2015. The demographic characteristics and trends presented in the primary analysis are, however, not substantially altered in the sensitivity analysis.

DISCUSSION

This study investigates the prevalence and determinants of extreme child poverty in the United States. In contrast to prior studies of extreme poverty, we apply an augmented set of survey data that adjusts for the underreporting of means-tested transfers. Moreover, we follow the standards of LIS, the Cross-National Data Centre in Luxembourg, in utilizing a definition of disposable income that includes all taxes and transfers. In our empirical investigations, we apply novel measures of TANF and SNAP generosity and take-up among eligible households to understand the evolution of extreme child poverty from 1997 to 2015.

Our findings demonstrate that the prevalence of extreme poverty among the non-homeless, non-institutionalized population is far lower than previous studies have estimated. Rather than the 3 million children living in households with less than $2 per person per day, we estimate the number around 60,000 children per year between 2011 and 2015. We show that the inclusion of SNAP benefits strongly affects levels and trends of extreme poverty. Even if SNAP benefits are added to a household's cash income at half of their market value, the estimated rate of children living with household income under $2 per day drops by more than 90 percent.

Moreover, we find that evaluations of extreme poverty using the uncorrected household income data have resulted in a mischaracterization the demographic composition of the extreme poor. Of all children in $2 poverty, only around 14 percent are estimated to live in single mother households – the family type often associated with extreme poverty in previous analyses. Instead, citizenship status and nativity appear to be the strongest predictors of extreme poverty. Around 70 percent of all children living with less than $2 per person per day live in a household headed by a non-citizen. This finding leads to a direct policy conclusion.

To reduce extreme poverty, the U.S. needs to expand social assistance programs, such as TANF and SNAP, to non-citizens.

In analyses of the determinants of extreme poverty, we found that the decline of TANF benefit levels and take-up rates among eligible households have contributed to increases in extreme poverty. If TANF take-up were to match its 1997 levels, we estimate a more than 50 percent reduction in each of our three measures of extreme child poverty. However, the increases in SNAP take-up have more than offset TANF's decline from 1997 onward. If SNAP take-up had not increased over the years, extreme child poverty would be much higher than the observed levels.

Our findings have several implications for poverty research and policy debates. Perhaps the most substantial takeaway is the difference in poverty estimates when adjusting for underreporting and including SNAP benefits into definitions of household income. Estimates of poverty derived from the uncorrected CPS ASEC are likely to overestimate the true prevalence of poverty, particularly among household types – such as single parents – that are more likely to receive social assistance benefits. Second, our results suggest that efforts to reduce levels of extreme child poverty must consider how to connect non-citizens with no other source of income to social assistance benefits. Given that extreme poverty appears to be concentrated among households headed by non-citizens, access to the safety net for non-citizens should be central to strategies attempting to reduce poverty.

Finally, we emphasize that empirical analyses of extreme poverty are inherently limited in their ability to capture the true prevalence of poverty. Similar to most other empirical estimates of extreme poverty, our analysis does not include the large share of families who are homeless or in precarious housing situations. The U.S. Department of Education estimates that about 1.3 million children in the U.S. were homeless in 2015-2016.

Adding these children to our estimates of $2 per day poverty would substantially lift our poverty estimates.

Moving forward, researchers and policymakers interested in reducing hardship among American families should continue to advocate for a strengthening of SNAP and a reversal in the two-decade decline of cash assistance from TANF. Ensuring that non-citizens, in particular, can access social assistance benefits is perhaps the most direct path forward toward reducing extreme child poverty.

REFERENCES

Bartfield, Judith, Craig Gundersen, T. Smeeding and James P. Ziliak. 2015. *Snap Matters: How Food Stamps Affect Health and Well-Being*. Palo Alto, CA: Standard University Press.

Brady, David. 2009. *Rich Democracies, Poor People: How Politics Explain Poverty*. Oxford: Oxford University Press.

Brady, David and Linda Burton. 2016. *The Oxford Handbook of the Social Science of Poverty*. Oxford: Oxford University Press.

Brady, David, R Finnigan and S Hübgen. 2017. "Rethinking the Risks of Poverty: A Framework for Analyzing Prevlances and Penalties." *American Journal of Sociology*.

Brady, David, Marco Giesselmann, Ulrich Kohler and Anke Radenacker. 2018. "How to Measure and Proxy Permanent Income: Evidence from Germany and U.S.". *Journal of Economic Inequality*.

Center on Budget & Policy Priorities. 2015. "State Fact Sheets: How States Have Spent Federal and State Funds under the Tanf Block Grant." *Center on Budget & Policy Priorities*.

Danziger, Sandra K. 2010. "The Decline of Cash Welfare and Implications for Social Policy and Poverty." *Annual Review of Sociology* (36):523-45.

Duncan, Greg J. and Greg Petersen. 2001. "The Long and Short of Asking Questions About Income, Wealth, and Labor Supply." *Social Science Review* (30):248-63.

Edin, Kathryn and H. Luke Shaefer. 2016. *$2.00 a Day: Living on Almost Nothing in America*. Boston: Mariner Books.

Edin, Kathryn and H. Luke Shaefer. 2018. "Welfare Reform and the Families It Left Behind." *Pathways* (Winter 2018).

Filauro, Stefano and Zachary Parolin. 2018. "Unequal Unions? A Comparative Decomposition of Income Inequality in the United States and European Union." *Journal of European Social Policy*. doi: 10.1177/0958928718807332.

Fox, Liana, Irwin Garfinkel, Neeraj Kaushal, Jane Waldfogel and Christopher Wimer. 2014. "Waging War on Poverty Historical Trends in Poverty Using the Supplemental Poverty Measure." Cambridge, Mass.: National Bureau of Economic Research,. Retrieved. (http://www.nber.org/papers/w19789).

Fox, Liana, Christopher Wimer, Irwin Garfinkel, Neeraj Kaushal, JaeHyun Nam and Jane Waldfogel. 2015. "Trends in Deep Poverty from 1968 to 2011: The Influence of Family Structure, Employment Patterns, and the Safety Net." *RSF* 1(1):14-34. doi: 10.7758/RSF.2015.1.1.02.

Gundersen, Craig and James P. Ziliak. 2003. "The Role of Food Stamps in Consumption Stabilization." *Journal of Human Resources* (38):1051-79.

Hoynes, Hilary W. and Diane Whitmore Schanzenbach. 2009. "Consumption Responses to in-Kind Transfers: Evidence from the Introduction of the Food Stamp Program." *American Economic Journal: Applied Economics* 1(4):109-39. doi: doi: 10.1257/app.1.4.109.

Jencks, Christopher. 2016. "Why the Very Poor Have Become Poorer." *The New York Review of Books* June 9.

Laird, Jennifer, Zachary Parolin, Jane Waldfogel and Christopher Wimer. 2018. "Poor State, Rich State: Understanding the Variability of Poverty Rates across U.S. States." *Sociological Science* 5(26):628-52. doi: 10.1111/jofi.12530.

LIS. 2016, "Disposable Household Income", LIS, Cross-National Data Center in Luxembourg.

Meyer, Bruce D. and Nikolas Mittag. 2015. "Using Linked Survey and Administrative Data to Better Measure Income: Implications for Poverty, Program Effectiveness and Holes in the Safety Net." *National Bureau of Economic Research Working Paper Series* No. 21676. doi: 10.3386/w21676.

Meyer, Bruce D. and Derek Wu. 2018. "The Poverty Reduction of Social Security and Means-Tested Transfers." *National Bureau of Economic Research Working Paper Series* No. 24567. doi: 10.3386/w24567.

Moffitt, Robert. 2015. "The Deserving Poor, the Family, and the U.S. Welfare System." *Demography* (52):729:49.

Parolin, Zachary. 2017. "Applying Augmented Survey Data to Produce More Accurate, Precise, and Internationally Comparable Estimates of Poverty within the 50 United States." *LIS Working Paper Series* No. 696.

Parolin, Zachary and Chris Luigjes. 2018. "Incentive to Retrench? Institutional Moral Hazard among Federal & State Social Assistance Programs after Welfare Reform." *CSB Working Paper Series* No. 18/02.

Rainwater, Lee and Timothy M. Smeeding. 2003. *Poor Kids in a Rich Country: America's Children in Comparative Perspective*: Russell Sage Foundation.

Shaefer, H. Luke and Italo Guiterrez. 2012. "The Supplemental Nutrition Assistance Program and Material Hardships among Low-Income Households with Children." *National Poverty Center Working Paper Series* #11-18.

Shaefer, H. Luke, Kathryn Edin and Elizabeth Talbert. 2015. "Understanding the Dynamics of $2-a-Day Poverty in the United States." *RSF* 1(1):120-38. doi: 10.7758/rsf.2015.1.1.07.

Smeeding, T. and Daniel H. Weinberg. 2001. "Toward a Uniform Definition of Household Income." *Review of Income and Wealth* (47):1-24.

Smith, Cory and Laurence Chandy. 2014. "How Poor Are America's Poorest? U.S. $2 a Day Poverty in a Global Context." *Brookings Institution*.

Stevens, Kathryn, Liana Fox and Misty Heggeness. 2018. "Precision in Measurement: Using State-Level Snap Administrative Records and the Transfer Income Model (Trim3) to Evaluate Poverty Measurement." *U.S. Census Bureau* Working Paper Number: SEHSD-WP2018-15.

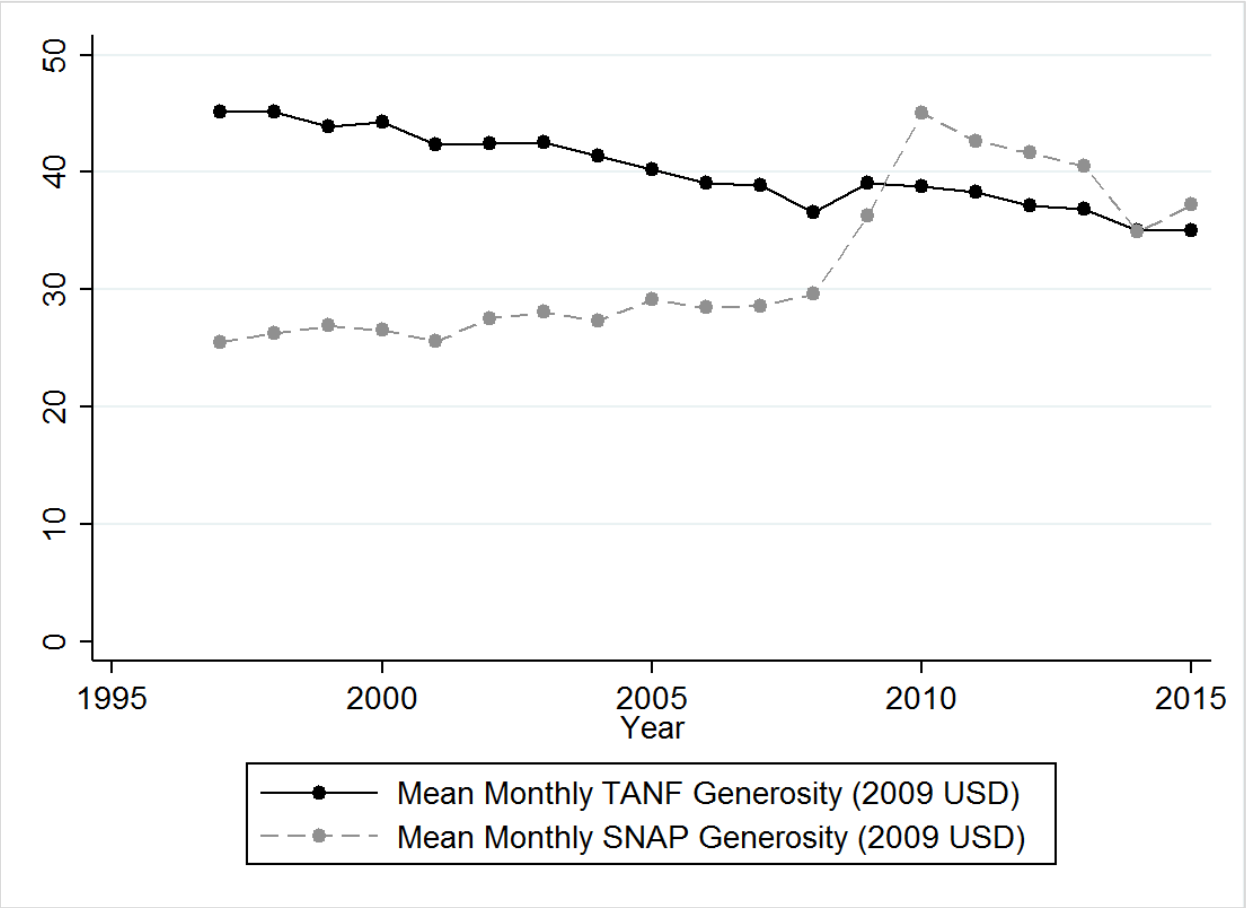
U.S. Department of Agriculture. 2017. "Supplemental Nutrition Assistance Program (Snap): National Level Annual Summary." *USDA Food & Nutrition Service*.

Wilson, William Julius. 2017. "Why Sociologists Matter in the Welfare Reform Debate." *Contemporary Sociology* (46):627-34.

Winship, Scott. 2016. "Poverty after Welfare Reform." *Manhattan Institute*.

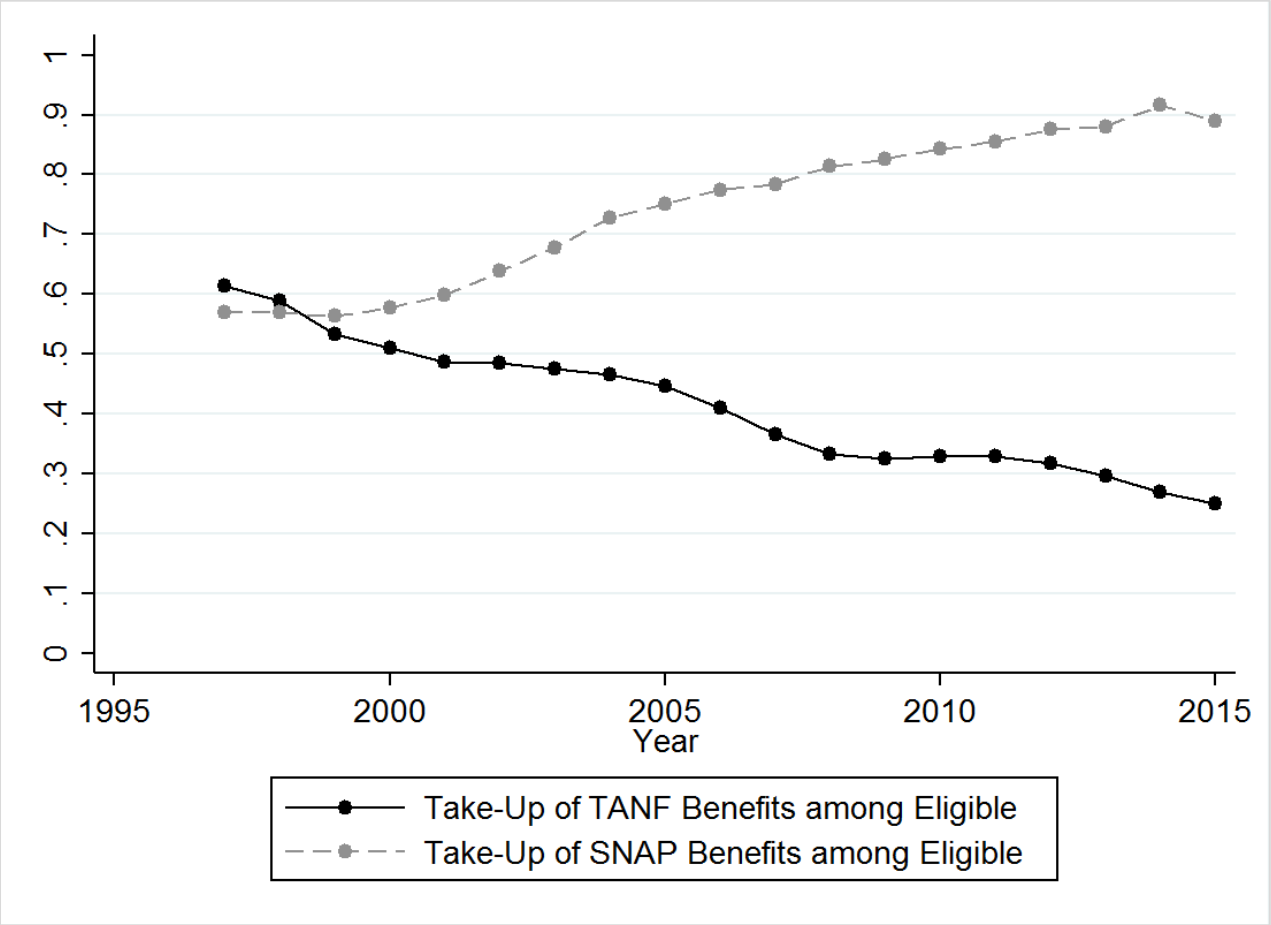
FIGURES & TABLES

Figure 1: SNAP & TANF Benefit Generosity for Households with Children (1997 – 2015)



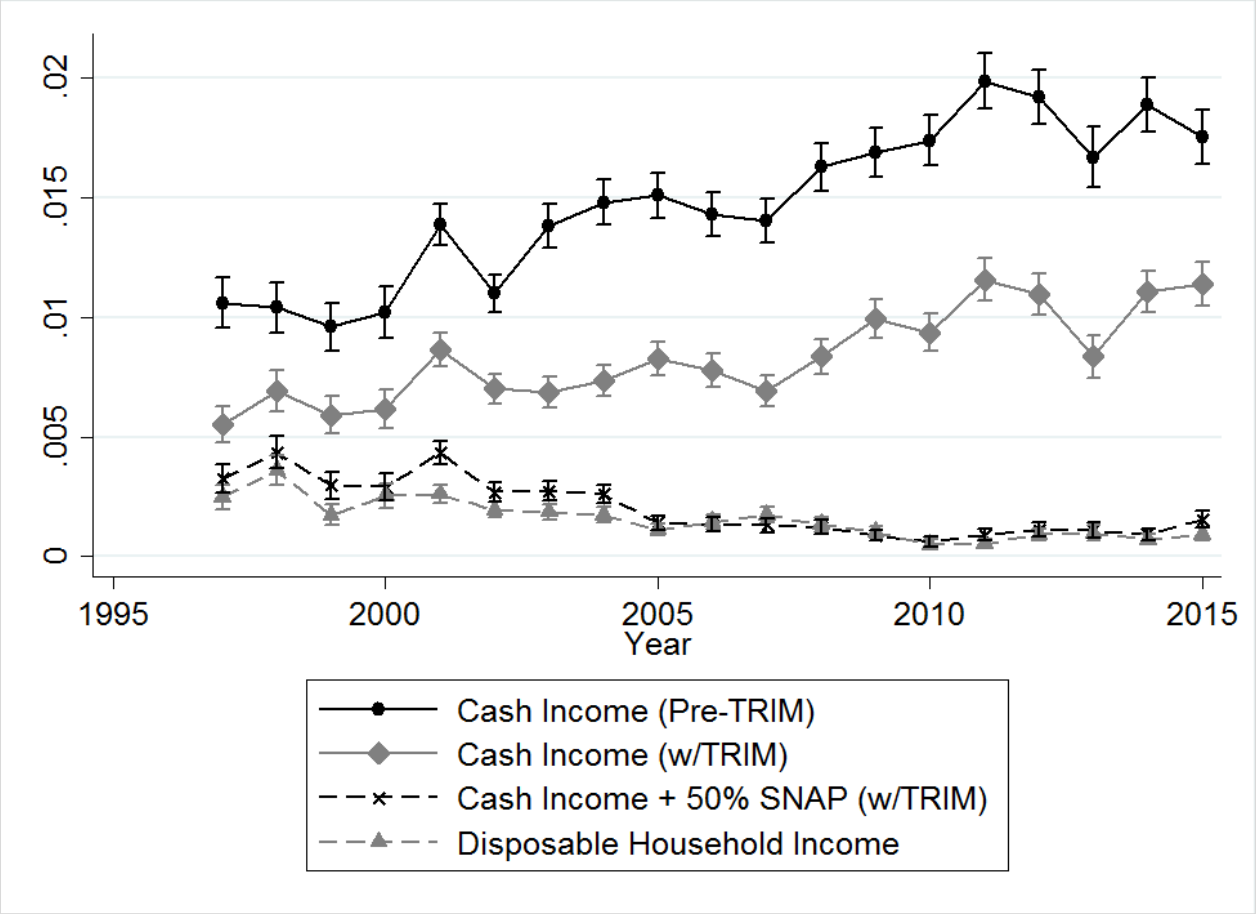
Note: Y-Axis: mean benefit value of all households with children based on state-year benefit levels and eligibility criteria (2009 USD). The mean generosity in each state-year includes zero values for ineligible households.

Figure 2: Take-Up of Social Assistance Benefits among Income-Eligible Households



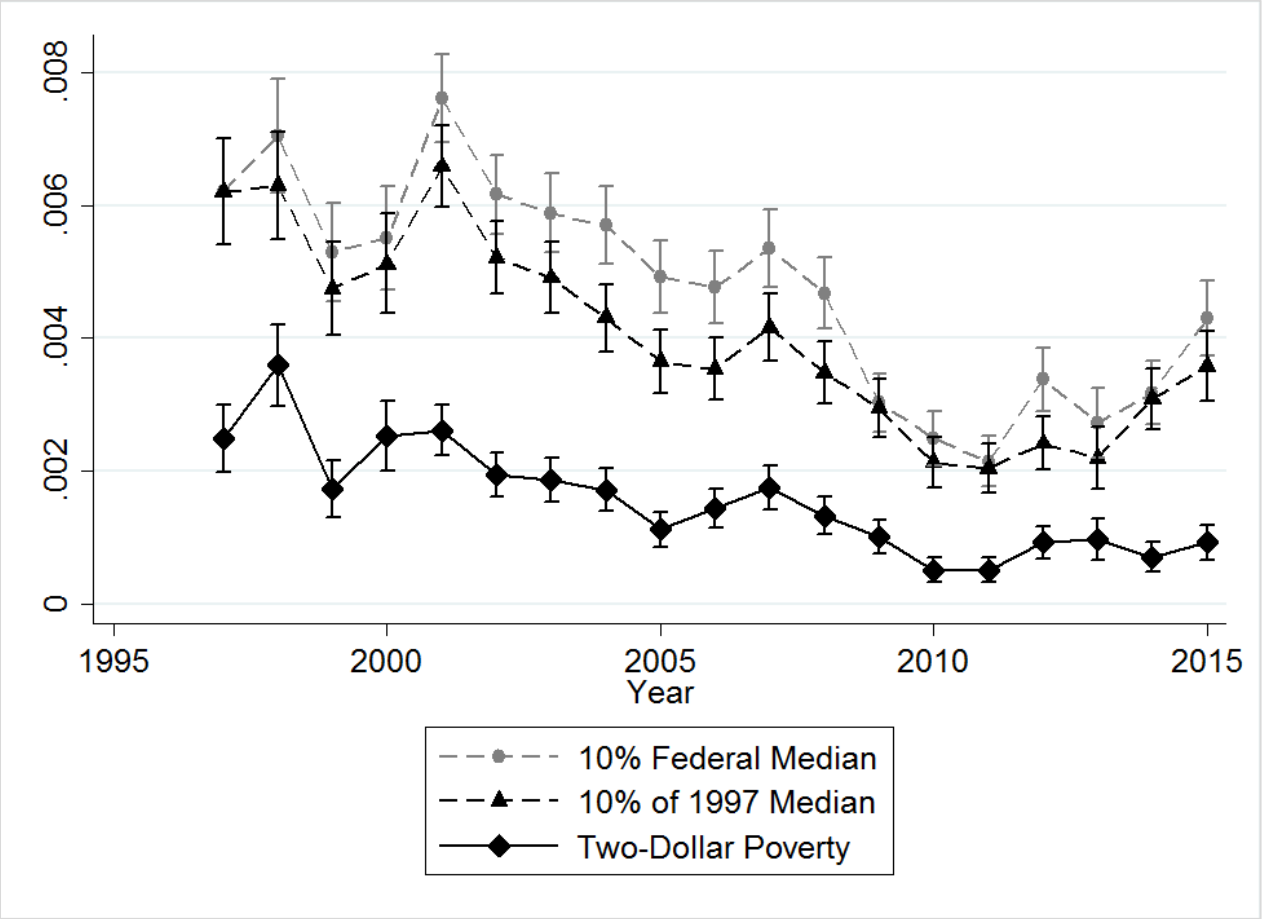
Note: Y-Axis: Share of eligible households receiving benefit. Authors' calculations from CPS ASEC with TRIM3 adjustments.

Figure 3: Levels of $2 per Day Poverty among Children Before & After Accounting for SNAP Benefits & TRIM3 Corrections (1997 – 2015)



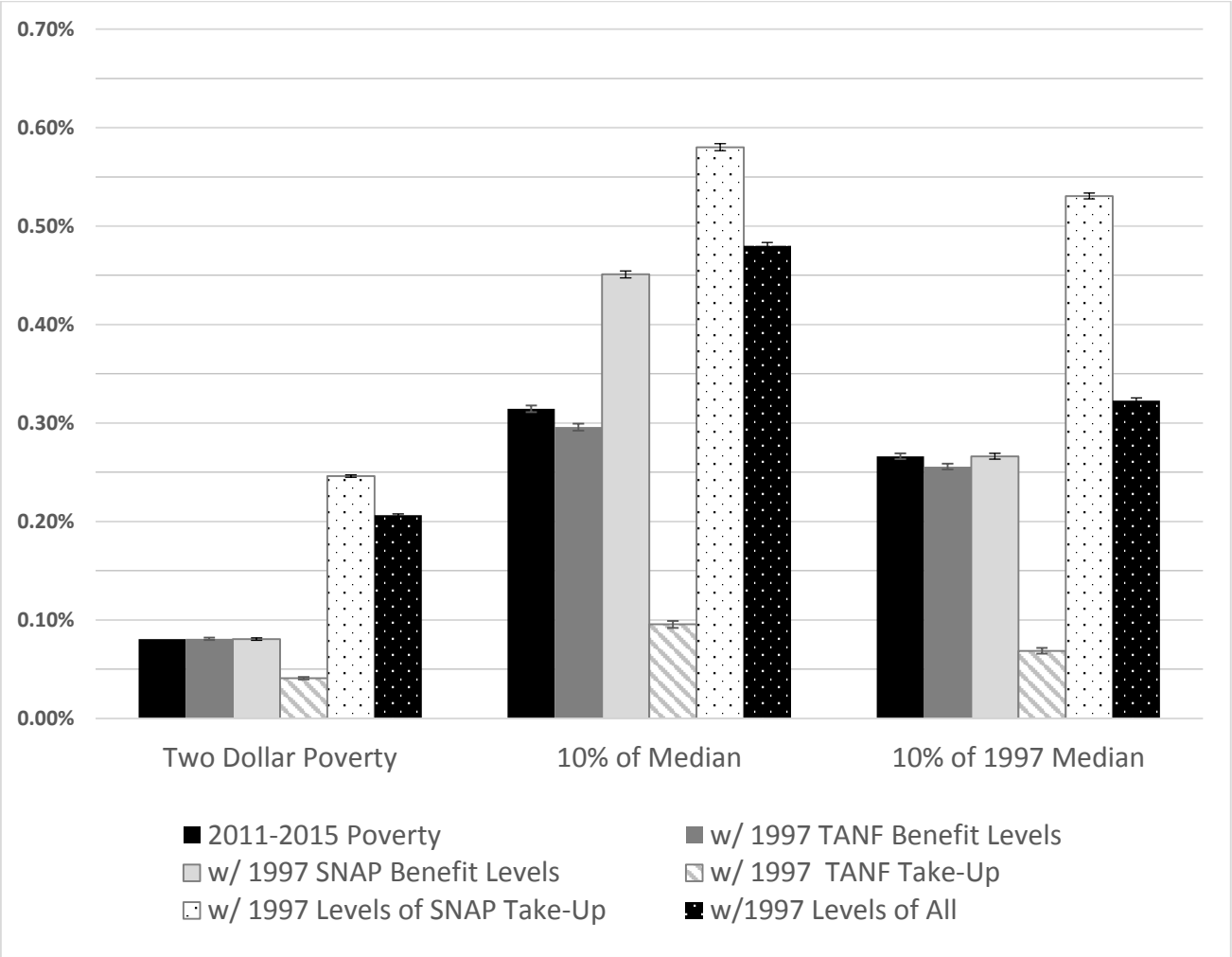
Note: Y-Axis: Share of children living in $2 per day poverty. Authors' calculations from CPS ASEC with TRIM3 adjustments. All measures use equivalized disposable household income definition.

Figure 4: Levels of Extreme Child Poverty (1997 – 2015)



Note: Y-Axis: Share of children living in $2 per day poverty. Authors' calculations from CPS ASEC with TRIM3 adjustments. All measures use equivalized disposable household income definition.

Figure 5: Counterfactual Estimates of Extreme Child Poverty with 1997 Social Policies (Average, 2011 - 2015)



Note: Y-Axis: Share of children living in $2 per day poverty. See Table 2 for estimation results. See Figures 1 and 2 for trends in TANF and SNAP generosity and take-up rates.

Table 1: Characteristics of Children Living in Extreme Poverty (2011 – 2015)

	Two Dollar Per Day	**CI +/-**	**10% Median**	**CI +/-**	**10% of 1997 Median**	**CI +/-**
Born Outside US	56.9%	8.3%	28.8%	4.4%	32.2%	1.3%
HH Head is Non-Citizen	72.9%	7.4%	57.9%	4.6%	61.1%	1.8%
Single Mother HH	13.5%	6.1%	31.1%	4.2%	28.8%	1.9%
Single Father HH	3.0%	3.4%	9.6%	2.6%	7.4%	1.1%
Jobless HH	67.2%	7.7%	57.3%	4.6%	56.7%	1.9%
HH Head Low Education	38.1%	8.2%	57.4%	4.7%	56.3%	1.8%
HH Head Under 25	5.3%	4.0%	13.7%	2.9%	12.1%	1.4%
Received TANF During Year	0.0%	0.0%	7.1%	2.7%	6.5%	1.5%
Received SNAP During Year	14.6%	7.3%	61.3%	4.6%	55.9%	1.3%
Share of Children	0.08%	0.01%	0.31%	0.03%	0.26%	0.03%
Weighted N, Annual Mean	52,159	6,487	232,857	22,219	197,164	14,732
Unweighted N, 2011-2015	173		708		609	

Note: Estimates derived from 5-year average of CPS ASEC (2011 to 2015). All measures based on equivalized disposable household income. See Appendix I for estimates with alternative income definitions.

Table 2: Two-Way Fixed Effects Estimation of Determinants of Extreme Child Poverty (1997 – 2015)

	Two Dollar Poverty	10% Median	10% of 1997 Median
TANF Generosity	-.000	-.023**	-.015
	(-0.05)	(-2.62)	(-1.71)
TANF Take-Up among Eligible	-.006	-.019**	-.019**
	(-1.15)	(-3.03)	(-3.21)
SNAP Generosity	-.028	-.043**	-.051***
	(-1.69)	(-3.11)	(-3.50)
SNAP Take-Up among Eligible	-.019**	-.019*	-.020*
	(-3.10)	(-2.34)	(-2.54)
Unemployment Rate	.000	.014	.016
	(0.02)	(1.49)	(1.86)
Union Density	.017	.021	.017
	(1.35)	(1.40)	(1.05)
GDP Per Capita (log)	.006	.006	.012
	(0.62)	(0.31)	(0.97)
Head Age Under 25	.005	.055***	.048***
	(0.39)	(5.22)	(4.52)
Head Age 25 - 34	-.006	-.015*	-.016**
	(-1.41)	(-2.43)	(-3.01)
Head Age 54 - 65	.000	-.017*	-.016
	(0.00)	(-2.05)	(-1.93)
Head Age 66-75	-.024	-.062***	-.070***
	(-1.20)	(-4.05)	(-5.54)
Head Age 75+	-.023	-.033	-.025
	(-0.53)	(-0.90)	(-0.54)
Head Less Than High School	-.001	.008	.008
	(-0.15)	(1.28)	(1.76)
Head College or More	-.000	.003	.005
	(-0.04)	(0.74)	(1.45)
# of Children in Household	-.002	.006	.003
	(-0.18)	(0.41)	(0.27)

# of Age 66+ in Household	-.026***	-.041***	-.038***
	(-5.55)	(-9.30)	(-8.48)
Single Mother Household	-.029**	.029	.005
	(-2.87)	(1.84)	(0.36)
Single Father Household	-.009	.046**	.031*
	(-0.63)	(2.79)	(2.03)
Jobless Household	.176***	.321***	.283***
	(6.88)	(10.28)	(10.01)
Dual-Earner Household	-.036***	-.052***	-.051***
	(-8.73)	(-14.78)	(-14.89)
Black	-.003***	-.044***	-.041***
	(-3.70)	(-5.58)	(-5.87)
Asian	.052***	.038***	.034***
	(4.35)	(3.69)	(3.55)
Hispanic	-.019*	-.009	-.008
	(-2.05)	(-1.38)	(-0.97)
Other Non-White Race	-.012	-.026*	-.018
	(-1.04)	(-2.49)	(-1.77)
Born Outside US	.219***	.021***	.224***
	(6.39)	(10.47)	(9.66)
Head Non-Citizen	.074***	.125***	.120***
	(5.49)	(5.82)	(5.17)

Note: N=1,030,234; All models includes state and year fixed effects. *t* statistics in parentheses; X- and Y-standardized coefficients presented for all state-level variables. Y-standardized coefficients presented for all household/individual-level variables. Constant not displayed. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

APPENDIX

Appendix I: Characteristics of Children Living in Two-Dollar Per Day Poverty by Income Definition (2011 – 2015)

	Cash Income (Pre-TRIM3)	**CI +/-**	**Cash Income (w/TRIM3)**	**CI +/-**	**Cash Income + 50% SNAP**	**CI +/-**
Born Outside US	7.2%	1.0%	9.2%	1.4%	45.6%	7.6%
HH Head is Non-Citizen	20.3%	1.5%	20.6%	1.9%	71.2%	7.0%
Single Mother HH	56.6%	1.8%	54.7%	2.3%	15.0%	5.6%
Single Father HH	7.6%	1.0%	7.4%	1.3%	3.1%	3.0%
Jobless HH	72.1%	1.6%	70.3%	2.2%	63.4%	7.2%
HH Head Low Education	67.7%	1.7%	63.6%	2.3%	41.6%	7.5%
HH Head Under 25	13.0%	1.2%	13.4%	1.6%	4.9%	3.5%
Received TANF During Year	24.9%	1.6%	4.0%	1.0%	0.0%	0.0%
Received SNAP During Year	94.9%	0.8%	92.1%	1.3%	24.6%	7.2%
Share of Children	1.84%	0.05%	1.07%	0.04%	0.11%	0.01%
Weighted N, Annual Mean	1,071,601	30,765	618,663	23,484	69,298	7,636
Unweighted N, 2011-2015	4,205		2,503		252	

Note: Estimates derived from 5-year average of CPS ASEC (2011 to 2015).