

Inequality Among American Families  
With Children, 1975 to 2005

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## **Abstract**

From 1975 to 2005, the variance in incomes of American families with children increased by two-thirds. Labor market studies of the growth in inequality emphasize the rising pay of college graduates, while demographers study changes in family structure. We join these lines of research by viewing income inequality as the product of the distribution of earnings in the labor market and the pooling of incomes in families. We develop this framework with a decomposition of family income inequality using annual data from the March Current Population Survey. The analysis shows that educational inequalities in incomes and single parenthood contributed to income inequality, but these effects were offset by rising educational attainment and women's employment. Most of the increase in family income inequality was due to increasing within-group inequality that was widely shared across family types and levels of schooling.

From 1975 to 2005, income inequality among American families with children increased by two-thirds, a larger rise in inequality than for men’s hourly wages or for the incomes of all households. Trends in the labor market and family formation widened the economic gap between children. In the labor market, the earnings advantage of college graduates increased over those with just a high school education. For families, inequality was increased by growing numbers of low-income single parents. Changes in family structure may have compounded educational inequality. Growth in the numbers of single-parent families was concentrated among mothers with little schooling, producing what Sara McLanahan (2004) called the “diverging destinies” of U.S. children (see also Ellwood and Jencks 2004). Adding further to class differences among children, economic power of a different kind—women’s employment—also increased more among mothers who had at least completed high school (Cohen and Bianchi 1999).

Earlier studies examined the effects of education, family structure and women’s employment on inequality, but labor market analysis was disconnected from demographic research. Estimates of the effects of single parenthood and women’s employment on family income inequality did not account for the growing earnings advantage of college graduates (e.g., Martin 2006; Chevan and Stokes 2000; Cancian and Reed 1999; Lerman 1996; Karoly and Burtless 1995). Because demographic trends and schooling are correlated, estimated effects of single-parenthood and women’s employment are confounded with educational inequality in earnings. It remains unclear whether rising inequality among children is associated more with the shrinking pay of low-skill workers or trends in marriage and employment among mothers.

We present a simple framework for studying inequality among children that combines labor market and demographic analysis. In this framework,

family income inequality depends on parents' earnings in the labor market and the pooling of incomes in families. We index the market power of workers in the labor market chiefly by their level of education, though we also control for age and race. Income pooling depends on the number of adults in the family and women's involvement in paid work. This approach goes beyond earlier research by separating the correlated effects of education, single-parenthood and maternal employment.

Families and labor markets produce between-group and within-group inequality. Between-group inequality describes variation across groups with different characteristics—the average difference in incomes between two-parent and single-parent families, for example. Within-group inequality describes heterogeneity in groups with the same characteristics—say, the variability of incomes among single-parent families. Researchers argue that the erosion of labor market institutions, such as unions and minimum wage standards, fuelled within-group inequality in earnings among workers with similar skills and experience (Sørensen 2000; McCall 2000; DiNardo, Fortin, and Lemieux 1996). Family structure, too, produces within-group inequality, differentially insulating individuals from the income losses associated with unemployment or other random shocks of family life.

Our labor-markets-plus-families framework is applied in a decomposition of income inequality among families with children from 1975 to 2005. Because the analysis separates the effects of demographic change from educational differences in incomes, demographic groups are defined more finely than in previous studies. Groups in our analysis are defined by family structure and the age, race, and education of family heads. To analyze between and within-group inequality for these finely-defined groups, we introduce a novel decomposition based on a variance-function regression. With this method,

the regression model includes the effects of predictors on the mean and the variance of incomes. We thus estimate not just the effects of family type and education on average incomes; we also estimate their effects on the variability of incomes.

#### TRENDS IN FAMILY INCOME

A variety of wage and income measures indicate increasing economic inequality in the United States from the mid-1970s to 2005. Inequality in the top panel of Figure 1 is measured by the variance of the log of inflation-adjusted incomes. The figure contrasts men's hourly wages with family incomes. Family income is the sum of annual incomes from related individuals living in the same household, including cohabitators. To account for family size and economies of scale in the household, incomes were scaled by the square root of the number of family members. The variances of wages and incomes were standardized to equal 100 in 1975.

Figure 1 shows that the increase in inequality for men's hourly wages was smaller than for family income inequality. The variance in log hourly wages for men with positive earnings increased by 30 percent from 1975 to 2005. By comparison, inequality in annual incomes increased by nearly 60 percent for all US families. Among families with children, income inequality increased by about two-thirds. These wage and income figures are similar to those tabulated by other researchers. For instance, Gottschalk and Danziger (2005) report that the ratio of the ninetieth to the tenth percentile of men's hourly wages increased by 30 percent from 1975 to 2002. Martin (2006) finds that the coefficient of variation for the incomes of families with children increased by about 60 percent from 1976 to 1993.

Figure 1 also indicates that the trend in wage and income inequality

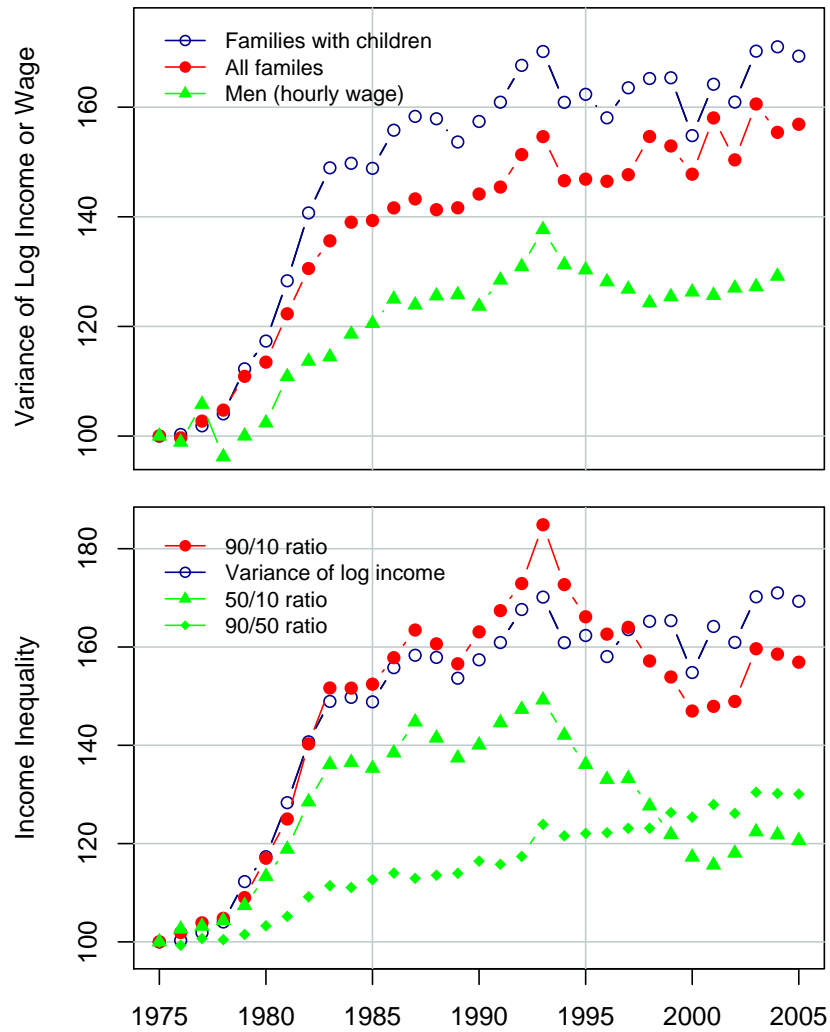


Figure 1. Top panel: The variance of men’s log hourly wages and log family incomes, 1975–2005. Bottom panel: The variance of log incomes and ratios of income deciles for families with children. (All series are standardized to 100 in 1975.) Sources: CPS Outgoing Rotation Group files for men’s hourly wages, 1976–2005; March CPS for family incomes, 1976–2006.

can be broken into two periods: a period of significant increase, from 1975 to 1995, and a high plateau in the subsequent decade. The lower panel of Figure 1 shows that the two periods reflect shifts in different parts of the income distribution. The variance of log incomes roughly tracks trends in overall inequality measured by the ratio of the ninetieth to the tenth percentile. In the first period, through the early 1980s, the 50/10 ratio shows that the increase in inequality was driven by falling incomes of those at the bottom. Inequality continued to grow from the mid-1980s, although at slower rate than in the previous decade. Rising inequality in this period was propelled mostly by rising incomes for affluent families. In the second period of sustained inequality, the incomes of poor families at the tenth percentile increased relative to the median. However, the incomes of rich families at the ninetieth percentile continued to pull away from the middle of distribution, as they had for the previous twenty years.

#### EXPLAINING TRENDS IN INCOME INEQUALITY

Research on US economic inequality has focused either on educational inequalities in workers' wages, or on the effects of single-parenthood and mothers' employment on family incomes. In our approach, labor markets and families comprise two domains that together shape the overall distribution of economic resources across families and children. Different jobs and family types also provide different levels of income security. Thus families and the labor market are also sources of within-group inequality.

##### *Educational Inequality in Earnings*

Labor market research on educational differences in wages has dominated the analysis of US economic inequality. This research documents the growing

economic distance between college graduates and workers with a high school education. The relative wages of college graduates grew rapidly in the 1980s. From 1979 to 1989, the wage advantage of male college graduates over their high school counterparts grew from 21 to 35 percent. In the same decade, the college wage premium among women grew from 29 to 45 percent. Educational inequality in hourly wages continued to rise through the 1990s, though more slowly than in the previous decade (Gottschalk and Danziger 2005, 243).

What explains the increasing educational gap in wages? Economists propose a market explanation in which demand increased for highly-skilled workers while college-educated workers were in relatively short supply in the late 1970s (Katz and Murphy 1992). As growth slowed in the demand for skilled workers through the 1990s, growth also slowed in the college-high school wage gap (Autor, Katz, and Kearney 2005). Growing demand for college graduates has been explained by technological changes, like computerization, that improved the productivity of highly-skilled workers (Levy and Murnane 1992). Krueger (1993) and Fernandez (2001) report some direct evidence for the effects of skill-biased technical change, but the effects of changing technology are often inferred from the increasing educational gradient in incomes. Against claims for the impact of technology, increasing immigration and trade with poor countries may have shifted demand away from the labor of low-skill native-born men (for reviews see Acemoglu 2002 and Morris and Western 1999).

### *Single Parents and Mothers' Employment*

Income inequality among families depends only partly on earnings inequality among workers. The pooling of incomes in families also has distributional effects. Growing numbers of single parents reduce family incomes, but these



effects may have been counteracted by increasing employment among mothers.

Single parenthood increases income inequality by adding to the number of low-income families. Growth in the number of single-parent families dates from the mid-1960s. From 1965 to the early 2000s, the proportion of mothers who are single increased from about 12 to 25 percent (Ellwood and Jencks 2004). The trend in single-parenthood paralleled the rise in inequality, with the period of fastest growth unfolding before the 1990s. Among African American families, for example, single parenthood increased from 36 to 64 percent between 1970 and 1995. However, single parenthood among black families had dropped to 62 percent by 2005 (US Census Bureau 2007). Rising proportions of single parent families increased poverty rates and overall income inequality (Iceland 2003; Lerman 1996). Decompositions of family income inequality associate 15 to 40 percent of the growth in inequality since the early 1970s with changes in family structure (Karoly and Burtless 1995; Lerman 1996, S129; Martin 2006).

Single-parenthood increased inequality, but the income gap was closed by mothers who entered the labor force. The distributional effects of mothers' employment on family incomes depends on who goes into paid work and their marriage patterns. Employment increased most, and marriage rates fell least, among college-educated mothers (Cohen and Bianchi 1999; Sayer, Cohen, and Casper 2004). Unions among couples with the same level of schooling also became more common in the four decades since 1960 (Schwartz and Mare 2005). These marriage and employment trends increased family income inequality. Against these trends, women's incomes grew relatively quickly in low-income couples. For example, from 1967 to 1994, wives' earnings increased more among families in the lower four deciles of the family

income distribution than among families in the upper three deciles (Cancian and Reed 1999). Consequently, working wives tended to equalize family incomes (see also Chevan and Stokes 2000; Daly and Valetta 2006). Since 1996, inequality may also have been reduced by welfare reform which tied welfare payments for poor single mothers to work or community service. Employment increased among poor single mothers since 1996. The incomes of those leaving welfare for employment were higher on average than for those who remained, raising the family incomes of single mothers (Ellwood 2000; Bavier 2002; Danziger, Helfin, Corcoran, Oltmans, and Chen-Wang 2002).

Family structure and women's employment affect income inequality, but they are correlated with other demographic variation. Single-parenthood and maternal employment are patterned by age, race, and education. The entire increase in the share of single mothers among women aged 25 to 34 is concentrated in the lower two-thirds of the education distribution and, by the early 2000s, rates of single-parenthood were about three times higher among black mothers than white (Ellwood and Jencks 2004). Underlining the importance of maternal age, marriage and first births were significantly delayed among female college graduates in the 1990s compared to the 1970s (Goldstein and Kenney 2001; Martin 2004, 93–94). Incomes may be rising for two-parent, two-earner families because parents in such families have become whiter, older, and more educated. Because of changes in the racial and age composition of single and two-parent families, we control for age and race in our analysis below.

The increasing stratification of incomes by education may partly explain why family structure and women's employment are associated with rising income inequality. If single motherhood increased most among the less-educated, part of the effect of family structure on income inequality reflects

the relative decline in pay for non-college workers and not just the growing prevalence of single-parent families. The effect of women's employment is more ambiguous. Increased employment among college-educated mothers is disequalizing, particularly if they are married to college-educated men. On the other hand, increased employment among unmarried mothers may mitigate the effects of single-parenthood if earnings from paid work exceed income from outside the labor market. In separating the effects of the labor market from changes in family structure, a key empirical task involves distinguishing educational inequality in incomes from the effects of single parenthood and maternal employment.

#### *Within-Group Inequality*

Theories of increasing demand for highly skilled workers and changing family structure describe a widening income gap between groups. However, within-group inequality also increased significantly through the 1980s and 1990s (e.g., Lemieux 2006; Martin 2006). In labor market studies, within-group inequality is often measured by the spread of residuals from a regression of hourly wages on measures of schooling and work experience. Indicating the sustained growth of within-group inequality, the residual variance of hourly wages grew by nearly a quarter from the mid-1970s to the early 2000s (Lemieux 2006). A market explanation attributes rising within-group inequality to increasing returns to unobserved skills like intrinsic ability, work effort, and school quality (Lemieux 2006, 461; Juhn, Murphy, and Pierce 1993).

However, workers' exposure to market forces is institutionally variable. Labor unions, minimum wage standards, and internal labor markets shelter wages from market competition. The erosion of labor market institutions

has been associated with growth in the residual variances of wages. While labor unions narrowed wage differentials within firms and industries, union membership decline diminished this effect (Freeman 1993). The declining value of the minimum of wage was found to increase within-group inequality at the bottom of the wage distribution, explaining from a quarter to a third of the rise in within-group inequality in hourly wages from the late 1970s through the late 1980s (DiNardo, Fortin, and Lemieux 1996). Finally, the erosion of internal labor markets and long-term employment relations in large firms is also associated with rising residual wage inequality (McCall 2000). Declining unionization, minimum wages, and long-term employment together reflect the “deinstitutionalization of the American labor market” that has increased the heterogeneity of wages among workers with similar skills and occupations (McCall 2000; Sørensen 2000). From this perspective, rising within-group inequality reflects increased volatility in wages.

Just as labor market institutions protect wages from random shocks, family members also insulate each other from risks to income. In this view, families are small risk-pooling organizations in which spouses or other family members step into the labor market to deal with the income losses associated with unemployment, sickness, or the care of family members. Oppenheimer (1997, 447–448) argues that married couples are involved in long-term relationships that can distribute fluctuating parental and economic responsibilities between husbands and wives. Single-parent families, by contrast, are more economically insecure, relying more for income support on nonresident parents and extended family. Welfare benefits provide some income security for poor single-parent families, but tightening eligibility criteria and mounting work requirements may also make incomes more variable for poor single mothers who move back and forth between public assistance and employment.

Income pooling within families, and the income insecurity of single-parent families, is indirectly indicated by panel data that shows greater volatility in earnings among individuals than for households (Orszag 2007). In this context, families—like labor market institutions—shape within-group inequality by moderating income insecurity. DiPrete and McManus (2000) provide some direct evidence of how family processes—union formation and dissolution in their analysis—produce variability in the household incomes of men and women in the United States and Germany. More generally, the configuration of families and labor market institutions influences individuals' income insecurity. Where incomes are more insecure, showing greater variation from year to year, within-group inequality will tend to be higher. A significant increase in within-group inequality may thus reflect an increase in the insecurity of incomes.

#### ANALYZING LABOR MARKET AND DEMOGRAPHIC INEQUALITIES

Distinguishing inequalities related to education from those related to family life helps specify the main contours of economic inequality among children. Large educational effects suggest that technological change and market forces widened the income distribution. Large family effects suggest that, whatever the distribution of rewards in the labor market, how families produce and pool incomes is decisive for the economic well-being of children. Indeed Esping-Andersen (2007) argues that women's employment and marriage patterns offer a major sociological alternative to the economic account of inequality that emphasizes technological change in the labor market. Family demographers make a similar argument, linking the growth of inequality to family structures that magnify differences in the well-being of children. From this perspective, the demographic effects of family structure and women's

employment are fundamental, because they influence both income inequality and the transmission of inequality from parents to children (McLanahan 2004; Lichter 1997).

To weigh the effects of family and education on income inequality, we divide all US families with children into a large number of groups. Groups are defined by family type, and the schooling, age, and race of the family head. Overall inequality has between-group and within-group components. Between-group inequality rises when the average incomes of different groups move further apart (an income effect), or when the population grows in groups that are widely spaced on the income distribution (a demographic effect). For example, growth in the college wage premium is an income effect, while growth in the fraction of families headed by a college graduate produces a demographic effect. Similarly, within-group inequality rises when incomes become more dispersed within groups (an income effect) or when population grows in groups with highly dispersed incomes (a demographic effect). Claims of increased income instability at the bottom of the US labor market describe an income effect on within-group inequality. Growth in the proportion of families whose incomes are highly-dispersed describes a demographic effect.

Research on family income inequality studied Gini coefficients, coefficients of variation, and other measures of dispersion (e.g, Martin 2006; Karoly and Burtless 1995; Cancian and Reed 1999; Lerman 1996). Decomposing these measures typically leaves a residual term that mixes within-group and between-group quantities or income and demographic effects. These decomposition methods also perform poorly with sparse data from finely-defined groups, when family types are further disaggregated by education, for example. We present an analysis that fully decomposes the total variance of

family incomes into income and demographic effects, and distinguishes these effects for within-group and between-group inequality. Lemieux (2006) and Gottschalk and Danziger (1993) also report variance decompositions of wages and incomes, though we introduce a new method based on a variance-function regression.

With data from the March CPS on log income,  $y_i$ , for family  $i$ , the model has two parts including a regression for the conditional mean,  $\hat{y}_i$ , and the residual variance,  $\sigma_i^2$ :

$$\begin{aligned}\hat{y}_i &= \beta_0 + \mathbf{e}'_i\boldsymbol{\beta}_1 + \mathbf{f}'_i\boldsymbol{\beta}_2 + \mathbf{a}'_i\boldsymbol{\beta}_3 + \mathbf{r}'_i\boldsymbol{\beta}_4, \\ \log(\sigma_i^2) &= \gamma_0 + \mathbf{e}'_i\boldsymbol{\gamma}_1 + \mathbf{f}'_i\boldsymbol{\gamma}_2 + \mathbf{a}'_i\boldsymbol{\gamma}_3 + \mathbf{r}'_i\boldsymbol{\gamma}_4,\end{aligned}$$

where the predictors are vectors of dummy variables for education,  $\mathbf{e}_i$ , family type,  $\mathbf{f}_i$ , age,  $\mathbf{a}_i$ , and race,  $\mathbf{r}_i$ . By estimating average incomes for different groups, the model allows us to study between-group inequality. The variance function regression adds predictors for the residual variance also allowing analysis of the effects of variables on within-group inequality. The model is estimated with a restricted maximum likelihood algorithm, similar to that used for fitting hierarchical linear models (Smyth 2002).

Groups are specified by three education categories, five family types, five age groups, and four race categories, yielding a table with  $3 \times 5 \times 5 \times 4 = 300$  cells (Table 1). Each cell has a population weight,  $\pi_j$ , giving the fraction of families falling into demographic group  $j$  ( $j = 1, \dots, 300$ ). The population weights are cell proportions from a cross-table of the CPS data, fitted with the CPS final weights. The regression results are used to estimate for group  $j$  the mean income,  $\hat{y}_j$ , and the within-group variance,  $\sigma_j^2$ . These quantities are used to calculate between-group and within-group inequality which are defined on the cells of the table.

Table 1. Description of predictors for the analysis of family income inequality in the March CPS, 1975–2005.

Variable	Description
Education	Three categories for family heads with: (1) less than a high school diploma or equivalency, (2) high school diploma or some college,* or (3) a four-year or higher degree.
Family type	Five category variable for families with: (1) two adults and no working woman,* (2) two adults with a working woman, (3) a single woman, not working, (4) a single woman, working, and (5) a single man.
Age	Five categories for family heads: (1) under 25, (2) 25–29* (3) 30–39, (4) 40–49, (5) 50 years and older.
Race	Four categories for family heads who are: (1) non-Hispanic blacks, (2) non-Hispanic whites,* (3) Hispanics, and (4) all others.

\* Indicates the reference category in regression analysis. Two-adult families have at least two adults counting cohabitators.

Income inequality among all families with children is measured by the total variance of log family incomes. The total variance is the sum of between-group and within-group components. Assuming a large number of groups, the total variance is written:

$$V = \sum_j \pi_j r_j^2 + \sum_j \pi_j \sigma_j^2, \quad (1)$$

where the between-group residual is the deviation of the group mean from the grand mean of incomes across all families,  $r_j = \hat{y}_j - \bar{y}$ . Equation (1) shows that income inequality may change because of: (1) demographic effects that change the distribution of the population across groups (changes in  $\pi_j$ ), (2) income effects that change the average incomes of groups (changes in  $r_j$ ), or (3) income effects that change the within-group inequality (changes in  $\sigma_j^2$ ).

Income and demographic effects are estimated by adjusted variances that fix incomes or population characteristics at a baseline year. Using subscripts to compare a baseline year  $b$  to the current year  $t$ , an income effect is calcu-



lated by fixing the regression coefficients at their values in the baseline year and allowing the population weights to change,

$$V_{1t} = \sum_j \pi_{tj} r_{bj}^2 + \sum_j \pi_{tj} \sigma_{bj}^2. \quad (2)$$

This adjusted variance can be calculated to study changes associated with a single variable, for example,

$$\begin{aligned} \hat{y}_{bj}^* &= \beta_{0t} + \mathbf{e}'_j \boldsymbol{\beta}_{1b} + \mathbf{f}'_j \boldsymbol{\beta}_{2t} + \mathbf{a}'_j \boldsymbol{\beta}_{3t} + \mathbf{r}'_j \boldsymbol{\beta}_{4t}, \quad \text{and} \\ \log(\sigma_{bj}^{*2}) &= \gamma_{0t} + \mathbf{e}'_j \boldsymbol{\gamma}_{1b} + \mathbf{f}'_j \boldsymbol{\gamma}_{2t} + \mathbf{a}'_j \boldsymbol{\gamma}_{3t} + \mathbf{r}'_j \boldsymbol{\gamma}_{4t}. \end{aligned}$$

In this case, group means and variances are estimated with coefficients for all variables from year  $t$ , except for the education effects, which are fixed at the baseline year  $b$ . Plugging in  $r_{bj}^* = \hat{y}_{bj}^* - \bar{y}_b$  and  $\sigma_{bj}^{*2}$  into equation (2) for  $V_{1t}$  shows the change in inequality associated with changes in educational inequality in incomes.

Adjusted variances can also be calculated to examine demographic shifts. The demographic effect is calculated by fixing the population weights in the baseline year and allowing the regression coefficients to change,

$$V_{2t} = \sum_j \pi_{bj} r_{tj}^2 + \sum_j \pi_{bj} \sigma_{tj}^2.$$

The adjusted variance,  $V_{2t}$ , describes the income inequality we would observe in year  $t$  if the incomes of different groups vary as observed but the demographic composition of families remains fixed at the baseline level, in year  $b$ . To separately study the effects of single parenthood and women's employment, weights are constructed to hold constant just one dimension of demographic variation (see appendix).

Finally, we calculate an adjusted variance to study changes in the within-group variance,

$$V_{3t} = \sum_j \pi_{tj} r_{tj}^2 + \sum_j \pi_{tj} \sigma_{bj}^{*2},$$

where the adjusted within-group variance is now given by

$$\log(\sigma_{bj}^{*2}) = \gamma_{0b} + \mathbf{e}'_j \boldsymbol{\gamma}_{1t} + \mathbf{f}'_j \boldsymbol{\gamma}_{2t} + \mathbf{a}'_j \boldsymbol{\gamma}_{3t} + \mathbf{r}'_j \boldsymbol{\gamma}_{4t}. \quad (3)$$

Here, we fix at the baseline year only the within-group variance of the reference group in the regression,  $\gamma_0$ , allowing all the other coefficients and population weights to change. With our codes, the reference group is a two-parent family, with a nonworking mother, headed by a white high school graduate, aged 25 to 29. This adjusted variance fixes a benchmark level of within-group inequality, while allowing differences in the within-group variance across groups to vary over time.

The decomposition of the trend income inequality is a descriptive, not a causal, analysis. The regression model is used to describe the heterogeneity of incomes across different groups in the population. The adjusted variances describe the income inequality we would observe if population weights or regression coefficients remained unchanged from the baseline year. Causal interpretation of these adjusted variances assumes that changes in incomes have not changed the size of different groups, and population weights and incomes have shifted exogenously. Rather than explain the growth in family income inequality in a causal sense, we pursue the descriptive goal of associating the growth inequality with different segments of the population and different components of the income distribution.

## THE DATA

The analysis examines family income data in the March CPS from 1976 to 2006, yielding annual incomes from 1975 to 2005. Because we are ultimately concerned with the economic resources of children, we take families rather than households as our unit of analysis. The Census Bureau defines a family as a group of people living in the same household who are related by birth, marriage, or adoption (Kostanich and Diplo 2002, 5-2). Thus a household may include more than one family. Our analysis adds cohabitators to the Census-defined family. Following Martin (2006) we count unrelated opposite-sex adults in some households as cohabiting with unmarried family heads. We analyze only families with children under age 18, though we have obtained similar results for families with young children, under age six.

Income in the CPS includes all labor market, business, and farm earnings, and receipts from government transfers and other payments like child support. Family income is the sum of incomes from all family members including cohabitators. Though we count all income sources, labor market earnings account for 80 to 85 percent of all incomes on average. Non-response to income questions has increased significantly in the CPS and Census Bureau allocation for nonresponse tends to underestimate the incomes of nonrespondents. Our results are insensitive to whether allocated income data are included, and our reported results omit the allocated data. Over the course of the survey, very high incomes have sometimes been top-coded. Top-coding schemes have not been uniform over time and changes in top-coding affect measured trends in high incomes. Similar to other studies, we adopt a uniform top-coding strategy in which the top two percent of each income category is imputed from a Pareto distribution (West 1985). We also replicated the analysis on a data set consisting of the lower 98 percent of family incomes, obtaining

substantively identical results to those reported below. Income data for each year were adjusted for inflation with the personal consumption expenditures index.

Studies of family income often standardize income measures to account for family size and the economies of scale in households (Karoly and Burtless 1995). A common approach divides a family's income by its poverty threshold—approximately equivalent to dividing income by the square root of family size. Because the poverty thresholds reported by the Census Bureau do not account for cohabitators in many years, we standardize family income by dividing by the square root of a family size measure that includes cohabitators.

Descriptive statistics show trends in the educational and demographic sources of income inequality (Table 2). Increasing inequality by education is clearly indicated. Controlling for age, race, and family structure, the income gap between dropouts and high school graduates increased from 30 to 35 percent (from  $1 - e^{-.357}$  to  $1 - e^{-.436}$ ). The income advantage of families headed by college graduates over those headed by high school graduates increased by even more, from about 40 to 60 percent (from  $e^{.325}$  to  $e^{.478}$ ). While family incomes became more stratified by education, income inequality also increased among family heads with the same level of schooling. The variance in incomes among families headed by a high school graduate increased by half in the 30 years from 1975. Within-group inequality was higher among high school dropouts than high school graduates in the decade from 1975, but by 2005 there was little difference in the within-group variance in incomes.

The CPS data also indicate increasing educational attainment and maternal employment, but declining rates of marriage among mothers. Although the relative incomes of high school dropouts declined, the proportion of fam-

Table 2. Descriptive statistics for the analysis of income inequality, families with children under 18, 1975–2005.

	1975– 1984	1985– 1994	1995– 2005
<i>Changes in Incomes</i>			
Dropout-H.S. gap in mean log income	-.357	-.413	-.436
College-H.S. gap in mean log income	.325	.436	.478
Dropout within-group variance	.483	.571	.624
H.S. within-group variance	.453	.553	.628
College within-group variance	.492	.604	.645
<i>Changes in Demographic Structure</i>			
Family heads, H.S. dropouts	.248	.180	.146
Family heads, college graduates	.194	.220	.257
Single adult families	.189	.247	.238
Families with working women	.639	.701	.732

*Note:* Education gaps in log income are estimated from a variance-function regression controlling for age, race, family structure and women’s employment. Figures in each column are ten-year averages. *Source:* March Current Population Survey, 1976–2006.

ilies headed by dropouts shrunk from 25 to 14 percent. The proportion of families headed by a college graduate, on the other hand, increased by over a third. The fraction of single-parent families increased from 19 to 24 percent, a larger proportionate increase than the employment rate for mothers. Women were working in nearly three-quarters of all families with children by 2005. Demographic change has ambiguous distributional implications. The shrinking share of high school dropouts may have reduced the number of low-income families, but this effect may be balanced by increasing levels of single-parenthood.

## RESULTS

Rising inequality reflects shifts in income means and variances for different demographic groups (income effects), and changes in the size of those groups (demographic effects). Table 3 separates income and demographic effects on the growth of family income inequality from 1975 to 2005. The initial period of significantly rising inequality, from 1975 to 1995, was dominated by shifts in group incomes rather than by demographic shifts in the size of groups. In this period, income shifts contributed equally to between-group and within-group inequality. Demographic change was modestly associated with increased inequality, accounting for less than a fifth of the rise in the income variance. In the second period of sustained inequality, from 1995 to 2005, income gaps between groups continued to rise but these effects were balanced by demographic change. Within-group inequality continued to increase, however, explaining nearly all of the modest increase in inequality in the recent decade. In sum, nearly all the growth in family income inequality from 1975 to 2005 can be traced to changes in the mean and spread of group incomes rather than compositional changes in the population.

Table 3. Decomposition of the change in variance of log annual income, for families with children under age 18.

	1975- 1985	1985- 1995	1995- 2005
Change in variance	.260	.072	.037
<i>Between group</i>	.150	.049	.002
Income effect	.084	.061	.046
Demographic effect	.066	-.012	-.044
<i>Within group</i>	.110	.023	.035
Income effect	.128	.026	.030
Demographic effect	-.018	-.002	.005

*Note:* Methods for decomposing the change in variance are detailed in the appendix.

We can disaggregate the effects of the labor market and families with adjusted variances that isolate the contributions of education, single-parenthood, and maternal employment to rising inequality. To study the effects of education, Figure 2 compares the observed income variance to an education-adjusted variance. With the adjusted variance, called  $V_1$  above, within and between-group inequality across levels of education are fixed at their 1975 levels. While the variance in family incomes increased by 69 percent from 1975 to 2005, holding education effects constant at 1975 yields a 61 percent increase. Only one-eighth of the growth in inequality ( $(69 - 61)/69 = .12$ ) is associated with changes in the educational inequality in incomes. Why is a 50 percent rise in the income advantage of college graduates associated with such a small increase in income inequality? Figure 2 also shows the adjusted variance in incomes holding constant the distribution of educational attainment at the 1975 level,  $V_2$  above. With few college graduates and a large number of high school dropouts in 1975, the adjusted variance is about a quarter higher than the observed variance by 2005. Strikingly, the equalizing

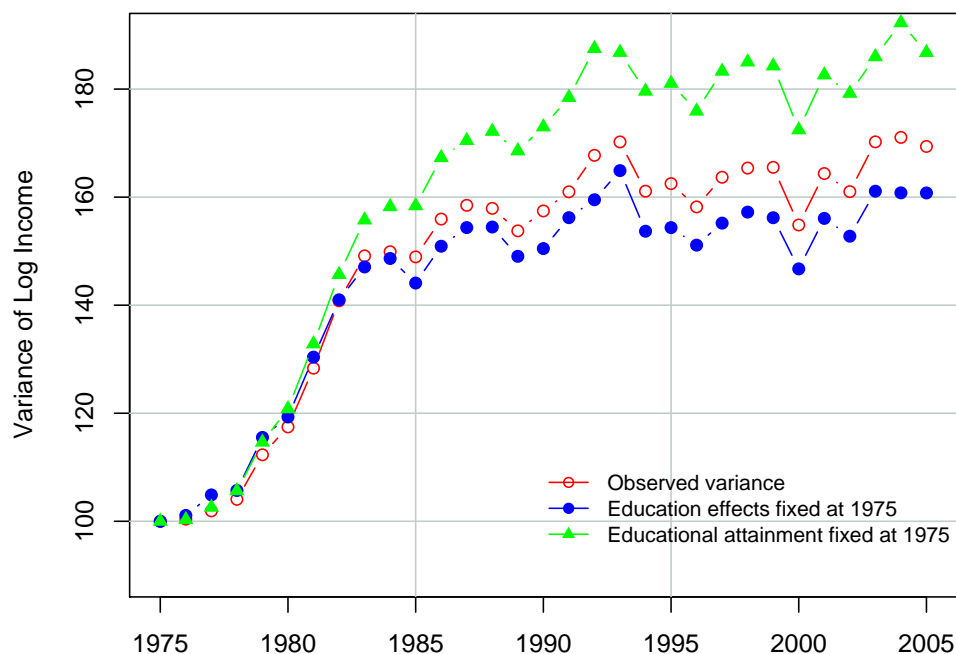


Figure 2. The total variance in annual family income, the adjusted variance given 1975 education effects, and the adjusted variance given 1975 education attainment, families with children under 18, 1975 to 2005.

effect of rising educational attainment of family heads is about twice as large as the disequalizing effect of increasing educational inequalities in income.

Our focus on the schooling of household heads may minimize women's contribution to family income inequality, at least in two-parent families where women's schooling is bracketed from the analysis. This limits the analysis in two ways: we cannot isolate the effect of women's incomes on inequality, and family incomes for college-educated men may be growing because those men are increasingly marrying well-paid college-educated women. Ed-



educational homogamy increased continuously from the mid-1970s through the end of the century (Schwartz and Mare 2005, 633). Consistent with increasing homogamy, Cancian and Reed (1999) report that the earnings correlation between husbands and wives increased from .13 to .22 from 1967 to 1994 and we find similar correlations. Although the income correlation increased, other researchers report that the effects were small and dominated by the equalizing effect of women's employment (Daly and Valetta 2006; Cancian and Reed 1999).

To study the distributional effects of women's incomes and trends in homogamy, we conducted a separate analysis based on the schooling of both spouses. Accounting for men's and women's education, however, did not change our main findings. Educational inequalities in income were found to contribute somewhat more to the overall rise in inequality once men's and women's schooling was included. Still, increasing educational attainment offset this effect. The effect of assortative mating was calculated by fixing the joint education distribution of both spouses at the 1975 level. After fixing the schooling of both spouses, the trend in income inequality is hardly different from the adjustment that counts only the family head. These results indicate that in two-parent families, neither educational inequalities in women's incomes nor assortative mating contributed significantly to the rise in family income inequality. (Results of this analysis are available on request.)

Figure 3 shows income inequality given 1975 rates of single-parenthood and women's employment. In 1975, only 16 percent of families with children were headed by a single parent, compared to 24 percent in 2005. Because of the large income gap between one-parent and two-parent families, the growing share of single-parent families accounted for about a quarter of the growth in income inequality by 1993. The growth of single-parenthood was

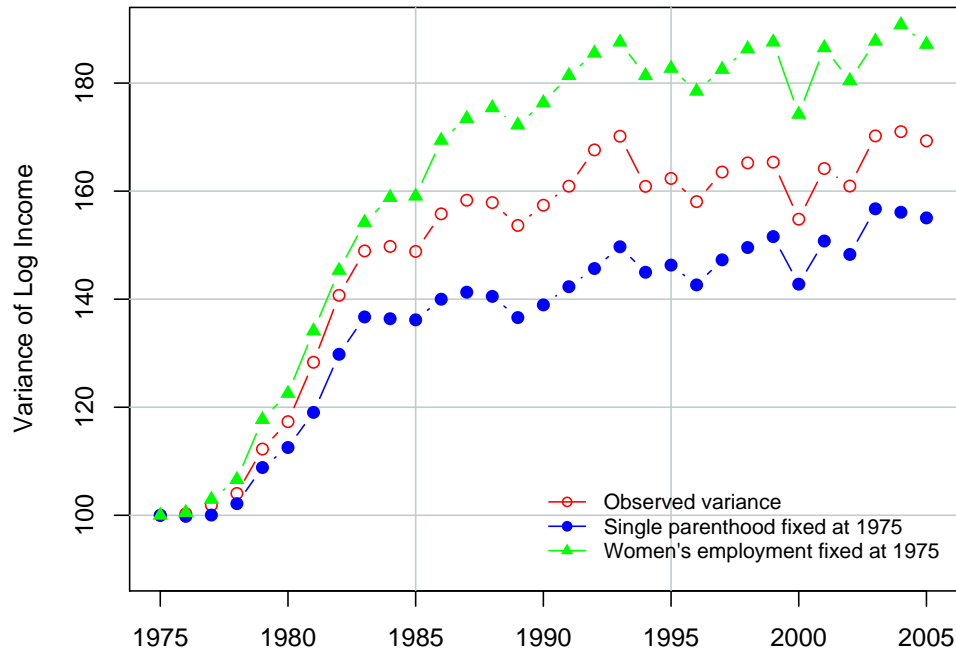


Figure 3. The total variance in annual family income, the adjusted variance given 1975 women’s employment rates, and the adjusted variance given 1975 rates of single-parenthood, families with children under 18, 1975 to 2005.

disequalizing, but women’s employment closed the gap in family incomes. If women’s employment remained fixed at the 1975 level of 59 percent, and had not grown to 71 percent by 2005, income inequality would have grown by nearly 90 rather than 69 percent. While increasing employment among single mothers reduced income inequality, we also found that maternal employment equalized incomes in two-parent families. The increasing independence of women thus boosted inequality by increasing the number of single-parent families, but lessened inequality through labor force participation.

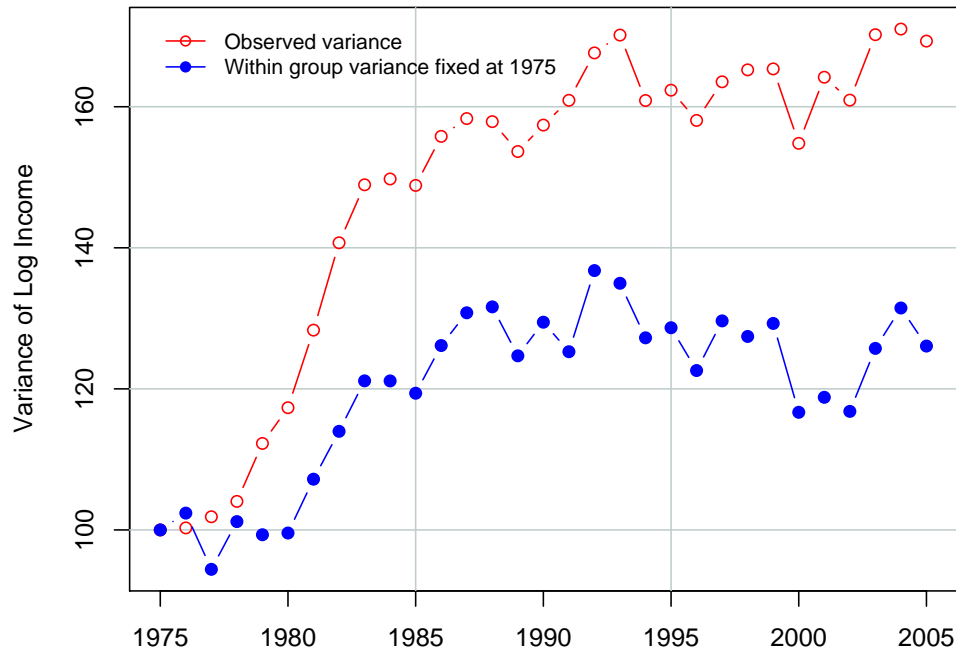


Figure 4. The total variance in annual family income and the adjusted variance given 1975 benchmark within-group inequality for white high school graduates in two parent families, families with children under age 18, 1975 to 2005.

Shifts in educational inequality, family structure, and women’s employment explain only a little of the growth in income inequality. Summing the income effects of education, and the demographic effects of women’s employment and single parenthood yields a family income inequality 16 percent lower in 2005 than the observed level. What, then, has driven the rise in income inequality among families with children?

Our last analysis examines the contribution of within-group inequality to income inequality. The analysis fixes within-group inequality at the 1975 level

for a reference group—a family headed by a white high-school graduate aged 25 to 30, with a spouse at home. (As in equation 3, this benchmark level of within-group inequality is given by the intercept,  $\gamma_0$ , in the variance-function regression.) For the adjusted variances,  $V_3$  above, differences from the reference group in within-group inequality are allowed to vary as observed. The adjusted variances suggest that growth in the benchmark level of within-group inequality accounts for nearly two-thirds of the 69 percent increase in family income inequality (Figure 4). The effect of within-group inequality greatly exceeds the net effects of educational inequality, single-parenthood, and women’s employment. Theories of the deinstitutionalization of the US labor market claim within-group inequality rises most at the bottom of the education ladder. However, the effect of benchmark within-group inequality on overall income inequality suggests educational differences in within-group were relatively unimportant. Most of the growth in inequality is associated with increased within-group inequality that is broadly shared by all demographic groups.

The general rise in within-group variance is shown in Figure 5. The top panel of the figure shows the within-group variance given the schooling of the family head. The within-group variance roughly doubled at each level of schooling. The lower panel of the Figure 5 shows the increase in within-group variance for four family types. Consistent with the idea that two-earner families pool risks and absorb income losses associated with reduced employment better than one-earner families, the within-group variance is lowest for two-adult families with a working mother. Still, within-group inequality increased by between 30 and 100 percent across all family types. By the end of the 1990s, incomes appeared most insecure—within-group inequality was highest—for one-adult families without a working mother.

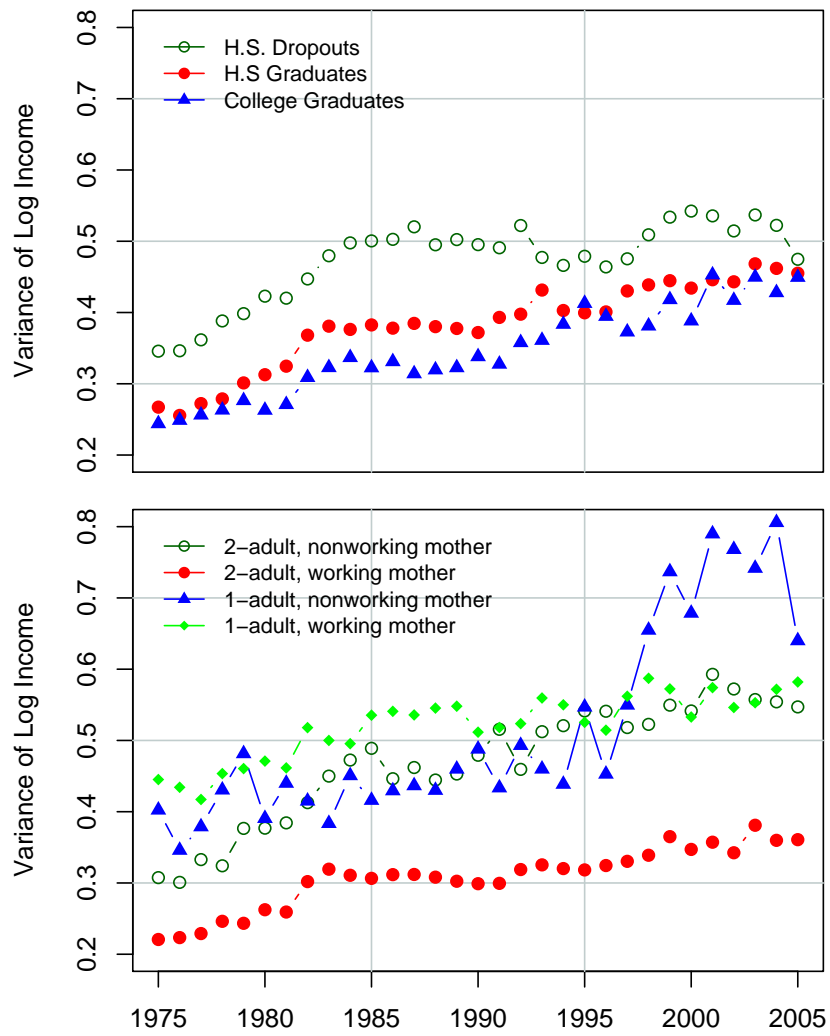


Figure 5. Within-group variances of log family income by education (top panel) and family type (bottom panel). Variances are estimated for families with a white family head, aged 25 to 29, families with children under 18, 1975 to 2005.

Table 4 summarizes the effects of education, family structure, women's employment and within-group inequality for each decade. Changes in educational inequality in incomes accounts for only 12 percent of the increase in variance from 1975 to 2005. Most of this effect is concentrated in the initial period of rising inequality, from 1975 to 1995. The disequalizing effect of educational inequality in incomes is only half as large as the equalizing effect of rising educational attainment. The changing family and economic status of women had larger effects on inequality. The growing share of single-parent families explains a fifth of the increase in family income inequality. During the high inequality plateau, from 1995 to 2005, changes in family structure were actually associated with a small decline in inequality as the fraction of single-parent families modestly fell. The broad disequalizing effects of changing family structure were balanced by the egalitarian effect of rising female employment rates. The most striking source of rising inequality is the dispersion of incomes within demographic groups. Growth in the benchmark within-group variance accounts for over 60 percent of the rise in inequality from 1975 to 2005.

## DISCUSSION

From 1975 to 2005, the variance of incomes of American families with children increased by two-thirds, with the great growth in inequality unfolding before the mid-1990s. Inequality increased more among families with children than among all families, and more than for men's hourly wages. Viewing income inequality as the product of earnings in the labor market and the pooling of incomes in families motivated a decomposition that accounted for family structure, women's employment, and the schooling of family heads.

The decomposition yielded three main findings. First, educational in-

Table 4. Summary of the decomposition of the change in variance in the incomes of families with children, 1975–2005.

	Change in Variance			Percent of Change Explained 1975–2005
	1975–85	1985–95	1995–2005	
Change in income variance	.260	.072	.037	-
<i>Change associated with:</i>				
Educational inequality in incomes	.026 (.008)	.018 (.008)	.002 (.008)	12.4%
Educational attainment	-.050 (.002)	-.048 (.004)	.006 (.006)	-25.0
Percentage of single parents	.068 (.002)	.018 (.003)	-.010 (.003)	20.6
Percentage of employed women	-.041 (.001)	-.051 (.004)	.022 (.004)	-19.0
Benchmark within-group variance	.157 (.013)	.023 (.016)	.051 (.015)	62.5

*Note:* Standard errors in parentheses. The variance in family incomes is calculated from a variance-function regression that also includes the effects of age, race, and ethnicity.

equality and differences in family structure were associated with increased income inequality. Controlling for age, race, and family type, we found a large increase in the income advantage of families headed by college graduates. Increasing educational inequality in incomes explains 12 percent of the growth in overall income inequality. In contrast, rising rates of single parenthood explain about a fifth of the increase in inequality. Though family structure, more than the educational inequality in earnings, is closely associated with the rise in inequality from 1975 to 1995, both effects were small after 1995.

Second, the disequalizing effects of education and single parenthood were cushioned by two other trends. From 1975 to 2005, the proportion of high school dropouts halved while the share of college graduates doubled. Without the educational upgrading from 1975, family income inequality would have increased by more than 80 percent by 1995, 15 points more than the actual increase. The large disequalizing effect of single-parenthood was balanced to a similar extent by growth in women's employment. While fewer than 60 percent of women in families with children worked outside the home in 1975, women's employment rate exceeded 70 percent through the early 2000s. This increase in employment entirely offset the contribution of single-parenthood to increased inequality. The effects of the education gradient and shifts in family structure are eliminated when added to the equalizing effects of educational attainment and the growth in women's employment.

Third, though inequalities in education and family structure have been central to research on incomes, over half of the increase in the variance of family incomes is related to the growth of within-group inequality. Claims of the deinstitutionalization of the American labor market highlighted increasing within-group inequality among low-skill workers (McCall 2000; DiNardo,



Fortin, and Lemieux 1996). However, we found that differences in within-group inequality across levels of schooling, family structures, races or age groups had no appreciable effect on the growth of income inequality. Instead, a broadly-shared increase in residual incomes accounts for most of the rise in family income inequality. The central point is not that the residual variance in incomes is large compared to the explained variance; rather, the residual variance grew more rapidly than inequality across levels of education or family types.

These findings have implications for the likely evolution of American inequality. Because education and family structure affect mobility as well as income inequality, the new American inequality may persist across generations. For example, educational inheritance will tend to reproduce educational inequalities in incomes from one generation to the next. Mobility and inequality may be more tightly linked by family structure. Economic resources and parenting in childhood affects development and later life chances (Duncan and Brooks-Gunn 1997 and Carneiro and Heckman 2004 review the evidence). This helps explain why poverty and family structure are both passed along across generations (Musick and Mare 2006). If poor single-parent families add greatly to income inequality and children in these families are likely to be poor adults, the growth in inequality is also self-sustaining (McLanahan 2004; Esping-Andersen 2007).

The equalizing trends we found may curtail enduring inequality. The increase in educational attainment among family heads suggests that children with low-education parents are gaining more schooling. Similarly, the children of unmarried mothers may be averting poverty by entering the labor market as adults. Increased educational attainment and women's employment may have checked persistent inequality, but the data also showed

that these egalitarian trends abated in the mid-1990s. Arrested increases in employment and education suggest the possibility of further increases in inequality in coming decades.

While parents who are employed and college-educated are doing relatively better, any income protection offered by a job and additional schooling may be undermined by increasing within-group inequality. Increasing schooling or sending family members to work might offer private strategies for maintaining incomes in a period of rising inequality. However, no skill level or family type was spared from the rising heterogeneity of incomes.

Labor market researchers see within-group inequality as reflecting the insecurity of earnings. Our results point to a broadly-based increase in income insecurity that is concentrated neither among low-skill workers nor single-parent families. Some researchers describe “a great risk shift” in which the salient fact of high inequality is not the distance between rich and poor but the novel insecurity of incomes (Hacker 2006; cf. Orszag 2007). From this perspective, family incomes may have become more variable because of increasing variability in the hours worked, because of reduced insurance against poor health or disability or, among poor mothers, because of cycling between employment and public assistance.

Better understanding the growth of within-group inequality among individual workers and among families will likely require a change in research design. Future work could unpack the sources of within-group inequality by following families and individuals over time, studying year-to-year variation in incomes for different periods and cohorts. Demographic change and the declining rewards flowing to low-skill workers explains part of the rise in inequality in family incomes. However, explaining growth in the variability of incomes among people who are demographically similar holds the key to

understanding inequality among families with children, and perhaps, the rise in American inequality more generally.

## APPENDIX

The total variance of family income is the sum of the between-group and within-group variance. The change in the total variance from a baseline year  $b$  to current year  $t$  can be written as the sum of the change in between-group and within-group components,

$$V_t - V_b = (B_t - B_b) + (W_t - W_b).$$

The change in the between-group variance can be written,

$$B_t - B_b = \sum_j (\pi_{tj} - \pi_{bj}) r_{tj}^2 + \sum_j (r_{tj}^2 - r_{bj}^2) \pi_{bj}$$

The first term,  $\sum (\pi_t - \pi_b) r_t^2$ , is the demographic effect—the change in variance due to changes in the distribution of the population across groups,  $(\pi_t - \pi_b)$ . The second term,  $\sum (r_t^2 - r_b^2) \pi_b$ , is the income effect—the change in the variance due to changes in the average incomes,  $(r_t^2 - r_b^2)$ . The change in within-group inequality is similarly decomposed,

$$W_t - W_b = \sum_j (\pi_{tj} - \pi_{bj}) \sigma_{tj}^2 + \sum_j (\sigma_{tj}^2 - \sigma_{bj}^2) \pi_{bj},$$

where the first term gives the demographic effect and the second term gives the income effect.

To calculate the adjusted variance,  $V_2$ , that holds constant the share of single parent families we construct a set of adjusted population weights. If the proportion of single parent families in the baseline year  $b$  is  $p_b$  and in the current year is  $p_t$ , an adjustment factor for single parent families is  $\theta = p_b/p_t$ , and for two parent families,  $\theta' = (1 - p_b)/(1 - p_t)$ . Given population weights,  $\pi_{tj}$ , adjusted weights are calculated as:

$$\pi_{tj}^* = \begin{cases} \theta \pi_{tj} & \text{if } j \text{ is a single parent group} \\ \theta' \pi_{tj} & \text{if } j \text{ is a two parent group} \end{cases}$$

The adjusted weights share the same marginal distribution of single parenthood with year  $b$ , but the conditional distribution of other covariates—age, race, women’s employment and education—are preserved from year  $t$ . Similar weights are constructed to hold constant women’s employment rate, and educational attainment.

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