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IZA DP No. 10942

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ABSTRACT

Welfare Reform and the Intergenerational Transmission of Dependence*

We estimate the effect of welfare reform on the intergenerational transmission of welfare participation and related economic outcomes using a long panel of mother-daughter pairs over the survey period 1968–2013 in the Panel Study of Income Dynamics. Because states implemented welfare reform at different times starting in 1992, the cross-state variation over time permits us to quasi-experimentally separate out the effect of mothers' welfare participation during childhood on daughters' economic outcomes in adulthood in the pre- and post-welfare reform periods. We find that a mother's welfare participation increased her daughter's odds of participation as an adult by roughly 30 percentage points, but that welfare reform attenuated this transmission by at least 50 percent, or at least 30 percent over the baseline odds of participation. While we find comparable-sized transmission patterns in daughters' adult use of the broader safety net and other outcomes such as educational attainment and income, there is no diminution of transmission after welfare reform. These results are obtained by addressing nonrandom selection into welfare and are robust to other potential threats to identification from misclassification error, life-cycle age effects, and cross-state mobility.

JEL Classification: I38, J62, H53

Keywords: welfare reform, welfare participation, intergenerational transmission, poverty

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* We are grateful for comments from Anna Aizer, Richard Blundell, Chris Bollinger, Paul Devereux, Steven Durlauf, James Heckman, Hilary Hoynes, Mike Keane, Henrik Kleven, Robert Moffitt, Bill Neilson, Lara Shore-Sheppard, Jeff Smith, Lowell Taylor, Genia Toma, Marianne Wannamaker, and participants at the 2015 Summer School on Socioeconomic Opportunity, 2016 NBER Summer Institute, 2016 Barcelona GSE Summer Forum, 2016 APPAM Conference, 2016 Tennessee Empirical Applied Microeconomics Festival, the Institute for Fiscal Studies, Lancaster University, London School of Economics, Ohio State University, Nuffield College (Oxford), University College Dublin, University of Oklahoma, University of Oregon, and VATT Institute for Economic Policy.

I. Introduction

A fundamental goal of the landmark 1996 welfare reform in the United States was to eliminate the dependence of needy families on government assistance. This was premised in part on the belief that dependence is passed down from parent to child through knowledge and values, creating a "culture of welfare" across generations (Murray 1984; DeParle 2004; Haskins 2007). While this belief was bolstered by an empirical consensus documenting a positive intergenerational correlation of welfare use, the literature is much less settled on whether the relationship is causal (Duncan, Hill, and Hoffman 1988; McLanahan 1988; Solon, et al. 1988; Gottschalk 1990, 1992, 1996; Levine and Zimmerman 1996; Borjas and Sueyoshi 1997; Pepper 2000; Page 2004; Dahl, Kostøl, and Mogstad 2014). Instead, the parent-child link in welfare participation could simply be a spurious by-product of incomes that are correlated across generations. That is, low economic mobility across generations means that children of parents with low incomes likely have low incomes themselves in adulthood, and both generations participate in means-tested programs solely because of their shared poverty status and not welfare exposure per se. If true, then we would not expect generational welfare participation to fall after reform unless poverty among the young declined. Scores of papers have been written evaluating welfare reform (see surveys in Blank 2002; Moffitt 2003; Grogger and Karoly 2005; Ziliak 2016), but to date there has not been research on whether it achieved a key aim of ending generational welfare dependence.

In this paper, we estimate the effect of welfare reform on the intergenerational transmission of welfare participation. In addition, because the goal of welfare reform was to reduce dependency more broadly, we also estimate whether reform changed the relationship between parental welfare use and other adult economic outcomes of the child including human

capital attainment, employment, and poverty status. The empirical framework we use builds on a canonical Becker-Tomes (1979) transmission model with a difference-in-difference-type specification whereby the economic outcome of the child during adulthood is regressed on the prior welfare participation of the parent, a variable reflecting the implementation of welfare reform in the parent's state, and the interaction of the welfare-reform variable with parent's participation. Our identification strategy exploits the quasi-experimental variation provided by the 1990s reforms to the Aid to Families with Dependent Children (AFDC) program in the United States. AFDC was established during the Great Depression and was the main cash transfer program for families with dependent children. Conditional on low income and assets, along with the presence of children under age 18, eligibility for assistance was an entitlement. Starting in 1992, states began implementing substantive changes to their AFDC programs with waivers from federal rules, and by 1996, 43 states had implemented some form of waiver affecting program features such as new work requirements, time limits on length of receipt, and caps on benefit generosity. These waivers culminated with passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, which replaced AFDC with the non-entitlement block grant program Temporary Assistance for Needy Families (TANF).

Even though welfare reform provides exogenous variation in access to program benefits across welfare eras, identifying whether there is a causal pathway from parent to child in welfare use *within* periods is complicated by four—potentially reinforcing—forms of bias. First, selection bias in welfare participation across generations can arise through possible unobserved correlations in labor market productivity between the parent and child, perhaps because of latent shared cognitive or noncognitive skills, or shared tastes for welfare relative to work (Solon, et al. 1988; Gottschalk 1992, 1996; Pepper 2000). The second threat to identification comes from

potential misclassification bias in survey responses (Bollinger and David 1997, 2001; Hausman, Abrevaya, and Scott-Morton 1998; Kreider, et al. 2012; Meyer and Mittag 2014). In transfer programs, this nonclassical measurement error mostly comes in the form of "false negatives" when the respondent states they did not participate in a program when in fact they did. Meyer, Mok, and Sullivan (2015a,b) document a trend increase in misreporting across all major household surveys in the U.S., including the PSID. Third, so-called life-cycle bias and the 'window problem' may affect intergenerational estimates of economic status because we generally only observe snapshots of a parent and child and not their full life cycles (Wolfe, et al. 1996; Page 2004; Haider and Solon 2006; Nybom and Stuhler 2016). In the welfare context, this form of bias may exacerbate or attenuate intergenerational transmission estimates depending on whether the window of parent-child observations is dominated by families in the midst of long-term welfare spells. Fourth, there could be bias in the transmission estimates if the child moves across states as an endogenous response to the generosity of the state's welfare system (Levine and Zimmerman 1999; Gelbach 2004; McKinnish 2007; Kennan and Walker 2010).

To estimate our model, we assemble a long panel of mother-daughter pairs over the survey period 1968-2013 in the Panel Study of Income Dynamics (PSID). We focus on mother-daughter pairs because over 90 percent of AFDC cases were headed by a single mother, and there has been a large secular increase since the 1960s in the fraction of first births to unmarried women in the U.S. from fewer than 1 in 10 to over 4 in 10 such that more than one third of U.S. children were exposed to welfare by age 10 (Levine and Zimmerman 2005; Cancian and Reed 2009). We address potential endogenous selection into welfare by instrumenting for mother's welfare use. Because selection is likely to be time-varying, we instrument mother's welfare participation with the state maximum AFDC/TANF benefit guarantee and the maximum federal

and state Earned Income Tax Credit (EITC) when daughters are ages 12 to 18. These instruments are constructed during a daughter's critical ages of exposure to her mother's potential welfare, which is generally well before she faces a participation decision as an adult. The mother's welfare participation decision is assumed to respond positively to greater state-level AFDC/TANF benefit standards, whereas EITC benefits may offer a substitute for AFDC/TANF assistance. Fundamentally, these aggregated measures of state-level policies identify the portion of a mother's participation decision that are related to her welfare status separately from conditions related to her poverty status, and consequently, her daughter's future poverty status.

Next, we address the implications of misclassified welfare participation, which may occur in both the dependent variable for daughters as well as the independent variable for mothers. Instruments for mother's participation will partially address misclassification in the right-hand-side variable, and we use a relatively long time history to determine whether the mother ever participated on welfare in the past, which also should attenuate measurement error compared to a contemporaneous measure. We address misclassification bias in the dependent variable by parametric methods using "extra-sample" information based on PSID reporting rates estimated in Meyer, et al. (2015b).

We attempt to mitigate the influence of the life-cycle window problem by using the relatively long time series for each mother-daughter pair now available in the PSID. We require the mother and daughter to live together at least 5 years during the critical exposure period of ages 12-18, and to observe the daughter for at least five years after she forms her own family unit. On average, we observe mothers and daughters co-residing for 14 years, and daughters for nearly 25 years as head of their own family, and thus we observe the full welfare life cycle for many mother-daughter pairs. As a sensitivity check, we also estimate a variant of the model with

the Lee and Solon (2009) age-adjustment in order to re-center the data at a common point in the mothers' and daughters' life cycles. Lastly, for the issue of cross-state mobility, we examine the sensitivity of estimates to possible endogenous migration by examining various subsamples of non-movers.

Our estimates show that there is strong evidence for a causal transmission of AFDC/TANF participation from mother to daughter, and it is economically sizable, on the order of 30 percentage points. However, welfare reform significantly attenuated the level of transmission pathway by at least 50 percent, or at least 30 percent over the baseline probability. Moreover, we find that childhood exposure to welfare substantively increases the use of the wider safety net, the odds of nonemployment, and the odds of family earnings at poverty or near poverty levels. Yet in these cases, welfare reform did not affect the transmission path, leaving daughters no better off in broader economic status. Estimates of the reform effect are robust across a variety of specifications, including the length of mother-daughter observation window, the age of welfare exposure by the daughter when living at home, the length of time the daughter is exposed to welfare, life-cycle age adjustments, and misclassification error.

II. Welfare Reform and Intergenerational Transmission

"Welfare" in the U.S. through the 1980s was largely defined by the AFDC program, which was established as part of the Social Security Act of 1935 to assist low-income families with children under age 18. Initially, assistance was restricted to the children of destitute widows and widowers, and then later was expanded to cover the guardian of the child, and eventually a second parent if present in the household. In well over 90 percent of the cases, the family was headed by a single mother. Eligibility for assistance (conditional on the presence of a dependent child under age 18) was determined by an income test, a liquid asset test, and a vehicle asset test.

The federal government set rules on what counted as income or an asset, and also established limits on the dollar value of those resources. States did have authority to set maximum benefit levels (which increase with family size) and need standards used in assigning income eligibility. The program was an entitlement funded by a federal-state matching grant based on state per-capita income, with the federal government picking up over 60 percent of expenditure on average (Ziliak 2016).

Beginning in the 1960s, states could apply for waivers from federal rules to experiment with program features, but with few exceptions, they did not utilize this flexibility, and when they did, it was typically for small pilot programs. This changed in the last half of the President George H.W. Bush administration when several states filed waiver applications, and then accelerated under President Clinton, who had pledged to "end welfare as we know it" as part of his 1992 campaign. By 1996, 43 states had waivers approved by the Department of Health and Human Services (Grogger and Karoly 2005). The waivers were far reaching, and included both strengthening and expanding of pre-existing policies (e.g. work requirements and sanctions on benefits for failing to work or participate in a training program introduced as part of the Family Support Act of 1988), as well as new policies aimed at family responsibility (e.g. caps on the generosity of benefits by family size and time limits on benefit receipt). Some of the new policies actually expanded eligibility, such as higher asset limits and earnings disregards for benefit determination, but the majority were designed to restrict program access. Time-limit waivers in particular were introduced to break long-term spells on AFDC, and in turn to reduce exposure of children to parental use of welfare.

The state-level waivers were codified into federal law with passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in August of 1996.

PRWORA replaced AFDC with a new program called Temporary Assistance for Needy Families (TANF), which is not an entitlement. The new law established federal maximum guidelines regarding funding, work requirements, and time limits, but otherwise devolved much more program design authority to the states. For example, the federal lifetime time limit for benefits for an adult is five years, but nearly half the states opted to impose shorter limits. Nineteen states now require some form of mandatory job search at the point of benefit application, and in fourteen of those states the sanction for noncompliance is to deny the application. Seventeen states have opted to impose a family cap on benefit generosity, and thirty-two states introduced "diversion payments" that steer eligible applicants away from the official caseload and toward a lump-sum payment, typically valued at three months of the maximum benefit for a given family size (Ziliak 2016).

[Figure 1 here]

Figure 1 depicts trends in the number of persons on AFDC/TANF, spanning the AFDC era (1960-1991), the major waiver period (1992-1996 shaded in gray), and the TANF era (from 1997 onward). Participation accelerated throughout the 1960s from about 3 million persons in 1960 to 10 million a decade later. The level of recipients remained fairly constant for nearly two decades, and then increased by approximately 30 percent from 1989 to 1994. By 2012, however, the number of recipients had plummeted 67 percent to levels roughly the same as five decades earlier. Numerous studies demonstrated that while the economy accounted for more of the decline in welfare in the mid 1990s, welfare waivers also reduced participation, especially in those states adopting more stringent responsibility and time limit policies (Council of Economic Advisers 1997; Ziliak et al. 2000; Blank 2001; Grogger 2003). For those few studies that examined caseload decline after passage of PRWORA, greater weight was given to policy

reforms in accounting for the decline in participation compared to the waiver era, though the macroeconomy was still the driving force (Grogger and Karoly 2005). The declining participation stemmed more from reduced entry onto welfare than from increased exits (Grogger, Haider, and Klerman 2003; Haider and Klerman 2005; Frogner, Moffitt, and Ribar 2009).

Families that received AFDC were categorically eligible for food assistance from the Food Stamp Program, which started in 1964 but took nearly a decade to roll out nationwide (and was renamed Supplemental Nutrition Assistance Program (SNAP) in 2008). Receipt of AFDC was not necessary for eligibility for food stamps, but it was sufficient, and typically about 80 to 90 percent of AFDC recipients took up both (Green Book 1994). This categorical eligibility remained after the introduction of TANF. While any given individual on AFDC could not simultaneously receive assistance from the disability program Supplemental Security Income (SSI), which began in 1972, it was possible for families to combine benefits with some on AFDC and some on SSI (and still also qualify for food stamps). These provisions remain after welfare reform.

Figure 1 also presents trends in the number of recipients on food stamps and SSI. There was a marked drop in food stamp participation in the immediate aftermath of welfare reform, followed by a huge expansion in the subsequent decade. These swings have been attributed to changes in the macroeconomy, welfare and food stamp policies, and program take-up rates among those eligible (Ganong and Leibman 2013; Ziliak 2015). There has also been growth in SSI, especially after 1990 when the Supreme Court's *Zebley Decision* expanded eligibility for children (Kubik 1999), and again after welfare reform where there is some evidence that states systematically facilitated the applications of former AFDC recipients for SSI program benefits (Schmidt and Sevak 2004). The implication is that even if welfare reform succeeded in breaking

the generational cycle on AFDC/TANF, it is not clear *a priori* that it reduced dependence more broadly when additional safety net programs are considered.

[Figure 2 here]

As motivating evidence for the role of welfare reform on the intergenerational transmission of dependence, Figure 2 presents the correlation between mother's and daughter's welfare participation for rolling cohorts of daughters over time based on the PSID. No attempt is made here to separate out cause and effect, only correlations over time in order to illustrate the trend and to anchor our estimates to those in the prior literature as summarized in Page (2004).[1] Figure 2 shows that the intergenerational correlation in welfare increased throughout the two decades leading up to the passage of welfare reform, and did not peak until 1998 when the correlation of 0.40 was more than double that of the late 1970s. The correlation between mothers' and daughters' AFDC/TANF use then fell precipitously afterwards to levels comparable to those in the early 1980s. However, expanding the definition of daughter's welfare to include food stamps or SSI (mother's welfare remains defined by AFDC/TANF use), then we see a very different pattern. The intergenerational correlation is relatively constant after welfare reform. The descriptive evidence thus points to the possibility that welfare reform succeeded in reducing the transmission of AFDC/TANF use across generations, but dependence more broadly defined has not changed.

To identify the intergenerational dependence parameter, one naturally has to separate the

[1] Specifically, across rolling cohorts of mother-daughter pairs in each year we estimate $W_{it}^{d} = \alpha_t + \delta_t W_{it}^{m} + \epsilon_{it}^{d}$ where W_{it}^{d} and W_{it}^{m} are the daughter's and mother's welfare indicators, respectively, δ_t is the year-specific intergenerational correlation in welfare use, and ϵ_{it}^{d} is the error term. In order to make our estimates comparable to Page (2004), we use daughter's PSID core longitudinal weights at age 25 in estimation, and we temporarily define our sample and measures of welfare participation for the purposes of Figure 2. For each year *t*, our sample consists of daughters ages 27-42 years old who are the heads of their family unit and the dependent variable is an indicator for any welfare use by the daughter between ages 14 and 27. The independent variable is an indicator for mother's welfare use prior to the daughter's matriculation to family headship.

poverty trap from the welfare trap. The correlations presented in Figure 2 can simply reflect persistence in poverty status, and thus, the evidence does not imply that welfare generated dependence on government assistance transmitted from mother to daughter. The literature, however, has elaborated on potential mechanisms beyond the poverty mechanism (see, e.g., Moffitt 1983; Duncan et al. 1988; Antel 1992; Durlauf and Shaorshadze 2014). First, a mother's participation might lower her daughter's stigma associated with welfare as well as other costs of participation. A child on welfare can observe and learn how the program 'works', while her mother does not incorporate potential future costs on her daughter in her utility-maximizing behavior. Secondly, contrasting the idea that welfare offers mothers additional resources in times of need, participation in government assistance affects job market opportunities for mothers, and consequently, can increase dependence for daughters through several factors such as labor force attachment and social capital, for example. Essentially, the reform targeted these plausible intertemporal mechanisms. Therefore, a framework for identifying the intergenerational transmission of dependence needs to move beyond the correlations presented in Figure 2 by considering that the reform could affect daughters' participation decisions, both directly on AFDC/TANF and more broadly on other programs and adult economic outcomes. We discuss further details on identification in the next section.

III. Estimating Intergenerational Transmission Pre- and Post-Reform

Contemporary empirical studies on intergenerational socioeconomic outcomes trace their intellectual foundation to the work of Becker and Tomes (1979, 1986), who provide a structural framework of dynastic family decision making. The corresponding canonical statistical model involves regressing the outcome of interest of the child on the corresponding outcome of the parent, whether it is earnings, education, health, income, wealth, or in our case, welfare

participation (see surveys in Solon 1999; Black and Devereux 2011). The *prima facie* evidence in Figure 2 suggests a structural break in (AFDC) welfare participation starting during the reform era. Introducing welfare reform implies a straightforward modification to the canonical model of the intergenerational transmission of welfare before and after reform as

$$W_{ist}^{d} = \alpha + \beta' \boldsymbol{x}_{ist}^{d} + \delta W_{is,\forall j<t}^{m} + \gamma R_{st}^{m} + \theta R_{st}^{m} W_{is,\forall j<t}^{m} + \mu_{s}^{d} + \rho_{t}^{d} + \nu_{ist}^{d}, \quad (1)$$

where W_{ist}^{d} is an indicator variable that takes a value of 1 if the daughter (*d*) in family *i* residing in state s at time period t participates in welfare and 0 otherwise; $W_{is,\forall j<t}^{m}$ takes a value of 1 if the mother (*m*) ever participates in welfare in any prior period $j = 1, \ldots, t-1$ and 0 otherwise; $\boldsymbol{x}_{ist}^{d}$ is a vector of observed demographic characteristics of the daughter; R_{st}^{m} is an indicator variable that takes a value of 1 when the state of residence of the mother implements welfare reform and 0 otherwise; and, v_{ist}^{d} is the error term.[2] The state effect μ_{s}^{d} controls for permanent differences in states such as natural endowments that affect economic opportunities, while the time effect ρ_{t}^{d} controls for macroeconomic and policy changes affecting all daughters the same in a given year.

In equation (1), once the mother participates, the $W_{is,\forall j<t}^{m}$ variable remains "on" for each subsequent observation. The use of ever on welfare for the mother instead of contemporaneous participation serves two purposes: first, it implies that once the mother participates in welfare it cannot be "unlearned" by the daughter; and second, the ever-on measure captures a longer window and thus attenuates potential measurement error. The baseline models define welfare of the daughter and mother as participation in AFDC/TANF, but we also explore heterogeneity in

[2] While the notation implies that the daughter and mother share the same state s, this constraint is nonbinding in practice where welfare reform implementation and state-level instruments correspond to the mother's state of residence. We test the robustness of the estimates to possible cross-state mobility below.

the transmission mechanisms by age of the daughter when exposed to the mother's welfare use, the length of exposure to the mother's welfare use, by race of the family, and by stringency of the state's welfare reforms. In addition, to examine whether welfare reform altered the relationship between mother's welfare use and other adult economic outcomes of the daughter, we also estimate models where we replace the dependent variable with an indicator for broader safety net participation on AFDC/TANF, food stamps/SNAP, or SSI, as well as indicators for low educational attainment, nonemployment, and poverty and near poverty status.[3]

In equation (1), δ is the intergenerational correlation of welfare participation, and $\delta + \theta$ is the correlation after welfare reform. This specification is akin to a difference-in-difference model whereby we exploit the quasi-experimental variation induced by the fact that different states adopted welfare reform at different times starting in the early 1990s.[4] That is, the indicator R_{st}^{m} "turns on" when the state *s* implements a waiver and remains on thereafter. By adopting this functional form, we implicitly assume that the TANF program implemented after PRWORA is a continuation of the reforms begun during the waiver period for those states that were early adopters of reform. This has been a standard assumption in the welfare reform literature, though in some cases researchers allow a trend break between the waiver era and TANF era (Blank 2002). If welfare reform succeeded in reducing the transmission across generations, then we expect that $\theta < 0$.

A ubiquitous challenge across the intergenerational transmission literature has been establishing a causal pathway from parent to child, i.e. separating out the poverty trap from the

[3] The prior literature generally only provided estimates of AFDC with General Assistance (e.g. Gottschalk 1996), or of combined AFDC/GA/Food Stamps/SSI in main results with some discussion of estimates restricted to AFDC/GA (e.g. Solon, et al. 1988; Page 2004).

[4] Ziliak, et al. (2000) show that a state's decision to apply for an AFDC waiver was not an endogenous response to caseload size, which supports the use of the waiver reform period as identifying variation for welfare participation.

welfare trap, because the conditional mean assumption for consistency of least squares that $E\left[v_{ist}^{d}\middle|W_{is,\forall j<t}^{m},\bullet\right]=0$ is generally violated. While the state and year effects are likely to control for some forms of endogeneity, it is still possible that the remaining time-varying error term v_{ist}^{d} can be correlated with mother's welfare use by endogenous selection and measurement error. Below, we offer a detailed discussion of each of these threats to identification, and how we address them. We also investigate other possible identification issues (i.e., life-cycle factors and geographic mobility) later in Section V.C.

III.A. Selection Bias

The conditional mean independence assumption for consistent causal estimates of the intergenerational parameters δ and θ will break down if there are unobserved characteristics common to the mother and daughter that affect the decision to participate. That is, if we backdate equation (1) by a generation, say $-t$, and write a model of the mother's participation as a function of her demographics ($\boldsymbol{x}_{is,-t}^{m}$) and the welfare choice of her mother (i.e. the daughter's grandmother, $W_{is,\forall k<-t}^{g}$), then shared tastes for work and welfare within families would imply that $E\left[v_{ist}^{d}v_{is,-t}^{m}\middle|\boldsymbol{x}_{ist}^{d},W_{is,\forall j<t}^{m},R_{st}^{m},\boldsymbol{x}_{is,-t}^{m},W_{is,\forall k<-t}^{g}\right]\neq 0$. The quasi-experimental design of using cross-state variation over time in adoption of welfare reform allows us to separate the pre- and post-reform eras, but *within* the AFDC and TANF eras there still remains a possible convolution of state dependence (welfare trap) and unobserved heterogeneity (poverty trap).

There have been several efforts over the years to control for endogenous selection in intergenerational welfare participation. In an early study, Solon, et al. (1988) used pairs of sisters in order to control for shared family background (i.e. family fixed effects) in identifying the effect of parental welfare participation. Antel (1992) adopted Heckman's (1978) dummy endogenous variable model within the context of a two-limit tobit specification. He included

exclusion restrictions in the mother's reduced form equation such as the state's AFDC benefit guarantee and local labor market conditions as proxied by net migration flows. In lieu of exclusion restrictions, Gottschalk (1996) addressed unobserved heterogeneity by modeling the event histories of daughter's and mother's welfare usage in order to identify causal effects relative to a mother's past participation. Levine and Zimmerman (1996) used mother's background as additional control variates, as well as state (e.g. welfare generosity) and local (e.g. county unemployment rate) variables as instruments for mother's welfare participation. Dahl, et al. (2014), who examined disability insurance in Norway, used the random assignment of appellate-court judges as an instrumental variable to identify parent's disability participation on child's disability insurance claims. Pepper (2000) eschewed point identification methods of the latter authors in favor of nonparametric bounding techniques to control for selection as proposed by Manski (1995). Antel, Gottschalk, Pepper, and Dahl, et al. all conclude that parent's participation in welfare is causal for the child and not spurious, while Solon, et al. and Levine and Zimmerman provide evidence more in favor of spurious poverty traps.

Our approach to address possible endogenous selection within welfare regimes is to extend the prior point identification literature by exploiting the comparatively long time histories now available in the PSID and estimate equation (1) via instrumental variables. Specifically, we instrument for mother's previous welfare participation using the policy parameters defined by the state maximum AFDC/TANF benefit guarantee and the combined Federal and state maximum EITC. Each of these instruments vary across states, time, and family size—the maximum AFDC/TANF guarantee is set by state legislatures, while the maximum Federal EITC is set by the U.S. Congress to vary by the number of qualifying children in the family and the state portion is set by state legislatures as a fixed percentage of the Federal credit. Both of the

variables speak to the prospect of the welfare trap, but in opposite directions. A higher maximum AFDC/TANF benefit guarantee means that all else equal welfare is more attractive to the mother, while a higher maximum EITC means that work is more attractive than welfare since EITC eligibility is work conditioned. To ensure that the policy instruments are most salient to the mother's welfare choice, we restrict the time period of the instruments by aggregating over values that are applicable to the mother when her daughter is in the critical exposure ages of 12-18 years old and not an adult living independently. Note that because the models are estimated with state and time effects, these instruments are demeaned variables by state and year, and therefore, they exploit exogenous transitory policy changes at the state level during a daughter's childhood. These welfare policies while the daughter is young should have no effect on her subsequent welfare decisions in adulthood except via the welfare choice of her mother (Antel 1992; Moffitt 1992; Levine and Zimmerman 1996).

We use four measures of welfare generosity for our instruments: the average and maximum of the state-specific AFDC/TANF benefit standard for families of 2, 3, or 4 or more persons, and the average and maximum of the combined Federal and state EITC maximum credit amounts for 0, 1, or 2 or more dependents. The EITC benefit is defined as $EITC_{it} * (1 + p_{ist})$, where $EITC_{it}$ is the Federal credit that varies by the number of qualifying children and year and p_{ist} is the fraction of the Federal EITC that a state refunds on the state return. The Federal EITC was begun in 1975, and expanded in 1986, 1991, 1993, and 2009, while states began introducing the refundable state EITC in the late 1980s. By the mid 2000s, nearly half the states had a separate EITC, providing cross-state and family-size variation over time in the instrument. In equation (1) both mother's welfare participation and its interaction with welfare reform are treated as endogenous, and thus the full set of instruments enter directly and interacted with the

welfare reform indicator. We test both the first-stage strength and the validity of overidentifying restrictions in the results section. We also test the robustness to additional policy and economic instruments.

III.B. Misclassification Bias in Models with and without Endogenous Variables

Misreporting of welfare is present both at the extensive participation margin and the intensive dollar margin, it pervades all social surveys, and has gotten worse over time (Meyer, et al. 2015a,b). In the case of welfare participation, misreports can be in the form of "false negatives"—the respondent states they do not receive assistance when in fact they do—and "false positives"—the respondent states they receive assistance when in fact they do not. Based on validation studies of the Food Stamp Program and TANF, most misclassifications are false negatives (Bollinger and David 1997, 2001; Meyer, Goerge, and Mittag 2014; Meyer and Mittag 2014, 2015).[5] The reasons for the increase in misreporting are generally unknown, but this trend may in part be a result of the increasing importance of in-kind transfers in the TANF program, which are generally more difficult for the respondent to place a monetary value.

Remedies for classification bias are not straightforward in the context of dichotomous variables. A standard approach for continuous variables in the intergenerational income literature with classical measurement error is to take 3- or 5-year averages of parent's (and possibly child's) income (Solon 1992, 1999; Mazumder 2005). While such averages are likely to improve things in dichotomous participation models, this is not ensured as the errors have been found to vary systematically with characteristics and are nonclassical. Some have proposed parametric or semiparametric adjustments to the likelihood function to incorporate misclassification (Bollinger

[5] When false positives do occur, the issue is often misreporting the correct source of actual transfer income or mistaking the timing of receipt, thus aggregate measures of welfare participation over time or across survey questions should diminish the relevance of this error type given our independent variable definition.

and David 1997, 2001, 2005; Hausman et al. 1998; Meyer and Mittag 2014), while others have proposed partial-identification nonparametric bounding techniques (Bollinger 1996; Black, Berger, and Scott 2000; Molinari 2008; Kreider, et al. 2012; Kreider, Pepper, and Roy 2016). These solutions have been proposed for cross-sectional data either for measurement error in the dichotomous dependent variable, or the independent variable, though we have potentially mismeasured dichotomous variables on both the left- and right-hand sides of the equation.

We consider several potential remedies for misclassification bias. First, evidence in Bollinger and David (2005) showed that respondents have a latent propensity to report or not report, and that cooperation increases with length of panel participation. Since we follow mothers for at least 14 years on average and daughters for 25 years, correct reporting should be more prevalent than in a sample with short observation windows. Second, for right-hand-side mismeasurement of mother's participation, again recall that we measure if the mother *ever* participates, which is likely to be less noisy than contemporaneous participation.[6] Moreover, the instrumental variables discussed in the prior section on selection bias are also likely to improve matters for misreports of mother's participation. Third, for left-hand-side classification error, we consider parametric bias-corrections along the lines proposed in Bollinger and David (1997, 2001) and Hausman, et al. (1998). Specifically, we follow Hausman et al. (1998) and assume that misreporting is independent of model covariates and constant across individuals, which implies that the partial effect of mother's participation on daughter's participation in equation (1) from observed data is proportional to the true partial effects,

[6] For further support that the mother's indicator for any prior welfare participation is measured more accurately, Appendix A demonstrates how the probability of ever misreporting tends to zero as the number of mother observations increases.

$$(2)\qquad \mathrm{P}\left(W_{ist}^{d}=1\middle|W_{is,\forall j<t}^{m}=1,\ \bullet\right)-\mathrm{P}\left(W_{ist}^{d}=1\middle|W_{is,\forall j<t}^{m}=0,\ \bullet\right)= (1-\tau_{0t}-\tau_{1t})(\delta+\theta R_{st}^{m}),$$

where • represents other controls, τ_{0t} is the false positive reporting rate at time t, and τ_{1t} is the false negative reporting rate at time t. To implement this correction, we set the false positive rate to 0, and for the linear probability models rescale all the right-hand-side variables in equation (1) by $(1-\hat{\tau}_{1t})$, which is based on estimates of AFDC/TANF reporting rates in the PSID by Meyer, Mok, and Sullivan (2015b) as depicted in Appendix Table A1. Appendix A offers additional details on the two-stage approach to estimate the parameter of interest in equation (2).

A convenient aspect of the proposed methodology is that it allows us to estimate models with endogenous variables using instrumental variables. This is an important innovation because, as discussed in the previous section, selection bias due to correlation of unobservables is likely to create biased estimates of the effect of welfare reform on the transmission parameter.

IV. Data

The data come from the Panel Study of Income Dynamics (PSID), which was begun in 1968 as a survey of 4,800 American families. The survey has followed the children and grandchildren of original sample parents as they split off to form their own households so that today there are over 10,000 PSID families and 24,000 individuals. As the longest continuously running longitudinal survey, the PSID is ideally suited for the study of intergenerational transmission, and has been found to be robust over time to changes in sample composition (Fitzgerald, Gottschalk, and Moffitt 1998; Fitzgerald 2011). The original sample drew about 60 percent of the families from the nationally representative Survey Research Center (SRC) subsample, and the other 40 percent from an oversample of low-income and minority families as part of the Survey of Economic Opportunity (SEO) subsample. We focus on linked mother-

daughter pairs over the entire life of the PSID survey years from 1968-2013, and in order to ensure adequate sample sizes we include observations from both the SRC and SEO subsamples.

The oversample of low-income families in the PSID allows for more precise estimation of welfare participation, yet this unrepresentative sample will yield biased causal estimates if, after conditioning on control variables, the selection probability remains endogenous to daughter's welfare participation, or if there exist heterogeneous transmission effects relative to the oversampled population (see Solon, Haider, and Wooldridge 2015).[7] Some examples in the literature have addressed endogenous sampling directly by controlling on observed characteristics (Corcoran, et al. 1992; Pepper 2000), or by restricting the estimation sample to the SRC only (Moffitt and Gottschalk 2002; Lee and Solon 2009). Other examples have used weights for estimators that are based on frequency counts (Solon, et al. 1988; Page 2004), as a sensitivity check (Solon 1992), or in the main estimation (Hoynes and Schanzenbach 2012). A primary concern for our estimates is the potential heterogeneity of welfare participation transmission by race coupled with overrepresented low-income, minority families, and our model maintains a fairly parsimonious structure that may not adequately account for this source of bias. Therefore, in all of our estimation results, we provide weighted estimates and also demonstrate that the results are robust to the use of weights or restriction to the SRC subsample.

Our baseline sample consists of mother-daughter pairs that are observed for at least five years while the daughter is living in the same household during the critical exposure period spanning the ages of 12-18, and that the daughter is observed at least five years as the head of her own family unit. Selecting adolescence and teenage years as the observation window for childhood exposure pervades the welfare transmission literature (Solon, et al. 1988; Duncan and

[7] See PSID documentation for background on survey selection procedures and sample weight construction. For detailed issues relate to the Survey of Economic Opportunity, see Brown (1996).

Yeung 1995; Gottschalk 1996; Pepper 2000; Page 2004). Part of this stems from data needs; that is, if we require observing early childhood as well as enough years in adulthood, then we will impose greater demands on the data in terms of length of time in the panel and in turn end up with fewer mother-daughter observations. The other reason for focusing on adolescent and teenage years is that cognitive, emotional, and physiological development are sufficiently advanced for the potential of "welfare learning" from the parent. However, it remains an open question in the literature which stage of childhood development is most important for the potential of welfare learning. Research shows that economic deprivation in early childhood has more deleterious effects in terms of achievement and health in early adulthood than does similar deprivation during adolescence (Duncan, et al. 1998; Duncan and Brooks-Gunn 2000; Ziol-Guest, et al. 2012; Elango, et al. 2016). But this research has not separated out the independent role of welfare in this process. As such, we follow convention and focus on the five years observed during the ages 12-18 as a key period of welfare exposure for our baseline models, and then explore how the estimates change as the age and length of exposure changes.

[Table 1 here]

A daughter is considered an adult at first childbirth or when establishing a new family unit if she is at least age 14, though she may continue to live at home as a subfamily. This yields a baseline sample of 2,961 mother-daughter pairs spanning 56,067 observation years of the daughter as an adult. Table 1 contains the key variables from the baseline sample used in estimation of equation (1), separated into the pre- and post-welfare reform eras, and weighted by the daughter's core longitudinal weight. While 4.4 percent of daughters receive AFDC/TANF as an adult in the sample period, the odds of participation are nearly 70 percent lower after welfare

reform, falling from 8 percent to 2.5 percent.[8] On the other hand, there is much more stability over time in participation in any of the three programs, with 13.2 percent receiving AFDC/TANF, food stamps/SNAP, or SSI before reform and 11.2 percent afterwards. Almost all of the additional uptake in welfare use is from food stamps/SNAP. The bottom panel of Table 1 shows that about 27 percent of mothers were ever on AFDC/TANF prior to welfare reform, and 6.6 percent were ever on during the period after reform, while those figures jump to 43 and 19 percent, respectively, if the mother ever received AFDC/TANF, food stamps/SNAP, or SSI. Note that it is possible for the mother to first participate on welfare after the daughter forms her own family unit. For AFDC/TANF participation, this can occur only if the mother has children (or dependents) under age 18 remaining in the household other than the focal daughter. Learning thus can occur from direct exposure while the daughter resides in the household with her mother, or from indirect "word of mouth" once the daughter forms her own family unit. We discuss this mechanism in the results section below.

The other focal regressor in equation (1) is the indicator for welfare reform. As discussed previously, states began reforming AFDC in earnest starting in 1992, four years prior to passage of PRWORA. States had to submit requests for waivers from Federal rules to the U.S. Department of Health and Human Services, e.g., to introduce a time limit on benefits or to expand asset limits for eligibility. If the waiver was approved, then there was generally a lag between the time of approval and when the policy was implemented. Indeed, some approved waivers never were implemented (Grogger and Karoly 2005). We thus use the implementation

[8] The PSID asks about AFDC/TANF receipt of the family head, spouse, and other family members, as well as an "other welfare" category (not including SSI, food stamps, workers' compensation, housing, Social Security). This other welfare category can contain assistance from various public sources including General Assistance. If the percent of daughters participating in AFDC/TANF are adjusted for misclassification (by inflating sample statistics by the reporting rates shown in Appendix Table A1), then the baseline participation over the sample period would be 7.8 percent of daughters, which then falls to an adjusted 5.6 percent after welfare reform.

date of the waiver as the date when reform is first in place, and the variable remains on for each year thereafter. For those states that did not implement waivers we use the implementation date of their TANF program. While the major AFDC waiver implementation period is defined as 1992-1996, the earliest major waivers were officially implemented in Michigan and New Jersey as of October 1992, and the latest implementation of TANF was in New York as of November 1997. In our data, the implementation of welfare reform is denoted by the earliest year in which at least 3 quarters of the year are observed after reform (either by waiver or TANF), implying that the reform variable spans 1993-1998.[9] As seen in Table 1, about 65 percent of daughter-year observations occur after welfare reform, while for mothers it is only around 14 percent.

Table 1 also contains demographic characteristics of the daughter and mother, as well as our main instrumental variables. Daughters are 28 years old on average before reform and 39 after reform, while mothers are 42 and 59 years old, respectively, highlighting the long observation windows we observe families compared to prior research. For the estimation sample, approximately 72 percent of daughters reside in their state of birth during adulthood.[10] The nominal values of the maximum guarantees and credit are converted to real 2012 dollars using the personal consumption expenditure deflator.[11] The average real maximum AFDC/TANF benefit standard facing mothers was $724 over the entire sample period, but fell nearly in half in the post reform era which reflects the fact that most states have left the nominal guarantees unchanged for decades (Ziliak 2007). On the other hand, the real value of the EITC facing mothers in the welfare/no-welfare decision increased by a factor of three, highlighting the push

[9] For specific dates of welfare reform waiver approval and implementation, see Crouse (1999).
[10] Also, statistics not shown in Table 1 indicate that 63 percent of daughters live in the same state as their mothers, while 57 percent never change states during the entire observation period.
[11] Source: U.S. Bureau of Economic Analysis, 2016, Personal Consumption Expenditures Excluding Food and Energy, Chain-Type Price Index [series: DPCCRG3A086NBEA], retrieved from FRED, Federal Reserve Bank of St. Louis.

to a work-based safety net in recent decades.

V. Estimates of Welfare Reform on Intergenerational Transmission

In presenting the empirical results, we first focus on the baseline linear probability model correcting for nonrandom selection and misclassification error, and then expand the outcomes to include participation in additional transfer programs as well as human capital and employment. Having established that welfare reform only affected the intergenerational transmission of AFDC/TANF and not additional outcomes, we then return to the AFDC/TANF model to assess the robustness of the findings to life-cycle bias and cross-state mobility. All models control for time-varying demographic controls of the daughter (a quadratic in her age and indicators for the number of children in her home) as well as dummy variables for state of residence and year. The standard errors are robust to heteroscedasticity and clustered at the state level given the focus on state welfare reforms.

V.A. Baseline Estimates

The first four columns of Table 2 contain the baseline estimates of the parameters of interest in equation (1), with and without instrumental variables and corrections for misclassification of the dependent variable. The IV estimate of the effect of mother's AFDC participation prior to welfare reform in column (2) is 0.281 (s.e. = 0.056), meaning that if the daughter's mother ever participated in AFDC then the daughter is 28 percentage points more likely to participate as an adult. This estimate, which corrects for correlated unobservables between mother and daughter and possible measurement error in mother's survey reports, is economically large and nearly double the OLS estimate in column (1), but is within the range of estimates among studies from that era surveyed in Page (2004).[12] That correlation falls 70

[12] Note that this estimate is lower than a simple average of the trend estimates in Figure 2 because the samples differ. Figure 2 depicts whether the daughter is ever on welfare before age 27, while the sample used in estimating

percent after welfare reform to 0.084 (=0.281-0.197). Because the underlying probability of being on welfare fell by a similar proportion as seen in Table 1, if we consider percent changes in transmission as a fraction of the baseline probability, then the effect of welfare reform in column (1) would be a 48 percent reduction (=1-((0.281-0.197)/0.025)/(0.281/0.044)). The p-value of these changes is less than 0.005. This suggests that two-thirds of the post-reform reduction in the probability of AFDC/TANF participation came about from reduced transmission from mother to child. We note that the after-welfare reform variable has a positive effect on daughter's participation, suggesting that in the absence of welfare reform the trend increase in intergenerational transmission would have continued.

[Table 2 here]

While our baseline estimates intrinsically address misclassification of the mother's welfare participation by design (longer panels of nonattriters, instrumental variables, and ever on welfare instead of contemporaneous), they do not directly address the possibility of a binary mismeasured dependent variable. Columns (3) and (4) in Table 2 show the baseline estimates with misclassification bias corrections. As expected, the estimates are larger than those with no correction in columns (1) and (2), and indeed the corrected estimates without instruments in column (3) are on par with the uncorrected IV estimates in column (2). The IV estimates in column (4) suggest that the transmission from mother to daughter is stronger in the pre-reform AFDC period after adjusting for misclassification, but the post reform reduction is still a large and statistically significant 55 percent, or 37 percent over the baseline odds of participation. We note that the bias-corrected IV estimates are likely to be upper-bounds because the estimates of

equation (1) is for any contemporaneous welfare use after forming a family unit, regardless of daughter age. Table 2 also includes state and year effects as well as daughter control variables, while the figure shows unconditional correlations.

reporting rates from Meyer, et al. (2015b) come from annual cross sections of the PSID but our sample consists of a long panel of stayers who tend to be more accurate in reporting (Bollinger and David 2005).

A standard concern with IV estimates is the quality and exogeneity of the instruments. In Appendix Table B1 we present the first stage estimates of the effect of the instruments on the mother's participation decision in the pre-reform period (recall that the model also instruments the interaction between mother's welfare and her state-by-year welfare reform indicator), and in the middle of Table 2 we present standard tests of instrument strength and exogeneity. The null hypothesis of weak instruments is strongly rejected using the Kleibergen-Paap rank test, while the null of valid overidentifying restrictions from the Hansen J-test is not, suggesting our IV estimates are consistent.

In Appendix Tables B2-B7 we subject the baseline IV estimates to a number of specification checks. In Table B2 we consider several additional state-by-year instruments, including the overall application denial rate in AFDC/TANF, the application denial rate for procedural reasons, the rate at which hearing requests are disposed in favor of the claimant, and the state unemployment rate. The first three of these are indicators for how administratively stringent the states application procedures are and are potentially strong instruments for separating the welfare and poverty trap arguments. We do not include the overall application denial rate in the baseline Table 2 estimates because the denial rate includes not only exogenous procedural denials but also legitimate denials based on failing income and asset tests, while the other two are not included because we were unable to construct a full state-by-year time series over the 45 years of our sample (note the loss of over 23,000 observations). Although prior research has demonstrated the strong role the macroeconomy plays in determining participation

in AFDC/TANF, it also is a key determinant of the cyclicality of poverty rates and thus may not be as effective in separating out the poverty trap from the welfare trap and thus we do not include it in Table 2. Regardless, across the 6 columns in Table B2 we get nearly identical transmission effects both before and after welfare reform as in Table 2. Likewise, the results are little changed when we add controls for mother's background like education and income (Table B3), when we do not weight the estimates or when we drop the SEO oversample of the poor (Table B4), when we limit attention to eldest daughters only (Table B5), and when we restrict the sample to those mothers at greatest risk of welfare participation, i.e. low education or ever in poverty or near poverty (Table B6).[13]

In all variants of equation (1) estimated in Table 2, we find that the OLS estimate of mother's participation is smaller than the IV estimate, a result that is consistent with other papers in the literature (see, e.g., Dahl, Kostol and Mogstad 2014). Generally, the OLS can be different from the IV estimate for, at least, three reasons: selection bias, heterogeneous effects, and measurement error. In our setting, it is difficult *a priori* to predict the sign of the bias of OLS. For instance, it may be natural to expect upward-biased OLS estimates under the assumption that unobservables are positively correlated over generations. However, the effects could be heterogeneous, too. Our sample includes a subpopulation of mothers who are not likely to be affected by the instruments because their family income is above the poverty line over the entire period of analysis. Figure B1 shows, as expected, that mothers exposed to higher ADFC/TANF benefits were more likely to participate on welfare, with the exception of mothers whose average family income is more than twice the poverty line. When we consider a subsample of mothers

[13] Regarding controls for mother's income and education, Levine and Zimmerman (1996) note that these variables could be endogenous to the daughter's welfare choice for the same reasons that the mother's welfare participation is likely to be endogenous. The unweighted estimates are larger in magnitude due to the oversample of the poor, suggesting that weights are needed as the weighted estimates are more comparable to the SRC subsample estimates.

with less than 9 years of education in Table B6, we find smaller IV estimates of welfare transmission compared to the corresponding OLS estimates in Table 2.[14] These results and the instrument-induced probabilities shown in Figure B1 suggest that the difference between IV and OLS estimates can be attributed to heterogeneous effects.

The last initial check is in Table B7. As a falsification exercise, we investigate whether mother's future welfare use in any year from $t + 5$ to $t + 11$ correlates with daughter's welfare use at time t. The OLS estimates suggest that among mothers who previously participated on welfare, future participation significantly increases the likelihood of daughter's participation by 25 percentage points (column 3). This point estimate is naturally biased and a probable explanation is failure of controlling for lack of economic opportunities which creates dependence between mother's and daughter's unobservables in our specification. On the other hand, using the same set of instruments as in Table 2, we find an estimate that it is not statistically significantly different from zero. The results for the broader safety net suggest similar conclusions. Overall, these results offer suggestive empirical evidence that our IV approach seems to attenuate, and possibly eliminate, biases in the estimation of the impact of the reform.

V.B. Participation in the Wider Safety Net and Economic Outcomes

Even if welfare reform reduced the causal transmission of AFDC/TANF participation, a relevant policy question is the extent to which welfare participation defined more generally is transmitted across generations. In columns (5)-(8) of Table 2, we examine what effects mother's AFDC/TANF participation and welfare reform had on the daughter's decision to participate in AFDC/TANF, food stamps/SNAP, or SSI. The specifications exactly parallel those in columns (1)-(4) and with the same controls for daughter's characteristics and state and year fixed effects.

[14] In the case of the broader safety net, the targeted-population IV estimate in Table B6 column (5) is smaller than the corresponding full-population OLS estimate in Table 2 column (5).

The estimates in columns (5)-(8) show that the magnitude of intergenerational transmission is very similar prior to welfare reform—mother's use of AFDC/TANF increased the odds of the daughter using welfare, food, or disability assistance in adulthood by 25-35 percentage points. But this is where the similarity with columns (1)-(4) end as we find no evidence that this transmission channel was changed after welfare reform.[15] In results not tabulated we obtain a similar result if we also define mother's participation as welfare, food, or disability assistance.

[Table 3 here]

In addition to reducing welfare participation, the architects of welfare reform aimed to improve the long-term economic outcomes of children. In Table 3 we present least squares and instrumental variables estimates of equation (1) where we alternately replace the dependent variable of daughter's welfare participation with indicators equal to 1 for (a) whether her educational attainment is less than or equal to a high school diploma (b) years of no earnings, (c) years with earnings less than the poverty line, and (d) years with earnings less than twice the poverty line. We present IV estimates because of possible shared unobservables that spill over from mother to daughter into wider economic domains. Here we find a consistent pattern that daughters exposed to welfare are at risk of worse economic outcomes in adulthood. The IV estimates suggest they are 18 percentage points more likely to have episodes of nonemployment compared to daughters not exposed, 37 percentage points more likely to have incomes under poverty in a given year, 49 points more likely to have episodes of near poverty, and 70 percentage points more likely to have lower human capital attainment. The findings in Table 3 indicate that the 1996 reform to welfare did not substantively alter these risks for daughters.

Because the evidence thus far points to a reduced transmission in AFDC/TANF

[15] For misclassification-corrected estimates in Table 2 columns (7) and (8), the reporting rate $(1 - \hat{\tau}_{1t})$ used in estimation is the maximum reporting rate for AFDC/TANF and food stamps/SNAP shown in Appendix Table A1.

participation across generations after welfare reform, but not on wider use of the safety net or risk of worse economic outcomes in adulthood, in the remaining sections we focus on potential mechanisms of the AFDC/TANF transmission pathway. The next section explores how the IV estimates (with and without misclassification corrections) vary once we adjust the length of observation window for mother and daughter living together during potential years of welfare exposure, which may be critical years susceptible to life-cycle bias. It also investigates the sensitivity of the results to daughters' geographic movements that may be an endogenous response to the welfare climate in the state.

V.C. Sensitivity of Results to Life-Cycle Corrections and Geographic Mobility

A data constraint facing most intergenerational research is that full life cycles of daughters and mothers are generally not available. This leads to two related forms of bias, potentially reinforcing. One form of bias results from the fact that mothers and daughters are typically observed at different points of their life cycles. In the intergenerational income mobility literature, this has come to be known as life-cycle bias (Jenkins 1987; Haider and Solon 2006; Grawe 2006; Lee and Solon 2009; Nybom and Stuhler 2016). The issue with income is that daughters tend to be observed when young and incomes low (but rising), and mothers at middle age when incomes are high (and stable or perhaps falling). This systematic deviation of current income from lifetime income is a form of nonclassical measurement error and tends to attenuate the intergenerational correlation of incomes. In the welfare context, participation tends to be high when young, both because incomes are low and odds of the presence of young children high, and participation is low when older (for the opposite reason of the young), again leading to attenuation in the intergenerational correlation.

A related measurement issue, frequently referred to as the "window problem" in the

welfare literature (Gottschalk 1992, 1996; Wolfe, et al. 1996; Page 2004), occurs when the length of observation is too short for either, or perhaps both, generations. The window problem is a form of measurement error in the sense that limited observations of an individual's welfare participation is an underreporting issue when complete histories are not available. Short windows could lead to underestimation of parameters if true participation is omitted, yet it could also lead to overestimation if long-term spells are overrepresented in the short window and long-term exposure matters more for transmitting dependency.

Our primary solution to the life-cycle bias and window problem is to utilize the much longer time series now available in the PSID compared to prior studies. For each mother-daughter pair, we observe the daughter as head/spouse of her own family unit for 25 years on average and for as long as 38 years. In addition, we observe the mother and daughter co-residing for 14 years on average with at least 5 years during the daughter's ages 12-18 when the potential for welfare learning is heightened. Thus, we come much closer to covering the entire life cycle of welfare participation. As a first check, in Appendix Table B8 we examine the window problem by extending the minimum requirement that the pairs be observed for at least ten and fifteen years, respectively. There we see that the reduction in the level of mother's transmission after welfare reform ranges between 56 percent to 77 percent, while the reduction in terms of baseline probability of participation ranges between 43 percent and 60 percent, both of which are comparable to the estimates reported in Table 2.

[Table 4 here]

We next present estimates in Table 4 that implement a life-cycle age adjustment proposed by Lee and Solon (2009) in the context of income mobility. Specifically, we augment the model with a quartic in the average age of the mother during prior (to time *t*) periods of potential

welfare participation, a quartic in the detrended daughter's current age, and the interactions between the quartic in daughter's detrended age and mother's participation as well as the indicator for mother's participation after welfare reform. Note that as before the interactions with mother's welfare participation are endogenous in our setting, and therefore, in the IV models of columns (2) and (4) we instrument using the detrended quartic in daughter's age times the average of mother's AFDC/TANF benefit standard and federal/state EITC by family size when the daughter was living with the mother and she was between 12 and 18 years old, and we also use these instruments interacted with reform. Because fertility rates among low-income women peak in their mid 20s (Lopoo 2007), we detrend around daughter's age of 25. Comparing the OLS estimates in column (1) of Tables 2 and 4, it is clear that the age adjustments do not influence the results qualitatively, and with only small quantitative differences in the pre-reform era and slightly larger attenuation in the post-reform era (in absolute value).[16]

[Table 5 here]

We now turn our attention to endogenous migration. Our models to this point have allowed for the possibility that daughters reside in a different state than their mothers and/or have moved to another state during adulthood. If such movements are an endogenous response to the welfare climate in the state, then this could lead to biased estimates of welfare reform and the transmission across generations. The power and exogeneity of the instrumental variables hinge on the degree to which welfare policies determine participation, and on the extent to which families have no control over welfare policy, especially via endogenous migration. The evidence on whether there is endogenous internal migration in response to welfare generosity in the U.S.

[16] While the IV estimates of percent reductions after reform are smaller, the Lee-Solon age adjustment introduces multiple endogenous variable interactions leading to lower instrument efficiency in estimation. Our takeaway is that our long panel is adequate to account for potential life-cycle bias in intergenerational transmission of welfare.

is mixed (Levine and Zimmerman 1999; Gelbach 2004; McKinnish 2007; Kennan and Walker 2010), yet when effects are found, they are very small in magnitude. Also, Ziliak, et al. (2000) show that states' decisions to adopt waivers were not an endogenous response to the growing welfare caseload in the early 1990s. Both of these suggest that state-level welfare policies like the maximum guarantee are exogenous to an individual's welfare choice.

As a test on our baseline sample, we consider three alternatives to our IV models in Table 2: restricting the sample of daughters to those who reside in the same state as their birth state, restricting the sample of daughters to those residing in the same state as their mothers, and restricting the sample of daughters to those who never move during their observed lifetime. Table 5 shows that both the direct effect of mothers' participation and the interaction with welfare reform are larger in absolute value in Table 5 compared to estimates in Table 2, yet the changes are relatively proportional such that both the percent reduction in levels and percent-over-baseline reduction of transmission after welfare reform are roughly the same. The magnitudes of estimates in Table 5 get successively larger in absolute value as we tighten the geographic link between mother and daughter, and are suggestive that the mobility of daughters across state lines can "undo" some of the intergenerational transmission of welfare, although the differences from the baseline estimates are modest.

VI. Heterogeneity of Policy Effects

We next investigate timing of transmission by age and duration of exposure, and heterogeneity by race and welfare reform aggressiveness.

VI.A. Timing of Welfare Transmission Effects

In the first set of results, we examine how the base-case IV estimates with and without misclassification corrections in Table 2 change if we restrict the daughter's potential welfare

exposure to only periods of co-residence. Recall that in Table 2, the daughter could be exposed to her mother's welfare use at any time in the life cycle provided it was prior to the current period *t*, including those periods when the daughter no longer lived at home but had younger siblings at home that make her mother welfare-eligible. In the first two columns of Table 6, we see that the pre-reform transmission effect is little changed relative to the baseline in Table 2, and again, the post-reform interaction changes proportionally. This implies that welfare reform had the same percent reduction of welfare transmission among those daughters exposed only during co-residence.

[Table 6 here]

In our baseline models, we require mothers and daughters to co-reside at least five years during the ages of 12-18. As discussed in the data section, this age range was selected in part from convention in the literature, but there is little prior evidence on whether "age of exposure" mattered for welfare learning. In Figure 3, we present new empirical evidence of age at critical exposure windows by using rolling five-year and ten-year windows from age 4 through age 17. The figure presents IV estimates of the pre-welfare reform effect of mothers' AFDC participation and the interaction between mother's participation and reform, along with 95-percent pointwise confidence intervals. Figure 3 shows that the magnitude of the direct effect of the mother's participation increases as the age of first exposure increases, suggesting that the learning effect is stronger during adolescence and teen years relative to early childhood. The definition of a critical exposure period matters more for shorter windows given that larger windows are more likely to include some critical learning period.

[Figure 3 here]

As a further exploration of age of exposure, columns (3)-(4) in Table 6 present panel-data

fixed-effects estimates of the welfare transmission with and without misclassification corrections. Specifically, we admit error components into the model consisting of latent person-specific heterogeneity as $\nu_{ist}^{d} = \lambda_{i}^{d} + u_{ist}^{d}$, where λ_{i}^{d} is a time-invariant daughter fixed effect and u_{ist}^{d} is an error term. We assume that the daughter fixed effect contains a component common to the daughter and the mother from shared family heritage and experiences (including health status, attitudes), as well as that which is daughter-specific such as school quality and neighborhood. Identification of the direct, pre-reform effect of mother's participation is subtler in the fixed-effects specification. Namely, transmission can only occur via "word-of-mouth" from mother to daughter after the daughter has left home to form her own family unit. This follows from our definition of mother's prior welfare use that once the variable "turns on" it remains on for the duration that they remain in the sample. If the mother joins welfare while the daughter co-resides then we cannot separate this from the fixed effect; however, if she joins after the daughter leaves because of younger children present, then verbal transmission of the program can still occur and identify the parameters of interest.

The direct effect of mother's transmission in column (3) of Table 6 is almost half the size of the estimate from column (1) of Table 2, suggesting that a sizable fraction of the transmission that is passed from parent to child occurs after the daughter leaves home. In fact, the total effect after welfare reform is negative (0.079 – 0.128), suggesting that welfare reform shut down this transmission channel. However, fixed-effects methods exacerbate attenuation bias, so it is natural to find estimates lower in absolute value.[17] Once we make time-varying corrections for misclassification in column (4), the mother's direct effect only drops about one tenth from the estimate in column (3) of Table 2, though the percent change after reform is larger and we find

[17] For measurement error in a dichotomous independent variable in a panel setting, see Freeman (1984); the case for errors in continuous variables in panels is addressed by Griliches and Hausman (1986).

that the level and percentage of the word-of-mouth transmission channel declines significantly.

[Figure 4 here]

A daughter's exposure to welfare and her resulting propensity for dependence will likely vary as a function of her mother's duration of participation, or otherwise stated, her intensity of treatment exposure. Gottschalk and Moffitt (1994) propose measuring welfare dependence as the total time on welfare or the total percent of income from transfers, and Pepper (2000) models daughters' welfare outcomes depending on categorical definitions of mother's duration in years. In order to allow the mother's effect to vary by duration, we successively redefine mothers' welfare participation as at least 1 year, at least 2 years, and so on, until at least 6 years and re-estimate the model with each specification.

Figure 4 shows the effects of mother's welfare participation differentiated by short- and long-term welfare dependence on the same dependent variable described above, that is, a daughter's extensive-margin decision to participate in a given year. While the OLS estimates suggest that the transmission effect is constant regardless of length of exposure, the IV estimates in Panel B indicate that the level of transmission effect of long-term mother's participation on welfare is larger than the effect of short-term participation. However, because the post-reform coefficient is getting larger in absolute value as the length of exposure increases, the percent reduction in transmission after welfare reform is fairly stable post reform.

VI.B. Heterogeneity of Welfare Transmission Effects

There is a vast literature on the socioeconomic differences between blacks and whites (see, for example, Smith and Welch 1989; Duncan and Hoffman 1990; Donohue and Heckman 1991), but with the notable exceptions of Gottschalk (1996) and Pepper (2000), whether or not there are racial differences in the transmission of intergenerational welfare has received less

attention compared to other outcomes. The issue is salient in part because the risk of out-of-wedlock births is at least two times higher among blacks than whites, as is the risk of poverty in childhood.

[Table 7 here]

The first two columns of Table 7 present OLS and IV estimates for the transmission of AFDC/TANF from mother to daughter separated by blacks and whites. Specifically, we include an indicator variable for whether the daughter is black, and we interact that with both mother's participation and welfare reform (and interact all instrumental variables with the indicator for daughter's race). As before, all models control for state and year effects, a quadratic in daughter's age, and indicators for the number of children in the daughter's family. The first two columns in the upper panel of Table 7 suggest that the pre-reform effect of welfare transmission was much stronger among blacks than whites (in column (2), 0.442 compared to 0.146). However, while the transmission channel was substantively reduced among both blacks and whites after welfare reform, the percent change is much larger among whites.

States differed dramatically in the degree of aggressiveness in implementation of welfare reform, both in the waiver era and after TANF. While there is no agreed upon measure of strictness in the literature, we follow Grogger and Karoly (2005, Table 4.2) and define strict states as those whereby all main studies surveyed agree that the sanctions policy adopted by the state during 1992-1996 was strict (there were 13 states that met this criteria). Ziliak (2007) examined five different categories of welfare reform aggressiveness and concluded that the latter measure was the best proxy for strict policy reforms. We then include this measure of welfare reform stringency in a triple-difference framework to test whether there were differences in intergenerational transmission in those states that adopted more-strict reforms compared to states

with less-strict reforms.

The last two columns of Table 7 report estimates corresponding to the effects of interest for the triple-difference model based on state reform aggressiveness. Across both specifications, the transmission mechanisms between mother and daughter before welfare reform were qualitatively smaller in aggressive states than in non-aggressive states. This suggests that there was some permanent difference among residents in states adopting strict reforms versus less strict reforms (even after controlling for state fixed effects). However, after reform, this difference was attenuated, resulting in very similar percent reductions in both the levels and probability of participation, suggesting some degree of convergence in welfare climates across states after welfare reform.

VII. Discussion and Conclusion

A focal aim of policymakers with the 1990s welfare reform was to end dependence on welfare, and based on the metric of the intergenerational transmission between mother and daughter, the evidence presented here suggests partial success toward meeting that goal. Viewed narrowly from the lens of participation in the AFDC/TANF program, we find strong evidence that the level of transmission from mother to daughter was reduced by at least 50 percent, and by at least 30 percent over the baseline odds of participation. These results are robust across a variety of specifications that address major threats to identification including selection bias, misclassification bias, life-cycle bias, and geographic mobility. Despite the statistical challenges we face in this work, one consistent interpretation of these results implies that when the AFDC/TANF use fell precipitously after 1996, the reform had a differential impact among adult daughters who were exposed to welfare in their childhood and those who were not. The change of at least 30 percentage points over the odds of participation suggests that between one-half and

two-thirds of the caseload decline comes from reduced transmission.

Beyond participation in AFDC/TANF, however, the 1996 welfare reform did not alter the generational economic bonds between mother and daughter. Our findings suggest that welfare reform did not change the transmission of participation in the wider safety net including food and disability assistance, nor did it alter the ties between mothers welfare use and daughters later life outcomes of human capital or labor market success. This finding is consistent with the previous welfare reform research on mothers' outcomes—the reforms explained some of the decline in AFDC/TANF participation but had no substantive effects on work, earnings, marriage, health, or wealth (Blank 2002; Moffitt 2003; Ziliak 2016). That research also found no substantive changes on the well-being of children, although the evidence in that domain is more limited. Our results expand upon the previous null effects of welfare reform on the wider domain of intragenerational economic outcomes to the intergenerational context.

[Figure 5 here]

At first blush this lack of effect on economic success seems surprising given the scale and scope of the reform. However, this becomes more clear when examining how states chose to allocate their block grants. Prior to reform states spent around $0.75 of every $1 of benefit in the form of cash assistance, whereas today only about $0.20 goes toward cash, and another $0.20 toward child care. Moreover, there is great variation across states, ranging from less than $0.15 on cash assistance and child care in Arizona to nearly $0.70 in Pennsylvania. The remaining funds are known as "non-assistance" and states have great leeway in how those funds get allocated, ranging from marriage preparation programs to middle class tax cuts (Bitler and Hoynes 2016). That is, the program is substantially less target-efficient and does not entail much investment in long-term economic self-sufficiency. A potential consequence is the stagnating

mobility of daughters. We explore this possibility in Figure 5 where we present descriptive trends in intergenerational correlations between mothers and daughters akin to Figure 2, but now for four measures of economic status: (1) poverty status defined as an income-to-needs ratio less than 1, where needs is defined by the U.S. Census Bureau poverty line that varies by family size; (2) poverty status defined as an income-to-needs ratio less than 1.3 (the cutoff for food stamps); (3) poverty status defined as an income-to-needs ratio less than 2; and, (4) log family income.[18] In the two decades from the late 1970s to 2000, the income mobility of daughters declined (i.e. the correlation was increasing). And while immobility has not deteriorated further in the past decade, the income correlations suggest daughters had continued economic need for assistance from the wider safety net.

We conclude by noting that implicit in most discussion surrounding welfare reform is that the transmission of welfare reliance from parent to child is inherently a bad outcome. It is not obvious, however, what is the socially efficient intergenerational correlation of welfare outcomes. For example, a correlation of zero—perfect mobility with respect to welfare use—would imply that accumulating "family capital" (wealth, culture, information, and skills) does nothing to ensure the self-sufficiency of future generations. In some cases, though, there may be positive attributes to intergenerational transmission of welfare knowledge if take-up rates are low and learning the welfare system helps needy recipients (Currie 2006). Indeed, in the few years after welfare reform, take-up rates of food stamps among those eligible fell about 20 percentage points to just over 50 percent, mainly because potential recipients were not aware of their eligibility in a post-reform environment that discouraged welfare more generally (Ganong and Leibman 2013; Ziliak 2015). The policy response by USDA was to grant more authority to states

[18] Income-to-needs ratios are constructed as the mean income to mean poverty threshold for a daughter's adult life through age 27, and for the mother's years while the daughter lives at home.

to design their programs to improve take up. Presumably, among those 50 percent who continued participation, some retained eligibility was because of shared information from parent to child. This suggests a need for future theoretical and empirical research on optimal transfer program design that incorporates knowledge spillovers across generations.

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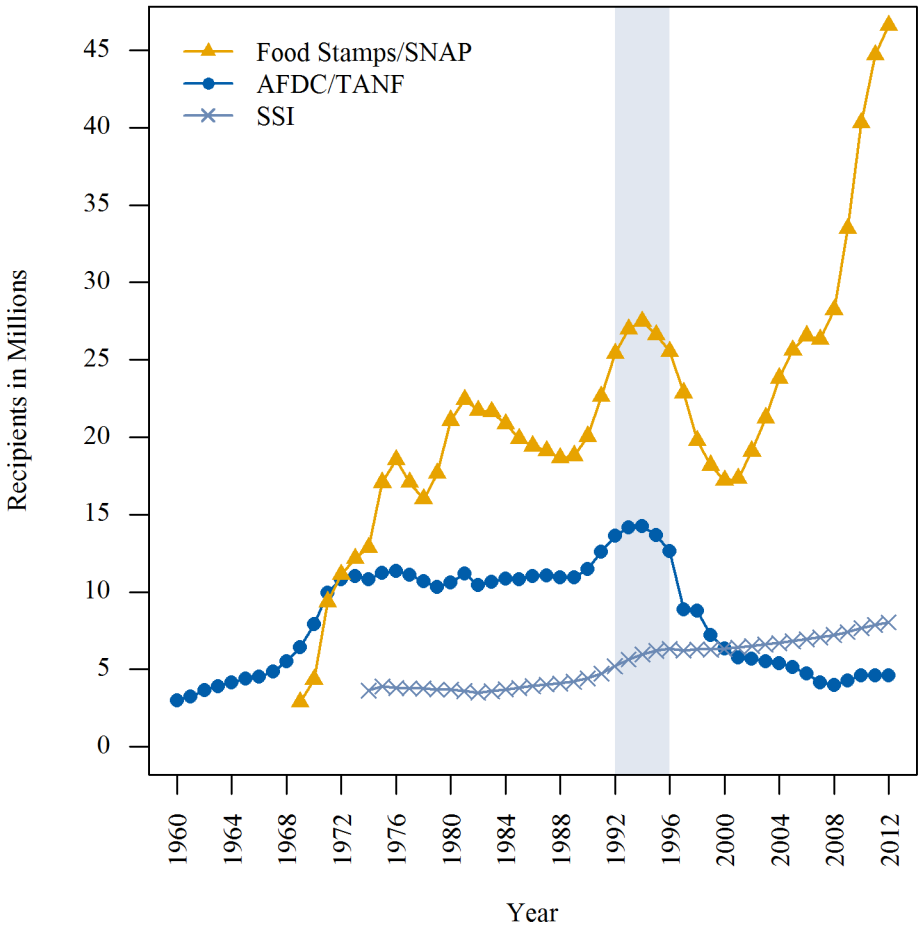
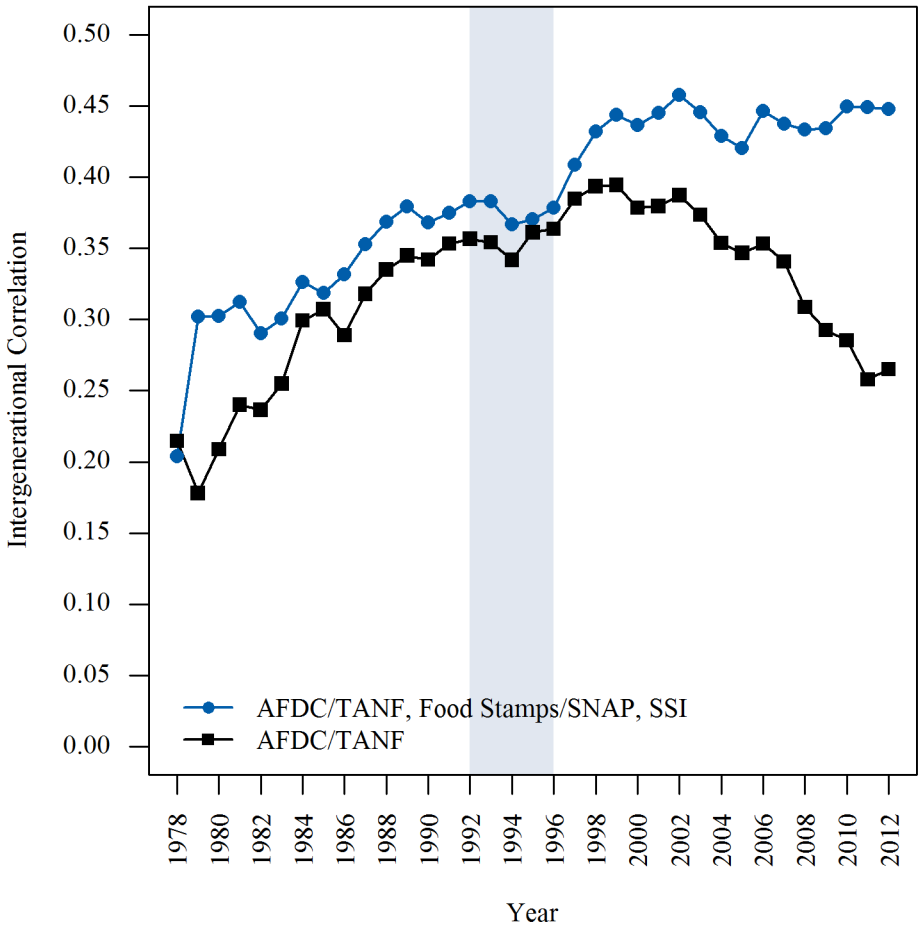
FIGURE 1. TRENDS IN AFDC/TANF, FOOD STAMP/SNAP, AND SSI RECIPIENTS



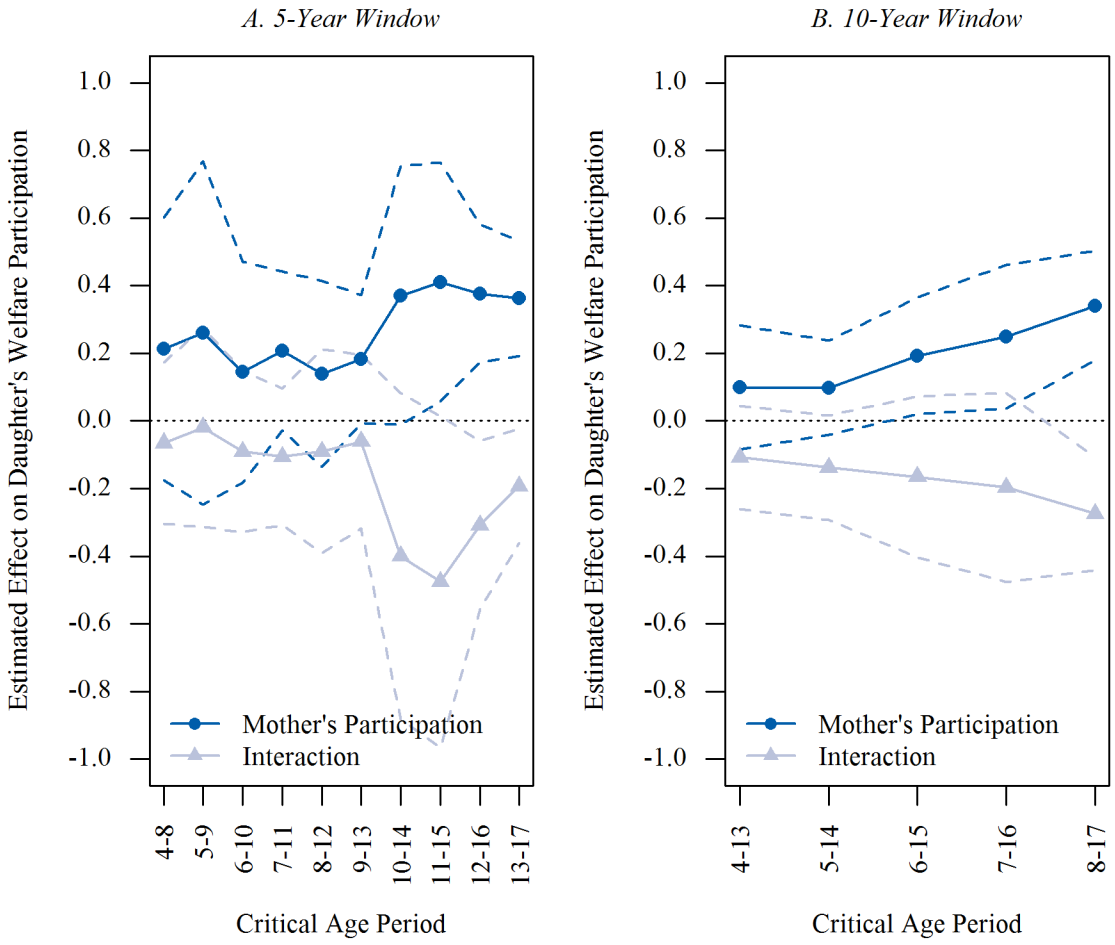
Notes: Authors' tabulations of data collected from the U.S. Department of Health and Human Services, U.S. Department of Agriculture, and Social Security Administration. The major waiver period of welfare reform is indicated by the shaded region. *Abbreviations:* Supplemental Nutrition Assistance Program (SNAP), and Supplemental Security Income (SSI).

FIGURE 2. TRENDS IN THE INTERGENERATIONAL CORRELATION OF WELFARE PARTICIPATION



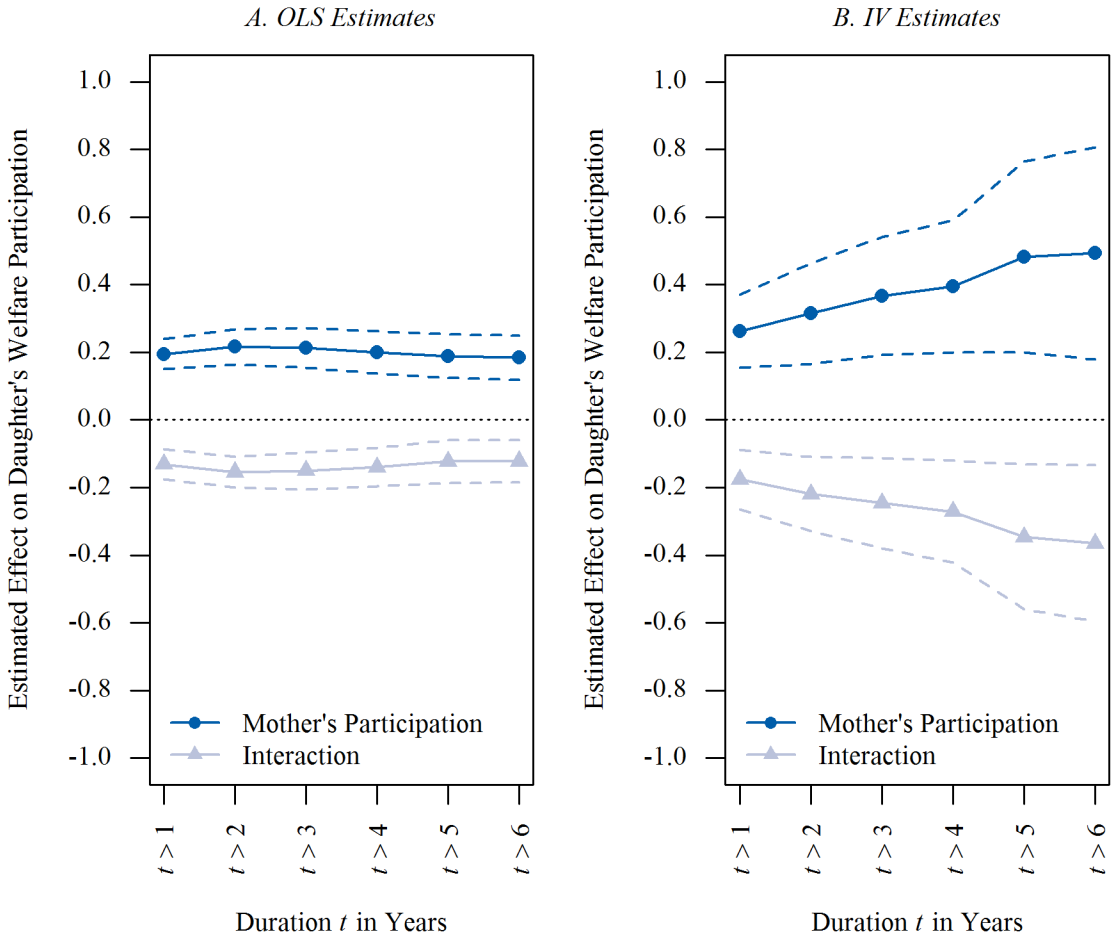
Notes: The dependent variable is an indicator for whether a daughter ever participated in AFDC/TANF (or, AFDC/TANF, food stamps/SNAP, or SSI) in any year after forming her own family through age 27. The independent variable is an indicator for whether the mother ever participated in AFDC/TANF when the child is observed living at home. These trends reflect rolling cohort groups of daughters aged 27-42 in each year. The major waiver period of welfare reform is indicated by the shaded region. *Abbreviations:* Supplemental Nutrition Assistance Program (SNAP), and Supplemental Security Income (SSI).

FIGURE 3. CRITICAL EXPOSURE PERIOD FOR AFDC/TANF TRANSMISSION THROUGH AGE 17



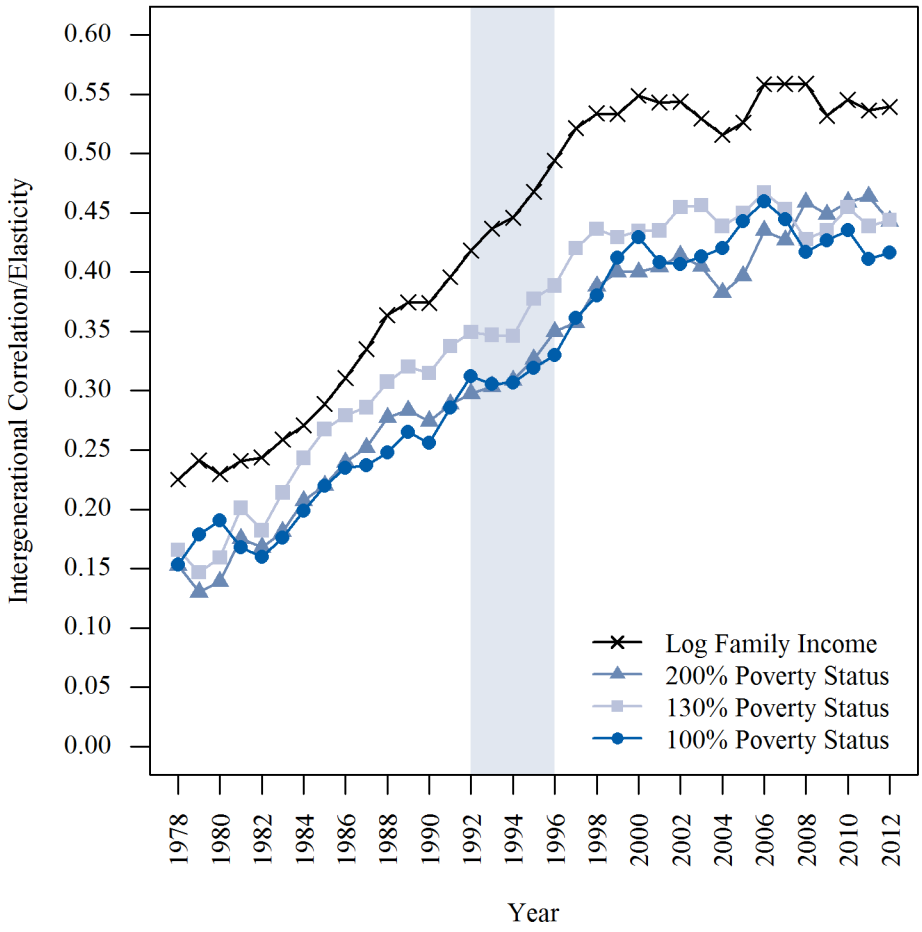
Notes: The dependent variable is daughter's current AFDC/TANF status, and the independent variables include an indicator for mother's AFDC/TANF participation during her daughter's critical age period, an indicator for after welfare reform, an interaction term for mother's participation after welfare reform, state and year effects, and daughter time-varying controls for her age, age squared, and indicators for number of children 1, 2, 3, or 4 or more. Instrumental variables including the average and maximum of mother's AFDC/TANF benefit standard and federal/state EITC maximum benefit by family size during the daughter's critical age period, and interactions of each with an indicator for welfare reform. Dashed lines represent 95% pointwise confidence intervals with state-level clustering@.

FIGURE 4. AFDC/TANF TRANSMISSION EFFECTS BY DURATION OF MOTHER'S LONGEST SPELL ON WELFARE



Notes: The dependent variable is daughter's current AFDC/TANF participation status, and the independent variables include an indicator for whether the mother's maximum welfare spell duration is greater than $t' = \{1,2,\ldots,6\}$ (see x-axis), an indicator for after welfare reform, an interaction term for mother's longest spell duration indicator and after welfare reform, state and year effects, and daughter time-varying controls for her age, age squared, and indicators for number of children 1, 2, 3, or 4 or more. Instrumental variables for the mother's participation in Panel B include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size and interactions of each with an indicator for welfare reform. Dashed lines represent 95% pointwise confidence intervals with state-level clustering.

FIGURE 5. TRENDS IN INTERGENERATIONAL TRANSMISSION OF POVERTY STATUS AND FAMILY INCOME



Notes: The intergenerational transmission for poverty status represents linear probability model estimates based on indicators for whether an individual's mean family income is equal to or below 100, 130, or 200% of the mean federal poverty threshold by age 27, and the intergenerational elasticity of family income is based on a log-log model of a daughter's average income through age 27 and the average of all of her mother's family income before the daughter begins her own family. These trends reflect rolling cohort groups of daughters aged 27-42 in each year. The major waiver period of welfare reform is indicated by the shaded region.

TABLE 1. DESCRIPTIVE STATISTICS

A. Daughter's Characteristics as an Adult	*Before Reform*	*After Reform*	*Pooled*
Currently Receiving Welfare?			
AFDC/TANF (%)	0.080	0.025	0.044
	(0.271)	(0.157)	(0.206)
AFDC/TANF, SNAP, SSI (%)	0.132	0.112	0.119
	(0.338)	(0.315)	(0.323)
Years Before/After Welfare Reform (%)	0.348	0.652	
	(0.476)	(0.476)	
Age	28.245	38.666	35.041
	(5.572)	(9.009)	(9.400)
Number of Children	1.249	1.186	1.208
	(1.169)	(1.273)	(1.238)
Race:			
Black (%)	0.161	0.170	0.167
	(0.368)	(0.375)	(0.373)
White (%)	0.812	0.805	0.807
	(0.391)	(0.396)	(0.394)
Other (%)	0.027	0.025	0.026
	(0.162)	(0.157)	(0.159)
Resides in Same State as Birth (%)	0.759	0.703	0.723
	(0.428)	(0.457)	(0.448)
B. Mother's Characteristics	*Before Reform*	*After Reform*	*Pooled*
Any Previous Welfare?			
AFDC/TANF (%)	0.269	0.066	0.271
	(0.444)	(0.248)	(0.444)
AFDC/TANF, SNAP, SSI (%)	0.428	0.190	0.433
	(0.495)	(0.392)	(0.496)
Years Before/After Welfare Reform (%)	0.858	0.142	
	(0.158)	(0.158)	
Age	42.472	59.357	61.429
	(8.841)	(10.512)	(11.425)
Policy Measures when Daughter Aged 12-18 (in thousands of 2012 dollars):			
AFDC/TANF Benefit Standard, Average	0.736	0.393	0.724
	(0.334)	(0.213)	(0.336)
AFDC/TANF Benefit Standard, Maximum	0.913	0.476	0.904
	(0.363)	(0.226)	(0.365)
EITC Federal/State Credit, Average	0.801	3.223	0.876
	(0.726)	(1.417)	(0.878)
EITC Federal/State Credit, Maximum	1.208	3.873	1.318
	(0.886)	(1.405)	(1.085)
Mean Mother-Child Family Observations			14.212
Mean Daughter-as-Adult Observations			25.085
Total Observations	25331	30737	56068

Notes: Sample averages are weighted by the daughter's PSID core longitudinal weights for both daughters' and mothers' statistics. Further, the pooled statistics for mothers are not a simple weighted average of before/after reform. Mothers' statistics before/after reform reflect her observed history during potential welfare participation years, 1967-2007, and the pooled statistics correspond to the daughter's current observation year in the estimation sample. Abbreviations: Food Stamps/Supplemental Nutrition Assistance Program (SNAP), and Supplemental Security Income (SSI).

TABLE 2. INTERGENERATIONAL TRANSMISSION OF MOTHER'S AFDC/TANF PARTICIPATION

Daughter's Outcome Variable:	AFDC/TANF				AFDC/TANF, SNAP, SSI			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother's Participation	0.146	0.281	0.236	0.428	0.226	0.279	0.294	0.349
	(0.014)	(0.056)	(0.022)	(0.093)	(0.019)	(0.070)	(0.024)	(0.091)
After Welfare Reform	0.036	0.072	0.047	0.087	0.003	-0.016	-0.011	-0.049
	(0.007)	(0.022)	(0.014)	(0.033)	(0.013)	(0.031)	(0.020)	(0.043)
Mother's Participation × After Welfare Reform	-0.101	-0.197	-0.134	-0.234	-0.044	0.055	-0.020	0.159
	(0.015)	(0.050)	(0.030)	(0.081)	(0.021)	(0.080)	(0.030)	(0.109)
Instrumental Variables	No	Yes	No	Yes	No	Yes	No	Yes
Misclassification Correction	No	No	Yes	Yes	No	No	Yes	Yes
Weak IV Test Statistic		23.092		21.083		23.092		21.739
p-value		0.002		0.004		0.002		0.003
Hansen J Statistic		2.370		2.069		9.970		9.792
p-value		0.883		0.913		0.126		0.134
Percent Change in Levels	-70%	-70%	-57%	-55%	-19%	20%	-7%	46%
p-value	0.000	0.000	0.000	0.000	0.025	0.552	0.495	0.268
Percent Change over Baseline	-47%	-48%	-40%	-37%	-14%	27%	-6%	47%
p-value	0.000	0.004	0.006	0.031	0.118	0.439	0.548	0.259
Number of Daughters	2961	2961	2961	2961	2961	2961	2961	2961
Observations	56068	56068	56068	56068	56068	56068	56068	56068

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation. Abbreviations: Food Stamps/Supplemental Nutrition Assistance Program (SNAP), and Supplemental Security Income (SSI).

TABLE 3. MOTHER'S AFDC/TANF PARTICIPATION EFFECT ON DAUGHTER'S HUMAN CAPITAL AND LABOR MARKET OUTCOMES

Daughter's Outcome Variable:	High School Education or Less		No Earnings		Earnings Below 100% Poverty		Earnings Below 200% Poverty	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother's Participation	0.251	0.698	0.134	0.181	0.252	0.365	0.313	0.488
	(0.049)	(0.326)	(0.019)	(0.057)	(0.023)	(0.076)	(0.023)	(0.094)
After Welfare Reform	0.026	0.120	0.014	0.022	0.012	0.012	0.014	0.006
	(0.044)	(0.093)	(0.012)	(0.023)	(0.020)	(0.032)	(0.021)	(0.041)
Mother's Participation × After Welfare Reform	0.005	-0.167	-0.023	-0.037	-0.049	-0.002	-0.041	0.063
	(0.064)	(0.274)	(0.017)	(0.056)	(0.022)	(0.076)	(0.032)	(0.109)
Instrumental Variables	No	Yes	No	Yes	No	Yes	No	Yes
Weak IV Test Statistic		22.238		23.191		23.191		23.191
p-value		0.002		0.002		0.002		0.002
Hansen J Statistic		2.430		7.978		6.586		7.137
p-value		0.876		0.240		0.361		0.308
Percent Change in Levels	2%	-24%	-17%	-20%	-19%	-1%	-13%	13%
p-value	0.938	0.416	0.117	0.472	0.015	0.978	0.173	0.586
Percent Change over Baseline	11%	-18%	-25%	-28%	-19%	0%	-9%	18%
p-value	0.705	0.584	0.009	0.264	0.019	0.991	0.358	0.471
Number of Daughters	2873	2873	2961	2961	2961	2961	2961	2961
Observations	2873	2873	55906	55906	55906	55906	55906	55906

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. Daughters' PSID core longitudinal weights are used in estimation.

TABLE 4. INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION WITH LEE-SOLON-TYPE (2009) LIFE-CYCLE ADJUSTMENTS

	(1)	(2)	(3)	(4)
Mother's Participation	0.114	0.254	0.223	0.443
	(0.012)	(0.042)	(0.020)	(0.081)
After Welfare Reform	0.024	0.062	0.032	0.065
	(0.008)	(0.017)	(0.015)	(0.038)
Mother's Participation × After Welfare Reform	-0.066	-0.140	-0.108	-0.192
	(0.015)	(0.043)	(0.035)	(0.100)
Instrumental Variables	No	Yes	No	Yes
Misclassification Correction	No	No	Yes	Yes
Weak IV Test Statistic		31.231		36.102
p-value		0.455		0.242
Hansen J Statistic		30.746		31.094
p-value		0.428		0.411
Percent Change in Levels	-58%	-55%	-49%	-44%
p-value	0.000	0.000	0.000	0.010
Percent Change over Baseline	-26%	-21%	-29%	-22%
p-value	0.151	0.343	0.134	0.351
Number of Daughters	2961	2961	2961	2961
Observations	56068	56068	56068	56068

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Additional controls for Lee-Solon-type age adjustments include a quartic on mother's mean age during prior years of potential welfare participation, a quartic on daughter's current age detrended by 25, and mother's participation indicator interacted with the quartic on daughter's detrended age. While coefficient estimates are centered at daughter's age 25, estimates shown above are average partial effects across the estimation sample. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform as well as interactions with a quartic in daughter's detrended age. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.

TABLE 5. IV ESTIMATES OF INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION BY DAUGHTER'S GEOGRAPHIC MOBILITY STATUS

	Same State as Birth		Same State as Mother		Never Moves States	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's Participation	0.331	0.527	0.379	0.534	0.414	0.644
	(0.081)	(0.140)	(0.082)	(0.133)	(0.105)	(0.168)
After Welfare Reform	0.084	0.103	0.079	0.086	0.107	0.132
	(0.030)	(0.050)	(0.019)	(0.034)	(0.046)	(0.070)
Mother's Participation × After Welfare Reform	-0.235	-0.273	-0.265	-0.279	-0.297	-0.348
	(0.075)	(0.125)	(0.070)	(0.116)	(0.104)	(0.160)
Misclassification Correction	No	Yes	No	Yes	No	Yes
Weak IV Test Statistic	18.419	17.718	18.119	16.813	13.906	13.735
p-value	0.010	0.013	0.011	0.019	0.053	0.056
Hansen J Statistic	3.924	3.427	3.834	3.432	3.279	3.570
p-value	0.687	0.754	0.699	0.753	0.773	0.735
Percent Change in Levels	-71%	-52%	-70%	-52%	-72%	-54%
p-value	0.000	0.001	0.000	0.000	0.000	0.000
Percent Change over Baseline	-49%	-33%	-48%	-36%	-52%	-38%
p-value	0.034	0.124	0.001	0.042	0.010	0.051
Number of Daughters	2618	2618	2757	2757	1961	1961
Observations	44122	44122	36823	36823	36404	36404

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.

TABLE 6. INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION BY EXPOSURE MECHANISM VIA "WORD OF MOUTH"

	Exposure During Co-Residence Only		Any Prior Exposure with Daughter Fixed Effects and "Word-of-Mouth" Learning	
	(1)	(2)	(3)	(4)
Mother's Participation	0.272	0.413	0.079	0.218
	(0.058)	(0.070)	(0.023)	(0.032)
After Welfare Reform	0.058	0.070	0.052	0.073
	(0.018)	(0.029)	(0.011)	(0.020)
Mother's Participation × After Welfare Reform	-0.188	-0.213	-0.128	-0.175
	(0.058)	(0.070)	(0.019)	(0.034)
Daughter Fixed Effects	No	No	Yes	Yes
Instrumental Variables	Yes	Yes	No	No
Misclassification Correction	No	Yes	No	Yes
Weak IV Test Statistic	17.399	16.969		
p-value	0.015	0.018		
Hansen J Statistic	6.285	6.123		
p-value	0.392	0.410		
Percent Change in Levels	-69%	-52%	-100%	-81%
p-value	0.000	0.006	0.000	0.000
Percent Change over Baseline	-46%	-33%	-100%	-72%
p-value	0.062	0.206	0.010	0.003
Number of Daughters	2961	2961	2961	2961
Observations	56068	56068	56068	56068

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, and interactions of each with an indicator for welfare reform. Given the independent variable definition in columns (1) and (2), the instruments are defined over the years of mother-daughter co-residence only (elsewhere, instruments are defined over the critical exposure years when the daughter is aged 12-18). The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.

TABLE 7. HETEROGENEOUS INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION

TRANSMISSION EFFECTS BY:	*A. RACE*		*B. REFORM AGGRESSIVENESS*	
	(1)	(2)	(3)	(4)
	Black		Aggressive States	
Mother's Participation	0.166	0.442	0.139	0.184
	(0.027)	(0.173)	(0.016)	(0.040)
Mother's Participation × After Welfare Reform	-0.101	-0.233	-0.099	-0.133
	(0.032)	(0.185)	(0.022)	(0.040)
	White		Non-Aggressive States	
Mother's Participation	0.068	0.146	0.148	0.305
	(0.013)	(0.073)	(0.018)	(0.074)
Mother's Participation × After Welfare Reform	-0.057	-0.125	-0.102	-0.228
	(0.014)	(0.071)	(0.018)	(0.065)
Instrumental Variables	No	Yes	No	Yes
Weak IV Test Statistic		25.131		26.612
p-value		0.022		0.014
Hansen J Statistic		8.813		9.567
p-value		0.719		0.654
	Black		Aggressive States	
Percent Change in Levels	-61%	-53%	-71%	-72%
p-value	0.000	0.041	0.000	0.000
Percent Change over Baseline	-31%	-17%	-50%	-51%
p-value	0.193	0.703	0.087	0.035
	White		Non-Aggressive States	
Percent Change in Levels	-84%	-85%	-69%	-75%
p-value	0.000	0.002	0.000	0.000
Percent Change over Baseline	-72%	-74%	-46%	-56%
p-value	0.001	0.115	0.002	0.001
Number of Daughters	2848	2848	2961	2961
Observations	54956	54956	56068	56068

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, interactions with an indicator for welfare reform, and interactions of each with an indicator for daughter's race is black in columns (1)-(2) or state's reform is stringent in columns (3)-(4). The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. Daughters' PSID core longitudinal weights are used in estimation.

Appendix A. Notes on Misclassification Bias Corrections

Estimates based on equation (1) rely on self-reported data for a daughter's welfare participation at time t and her mother's self-reported participation at any time prior to t,

$$W_{ist}^{d} = \alpha + \beta' \boldsymbol{x}_{ist}^{d} + \delta W_{is,\forall j<t}^{m} + \gamma R_{st}^{m} + \theta R_{st}^{m} W_{is,\forall j<t}^{m} + \mu_{s}^{d} + \rho_{t}^{d} + \nu_{ist}^{d},$$

where $W_{is,\forall j<t}^{m} = \max\{W_{is,t-1}^{m}, W_{is,t-2}^{m}, W_{is,t-3}^{m}, \ldots\}$. Let the true participation status be denoted $\widetilde{W}_{ist}^{d}$ for daughter at time t, $\widetilde{W}_{ist}^{m}$ for mother at time t, and $\widetilde{W}_{is,\forall j<t}^{m}$ for mother at any time prior to time t. In principle, both W_{ist}^{d} and W_{ist}^{m} can be affected by misclassification error. However, as demonstrated below, $W_{is,\forall j<t}^{m}$ does not represent a challenge for point estimation as long as individuals have some positive probability of truthfully reporting welfare participation at time t.

To fix ideas, consider for simplicity $t = 3$ with $j \in \{1,2\}$ and let the probability of truthfully reporting participation be defined as $q = \mathrm{P}\left(W_{ist}^{m} = 1 \middle| \widetilde{W}_{ist}^{m} = 1\right) > 0$. In this case, the mother's measure of any prior participation at $t = 3$ will be accurately reported with probability

$$\begin{aligned}\mathrm{P}\left(W_{is,\forall j<3}^{m} = 1 \middle| \widetilde{W}_{is,\forall j<3}^{m} = 1\right) = \\ &\mathrm{P}\left(W_{is1}^{m} = 1 \middle| \widetilde{W}_{is1}^{m} = 1\right) + \mathrm{P}\left(W_{is2}^{m} = 1 \middle| \widetilde{W}_{is2}^{m} = 1\right) \\ &-\mathrm{P}\left(W_{is1}^{m} = 1 \middle| \widetilde{W}_{is1}^{m} = 1\right)\mathrm{P}\left(W_{is2}^{m} = 1 \middle| \widetilde{W}_{is2}^{m} = 1, W_{is1}^{m} = 1, \widetilde{W}_{is1}^{m} = 1\right).\end{aligned}$$

Denoting $\mathrm{P}\left(W_{is2}^{m} = 1 \middle| \widetilde{W}_{is2}^{m} = 1, W_{is1}^{m} = 1, \widetilde{W}_{is1}^{m} = 1\right) = r$, it follows that,

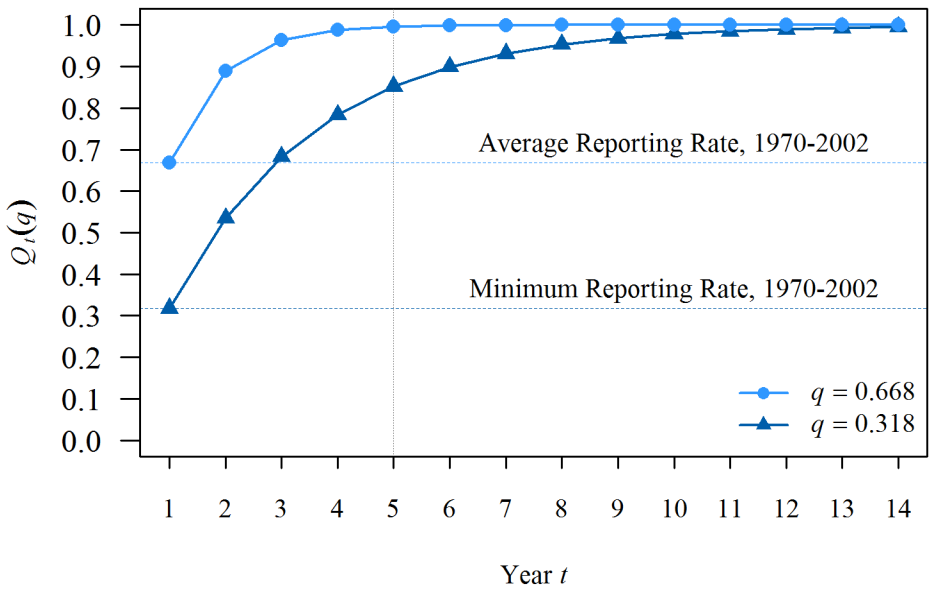
$$\mathrm{P}\left(W_{is,\forall j<3}^{m} = 1 \middle| \widetilde{W}_{is,\forall j<3}^{m} = 1\right) = q\,(2 - r) > q = \mathrm{P}\left(W_{is3}^{m} = 1 \middle| \widetilde{W}_{is3}^{m} = 1\right).$$

We can now generalize the argument assuming, again for simplicity in exposition, that $q = r$. The probability of ever truthfully reported welfare participation under the above conditions can be expressed (based on the inclusion-exclusion principle for the union of finite events

(Billingsley 1995, p. 24)) as

$$Q_t(q) \equiv \mathrm{P}\left(W^m_{is,\forall j<t} = 1 \middle| \widetilde{W}^m_{is,\forall j<t} = 1\right) = \sum_{j=1}^{t-1} (-1)^{j-1} \binom{t-1}{j} q^j \text{, where } \binom{t-1}{j} = \frac{(t-1)!}{j!\,(t-1-j)!},$$

which is increasing in the number of time periods observed. For our analysis, the mother's minimum number of time periods is five years, and for the average reporting rate for 1970-2000 (see Table A1 and Meyer et al. 2015b), the probability is $Q_5(q = 0.668) \approx 0.996$, or for the minimum reporting rate over that time period, $Q_5(q = 0.318) \approx 0.852$. Given that mothers are observed for about 14 years on average prior to the daughter's participation decision, the probability that a mother truthfully reports any prior participation tends to 1, as shown in the graph below.



We focus instead on misclassification in the binary dependent variable for daughter's current welfare status. The probability that a daughter reports participating in welfare can be written as

$$\mathrm{P}\left(W_{ist}^{d}=1\right)=\mathrm{P}\left(W_{ist}^{d}=1\middle|\widetilde{W}_{ist}^{d}=1\right)\mathrm{P}\left(\widetilde{W}_{ist}^{d}=1\right)+\mathrm{P}\left(W_{ist}^{d}=1\middle|\widetilde{W}_{ist}^{d}=0\right)\mathrm{P}\left(\widetilde{W}_{ist}^{d}=0\right),$$

where false negatives are defined as $\tau_{1,ist}\coloneqq\mathrm{P}\left(W_{ist}^{d}=0\middle|\widetilde{W}_{ist}^{d}=1\right)$ and false positives are defined as $\tau_{0,ist}\coloneqq\mathrm{P}\left(W_{ist}^{d}=1\middle|\widetilde{W}_{ist}^{d}=0\right)=0$ by assumption.[19] This assumption is standard in the literature as false positive reports are relatively small, and these misreports typically correspond to individuals who mistake the source or timing of actual welfare participation.

Therefore, using equation (1) and $\tau_{1,ist}$, we can rewrite the daughter's probability of reported welfare participation as

$$\mathrm{P}\left(W_{ist}^{d}=1\right)=\left[1-\tau_{1,ist}\right]\left[\alpha+\beta'\boldsymbol{x}_{ist}^{d}+\delta W_{is,\forall j<t}^{m}+\gamma R_{st}^{m}+\theta R_{st}^{m}W_{is,\forall j<t}^{m}+\mu_{s}^{d}+\rho_{t}^{d}\right].$$

We estimate the previous equation in two steps. The first step estimates misclassification probabilities based on estimates of AFDC/TANF reporting rates in the PSID by Meyer, Mok, and Sullivan (2015b) considering that $\mathrm{E}\left(\tau_{1,ist}\right)=\tau_{1t}$. Table A1 shows the reporting rates used in estimation. In the second stage, we estimate the parameter of interest, (δ,γ,θ), by estimating the model of W_{ist}^{d} on weighted independent variables including a weighted intercept $[1-\hat{\tau}_{1t}]\alpha$, $[1-\hat{\tau}_{1t}]\mu_{s}^{d}$ and $[1-\hat{\tau}_{1t}]\rho_{t}^{d}$.

[19] Note that whereas q is assumed fixed for the purposes of exposition above, false negatives here can be shown equivalently as $\tau_{1,ist}=1-q_{ist}$.

TABLE A1. PSID REPORTING RATES TAKEN AS GIVEN FOR MISCLASSIFICATION BIAS CORRECTION ESTIMATES

	AFDC/TANF			Food Stamps/SNAP		
	Meyer, et al. (2015b)		Estimation	Meyer, et al. (2015b)		Estimation
Year	Transfers	Cases	Parameter	Transfers	Cases	Parameter
1975	0.646		0.722	0.779		0.773
1976	0.662		0.740	0.734		0.728
1977	0.630		0.704	0.754		0.748
1978	0.661		0.739	0.772		0.766
1979	0.642		0.717	0.782		0.776
1980	0.700		0.782	0.761	0.782	0.755
1981	0.699		0.781	0.761	0.780	0.755
1982	0.679		0.759	0.832	0.841	0.826
1983	0.708		0.791	0.808	0.817	0.802
1984	0.631		0.705	0.830	0.784	0.824
1985	0.594		0.664	0.817	0.786	0.811
1986	0.587		0.656	0.818	0.841	0.812
1987	0.555		0.620	0.871	0.846	0.864
1988	0.620		0.693	0.862	0.847	0.855
1989	0.576		0.644	0.982	0.845	0.974
1990	0.586		0.655	0.857	0.770	0.850
1991	0.612		0.684	0.756	0.681	0.750
1992	0.600		0.671	0.731	0.720	0.725
1993	0.528	0.605	0.590	0.621	0.700	0.616
1994	0.474	0.569	0.530	0.662	0.686	0.657
1995	0.493	0.539	0.551	0.632	0.652	0.627
1996	0.541	0.572	0.605	0.572	0.604	0.568
1997			0.508	0.509	0.522	0.505
1998	0.369	0.403	0.412	0.563	0.561	0.559
1999			0.387	0.654	0.535	0.649
2000	0.323	0.445	0.361	0.617	0.583	0.612
2001			0.350	0.592	0.573	0.587
2002	0.303	0.343	0.339	0.744	0.595	0.738
2003	0.387	0.458	0.432	0.685	0.719	0.680
2004	0.487	0.510	0.544	0.718	0.807	0.712
2005	0.285	0.285	0.318	0.688	0.635	0.683
2006	0.395	0.365	0.441	0.693	0.758	0.688
2007			0.472	0.742	0.794	0.736
2008	0.450	0.497	0.503	0.777	0.791	0.771
2009			0.486	0.704	0.764	0.699
2010	0.419	0.504	0.468	0.648	0.713	0.643
2011			0.477			0.671
2012			0.473			0.657

Notes: PSID reporting rates for dollar amount in transfers and number of cases for AFDC/TANF and food stamps/SNAP are estimated in Meyer, et al. (2015b). The estimation parameter used in misclassification bias correction estimates, $(1 - \hat{\tau}_{1t})$, is the imputed reporting rate (or the greater of the two reporting rates for daughter's broader safety net estimates). The imputed rate is equal to the reporting rate for transfers in the first column inflated by the average ratio of the reporting rates for transfers and cases given the years with available data, which is approximately 1.118 for AFDC/TANF and 0.992 for food stamps/SNAP. In years where we are missing both rates for amounts and cases, we linearly interpolate between observed years and use a two-year moving average for the last years.

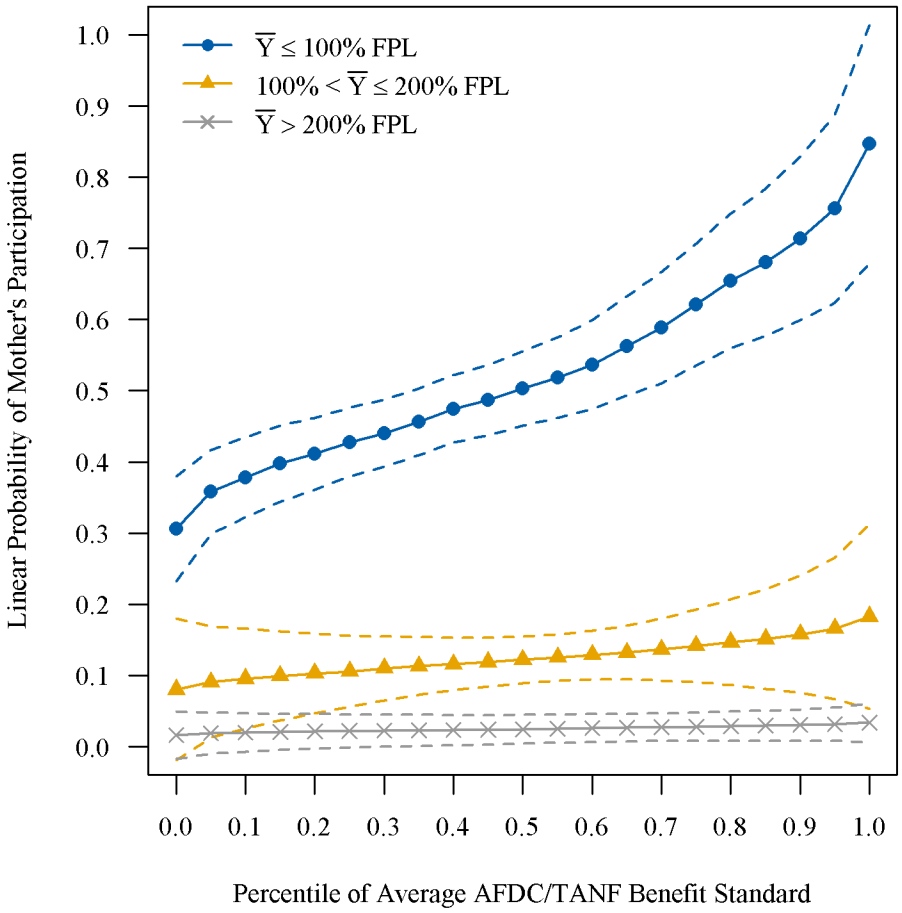
Appendix B. Additional Results and Robustness Checks

As referenced throughout the paper, the following section introduces additional results that explore the sensitivity of our main findings. The qualitative results of welfare reform are consistent: there is a causal influence from mother's welfare participation, and reform attenuates this transmission by more than 50 percent in levels and about 30 percent above baseline probabilities given the mechanical change in participation after reform.

Figure B1 demonstrates the relationship between mother's welfare participation and the main policy instrument of AFDC/TANF benefit generosity. Table B1 shows the first stage results for the mother's AFDC/TANF participation decision for instrumental variable estimates in Table 2. In Table B2, we compare estimates for different sets of instrumental variables, which are key to identifying the effect of mother's participation given her selection into welfare. Then, in Table B3 we re-estimate the baseline IV model including mother's variables related to her lifetime earnings ability: an indicator for less than high school education and an indicator for any prior family income below 200% of the Census poverty threshold by family size. Next in Table B4, we re-estimate the baseline specifications from Table 2 without using the daughter's PSID core longitudinal survey weights, first for the full baseline sample including the Survey of Economic Opportunity (SEO), which oversamples low-income, minority families, and then for only the Survey Research Center (SRC) subsample, which is nationally representative. In Table B5 we re-estimate the baseline results in Table 2 for a sample of eldest daughters only. Eldest daughters have the most opportunity to continue learning from their mothers' participation after leaving home since there may still be younger siblings living with the mother, and this sample abstracts away from larger families being overrepresented in the data. Table B6 estimates the intergenerational transmission of welfare participation for the subsample of daughters whose

mothers were more likely to participate based on lifetime education and family income. In Table B7, we present a falsification exercise including a mother's future welfare participation. Lastly, in B8 we present estimates of the baseline IV models imposing different levels of minimum years required for mother and daughter to be observed living together before the daughter forms her own family.

FIGURE B1. MOTHER'S WELFARE PARTICIPATION RELATIVE TO AFDC/TANF BENEFIT LEVELS



Notes: Linear probability estimates are shown for the mother's indicator for any prior AFDC/TANF participation conditional on an average measure of AFDC/TANF benefit standard while the daughter is aged 12-18 along with the baseline controls of state and year effects as well as the daughter's quadratic in age and indicators for her number of children. The predicted probabilities are estimated for subsamples by the mother's ratio of mean family income, $\bar{Y}$, relative to the mean Federal Poverty Line (FPL) across all observation years. Dashed lines represent 95% pointwise confidence intervals with state-level clustering.

TABLE B1. FIRST STAGE INSTRUMENTAL VARIABLE ESTIMATES FOR MOTHER'S AFDC/TANF PARTICIPATION DECISION

Second-Stage Dependent Variable:	Daughter's AFDC/TANF		Daughter's AFDC/TANF, SNAP, SSI	
	(1)	(2)	(3)	(4)
Average AFDC/TANF	0.548	0.532	0.741	0.733
	(0.087)	(0.096)	(0.081)	(0.082)
Reform × Average AFDC/TANF	0.199	0.231	0.263	0.281
	(0.122)	(0.114)	(0.108)	(0.104)
Maximum AFDC/TANF	-0.385	-0.385	-0.637	-0.633
	(0.117)	(0.114)	(0.101)	(0.099)
Reform × Maximum AFDC/TANF	-0.137	-0.170	-0.162	-0.179
	(0.108)	(0.104)	(0.108)	(0.106)
Average EITC	0.058	0.039	0.082	0.075
	(0.040)	(0.038)	(0.051)	(0.051)
Reform × Average EITC	-0.030	-0.018	-0.035	-0.030
	(0.046)	(0.041)	(0.053)	(0.053)
Maximum EITC	-0.030	-0.023	-0.058	-0.055
	(0.030)	(0.027)	(0.029)	(0.029)
Reform × Maximum EITC	0.023	0.015	0.018	0.014
	(0.034)	(0.032)	(0.032)	(0.031)
Misclassification Correction	No	Yes	No	Yes
F Test of Excluded Instruments	10.200	9.337	10.200	9.539
p-value	0.000	0.000	0.000	0.000
Weak IV Test Statistic	23.092	21.083	23.092	21.739
p-value	0.002	0.004	0.002	0.003
Hansen J Statistic	2.370	2.069	9.970	9.792
p-value	0.883	0.913	0.126	0.134
Number of Daughters	2961	2961	2961	2961
Observations	56068	56068	56068	56068

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. Daughters' PSID core longitudinal weights are used in estimation. Abbreviations: Food Stamps/Supplemental Nutrition Assistance Program (SNAP), and Supplemental Security Income (SSI).

TABLE B2. INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION WITH ALTERNATIVE INSTRUMENTAL VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)
Mother's Participation	0.281	0.316	0.330	0.332	0.297	0.313
	(0.056)	(0.055)	(0.057)	(0.079)	(0.065)	(0.067)
After Welfare Reform	0.072	0.081	0.087	0.085	0.077	0.080
	(0.022)	(0.022)	(0.020)	(0.030)	(0.025)	(0.026)
Mother's Participation × After Welfare Reform	-0.197	-0.221	-0.241	-0.239	-0.214	-0.224
	(0.050)	(0.048)	(0.046)	(0.069)	(0.055)	(0.056)
Instrumental Variables:						
AFDC/TANF	X	X	X	X	X	X
EITC	X	X	X	X	X	X
AFDC/TANF Application Denial Rate		X	X			
Unemployment Rate			X			
AFDC/TANF Procedural Denial Rate					X	X
AFDC/TANF Favorable Claims Rate						X
Weak IV Test Statistic	23.092	25.068	29.108	19.636	23.259	24.449
p-value	0.002	0.009	0.016	0.006	0.016	0.058
Hansen J Statistic	2.370	12.196	13.015	1.682	5.740	16.434
p-value	0.883	0.272	0.525	0.947	0.837	0.288
Percent Change in Levels	-70%	-70%	-73%	-72%	-72%	-72%
p-value	0.000	0.000	0.000	0.000	0.000	0.000
Percent Change over Baseline	-48%	-47%	-53%	-43%	-43%	-42%
p-value	0.004	0.001	0.000	0.098	0.071	0.062
Number of Daughters	2961	2961	2961	1422	1422	1422
Observations	56068	56068	56068	32988	32988	32988

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables vary by column and include average and maximum [or minimum for denial rates] measures of indicated variables, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. Given the limited data availability of procedural denial and favorable claims across years, estimates in columns (4)-(6) use a restricted sample of daughters who were ages 16-35 in 1991. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. Daughters' PSID core longitudinal weights are used in estimation.

TABLE B3. IV ESTIMATES OF INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION WITH CONTROLS FOR MOTHER'S CHARACTERISTICS

	(1)	(2)	(3)	(4)	(5)	(6)
Mother's Participation	0.284	0.320	0.325	0.435	0.498	0.514
	(0.059)	(0.078)	(0.081)	(0.098)	(0.148)	(0.155)
After Welfare Reform	0.072	0.072	0.072	0.086	0.088	0.087
	(0.021)	(0.021)	(0.021)	(0.032)	(0.032)	(0.032)
Mother's Participation × After Welfare Reform	-0.195	-0.206	-0.205	-0.228	-0.248	-0.246
	(0.050)	(0.052)	(0.052)	(0.079)	(0.085)	(0.085)
Mother's Controls:						
Less than High School Education	X		X	X		X
Ever Below 200% Poverty		X	X		X	X
Misclassification Correction	No	No	No	Yes	Yes	Yes
Weak IV Test Statistic	21.826	17.134	16.483	19.923	14.095	13.295
p-value	0.003	0.017	0.021	0.006	0.050	0.065
Hansen J Statistic	2.256	3.066	2.960	1.901	2.553	2.409
p-value	0.895	0.800	0.814	0.929	0.862	0.878
Percent Change in Levels	-69%	-64%	-63%	-52%	-50%	-48%
p-value	0.000	0.000	0.000	0.000	0.000	0.000
Percent Change over Baseline	-45%	-37%	-35%	-34%	-30%	-28%
p-value	0.006	0.067	0.081	0.042	0.089	0.111
Number of Daughters	2946	2946	2946	2946	2946	2946
Observations	55946	55946	55946	55946	55946	55946

Notes: Robust standard errors with state clustering are shown in parentheses. Controls for mother's characteristics, used where indicated, include an indicator if the mother's educational attainment is less than 12 years and an indicator for mother's family income has ever been below 200% the Census poverty threshold by family size. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.

TABLE B4. INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION ESTIMATED WITHOUT PSID LONGITUDINAL WEIGHTS

	(1)	(2)	(3)	(4)
A. FULL SAMPLE				
Mother's Participation	0.202	0.391	0.312	0.606
	(0.017)	(0.061)	(0.023)	(0.098)
After Welfare Reform	0.077	0.150	0.088	0.179
	(0.010)	(0.036)	(0.018)	(0.053)
Mother's Participation × After Welfare Reform	-0.158	-0.278	-0.202	-0.344
	(0.017)	(0.058)	(0.031)	(0.092)
Instrumental Variables	No	Yes	No	Yes
Misclassification Correction	No	No	Yes	Yes
Weak IV Test Statistic		21.100		21.184
p-value		0.004		0.004
Hansen J Statistic		8.222		6.932
p-value		0.222		0.327
Percent Change in Levels	-78%	-71%	-65%	-57%
p-value	0.000	0.000	0.000	0.000
Percent Change over Baseline	-55%	-40%	-45%	-32%
p-value	0.000	0.008	0.001	0.024
Number of Daughters	2961	2961	2961	2961
Observations	56068	56068	56068	56068
A. SURVEY RESEARCH CENTER (SRC) SAMPLE ONLY				
Mother's Participation	0.115	0.212	0.182	0.275
	(0.021)	(0.067)	(0.034)	(0.106)
After Welfare Reform	0.030	0.054	0.043	0.063
	(0.010)	(0.022)	(0.018)	(0.034)
Mother's Participation × After Welfare Reform	-0.089	-0.181	-0.121	-0.194
	(0.022)	(0.067)	(0.039)	(0.108)
Instrumental Variables	No	Yes	No	Yes
Misclassification Correction	No	No	Yes	Yes
Weak IV Test Statistic		19.330		16.900
p-value		0.007		0.018
Hansen J Statistic		6.711		6.519
p-value		0.348		0.368
Percent Change in Levels	-78%	-85%	-67%	-71%
p-value	0.000	0.000	0.000	0.001
Percent Change over Baseline	-55%	-71%	-49%	-55%
p-value	0.001	0.016	0.008	0.104
Number of Daughters	1422	1422	1422	1422
Observations	28917	28917	28917	28917

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details).

TABLE B5. INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION FOR THE SUBSAMPLE OF ELDEST DAUGHTERS

	(1)	(2)	(3)	(4)
Mother's Participation	0.137	0.259	0.219	0.371
	(0.014)	(0.087)	(0.022)	(0.149)
After Welfare Reform	0.031	0.058	0.037	0.058
	(0.007)	(0.025)	(0.013)	(0.040)
Mother's Participation × After Welfare Reform	-0.100	-0.176	-0.135	-0.183
	(0.017)	(0.070)	(0.030)	(0.119)
Instrumental Variables	No	Yes	No	Yes
Misclassification Correction	No	No	Yes	Yes
Weak IV Test Statistic		20.956		18.285
p-value		0.004		0.011
Hansen J Statistic		3.237		3.010
p-value		0.779		0.808
Percent Change in Levels	-73%	-68%	-62%	-49%
p-value	0.000	0.000	0.000	0.021
Percent Change over Baseline	-52%	-43%	-47%	-29%
p-value	0.000	0.096	0.001	0.336
Number of Daughters	1914	1914	1914	1914
Observations	36288	36288	36288	36288

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.

TABLE B6. IV ESTIMATES OF INTERGENERATIONAL TRANSMISSION OF MOTHER'S AFDC/TANF PARTICIPATION BY RELEVANT SUBSAMPLE

Daughter's Outcome Variable:	AFDC/TANF				AFDC/TANF, SNAP, SSI			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother's Participation	0.219	0.258	0.351	0.344	0.207	0.246	0.362	0.303
	(0.053)	(0.047)	(0.074)	(0.061)	(0.072)	(0.070)	(0.096)	(0.070)
After Welfare Reform	0.069	0.071	0.153	0.117	-0.004	-0.020	0.051	-0.009
	(0.019)	(0.020)	(0.038)	(0.030)	(0.041)	(0.032)	(0.051)	(0.040)
Mother's Participation × After Welfare Reform	-0.185	-0.195	-0.261	-0.254	0.038	0.061	-0.075	0.010
	(0.048)	(0.049)	(0.058)	(0.053)	(0.098)	(0.085)	(0.084)	(0.080)
Subsample by Mother:	Education < 9 years	Education ≤ 12 years	Ever below 130% FPL	Ever below 200% FPL	Education < 9 years	Education ≤ 12 years	Ever below 130% FPL	Ever below 200% FPL
Weak IV Test Statistic	23.305	21.932	20.521	21.828	23.305	21.932	20.521	21.828
p-value	0.002	0.003	0.005	0.003	0.002	0.003	0.005	0.003
Hansen J Statistic	2.304	1.690	3.240	1.709	12.036	11.423	5.747	5.979
p-value	0.890	0.946	0.778	0.944	0.061	0.076	0.452	0.426
Percent Change in Levels	-84%	-75%	-74%	-74%	18%	25%	-21%	3%
p-value	0.000	0.000	0.000	0.000	0.725	0.536	0.268	0.898
Percent Change over Baseline	-67%	-57%	-55%	-54%	30%	31%	-16%	9%
p-value	0.006	0.004	0.000	0.000	0.600	0.460	0.424	0.745
Number of Daughters	1328	2507	2213	2634	1328	2507	2213	2634
Observations	30168	49918	40997	49266	30168	49918	40997	49266

Notes: Robust standard errors with state clustering are shown in parentheses. Subsamples are defined by the mother's highest educational attainment and average family income relative to the federal poverty line (FPL) over the entire observation period. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.

TABLE B7. INTERGENERATIONAL TRANSMISSION OF MOTHER'S AFDC/TANF PARTICIPATION CONTROLLING FOR MOTHER'S FUTURE WELFARE PARTICIPATION

Daughter's Outcome Variable:	AFDC/TANF				AFDC/TANF, SNAP, SSI			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother's Prior Participation	0.182	0.267	0.139	0.316	0.225	0.267	0.179	0.387
	(0.024)	(0.085)	(0.023)	(0.101)	(0.028)	(0.087)	(0.027)	(0.094)
After Welfare Reform	0.024	0.038	0.016	0.052	0.004	0.007	-0.004	0.032
	(0.012)	(0.019)	(0.012)	(0.027)	(0.015)	(0.023)	(0.015)	(0.033)
Mother's Prior Participation × After Welfare Reform	-0.111	-0.167	-0.090	-0.223	-0.066	-0.076	-0.040	-0.098
	(0.031)	(0.077)	(0.027)	(0.095)	(0.032)	(0.078)	(0.033)	(0.102)
Mother's Future Participation			0.013	0.483			-0.007	0.896
			(0.023)	(0.579)			(0.035)	(0.732)
Mother's Future Participation × After Welfare Reform			-0.025	-1.030			-0.030	-1.424
			(0.026)	(0.740)			(0.042)	(0.934)
Mother's Prior × Future Participation			0.250	-0.490			0.281	-0.996
			(0.063)	(0.810)			(0.072)	(1.030)
Mother's Prior × Future × After Welfare Reform			-0.029	1.312			-0.060	1.540
			(0.063)	(0.992)			(0.079)	(1.260)
Instrumental Variables	No	Yes	No	Yes	No	Yes	No	Yes
Weak IV Test Statistic		12.565		18.900		12.565		18.900
p-value		0.083		0.463		0.083		0.463
Hansen J Statistic		5.106		19.109		4.959		15.920
p-value		0.530		0.385		0.549		0.598
Percent Change in Levels	-61%	-62%	-65%	-71%	-29%	-29%	-22%	-25%
p-value	0.000	0.000	0.000	0.000	0.023	0.203	0.183	0.255
Percent Change over Baseline	-31%	-34%	-38%	-49%	-3%	-2%	6%	2%
p-value	0.178	0.168	0.122	0.091	0.862	0.940	0.783	0.948
Number of Daughters	1665	1665	1665	1665	1665	1665	1665	1665
Observations	15034	15034	15034	15034	15034	15034	15034	15034

Notes: Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's prior and future AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, interactions of each variable's prior and future measure, and interactions of each with an indicator for welfare reform. Mother's future participation and instrumental variables are measured over years $t + 5$ to $t + 11$, which is arbitrarily distant from time t with an equivalent window size to prior instrument measures over the critical exposure period for daughter's ages 12-18. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. Daughters' PSID core longitudinal weights are used in estimation.

TABLE B8. IV ESTIMATES OF THE INTERGENERATIONAL TRANSMISSION OF AFDC/TANF PARTICIPATION BY MINIMUM NUMBER OF MOTHER-DAUGHTER FAMILY OBSERVATIONS, N_F

	$N_F \geq 5$		$N_F \geq 10$		$N_F \geq 15$	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's Participation	0.281	0.428	0.328	0.541	0.281	0.462
	(0.056)	(0.093)	(0.071)	(0.115)	(0.064)	(0.111)
After Welfare Reform	0.072	0.087	0.094	0.129	0.087	0.117
	(0.022)	(0.033)	(0.027)	(0.041)	(0.027)	(0.045)
Mother's Participation × After Welfare Reform	-0.197	-0.234	-0.253	-0.355	-0.195	-0.257
	(0.050)	(0.081)	(0.066)	(0.107)	(0.059)	(0.105)
Misclassification Correction	No	Yes	No	Yes	No	Yes
Weak IV Test Statistic	23.092	21.083	23.234	22.099	16.942	17.735
p-value	0.002	0.004	0.002	0.002	0.018	0.013
Hansen J Statistic	2.370	2.069	5.138	5.164	4.515	5.040
p-value	0.883	0.913	0.526	0.523	0.607	0.539
Percent Change in Levels	-70%	-55%	-77%	-66%	-69%	-56%
p-value	0.000	0.000	0.000	0.000	0.000	0.001
Percent Change over Baseline	-48%	-37%	-60%	-52%	-53%	-43%
p-value	0.004	0.031	0.007	0.018	0.009	0.040
Number of Daughters	2961	2961	2466	2466	1806	1806
Observations	56068	56068	43733	43733	28903	28903

Notes: The minimum number of mother-daughter family observations, denoted N_F, represents years when the mother is observed living with the daughter before her daughter has formed her own family unit (the baseline minimum restriction used throughout is $N_F \geq 5$). Robust standard errors with state clustering are shown in parentheses. All specifications control for state and year effects in addition to time-varying controls for daughter's age, age squared, and indicators for number of children equal to 1, 2, 3, or at least 4. Instrumental variables include average and maximum measures of the mother's AFDC/TANF benefit standard and federal/state EITC maximum credit by family size, which are defined over the daughter's critical exposure ages 12-18, and interactions of each with an indicator for welfare reform. The weak IV test statistic is a Kleibergen-Paap (2006) rank statistic. The misclassification correction uses reporting rates in the PSID to address potential misreporting for the daughter's welfare participation (see Appendix A for details). Daughters' PSID core longitudinal weights are used in estimation.