

How Much Does Change in the Proportion of Children Living in Immigrant Families Contribute to Change in the Poverty Rate among Children?

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ABSTRACT In the midst of the debate over immigration, some argue that the high poverty rate among children in the United States is mainly due to the large number of children who live in poor immigrant families. Using data from the US Current Population Survey, this study investigates how much of the dramatic decrease in the child poverty rate between 1993 and 2001, and the equally dramatic increase between 2001 and 2010, can be attributed to changes in the proportion of children living in immigrant families. The decomposition analyses show that, although children of immigrants placed upward pressure on the child poverty rate during both periods, they played a negligible role in the fluctuations of the rates. Nonetheless, children in noncitizen families and those with longer residency made larger contributions to the child poverty rate than children in naturalized-citizen or newly immigrated families.

Both the number of immigrants and their share of the US population have been on the rise over the past few decades. The immigrant population nearly doubled in size between 1990 and 2007, growing from 19.8 million to 38.1 million (Fortuny and Chaudry 2009). The number of children in native families grew by 1.9 million between 1990 and 2009 (from 53.7 million to 55.6 million), and the number of children in immigrant families increased by 8.5 million (from 8.3 million to 16.8 million), accounting for nearly 82 percent of the total increase in children during this time (Fortuny and Chaudry 2011). The stream of immigrants from Mexico and other Latin American countries grew in the 1990s; by 2007, 59 percent of chil-

dren of immigrants had parents from Latin America (Fortuny and Chaudry 2009; Camarota 2011). As of 2009, immigrants comprised nearly 13 percent of the US population; nearly a quarter of all children came from immigrant families (Fortuny and Chaudry 2009, 2011).

Much of the national debate over immigrants and their children has centered on this population's high incidence of poverty and their use of public services. Studies to date suggest that children in immigrant families are more likely to live in poverty than children in native families (Chitose 2005; Hernandez, Denton, and Macartney 2008; Passel 2011). The child poverty rate rose sharply between 1970 and 1995—from 14.7 percent to 20.4 percent—and more than half of this spike can be attributed to the large increase in number of children of immigrants, especially low-income Mexicans and undocumented immigrants (Ruiz de Velasco, Fix, and Clewell 2000). In 1994, the child poverty rate peaked at 22 percent for the general population (US Census Bureau 2012*b*) but was more than 43 percent for foreign-born children. In the same year, nearly 45 percent of first-generation Hispanic children (the largest subset among children of immigrants) were reported to be poor (Elmelech, McCaskie, and Lennon 2002). In 2003, when the child poverty rate declined to its lowest level in more than 20 years, approximately 54 percent of children of immigrants (compared to 36 percent of children of native-born parents) lived in families with incomes less than twice the federal poverty level (Urban Institute 2006). In 2009, nearly 32 percent of foreign-born children were poor (Macartney 2011); in 2010, 40.2 percent of Hispanic children with foreign-born parents were reported to be living in poverty (Lopez and Velasco 2011). According to Mark Krikorian (2010), of the 14.1 million poor children in the country in 2008, 6 million were children and grandchildren of immigrants, accounting for almost 43 percent of all children in poverty. Based on his calculations, almost all of the 1.8 million increase in the number of children living in poverty (from 12.3 million in 1999) can be explained by an increase of 800,000 children of immigrants and 900,000 Hispanic children with US-born parents (Krikorian 2010).

Because of the growing number of immigrant families and the high incidence of poverty among children living in them, some argue that immigrants—particularly those with low skills and education levels—are the cause of the high poverty rate among US children (Camarota 1999; Rector 2006; Krikorian 2008, 2010). However, a closer look at the literature reveals a much more complex account of child poverty in the United States.

The level of child poverty is determined not only by the proportion of immigrants but also by many other factors, including economic conditions, parental employment and education, family structure, and the composition of the immigrant population (Chapman and Bernstein 2003; Raphael and Smolensky 2009; Peri 2011). In fact, the existing literature suggests that the growing proportion of families headed by immigrants cannot be the sole or the major driving force of the increase in poverty. Rather, the level of child poverty is largely influenced by economic conditions and parental education and employment (Bianchi 1999; Lichter, Qian, and Crowley 2005; Chen and Corak 2008). The composition of the immigrant population has changed as it has grown, making it difficult to isolate the contributions of the growth in the share of children living in immigrant families to the child poverty rate. Overall, the share of naturalized citizens (who are better educated and employed at a higher rate than natives and noncitizens) in the total immigrant population has risen, thus lowering the overall risk of poverty among immigrants (Baker 2007; Passel 2007). Moreover, immigrants who have been in the country for 10 years or more make up a growing share of the total immigrant population. Perhaps not surprisingly then, between 1994 and 2000 immigrant families experienced a larger reduction in the poverty rate than native families (Chapman and Bernstein 2003). The rapid decline of this group's poverty risk more than offsets the potentially negative effects of the increasing share of immigrant families on the child poverty rate (Chapman and Bernstein 2003).

This article investigates how much of the change in the child poverty rate is actually associated with changes in the share of children in immigrant families, and how much is associated with other potential determinants. This study therefore makes an empirical contribution toward unraveling the argument that immigration is either the sole or the most important factor behind fluctuations in the child poverty rate in the United States.

LITERATURE REVIEW

DETERMINANTS OF CHILD POVERTY: ECONOMY, FAMILY, AND EMPLOYMENT

Previous studies identify several major factors that help determine the national child poverty rate: strength of economy, family structure, parental employment, and size of the immigrant population. In general, a robust national economy is negatively correlated with the national poverty rate,

and the unemployment rate and the real wage are indicators of economic strength that are directly related to the working population. In addition, the proportion of single-parent families in the population is positively associated with the national child poverty rate. And, even after controlling for these other factors, studies show that a change in the immigrant population also affects the poverty rate because it influences the percentage of the population with limited education and skills, which are correlated with a high risk of poverty.

Scholars unanimously agree that economic expansion, job growth, high levels of employment, and real wage growth are key in reducing the poverty rate (Blank 2000; Iceland 2003; Lichter et al. 2005). The effect of a strong economy on the child poverty rate was particularly evident in the 1990s (Iceland 2003; Chen and Corak 2008); economic expansion during that period lasted more than 106 months, and job growth—boosted by extremely low unemployment rates and substantial wage growth—helped reduce the poverty rate by providing greater incomes for low-income families (Blank 2000).

Family structure is another important factor in considering poverty, as the risk of poverty is strongly associated with family structure (McLanahan 1985; Lichter and Landale 1995; Lerman 1996; Moffitt 2002). Empirical studies on family structure divide families into two groups—single-earner households and multiple-earner households—and show that the rise in single-mother families accounts for nearly the entire rise in the child poverty rate from 1971 to 1989 (Gottschalk and Danziger 1993; Lerman 1996). Adam Thomas and Isabel Sawhill (2002) and Maria Cancian and Deborah Reed (2002) echo this finding by showing that the child poverty rate would have been statistically significantly lower in the 1990s if the percentage of children in single-parent families had remained constant since 1970. Daniel Lichter, Zhenchao Qian, and Martha Crowley (2006) also estimate that child poverty would have decreased further if family structure had remained stable between 1990 and 2000.

Research also documents the role that parental-education levels and work patterns play in shaping the child poverty rate (Bianchi 1999). In their study, Wen-Hao Chen and Milles Corak (2008) observe that in almost all of the 12 countries in the Organization for Economic Cooperation and Development (OECD), increased maternal employment is a consistent force in lowering the child poverty rate, whereas decreased paternal employment and earnings are forces in raising it. Likewise, research on

the United States suggests that there is a positive correlation between increased maternal employment and the dramatic decline in child poverty during the late 1990s. Lichter et al. (2005) find that the rise in maternal employment during this time accounts for about one-third of the decline in poverty for children in single-mother families. The unprecedented employment growth among single mothers in the 1990s particularly benefited minority and at-risk children, including those living with mothers who had little education (Gunderson and Ziliak 2004; Lichter et al. 2005).

SHARE OF IMMIGRATION AS A DETERMINANT OF THE CHILD POVERTY RATE

There is evidence that the number of immigrants relative to the total population positively affects the poverty rate, because many immigrants have low education levels and lack the skills valued by the US labor market. In reviewing the empirical evidence on the effects of immigration and the national poverty rate, three studies are particularly useful for the present study: Jeff Chapman and Jared Bernstein (2003), Steven Raphael and Eugene Smolensky (2009), and Giovanni Peri (2011). Although none of these studies specifically deals with the potential effect that the share of immigrants has on child poverty, they shed light on the general relationship between immigration and poverty. Chapman and Bernstein (2003) quantify the effects of immigrants on child poverty by distinguishing the “share effect” from the “income effect.” That is, they explain that an increase of immigrants as a share of the population affects the poverty rate (the share effect) but also that the effect can be offset by trends in immigrants’ personal income and poverty status (the income effect). Based on the March Current Population Survey (CPS) of 1994 and 2000, Chapman and Bernstein (2003) show that the poverty rate fell about 4 times faster for recent immigrants compared to natives and 2.7 times faster for all immigrants. Their analysis decomposes the separate contributions of the share and income effects to the overall poverty rate and reveals that the decline in the immigrant poverty rate (the income effect) more than offset the share effect in those years. The net result is that immigration actually lowered the national poverty rate.

A similar study by Raphael and Smolensky (2009) focuses primarily on changes in the native-born poverty rate as affected by labor market competition with immigrants. Because immigrants still compose a minority

of the US population and poor immigrants are a minority of that minority, the compositional effect cannot be large.¹ Using a decomposition technique, Raphael and Smolensky (2009) also quantify the change in the national poverty rate between 1970 and 2005. Their analyses show that although an increase in the share of immigrants tends to increase poverty, the declines in poverty within the immigrant population compensate for those increases. For example, between 1970 and 2005, while the change in the population distribution between natives and immigrants increased the poverty rate by 1.15 percentage points, the changes in poverty rates within these groups reduced the overall poverty rate by 2.09 percentage points, resulting in a net overall decline of .94. The results are similar for all periods between 1970 and 2005, except for 2000–2005, when changes in poverty rates among immigrant and native-born groups brought about a slight net increase in the poverty rate. Nonetheless, the decomposition analyses suggest that immigration has had a modest effect on poverty in recent decades.

Peri's (2011) study, the most recent of the three, simulates the effect of immigration on the poverty rate among native-born children through labor market competition using individual data from the Census and American Community Surveys across skill groups between 1990 and 2000, and between 2000 and 2009. According to Peri's study, immigration had a negligible connection to the national poverty rate for all parameters chosen for his simulations in the periods above. For instance, the proportion of immigrants is associated with a very small reduction in the poverty rate (0 to .51 percent) between 2000 and 2009. Considering the change in the poverty rate during the 2000s, the increased proportion of immigrants in the population appears to have a poverty-reducing effect ranging from .07 to .12 percent for natives as a whole. The change is slightly larger for women (ranging from .07 to .13 percent) than for men (ranging from .08 to .09 percent). Overall, however, Peri's results suggest that immigration does not have much influence on native-born poverty at the national level.

RESEARCH HYPOTHESES

The literature points to two important factors on which this study focuses in examining the relationship between the child poverty rate and the changing proportion of children of immigrants to all children. First, I

1. Approximately 12 percent of all US residents were immigrants in 2005, and less than 18 percent of the immigrants were in poverty in the same year (Raphael and Smolensky 2009).

hypothesize that the change in the share of children in immigrant families did not play a major role in the dramatic changes in the child poverty rate in the 1990s and the 2000s. As stated above, the child poverty rate was at its highest in the early 1990s but declined to a record low at the end of the decade after years of economic expansion. The rate increased again throughout the 2000s, particularly in the late 2000s. Although economic expansion during the mid- and late 1990s accelerated the reduction in the poverty rate among immigrants, the Great Recession in the late 2000s slowed down their progress relative to the general population because immigrants are historically more vulnerable in a weakened labor market (Kim and Tebaldi 2009). This study pays close attention to the dramatic decline in the child poverty rate from 1993 to 2001 and the dramatic increase from 2001 to 2010. Consistent with the findings of prior research, I hypothesize that the change in the share of children of immigrants in the population makes only a minor contribution to changes in the child poverty rate.

Second, the analysis focuses on the relationship between the share of children with immigrant parents and the child poverty rate, hypothesizing that it differs by parental citizenship status and years of US residence. As stated above, not all children of immigrant families face a higher risk of poverty than children of native-born parents, placing upward pressure on the national child poverty rate. Although the poverty rate among new immigrants declines quickly with time in the country and acquisition of citizenship (Passel 2007; Raphael and Smolensky 2009; DeNavas-Walt, Proctor, and Smith 2011), few empirical studies include parental citizenship status and years of US residence in decomposition analysis (e.g., Van Hook, Brown, and Kwenda 2004). This study hypothesizes that children of parents who are naturalized or have lived in the United States for 10 years or more contribute to a reduction in the poverty rate, whereas children of parents who are not citizens, or have fewer years of residence, contribute to an increase in the poverty rate.

METHODS

DATA AND SAMPLE

This study uses the Annual Social and Economic Supplement to the Current Population Survey. The CPS is an annual survey conducted by the US Census Bureau that provides data about demographic characteristics, previous year's income from all sources, work experience, geographic mobility, poverty, and immigration status from a sample of approximately 65,000

households. The CPS is an ideal source for this study because it has been collecting data on a large group of foreign-born individuals since 1994, making it possible to monitor changes in the poverty rate. The CPS also provides information on participants' nativity, citizenship, and year of entry into the United States. One limitation of the CPS, however, is that it does not allow researchers to identify the legal status of immigrants, although it includes undocumented immigrants in the sample.² It would have been ideal to distinguish children of legal noncitizens from children of undocumented immigrants, who are more likely to be in poverty (Kanaiaupuni 2000), but the data limitations made such a distinction impossible. Because the CPS does include undocumented immigrants, the sample of children chosen for this study also includes undocumented foreign-born children and US-born children of undocumented immigrants. Therefore, this study is able to include all types of immigrant families in estimating the effects that immigrants have on the national child poverty rate. Nevertheless, families with undocumented immigrants may be underrepresented because they tend to be reluctant to reply to surveys (Passel, Cohn, and Gozales-Barrera 2012).

I chose to investigate the recent fluctuations in the child poverty rate by studying 3 years: 1994, 2002, and 2011. Note that because the CPS asks respondents about income from the previous year, the CPS poverty statistics refer to the year prior to the survey (i.e., 1993, 2001, and 2010), while all demographic statistics come from the survey itself and thus refer to the years 1994, 2002, and 2011. In 1994, the child poverty rate was at its highest since the mid-1970s, and nativity and citizenship information became available in the CPS. In 2002, the child poverty rate dropped to its lowest in decades, after years of economic expansion in the late 1990s. And 2011, the most recent year available, selects the escalating poverty rate since the Great Recession of the late 2000s. These 3 years, therefore, were chosen to mark the ups and downs of the national poverty rate over the past 2 decades.

The sample for this study is composed of children under age 18 who meet the following criteria. First, each child must be the reference person's

2. According to the most recent estimation by Jeffrey Passel (2011, 27–28), the number of these children is quite considerable: they constitute about 30 percent of all immigrant youth, with undocumented foreign-born children accounting for about 6 percent of immigrant youth and the US-born children of undocumented immigrants making up about 24 percent. About 80 percent of the unauthorized immigrants are from Mexico or other parts of Latin America, and most of the children of unauthorized immigrants are Latino.

own child, grandchild, or relative.³ Children whose parents' information is missing and children living in households with other family relationships or nonrelatives, such as foster children, are not included in the sample because their families' nativity, citizenship status, or years of residence in the United States could not be identified. A very small percentage of children in native-born families whose reference person or spouse was born outside the country (e.g., native but born in Puerto Rico or other outlying areas) are also excluded from the sample. A total of 260,205 children were chosen: 64,450 in 1994, 106,950 in 2002, and 88,805 in 2011.

VARIABLES AND MEASURES

The dependent variable is poverty, defined as living below 100 percent of the federal poverty guidelines based on family size, as set forth by the Department of Health and Human Services. For a four-person family, the poverty guideline was set at \$14,350 for 1993, \$17,650 for 2001, and \$20,050 for 2010 (US Department of Health and Human Services 2012).⁴ The explanatory variables include immigration status (nativity, citizenship, and years of residence in the United States), demographic information (age of the reference person, age of children, race of children, number of children in the family, and family structure), parents' human capital (educational attainment and employment status), and regional economic indicators (state unemployment rate and region of residence).

I divided children into five categories representing family immigration status, based on a combination of the reference person's (not the child's) nativity, citizenship, and years of residence in the country (and the spouse's information, if married). Nativity is determined with the CPS question about country of birth. CPS further classifies reference persons and their spouses who were born outside the United States into either naturalized citizens or

3. The decision to use the reference person rather than the parent of a child was made due to a limitation in the CPS. Because the CPS data identified only one parent on a child's record before 2007, a second parent could not be identified unless he or she was married to the first parent (Federal Interagency Forum on Child and Family Statistics 2011, 2). An attempt to match fathers, mothers, and children in 1994 and 2002 CPS data files resulted in the loss of a large number of children (e.g., children living with cohabiting couples and those not living with parents, etc.). The CPS began including pointers that allow for data line identification of both parents within a household in 2007, which permit matching of two cohabiting parents regardless of their marital status.

4. The dollar values are for the calendar years.

noncitizen immigrants. I calculated approximate years of residence in the United States for these two subgroups based on their year of entry. Following the existing studies, immigrants with fewer than 10 years of residence in the country are classified as recent immigrants (e.g., Van Hook et al. 2004). Children are classified as native-born if their reference person and spouse (if married) are both native-born. Children living with at least one immigrant adult (the reference person and possibly his or her spouse) are defined as living in immigrant families. Therefore, the five categories are as follows: natives, naturalized citizens with at least 10 years of residence in the country, naturalized citizens with fewer than 10 years of residence in the country, noncitizens with at least 10 years of residence in the country, and noncitizens with fewer than 10 years of residence in the country.

The demographic variables include children's age (0–5, 6–12, and 13–17 years) and race and ethnicity (white, black, Hispanic, and other). Also included are family characteristics, including the age of the reference person (younger than 30, 30–39, 40–49, and 50 years or older), family structure (single parent or two parents), highest educational attainment of either the reference person or spouse (less than high school, high school diploma, some college, or college degree or more), number of children under age 18 (one, two, three, or four or more), and employment status. To avoid confounding family structure with hours of paid work per family, the employment status of a family measures whether the head and the spouse of a family together work at least 1,820 hours annually, equivalent to full-time year-round hours of work as defined by the US Department of Labor (1,820 hours = 35 hours per week × 52 weeks; US Department of Labor 2007).

In order to gauge the strength of local economies, I merged annual state unemployment rates for the years 1993, 2001, and 2010 from the US Department of Labor with the CPS microdata. Eight dummy variables that measure regional divisions are included (i.e., New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, and Mountain Divisions) to help control for geographical differences in unobservable determinants of child poverty (US Census Bureau 1994).

STATISTICAL ANALYSIS

This study uses the nonlinear decomposition technique developed by Robert Fairlie (1999, 2005), who extends the standard Blinder-Oaxaca decom-

position designed for a linear regression. The technique is typically used to decompose changes over time or differences between two groups into various explanatory factors (Fortin, Lemieux, and Firpo 2010). In this case, the technique partitions changes in the child poverty rate between the periods into two components: changes attributable to shifts in population composition (e.g., the proportion of children of immigrants in the population) and changes attributable to shifts in the poverty risk of population subgroups, which could be due to many factors, including changes in social and economic contexts (e.g., discriminatory practices in the labor market; Fairlie 1999, 2005). Such factors remain largely unexplained, however, in part due to the inability to include unobservable variables. This study therefore pays close attention to the first component (changes explainable by the populations' demographic composition) and intends to test whether changes in the share of children in immigrant families made a substantial contribution to changes in the child poverty rate during the periods under study and, if so, by how much.

In the decomposition analyses below, the relationship between the share of immigrants in the population and the change in the child poverty rate was estimated using a logistic regression analysis at the individual level.⁵ I obtained the coefficients of explanatory variables (e.g., being an immigrant) in the model and the probability of living in poverty by logistic regression. These coefficients were then used, with the population means, to simulate the counterfactual child poverty rates that would answer the question of what would have happened to the poverty rate if, say, in 2001 the demographic composition and the risk of poverty remained the same as in 1993 but the share of immigrants in the population changed between the years. An answer to this question provides insight into how change in the proportion of immigrants is associated with change in the poverty rate (Dickens and Ellwood 2003).

Following the guidelines offered by Fairlie (1999, 2005), decomposition was conducted in the following steps. Using the change between 1993 and 2001 as an example, the first step estimated the logit model of the probability of living in poverty, regression coefficients, and the predicted probabilities for both years (1993 and 2001) separately. After sorting both years

5. Analyses did not adjust standard errors for nonindependence due to the clustering of children within families. This study used a sample of more than 260,000 children from more than 110,000 family households. Because of the large number of household clusters, the standard errors with and without clustering were nearly identical.

of data by predicted probabilities and merging them into one data file, I switched the variable distributions from 1993 to 2001 to calculate the mean predicted probability for each variable switch.⁶ This simulation process was repeated 100 times to obtain nonbiased estimates of the mean predicted probabilities. It is important to note that in the process of each variable switch, two specifications of analyses were conducted because the regression coefficients (i.e., risks of poverty) could be held constant at either 1993 or 2001 (as shown in tables 4 and 5). The last step calculated the estimated contributions of each variable based on changes in the mean predicted probabilities between the 2 years, as well as the percent contribution of each variable out of total change in the poverty rate. The same steps were followed to decompose change in the child poverty rate between 2001 and 2010.⁷ The results of this process provide an estimate of the contribution that the change in immigrant distributions made to the child poverty rate, relative to the contributions made by changes in other variables.

FINDINGS

SAMPLE CHARACTERISTICS: DISTRIBUTION BY FAMILY NATIVITY, CITIZENSHIP, AND YEARS OF RESIDENCE

As table 1 shows, the percentage of children in immigrant families increased rather dramatically during the period under study, from 16.0 percent in 1993 to 20.2 percent in 2001, and 24.2 percent in 2010. All percent changes except one (the change between 2001 and 2010 for children in noncitizen families with less than 10 years of residence) are statistically significant at the .001 level. In general, these descriptive findings are in line with the findings reported by Passel (2011) in his examination of the demographic profiles of children in immigrant families. The current study finds that of all the children in immigrant families, the subgroup com-

6. The results of this study should not be considered as causal statements. A decomposition analysis is not an attempt to identify causal relationships between the explanatory variables and child poverty rates but to offer insights into how changes in the explanatory variables are associated with changes in rates of child poverty. In addition, a decomposition approach does not answer how the explanatory variables included in the model are correlated with each other. Neither does it examine the total effect of a change taking account of those correlations.

7. For further information on the decomposition analysis conducted in this study, please refer to appendix 1.

TABLE 1. Percentage Distributions of Children by Year and Family Nativity and Citizenship Status, Weighted

	1993 (<i>n</i> =64,450)	2001 (<i>n</i> =106,950)	2010 (<i>n</i> =88,805)	Percent Change (1993– 2001)	Percent Change (2001– 2010)
Native born	84.02	79.82	75.76	−5.00***	−5.09***
Immigrants	15.98	20.18	24.24	26.28***	20.12***
Naturalized citizens (at least 10 years)	8.09	11.07	13.46	36.84***	21.59***
Naturalized citizens (less than 10 years)	1.16	1.54	1.82	32.76***	18.18***
Noncitizens (at least 10 years)	4.61	5.07	6.53	9.98***	28.80***
Noncitizens (less than 10 years)	2.12	2.49	2.43	17.45***	−2.41

* $p \leq .05$.** $p \leq .01$.*** $p \leq .001$.

posed of those living with at least one established, naturalized adult citizen is the fastest growing subgroup. This segment represented 8.1 percent of all children in 1993 and increased to 11.1 percent in 2001, and to 13.5 percent in 2010. Comparatively, the growth of other subgroups remained small and relatively stable. For example, 4.6 percent of all children in 1993 and 6.5 percent of all children in 2010 were from noncitizen, established immigrant families. Only 2–2.5 percent of all children were from noncitizen, recent immigrant families who lived in the country fewer than 10 years.

Table 2 shows that the child poverty rate fluctuates from 21.7 percent in 1993 to 14.9 percent in 2001, back to 21.1 percent in 2010. When the rate is analyzed according to immigration and citizenship status, it shows that children in naturalized, established immigrant families experienced a lower rate of poverty than children in native families in 1993 (18.6 percent vs. 20.1 percent, $p < .01$) and 2001 (12.7 percent vs. 13.5 percent, $p < .05$). In 2010, however, their poverty rates were nearly identical at around 18.5 percent. These descriptive statistics on the level and trend of child poverty are generally consistent with the findings reported by prior research (Van Hook et al. 2004; Wight, Tampi, and Chau 2011; US Census Bureau 2012a), which suggests that, as opposed to children in naturalized families, children in noncitizen families experience poverty at a much greater rate. The child poverty rate in noncitizen, established immigrant families and the rate in noncitizen, recent immigrant families in 1993 were

TABLE 2. Child Poverty Rate by Year and Family Nativity and Citizenship Status, Weighted

	1993	2001	2010	Percent Change (1993–2001)	Percent Change (2001–2010)
All	21.74	14.87	21.07	–31.60***	41.69***
Native-born	20.10	13.49	18.49	–32.89***	37.06***
Naturalized citizens (at least 10 years)	18.59	12.73	18.53	–31.52***	45.56***
Naturalized citizens (less than 10 years)	30.56	19.45	29.17	–36.35***	49.97***
Noncitizens (at least 10 years)	43.56	31.58	45.43	–27.50***	43.86***
Noncitizens (less than 10 years)	46.58	31.81	44.22	–31.71***	39.01***

Note.—Because income data in the CPS refer to the previous years of surveys, the analyses show poverty rates for 1993, 2001, and 2010 for the data files of 1994, 2002, and 2011 CPS supplements.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

43.6 percent and 46.6 percent ($p < .10$), respectively. Although poverty rates for both groups of children decreased to around 31 percent in 2001, they bounced back to nearly 45 percent in 2010. Table 2 shows that although children in naturalized families may escape from poverty as their families stay longer in the country, this might not necessarily be the case for children in noncitizen families. For naturalized families, the child poverty rate in established immigrant families was significantly lower than the rate in recent immigrant families in 2010 (29.2 percent vs. 18.5 percent, $p < .001$), for example. For noncitizen families, however, the difference in commensurate rates was not significant (44.2 percent vs. 45.3 percent).

CHANGES IN CHILDREN’S DEMOGRAPHIC COMPOSITIONS, BY FAMILY NATIVITY AND CITIZENSHIP STATUS

Table 3 shows the general trends in the demographic composition of children during the study period. Compared to 1993, a higher percentage of children in 2001 were between the ages of 6 and 12 years and 13 and 17 years. The 2010 sample had a higher percentage of older reference persons with 16 percent at 50 or older, up from 12 percent in 2001.

The racial composition of children became much more diverse during the 2 decades under study. The proportion of white children in the child population was around 70 percent in 1993 but dropped to 65 percent in 2001 and 58 percent in 2010. Meanwhile, Hispanic children made up 12 percent of the population in 1993 and increased to 21 percent in 2010. Similarly, those in the category “other race” almost doubled their share over the same period, from 4.1 percent to 8.2 percent. Regarding shifts in edu-

TABLE 3. Demographic Characteristics of Children, Weighed

	1993	2001	2010	Percent Change 1993–2001	Percent Change 2001–2010
Age of child (years):					
0–5	34.04	30.81	31.82	–9.49***	3.28***
6–12	37.36	38.07	37.27	1.90**	–2.10***
13–17	28.60	31.12	30.91	8.81***	–.68
Age of reference person (years):					
Younger than 30	15.73	14.51	14.03	–7.76***	–3.31**
30–39	42.57	39.40	36.98	–7.45***	–6.14***
40–49	28.58	34.07	33.01	19.21***	–3.11***
50 or older	13.11	12.02	15.99	–8.31***	33.03***
Race/ethnicity of child:					
White	69.16	65.16	57.84	–5.78***	–11.23***
Black	14.73	14.19	12.97	–3.67***	–8.60***
Hispanic	12.02	15.17	21.04	26.21***	38.70***
Other	4.09	5.48	8.15	33.99***	48.72***
Parental education:					
Less than high school	11.82	9.87	9.36	–16.50***	–5.17***
High school diploma	27.97	24.41	21.31	–12.73***	–12.70***
Some college	30.18	29.64	28.64	–1.79*	–3.37***
College degree or more	30.03	36.08	40.69	20.15***	12.78***
Number of child(ren):					
1	25.20	25.58	26.50	1.51 ⁺	3.60***
2	39.85	39.87	39.12	.05	–1.88***
3	18.55	17.70	17.50	–4.58***	–1.13
4	16.40	16.85	16.88	2.74***	.18
One-parent family	26.00	26.82	29.92	3.15***	11.56***
At least 1,820 hours of annual work	76.88	83.88	77.33	9.11***	–7.81***
Region of residence:					
New England	4.68	4.53	4.51	–3.21	–0.44
Middle Atlantic	13.54	12.89	12.18	–4.80***	–5.51***
East North Central	17.45	16.18	15.44	–7.28***	–4.57***
West North Central	7.15	6.98	7.00	–2.38	.29
South Atlantic	16.61	17.73	18.28	6.74***	3.10**
East South Central	6.09	6.30	6.02	3.45 ⁺	–4.44*
West South Central	11.87	11.95	12.81	.67	7.20***
Mountain Division	6.08	7.02	7.74	15.46***	10.26***
Pacific	16.53	16.41	16.02	–.73	–2.38*
State unemployment rate:					
Mean	6.85	4.75	9.45	–30.66***	98.95***
Median	7.00	4.80	9.30	–31.43***	93.75***

⁺ $p \leq .10$.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

cation levels, the share of children whose reference person or reference person's spouse had at least a college degree rose from 30.0 percent in 1993 to 36.1 percent in 2001 and 40.7 percent in 2010. At the same time, the percentage of children whose reference person or reference person's spouse had a high school education or less decreased over time.

Additionally, the percentage of children whose families worked full-time year-round went from 77 percent in 1993 to 84 percent in 2001 (see table 3). The high level of full-time year-round employment in 2001 reflects the exceptionally low average state unemployment rate of 4.8 percent in that year. The percentage of children in full-time year-round working families, however, dropped to 77.3 percent in 2010 when the average state unemployment rate increased to more than 9 percent. The share of children living in one-parent families gradually increased, from 26 percent in 1993 to 26.8 percent in 2001 and 29.9 percent in 2010. Contrary to these compositional changes, the number of children in immigrant families remained relatively stable over time, as did their regions of residence. There were substantial changes in the demographic composition among children during the period, and the following decomposition analyses suggest how these changes contributed to fluctuations in the overall child poverty rate.

LOGISTIC REGRESSION OF CHILD POVERTY BY YEAR

Separate logistic regression models of the likelihood of child poverty that are run by year examine the major factors explaining rates of child poverty and their year-to-year changes (results are shown in appendix 2). I used the coefficient estimates from these models to gauge whether there are year-to-year differences in the risk of poverty and then to calculate the contributions of changes in demographic compositions as related to changes in the child poverty rate. Although all variables entered in the regression models are statistically significant at the .05 level, child poverty is most strongly associated with parental education and family structure for all 3 years. For 1993, the odds of being in poverty for children with adults with less than a high school education was nearly 500 percent higher than the odds for those living with college-educated adults. Also, the odds of living in poverty for children in one-parent families was more than 300 percent higher than the odds for those in two-parent families. In 1993, children in established immigrant, naturalized families experience about a 25 percent higher risk of living in poverty than children with native-born parents. Yet children in recent immigrant, noncitizen families had nearly 187 percent higher odds of living in poverty in the same year compared to those with native-born parents. Essentially, this analysis provides evidence

that children in immigrant families are significantly more likely to live in poverty than those in native families.

The logistic regressions indicate that there are some year-to-year differences in the poverty risk for children. The risk of living in poverty for all children in immigrant families decreased slightly between 1993 and 2001 but bounced back higher in 2010. The risk of poverty associated with living in one-parent families fluctuates in a similar pattern, declining slightly from 1993 to 2001 and going back up in 2010. On the other hand, for children living with adults who have less than a college education, the overall risk of poverty increased from 1993 to 2010. Additionally, children in the other racial category had a higher risk of poverty in 2001 and a lower risk in 1993 and 2010 than white children.

As stated above, the changes in poverty risk between the years account for a part of the changes in the poverty rate between 1993 and 2001 and between 2001 and 2010. The remaining part of the change in the rate of child poverty should be at least partially due to changes in the composition of the population, including the share of children living in immigrant families. The decomposition analyses conducted here are an attempt to tease out the contribution made by the changes in the share of children of immigrants to changes in the child poverty rate.

DECOMPOSITION ANALYSES OF CHANGES IN THE CHILD POVERTY RATE

Table 4 reports the results of decomposition analyses, which estimate if and by how much changes in the share of immigrants contribute to changes in the child poverty rate based on the available data. In decomposing the change in the child poverty rate between 1993 and 2001, results from two scenarios are presented: one using the logits from the logistic regression of the 1993 poverty rate (results shown in table 4, col. 2) and the other using the logits from the regression of the 2001 poverty rate (results shown in table 4, col. 3). Similarly, in decomposing the change in the child poverty rate between 2001 and 2010, the procedure uses separate logits from logistic regressions of the 2001 and 2010 poverty rates (results shown in table 4, cols. 4 and 5).

The finding reported in the row number 8 of table 4 indicates that if 1993 had the same demographic composition as 2001, the child poverty rate

TABLE 4. Decomposition of Changes in the Child Poverty Rate

Sample Used for Coefficient ^a (1)	1993–2001		2001–2010	
	1993 (2)	2001 (3)	2001 (4)	2010 (5)
Estimated poverty rate	21.40	13.67	13.67	19.11
Change in the poverty rate	- 7.73		5.44	
Contribution to the change in poverty rate due to changes in the following variables: ^b				
1. Control variables ^c	-1.32 (-17.13)	-1.08 (-14.04)	-1.22 (-22.38)	-1.28 (-23.60)
2. Race of child	-.72 (-9.30)	-.54 (-7.02)	.19 (3.52)	.10 (1.92)
3. One-parent family	-2.65 (-34.22)	-2.10 (-27.24)	-.29 (-5.28)	-.30 (-5.48)
4. Parental education	-.81 (-10.53)	-.76 (-9.91)	-.94 (-17.29)	-1.03 (-19.00)
5. At least 1,820 hours of annual work	.22 (2.85)	.62 (8.04)	1.95 (35.88)	1.80 (33.02)
6. Nativity/citizenship/years in United States	-.24 (-3.13)	-.12 (-1.61)	.20 (3.68)	.48 (8.81)
7. Unemployment/regional division	10.73 (138.86)	7.92 (102.57)	2.84 (52.16)	3.56 (65.33)
8. All variables: ^d (1+2+3+4+5+6+7)	5.21	3.94	2.74	3.32
9. Explained part of change in the poverty rate by all variables: [(8/change in the poverty rate)] × 100	67.40	50.79	50.29	60.99

^a Two specifications are performed to decompose change in the child poverty rate between the 2 years, each using the regression coefficients of 1 year at a time. The second and third columns present decomposition results using the logits from the logistic regressions of the 1993 and 2001 poverty rates, respectively. The fourth and last columns are decomposition results using the logits from the logistic regression of the 2001 and 2010 poverty rates, respectively.

^b The contribution of each variable to the poverty rate change is presented in two rows, using two metrics: The top row is the contribution to the child poverty rate and the second row is the contribution as a percent of the change in the child poverty rate. For example, “race of child” contributes $-.79$ to the child poverty rate, which is -9.3% of the total (-7.73) change in the child poverty rate between 1993 and 2001 (the percentages are not exact due to rounding).

^c Control variables include age of child, age of reference person, and number of children in the family.

^d The numbers in the row show the total contribution of all variables in poverty rate.

between the years would have declined by 5.2. This means that the demographic changes between 1993 and 2001 included in the model account for 67.4 percent of the total reduction in the child poverty rate between the years (see last row in table 4). Conversely, if 2001 had the same demographic composition as 1993, the rate would have dropped by 3.9, accounting for approximately 51 percent of the total reduction in the rate between the years. The remaining results provide the estimated contribu-

tions of each demographic composition to the reduction of child poverty rate between 1993 and 2001 (shown in table 4). Except for changes in local labor market conditions and the percentage of children living in families with full-time year-round employment, all other demographic composition changes actually suppressed the reduction in the child poverty rate. Although there was only a small increase in the percentage of single-parent families between 1993 (26 percent) and 2001 (26.8 percent), the results show that the increase suppressed the reduction in the child poverty rate by between 27 percent and 34 percent, depending on the estimates.

This article's central finding is that, while the increase in the percentage of children in immigrant families from 1993 to 2001 suppressed the reduction in the child poverty rate, the increase explained only about 1.6 and 3.1 percent of the total reduction. This finding is in line with findings from the previous studies discussed above, which report minor or negligible effects of immigration on overall national poverty rates. The results as a whole suggest that the most important determinant of the reduction in child poverty rate between 1993 and 2001 was local economic conditions, which explains between 103 and 139 percent of the total reduction. This means that if there had been no factors in addition to economic conditions that deterred poverty decline, the rate would have dropped even more than the actual decline.

Columns 4 and 5 of table 4 display the analysis of the increase in the child poverty rate between 2001 and 2010. According to the findings, changes in the demographic and economic condition variables account for about 50 and 61 percent of the total increase, respectively, in the child poverty rate between 2001 and 2010. Of all the factors associated with changes in child poverty rate, local economic conditions explain between 52 and 65 percent of the increase, and the percentage of children living in families with full-time year-round hours of paid work explain between 33 and 36 percent of the increase. The increased percentage of children in immigrant families contributes to the increase in the child poverty rate between 2001 and 2010 but to a fairly minor extent; if 2001 had the same percentage of children in immigrant families as 2010, while holding the rest of the demographic composition factors constant, the child poverty rate would have increased by only .2. Conversely, if 2010 had the same percentage of children in immigrant families as 2001, the rate would have risen by .5. In other words, the increase in the percentage of children in

immigrant families between 2002 and 2011 only contributes between 3.7 and 8.8 percent to the total rise in the child poverty rate during the period.

DETAILED DECOMPOSITION ANALYSES: IMMIGRANTS
BY CITIZENSHIP AND YEARS OF RESIDENCE

To take a closer look at the contribution of children in immigrant families to changes in the child poverty rate, I conducted decomposition analyses that divide children of immigrants into categories based on their families' citizenship status and years of US residence. The overall results show that all children in immigrant families, regardless of the families' citizenship status and years of US residence, suppressed the decline in the poverty rate between 1993 and 2001 and helped to increase the rate between 2001 and 2010. As table 5 presents, not surprisingly, children in naturalized families contribute less to changes in the child poverty rate than those in noncitizen families. For example, the increase in the percentage of children in naturalized families explains between .7 and 1.0 percent of the total decline in the child poverty rate between 1993 and 2001, smaller than the contribution (between 1.0 and 2.1 percent) made by children in noncitizen families. However, because the increase of children in naturalized families is larger than in noncitizen families (e.g., 12.6 vs. 7.6 percent in 2010), the findings suggest that each child in noncitizen families exerts a greater influence in hindering the decline in the child poverty rate than his or her counterpart in naturalized families. The last two columns of table 5 show a similar trend. Children in noncitizen families, with a smaller increase in the share of the population, made a greater contribution to the dramatic increase in the child poverty rate between 2001 and 2010 than children in naturalized families. The increase in the percentage of children in naturalized families explains between 1.1 and 3.9 percent of the total increase in the child poverty rate, whereas the increase in the percentage of noncitizen families explains between 2.6 and 5.0 percent of the total increase.

The bottom four rows of table 5 present the results of decomposition analyses that examine the relationship between changing percentages of children in immigrant families and changes in the child poverty rate, by parental citizenship status and years of US residence. Among children of naturalized citizens, children whose families lived in the United States for

TABLE 5. Detailed Decomposition of Changes in the Child Poverty Rate by Family Citizenship and Years of US Residence

Sample used for coefficient ^a	1993–2001		2001–2010	
	1993	2001	2001	2010
Contribution to the change in poverty rate due to changes in the following variables ^b				
Nativity/citizenship/years in US	-.24 (-3.13%)	-.12 (-1.61%)	.20 (3.68%)	.48 (8.81%)
Naturalized citizens	-.08 (-1.01%)	-.05 (-.66%)	.06 (1.05%)	.21 (3.86%)
Noncitizens	-.16 (-2.12%)	-.07 (-.95%)	.14 (2.63%)	.27 (4.95%)
Naturalized citizens (at least 10 years of residence)	-.049 (-.64%)	-.037 (-.47%)	.031 (.58%)	.140 (2.60%)
Naturalized citizens (less than 10 years of residence)	-.029 (-.37%)	-.014 (-.18%)	.026 (0.47%)	.068 (1.25%)
Noncitizens (at least 10 years of residence)	-.071 (-.91%)	-.049 (-.64%)	.110 (2.05%)	.240 (4.32%)
Noncitizens (less than 10 years of residence)	-.090 (-1.20%)	-.024 (-.31%)	.031 (.58%)	.035 (.63%)

^a Two specifications are performed to decompose change in the child poverty rate between the 2 years, each using the regression coefficients of 1 year at a time. The second and third columns present decomposition results using the logits from the logistic regressions of the 1993 and 2001 poverty rates, respectively. The fourth and last columns are decomposition results using the logits from the logistic regression of the 2001 and 2010 poverty rates, respectively.

^b The contribution of each variable to the poverty rate change is presented in two rows: The top row is the contribution to the child poverty rate and the second row is the contribution as a percent of the change in the child poverty rate. For example, “naturalized citizen” contributes $-.08$ to the child poverty rate, which is approximately -1.01% of the total change (-7.73) in the child poverty rate between 1993 and 2001.

at least 10 years play a very slightly larger role in explaining changes in the poverty rate than those whose families are recent immigrants: they suppressed the decline in the poverty rate between 1993 and 2001 and helped to increase the rate between 2001 and 2010 slightly more than their counterparts in recent immigrant families. This is most likely because established immigrant families represent a much larger and faster growing group than recent immigrant families. Among children in noncitizen families, children in families with at least 10 years of US residence also contribute more to fluctuations in the child poverty rate, compared with children in recent immigrant families, particularly in the 2001–2010 period.

Of all children in immigrant families, an increase in the percentage of children in noncitizen families that lived in the United States for at least

10 years made the largest contribution to changes in the child poverty rates during the periods under study. The group grew by nearly 29 percent during the 2000s (see table 1), explaining between 2.1 and 4.3 percent of the total increase in child poverty rate between 2001 and 2010. Nevertheless, in all cases, contributions to explained variance are low, suggesting that the percent increase of children in immigrant families cannot be credited as the primary factor explaining fluctuations in the child poverty rates during the periods under study.

DISCUSSION AND IMPLICATIONS

This study contributes to the growing literature on the relationship between immigration and child poverty by unpacking the contributions that changes in the composition of the immigrant population make to changes in the child poverty rate. First, the overall relationship between increases in children living in immigrant families and the national child poverty rate is weak, as hypothesized. This study provides evidence that the increasing proportion of children in immigrant families is not the primary cause of fluctuations in the child poverty rate, as some scholars argue (e.g., Rector 2006; Krikorian 2010). In fact, additional decomposition analysis shows that much of the changes in the child poverty rate during the study periods are attributable to changes in poverty risks, rather than changes in population composition (see appendix 3 for more detail). The findings indicate that the strength of the economy and parental employment status account for most of the decline in the child poverty rate from 1993 to 2001 and most of the increase from 2001 to 2010. Compared to the contributions of these economic factors, the increase of children in immigrant families as a share of the child population appears to play a very minor role in the child poverty rate. Nevertheless, the findings do not mean that immigration does not contribute to the rise and fall of the child poverty rate. The present analyses suggest that the share of children in immigrant families is related to the child poverty rate but is not the root of child poverty, as is suggested in public discourse (e.g., Rector 2006; Krikorian 2010).

This study also finds that the relationship between the share of children in the US population living in immigrant families and the child poverty rate does not differ by parents' citizenship status and years of US residence. I hypothesized that children of immigrant parents who are nat-

uralized or have lived in the United States for more than 10 years would contribute to a decrease in the child poverty rate, whereas children of immigrant parents who are not citizens or have fewer years of residence would contribute to an increase in the poverty rate. Contrary to these hypotheses, the findings reveal that children in all types of immigrant families may have played a role in suppressing the decline in the poverty rate from 1993 to 2001 and in contributing to the increase from 2001 to 2010, regardless of parental citizenship and years of US residence. That is, although the contribution that children in immigrant families made to the fluctuations of the child poverty rate is very small, all of them contributed to raising it. It is notable that children in immigrant families with 10 years or more of US residence made a greater contribution to the rise and fall of the child poverty rate than children in families with shorter residency, despite their low risk of poverty (particularly in the case of those in naturalized families, shown in table 2). This appears to be because they not only composed much larger shares of all children in immigrant families in all 3 years under study, but their share also increased at higher rates between the years, compared to children in recent immigrant families, as shown in table 1.

The findings of this study also suggest that, relative to their much smaller share in the population, children in noncitizen families with at least 10 years of US residence made a greater contribution to change in the child poverty rate than their counterparts in naturalized families; each child in a noncitizen family exerts a greater influence on the change in the poverty rate compared to her counterpart in a naturalized family because of his or her higher vulnerability to poverty. Nevertheless, the overall findings of this study clearly show that it is not children in noncitizen families that drive up the national child poverty rate: children living in immigrant households in general contribute to fluctuations in the child poverty rate only slightly. Again, in the current study, the major factors that drive changes in the child poverty rate are local labor market conditions and parental employment.

The findings of this study should be considered with certain limitations in mind. First, the study is not able to separate children of undocumented immigrants from those of other noncitizen parents due to the CPS data limitations discussed earlier. Although the results of this study on the children of noncitizen immigrants include children with undocumented

parents, they may be underrepresented in the results because their parents' survey response rate may be low. Therefore, it would be more helpful if the analyses could estimate their separate contributions to changes in the child poverty rate. Another limitation is that the findings of this study do not shed light on regional variation in poverty rates or immigration. Due to a concentration of immigrant families in certain states (e.g., California, New York, Texas), it is possible that the national average estimations mask important variations in the level of contributions that children in immigrant families make to state or local child poverty rates (Friedberg and Jaeger 2009).

Despite these limitations, the findings of this study have implications for the direction of federal immigration policies. Most importantly, they challenge the view that children in immigrant families are one of the major obstacles to the country's fight against child poverty. Still, the results underline the dire economic situation of children in some immigrant families, particularly those living in noncitizen or recent immigrant families. The demographic shifts projected for the coming decades make this issue even more important. Children in immigrant families are projected to comprise nearly one-third of more than 100 million children in the United States by the year 2050 (Passel 2011). Because the majority of children in immigrant families, including those in noncitizen families, are currently US citizens by birth and are likely to remain in the country throughout their lives, investing in their human capital and economic outcomes should be an important national agenda.

APPENDIX 1

NONLINEAR DECOMPOSITION

According to Fairlie (1999, 2005), for a linear regression, the Blinder-Oaxaca decomposition of poverty-rate changes between 2 years, t and $t + 1$, can be expressed as

$$\bar{Y}^t - \bar{Y}^{t+1} = [(\bar{X}^t - \bar{X}^{t+1})\beta^{t+1}] + [\bar{X}^t(\beta^t - \beta^{t+1})], \quad (1)$$

where \bar{X} is a row vector of average values of the explanatory variables and β is a vector of coefficient estimates. For a nonlinear regression, such as $Y = F(X\beta)$, the decomposition could be written as the following, where N was the sample size for 1 year:

$$\begin{aligned} \bar{Y}^t - \bar{Y}^{t+1} = & \left[\sum_{i=1}^{N^t} \frac{F(\mathbf{X}_i^t \boldsymbol{\beta}^{t+1})}{N^t} - \sum_{i=1}^{N^{t+1}} \frac{F(\mathbf{X}_i^{t+1} \boldsymbol{\beta}^{t+1})}{N^{t+1}} \right] \\ & + \left[\sum_{i=1}^{N^t} \frac{F(\mathbf{X}_i^t \boldsymbol{\beta}^t)}{N^t} - \sum_{i=1}^{N^t} \frac{F(\mathbf{X}_i^t \boldsymbol{\beta}^{t+1})}{N^t} \right]. \end{aligned} \quad (2)$$

In equations (1) and (2), the first term in brackets represents the part of poverty-rate change caused by year-to-year changes in the distributions of the entire set of independent variables \mathbf{X} , and the second term represents the other part, caused by changes in subgroup poverty risks. The decomposition could be calculated by substituting the average probability of poverty for \bar{Y} , the logistic function for F , and the coefficient estimates for $\boldsymbol{\beta}$.

To identify immigrants' contributions to poverty-rate changes, it was necessary to add a calculation that could distinguish between the contributions of specific independent variables. According to Fairlie (1999, 2005), the contribution of each variable was equal to the change in the average predicted probability, by replacing the year t distribution with the $t + 1$ distribution of that variable while holding other variables' distributions constant. That is, if X was assumed to include both X_1 and X_2 , the independent contributions of X_1 and X_2 to poverty-rate change could be expressed as shown in equations (3) and (4), respectively:

$$\frac{1}{N^{t+1}} \sum_{i=1}^{N^{t+1}} F(\mathbf{X}_{1i}^t \boldsymbol{\beta}_1^{t+1} + \mathbf{X}_{2i}^{t+1} \boldsymbol{\beta}_2^{t+1}) - F(\mathbf{X}_{1i}^{t+1} \boldsymbol{\beta}_1^{t+1} + \mathbf{X}_{2i}^{t+1} \boldsymbol{\beta}_2^{t+1}) \quad \text{and} \quad (3)$$

$$\frac{1}{N^{t+1}} \sum_{i=1}^{N^{t+1}} F(\mathbf{X}_{1i}^t \boldsymbol{\beta}_1^{t+1} + \mathbf{X}_{2i}^t \boldsymbol{\beta}_2^{t+1}) - F(\mathbf{X}_{1i}^t \boldsymbol{\beta}_1^{t+1} + \mathbf{X}_{2i}^{t+1} \boldsymbol{\beta}_2^{t+1}). \quad (4)$$

Note that the calculation of equations (3) and (4) needed to be preceded by matching the year t and $t + 1$ distributions of the respective variables. Matching was performed, for example, by using predicted probabilities for observations in year t and observations in a random subsample of year $t + 1$, with a sample size of year t . Each case of the two samples was rank ordered by its predicted probabilities and matched accordingly. The results of matching largely depended on the sample (year t or year $t + 1$) used to obtain coefficients to estimate the predicted probabilities. To mitigate the potential for skewed numbers, the results were obtained by alternately using year t and $t + 1$ samples in the matching process. Because the matching result was also known to differ by the number of randomly drawn year $t + 1$ subsamples, a large number of random subsamples ($n = 100$) was used for decomposition (Fairlie 1999, 2005).

APPENDIX 2**ODDS RATIOS OF LOGISTIC REGRESSION OF THE CHILD POVERTY RATE**

	1993 (N=64,450)	2001 (N=106,950)	2010 (N=88,805)
Intercept			
Age of children (years):			
(0–5)			
6–12	.712	.761	.712
13–17	.568	.617	.592
Age of reference person (years):			
(Younger than 30)			
30–39	.671	.729	.654
40–49	.648	.660	.605
50 or older	.583	.611	.684
Ethnicity:			
(White)			
Black	.575	.594	.704
Hispanic	1.223	.978	1.206
Other	.857	1.086	.953
Education:			
Less than high school	5.961	5.416	5.685
High school diploma	3.072	3.198	3.421
Some college	1.905	1.969	2.110
(College degree or more)			
Family:			
(1 child)			
2 children	1.262	1.235	1.301
3 children	2.037	2.381	2.544
4 or more children	3.379	3.134	3.365
One-parent family	4.163	3.709	3.763
At least one full-time worker	.132	.130	.118
Citizenship:			
(Native)			
Naturalized citizen (>10 yr)	1.247	1.180	1.577
Naturalized citizen (<10 yr)	2.382	1.880	2.728
Noncitizen (>10 yr)	1.584	1.662	2.601
Noncitizen (<10 yr)	2.872	2.356	2.826
State unemployment rate	1.065	1.005	1.013
Likelihood ratio (df)	26,529 (29)	29,603 (29)	33,308 (29)

Note.—Region of residence is included in the model but is not shown in the table to save space. Reference groups are in parentheses.

APPENDIX 3

DECOMPOSITION OF CHANGES IN THE CHILD POVERTY RATE

	Total percentage point change in child poverty rate	Change attributable to	
		Changes in population compositions	Changes in group-specific poverty rates
1993–2001	–6.87	.17	–7.05
2001–2010	6.20	.33	5.87

Note.— The numbers in the table above are calculated by following the decomposition method used by Raphael and Smolensky (2008). According to the authors, the national poverty rate for year t , $Poverty_t$, can be expressed as a weighted sum of the year-specific poverty rates as below. In the equation, pro_{it} is the proportion of the population in year t accounted for by group i (i.e., children of natives, naturalized citizens, and noncitizens), and $poverty_{it}$ is the corresponding poverty rate for group i in year t : $Poverty_t = \sum pro_{it} poverty_{it}$. Change in poverty rate can be expressed by the following: $\Delta Poverty = \sum (pro_{it+1} - pro_{it}) poverty_{it+1} + \sum pro_{it} (poverty_{it+1} - poverty_{it})$. The first term on the right-hand side of the equation shows the amount of contribution associated with change in group proportions, and the second term shows the amount of contribution associated with change in group-specific poverty rates.

NOTE

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