NBER WORKING PAPER SERIES

WELFARE REFORM AND FAMILY EXPENDITURES: HOW ARE SINGLE MOTHERS ADAPTING TO THE NEW WELFARE AND WORK REGIME?

Neeraj Kaushal
Qin Gao
Jane Waldfogel

Working Paper 12624
http://www.nber.org/papers/w12624

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
October 2006

We are grateful to Liz Washbrook and Geng Li for helpful advice. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

Welfare Reform and Family Expenditures: How are Single Mothers Adapting to the New Welfare and Work Regime?

Neeraj Kaushal, Qin Gao, and Jane Waldfogel
NBER Working Paper No. 12624
October 2006
JEL No. I3,I31,I38

ABSTRACT

We study the effect of welfare reform, broadly defined to include social policy changes in the 1990s, on the material well-being and expenditure patterns of poor single-mother families. Our research suggests that welfare reform did not affect total expenditures in households headed by low-educated single mothers. However, patterns of expenditure did change. We find strong evidence that the policy was associated with an increase in spending on transportation and food away from home, and some evidence of an increase in spending on adult clothing and footwear. In contrast, we find no statistically significant changes in expenditures on childcare or learning and enrichment activities. This pattern of results suggests that welfare reform has shifted family expenditures towards items that facilitate work outside the home, but, at least so far, has not allowed families to catch up with more advantaged families in terms of their expenditures on learning and enrichment items.

Neeraj Kaushal
Columbia University
School of Social Work
1255 Amsterdam Avenue
New York, NY 10027
and NBER
nk464@columbia.edu

Jane Waldfogel
Columbia University
School of Social Work
1255 Amsterdam Avenue
New York, NY 10027
jw205@columbia.edu

Qin Gao
Fordham University Graduate School of Social Services
113 West 60th Street
New York, New York-10023
aqigao@fordham.edu

Introduction

A decade long policy to "end welfare as we know it" has dramatically altered life circumstances and opportunities faced by single mother headed families in the U.S. Approximately 69 percent of single mothers were employed in 2005, up from 61 percent a decade ago, and the number on welfare continued to decline even during the 2001 recession after falling by half within the first five years of the implementation of the 1996 welfare law (O' Neill 2006, Parrott and Sherman 2006). How have these changes affected the material circumstances of families headed by single mothers? A rich body of research has documented the effects of welfare reform on the employment and incomes of low-educated single mothers (Blank 2002, Grogger et al. 2003). In this paper, we provide evidence on how welfare reform affected their material well-being and patterns of expenditure.

In their extensive research using expenditure data, Meyer and Sullivan (2003, 2004, 2006) find that while incomes of the poorest (bottom decile) single-mother families fell noticeably after welfare reform, trends in expenditures indicate an improvement in the material circumstances of this group. However, it is not clear from their analyses whether the improvement in expenditures is due to changes in social policy or due to economic factors. From a policy perspective it is important to separate the two effects and isolate the impact of social policy on the material well-being of low-educated single parent families. We use a difference-in-difference-in-difference research design, described in detail below, that allows us to separate the effect of changes in social policy from that of other secular trends.

The second contribution of our paper is to examine trends in expenditures on specific items, such as those related to work or development and learning, so as to provide evidence of how single mother families are adapting to their new life circumstances. For example, changed circumstances may require families to spend more on work related activities such as transportation, food away from home, or adult clothing. Realizing the significance of education in the labor market, families may decide to spend more on development or learning activities. Working families may also purchase more childcare (which may or may not benefit children, depending on factors such as the age of the child and the quality of the care). Recent research from the UK suggests that focusing on detailed

items can yield important new insights into how policy changes affect the material well-being and expenditure patterns of low-income families (Gregg, Waldfogel, and Washbrook, in press).

To preview our results, we find that while total expenditures in households headed by low-educated (education ≤ high-school) single mothers rose after welfare reform, similar increases were also experienced in households belonging to other demographic groups that were much less affected by welfare reform (e.g. families headed by high-educated single mothers or low-educated married-couple families). Our research suggests that welfare reform per se did not have any statistically significant effect on total expenditures in low-educated single mother households. However, patterns of expenditure did change. There is strong evidence that the policy change was associated with an increase in spending on transportation and food away from home, and some evidence of an increase in spending on adult clothing and footwear. Welfare reform was also associated with an increase in ownership of microwave ovens, phones, and cars. These increases were higher, in absolute as well as relative terms, among families headed by very low educated (education < high-school) single mothers. In contrast, we find no statistically significant changes in expenditures on childcare or learning and enrichment activities, and, if anything, a relative decline in ownership of computers in low-educated single mother households. This pattern of results suggests that welfare reform has shifted family expenditures towards items that facilitate work outside the home, but, at least so far, has not allowed families to catch up with more advantaged families in terms of their expenditures on learning and enrichment items.

Policy Background and Previous Research

A spate of policy changes in the 1990s shifted the focus of US welfare policy from providing cash benefits to low-income single mothers to providing work incentives and a range of supports for the working poor. The 1996 federal law and state initiatives discouraged welfare dependence by eliminating the entitlement to cash assistance and by imposing mandatory work requirements and time-limits on welfare receipt. These changes were accompanied by expansions in a plethora of work support programs for low-income families including federal and state Earned Income Tax Credits

(EITCs), childcare subsidies, child tax credits, and Medicaid and child health insurance programs that radically altered the form of public assistance available to low-income single-mother families.[1]

These policy changes were implemented at a time when the US economy experienced impressive growth that generated over 20 million jobs during 1992-2000 (Blank 2000). It may be partly due to changes in incentives brought about by tax and transfer programs and partly on account of economic growth that the employment rate of low-educated single mothers increased from 62 percent in 1995 to 73 percent in 2000, before declining in the recent recession to 69 percent in 2005 (Parrott and Sherman 2006). Indeed, the economic expansion of the 1990s made it relatively easy for low-income single mothers to move from welfare to work. It is, however, not easy to determine what proportion of the increase in employment (or incomes) is due to policy and what proportion due to economic factors (Blank 2002). Moreover, multiple policy changes occurred during a short time period, making it difficult to attribute changes in incomes or other aspects of material well-being to a single aspect of welfare reform or work assistance programs. This task becomes even more challenging if we allow for the possibility that certain policy changes may have a lagged effect.

According to the US Census Bureau, the poverty rate among children in single-mother families declined from 54 percent in 1993 to 43 percent in 2005. Again, part of the decline in poverty is due to the economic boom of the 1990s and part due to other factors including changes in tax and transfer programs. Cancian et al. (1999) found that after adjusting for inflation, both earnings and family incomes of welfare leavers increased over time (see also Haskins 2001). The scenario is less rosy for the very poor. Haskins (2001) concluded that "there is a small to moderate-sized group of mother-headed families that are worse off than they were before welfare reform" (p. 105). Primus et al. (1999) found that the 1996 welfare reform caused disposable income for the bottom decile of the population to decline (see also Meyer and Sullivan 2005). The picture is mixed as one looks at other aspects of family well-being. Research suggests that welfare reform did not result in any deterioration in food insecurity faced by low-income single-mother families (Winship and Jencks 2002). A number

[1] These changes have been well-documented elsewhere and for space considerations we do not repeat them here (see Blank 2002 and Grogger et al. 2002).

of studies have found that welfare reform affected the health insurance of single mothers and their children (Kaushal and Kaestner 2005, Bitler et al 2005).

Expenditures are an important aspect of material well-being and were an under-studied topic until recently. Several researchers have argued for the superiority of an expenditure measure of poverty over an income measure (Meyer and Sullivan 2003, 2004, 2006; Rector 2004; see also discussion in Haskins 2001). Meyer and Sullivan (2004, 2006) find that aggregate expenditures, in particular, expenditures on housing and transportation, increased among the lowest decile of single mothers, although it is not clear from their analysis whether these changes were on account of changes in policy or due to economic factors. We try to answer this question by adopting a research methodology that allows us to separate the two effects. This methodology has been used in one recent study of the impact of welfare reforms on family expenditures in the UK (Gregg, Waldfogel, and Washbrook, in press), but has not been applied in the US research to date.

Our study, as any study on expenditures, is limited by the fact that we examine only certain aspects of material well-being, and not all aspects of individual well-being. For instance, tax incentives and welfare reforms that increase the employment of mothers may affect the time mothers spend with children, and may adversely affect the well-being of children in this sense, although it is also possible that children gain when mothers are employed, due to improvements in maternal mental health or family routines (Duncan and Chase-Lansdale 2004; Waldfogel 2006). Similarly, employment may entail more or less physical labor than household work, and there may also be differences in the amount of psychological stress between paid work and household work. Mother's self-esteem may be higher when employed and lower when on welfare. Our analysis does not factor in these other aspects of individual well-being.

Data

We use micro-level data from the Consumer Expenditure Surveys (CES) from 1990-1995 for the pre-reform period, and from 1998-2003 for the post-reform period. Since all states implemented PRWORA during 1996-1997, we exclude 1996-1997 as this period can not be categorized as pre- or post-reform. The CES consists of two different components: a quarterly Interview Survey (IS) and a

weekly Diary Survey (DS). Our analysis is based on the IS, which provides detailed information on expenditures incurred by a sample of consumer units, defined as: all members of a housing unit related by blood, marriage, adoption or some other legal arrangement; or two or more persons living together who use their incomes to make joint expenditures; or a single person who is living with others but is financially independent (BLS 2005). The IS sample is a rotated panel in which approximately 7,500 units are interviewed every three months for five consecutive quarters, after which these households are replaced by new units.[2] Thus, by design 20 percent of the sample is replaced every year. The first quarter is a contact interview, while in the second to fifth quarters households are asked about their expenditures over the previous three months. Since the IS surveys are based on recall data on expenditures in the past three months, they suffer from response recall errors (Battistin, 2003).[3]

We restrict the analysis to families with children, where the mother is aged 18-54 years. The samples are stratified into four groups by mother's education level and marital status to identify those most and least affected by welfare reform. These are: low-educated (mother's education≤ high-school) single-mother families, an exceedingly vulnerable group with a high probability of being on welfare; low-educated married-couple families; high-educated (mother's education>high-school) single-mother families; and high-educated married-couple families. In supplemental analyses, we also estimated models defining a very low education group to include only those with less than a high-school education. This very low education group would be expected to be most sharply affected by welfare reform. Thus, seeing whether our results hold up, and indeed are stronger, for the very low education group provides a useful robustness check on our results.

Since the CES provides data at the household level and not at the subfamily level, we are unable to identify single mothers who reside in a household with parents or other family members. If welfare reform resulted in a larger number of single mothers living with their parents, the results of our analysis would be biased.[4] Meyer and Sullivan (2003) computed the ratio of single-mother

[2] The sample size was increased in 1999. During 1990-1998, in any single quarter the IS consisted of about 5000 units.
[3] However, there is no reason to believe that these errors are correlated with welfare reform.
[4] Note this was one of the conditions for teenage mothers to stay on welfare.

subfamilies to all single mothers using the Current Population Surveys and found that throughout the 1990s the ratio was around 0.2, suggesting that the bias on account of changes in the proportion of single-mother subfamilies in the CES data would be modest.

The CES provides detailed information on each household unit including the respondent's age (and spouse's age), education level (and spouse's education level), marital status, race and ethnicity (and spouse's race and ethnicity), region of residence, family size, number of children and number of elderly persons (aged 65 or above) in the family. This information is used to construct various demographic groups or control variables.

We first classify quarterly expenditures into ten major categories -- housing and utility; food; alcohol and tobacco; clothing and footwear; transportation; health; leisure; personal care; education (including reading); and miscellaneous -- and study whether welfare reform affected expenditures on these major categories. The CES also provides data on expenditures on more narrowly defined items that can be assigned to work-related and learning or development related expenses. More specifically, we use CES data to define the following specific expenditure categories: expenditure on food away from home; adult's clothing, footwear and accessories; childcare; and learning and enrichment expenditures, defined as spending on books, magazines, newspapers, tuition (elementary, high school and college) and school books, supplies and equipment, computers, calculators, and typewriters, toys, games and sports.[5] For comparison, we also study changes in expenditures on food at home and children's clothing, footwear, and accessories. Details on the measures of each expenditure category are presented in Appendix Tables 1 (major categories) and 2 (detailed items).

We also study ownership of several consumer durables, to examine if welfare reform has induced families to invest in durables to save time in household work (e.g. microwave ovens, washer and dryer, and dishwasher) and to better connect with employers (as well as family and friends) (e.g. phone and car); or whether they are investing in durables that may be used to enhance learning (e.g. computer and VCR). CES provides information on ownership of all of these items, except phones.

[5] In an earlier version of this paper, we examined trends in expenditures on each item that comprises our composite variable on learning and enrichment activities. Since expenditure on many of these items is very small, especially for the target group of families, we think it is more meaningful to use a composite variable.

Information on whether a family spent any money on phone services in the previous quarter is used as a proxy for phone ownership.

To take account of differences in household size and composition, like Gregg, Waldfogel, and Washbrook (in press), we adjust expenditures in the ten major categories for each household using an equivalence scale, which assigns a weight of 0.67 to the first adult, 0.33 to all other persons in the household age over 17, and 0.2 to children 17 or under.[6] More specific items (such as adult clothing, footwear and accessories; children's clothing, footwear and accessories; and baby-sitting and childcare) are deflated by the number of adults or children in the family who are likely to use these goods and services. Expenditures are expressed in January 2003 dollars using the Personal Consumption Expenditure index of the Bureau of Economic Analysis.

A major limitation of the CES data is that it does not provide state identifiers for the entire sample. For instance, in 2003, CES did not provide state codes for 15 states and suppressed state codes for several respondents from 17 other states. Therefore, like Meyer and Sullivan (2004, 2006) we are not able to control for time-varying state effects. We chiefly rely on the difference-in-difference-in-difference methodology, described in detail below, to control for any time-varying state effects.

Methodology

Our objective is to examine whether welfare reform (and other contemporaneous policy changes) have made any difference to the material well-being and expenditure patterns of families headed by low-educated single mothers, a group that faces a high risk of being on welfare and was the primary target of state and federal welfare reform. One simple way to do this is by computing the pre- and post-welfare reform changes in expenditures incurred by these families. Following Gregg, Waldfogel, and Washbrook (in press), we can compute the change using levels or percentage methods as specified below:

[6] The specific scale we use is the one used by many analysts including the OECD (Organization for Economic Cooperation and Development). This scale rate assigns 0.33 to all other persons in the household 14 or over; and 0.2 to children under 14. Since in the US all persons less than 18 are considered children, we modify the OCED scale to meet with the US norms.

(1) Levels method: $\lambda_{ls} = \overline{E_{ls}^{post}} - \overline{E_{ls}^{pre}}$

Percentage method: $\lambda_{ls} = \dfrac{\overline{E_{ls}^{post}} - \overline{E_{ls}^{pre}}}{\overline{E_{ls}^{pre}}}$

where $\overline{E_{ls}^{pre}}$ is the mean real equivalized expenditure of low-educated single-mother families on an item in the pre-reform period, and $\overline{E_{ls}^{post}}$ is the corresponding expenditure in the post-reform period. Under the levels method λ_{ls} estimates the absolute change in mean quarterly expenditure; and under the percentage method, it measures the percentage change in mean quarterly expenditure. If there were no other factors that influenced household expenditures in the pre- versus post-welfare reform periods, λ_{ls} would provide the estimated effect of welfare reform on spending on this item by low-educated single-mother families. However, there may be other factors, for instance, economic trends that affected incomes and therefore expenditure levels, or changes in relative prices that affected spending patterns.

The difference-in-difference-in-difference (D-in-D-in-D) methodology we adopt allows us to control for time-varying factors correlated with welfare reform that may have affected expenditure patterns (absolute as well as relative). The methodology is implemented in three steps. As a first step, we compare the pre- versus post-policy change in expenditures on an item by low-educated single-mother families with the pre- versus post-policy change in expenditures on this item by high-educated single-mother families. This allows us to control for secular trends in spending patterns that had a similar effect on low- and high-educated single-mother families. The estimated difference-in-difference can be specified as:

(2) $\lambda_s^2 = \lambda_{ls} - \lambda_{hs}$

where λ_{hs} is the change in equivalized expenditure on an item by high-educated single-mother families after welfare reform. Since high-educated single-mother families are assumed to be unaffected by welfare reform, λ_{hs} captures the secular trends correlated with welfare reform. The variable λ_s^2 thus estimates whether the pre-versus post- welfare reform trend in expenditures differed

for low-educated and high-educated single-mother households. If the estimated value of λ_s^2 is positive, that would indicate that the relative gap between low and high-income single-mother families narrowed. Equation (2) can be computed using either the level or percentage method described in equation (1).

The identifying assumption in equation (2) is that time-varying factors correlated with welfare reform have the same effect on the target and comparison groups. This may be a rather restrictive assumption since the labor market opportunities for low-educated women differed from the opportunities that high-educated women encountered during the 1990s. To control for these differences, we move to step 2 of the difference-in-difference-in-differences procedure, and estimate equation (2) for married-couple families, stratified by mother's education, given by equation (2`).

(2`) $\lambda_m^2 = \lambda_{lm} - \lambda_{hm}$

Since married parents are at low risk of being on welfare, λ_m^2, the second difference-in-difference, captures the difference in the effect of factors other than welfare reform on the expenditure patterns of low-educated married-couple families and high-educated married-couple families. Assuming that the convergence (or divergence) in the spending patterns across groups with different education levels was the same irrespective of mother's marital status, in step 3 we examine whether the gap between expenditures of families headed by less-educated single mothers and families headed by more-educated single mothers closed more quickly than the gap between families headed by less-educated married mothers and more-educated married mothers. This provides the D-in-D-in-D estimate, given by equation (3):

(3) $\lambda^3 = \lambda_s^2 - \lambda_m^2$

The D-in-D-in-D estimate in equation (3) can also be obtained in one step using the following regression on a combined sample of single-mother and married-couple families:

(4) $$E_{it} = \lambda_0 + \lambda_p\, Policy_t + \lambda_s Sm_{it} + \lambda_e Le_{it} + \lambda_{es}(Sm_{it} * Le_{it}) + \lambda_{sp}(Policy_t * Sm_{it}) + \lambda_{ep}(Policy_t * Le_{it}) + \lambda_{esp}(Policy_{jt} * Le_{ijt} * Sm_{it}) + X_{it}\Gamma + \delta_m + u_{it}$$

In equation (4), E_{it}, the quarterly equivalized expenditure incurred by family i in period t, is a function of $Policy_t$ (equal to 1 if an observation is taken from the post welfare reform period, otherwise 0); family characteristics (X_{it}) namely mother's age, race and ethnicity, education, whether family lives in an urban area, family size, number of children under 18, and number of persons in the family aged 64 or above; and δ_m, which is a vector representing month of interview effects. The variable Sm_{it} is an indicator for whether the family is headed by a single mother and Le_{it} is a dummy variable indicating whether the mother is low-educated. The level first-difference, D-in-D and D-in-D-in-D coefficients are given by $\lambda_p + \lambda_{ep} + \lambda_{sp} + \lambda_{esp}$, $\lambda_{ep} + \lambda_{esp}$ and λ_{esp}, respectively. Following Gregg, Waldfogel, and Washbrook (in press), the percentage estimates are given by dividing the pre- versus post-policy changes in expenditures for a group by the mean expenditure in the pre-policy period:

$$\text{1st D} = \frac{\lambda_p + \lambda_{ep} + \lambda_{sp} + \lambda_{esp}}{\lambda_0 + \lambda_e + \lambda_s + \lambda_{es}}$$

$$\text{D-in-D} = \frac{\lambda_p + \lambda_{ep} + \lambda_{sp} + \lambda_{esp}}{\lambda_0 + \lambda_e + \lambda_s + \lambda_{es}} - \frac{\lambda_{sp} + \lambda_p}{\lambda_0 + \lambda_s}$$

$$\text{D-in-D-in-D} = \frac{\lambda_p + \lambda_{ep} + \lambda_{sp} + \lambda_{esp}}{\lambda_0 + \lambda_e + \lambda_s + \lambda_{es}} - \frac{\lambda_p + \lambda_{ep}}{\lambda_0 + \lambda_e} - \frac{\lambda_{sp} + \lambda_p}{\lambda_0 + \lambda_s} + \frac{\lambda_p}{\lambda_0}$$

In the empirical analysis, base level expenditures adjust for family characteristics. We compute Huber/White/sandwich standard errors that allow for arbitrary heteroscedasticity in the data. To adjust for potential non-independence among observations belonging to the same family, standard errors are computed by clustering at the family unit.

Ideally, we would have liked to have chosen comparison groups that were similar to low-educated single mothers, but unaffected by welfare reform. But it is difficult to get comparison groups that meet both the criteria. In our sample, a small proportion of low-educated married mothers (about 5 percent) received welfare in 1994. Similarly, a small proportion of high-educated single mothers also received welfare. In addition, several other social policy changes (e.g. changes in EITC) affected low-educated married-mother families as well as single-mother families. Therefore, the

coefficient estimated through equation (3) could be downward biased.[7] At the very least, however, the D-in-D-in-D approach we employ identifies whether any observed effects of welfare reform on expenditure patterns are group-specific, and whether the effects are primarily found for the group of interest—the low-educated single-mother target group. We realize the limitations of our research methodology, and therefore present the estimated first-difference, D-in-D, and D-in-D-in-D coefficients.

Results

Major Expenditure Categories: Descriptive Analysis

Figure 1 presents total quarterly equivalized real expenditures for low- and high-educated single-mother and married-couple families before and after welfare reform. Expenditure figures are adjusted for mothers' age, race and ethnicity, education, whether the family lives in an urban area, family size, number of children under 18, number of persons in the family aged 65 or above, and month effects. Total equivalized household expenditures for all four demographic groups increased between 1990-1995 and 1998-2003, reflecting the 1990s economic boom that benefited all education groups. The increase seems to be slightly higher for single-mother families, and among them, the high-educated appear to have gained more than the low-educated. However, it is difficult to comment on proportional changes in household expenditures relative to the base. We return to this point shortly when we present the results of the multivariate analyses.

In the pre-welfare reform period, low-educated single-mother families spent approximately 62 percent of their household budget on two items of consumption: food and housing. In contrast, high-educated single- mother families spent 54 percent of their total expenditures on food and housing, and were therefore left with a higher proportion of their larger budgets (relative to the low-educated single-mother target group) for other consumption. The proportion of household budget

[7] If welfare reform influenced marriage our selection of the target and comparison groups on the basis of marital status may yield biased results. However, previous results suggests that welfare reform did not have any effect on marital status (Kaushal and Kaestner 2001; Schoeni and Blank 2002). A related issue is that if welfare reform affected cohabitation, this may bias the results of the analysis. CES, the dataset we use, does not provide information on cohabitation. To some extent, we address this issue by including controls for number of family members and number of children in the family.

spent on these two basic items in married-couple families was even lower - between 46 and 48 percent. In the pre-reform period, low-educated single-mother families spent a much smaller share of their budgets on items of enrichment such as education and leisure than the other three groups. Did households reallocate their budgets in the face of changes in life circumstances brought about by welfare reform? Next, we apply multivariate regression models to examine this issue.

Major Expenditure Categories: Multivariate Analysis

Table 1a presents a summary of estimates of the association between welfare reform and major categories of expenditures based on models outlined in equations (1) and (4) for low-educated (education ≤ high-school) single-mother families. The columns labeled I and II show the adjusted mean real equivalized expenditures per quarter (adjusted for mothers' age, race or ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects) in the five years before welfare reform (1990-1995) (column I) and the five years after the policy change (1998-2003) (column II). The column labeled III shows the difference in levels between the mean expenditures in the pre- and post welfare reform period (II-I) and the column labeled VI contains the same expressed in percentage terms. The columns labeled IV and V show the results of the levels analysis based on equation (4), and in columns VII and VIII the same are presented in percentage terms (using the percentage method). Heteroskodasticity adjusted standard errors clustered at the consumer unit are in parentheses.

Estimates in the first row suggest that between 1990-1995 and 1998-2003, total real equivalized quarterly expenditures in low-educated single-mother families increased by a statistically significant $605 or 13.9 percent. On an annualized basis, this represents a gain of $2420. As observed in Figure 1, total equivalized expenditure among the comparison group of high-educated single-mother families increased by a higher level than the increase experienced by the low-educated single-mother target group. The D-in-D estimate for the target group of families, with high-educated single-mother families as the comparison, is a statistically insignificant $292 decline per quarter. Relative to the pre-reform base level expenditures incurred by the target and comparison groups

(using the percentage method), the D-in-D estimate indicates a marginal one percent increase in total expenditure for the target group, and this effect is also statistically insignificant.

The D-in-D estimate may be biased if time-varying factors such as business cycle effects influenced incomes and therefore expenditures in low- and high-educated families differently. To control for these factors, we estimate the D-in-D-in-D coefficient and find that welfare reform had no statistically significant effect on the total expenditures of the target group. The statistically insignificant results indicate that welfare reform lowered the total expenditures of the target group by $77, by the level method. Using the percentage method, the change in total equivalized expenditure, relative to pre-reform base spending, also was modest: a statistically insignificant 1.1 percent increase.

The pre- to post-welfare reform increase in expenditures among the target group of low-educated single-mother families was largely on account of increases in expenditures in three major categories: housing, transportation, and, to a lesser extent, leisure.[8] Between 1990-1995 and 1998-2003, the target group's quarterly expenditures on housing increased by $254 or 15 percent; on transportation by $252 or 42 percent; and on items of leisure by $39 or 24 percent. These changes may be on account of several factors including changes in tastes, relative prices, economy-wide trends, or policy. To purge the effects of factors, other than the policy change, that had the same effect on spending patterns of the target and comparison groups, we compute the D-in-D estimates. We find that the first difference gain in expenditure on housing is completely wiped out. In fact, the D-in-D estimate is a statistically significant decline of $183. With the percentage method, the D-in-D coefficient indicates a modest and statistically insignificant 1.8 percent decline. The increase in expenditures on transportation, however, continues to be large (in percentage terms) even at the D-in-D level, and suggests that the target group spent a statistically significant 20 percent more on transportation after welfare reform. The only other statistically significant D-in-D increase in expenditures is on clothing.[9] The D-in-D estimate suggests that expenditures on clothing in low-educated single-mother families increased by $57 or 11 percent. However, as the results in the first

[8] There was also a small but statistically significant increase in expenditures in the miscellaneous category.
[9] There is a statistically significant D-in-D decline in expenditures in the miscellaneous category.

difference analysis make clear, the D-in-D estimates of the effect on clothing are entirely due to the decline in expenditures on clothing in high-educated single-mother families.

The D-in-D estimates do not control for factors that may have a different effect on low- and high-educated families. The D-in-D-in-D estimates that adjust for these factors suggest that welfare reform increased the target group's expenditures on transportation by $65 or 19 percent, with the effect in percentage terms being statistically significant. The increase in expenditures on transportation is consistent with the idea that increased employment among low-educated single mothers that is associated with welfare reform is likely to have increased expenditures on work-related expenses, of which transportation is a big component.

The estimated effects of welfare reform on all other categories of expenditures are statistically insignificant. Some of the statistically insignificant D-in-D-in-D results are large, but imprecisely estimated due to large standard errors. For example, welfare reform was associated with a statistically insignificant 3.6 percent decline in expenditures on housing, an 8.4 percent decline in expenditures on alcohol and tobacco, a 10 percent decline in expenditures on health, and a 16.4 percent decline in expenditures on education for the target group. Welfare reform was also associated with statistically insignificant increases in spending on the following items: a 1.6 percent increase in expenditures on food, a nine percent increase in spending on clothing, a 12.1 percent increase in spending on leisure-related items, and a 2.4 percent increase in spending on personal expenses.

Among the members of the target group, those with fewer resources were more likely to be on welfare, and therefore more likely to be affected by the policy change. To see how the less privileged among the target group were affected by the policy change, we repeat the analysis by restricting the low-educated group to those with less than a high school degree. As before, the high-educated group consists of those with more than a high school education. (Thus those with exactly 12 years of schooling are not included in this particular analysis). The results are presented in Table 1b.

Estimates in Table 1b are quite similar to those in Table 1a. Real equivalized expenditures in households headed by single mothers without a high school degree increased by $529 or a statistically significant 15.5 percent between 1990-1995 and 1998-2003, but most of the increase was accounted for by increases in expenditures on transportation, housing, and, to a lesser extent, leisure. Relative to

baseline spending, the largest increase was on transportation (an 80 percent increase), followed by leisure (33 percent) and housing (12 percent). Changes in other expenditure categories were relatively small and statistically insignificant.

As in the earlier analysis (for families headed by single mothers with a high-school or lower education in Table 1a), the D-in-D and D-in-D-in-D estimates of the association between welfare reform and total spending are modest and statistically insignificant. Among major expenditure items, the D-in-D estimates are positive and statistically significant for two items: expenditures on clothing (significant increases in both levels and percentage) and transportation (a significant increase in percentage terms only). Similarly, as in the earlier analysis, the D-in-D-in-D estimates indicate that welfare reform did not lead to significantly increased spending on any item other than transportation. The increase in expenditures on transportation for the very low educated (with less than a high school degree) is much higher both in absolute (level) and relative (percentage) terms than the estimated increase for the low educated (with a high school or lower education; see Table 1a). Results for the very low educated (in Table 1b) show that welfare reform was associated with a $180 increase in expenditure on transportation by the level method, and a statistically significant 59 percent increase by the percentage method. The increase in expenditures on transportation for the very low-educated single mothers was coupled with a cut in spending on housing of $203 (in money value) or eight percent, with the percentage effect being statistically insignificant.

To sum up, the results presented in Tables 1a-b suggest that welfare reform did not have any statistically significant effect on total expenditures in households headed by low-educated single mothers. The composition of household expenditures, however, changed, with households headed by low-educated single mothers spending a larger proportion of their budget on transportation and a somewhat smaller proportion on housing.

Detailed Expenditure Categories: Descriptive Analysis

Next, we explore how welfare reform affected expenditures on specific items related to work, learning, and enrichment. We begin this analysis by first studying the pattern of spending on these

items by the target and comparison groups in the pre-welfare reform period, and then investigate whether there were changes in expenditures that were associated with welfare reform.

Figure 2 presents the proportion of expenditures on food away from home (for comparison we also look at food at home), adult clothing and footwear (and children's clothing and footwear, for comparison), childcare and baby-sitting, and learning and enrichment activities incurred by the four groups of families defined by family type and mother's education during 1990-1995. In the pre-reform period, low-educated single-mother families spent 19 percent of their budget (equivalized total expenditure) on food at home and three percent on food away from home. The other three groups spent a smaller proportion of their budget on food, which is expected since the overall size of their budget is bigger. However, they allocated a higher proportion of the budget (between three to four percent) on food away from home.

In this pre-reform period, low-educated single-mother families spent two percent of their budget (equivalized total expenditure) on children's clothing and footwear and about the same proportion on adult clothing and footwear. The comparison group of families headed by single mothers with more than a high-school degree spent 1.5 percent of their budget on children's clothing and footwear, and 2.7 percent of their budget on adult clothing and footwear. Married-couple families, in contrast, spent a relatively lower proportion of their budget on clothing and footwear: a little over one percent on children's clothing and footwear and between 1.5 to 1.7 percent on adult clothing and footwear. Single-mother families also spent a larger proportion of their budgets on childcare and baby-sitting than did married-couple families with similar education levels. Finally, households with less educated mothers spent a smaller proportion of their budgets on items or activities relating to learning and enrichment (e.g. books/magazines, tuition, books and school supplies, games, toys, sports and other enrichment activities); and among these households those headed by single mothers spent an even smaller proportion on these items. Given their smaller budgets, the gap in spending on learning and enrichment activities between low- and high-educated families is even larger in money terms.

How did welfare reform affect expenditures on these work- and development-related items? Did it lower the gap in spending on learning and enrichment activities between rich and poor

households? To answer these questions, we turn to regression analysis, as outlined in equations (1) and (4).

Detailed Expenditure Categories: Multivariate Analysis

Table 2a presents a summary of the estimated associations between welfare reform and expenditures on detailed items, based on models outlined in equations (1) and (4), for low-educated (education ≤ high-school) single-mother families. It has the same layout as Table 1a, and the regression models have the same controls as the analysis on major expenditure categories.

The top two rows in Table 2a present quarterly expenditures on food at home and food away from home. Between 1990-1995 and 1998-2003, low-educated single-mother families lowered their equivalized quarterly expenditures on food at home by a statistically significant $23 or three percent and raised expenditures on food away from home (in restaurants, cafeterias, fast food places) by a statistically significant $28 or 21 percent. During the same period, high-educated single-mother families increased expenditures on food, both at home and away from home. The D-in-D estimates, therefore, suggest that in the post reform period low-educated single-mother families lowered expenditures on food at home and away from home by a statistically significant $82 and $109 respectively. In percentage terms, relative to the base level spending on food for the target and comparison groups, the D-in-D estimates reflect a statistically insignificant two percent decrease in expenditures on food at home and a statistically significant 17 percent increase in expenditures on food away from home. The D-in-D may be biased if factors contemporaneous with welfare reform affected food expenditures, at home and away from home, for the low- and high-educated single-mother families differently. The D-in-D-in-D estimates that are assumed to control for these unobserved factors suggest that welfare reform was associated with a statistically insignificant $8 or 1.1 percent decline in expenditure on food at home and an $11 or 16 percent increase in spending on food away from home. The estimated coefficient on food away from home using the percentage method is statistically significant.

Equivalized expenditures on children's clothing and footwear for the target group of low-educated single-mother families remained almost unchanged between 1990-1995 and 1998-2003,

while equivalized expenditures on adult's clothing and footwear declined by a non-significant $ 7 or seven percent. The D-in-D estimate, however, indicates a significant $36 or 15 percent increase in expenditures on adult clothing and footwear for the target group and no change in spending on children's clothing and footwear. The D-in-D-in-D estimate suggests that welfare reform lowered expenditures on children's clothing and footwear by a statistically insignificant 1.8 percent and raised expenditures on adult clothing by a statistically significant 13.8 percent.

Next, we examine whether welfare reform was associated with changes in expenditures on learning and enrichment activities defined as the sum of expenditures on: books/magazines; tuition/school books/supplies; computers, typewriters and calculators; toys, games and sports and other enrichment activities. We find that families headed by low-educated single mothers increased their equivalized expenditures on this set of learning and enrichment items by a statistically significant $20 or 15 percent after welfare reform. Families headed by high-educated single mothers increased their spending on learning and enrichment items by an even higher amount, resulting in a D-in-D estimate of a statistically significant decrease of $280 (using the level method) or 8.4 percent (using the percentage method). The D-in-D-in-D estimate that adjusts for factors correlated with welfare reform that may be affecting high- and low-educated families differently indicates that the policy change increased overall equivalized spending on learning and enrichment by a statistically insignificant $4. But using the percentage method, we find that relative to base level spending, expenditure on learning and enrichment activities fell by a statistically insignificant 8.3 percent.

Finally, as the last row in Table 2a shows, in the post-reform period low-educated single-mothers increased spending on childcare and baby-sitting by a statistically insignificant $11 or 18 percent. The comparison group of high-educated single-mother families also increased spending on childcare and baby-sitting in this period, resulting in D-in-D estimates of a decline of $97 (in money terms), but an increase of 10.6 percent (by percentage method). The D-in-D-in-D estimates suggest that welfare reform was associated with a modest and statistically insignificant $3 or 4.3 percent increase in spending on childcare and baby-sitting by low-educated single-mother families.

Table 2b provides a similar summary of the associations between welfare reform and detailed expenditures with the group of very low-educated families restricted to mothers with less than a high

school degree (the high-educated comparison group again consists of mothers with more than a high school education). The results are somewhat similar to those in Table 2a. While welfare reform had no statistically significant association with expenditures on food at home, expenditures on food away from home increased by 33 percent in the very low-educated single-mother families. Similarly while expenditures on children's clothing in the target group of very low-educated single-mother families fell by a statistically insignificant 9.7 percent, expenditures on adults' clothing for this group increased in the D-in-D-in-D estimates by an insignificant $21 in money terms or a statistically significant 26 percent. The percent gains in expenditures on food away from home and adult clothing appear to be larger than the gains when the target group included mothers with a high-school degree (Table 2a). This may be because the least educated experienced a relatively higher increase in employment due to welfare reform, resulting in a greater increase in work related expenses for this group (Kaushal and Kaestner 2001).

The target group consisting of families headed by single mothers without a high-school degree did not experience any statistically significant change in spending on learning and enrichment activities. The D-in-D-in-D estimates, however, suggest that welfare reform increased spending on learning and enrichment activities by a statistically insignificant $14 or 1.8 percent. The D-in-D-in-D estimates also suggest a statistically insignificant 47 percent decline in spending on childcare and babysitting. The decline in childcare and babysitting expenditures is somewhat surprising, as we might expect those costs to have increased along with increased employment. Notice that most of the change in the D-in-D-in-D estimates is driven by increases in childcare expenditures in high-educated families. It may be that increases in childcare subsidies were effectively targeted to the lowest-income groups and may have slowed their growth in childcare costs as compared to other families. It may also indicate that many single mothers who joined work increased reliance on family members for free child care.

To sum up, the above analysis suggests that welfare reform was associated with an increase in spending on items that may be related to work expenses such as spending on food away from home and adults' clothing and footwear in families headed by low-educated single mothers. The increase, both in absolute and percentage terms, was higher for the very low-educated group than the low-

educated group. There was no corresponding increase in spending on children's clothing or footwear. If anything, the negative although statistically insignificant estimates for children's clothing and footwear provide some suggestion that expenditures on children's clothing and footwear may have declined after welfare reform, particularly for the very low-educated single-mother group. There was no statistically significant rise in overall expenditures on learning and enrichment related activities, however, the statistically insignificant results suggest some increase in spending on these items by the target group of single-mother families with less than high-school education. Finally, the results for childcare and babysitting suggest that for the very low-educated single-mother group, spending on childcare fell (non-significantly) in money terms and percentage terms, relative to the changes in spending for the comparison groups. This latter result suggests that the expansions in childcare subsidies in the 1990s may have been well-targeted to the most needy families or that low-educated single mother families increased reliance on kin for childcare.

Ownership of Consumer Durables

Figure 3 presents ownership of seven consumer durables in the pre-reform period and depicts differences across demographic groups. Low-educated single-mother families are the most deprived group in terms of ownership of these items followed by low-educated married-couple families, who closely precede high-educated, single-mother families, with high-educated married-couple families being the most privileged group. Thirty seven percent of low-educated single mother families did not own a microwave oven during 1990-1995; 42 percent did not own a washer/dryer; and 75 percent did not have a dishwasher. Further, 41 percent of our target group did not possess a VCR, 45 percent did not own a car, and 92 percent did not have a computer. About 12 percent did not pay for any phone service in the previous quarter, an outcome we use to proxy for families lacking phone ownership.

To study how welfare reform affected ownership of consumer durables, next we discuss the results of the multivariate analysis presented in Tables 3a and 3b. The analysis in Table 3a shows that in the post welfare reform period, low-educated single-mother families increased ownership of microwave ovens and dishwashers, items that may reduce time on housework and thus facilitate work outside the home, but there was no change in their ownership of washers/dryers. The D-in-D

estimates suggest that the comparison group consisting of high-educated single-mother families also increased ownership of these items, with the increase in ownership of washer/dryers and dishwashers being relatively higher for this group as compared to the target group. The D-in-D estimates could be driven by welfare reform or by differences in economic prosperity or tastes experienced by low- versus high-educated single-mother families. The D-in-D-in-D, employed to control for unobserved effects correlated with policy, suggests that welfare reform induced low-educated single-mother families to increase their ownership of microwave ovens by a statistically significant 3.7 percentage points, while reducing their ownership of washer/dryers by a statistically insignificant 3.8 percentage points and their ownership of dishwashers by a statistically insignificant 3.1 percentage points.

In the post-reform period, ownership of computers and VCRs, items that may be used for learning and enrichment, increased in low-educated single-mother families by 20 to 21 percentage points. The ownership of these items also increased for the comparison group of high-educated single-mother families. The D-in-D-in-D estimates suggest that welfare reform was associated with a statistically significant 15 percentage points decline in computer ownership in the low-educated single-mother families, along with a statistically significant five percentage point increase in their VCR ownership.

Turning to the results for phone and car ownership, the first difference estimates show that in the post-welfare reform period, phone ownership (i.e. the proportion of families that spent any amount on phone services) and car ownership among low-educated single-mother families increased by approximately nine percentage points. Phone ownership among high-educated single mother families also increased resulting in a D-in-D estimate of a statistically insignificant 0.9 percentage point increase. These families also increased their car ownership but by a relatively lower level, resulting in a D-in-D estimate of a 5.9 percentage point increase. Finally, the D-in-D-in-D estimates suggest welfare reform was associated with low-educated single-mother families increasing their ownership of a car by a statistically significant 6.7 percentage points and their ownership of a phone by a statistically significant 4.1 percentage points.

Table 3b has the results of the analysis on ownership of durables in the very low-educated (<high school) single-mother families. These results are quite similar to those in Table 3a with three

differences. The estimated association between welfare reform and microwave ownership, although positive, is relatively modest and statistically insignificant. The estimated D-in-D-in-D coefficients for phone and car ownership are larger, but the estimated negative coefficient for computer ownership is considerably smaller (in absolute terms).

To sum up, our analysis suggests that in the post-reform period low-educated single-mother families increased their ownership of several consumer durables. There also appears to be a secular increase in ownership of these consumer durables among other groups that were unaffected by welfare reform. After purging out these secular trends in ownership of durables, estimates suggest that welfare reform was associated with increased ownership of microwave ovens, phones, and cars among low-educated single-mother families, alongside a decline in ownership of computers.

Conclusion

In this paper, we investigate the effect of welfare reform, broadly defined to include social policy changes in the 1990s, on the material well-being and expenditure patterns of low-educated single-mother families. We use the Consumer Expenditure Surveys for 1990-1995 and 1998-2003, and apply a difference-in-difference-in-difference research design to control for factors correlated with welfare reform that may have affected the material well-being of single-mother families.

We find that welfare reform did not have any statistically significant effect on total expenditures in households headed by low-educated single mothers. The composition of household expenditures, however, changed somewhat, with households headed by low-educated single mothers spending a larger proportion of their budget on work-related expenses, and a somewhat smaller proportion on housing. We find strong evidence that welfare reform was associated with an increase in spending on transportation and food away from home and some evidence of an increase in spending on adult clothing and footwear among the target group of families headed by low-educated single mothers, with the increase (both in absolute terms and relative to the base level expenditures) being higher among households headed by the least-educated (education < high-school) single mothers. This finding conforms with previous research that suggests that the increase in labor force participation among single mothers with less than a high-school degree was higher than the increase

experienced by single mothers with a high-school degree, suggesting that the least educated group perhaps adapted the most in the new welfare and work regime (Kaushal and Kaestner 2001).

We find that welfare reform was not associated with any statistically significant increase in spending on children's clothing or footwear. If anything, the negative although statistically insignificant estimates for children's clothing and footwear provide some evidence that expenditures on children's clothing and footwear may have declined after welfare reform, particularly for the very low-educated single-mother group. Our analysis suggests that there was no statistically significant rise in expenditures on learning and enrichment related activities, although the statistically insignificant results suggest some increase in spending on these items by very low-educated single-mother families with less than high-school education. These estimates suggest that social policy changes in the 1990s did not trigger any overall reduction in inequality of expenditures on learning and enrichment in low- versus high-income families. Finally, we find that for the very low-educated single mother group, spending on childcare fell (non-significantly) in money terms and percentage terms, relative to the changes in spending for the comparison groups. This result is somewhat surprising and suggests that the expansions in childcare subsidies in the 1990s may have been well-targeted to the most needy families or that low-educated single mother families increased reliance on kin for childcare.

We also study whether welfare reform was associated with increases in ownership of consumer durables that can support employment or enhance learning and development. Our estimates suggest that the policy change was associated with increased ownership of microwave ovens, phones, and cars in low-educated single-mother families, but also a decline in ownership of computers. These last results are quite similar to results from a recent study of the effects of welfare reforms on the expenditures of low-income families with children in the UK (Gregg, Waldfogel and Washbrook, in press). That study too found that families affected by welfare reform increased their ownership of cars and telephones, but lost ground in spending on computers.

However, in contrast to our study, the UK study found significant shifts in spending toward children's items, such as children's clothing and footwear. We can only speculate as to why these results differ across countries. It may be that the UK reforms led to more spending on children

because they included benefit increases specifically tied to children. For example, the UK reforms included increases in the value of universal child benefits, as well as child-related allowances provided through welfare programs. The labeling of these benefits as child benefits may have increased parents' propensity to spend the additional money on children's items such as clothing and footwear. A second point of difference is that the UK reforms did not mandate employment for single mothers, although as in the US the reforms were intended to increase incentives to work. As a result, parents affected by the reforms in the UK may not have been as likely as parents in the US to increase their spending on items related to employment such as food away from home and adult clothing and footwear.

Another point of difference is that the UK study found that the reforms there led to reduced spending on alcohol and tobacco, while this study for the US does not. Here again we can only speculate as to the reason for this difference. There is some evidence in the UK study that the reforms increased families' spending on leisure (as well as their social connections through phone and car ownership) and it is perhaps this mechanism that led to the reduced spending on alcohol and tobacco. However, it is not clear why this mechanism would not operate similarly in the US. Taken together, the cross-country differences in results are intriguing and suggest that further analysis of these effects within countries, and across countries, would be a good topic for further research.

References

Bitler, Marianne P., Jonah B. Gelbach, and Hilary W. Hoynes. 2005. "Welfare Reform and Health." *Journal of Human Resources* 40(2): 309-334.

Blank, Rebecca. 2002. "Evaluating welfare reform in the United States." *Journal of Economic Literature* 40(4):1-43.

Blank, Rebecca. 2000. "Fighting Poverty: Lessons from Recent US History." Distinguished lecture on economics in government, delivered to a joint session of the Society of Government Economists and the American Economic Association at the annual meetings of the ASSA, Boston, MA.

Battistin, Erich. 2003. "Errors in Survey Reports of Consumer Expenditures", The Institute for Fiscal Studies, WP03/07.

Bureau of Labor Statistics. 2005. "2003 Consumer Expenditure Interview Survey Public Use Microdata Documentation." http://www.bls.gov/cex/csxintvw.pdf

Cancian, Maria, Robert Haveman, T. Kaplan, Dan Meyer, and Barbara Wolfe. 1999. "Work, Earnings, and Well-Being after Welfare: What Do We Know?" In Sheldon H. Danziger (Ed.), *Economic Conditions and WelfareRreform* (pp. 161-186). Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Duncan, Greg and Lindsay Chase-Lansdale. (eds) 2004. *For Better and For Worse: Welfare Reform and the Well-Being of children and Families.* New York: Russell Sage Foundation.

Gregg, Paul, Jane Waldfogel, and Elizabeth Washbrook (in press). "Tackling Child Poverty in the UK: Are Low-Income Families with Children Starting to Catch Up?" Forthcoming in *Labour Economics.*

Grogger, Jeff, Lynn Karoly, and Jacob Klerman. 2002. "Consequences of Welfare Reform: A Research Synthesis." DRU-2676-Depatment of Health and Human Services.

Haskins, Ron. 2001. "Effects of Welfare Reform on Family Income and Poverty." In Rebecca Blank and Ron Haskins (eds). *The New World of Welfare.* Washington, DC: Brookings Institution Press.

Kaushal, Neeraj and Robert Kaestner. 2005. "Welfare Reform and Health Insurance of Immigrants." *Health Services Research* Volume 40, Number 3, June 2005, pp. 697-722(26)

Kaushal, Neeraj and Robert Kaestner. 2001. "From Welfare to Work: Has Welfare Reform Worked?" *Journal of Policy Analysis and Management* 20(4), 699-719.

Meyer, Bruce and James X. Sullivan. 2003. "Measuring the Well-being of Poor using Income and Consumption." *Journal of Human Resources* 38(S):1180-1220..

Meyer, Bruce and James X. Sullivan. 2004. "The Effects of Welfare and Tax Reform: The Material Well-Being of Single Mothers in the 1980s and 1990s" *Journal of Public Economics* 88: 1387-1420.

Meyer, Bruce and James X. Sullivan. 2006. "Consumption, Income and Material Well-being after Welfare Reform." NBER Working paper 11976. National Bureau of Economic Research, Cambridge: MA.

Meyer, Bruce and James X. Sullivan. 2005. "The Well-Being of Single-Mother Families After Welfare Reform" Welfare Reform and Beyond Brief #33, The Brookings Institution. August.

O'Neill, June. 2006. "Testimony Before the House Committee on Ways and Means", July 19, http://waysandmeans.house.gov/hearings.asp?formmode=view&id=5149

Primus, Wendell, L. Rawlings, K. Larin, and K. Porter. "The Initial Impact of Welfare Reform on the Economic Well-being of Single Mother Families." Washington, DC: Center on Budget and Policy Priorities, August 1999.

Rector, Robert. 2004. "Understanding Poverty and Economic Inequality in the United States." Backgrounder No. 1756. Washington, DC: The Heritage Foundation.

Schoeni, R. F. and Blank, R.M. 2000. "What has welfare reform accomplished? Impacts on welfare participation, employment, income, poverty and family structure." *National Bureau of Economic Research, Working Paper No. 7627*. Cambridge, MA: National Bureau of Economic Research.

Sherman, Arloc, and Sharon Parrott. 2006. "TANF AT 10: Program Results are More Mixed Than Often Understood." Center on Budget and Policy Priorities, Washington DC. August, http://www.cbpp.org/8-17-06tanf.htm

Waldfogel, Jane (2006). *What Children Need*. Cambridge: Harvard University Press.

Winship, Scott and Christopher Jencks. 2002. "Changes in Food Security and Welfare Reform: Can We Identify a Policy Effect?" Unpublished document, Harvard University.

Figure 1 Total Quarterly Equivalized Expenditure in Families with Children
(Adjusted for demographic characteristics, at January 2003 prices)

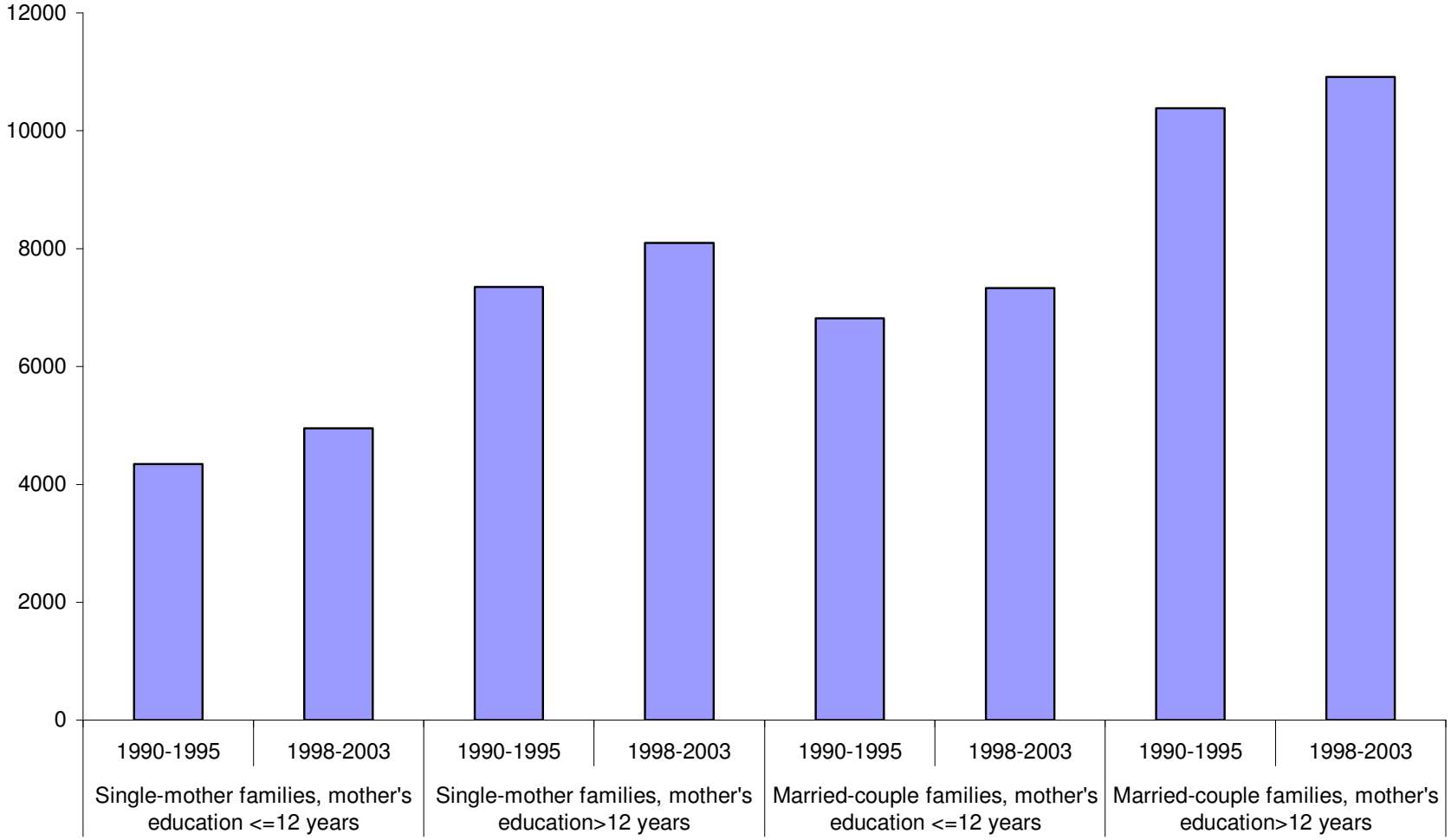

Figure 2 Share of Quarterly Equivalized Expenditures in Families with Children during 1990-1995
(Adjusted for demographic characteristics, at January 2003 prices)

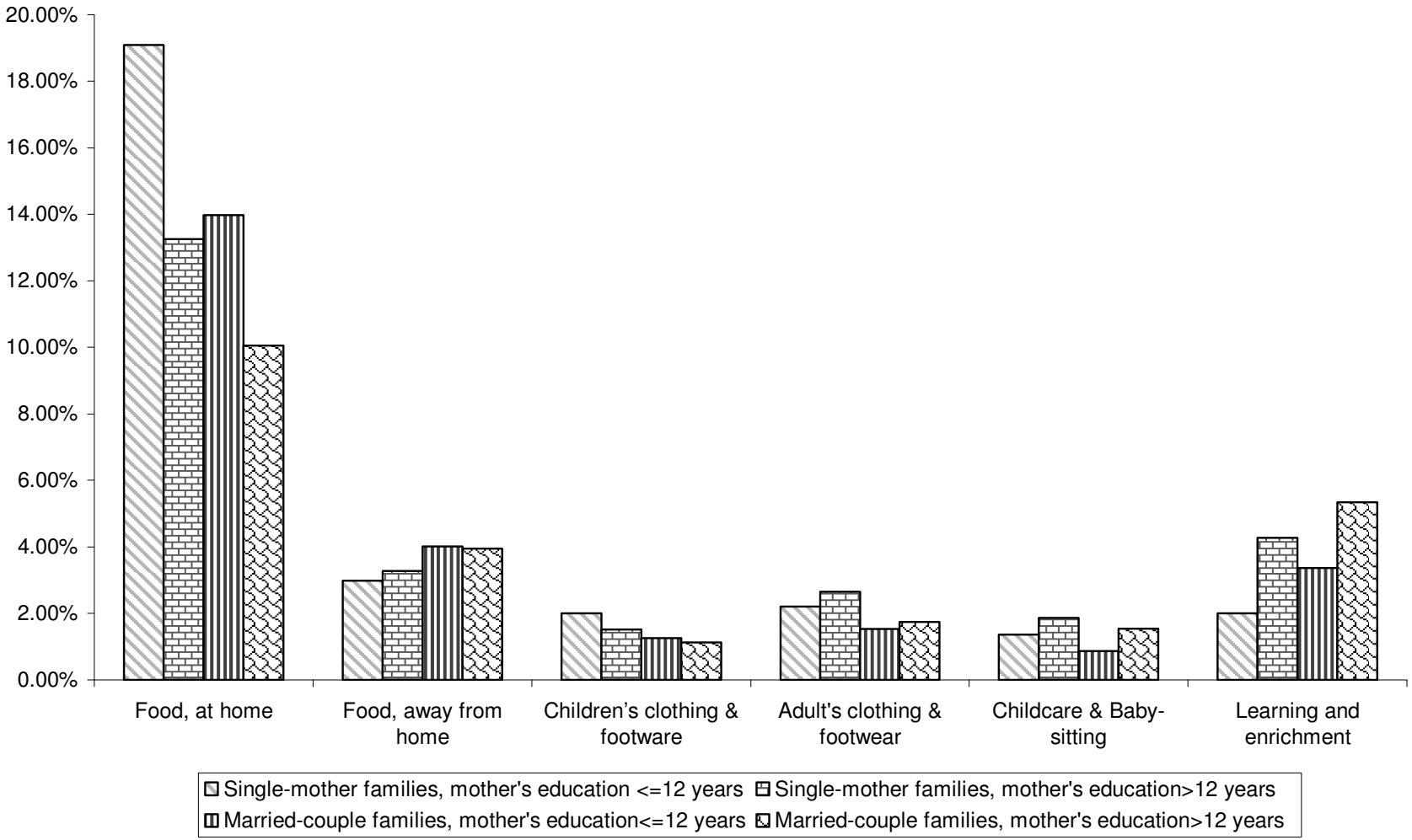

Figure 3 Ownership of Consumer Durables in Families with Children during 1990-1995

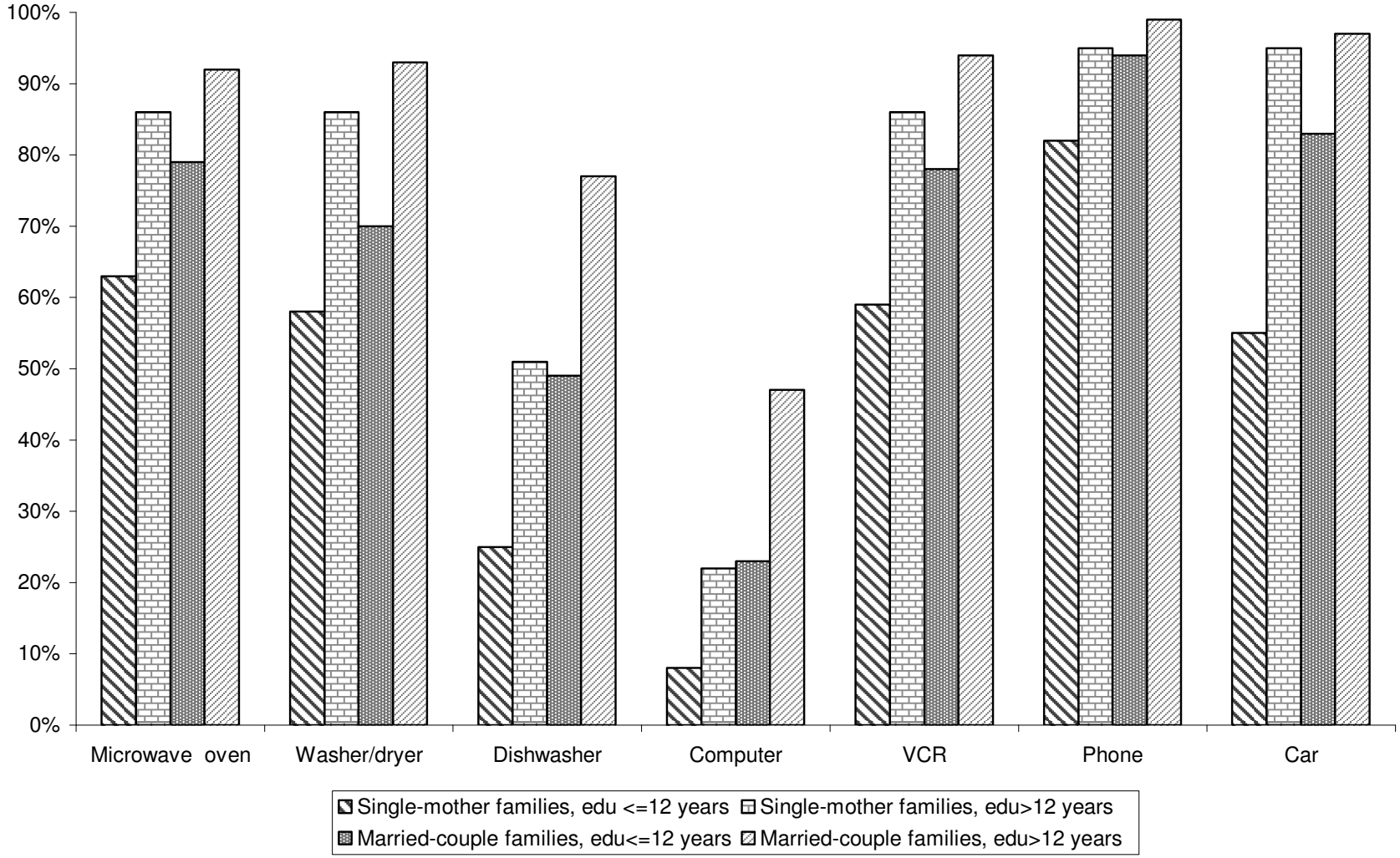

Table 1a Estimates of Major Quarterly Expenditures in Households headed by Low-Educated (education ≤ 12 years), Single Mothers

	Mean Adjusted Expenditure (in $s)		Level Difference in Means (in $s)			Percentage Difference in Means (in %)		
	1990-1995	1998-2003	1st D	DD	DDD	1st D	DD	DDD
	I	II	III	IV	V	VI	VII	VIII
Total	4347	4951	605***	-292	-77	13.9***	1.0	1.1
			(100)	(209)	(248)	(2.3)	(3.4)	(3.7)
Housing	1721	1976	254***	-183*	-124	14.8***	-1.8	-3.6
			(38)	(85)	(101)	(2.2)	(3.5)	(4.0)
Food	986	998	12	17	12	1.2	1.5	1.6
			(17)	(13)	(33)	(1.7)	(2.6)	(2.8)
Alcohol & Tobacco	86	86	0.5	-8	-7	0.5	-8.7	-8.4
			(4)	(7)	(8)	(5.2)	(8.2)	(8.8)
Clothing	267	259	-8	57**	11	-2.8	11.4**	8.9
			(9)	(21)	(23)	(3.4)	(5.4)	(5.9)
Transport	607	860	252***	7	65	41.7***	20.4**	19.1*
			(54)	(91)	(105)	(8.9)	(10.8)	(11.2)
Health	142	146	4	-30	-33	2.6	-7.9	-10.3
			(13)	(22)	(25)	(9.2)	(10.5)	(10.9)
Leisure	167	207	39***	-26	26	23.5***	4.2	12.1
			(9)	(20)	(17)	(5.2)	(7.2)	(8.3)
Personal	45	45	0	2	-1	0.1	2.7	2.4
			(2)	(4)	(4)	(4.7)	(6.3)	(6.7)
Education (incl. reading)	40	36	-4	-28	9	-10.3	-22.5	-16.4
			(4)	(18)	(22)	(11.0)	(15.5)	(16.9)
Misc.	285	339	54***	-119***	-30	18.9**	-8.5	-5.0
			(17)	(44)	(56)	(6.1)	(8.6)	(9.0)

Note: Figures in columns labeled I and II are mean equivalized expenditures, adjusted for mothers' age, race and ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects. Expenditures are expressed in January 2003 dollars using the Personal Consumption Expenditure index of the Bureau of Economic Analysis. Heteroskodasticity adjusted standard errors clustered at consumer unit are in parenthesis. The comparison group in the DD analysis consists of households headed by high-educated (education > 12 years) single mothers. The DDD estimates are derived by subtracting the DD estimates for low-educated married-couple families (with high educated married-couple families as comparison) from the DD estimates for low-educated single-mother families presented in columns labeled IV and VII. The sample of analysis consists of 8610 observations of low-educated single mothers, 7187 observations of high-educated single mothers, 32547 observations of low-educated married mothers and 43463 observations of high-educated married mothers. * 0.05<p=<0.1, ** 0.01<p=<0.05, ***p=<0.01.

Table 1b Estimates of Major Quarterly Expenditures in Households headed by Very Low-Educated (education < 12 years), Single Mothers

	Mean Adjusted Expenditure (in $s)		Level Difference in Means (in $s)			Percentage Difference in Means (in %)		
	1990-1995	1998-2003	1st D	DD	DDD	1st D	DD	DDD
	I	II	III	IV	V	VI	VII	VIII
Total	3426	3955	529***	-421*	-52	15.5***	0.05	1.8
			(124)	(231)	(284)	(3.6)	(4.8)	(5.4)
Housing	1460	1633	173***	-296***	-203*	11.9***	-7.3	-7.8
			(52)	(95)	(115)	(3.6)	(4.8)	(5.5)
Food	947	928	-19	-25	-16	-2.0	-3.1	-1.4
			(26)	(36)	(42)	(2.7)	(3.4)	(3.8)
Alcohol & tobacco	76	83	7	1	-2	9.0	-6.6	-2.8
			(7)	(7)	(11)	(9.5)	(11.3)	(12.5)
Clothing	215	234	19	84***	2	8.6	22.8***	10.3
			(14)	(23)	(26)	(6.3)	(7.6)	(8.4)
Transport	322	581	259***	18	180	80.4***	57.0***	59.2***
			(59)	(93)	(119)	(18.4)	(19.2)	(20.3)
Health	84	83	-0.5	-33	-22	-0.5	-11.7	-8.8
			(12.3)	(22)	(26)	(14.7)	(16.3)	(17.2)
Leisure	118	157	39***	-30	30	32.9***	8.1	19.1
			(10)	(21)	(28)	(8.4)	(11.3)	(12.7)
Personal	35	37	2	4	-2	6.6	8.4	5.4
			(3)	(5)	(5)	(9.2)	(9.9)	(10.5)
Education (incl. reading)	23	19	-4	-24	21	-17.5	-29	-12
			(4)	(19)	(24)	(17.6)	(34)	(36)
Misc.	146	200	54***	-114***	-31	37.0***	-7.4	-3.5
			(17)	(47)	(61)	(11.6)	(18.2)	(18.8)

Note: Figures in columns labeled I and II are mean equivalized expenditures, adjusted for mothers' age, race and ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects. The figures are expressed in January 2003 dollars using the Personal Consumption Expenditure index of the Bureau of Economic Analysis. Heteroskodasticity adjusted standard errors clustered at consumer unit are in parenthesis. The comparison group in the DD analysis consists of households headed by high-educated (education > 12 years) single mothers. The DDD estimates are derived by subtracting the DD estimates for very low-educated married-couple families (with high-educated married-couple families as comparison) from the DD estimates for very low-educated single-mother families presented in columns labeled IV and VII. The sample of analysis consists of 3067 observations of unmarried very low-educated mothers, 7187 observations of unmarried, high-educated mothers, 8092 observations of married, very low-educated mothers and 43463 observations of married, high-educated mothers. * 0.05<p=<0.1, ** 0.01<p=<0.05, ***p=<0.01.

Table 2a Estimates of Detailed Quarterly Expenditures for Children and Adults in Households Headed by Low-Educated (education ≤ 12 years) Single Mothers

	Mean Adjusted Expenditure (in $s)		Level Difference in Means (in $s)			Percentage Difference in Means (in %)		
	1990-1995	1998-2003	1st D	DD	DDD	1st D	DD	DDD
	I	II	III	IV	V	VI	VII	VIII
Food at home	830	807	-23*	-82***	-8	-2.8*	-1.6	-1.1
			(14)	(28)	(25)	(1.7)	(2.6)	(2.7)
Food away from home	130	158	28***	-109***	11	21.3***	17**	16**
			(6)	(21)	(17)	(4.7)	(7)	(7)
Children's clothing /footwear	87	86	-1	0.1	-4	-1.2	-0.8	-1.8
			(4)	(6)	(7)	(4.0)	(6.0)	(6.6)
Adult's clothing /footwear	96	89	-7	36***	17	-7.1	14.7**	13.8*
			(4)	(11)	(11)	(5.4)	(7.3)	(7.8)
Learning and enrichment	136	156	20***	-280***	4	14.9***	-8.4	-8.3
			(7)	(39)	(32)	(4.9)	(9.5)	(11.0)
Childcare & baby-sitting	59	70	11	-97***	3	18.2	10.6	4.3
			(7)	(19)	(16)	(12.0)	(15.1)	16.9)

Note: Figures in columns labeled I and II are mean equivalized expenditures, adjusted for mothers' age, race and ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects. The figures are expressed in January 2003 dollars using the Personal Consumption Expenditure index of the Bureau of Economic Analysis. Heteroskodasticity adjusted standard errors clustered at consumer unit are in parenthesis. The comparison group in the DD analysis consists of households headed by high-educated (education > 12 years) mothers. The DDD estimates are derived by subtracting the DD estimates for low-educated married-couple families (with high-educated married-couple families as comparison) from the DD estimates for low-educated single-mother families presented in columns labeled IV and VII. See notes to Table 1a for sample size. * 0.05<p=<0.1, ** 0.01<p=<0.05, ***p=<0.01.

Table 2b Estimates of Detailed Quarterly Expenditures for Children and Adults in Households Headed by Very Low-Educated (education < 12 years) Single Mothers

	Mean Adjusted Expenditure (in $s)		Level Difference in Means (in $s)			Percentage Difference in Means (in %)		
	1990-1995	1998-2003	1st D	DD	DDD	1st D	DD	DDD
	I	II	III	IV	V	VI	VII	VIII
Food at home	846	777	-69***	-114***	-46	-8.2***	-7.8**	-5.6
			(23)	(39)	(33)	(2.7)	(3.3)	(3.6)
Food away from home	87	121	34***	-142***	21	39.3***	29.8**	33.2**
			(10)	(27)	(20)	(11.7)	(12.4)	(13.7)
Children's clothing /footwear	76	74	-1	1	-10	-1.7	-0.4	-9.7
			(5)	(7)	(8)	(6.9)	(8.3)	(9.6)
Adult's clothing /footwear	66	71	5	51***	21	7.3	32.5***	26.3**
			(8)	(12)	(13)	(11.5)	(12.0)	(13.0)
Learning and enrichment	64	73	9	-328***	14	14.5	-10.2	1.8
			(7)	(44)	(35)	(11.0)	(21.4)	(24.8)
Childcare & baby-sitting	31	34	3	-124***	-15	8.2	-9.6	-47.1
			(7)	(21)	(18)	(23.0)	(28.8)	(34.4)

Note: Figures in columns labeled I and II are mean equivalized expenditures, adjusted for mothers' age, race and ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects. The figures are expressed in January 2003 dollars using the Personal Consumption Expenditure index of the Bureau of Economic Analysis. Heteroskodasticity adjusted standard errors clustered at consumer unit are in parenthesis. The comparison group in the DD analysis consists of households headed by high-educated (education > 12 years) mothers. The DDD estimates are derived by subtracting the DD estimates for very low-educated married-couple families (with high-educated married-couple families as comparison) from the DD estimates for low-educated single-mother families presented in columns labeled IV and VII. See notes to Table 1 b for sample size. * 0.05<p=<0.1, ** 0.01<p=<0.05, ***p=<0.01.

Table 3a Summary Estimates of Ownership of Durables in Households Headed by Low-Educated (education ≤ 12 years) Single Mothers

	Adjusted Probability of Ownership (%)		Percentage Difference in Means (% points)		
	1990-1995	1998-2003	1st D	DD	DDD
	I	II	III	IV	V
Microwave oven	63	83	20***	-0.3	3.7*
			(1.5)	(2.5)	(2.3)
Washer/dryer	58	58	-0.1	-7.1**	-3.8
			(1.7)	(2.7)	(2.6)
Dishwasher	25	29	4.4***	-24.6***	-3.1
			(1.6)	(3.2)	(2.8)
Computer	8	28	20.2***	-35.3***	-14.7***
			(1.3)	(3.0)	(2.6)
VCR	59	81	21.3***	-0.3	5.4**
			(1.6)	(2.5)	(2.3)
Phone	82	90	8.8***	0.9	4.1**
			(1.1)	(1.4)	(1.4)
Car	55	65	9.3***	5.9**	6.7***
			(1.6)	(2.4)	(2.3)

Note: Figures in columns labeled I and II adjust for mothers' age, race and ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects. Heteroskodasticity adjusted standard errors clustered at consumer unit are in parenthesis. The comparison group in the DD analysis consists of households headed by high educated (education > 12 years), single mothers. The DDD estimates are derived by subtracting the DD estimates for low-educated married-couple families (with high-educated married-couple families as comparison) from the DD estimates for low-educated single-mother families presented in column labeled IV. The sample of analysis consists of 8610 observations of unmarried low-educated mothers, 7187 observations of unmarried, high-educated mothers, 32547 observations of married, low-educated mothers and 43463 observations of married, high-educated mothers. * 0.05<p=<0.1, ** 0.01<p=<0.05, ***p=<0.01.

Table 3b Estimates of Ownership of Durables in Households Headed by Very Low-Educated (education <12 years) Single Mothers

	Adjusted Probability of Ownership (%)		Percentage Difference in Means (% points)		
	1990-1995	1998-2003	1st D	DD	DDD
	I	II	III	IV	V
Microwave oven	52	77	24.8***	-12.8***	1.7
			(2.8)	(4.1)	(3.5)
Washer/dryer	50	51	1.0	-13.2***	-2.2
			(3.0)	(4.3)	(3.8)
Dishwasher	16	19	2.7	-40.2***	-4.8
			(2.3)	(4.4)	(3.6)
Computer	5	19	13.8***	-35.6***	-8.1**
			(2.0)	(3.8)	(3.2)
VCR	51	71	20.4***	-15.1***	1.0
			(2.9)	(4.2)	(3.6)
Phone	74	88	13.4***	-4.4	5.0**
			(2.0)	(2.7)	(2.3)
Car	41	52	10.3***	3.3	7.6**
			(2.7)	(3.6)	(3.4)

Note: Figures in columns labeled I and II adjust for mothers' age, race and ethnicity, education, whether she lives in an urban area, family size, number of children under 18 and number of persons in the family aged 65 or above, and month effects. Heteroskodasticity adjusted standard errors clustered at consumer unit are in parenthesis. The comparison group in the DD analysis consists of households headed by high educated (education > 12 years), single mothers. The DDD estimates are derived by subtracting the DD estimates for low-educated married-couple families (with high-educated married-couple families as comparison) from the DD estimates for very low-educated single-mother families presented in column labeled IV. The sample of analysis consists of 3067 observations of unmarried very low-educated mothers, 7187 observations of unmarried, high-educated mothers, 8092 observations of married, very low-educated mothers and 43463 observations of married, high-educated mothers.
* 0.05<p=<0.1, ** 0.01<p=<0.05, ***p=<0.01.

Appendix Table 1: Major Expenditure Categories:

Category	Description
Housing and utility	Housing expenditures include the following four categories: 1. Shelter cost, including owned dwelling (mortgage interest, property taxes, and maintenance, repairs, insurance, and other expenses), rent, and other lodging cost; 2. Utility cost, including natural gas, electricity, fuel oil and other fuels, telephone services, water and other public services 3. Household operations, including domestic services (babysitting and child day care included) and other household expenses 4. House furnishings and equipment, including household textiles, furniture, floor coverings, major appliances (such as built-in dishwasher, garbage disposal, purchase and installation of refrigerator or home freezer, clothes washer or dryer, cooking stove, range or oven, microwave, portable dishwasher, window air conditioner, electric floor cleaning equipment, and sewing machines), small appliances (such as dinnerware, flatware, glassware, non-electric cookware, small electrical kitchen appliances, portable heating and cooling equipment), and other miscellaneous household equipment.
Food	Food at home and away from home (including meals as, and not as, pay).
Alcohol & tobacco	Alcoholic beverages and tobacco and smoking supplies.
Clothing	Clothing and footwear for men, women, boys and girls, and other apparel products and services.
Transportation	Cars and trucks (new and used), other vehicles, gasoline and motor oil, vehicle finance charges, maintenance and repairs, vehicle insurance, rental, leases, licenses, and other charges, and public transportations, both local and on trips.
Health	Health insurance, medical services, prescription drugs, and medical supplies.
Leisure	Fees and admissions to entertainment activities, televisions, radios, and sound equipments, pets, toys, and playground equipments, and other entertainment.
Personal care	Wigs, hairpieces, or toupees, electric personal care appliances, and personal care services for males and females, including haircuts.
Education (including reading)	Tuition, school books, supplies, and equipment for college, elementary and high school, day care center, nursery school, and other schools, rentals of books and equipment, and other school-related expenses; newspapers and magazines (subscriptions and non-subscriptions), books (through and not through book clubs), and encyclopedia and other sets of reference books.
Misc.	Including miscellaneous expenditures (membership fees for credit card memberships and shopping clubs, lotteries and pari-mutuel losses, legal fees (excluding real estate closing costs), funeral, burial or cremation expenses, including limousine and flowers, safe deposit boxes, charges for checking accounts and other banking services, purchase and upkeep of cemetery lots or vaults, accounting fees, interest on line of credit home equity loan (properties other than owned homes), and occupational expenses), and cash contributions (alimony and child support expenditures, support for college students, gifts to non-cu members of stocks, bonds, mutual funds, and cash contributions to charities, churches or religious organizations, educational institutions, political organizations, and other organizations, and other cash gifts), life and other personal insurance, and retirement, pensions, Social Security contributions.
Total	Total of above.

Appendix Table 2: Detailed Expenditures for Children and Adults:

Category	Description
Children's clothing	Children's clothing, footwear, and accessories
Adult's clothing	Adult's clothing, footwear, and accessories
Learning and enrichment	
Books/ magazines/ newspaper	Books (through or not through book clubs), and newspapers and magazines (subscriptions or non-subscriptions).
Tuition, school books, supplies, and equipments	Tuition for college, elementary and high school, and other schools other than day care centers and nursery schools; school books, supplies, and equipment for college, elementary and high school, day care centers, nursery schools, and other schools; encyclopedia and other sets of reference books, rentals of books and equipment, and other school-related expenses.
Computers, calculators, typewriters	Computers, computer systems, and related hardware, computer software and accessories, and repair of computers, computer systems, and related equipment for non-business use, computer information services, calculators, and typewriters and other office machines for non-business use.
Toys, games, hobbies, playground equipments	TV computers games and computer game software, toys, games, hobbies, tricycles, and battery powered riders, and playground equipment.
Sports equipments	Ping-Pong, pool tables, other similar recreation room items, general sports equipment, and health and exercise equipment; bicycles; camping, hunting and fishing, winter sports, water sports, and other sports equipments.
Enrichment activities	Musical instruments, supplies, and accessories; membership fees for country clubs, health clubs, swimming pools, tennis clubs, social or other recreational organizations, civic, service, or fraternal organizations; fees for participant sports, such as golf, tennis, and bowling; management fees for recreational facilities, such as tennis courts and swimming pools in condos and coops; admission fees for entertainment activities, including movie, theater, concert, opera or other musical series (single admissions and season tickets); admission fees to sporting events (single admissions and season tickets); fees for recreational lessons or other instructions; rental and repair of musical instruments, supplies, and accessories; and rental and repair of sports, recreation, and exercise equipment.
Childcare & baby-sitting	Babysitting or other child care in own home or someone else's home; tuition and other expenses (other than school books, supplies, and equipments) for day care centers and nursery schools.