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Welfare Reform and the Quality of Young Children's Home Environments

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Abstract

This study investigates effects of welfare reform in the U.S., a major policy shift that increased employment of low-income mothers and reliance on their own earnings instead of cash assistance through the welfare system, on the quality of the home environments they provide for their preschool-age children. Using empirical methods designed to identify plausibly causal effects, we estimate effects of welfare reform on validated survey and observational measures of maternal behaviors that support children's cognitive skills and emotional adjustment and material goods that parents purchase to stimulate their children's skill development. The results suggest that welfare reform did not affect the amount of time and material resources mothers devoted to cognitively stimulating activities with their young children but was significantly associated with approximately 0.3–0.4 standard deviation lower scores on provision of emotional support, with stronger effects for mothers with low human capital. The findings provide evidence that maternal work incentives as implemented by welfare reform came at a cost to children in the form of lower quality parenting and underscore the importance of considering quality, and not just quantity, in assessing the effects of maternal work incentive policies on parenting and children's home environments.

Introduction

In the decade leading up to the current millennium, the U.S. saw unprecedented increases in employment rates of low-income unmarried mothers. In 1992, prior to the onset of welfare reforms that were implemented during the 1990s, the labor force participation rate of unmarried mothers ages 25–34 years was 66% and the percentage of that group that was employed was 58% (authors' calculations from the Annual Social and Economic Supplement, ASES, of the U.S. Current Population Survey, CPS). By the time welfare reform had been fully implemented in 2000, these figures increased to 80% and 75%, respectively (authors' calculations from the ASES of the CPS). The reforms, which imposed time limits and work requirements as conditions for the receipt of cash assistance, alongside other substantial expansions of work supports (most notably, the Earned Income Tax Credit, EITC), contributed significantly to these trends (e.g., Fang and Keane 2004, Johnson et al. 2012, and Ziliak 2016 for welfare reform and Hoynes 2009 and Bastian and Lochner 2022 for EITC). Although welfare reform and the EITC have been fully implemented for decades, both are currently still in effect, and by 2019 (the last pre-COVID pandemic year) the labor force participation rate of young unmarried mothers was over 10 percentage points higher, and the work participation rate was 13 percentage points higher, than in 1992 (authors' calculations from the ASES of the CPS).

Despite clear labor supply effects, the 1990s work incentive policies had heterogeneous effects on families' material circumstances. Hoynes and Patel (2018) found that the EITC led to improved economic circumstances among families with incomes at 75–200% of the federal poverty level, but not among more disadvantaged families. Welfare reform had positive effects on earnings, income, and consumption in the early years (Ziliak 2016), but after fuller implementation appeared to have mixed effects, with overall positive effects but also increases in

deep poverty (Bollinger et al. 2009; Shaefer and Edin 2018; Schoeni and Blank 2000; Trisi and Sherman 2016). Han et al. (2021) found that welfare reform led to increases in consumption among unmarried mothers, particularly those who were the *most* disadvantaged. Although some of these findings may seem inconsistent, it is possible that work incentive-induced increases in earnings, income, and even consumption do not automatically translate to improvements in material circumstances. For example, employment can lead to increased expenses (e.g., on transportation, child care, or prepared food) that might not always be offset by increased earnings.

Much less is known about how the policy-induced increases in women's employment have affected the home environments experienced by children. The quality of the home environment and the emotional support and learning opportunities that parents provide in that setting are key inputs into children's development and long-run success (Bjorklund and Salvanes 2011; Doepke et al. 2019). Aside from potential improvements in material well-being, a key pathway by which work incentive policies could influence children's home learning and developmental environments is through changes in the quantity and quality of parental time. Parental investments of time and emotional energy are central to children's development, especially in children's first years of life when they are most often, if not exclusively, in their parents'—most often their mothers'—care (Bono et al. 2016; Kalil 2015; Duncan et al. 2022).

Increased maternal employment may lead to decreases in mothers' time spent with children, resulting in poorer supervision or care and less time available to provide emotional support or foster children's involvement in enriching activities (Aizer 2004). However, studies have found that although working reduces the time mothers spend with children, quality time with children is protected by mothers cutting back least on activities directly engaging children

(Bianchi 2000; Hofferth and Sandberg 2001). In particular, a recent study using detailed time diary data from the American Time Use Survey found that EITC expansions led to reductions in maternal time spent with children in "passive" non-investment activities including housework, running household errands, waiting, shopping, and relaxing as well as maternal time spent volunteering and attending social events with their children, but did not reduce mothers' time spent reading, playing, and doing arts and crafts with their children, helping them with homework, and providing and consuming medical care (Bastian and Lochner 2022). Additionally, if maternal employment increases the use of high quality child care, this could favorably affect children's home learning and developmental environments. For example, Gelber and Isen (2013) found, using experimental data, that low-income children's participation in Head Start led to increases in parents' time investments in home learning activities, perhaps because parents acquired new information about the positive impacts of educational investments on children's skill development.

Nonetheless, for low-income families, increased employment could lead to worse parent-child interactions if the conditions of work (e.g., hours or shifts, tasks, dangers, commutes) are stressful or tiring, in which case they could compromise both the quantity and quality of parental investments by depleting attention or behavioral self-control (Gennetian and Shafir 2015). In the extreme, Paxson and Waldfogel (2003) found suggestive evidence that early welfare reforms led to increases in child maltreatment. However, greater attachment to the labor market could improve mothers' self-esteem and provide more structure, leading to more positive parent-child interactions (Reichman and McLanahan 2001), and changes in parental stress or time use because of work incentive policies need not arise exclusively from changes in parents' individual employment experiences (Morrill and Pabilonia 2012). For example, changes in fertility and

living arrangements resulting from welfare reform (Bitler et al. 2006) could affect parental stress or time use, although the expected direction in those cases would be ambiguous.

Apart from Bastian and Lochner (2022), few studies have investigated plausibly causal effects of maternal work incentive policies on the quantity and quality of parental time with children. A review of seven welfare demonstration experiments conducted in the early 1990s found little to no effect on parenting behaviors such as warmth, cognitive stimulation, and harsh parenting or on maternal depression or self-esteem (Chase-Lansdale and Pittman 2002). However, the experimental evidence is based on a sparse set of findings from specific geographic areas that generally predated the post-1996 welfare reform period; as such, it is not clear how generalizable those findings would be in the context of national welfare reform as implemented by the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). In fact, Chase-Landsdale and Pittman concluded that there is much more to be learned about connections between welfare reform and parenting. In addition, a few quasi-experimental studies of maternal behavioral outcomes found that PRWORA led to decreases in low-income mothers' substance abuse and crime (Corman et al. 2013; Corman et al. 2014; Kaestner and Tarlov 2006), outcomes that may be relevant for the quality of young children's home environments.

In a related inquiry, Guldi et al. (2022) estimated the effects of eliminating Supplemental Security Income benefits for poor families with infants that were very low birthweight (VLBW, < 1500 grams) on maternal labor supply and the quality of observed parent-child interactions using validated assessment tools. The authors found that eliminating benefits for the subset of families whose VLBW infants were >1200 grams led to increased maternal labor supply at 9 months and 2 years and poorer quality parent-child interactions at 9 months but not 2 years,

suggesting that the maternal work led to worse parenting during infancy. However, the findings from this study may not be generalizable to the broader population, because only a small fraction of infants are VLBW and those children often have significant health and developmental issues.

The present study adds to this limited body of work by investigating the effects of welfare reform, a major policy shift that increased employment of low-income mothers and reliance on their own earnings instead of cash assistance through the welfare system, on the quality of the home environments they provide for their children using empirical methods designed to identify plausibly causal effects. Our paper is close in spirit to Bastian and Lochner (2022), but focuses on a different work incentive policy shift, uses a different nationally representative data set, and, instead of time diary data, focuses on the quality of children's home environments. Those environments were assessed using rich, well-validated survey and observational measures of maternal behaviors that support children's cognitive skills and emotional adjustment along with measures of the material goods that parents purchase to stimulate their children's skill development.

Our analysis begins by confirming the consensus that welfare reform led to substantial increases in maternal employment and labor supply of low-income mothers. Next, we present estimates of the effects of welfare reform on detailed and validated measures of the home environment that appear in every survey year of the 1979 National Longitudinal Survey of Youth (NLSY), focusing on children ages 0–5 years because the strongest labor supply effects of welfare reform were among mothers with young children (Fang and Kean 2004) and the early years are foundational for children's development. Our results suggest that welfare reform did not significantly affect the amount of time and material resources mothers devoted to cognitively stimulating activities with their young children. However, it had significant negative effects on

mothers' provision of emotional support, with stronger effects for mothers with low human capital. The findings provide evidence that maternal work incentives as implemented by welfare reform came at a cost to children in the form of lower quality parenting and underscore the importance of considering quality, and not just quantity, in assessing the effects of maternal work incentive policies on parenting and children's home environments.

Welfare reform in the U.S.

PRWORA, enacted in 1996 and often referred to as welfare reform, ended entitlement to welfare benefits under Aid to Families with Dependent Children (AFDC) and replaced AFDC with Temporary Assistance for Needy Families (TANF) block grants to states. Key features of the legislation were time limits on cash assistance and work requirements as a condition for receiving benefits. States were granted considerable latitude in establishing eligibility and program rules subject to national guidelines under PRWORA that mandated work requirements and a 5-year lifetime limit on the receipt of cash assistance.

Although welfare reform is often dated to the PRWORA legislation, reforms started taking place in the early 1990s when the Clinton Administration expanded the use of "welfare waivers" to allow states to carry out experimental changes to their AFDC programs and many features of PRWORA, such as work requirements and time-limited welfare receipt, were integral parts of these earlier programs. Although not federally mandated, waivers were implemented in most states by the time the federal PRWORA legislation was enacted in 1996. Specifically, major statewide waivers—defined in a 1997 report by the Council of Economic Advisors (CEA, 1997) as those that substantially altered the nature of AFDC with respect to work requirements and incentives, time limits, and family caps—were introduced in 29 states over a period of 53 months, and TANF was implemented in all states over a period of 17 months. Considering both

waivers and TANF, states reformed their welfare programs over a period of 64 months, from October 1992 through January 1998 (Appendix Table 1).

Data

We use restricted data from the 1979 cohort of the National Longitudinal Survey of Youth (NLSY79), which follows a nationally representative sample of over 12,000 people who were 14–22 years old in 1979. The survey began that year and was conducted annually until 1994 and biannually thereafter (National Longitudinal Surveys 2022a). The observation period for our study begins in 1990 (a few years before any of the 1990s welfare reforms were implemented) and ends in 2006 to allow all states to have fully implemented welfare reform and avoid conflating our results with the effects of the Great Recession that began in the last quarter of 2007. The NLSY79 allows us to have an observation period that envelops welfare reform; has large sample sizes; and includes rich information on the home environment as well as measures of mother's marital status, education, and other relevant variables. As far as we know, there is no more appropriate data set available for estimating the effects of welfare reform on children's home environments using rigorous econometric techniques.

The NLSY79 includes demographic data on mothers (age, education, marital status, and employment) and their children (age, sex, and race/Hispanic ethnicity), as well as number of other children in the household, mother's score on the Air Force Qualifying Test (AFQT, used in supplemental analyses), and state identifiers that we used to attach measures of welfare reform implementation and other state policy and economic measures.

We use an indicator for any welfare reform (AFDC waiver or TANF) in a given a month/year in the respondent's state of residence in childhood. Other state/year level variables included in the analyses were unemployment and poverty rates, personal income per capita,

the minimum wage, number of children receiving the National School Breakfast and Lunch Program benefits, population, number of Medicaid beneficiaries, lagged welfare caseload, EITC rate as a percent of the federal rate, and whether the EITC was refundable.

All waves of the NLSY79 included the Home Observation Measurement of the Environment-Short Form (HOME-SF) and the data include overall scores as well as subscale scores for cognitive stimulation and emotional support (National Longitudinal Surveys, 2022b). The instrument assesses resources that are available in the home, as well parental warmth and responsiveness, control and discipline, supervision, and cognitive stimulation, all of which are important dimensions of parenting (Chase-Lansdale and Pittman 2002), and the scores characterize the quality of children's learning and developmental home environments.

Separate age-appropriate scales were used for children ages 0–2 years (Appendix Table 2) and 3–5 years (Appendix Table 3), and both caregivers and in-home interviewers provided information. The NLSY created binary measures from the answers to each of the questions in each of these instruments. For children ages 0–2, the raw cognitive and emotional scores each had a maximum of 9 points. For children ages 3–5, the raw cognitive score had a maximum of 14 points and the raw emotional scale had a maximum of 12 points. The NLSY calculated standardized measures of the overall and subscale scores based on the NLSY79 sample, with means of 100 and standard deviations of 15 for entire sample. These validated and widely used measures of the cognitive stimulation and emotional support that parents provide in the home have been used in hundreds of influential research studies from multiple disciplines (Mott 2004).

Empirical approach

Our analyses are based on a quasi-experimental difference-in-differences (DD) design that exploits variation in mothers' exposure to the new welfare rules based on differential timing of welfare reform implementation across states. This approach is the standard in the economics literature on evaluating the effects of welfare reform. The following reduced-form baseline DD specification directly relates changes in HOME scores to the child's exposure to welfare reform.

$$HOME_{imst} = \pi\, Welfare_{st-12} + X_{imst}\beta_1 + V_{mst}\beta_2 + Z_{st}\beta_3 + \alpha_s + \tau_t\,[+\alpha_s * t] + \varepsilon_{ismt} \quad (1)$$

The HOME score (*HOME*), for the i^{th} child born to mother *m* residing in state *s* and observed at time *t*, is a function of welfare reform (*Welfare*), measured here by an indicator for whether a given state had in place a major AFDC waiver (prior to implementing TANF) or had implemented TANF for at least 12 months at the time of the interview. We incorporate the 12-month lag ($Welfare_{st-12}$) in our main analyses because potential effects of welfare reform on the quality of the home environment, operating through changes in maternal work, time, and resource constraints, may take some time to materialize. In supplementary analyses, we explore effect dynamics more flexibly. The vector *X* denotes controls for child characteristics (age, sex, race/ethnicity), and *V* denotes controls for the mother's characteristics (age, highest grade of schooling completed, number of children of various ages).

The validity of the DD approach hinges on the "parallel trends" assumption—in our case, that conditional outcomes for individuals in the control states are a valid counterfactual for the conditional outcomes for individuals in the treated states. That is, trends in outcomes would have been similar in treated and control states in the absence of welfare reform. Deviations from parallel trends reflect unobserved time-varying factors differentially impacting the treated and

control states. To account for potentially confounding policy shifts and other unobserved factors, we include a rich set of time-varying state factors (Z_{st}), detailed earlier and in table notes. Models further include fixed effects for the mother's state of residence (α_s) and period (month/year of interview; τ_t), which control for time-invariant state heterogeneity, national trends, and any seasonal variations in the demand for parenting inputs. We report state-clustered standard errors that are adjusted for arbitrary correlation in the error term (ε) across and within individuals in a given state and over the survey waves. In supplementary analyses, we include state-specific linear time trends ($\alpha_s * t$), which allow all states (including early- and late-reform states) to have differential systematic trends over the entire sample period. However, we are careful in interpreting estimates from models that include state-specific linear time trends because of potential concerns that those controls capture part of the treatment effect in addition to the unobserved factors when there is a dynamic response to the treatment (Wolfers 2006).

Given that the welfare caseload has consisted primarily of low-educated unmarried mothers (Bitler and Hoynes 2010), we limit our main analysis sample to unmarried mothers with at most a high school degree. This group represents the population of interest, which is mothers at risk of relying on public assistance, and it is for this focal group of women for whom changes in welfare policy would be expected to have the largest effects on employment, income, and other household conditions and potentially the largest behavioral effects, if any.

We conduct additional analyses to address substantively important questions or methodological issues. First, we assess heterogeneity in the parenting response to welfare reform across children's age (ages 0–2 vs. 3–5, as delineated by the NLSY) and sex, following the distinction between these two age periods in the child development literature

(Kalil et al. 2012) and increasing evidence that the returns to parental inputs differ substantially by gender (Bertrand and Pan 2013). We also assess heterogeneity by maternal human capital (proxied by educational attainment) and ability (proxied by score on the Armed Forces Qualification Test; AFQT), given prior research pointing to non-uniform effects of welfare reform on women's material conditions depending on their initial level of disadvantage.

Second, an emerging literature has identified potential issues that arise with a two-way fixed effects or DD setting with staggered adoption of the treatment, as in our case with multiple states implementing welfare reform at different points in time (Goodman-Bacon 2021; Sun and Abraham 2021; Callaway and Sant'Anna 2021). In the presence of dynamic treatment effects, the effect estimated by the standard DD model could be biased, as it may capture the true treatment effect plus additional terms that reflect deviations from parallel trends as well as bias due to treatment effect dynamics. The latter source of bias largely arises due to using earlier-treated units as a counterfactual for later-treated units. Moreover, as Sun and Abraham (2021) show through decomposition analyses, dynamic coefficients estimated within a standard event study framework could also be biased in this setting.

To assess the importance of biases attributable to heterogeneous treatment effects within our staggered policy rollout, we implement a stacked DD estimator (Cengiz et al. 2019; Abouk et al. 2021; Baker et al. 2022). For each treated group, based on the state and the period that it was initially treated, "clean" controls are identified using the not-yet treated, i.e., individuals from states that have not yet implemented welfare reform. This technique avoids the problematic comparisons brought to light in the standard DD setting (i.e., including previously treated observations as controls) by construction, and ensures that treatment effects

are identified only using comparisons between treated individuals and individuals who have not yet been treated; individuals in a control state, once that state implements welfare reform, are dropped as counterfactuals. Each "stack" in the stacked DD estimator represents a sample of individuals treated in a given treatment year (i.e. states that separately implemented reform in 1992, 1993, etc.) and their controls drawn from the not-yet implemented states.[1] These stacks are pooled across all treatment years, and Equation 1 is estimated for this pooled sample to identify the average policy impact; this estimation allows for stable state heterogeneity and overall trends to differ across treatment groups by further controlling for stack-specific state and period fixed effects.

To assess the validity of the parallel trends assumption, we further implement an event study analysis for the stacked DD estimator (Equation 2 below), thereby decomposing the treatment effect into separate leads and lags of the policy effect.

$$HOME_{imst,k} = \sum_{j=\underline{J}}^{\bar{J}} \pi^j D^j_{st,k} + X_{imst,k}\beta_1 + V_{mst,k}\beta_2 + Z_{st,k}\beta_3 + \alpha_{s,k}$$

$$+ \tau_{t,k} \left[+ \alpha_{s,k} * t\right] + \varepsilon_{ismt,k}, \qquad (2)$$

All subscripts and variables are defined as above, with *k* denoting the treatment group or stack, and $\alpha_{s,k}$ and $\tau_{t,k}$ denoting the stack-specific state and period fixed effects. D^j_{st} is a treatment indicator for an event (in this case, the state implementation of welfare reform) occuring *j* years away from *t*. The vector π denotes the coefficients on the treatment effect,

[1] Note that the treatment effect in the stacked DD estimator reflects states that implemented AFDC waivers and/or TANF through 1996. The last batch of states to implement TANF (with no previous AFDC waiver) in 1997 cannot be considered as a treatment stack, since for individuals residing in these states there are no clean controls. In other words, all states implemented welfare reform (either TANF or the earlier AFDC waivers) by 1997 so there were no more not-yet implanted states to draw from.

with the reference period being *j-1*, the year of welfare reform implementation.[2] If the estimates of π for the period [$\underline{J}$, *j-2*] are equal to 0, this would provide evidence in support of the parallel trends assumption. Moreover, the trajectory of the coefficients for the periods [0, $\bar{J}$] informs any dynamics evident in the policy impact.

As a placebo check, we estimate the effects of welfare reform on the children of married low-educated mothers and unmarried higher-educated mothers. Given that these groups of mothers are generally ineligible for cash-assistance welfare, we would not expect any statistically or substantively significant effects of welfare reform in these cases.[3] If we were to find significant effects for these samples, it would suggest spurious time-varying state trends.

Results

Table 1 shows mean weighted standardized scores on the overall HOME scale and two subscales for the focal group of mothers with children ages 0–5 years who were at risk for relying on welfare (unmarried mothers with a high school education or less), as well as for all mothers, married mothers with a high school education or less, unmarried mothers with more than a high school education, and married mothers with more than a high school education. The mothers in the at-risk group scored significantly below those in the other three groups, with lower-educated married mothers scoring above higher-educated unmarried mothers and married mothers with more than a high school education scoring highest of all. All but the last

[2] Note that we are building in a 12-month lag for the policy impact as described earlier. Hence the period denoted by j=0 represents the period 12 months following the implementation of welfare reform.

[3] These groups have been used in the welfare reform literature as control groups within a difference-in-difference-in-differences (DDD) estimation strategy (see, for example, Dave et al. 2021). We do not rely on that approach here because it would require an additional assumption that is questionable because of the significant mean differences across groups in Table 1—that trends in outcomes across the at-risk and control groups would have been similar within states in the absence of policy implementation. That said, we discuss below what these placebo checks imply in terms of a DDD version of our estimate of the impact of welfare reform on HOME scores.

group scored below the overall national and NLSY79 mean of 100, which was expected because each represents a relatively disadvantaged subset of the population.

Given that the key proximate pathway through which welfare reform would affect maternal parenting behaviors is through changes in maternal labor supply, we start by confirming that welfare reform indeed resulted in significant and substantial increases in labor supply for our NLSY79 sample of low-educated unmarried mothers. Table 2 reports these results from both standard and the stacked DD models. Estimates point to a substantial increase in employment on the order of 9.3 to 13.4 percentage points (17 to 24 percent relative to the baseline mean) and an increase in weeks worked of between 30 and 52 percent, although the stacked DD estimates are imprecise and do not achieve statistical significance at conventional levels.[4] We note that these increases in maternal labor force participation and employment are not a new result, and are largely in line with the large literature on the first-order effects of welfare reform.

We present our main estimates of the effects of welfare reform on HOME scores in Table 3, and how these effects vary across child and maternal characteristics in Tables 4–6. Across all outcomes and samples, estimates are reported for both the standard and stacked DD models. Standard DD estimates, presented in Table 3, suggest that welfare reform significantly reduced overall quality of the home environment – as reflected in a significant decrease in the standardized overall HOME score – by 2.9 points, an effect magnitude that represents about a 3.3 percent (relative to the baseline mean) or a 0.15 standard deviation

[4] We also find significant increases in annual hours worked, though as with weeks worked, these effects are driven by the extensive margin (increases in employment) rather than the intensive margin (increases in labor supply, conditional on the mother already being employed). We use an inverse hyperbolic sine (IHS) transformation for weeks and hours worked, since the IHS approximates the natural log and is interpreted in a similar manner but has the advantage of retaining zeroes (almost 45 percent of mothers were not working at baseline and thus worked zero weeks and zero hours) (Bellemare and Wichman 2020). The reported baseline means in the tables are computed as the weighted means for all non-treated observations.

decline (relative to the standard deviation for the treated sample; see Table 1). The next two columns indicate that virtually all of this adverse impact is driven by a decrease in the subscale score for emotional support (a 4.95-point decrease, representing a 5.5 percent or 0.28 standard deviation decrease in relative terms); the estimated effect for cognitive support, while negative, is small and statistically insignificant. In the presence of dynamic treatment effect heterogeneity, these estimates could be biased.[5] When we turn to the stacked DD estimates, we find a similar pattern of results, though the effect magnitudes are markedly larger. These results indicate that welfare reform led to worsening in overall quality of the HOME environment (by about 6.2 percent or 0.28 standard deviations); again, most of this decrease is driven by the emotional component (7.3 percent or 0.36 standard deviations), though there is also now a marginally significant decrease in the cognitive component (3.9 percent or 0.18 standard deviation).

The validity of the DD approach rests on unobservable factors trending similarly across treated and control states, in which case outcomes for similar mothers in states that have not yet implemented welfare reform would be a plausible counterfactual for outcomes for the treated mothers in the states that had implemented welfare reform. We assess the validity of this assumption in two ways. First, in Appendix Table 4, we present estimates from supplementary analyses that parametrically control for state-specific trends. It is validating that our results remain robust with these additional trend controls, across both the standard and the stacked DD models.

[5] The standard DD model, by default, uses observations from states that had not yet implemented welfare reform and from states that had previously implemented welfare reform as counterfactuals when identifying the treatment effect for states implementing welfare reform in later years. If the treatment effect for the states that had previously implemented welfare reform is not static but rather grows over time (and there is some indication in the event study analyses, discussed below, that this may be the case), then using already-treated units as a counterfactual could lead to some attenuation bias.

Next, we implement and visually present (in Figure 1) conditional event studies, based on the stacked DD model as specified in Equation 2. The event study framework allows us to directly test for any differential pre-policy trends across treated and control states, thereby providing a more explicit assessment of the parallel trends assumption. It also allows us to decompose the dynamics in the main stacked DD estimates (reported in Table 3) which represent an average effect over the post-policy window. While decomposing time-specific effects in this way can be somewhat of a noisy endeavor, the event study (Figure 1) underscores three main points.

First, the results are validating and speak to the quality of the natural experiment being studied; the lead pre-policy effects are close to zero in magnitude and statistically insignificant in virtually all cases, indicating that trends in the outcomes between the treated and control units were parallel prior to the treatment (implementation of welfare reform). Only for the cognitive component is there a slight indication of a pre-trend difference (i.e., the coefficient for the 2-year lead is marginally significant). In Appendix Figure 1, which presents event studies from stacked DD models that control for state-specific linear trends, we find that all lead policy effects are statistically insignificant and virtually zero. That is, the additional controls fully purge the minimal differential pre-policy trends seen in Figure 1.

Second, the marked decrease in the quality of the home environment for the treated mothers, relative to similar not-yet-treated mothers, materializes only after the implementation of welfare reform. Third, there is some indication, particularly in models that control for state-specific trends (Appendix Figure 1), that the policy impact may get stronger as the post-policy window extends further. It is important to note that several potential channels may underlie this magnification. As the work constraints imposed by welfare reform likely operate and bind

with a lag, thereby impacting a greater portion of current and potential welfare recipients among our sample of at-risk mothers over time, one would expect stronger policy effects over the medium term than in the short term. The dynamics could also reflect stronger effects due to growing cumulative exposure to welfare reform among older children who were exposed at younger ages as time since implementation increases.[6]

Results reported in Tables 4–6 explore heterogeneity in the effects by child age, maternal human capital, and child sex. Exposure to welfare reform resulted in significantly lower overall HOME scores for both infants and toddlers (ages 0–2 years) and preschool-age (ages 3–5 years) children, with estimates very similar for the two age groups and largely driven by the emotional subscale (Table 4). We find some evidence that welfare reform took a greater toll on the home environments of children whose mothers had lower levels of human capital—i.e., were less educated (had less a than high school education) or had lower ability (scored below the median on the AFQT), particularly for the emotional subscale and for AFQT scores (Table 5). Specifically, estimates from stacked DD models indicate a significant welfare-reform associated decrease in scores on the overall HOME scale (7.2 percent; 0.33 standard deviation) and both cognitive (4.6 percent; 0.21 standard deviation), and emotional (8.2 percent; 0.41 standard deviation) subscales for children of mothers with below-median AFQT scores. While the coefficients are negative for higher-ability mothers, the magnitudes are much smaller and not statistically significant. When stratifying by child sex, we find similar effects for boys and girls with point estimates suggestive of slightly larger effects for

[6] The dynamics could also potentially reflect heterogeneity across early vs. later state implementers. Note that the short-term effect (e.g., one- or two-years post) are identified off all or most of the treated states. However, by the nature of forming valid counterfactuals in the stacked DD approach, effects for 4 years post-policy implementation would be identified only from states that implemented welfare reform in 1992, and effects for 3 years post-policy implementation would be identified only from states that implemented reform in 1992 or 1993.

girls, particularly for the emotional subscale (Table 6). Overall, while the subgroups patterns are suggestive of some heterogeneity by maternal human capital or ability and the child's sex, sample size constraints limit more precise comparisons and preclude stronger inferences.

Finally, in Table 7, we present estimated effects of welfare reform on HOME scores of for two groups of disadvantaged mothers – low-educated married mothers (Panel A) and higher-educated unmarried mothers (Panel B) – who are otherwise like our main sample of mothers but unlikely to be at risk of welfare receipt due to their marital status and/or higher educational attainment, as a placebo check. We also present estimates for college-educated married mothers (Panel C), who are highly unlikely to be affected by welfare reform given their extremely low rates of welfare participation.[7] Across the 18 models and samples, virtually all estimated DD effects are statistically insignificant with effect sizes that are small and close to zero.[8]

Finally, our placebo samples of disadvantaged mothers in Panels A and B are often used in studies of welfare reform as an additional control group within a difference-in-difference-in-differences framework; however, doing so imposes an addition restrictive assumption—that time-varying unobserved factors in any given state effect outcomes identically across groups. The large baseline differences call this assumption into question. Nevertheless, as a robustness check, the DDD estimates can be derived by differencing out the DD effects in Table 7 (for the

[7] Data from the 2001–2002 American Community Surveys indicate that 0.2% of college-educated married mothers with minor children in the household reported receiving public cash assistance. About 4.4% of higher-educated (greater than a high school education) unmarried mothers with minor children reported welfare receipt; current welfare participation was 2% among low-educated (at most a high school degree) married mothers. In contrast, current welfare participation was 13% (3–6 times higher relative to other disadvantaged mothers; and 65 times higher relative to college-educated married mothers) among low-educated unmarried mothers. Note that this current participation rate under-estimates risk since welfare policies can impact not just women who are currently participating but also those who have participated in the past or at-risk of participating in the future by restricting their options.

[8] For the two samples of higher-educated mothers, the effect is marginally significant (at the 10 percent level) only for the cognitive scale. This low significance rate among the 18 placebo checks is what we would expect due to a Type I error.

groups of mothers in Panels A and B), from the corresponding DD effects in Table 3 for our main at-risk population. Given that the placebo effects in Table 7 are statistically insignificant and small in magnitude, there is little difference between the imputed DDD and main DD estimates; if anything, given that some of the placebo estimates are positively signed, making DDD estimates become even stronger. Thus, our main results, both in terms of patterns and magnitudes, are insensitive to explicitly using the placebo groups as control groups within a DDD research design.

Discussion

This study investigated effects of welfare reform in the U.S.—a major policy shift that increased employment of low-income mothers and reliance on their own earnings instead of cash assistance through the welfare system—on the quality of the home environments of their preschool-age children. The findings add to the small body of research exploring how large-scale work incentive policies affect children's home environments, which are important inputs into children's development. Using a national sample and empirical methods designed to identify plausibly causal effects, we estimated effects of welfare reform on the quality of the home environment using widely-validated survey and observational measures of maternal behaviors that support children's cognitive skills and emotional adjustment and material goods that stimulate their skill development. The results suggest that welfare reform did not generally affect the amount of time and material resources mothers devoted to cognitively stimulating activities with their young children, but that it had significant and substantial negative effects on mothers' provision of emotional support, with stronger effects for mothers with low levels of human capital. The effect sizes were substantial; on average, welfare reform reduced the quality of mothers' emotional support by about one-third of a standard

deviation and the magnitude increased to about 40% of a standard deviation for mothers with particularly low human capital.

The findings complement those of time use studies—e.g., Bastian and Lochner (2022), which found that EITC expansions, another major work incentive policy targeted to low-income families, led to reductions in maternal time spent with children in passive non-investment activities but not time spent engaging in developmentally enriching activities with them, and the foundational finding of Bianchi (2000) that maternal employment was not associated with reductions in mothers' time with children because working mothers instead reduced the time they spent on home production, their own leisure, and sleep. The findings are also broadly consistent with those from a previous study of older children (ages 10–14 years) that found that welfare reform had adverse effects on parent-child activities, children feeling close to their mothers, and mothers knowing their children's whereabouts, with effects generally concentrated among boys (Reichman et al. 2020). That study used data from the Monitoring the Future youth surveys, focused on a much older age group, and considered different parenting-related outcomes than the current study.

Our finding that welfare reform had significant and substantial negative effects on mothers' provision of emotional support is important because emotional sensitivity in parenting is associated with children's self-regulation, social functioning, and early cognitive skills (Eisenberg et al. 2001, Hane and Fox 2006, Kochanska 2002, Tamis-LeMonda et al. 2001) and numerous studies have found associations between corporal punishment, such as spanking, and a host of adverse cognitive and socioemotional child outcomes (Gershoff and Grogan-Kaylor 2016).

The pattern of our results suggests that low-income mothers faced with stronger work demands were able to maintain the quantity of their investments in their children (i.e., reading to them or taking them on outings), but that the potential stressors or disruptions associated with mandated work requirements took a toll on the quality of those interactions in terms of emotional affection or positive approaches to discipline. We can only speculate about what such stressors might be, but research has established that the employment experiences of many low-income mothers are characterized by non-standard and irregular hours and also that the transition from welfare to work can pose costly challenges for mothers seeking appropriate child care and transportation (Carrillo et al. 2017; Gassman-Pines 2011).

The findings from this study reveal the importance of considering both quantitative and qualitative aspects of parenting and the home environment in the evaluation of social policy change and pose an important question for researchers interested in the associations between parental time investments and children's skill development: Are the returns on parents' time investments to children's skills lower when parent-child interactions are of lesser quality? Findings from two recent studies in conjunction with the findings from the current study provide some indirect support for that scenario. Mullins (2022) simulated the combined effect of welfare reform and changes in the EITC on children's skill acquisition and found that children whose mothers had strong employment skills benefited from the policies but that children whose mothers had weaker job skills lost ground in terms of cognitive and behavioral skill development. Similarly, Agostinelli and Sorrenti (2021) found that the net effects of the EITC on reading, math, and behavioral outcomes were negative for low wage parents, but positive for parents that had sufficiently high wages. Our findings of stronger adverse effects on home environments for mothers with very low levels of human capital

point to a potential pathway underlying the findings from those two studies, and in concert with the stronger effects we found on the emotional subscale than the cognitive subscale suggest that the returns on parents' time investments may indeed be lower when parent-child interactions are of lesser quality.

Another way to place our findings in context is to consider how easy or costly it is to improve home environments. Many parenting interventions for young children in low-income families aim to improve the quality of the home environment along both dimensions studied here. For example, a recent large-scale HHS-funded evaluation experimentally tested the impact of the leading nurse home visiting programs (Michalopolous et al. 2019). These programs are intensive in their time demands of parents and expensive to offer—costing about $6,600 per family on average for 44 weeks of services in 2012 dollars (Burwick and Zaveri 2014)—but had only modest impacts on the quality of the home environment and only for select subscales. The Michalopolous et al. study reported treatment impacts of .09 standard deviations on a measure of the home literacy environment but no impact on parental supportiveness, which is akin to the emotional support measure in our study, and the well-known Early Head Start program achieved modest (~.10 standard deviations) treatment impacts on a wider range of measures of the home environment for children ages 2–3, but no impacts at all for the highest-risk mothers—defined, as in our study, as mothers with the lowest level of human capital (Love et al. 2005). All told, it appears to be very hard for the leading interventions to improve the quality of the home environment for low-income families. The fact that welfare reform substantially worsened these home environments is thus a costly problem.

In terms of the broader welfare reform literature, the findings from this study underscore the importance of studying the effects of social policies—particularly those focusing on low-income families—not only on the target population, but also on the next generation. They also suggest a potential mechanism underlying recent findings that welfare reform led to increases in delinquent behaviors among teenage boys and increases in substance use among both boys and girls, with larger effects for boys (Dave et al. 2021): welfare reform-associated declines in mothers' provision of emotional support. The stronger effects for boys could reflect gender differences in non-cognitive returns to parental inputs in the teenage years (Bertrand and Pan 2013). Although the Dave et al. findings suggest that welfare reform placed children on compromised long-term human capital trajectories, the literature on longer-term second-generation effects of welfare reform is in its infancy and does not yet point to strong evidence-based conclusions.

Overall, the findings from this study indicate that maternal work incentives as implemented by welfare reform came at a cost to children in the form of lower quality parenting, that this was particularly true for children with the most disadvantaged mothers, and that the negative effects were substantially larger than the positive treatment impacts yielded by any existing intervention to improve the quality of low-income children's home environments. Our findings also underscore the importance of considering quality, and not just quantity, in assessing the effects of maternal work incentive policies on parenting and children's home environments and may at least partially explain very recent findings showing that work incentive policies (welfare reform and EITC expansion policies) had negative effects on children's skill development among mothers with limited human capital. Finally, although welfare reform was implemented over 25 years ago, the same cash assistance framework is in place today and

learning about its effects can provide guidance to states contemplating changes to their TANF programs, inform future welfare reform efforts, and help anticipate effects of other current and proposed policies that impose time limits and tie program benefits to employment.

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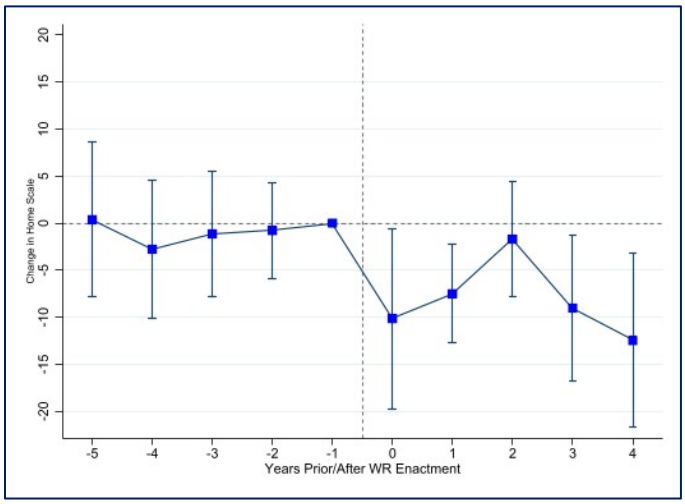
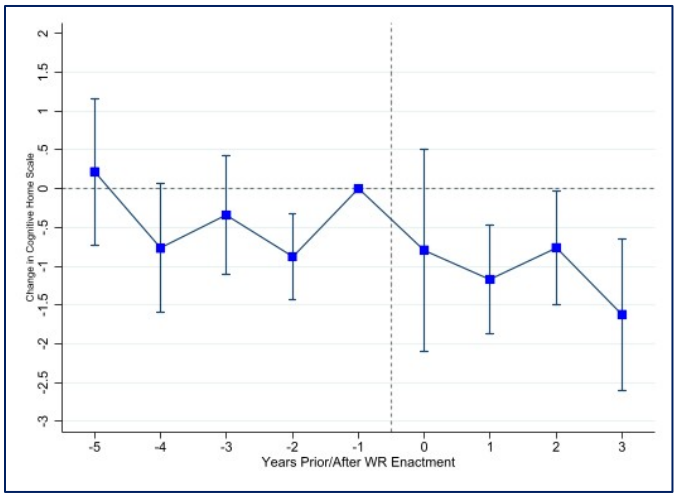
Figure 1
Event-Study Analyses of the Effects of Welfare Reform on Standardized HOME-SF Scores (with 90% CI)

Panel A: Home Scale – Overall



Panel B: Home Scale – Cognitive



Panel C: Home Scale – Emotional

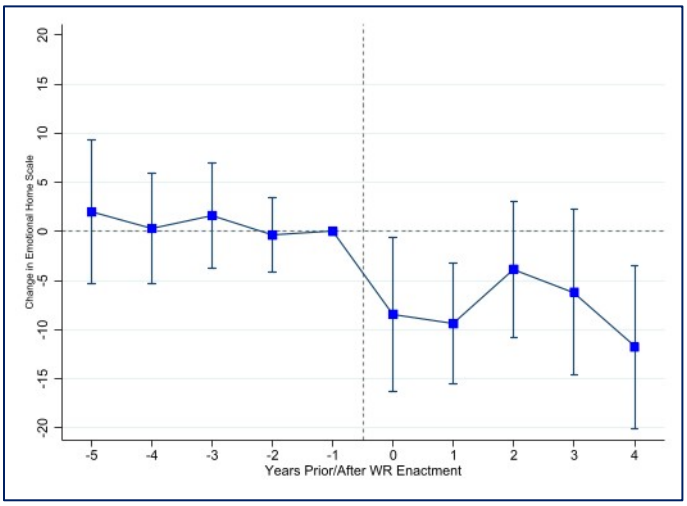


Table 1
Mean (standard deviation) Standardized HOME-SF Scores, Weighted
Children Ages 0–5 Years
1979 National Longitudinal Survey of Youth, 1990–2006

	(1)	(2)	(3)	(4)	(5)
	All mothers	Unmarried mothers <=high school: **At-risk group**	Married mothers <=high school	Unmarried mothers >high school	Married mothers >high school
HOME Scale:					
Overall	100.0 (14.9)	87.4 (18.6)	99.2 (14.6)	94.9 (14.8)	103.8 (12.4)
Cognitive	100.0 (14.9)	89.7 (19.6)	98.8 (15.2)	98.0 (15.1)	103.2 (12.3)
Emotional	100.0 (15.0)	89.6 (17.7)	99.7 (14.6)	93.1 (16.3)	103.1 (13.1)
Observations	11,482	1,731	4,118	730	4,903

Note: At-risk group is significantly different ($p < .01$) from each of the other subgroups (columns 3–5) for all three outcomes.

Table 2
Effects of Welfare Reform on Maternal Labor Supply
Difference-in-Differences (DD) Estimates
1979 National Longitudinal Survey of Youth, 1990–2006
Low-educated Unmarried Mothers with Children Ages 0–5 Years

Estimation	Standard DD		Stacked DD	
Outcome	Employed	Weeks Worked (IHS) [1]	Employed	Weeks Worked (IHS) [1]
Welfare Reform	0.1339**	0.5242**	0.0932	0.2984
	(0.0507)	(0.2119)	(0.0606)	(0.2368)
	[0.012]	[0.018]	[0.133]	[0.215]
Observations	1628	1628	4735	4735
Baseline Mean [1]	0.5495	21.6698	0.5577	22.4388

Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. P-values are reported in brackets. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year-level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month. Stacked DD models include stack-specific state and period fixed effects.
[1] For weeks worked, the outcome is transformed to an inverse hyperbolic sine (IHS). Mean reported is for the untransformed number of weeks worked annually.

Table 3
Effects of Welfare Reform on Standardized HOME-SF Scores
Difference-in-Differences (DD) Estimates
1979 National Longitudinal Survey of Youth, 1990–2006
Low-educated Unmarried Mothers with Children Ages 0–5 Years

Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	-2.8875**	-0.6334	-4.9523***	-5.4034***	-3.5390*	-6.5583***
	(1.3862)	(1.9249)	(1.4351)	(1.7137)	(1.8674)	(1.7725)
Observations	1,716	1,627	1,536	4,998	4,733	4,508
Baseline Mean	87.73	90.31	89.75	87.49	90.15	89.64

Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year-level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month. Stacked DD models include stack-specific state and period fixed effects.

Table 4
Effects of Welfare Reform on Standardized HOME-SF Scores
Difference-in-Differences (DD) Estimates
1979 National Longitudinal Survey of Youth, 1990–2006
Low-educated Unmarried Mothers
Heterogeneity by Child's Age

Panel A	Children Ages 0–2 Years					
Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	-4.8687* (2.8735)	-2.3470 (3.4772)	-6.9579** (3.0249)	-5.5391 (3.3364)	-3.8626 (3.7069)	-8.1287* (4.2067)
Baseline Mean	689	677	613	2,032	1,998	1,811
Observations	87.95	91.39	89.55	87.43	90.78	89.32
Panel B	Children Ages 3–5 Years					
Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	-3.7705** (1.7644)	-0.8246 (2.2643)	-5.5143** (2.07154)	-8.1030*** (2.3119)	-4.0772 (2.5790)	-9.1605*** (2.3370)
Baseline Mean	1027	950	923	2945	2714	2674
Observations	87.5948	89.5510	89.8793	87.5727	89.7941	89.8296

Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month. Stacked DD models include stack-specific state and period fixed effects.

Table 5
Effects of Welfare Reform on Standardized HOME-SF Scores
Stacked Difference-in-Differences (DD) Estimates
1979 National Longitudinal Survey of Youth, 1990–2006
Low-educated Unmarried Mothers with Children Ages 0–5 Years
Heterogeneity by Mother's Human Capital

Panel A	Educational Attainment					
Estimation	Standard DD			Stacked DD		
HOME scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform * Less-than-High School	-3.6889	0.8020	-8.1791***	-5.9701**	-2.0724	-9.0407***
	(2.3287)	(2.2773)	(3.0153)	(2.5647)	(2.5867)	(2.4090)
Welfare Reform * High School	-2.5735*	-1.2112	-3.7374*	-5.1863***	-4.1388**	-5.6395**
	(1.4622)	(2.1244)	(1.8790)	(1.7483)	(1.9512)	(2.3391)
P-value for difference	[0.642]	[0.348]	[0.257]	[0.740]	[0.374]	[0.327]
Observations	1,716	1,627	1,536	4,998	4,733	4,508
Baseline Mean	87.73	90.31	89.75	87.49	90.15	89.64
Panel A	AFQT Score					
Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform * Low AFQT	-4.0213**	-1.4519	-5.8398***	-6.3106***	-4.1457**	-7.3272***
	(1.7550)	(2.2636)	(1.6956)	(1.9869)	(1.8891)	(1.7524)
Welfare Reform * High AFQT	1.2575	2.2512	-1.7155	-2.3889	-1.7683	-4.2810
	(2.1642)	(2.8731)	(2.8248)	(2.6108)	(3.0800)	(3.4145)
P-value for difference	[0.033]	[0.202]	[0.187]	[0.163]	[0.410]	[0.390]
Observations	1,682	1,595	1,509	4,912	4,657	4,442
Baseline Mean	87.82	90.39	89.77	87.59	90.23	89.69

Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. Low and high AFQT are defined relative to the weighted median for the target group. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year-level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month. Stacked DD models include stack-specific state and period fixed effects.

Table 6
Effects of Welfare Reform on Standardized HOME-SF Scores
Stacked Difference-in-Differences (DD) Estimates
1979 National Longitudinal Survey of Youth, 1990–2006
Low-educated Unmarried Mothers with Children Ages 0–5 Years
Heterogeneity by Child's Sex

Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform * Male	-1.9454	-0.4046	-3.1448*	-4.6418**	-3.3808*	-5.0023**
	(1.5769)	(2.0228)	(1.6740)	(1.8036)	(1.9788)	(1.8500)
Welfare Reform * Female	-3.7478*	-0.8385	-6.6205***	-6.1260***	-3.6877	-7.9628***
	(1.8920)	(2.2985)	(1.7425)	(2.1788)	(2.3272)	(2.3197)
P-value for difference	[0.396]	[0.830]	[0.063]	[0.482]	[0.890]	[0.193]
Observations	1,716	1,627	1,536	4,998	4,733	4,508
Baseline Mean	87.73	90.31	89.75	87.49	90.15	89.64

Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year-level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month. Stacked DD models include stack-specific state and period fixed effects.

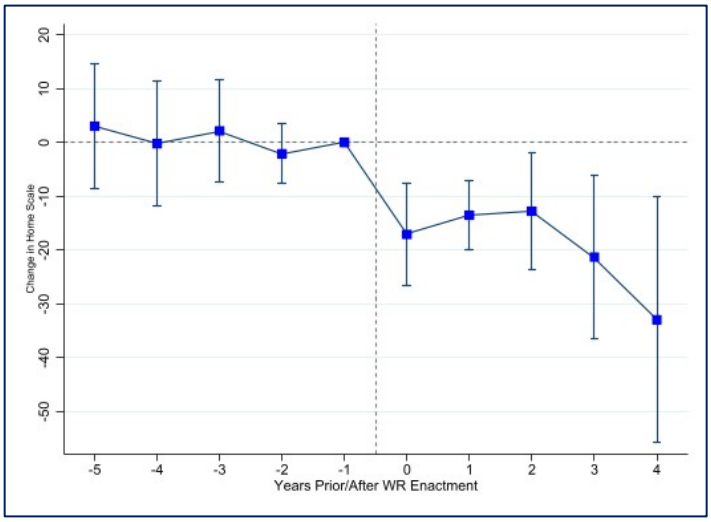
Table 7
Effects of Welfare Reform on Standardized HOME-SF Scores
Difference-in-Differences (DD) Estimates
1979 National Longitudinal Survey of Youth, 1990–2006
Mothers with Children Ages 0–5 Years
Placebo Checks

Panel A	Sample: Low-educated (HS or below) Married Mothers					
Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	2.5041	2.2762	0.9959	1.7212	1.2608	-0.0010
	(1.5349)	(1.4752)	(1.5151)	(1.6706)	(1.6985)	(1.7503)
Observations	4,093	3,927	3,690	11,990	11,582	10,880
Baseline Mean	99.40	99.15	99.74	99.40	99.13	99.60
Panel B	Sample: Higher-educated (> HS degree) Unmarried Mothers					
Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	0.1980	-1.1615	-0.7693	-1.8883	-5.6359*	-1.9668
	(2.9638)	(3.1706)	(2.8517)	(2.9444)	(3.1859)	(2.7684)
Observations	722	688	651	1,980	1,902	1,808
Baseline Mean	95.88	99.45	93.48	96.08	99.66	93.74
Panel C	Sample: College-educated Married Mothers					
Estimation	Standard DD			Stacked DD		
HOME Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	-0.4019	-1.2281	0.7459	-1.5828	-2.8478*	0.7892
	(0.9723)	(1.3372)	(0.9713)	(1.2623)	(1.4216)	(1.6020)
Observations	2,560	2,451	2,280	6,434	6,208	5,720
Baseline Mean	105.27	104.47	104.36	105.21	104.33	104.33

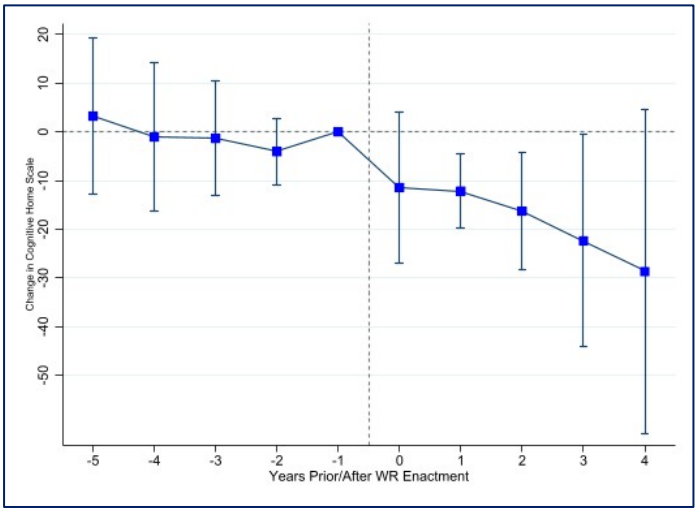
Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. Low and high AFQT are defined relative to the weighted median for the target group. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year-level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month. Stacked DD models include stack-specific state and period fixed effects.

Appendix Figure 1
Event-Study Analyses of the Effects of Welfare Reform on Standardized HOME-SF Scores Controlling for State-specific Trends (90% CI shown)

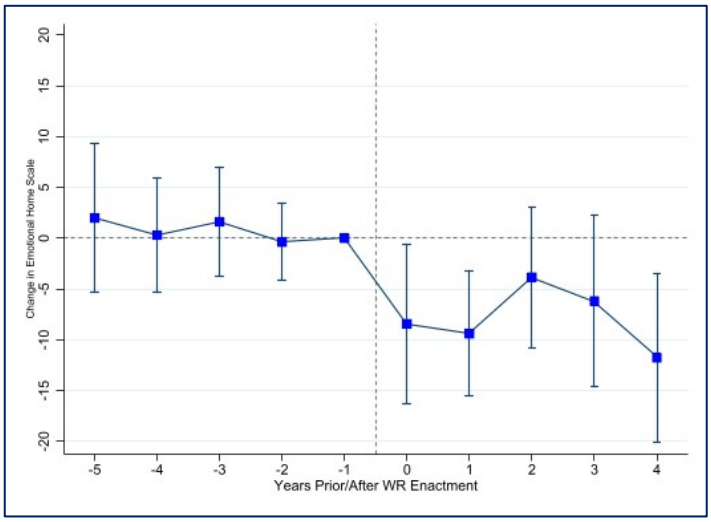
Panel A: Home Scale – Overall



Panel B: Home Scale – Cognitive



Panel C: Home Scale – Emotional



Appendix Table 1
Implementation Dates of Welfare Reform by State

	10/92 to 2/97 **AFDC Waiver**	9/96 to 1/98 **TANF**	10/92 to 1/98 **Any Welfare Reform**
Alabama		Nov-96	Nov-96
Alaska		Jul-97	Jul-97
Arizona	Nov-95	Oct-96	Nov-95
Arkansas	Jul-94	Jul-97	Jul-94
California	Dec-92	Jan-98	Dec-92
Colorado		Jul-97	Jul-97
Connecticut	Jan-96	Oct-96	Jan-96
DC		Mar-97	Mar-97
Delaware	Oct-95	Mar-97	Oct-95
Florida			Oct-96
Georgia	Jan-94	Jan-97	Jan-94
Hawaii	Feb-97	Jul-97	Feb-97
Idaho		Jul-97	Jul-97
Illinois	Nov-93	Jul-97	Nov-93
Indiana	May-95	Oct-96	May-95
Iowa	Oct-93	Jan-97	Oct-93
Kansas		Oct-96	Oct-96
Kentucky		Oct-96	Oct-96
Louisiana		Jan-97	Jan-97
Maine		Nov-96	Nov-96
Maryland	Mar-96	Dec-96	Mar-96
Massachusetts	Nov-95	Sep-96	Nov-95
Michigan	Oct-92	Sep-96	Oct-92
Minnesota		Jul-97	Jul-97
Mississippi	Oct-95	Jul-97	Oct-95
Missouri	Jun-95	Dec-96	Jun-95
Montana	Feb-96	Feb-97	Feb-96
Nebraska	Oct-95	Dec-96	Oct-95
Nevada		Dec-96	Dec-96
New Hampshire		Oct-96	Oct-96
New Jersey	Oct-92	Jul-97	Oct-92
New Mexico		Jul-97	Jul-97
New York		Nov-97	Nov-97
North Carolina	Jul-96	Jan-97	Jul-96
North Dakota		Jul-97	Jul-97
Ohio	Jul-96	Oct-96	Jul-96
Oklahoma		Oct-96	Oct-96
Oregon	Feb-93	Oct-96	Feb-93
Pennsylvania		Mar-97	Mar-97
Rhode Island		May-97	May-97
South Carolina		Oct-96	Oct-96
South Dakota	Jun-94	Dec-96	Jun-94
Tennessee	Sep-96	Oct-96	Sep-96
Texas	Jun-96	Nov-96	Jun-96
Utah	Jan-93	Oct-96	Jan-93
Vermont	Jul-94	Sep-96	Jul-94
Virginia	Jul-95	Feb-97	Jul-95
Washington	Jan-96	Jan-97	Jan-96
West Virginia		Jan-97	Jan-97
Wisconsin	Jan-96	Sep-97	Jan-96
Wyoming		Jan-97	Jan-97

Source: U.S. Department of Health and Human Services (1999)

Appendix Table 2

Home Observation Measurement of the Environment-Short Form (HOME-SF) for Ages 0–2 Years

Subscale		1 point
	QUESTIONS FOR CAREGIVER	
C	How often does child have a chance to get out of the house?	4+ times/week
C	About how many children's books does child have?	3+ books
C	How often do you get a chance to read to child?	3+ times/week
C	How often do you take child to the grocery store?	2+ times/month
C	About how many, if any, cuddly, soft, or role-playing toys does child have?	>=1
C	About how many, if any, push or pull toys does child have	>=1
C	Some parents spend time teaching their children new skills while other parents believe children learn best on their own. Which most closely describes your attitude?	Usually or always spend time teaching
E	How often does child eat a meal with both you and his/her father/step/father-figure	1+ times/day
E	How often do you talk to child while you are working?	Often or always
E	About how many times, if any, have you had to spank child in the past week?	Never or once
	INTERVIEWER OBSERVATIONS	
C	Mother provided toys or interesting activities for child	Yes
C	Child's play environment is safe	Yes
E	Mother spontaneously spoke to child twice or more (excluding scolding)	Yes
E	Mother responded verbally to child's speech	Yes
E	Mother caressed, kissed, or hugged child at least once	Yes
E	Mother did not spank child	Yes
E	Mother did not interfere w/ child's actions or restricted child from exploring >= 3 times	Yes
E	Mother kept child in view/could see child/looked at at him/her often	Yes

Source: National Longitudinal Surveys (2022)

Note: C = cognitive. E = emotional.

Appendix Table 3

Home Observation Measurement of the Environment-Short Form (HOME-SF) for Ages 3–5 Years

Subscale		1 point
	QUESTIONS FOR CAREGIVER	
C	How often do you read stories to child?	3+ times/wk
C	About how many children's books does child have?	10+
C	About how many magazines does your family get regularly?	1+
C	Does child have the use of a CD player, tape deck, or tape recorder, or record player at home and at least 5 children's records or tapes	yes
C	Do you or have you helped [child) with numbers?	Yes
C	Do you (or someone else) help [child] with the alphabet?	Yes
C	Do you (or someone else) help [child] with colors?	Yes
C	Do you (or someone else) help [child] with shapes and sizes?	Yes
C	How often does a family member get a chance to take child on any kind of outing?	2+ times/month
C	How often has a family member taken or arranged to take child to any type of museum in past year	At least once
E	How much choice is child allowed in deciding foods s/he eats at breakfast & lunch	Some or a great deal of choice
E	About how many hours Is the TV on in your home each day?	<5
E	How often does child eat a meal with both you and his/her father/step/father-figure	1+ times/day
E	About how many times, if any, have you had to spank child in the past week?	<2 times/week
E	***NON-HARSH PARENTING*** *– Any harsh parenting is scored a 0 for category*	
	If child got so angry that s/he hit you, what would you do? Hit him/her back	Yes=harsh
	If child got so angry that s/he hit you, what would you do? Send child to room	Yes=Non-harsh
	If child got so angry that s/he hit you, what would you do? Spank child	Yes=harsh
	If child got so angry that s/he hit you, what would you do? Ignore It	
	If child got so angry that s/he hit you, what would you do? Give child a chore	Yes=Non-harsh
	If child got so angry that s/he hit you, what would you do? Take away allowance	Yes=Non-harsh
	If child got so angry that s/he hit you, what would you do? Hold hands until calm	Yes=Non-harsh
	If child got so angry that s/he hit you, what would you do? Short time out	Yes=Non-harsh
	QUESTIONS FOR INTERVIEWER	
E	Mother conversed w/child >= 2 times (no scolding, suspicious comments)	Yes
E	Mother answered child's questions or requests verbally	Yes
E	Mother caressed, kissed or hugged child at least once	Yes
E	Mother introduced interviewer to child by name	Yes
E	Mother did not physically restrict or (shake/grab) child	Yes
E	Mother did not slap or spank child	Yes
E	Mother's voice conveyed positive feeling about child	Yes
C	Child's play environment is safe	Yes
C	Interior of the home is not dark	Yes
C	All visible rooms of house/apartment are reasonably clean	Yes
C	All visible rooms of house/apartment are minimally cluttered	Yes

Source: National Longitudinal Surveys (2022)

Note: C = cognitive. E = emotional.

Appendix Table 4
Effects of Welfare Reform on Standardized HOME-SF Scores
Difference-in-Differences (DD) Estimates: Controlling for State-specific Trends
1979 National Longitudinal Survey of Youth, 1990–2006
Low-educated Unmarried Mothers with Children Ages 0–5 Years

Estimation	Standard DD			Stacked DD		
Home Scale	Overall	Cognitive	Emotional	Overall	Cognitive	Emotional
Welfare Reform	-3.7906**	-0.7764	-5.9734***	-8.0087***	-5.8883**	-9.7396***
	(1.6016)	(2.0905)	(1.5595)	(2.3850)	(2.6634)	(2.3135)
Observations	1,716	1,627	1,536	4,998	4,733	4,508
Baseline Mean	87.73	90.31	89.75	87.49	90.15	89.64

Notes: Coefficients are reported, with state-clustered standard errors reported in parentheses. Asterisks denote significance as follows: *** p-value ≤ 0.01; ** 0.01 < p-value ≤ 0.05; * 0.05 < p-value ≤ 0.10. All specifications include the following covariates: child characteristics (indicators for the child's age, sex, and race/ethnicity); maternal characteristics (indicators for the mother's age and highest grade completed; number of children <5 years of age, number of children ages 5–9; number of children ages 10–18); state/year-level economic conditions and policies (unemployment rate, poverty rate, personal income per capita, Earned Income Tax Credit (EITC) rate, refundable EITC, minimum wage, number Medicaid beneficiaries, numbers of National School Lunch and School Breakfast Program participants, and population); controls for policy endogeneity (one-, two-, and three-year lags of the state unemployment rate, poverty rate, personal income per capita, and welfare caseload). All specifications also include fixed effects for the mother's state of residence and child interview year and month, and interactions between state and a linear time trend. Stacked DD models include stack-specific state and period fixed effects, and stack-specific interactions between state and a linear time trend.