Suet-ling Pong   *Penn State University*

Jaap Dronkers*   *European University Institute*

Gillian Hampden-Thompson**   *Penn State University*

Family Policies and Children's School Achievement in Single- Versus Two-Parent Families

We investigate the gap in math and science achievement of third- and fourth-graders who live with a single parent versus those who live with two parents in 11 countries. The United States and New Zealand rank last among the countries we compare in terms of the equality of achievement between children from single-parent families and those from two-parent homes. Following a multilevel analysis, we find single parenthood to be less detrimental when family policies equalize resources between single- and two-parent families. In addition, the single- and two-parent achievement gap is greater in countries where single-parent families are more prevalent. We conclude that national family policies can offset the negative academic outcomes of single parenthood.

Penn State University, 310D Rackley Building, University Park, PA 16803, (pong@pop.psu.edu).

*Department of Political and Social Science, European University Institute, Via dei Roccettini 9, I-50016 San Domenico di Fiesole, Italy.

**Penn State University, 310 Rackley Building, University Park, PA 16803.

During recent decades, a burgeoning research literature has documented the educational consequences of single parenthood in the United States and other Western societies. Although most research has been conducted within single nations, comparative research is essential if we are to understand the relative importance of public policy, which may mitigate or exacerbate the challenges associated with living with a single parent. In this article, we investigate how the relationship between single parenthood and children's academic achievement varies according to a society's safety net systems. We specifically test whether the achievement gap between children living with a single parent and those residing with both parents is smaller in those countries that make greater investments in social welfare. Our study is unique because we are able to analyze comparable data from 11 nations. These data allow us to fill the gap in comparative knowledge on single parenthood and children's school performance.

We address three related questions in this study. First, cross-nationally, how varied is the gap in academic achievement between children who live in single-parent families and those who live with two biological parents? Second, do academic differences between children from single-parent families and those from two-parent homes persist after family resources are taken into ac-

count? Third, and most important, among the 11 countries we selected, does the achievement gap between children from single- and two-parent families vary by demographic characteristics and national family policies?

RELEVANT LITERATURE

After more than two decades, social science researchers in the United States agree that single parenthood is not an unequivocal source of disadvantage. Some investigators note the strengths offered by successful single-parent families (Olson & Haynes, 1993; Richards & Schmiege, 1993), however, research on children's educational outcomes has not found positive results. Despite the fact that some American children living in single-parent homes do well in school, in general they face a higher risk of low academic achievement and of dropping out than do children who live in two-parent families (Amato, 2001; Astone & McLanahan, 1991; Mulkey, Crain, & Harrington, 1992; Pong & Ju, 2000; Zill, 1996). This educational disadvantage of children from single-parent homes is not unique to the United States. Research also shows an educational gap between children from single-parent families and those from two-parent families in other Western industrialized countries, including Britain (Cherlin et al., 1991; Kiernan, 1992), the Netherlands (Borgers, Dronkers, & Van Praag, 1996; Bosman & Louwes, 1982; Dronkers, 1994), Sweden (McNab & Murray, 1985; Murray & Sandqvist, 1990), and Switzerland (Oggenfuss, 1984).

Various explanations have been offered for a detrimental effect of single parenthood on children's education in the United States and other industrialized countries. One explanation stresses the interparental conflict that is too often generated as marriage dissolves, and that inflicts psychological stress on children (Amato, 2001; Amato & Keith, 1991; Dronkers, 1999). A second set of explanations emphasizes the meager material resources of most single parents and the fact that time pressures on single parents make them less able to participate in their children's schooling (Astone & McLanahan, 1991; Downey, 1994; Entwisle & Alexander, 1995; Joshi et al., 1999; McLanahan, 1985; McLanahan & Sandefur, 1994). Lower income families possess fewer educational materials at home and cannot afford enrichment outside of school. On average, parental involvement in the child's schooling is lower, and there is less supervision and lower expectation of

the child. Fewer monetary and nonmonetary resources are possible reasons why students from single-parent homes tend to have lower achievement compared with students from two-parent families. Lending support to these explanations is the finding that, when monetary and nonmonetary resources are statistically controlled, the effect of single parenthood is reduced and even disappears in some studies (Cooksey, 1997; McLanahan & Sandefur, 1994).

Single-parent families are not a homogenous group. Even mother-headed households, which make up the majority of single-parent families with dependent children, have changed over time. In the United States, divorce is still the major cause of single motherhood, but the proportion of children living in mother-only families as a result of out-of-wedlock childbearing is increasing. Today, nearly one third of births are nonmarital, and the proportions among Hispanics (40%) and African Americans (70%) are much higher. These *fragile families* can be severely limited in terms of human capital and financial resources (McLanahan, Garfinkel, Reichman, & Teitler, 2001). Children from these American families are substantially less likely to graduate from high school than are those children who reside in two-parent families (Haveman, Wolfe, & Pence, 2001). In terms of children's cognitive development, as measured by reading and vocabulary test scores in cross-sectional analyses, the disadvantage of children with never-married mothers is greater than that of children with divorced or separated mothers (Korenman, Kaestner, & Joyce, 2001). Despite the differences between unmarried and divorced parents in their association with children's educational achievement, because of data limitations we are unable to distinguish these two types of single parenthood.

Single parenthood in other Western industrialized countries is somewhat different from that in the United States. Nonmarital childbearing is substantially high in some European countries, particularly in Scandinavia where approximately one of every two births is outside of marriage (Kiernan, 2001). Unlike in the United States, teen pregnancy rates are relatively low in European countries, and nonmarital childbearing is largely to adult women in cohabiting unions. According to Kiernan, many such cohabiting unions are converted into marriages within 5 years after the birth of a child. The conversion rate varies across nations, however. For example, about 39% of cohabiting unions in Great Britain are converted into

FIGURE 1. THE RELATIONSHIP BETWEEN DEMOGRAPHIC CONTEXTS, FAMILY SITUATION, AND CHILD ACHIEVEMENT OUTCOMES
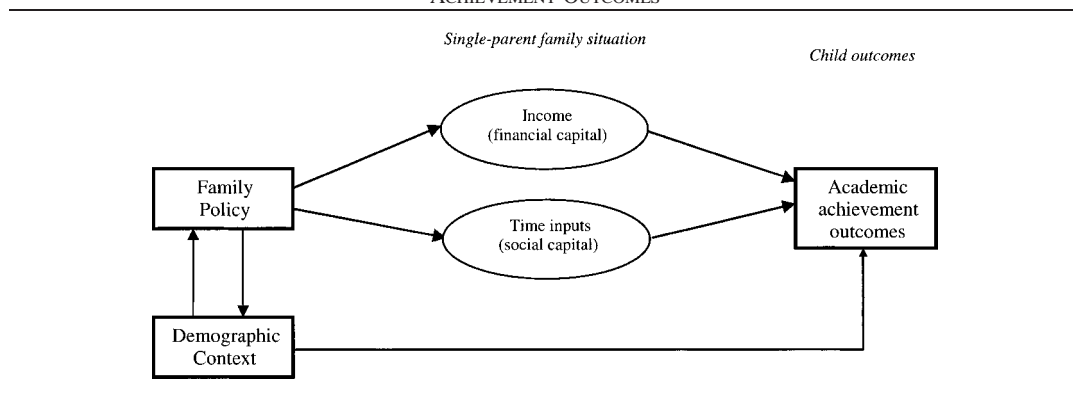
marriages within 5 years after a child's birth. The proportion is much higher in Norway and Austria, at 60% and 69%, respectively. Cohabiting unions that do not convert into marriages are most likely to dissolve, resulting in single parenthood or reconstituted cohabiting unions in which only one biological or adoptive parent is present. Because of data limitations, we are unable to differentiate two-parent families from cohabiting unions if the cohabiting couples are biological or adoptive parents. Only those cohabiting unions with one biological or adoptive parent present are defined as single-parent families in our study.

Single-father families constitute a small proportion of all single-parent families in all countries in our data. Children in single-father families, however, exhibit more behavioral and academic problems than do children in either single-mother or stepfamilies (Downey, 1994; Harris, Cavanagh, & Elder, 2000). In this study, we term two-parent families as families with two biological or adoptive parents, which do not include stepparents. Previous research has found stepfamilies to differ from two-parent families in providing support to children's education. The negative influences of stepfamilies on children's attained schooling, the risk of dropping out of high school, and the chance of entering college appear to be similar to those of single-mother families (Beller & Chung, 1992; Li & Wojtkiewicz, 1992).

There have been few truly comparative studies on single-parent families and children's educational outcomes. Virtually all previous American and European studies on this subject have been conducted within individual countries (exceptions are Cherlin et al., 1991, and Joshi et al., 1999). Comparative studies are necessary if we want to un-

derstand the importance of policy environments. Our goal here is to investigate if the achievement gap between one- and two-parent families exists in the countries we study, and if national family policies can account for any variation in this achievement gap.

CONCEPTUAL FRAMEWORK

Figure 1 outlines our conceptual framework. We hypothesize that different policy environments can influence the relationship between single parenthood and children's academic achievement by changing a family's disposable income and parental time inputs. According to Becker's (1981) theory of household production, children's education is a form of consumer good that is produced by parents using two types of household inputs: money income and parental time. Consistent with this economic framework, Coleman (1988) distinguished three family background factors that influence children's education: financial capital, human capital, and social capital. As a form of financial capital, family income has been found to be positively related to children's educational attainment and achievement (Hill & Duncan, 1987; Schneider & Coleman, 1993). A large literature on social stratification has established in many countries the association between parents' education (human capital) and their children's educational attainment (see, for example, Shavit & Blossfield, 1993). Coleman theorized, however, that parents' human capital cannot be transmitted to children without the support of social capital. Social capital, according to Coleman, consists of the relationship between children and adults that enhances children's education. Building social

capital requires parents to communicate and interact with their children frequently, as well as to forge relationships and networks with other adults in school and in the community (Schneider & Coleman). Consequently, parents who spend more time with their children could forge greater social capital, thereby enhancing their children's school success. Parental inputs of time, especially from the mother, have been shown to be positively associated with children's educational achievement (Leibowitz, 1974). Consistent with this parental time argument, previous research has found maternal employment to have detrimental effects on a child's cognitive development in the child's first year of life (Baydar & Brooks-Gunn, 1991).

Countries with supportive family policies offer a range of generous provisions, such as child and family allowances, child benefits and family transfers, tax benefits to lone parents, and maternity leave benefits. In these countries, single parents have greater economic resources for their children's education than do their counterparts in nations with weaker family policies. Single parents also receive more release time from work to care for their infants or young children, which may promote children's cognitive development. Based on the conceptual frameworks offered by household production and social capital theories, we expect that children residing in single-parent families in countries with stronger family policies are less likely to suffer from educational disadvantage than would be the case in countries with weaker family policies.

National family policies vary across countries with different demographic characteristics. In fact, the demography of a nation and its family policy are likely to be reciprocally related. On the one hand, generous family policies may encourage cohabitation and nonmarital childbearing and eventually produce greater proportions of single-parent families when cohabiting unions dissolve. Alternatively, where single parents are politically organized, they demand greater resources from the government. In both cases, the proportion of single-parent families may be positively associated with the generosity of the nation's family policies toward single parents.

On the other hand, the growth in single-parent families could reduce the tolerance and sympathy toward single parents, and subsequently trigger policy stringency. In recent decades, Canada, the Netherlands, the United Kingdom, and the United States have responded to the rise in single parenthood by replacing universal child benefits with means-tested programs and by reducing welfare benefits for low-income single-parent families (Baker, 1995; Clearinghouse, n.d.; Van Drenth, Knijn, & Lewis, 1999). In this situation, the prevalence of single parenthood may be negatively associated with the generosity of family policies. Regardless of the direction of the association, we need to take into account a country's concentration of single parenthood as we examine the role of family policy, because the national proportions of single-parent families may influence children's school achievement.

Two alternative explanations can be made for the relationship between national proportions of single-parent families and the national achievement disadvantage of children living in single-parent homes. Recent empirical research suggests that as divorce becomes prevalent, the nature of marital dissolution will change. In the United States, when divorces were rare, only the extremely dissatisfied—typically families with high parental conflict—would seek a divorce. When divorces became prevalent, many more moderately dissatisfied individuals also divorced their spouses (Booth, 1999). Compared with conflict-ridden marriages ending in divorce, families with little parental conflict that end in divorce may be more damaging to children's psychological well-being (Hanson, 1999; Jekielek, 1998; Morrison & Coiro, 1999). These findings suggest that, in nations where divorce rates are high, children from single-parent homes suffer greater psychological stress than do their counterparts in countries where divorces are relatively rare. Thus, to the extent that single parenthood results from divorce, the correlation between a country's percentage of single-parent families and the academic achievement disadvantage of children from single-parent homes is likely to be positive. Although this *family conflict hypothesis* is plausible, in many industrialized countries today, single parenthood increasingly results from increases in nonmarital childbearing rather than from divorce.

An alternative explanation for the negative relationship between the national concentration of single-parent families and the national achievement gap can be derived from recent research on school peers or school compositional effects in the United States. Bankston and Caldas (1998) found that studying with peers from female-headed families was a main reason that schools with high concentrations of minority students exhibit low achievement. Similarly, Pong (1997, 1998) found that children's academic achievement is negative-

ly related to their attending a school with a high concentration of children from single-parent homes. Such a detrimental contextual effect was partly attributable to the fact that single parents had fewer economic resources and less social capital to contribute to the school. To extend the findings of research on the contextual influence of single parenthood, we hypothesize that the concentration of single-parent families in a country confers academic disadvantage on children in that country, and particularly on those from single-parent homes because they tend to attend schools with peers from similar family backgrounds.

Because of the potential correlation between family policies and the demographic context of single parenthood, and because the demographic contexts of single parenthood may predict achievement gaps between children from two- and single-parent homes, demographic contexts may confound the relationship between family policy and children's achievement outcomes. For this reason, we control for the concentration of single-parent families when examining the net influence of family policy on the achievement gap.

In this study, we define residence in a single-parent family to mean that the child lives with only one biological or adoptive parent (who is not a stepparent). Single parenthood may be due to divorce or separation, to the death of a spouse, or to nonmarital childbearing and childrearing without the presence of a spouse. Our data do not allow us to differentiate between these types of single parenthood, but all single-parent families in this study share a common characteristic: There is only one adult in the family whom the focal child identifies as a *parent*—biological or adoptive. Our data also do not allow us to differentiate between two-parent families and cohabiting unions in which both the biological or adoptive parents of the focal child are present. The lumping of these two types of two-parent families may be reasonable in many European countries where cohabitation is common and where cohabiting parents behave like married couples.

Before concluding our discussion of the theoretical framework, a caveat about the data is needed. Whereas our conceptual model indicates causal relationships between family policy, single parenthood, and children's academic achievement, because our data are cross-sectional rather than longitudinal, we cannot definitively identify causes and effects. Despite these limitations, the evidence we present is consistent with our theoretical framework that outlines causal relations between family policy, family structure, and student achievement.

SELECTION OF COUNTRIES FOR COMPARISON

In our comparative study, we attempt to control for cultural influence by selecting countries sharing similar Western cultural traditions and social institutions. Along with the United States, we selected 10 other industrialized countries: Australia, Austria, Canada, England, Ireland, Iceland, Netherlands, New Zealand, Norway, and Scotland. These countries can be grouped into four categories: (a) the North American nations of Canada and the United States; (b) the Pacific Rim countries of Australia and New Zealand; (c) the Nordic states of Norway and Iceland; and (d) the Western European nations of Austria, the Netherlands, Great Britain (England and Scotland), and Ireland.

We selected these countries for several reasons. Canada is chosen because of its proximity to the United States, which has a strong influence on the Canadian economy. Both the United States and Canada are similar to Australia and New Zealand in their culture and linguistic heritage. These four societies were once colonies of Great Britain, and most of their early immigrants originated from England, Scotland, and Ireland—three other industrialized countries we selected.

For a clear policy contrast with the United States, we also selected Austria, Norway, Iceland, and the Netherlands. These highly developed welfare states have long histories of family policies aimed deliberately at redistributing wealth to achieve the goal of equality. Norway and Iceland share many common cultural traditions, and these commonalties have been strengthened by the Nordic Council, which has promoted policy collaboration among the Nordic states (Kjellin, 1980). The Netherlands shares many similar family policies with the Nordic states, although these policies are less developed (de Bie, 1980). Austria provides an example of a European welfare system in which the Catholic parties, who take the center-right position, as opposed to the left position, on family affairs, are historically strong (Kjellin). Their position includes preserving traditional institutions such as the two-parent family.

METHOD

Data

Two data sources are used to address our questions. The first is derived from the Third Inter-

national Math and Science Study (TIMSS). TIMSS was conducted in 1995 under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). It is one of the largest international surveys ever done, testing a half million students from 41 countries. Separate questionnaires for students, teachers, and school administrators provide comprehensive information on various learning environments, inputs, and outcomes (see the following Web site: http://www.nces.ed.gov/timss).

In this article, we investigate students in Population 1 of the TIMSS: students enrolled in the two adjacent grades that contain the largest proportion of 9-year-olds at the time of the survey (1995). In most countries, these are the equivalent of American third or fourth grade students. The advantage of studying young children is that they are still in school in most parts of the world, and the problem of selectivity bias, as a result of children leaving school for work, would be minimal. In addition, school tracking is usually not practiced at this level. For each of the 11 countries of our study, we used the test scores and students' self-reported living arrangements, as explained later.

The second data source consists of the country-specific welfare policy and demographic indicators. These include important maternal and parental leave policies, policies of child and family allowances, and tax benefits to single parents. Demographic indicators include the prevalence of single parenthood, divorce, and teenage motherhood. Because this research analyzes 11 nationally representative samples of young children surveyed in 1994–1995, the policies most relevant to these children would be those found between the late 1980s and mid-1990s. Thus, we focus on national family policies from this period. These data are collected from books and Web sites (see Appendix for sources).

Variables and Measures

Academic achievement, the dependent variable in our analysis, refers to the child's math and science achievement test scores. In TIMSS, different students received different test items, and each student was assessed on only a fraction of all test items. Thus, the raw test scores are not comparable across individuals, and standard procedures that use individual scores to make estimates of population parameters may be biased. To remedy this problem, TIMSS provides five *plausible values* for each student for each subject. All five values are used here to calculate parameter estimates.

Our major independent variable is *single parenthood.* The information comes from the following question: "Do each of these people live at home with you most or all of the time?" Students were asked to respond yes or no to the list: mother; father; one or more brothers; one or more sisters; stepmother; stepfather; one or more grandparents; another relative or relatives such as uncles, aunts, cousins, and so on; and another person or persons (not relatives). Using student responses, we constructed three dummy variables: single parenthood, stepfamily, and guardian family. Single parenthood refers to residing with either the father and not the mother or the mother and not the father. Stepfamilies are families with either a stepmother, the stepfather, or both. Guardian families are families with neither the mother, the father, nor a stepparent. The reference group is residence with two parents.

The TIMSS Population 1 survey did not solicit information on parental education, occupation, or income. Several indicators can be used to proxy the amount of monetary or nonmonetary family resources available to the child, however. One is the *number of books* at home. Another is the *number of possessions,* which is based on the list of items students reported they have at home (i.e., a computer, an encyclopedia set, a stereo system, a video camera, and three or more cars, vans, or small trucks). The third indicator is *immigrant status.* Our exploratory analysis found that this variable is associated with lower family resource measures in every country we study. In the United States, poverty rates are higher among immigrant children than among native children (Hirschman, 2001). Nevertheless, some groups of immigrants manage to outperform their native counterparts in school (Kao & Tienda, 1995). Thus it is unclear how immigrant status is related to academic achievement, and we take the examination of immigrant status as an empirical question. Finally, we include *household size,* measured by the total number of people living with the child. This indicator is a proxy of the number of siblings the child has. Previous research has shown a negative relationship between sibship size and children's educational achievement (Downey, 1995)

Three other control variables are included in the multivariate analysis. These are the child's *age, gender* (1 = girl), and *grade level.* Grade level indicates whether the child is in the upper of the two grades sampled by TIMSS. In the Unit-

ed States and most other countries in this study, the upper grade is the fourth grade.

At the country level, we take into account several indicators of policies that support family income and parental time inputs. These include the existence of a family or child allowance, universal child benefits to lone parents, benefits in tax and social security to lone parents, family transfer per child, social expenditure per gross domestic products (GDP), and parental leave policies (consisting of maternity leave duration and benefits). Our national indicators further include three demographic indicators: crude divorce rates, the percentage of births to mothers under 20 years old, and the percentage of lone-parent families. Detailed description of each family policy variable is provided in the Appendix.

Analytical Strategy

We first treat each country as a separate case in our analysis, using ordinary least squares (OLS) regression to gauge the relationship between single parenthood and children's math and science achievement. Next, we combine data from all 11 countries in a single analysis to see if there are variations among countries in the association between single parenthood and academic achievement.

We use two statistical methods in our analysis of all 11 countries combined. The first method is a *fixed-effects model,* which is equivalent to a saturated hierarchical linear model (HLM) without random coefficients. In this model, 10 dummy variables representing each nation, with the United States as reference category, absorb all the observed and unobserved characteristics of each nation, allowing the random error to be independent of the observed variables. In addition to the dummy variables representing nations, 10 interaction terms are included in the model. Each term indicates the interaction between the nation variable and the variable of single parenthood at the individual student level. From these interaction terms, we can compare the achievement gap between children from single-parent and those from two-parent families in the United States and other countries. We make the comparison both with and without adjustments for differences in individual-level family resources.

Second, we build a two-level *random-effects* HLM model (Bryk & Raudenbush, 1992). The unit of analysis in the first-level model is the student, and the unit of analysis in the second-level

model is the nation within which the student is nested:

$$(\text{Achievement})_{ij} = \beta_{0j} + \beta_{1j}(\text{family structure})_{ij}$$
$$+ \beta_{2j}(\text{other})_{ij} + R_{ij}, \qquad (1)$$
$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{family policy})_j$$
$$+ \gamma_{02}(\text{context})_j + U_{0j}$$
$$\beta_{j1} = \gamma_{10} + \gamma_{11}(\text{family policy})_j$$
$$+ \gamma_{12}(\text{context})_j + U_{1j}. \qquad (2)$$

Unlike the fixed-effects model in which all coefficients are specified as fixed, here some coefficients are specified as random. We assume that the parameter residuals U_{0j} and U_{1j} are unrelated to the γs. U_{1j} may not be specified if there is no estimated parameter variance of β_{1j}. Our primary interest is to estimate γ_{11} and $\gamma_{12,}$ which are predictors of β_{1j}—the achievement gap between children from single-parent families and their counterparts from two-parent homes. We examine the covariates of various family policies and the demographic context of single parenthood and report the coefficients of γ_{11} and γ_{12}.

One problem of the HLM model is that we have only 11 cases at the second or country level (Equation 2). Missing data arise from the fact that there is no available comparable data from Iceland for most variables in our study. In two cases, we do not find comparable data from Canada as well. Thus our HLM model, which is based on between 9 and 11 second-level units, has low statistical power, and the parameter variances are estimated with large imprecision. Although some methodologists have suggested that the minimum number for running a random coefficient model is 10 (Snijders & Bosker, 1999, pp. 43–44), we believe that HLM results for 9 and 11 second-level units are equally unstable. Despite this possible statistical instability, our HLM results are consistent with the results from the model using fixed parameters (not presented). For simplicity of presentation, we show the HLM coefficients only.

Each of the three models—OLS, fixed-effects, and random-effects—were estimated five times, each on one of the five plausible values. The *multiple imputation* method (Gonzalez & Smith, 1997; Schafer, 1997) was then used to achieve consistent estimates of TIMSS population distributions. We follow this method to calculate the combined coefficients and standard errors.
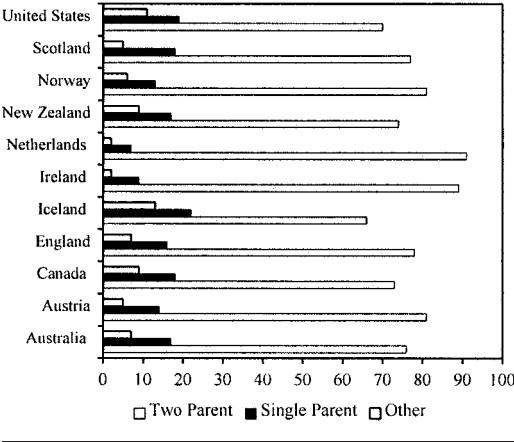
TABLE 1. DEMOGRAPHIC CHARACTERISTICS AND FAMILY POLICIES, BY COUNTRY

Country-Level Variables[a]	AUS	AUT	CAN	ENG	IRL	NLD	NZL	NOR	SCO	USA
% Lone-parent families	18	15	13	21	11	16	25	21	21	29
Crude divorce rates	4.34	2.26	2.62	2.97	—	2.35	2.65	2.54	2.97	4.44
% Births to mothers <age 20	4.9	4	6.3	7.3	5.5	1.3	7.6	2.8	7.3	12.8
Family or child allowance	3.4	11.3	2.4	6.3	3.0	7.4	2.1	9.1	6.3	0
Universal child benefits to lone parents	42	124	0	107	38	96	0	169	107	0
Benefits in tax and security to lone parents	−12	0	—	0	0	26	0	−16	0	−24
Family transfers per child	511	1,012	318	855	217	914	603	684	855	232
Social expenditure per GDP	17.7	19.9	25.3	27.6	25.2	34.4	19.8	35.5	27.6	20.1
Maternity leave benefits (%)	0	100	55	45	70	100	0	100	45	0
Maternity leave in weeks	52	16	15	18	14	16	14	38	18	12
Parental leave	0	2	—	0	0	1	0	2	0	0

Note: AUS = Australia; AUT = Austria; CAN = Canada; ENG = England; GDP = gross domestic product; IRL = Ireland; NLD = Netherlands; NZL = New Zealand; NOR = Norway; SCO = Scotland; USA = United States. Iceland is missing on all variables except crude divorce rates (1.78), maternity leave benefits (100), and maternity leave in weeks (24).

[a]See Appendix for the metric and source of each variable.

FIGURE 2. PERCENTAGES OF TWO-PARENT, SINGLE-PARENT, AND OTHER FAMILIES AMONG THIRD- AND FOURTH-GRADE CHILDREN IN 1995

RESULTS

Demographic Context

Table 1 shows the demographic characteristics of the 11 countries we study. In 1994, the divorce rates were highest in the United States and Australia, followed by England and Scotland. The lowest divorce rates are found in Iceland. Divorce is illegal in Ireland, and there is no record for it. The United States also ranks first in the percentage of births to teen mothers. The percentage is 1.7 times greater than that in New Zealand, the second-ranked country in terms of teen births. Given the high rates of divorce and teen births, it comes as no surprise that the United States has the highest percentage of lone-parent families. New Zealand ranked second in the percentage of single parenthood, whereas Ireland has the lowest proportion of lone-parent families.

Descriptive Analysis of TIMSS

The percentages of single parenthood are slightly different when we examine the self-reported family structure of the 3rd and 4th graders in TIMSS. Figure 2 presents, for each of the 11 countries, the percentages of children living with two parents, with single parents, and in other family structures. As can be seen in Table 1, two-parent families are the dominant family type for these children who are about 9 years old. The percentages of two-parent families are highest in the Netherlands, and lowest in Iceland and the United States. Single-

parent families are predominately single-mother families in all 11 countries; the share of single-father families is small, only about 1%–3% of all families. Iceland, where cohabitation is prevalent, houses the largest percentage of single-parent families (22%), followed by the United States (19%) and Scotland (18%). Other forms of non-two-parent families, that is, stepfamilies and guardian families, constitute less than 10% of all families in which a 3rd- or 4th-grade child resides.

Single-parent families in our sample have fewer family resources, as measured by the number of books and the number of items or possessions at home. On average, the 3rd- and 4th-grade children in two-parent families have more than 200 books and 5 household items, but their counterparts in single-parent families have fewer than 101 books and 4.5 items. In six countries, including the United States, immigrant children are overrepresented in single-parent households. In all countries except Norway and the Netherlands, the difference in household size between single- and two-parent families is less than one person. Because two-parent families have at least one more adult than single-parent families, given the same number of children, this result suggests that, on average, single parents may have more children or that they are living with other adults. Thus, the difference in family resources per capita between these two family types is greater than what is observed.

Family Policy Context

In Table 1, we present key indicators of the family policies that were aimed to improve family income and parental time inputs. In the fourth row, family or child allowances are universal government payments that usually come as a weekly, bimonthly, or monthly check mailed to the mother or official guardian of dependent children. Benefits are often tax free, and the amount and eligibility often depends on the age of the child (Baker, 1995). Family allowances can be a major source of economic support for low-income single parents. In the countries of this study, Austria paid the highest family allowance, equivalent to 11.3% of the average male wages in manufacturing in 1990. Family allowances in Norway, the Netherlands, England, and Scotland were in the range of 6%–9%. Smaller allowances are evident in Canada, Australia, and New Zealand, ranging between 2%–3%. The United States is the only country

that has never paid universal family or child allowances.

Some countries offered universal child benefits or allowances that are paid regardless of family income. Other countries paid means-tested allowances, which depends on family income. Still other countries paid a combination of both. All countries except Canada, New Zealand, and the United States paid universal child benefits to lone parents with two children in 1994. Norway and Austria paid the highest amount in Sterling purchasing power parities (169 and 124, respectively, equivalent to United States $260 and United States $191 using the 2001 exchange rates), relative to average male earnings within each country, whereas Canada and New Zealand abolished their universal programs prior to 1994. Purchasing power parity is a form of exchange rate based on traded goods and services and is converted into a standard currency—British Sterling—for international comparison.

Table 1 also shows the difference in the amounts paid in tax and social security contributions by lone parents and by married couples in 1994. The larger the positive values, the more the tax system makes extra allowances for lone parents. In Austria, England, Scotland, Ireland, and New Zealand, there was no difference in the tax treatment of lone parents compared with married couples. In the United States, Australia, and Norway, the difference was negative, meaning that lone parents paid more direct tax than married couples did on the same earnings. Among these three countries, the difference was highest in the United States. The positive figure for the Netherlands suggests that the Dutch tax system treated lone parents more generously than it did married couples.

When considering all universal or means-tested allowances and tax deductions for children, in the early 1990s Austria had the highest amount of family transfers per child, followed by the Netherlands. Ireland and the United States had the lowest family transfers. By comparing social expenditure across countries, we may capture differences in government investments in other child-related benefits, such as child care, housing, and medical costs. Here we can see that Norway and the Netherlands had the greatest government social expenditures per GDP in 1990.

Regarding maternity leave, its duration was highest in Australia, which offered 52 weeks. Poor mothers were unlikely to take advantage of this policy, however, because the leave was unpaid.

The United States and New Zealand also did not provide any maternity leave benefits. By contrast, Norway had the most generous policy, providing mothers with 38 weeks of maternity leave with 100% salary replacement. Austria, Iceland, and the Netherlands also paid the mother her full salary during the leave period. According to Bradshaw et al. (1996), the parental leave package was the most generous in Austria and Norway, followed by that in the Netherlands.

Results From OLS Regression Analysis

Table 2 shows the OLS regression results of the association between single-parent family and math or science achievement for each country separately. Model 1 has the family structure dummy variables—single parenthood, stepfamily, and guardian family—and the control variables of age, gender, immigrant status, and grade level. In addition to the variables in Model 1, Model 2 includes the family resources variables: number of books, number of possessions, and household size. All regression coefficients shown in the table are parameter estimates for the dummy variable of single parenthood, with two-parent families as the reference group.

In Model 1, single parenthood is significantly negatively associated with math and science scores for almost all countries we study. With the exception of Austria and Iceland, all the insignificant coefficients bear a negative sign. To compare coefficients, we calculate what is conventionally termed the *effect size,* indicated by the size of the coefficient as the proportion of a standard deviation of the test score being analyzed. We found the largest effect size in the United States amounting to .30 of a standard deviation of the math score and .34 of a standard deviation of the science score. Following closely behind the United States is New Zealand, with .29 of a standard deviation for math and .32 of a standard deviation for science. A weak relationship between single parenthood and test scores is evident in both Austria and Iceland where the effect size is consistently low, between .01 and .03, for both subjects.

Including family resources variables (in Model 2) does not change this large picture. The United States still ranks first in terms of the strength of the negative relationship between single parenthood and test scores. This relationship is weakest in Iceland, Ireland, and Austria. Overall, the size of the coefficient of single parenthood is smaller for most countries after family resources are taken

TABLE 2. WITHIN-COUNTRY ORDINARY LEAST SQUARES REGRESSION PREDICTING MATH AND SCIENCE ACHIEVEMENT FROM SINGLE PARENTHOOD

Countries	Model 1		Model 2	
	β	Effect size	β	Effect size
Math achievement				
Australia	−20.69**	.23	−20.53**	.22
Austria	2.47	.03	1.44	.02
Canada	−22.12**	.24	−19.27**	.21
England	−21.51**	.23	−16.55**	.18
Iceland	1.11	.01	2.38	.03
Ireland	−11.70**	.13	−6.66	.07
Netherlands	−9.60*	.10	−7.72†	.08
New Zealand	−27.31**	.30	−17.95**	.20
Norway	−21.84**	.24	−13.38**	.15
Scotland	−17.72**	.19	−12.70**	.14
United States	−28.68**	.31	−23.11**	.25
Science achievement				
Australia	−18.17**	.19	−20.71**	.22
Austria	4.31	.04	2.47	.03
Canada	−24.01**	.25	−19.97**	.21
England	−20.70**	.22	−14.51**	.15
Iceland	−1.31	.01	−0.60	.01
Ireland	−3.88	.04	−0.64	.01
Netherlands	−5.93	.06	−3.78	.04
New Zealand	−31.88**	.33	−23.34**	.24
Norway	−13.08**	.14	−6.92	.07
Scotland	−19.92**	.21	−15.13**	.16
United States	−33.34**	.35	−26.09**	.27

Note: All five plausible values of math and science scores are used in the calculation.

†$p < .10$. *$p < .05$. **$p < .01$.

into account. In Model 2, the single parenthood coefficient for Ireland is no longer significant for math. Neither is the coefficient for science in Norway.

Results From Fixed-Effects Models

Single-country analysis does not definitively demonstrate that the math and science achievement gap by family structure differs across countries. Our next step is to combine all countries and to build fixed-effects models so as to compare the achievement gap between single-parent and two-parent families among nations. Table 3 presents the results. In both Models 1 and 2, family structure is measured by the three dummy variables of single parenthood, stepfamily, and guardian family. Two-parent families are the reference group. Again, the difference between Models 1 and 2 is that the latter model includes family resource variables but the former does not. In each model, the countries are entered as dummy variables, with

TABLE 3. ORDINARY LEAST SQUARES REGRESSION ANALYSIS FOR VARIABLES PREDICTING MATH AND SCIENCE ACHIEVEMENT, ALL 11 COUNTRIES COMBINED

Variables	Math		Science	
	Model 1	Model 2	Model 1	Model 2
Intercept	495.16**	442.87**	529.03**	467.94**
Family structure[a]				
Single parenthood	−27.89**	−20.91**	−31.75**	−23.33**
Stepfamily	−25.07**	−17.87**	−25.68**	−16.81**
Guardian family	−29.99**	−21.18**	−35.01**	−24.96**
Control variables				
Age 6–8	−11.94**	−13.28**	−10.75*	−11.56*
Age 11–17	−2.47**	1.32	−2.88*	1.87†
Gender: being girl	−5.94**	−6.15**	−8.81**	−9.39**
Upper grade	65.87**	61.70**	56.83**	51.35**
Family resources				
Number of books		12.12**		17.11**
Number of possessions		4.08**		4.10**
Immigrant status		−11.22**		−15.35**
Household size		−5.40**		−7.13**
Country[b]				
Australia	−2.10	9.92**	−7.67**	2.48
Austria	2.52	14.16**	−14.24**	−.47
Canada	−17.06**	.95	−24.17**	−6.55**
England	−34.06**	−24.70**	−20.43**	−11.00**
Iceland	−75.03**	−60.97**	−74.43**	−60.53**
Ireland	−5.80**	−2.10	−36.77**	−26.00**
Netherlands	14.80**	34.02**	−20.53**	−.96
New Zealand	−42.59**	−42.05**	−35.72**	−34.46**
Norway	−56.75**	−53.17**	−55.44**	−52.19**
Scotland	−25.81**	5.63**	−32.52**	−.68
Interaction: single-parenthood × country				
Australia	7.41†	2.31	13.58**	6.19
Austria	30.48**	20.79**	35.82**	23.09**
Canada	5.58	2.35	7.53*	3.12
England	7.32**	.99	11.92**	4.84
Iceland	25.64**	19.54**	26.98**	18.94**
Ireland	14.95**	11.19*	27.39**	22.12**
Netherlands	16.29**	10.52†	24.68**	16.35**
New Zealand	2.83	3.09	1.57	.95
Norway	5.88	3.99	18.19**	12.95**
Scotland	10.65**	4.48	12.40**	4.93
Number of observations	72,602	68,200	72,602	68,200

Note: All five plausible values of math and science scores are used in the calculation.
[a]Reference: two parents. [b]Reference: United States.
†$p < .10$. *$p < .05$. **$p < .01$.

the United States as the reference nation. We are most interested in the interaction between single parenthood and the country, and we focus our attention on those coefficients, alongside the regression slope of single parenthood.

The reference category is the United States, and therefore the regression slope of family structure reveals the relationship between family types and test scores in America. As can be seen from Model 1, American children living with single

parents score about 28 points less in math and 32 points less in science than do children who live with both parents (the reference group). This negative association drops in magnitude but remains large and significant after family resources are controlled, as shown in Model 2, Table 3.

Do the countries differ in this achievement gap between single- and two-parent families? This can be seen from the interaction term between the country and single parenthood. From Model 1, it

is evident that the disadvantage in math achievement associated with single parenthood is the largest in magnitude in the United States (the reference group) among all 11 countries. This is shown by the positive interaction terms in all other countries: The negative coefficient of single parenthood is offset by the positive amounts of the interaction term. For example, the coefficient of the interaction term for Iceland is 25.6 in Model 1 (math). This means that Icelandic children from single-parent homes scored only 2.3 points less in math than did children from two-parent households (i.e., $-27.9 + 25.6$). Although the association between single parenthood and test scores appears to be smaller in magnitude in other countries than in the United States, there is no significant difference between the United States and New Zealand for either the math or the science achievement gap. If we consider the math achievement gap only, there is also no significant difference between these two countries and Norway.

One of the reasons children from single-parent homes face greater hardship in the United States and New Zealand may be that differences in family resources between single-parent and two-parent families are larger in the United States and New Zealand than in other countries. When family resources variables are controlled, in Model 2, Australia, Canada, England, Norway, and Scotland no longer differ from the United States and New Zealand in terms of the math gap between single- and two-parent families. For the science achievement gap, after family resources are controlled, Australia, Canada, England, and Scotland do not differ from the United States and New Zealand. In comparison with the United States, the math gap is significantly smaller ($p < .05$) in three countries: Austria, Iceland, and Ireland. The science gap is significantly smaller in five nations: Austria, Iceland, Ireland, the Netherlands, and Norway.

Although our focus in Table 3 is the interaction between single parenthood and the country dummy variables, it is worth noting that in Model 1, the coefficients of the country dummy variables are mostly negative for math, and all are negative for science. This means that the United States (reference group) has the highest average third- and fourth-grade science performance among these industrialized countries. Its third-and fourth-grade average math performance ranks second after the Netherlands.

Results From Random Effects Hierarchical Linear Modeling

To study the relation between family policy and the achievement gap by family structure, we next built random effects HLM models. In Table 4, each coefficient comes from an HLM model in which a country-level variable is included in the second-level equation (γ_{11} in Equation 2). At the individual level, we include the family structure variables, the control variables, and the family resources variables (as in Model 2 of Table 3). We include the family resources variables, even though by controlling for these resources we underestimate the association between family policy and the achievement gap because family policy redistributes financial resources to poor families with children, including those with single parents. Some of the family resources we control for might have been a result of this redistribution. Therefore, the parameters at the country level may be underestimated but nevertheless give a conservative, lower bound estimate of the strength of the relationship between family policy and the achievement gap by family structure (i.e., between single- and two-parent families). Because of the few countries in our sample, our estimate of γ_{11} has low statistical power, and including all country-level variables in one step would further reduce its reliability. Therefore, it is necessary to examine one family policy or demographic variable at a time (Table 4) before we increase the number of country-level variables in subsequent analyses (Table 5).

There is a limitation of our statistical approach. We conduct many analyses, and each analysis is associated with an experiment-wise alpha error; thus, we face the risk of making a Type I error, that is, identifying a significant relationship where there is not one. To control for this, we tighten the acceptable significance level and will not interpret any coefficients that are significant at a level greater than .05.

All family policy variables in Table 4, except for maternity leave duration, are significant and positive for both math and science achievement. Recall that the country-level outcome variable (Equation 2) is the regression slope of single parenthood (β_{1j}), that is, the achievement gap between children from single-parent and two-parent homes. The coefficient of family policy (γ_{11} in Equation 2) predicts a change in the achievement gap given a change in family policy. Because the regression slope of single parenthood has a neg-

TABLE 4. HIERARCHICAL LINEAR MODELS PREDICTING MATH AND SCIENCE ACHIEVEMENT GAP BETWEEN SINGLE- AND TWO-PARENT FAMILIES FROM EACH FAMILY POLICY OR FROM EACH DEMOGRAPHIC CONTEXT VARIABLE

	Math		Science	
Model With a Family Policy Variable	γ_{11}	(β_{1j})	γ_{11}	(β_{1j})
1. Family or child allowances	1.74**	(−23.2**)	2.21**	(−25.3**)
2. Universal child benefits to lone parents	.08**	(−20.2**)	.11**	(−21.9**)
3. Benefits in tax and security to lone parents	.40**	(−12.4**)	.48**	(−11.9**)
4. Family transfers per child	.02**	(−25.2**)	.02*	(−26.3**)
5. Social expenditure per GDP	.84**	(−37.0**)	1.20**	(−45.9**)
6. Maternity leave benefits	.15**	(−21.8**)	.20*	(−24.2**)
7. Maternity leave in weeks	−.05	(−15.2**)	.01	(−16.4**)
8. Parental leave	6.95**	(−17.9**)	9.23**	(−18.8**)
Model With a Demographic Variable	γ_{12}	(β_{1j})	γ_{12}	(β_{1j})
9. % Lone-parent families	−.90**	(2.4)	−1.31**	(10.7)
10. Crude divorce rates	−3.92**	(−4.3)	−5.40**	(.1)
11. % Births to mothers under 20	−1.21**	(−8.0)	−1.77**	(−4.3)

Note: GDP = gross domestic product. Each coefficient comes from a hierarchical linear model in which the corresponding family policy or demographic variable and all individual-level variables are included. All five plausible values of math and science scores are used in the analysis. β_{1j} is the coefficient of single parenthood (i.e., the achievement gap between single-parent and two-parent families). γ_{11} is the coefficient of family policy predicting the achievement gap, and γ_{12} is the coefficient of demographic context predicting the achievement gap. See Equations 1 and 2 for more details.

*$p < .05$. **$p < .01$.

ative sign, *a positive coefficient of family policy suggests that with greater values of these family policy variables, there are smaller achievement gaps* between children from single-parent families and those from two-parent homes. For example, without any differences in family or child allowances across countries, the average math achievement gap across nations is −23.2. This indicates that, on average, students from single-parent families fall behind their counterparts from two-parent families in the math achievement test by about 23 points. We found that countries differ in their family or child allowance payments. The coefficient of allowances is 1.74. This means that in countries where family or child allowances are 10% higher (in terms of male manufacturing wage), the achievement gap is about 17 points less. Students from single-parent families fall behind their counterparts from two-parent families in the math achievement test by 6 points rather than 23 points. For science achievement, an increase of 10% in the cash benefits for a family with children almost eliminates the science achievement disadvantage of living with a single parent.

Whereas family or child allowances are more strongly linked to the achievement gap, most other family policies are only weakly related, although their relationship with the achievement gap is statistically significant. Using maternity leave benefits as an example, children from single-parent families score about 23 points lower in the science tests than do children from two-parent families (see Model 2, Science, Table 3). An increase of 10% in maternity leave benefit reduces this gap by only 2 points, a minute amount.

In addition to family policy, we also examined the association between demographic characteristics and the achievement gap. In Table 4, it is evident that virtually all demographic variables are significantly and negatively associated with the achievement gap. When a country is characterized by higher divorce rates, more single-parent families, and more teen births, the achievement gap between single-parent and two-parent families is greatest. Among these three demographic variables, the percentage of lone-parent families has the largest *t* statistic. It is apparent from the HLM regression results that family policy variables are negatively related to demographic factors. In exploratory analyses (not presented), we found moderate negative correlations between family policy characteristics and demographic variables.

To investigate whether the association between family policy and the achievement gap is not confounded by demographic context, we include the percentage of lone-parent families alongside eight family policy variables, entered one at a time, in the HLM model. For simplicity of presentation, we do not present student-level equations. Panel 5A of Table 5 shows the results for math and sci-

TABLE 5. HIERARCHICAL LINEAR MODELS PREDICTING MATH AND SCIENCE ACHIEVEMENT GAP BETWEEN SINGLE- AND TWO-PARENT FAMILIES FROM EACH FAMILY POLICY TOGETHER WITH ONE OR TWO DEMOGRAPHIC CONTEXT VARIABLES

5A. Country-Level Equations, Each With a Family Policy Variable and % of Lone-Parent Families

	Math		Science	
Model With a Family Policy and % of Lone-Parent Families	γ_{11}: Family Policy	γ_{12}: % Lone Parent	γ_{11}: Family Policy	γ_{12}: % Lone Parent
Family or child allowances	1.42**	−.36	1.61**	−.70
Universal child benefits to lone parents	.06**	−.64*	.08**	−.96**
Benefits in tax and security to lone parents	.22†	−.63†	.15	−1.15*
Family transfers per child	.01**	−.65*	.01†	−1.08**
Social expenditure per GDP	.61**	−.67*	.86**	−0.93**
Maternity leave benefits	.10*	−.45†	.14**	−.69*
Maternity leave in weeks	− .18†	−1.08**	−.18†	−1.49**
Parental leave	5.14*	−.72**	6.53**	−1.06**

5B. Country-Level Equations, Each With a Family Policy Variable and Two Demographic Variables

	Math			Science		
Interaction: Single Parenthood × (Family Policy)	γ_{11}: Family Policy	γ_{13}: Divorce Rates	γ_{14}: % Teen Births	γ_{11}: Family Policy	γ_{13}: Divorce Rates	γ_{14}: % Teen Births
Family or child allowances	.89*	−2.15*	−.00	.89*	−1.87*	−.77†
Universal child benefits to lone parents	.02	−2.36**	−.40	.03†	−2.09*	−1.03**
Benefits in tax and security to lone parents	.05	−2.33*	−.52	−.16	−3.32**	−1.59**
Family transfers per child	.01*	−2.51**	−.24	.00	−2.16*	−1.14**
Social expenditure per GDP	.10	−2.11*	−.55†	−.01	−2.08†	−1.36**
Maternity leave benefits	.07†	−1.38	−.30	.06	−1.24	−1.11**
Maternity leave in weeks	−.08	−2.10	−.90†	.16	−4.17**	−.71
Parental leave	3.65*	−2.28*	−.23	2.92†	−2.43*	−1.06**

Note: GDP = gross domestic product. For each subject, each row represents one hierarchical linear model in which the corresponding family policy variable, demographic variable, and all individual-level variables are included. All five plausible values are used in this analysis.

†$p < .10$. *$p < .05$. **$p < .01$.

ence achievement. For each subject, eight separate HLM models were analyzed with only two country-level variables: lone-parent families and one of the eight family policies we study.

The results in Panel 5A suggest that including the percentage of lone-parent families does not affect the association between family policy and the achievement gap in any major way. The percentage of lone-parent families remains significantly and negatively related to the achievement gap. In addition, all family policies, except maternity leave duration, continue to be significantly and positively associated with the achievement gap for both math and science. Panel 5B tells a similar story, although the results are less stable because we have too few degrees of freedom. Here we replace the percentage of lone-parent families with two demographic variables, which can be seen as the main causes of high percentages of single-parent families: crude divorce rates and the percentage of births to mothers younger than 20.

These two variables have a correlation of .44. Again, we enter these two variables at the country level together with a family policy variable, one at a time. Despite the fact that we have too few degrees of freedom, child or family allowances and parental leave are still positively and significantly related to the achievement gap, for both math and science achievement. Divorce rates also continue to show a negative relationship with the achievement gap in most countries, for both math and science achievement.

DISCUSSION

Several conclusions can be drawn from our analyses of 11 industrialized countries. First, single parenthood is associated with lower math and science achievement among young children. With only two exceptions, the single- and two-parent family achievement gap is found within each country, as well as for all 11 countries combined, for both math and science subjects. These excep-

tions are Austria and Iceland, which consistently show no significant achievement gap between single- and two-parent families. The largest math and science performance gap among all 11 countries is found in the United States and in New Zealand. Put differently, the United States and New Zealand consistently rank last among the 11 developed countries in terms of the equality of school performance between children from these two types of families.

Second, family resources cannot account for this significant achievement gap, although we must acknowledge that our measures of family resources are crude. We have information about a child's immigrant status, the number of people the child lives with, and the number of books and possessions the child has at home. These are only proxies for the educational, financial, and social resources parents provide their children.

Readers should be reminded that our focus is not on the achievement gap by family structure per se. In this research, we began with the expectation that living with a single parent is less detrimental in countries with more generous family policies. We did find, from our multilevel analysis, that the achievement gap between single- and two-parent families is narrowed where there are family policies aimed at equalizing economic resources between single-parent and other families. This relationship is generally weak, although it is particularly strong when we consider the policies of family or child allowances and parental leave. These policies can make a difference in the disposable income of single-parent families, as well as the time single parents need for their children, thus decreasing the negative effects of living with single parents.

This third finding confirms our observation that countries having more generous welfare policies show smaller or no achievement gap by family structure. For example, we find no achievement gap in Austria, which has a history of a social protection system with relatively large universal family allowances. A previous study ranked Austria 6th among 20 Western countries for the most generous universal child benefit scheme (Bradshaw, 1996). The United States and New Zealand, however, lag behind the other industrialized countries in providing financial assistance, in the form of universal child benefits, tax benefits, and maternity leave benefits to poor and single-parent households. The same can be said about the quality and the generosity of parental leave packages. Because of a history of full em-

ployment until the last two decades, New Zealand did not have a generous policy toward the underprivileged segment of the society. Around 1991, the rise of the ideology of the New Right even led to the dismantling of the welfare system (Kamerman & Kahn, 1997). Similarly, before the mid-1990s, Aid to Families With Dependent Children (AFDC) had been a source of support for American children in poor single-parent families. Suspicion of the social role of the federal government and the belief that social welfare creates dependency has led to the dismantling of AFDC (Zimmerman, 1995). The United States has never provided any family or child allowances. To some extent the investment in national family policies explains why Austria ranks at the top but the United States and New Zealand rank last in the academic resilience of children from single-parent homes.

A limitation of our study is that we are unable to distinguish children of never-married single parents from children with divorced or separated parents. Research in the United States has found greater disadvantage of children with never-married single mothers than disadvantage of children with divorced or separated mothers (Korenman et al., 2001). Thus we may have underestimated or overestimated the strength of the association between family policy and a country's achievement gap, depending on which type of single parenthood dominates.

Our conclusion about the link between family policy and children's achievement by family structure is also limited by the lack of data on the child's race and ethnicity. In the United States, it is well known that being African American is positively correlated with single parenthood on the one hand and negatively correlated with academic achievement on the other. Much of the achievement gap between children from single- and two-parent families may be due to historical discrimination and racial inequality in the United States, and this gap would have been smaller if the child's race and ethnicity is controlled. To examine how much our results on family policy are driven by the unique situation in the United States, we excluded the United States and reanalyzed the random effects HLM models in Table 4. Despite the fact that the already low degree of freedom is further reduced, the reanalysis does not change our conclusion about the relationship between family policy and the achievement gap (results available upon request).

Even with the United States excluded, we still

cannot rule out the possibility that race and ethnicity explains much of the single- and two-parent achievement gap in other countries. For example, New Zealand also has a minority group over 10% of its population. This largest minority group, the Maori, occupy the bottom echelon of society. Not only are Maori educationally disadvantaged, they are also overrepresented in single-parent families (Clearinghouse, n.d.; Kamerman & Kahn, 1997). Despite the fact that racial and ethnic inequality affects some countries but not others, we argue that such inequality may well serve as a proxy for inequality of family resources. By not taking into account the racial and ethnic background of each student, we allow the achievement gap to reflect possible racial and ethnic differences in family resources. We then examine how family policy can compensate for the differences. That said, we also acknowledge that our estimates of family policy may have been overstated, to the extent that some racial-ethnic differences in academic achievement are not due to inequality in family resources. There is no doubt that racial and ethnic inequality and discrimination play a significant role in the link between family policy, family structure, and children's achievement outcomes. More cross-national studies are needed to understand these relationships.

The fourth finding in this research is the systematic relationship between the prevalence of single-parent families and the achievement gap between children from single- and two-parent homes. The achievement gap is greater in countries where single-parent families are more common. The result is consistent with the family conflict hypothesis (Amato & Keith, 1991). It also corroborates the previous finding that schools with high concentration of children from single-parent families are associated with lower academic achievement (Bankston & Caldas, 1998; Pong, 1997, 1998).

During American political campaigns in recent decades, much public discussion of welfare has been directed toward the "danger" of welfare dependency. That is, family or welfare policies are feared to reinforce "undesirable" behavioral patterns by creating nontraditional domestic units dependent on public welfare. Our analyses do not support this fear. We found that family policies are negatively correlated with the percentage of nontraditional families. For example, the United States has the least generous welfare system and hardly any national family policies, yet its divorce rates are high, and single-parent families and teen

births are more prevalent here than in all the other countries we studied. Family and welfare policies, especially family and child allowance, may compensate for the negative consequences of living in single-parent families.

What seems apparent from our investigation is that the detriment of single parenthood on children's education, so widely noted in the United States and elsewhere, is not a necessary consequence of single parenthood. Economic assistance to the children in single-parent homes, in the form of family or child allowances or parental leave, can partially offset these detrimental consequences. Public welfare policies can make a difference for children, especially those in difficult situations.

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APPENDIX

DESCRIPTION OF COUNTRY-LEVEL VARIABLES

Country-Level Variables	Description	Source
% Lone-parent families	Lone-parent families as a percentage of all families in the early 1990s	Bradshaw et al. (1996), Table 1.2. Figure for Canada comes from Baker (1995)
Crude divorce rates	Divorce per 1,000 average population, 1994	United Nations (1996), Table 14
% Births to mothers <age 20	Births to mothers <age 20 as a percentage of all births in 1993–1998	United Nations (2000)
Family or child allowances	Cash benefits for a family with two children over the period of 1986–1990, measured as the percentage of average male manufacturing wage in 1990	Gauthier (1996), Table 10.1
Universal child benefits to lone parents	Monthly values of non-means-tested child benefits paid to a lone parent with two children aged 7 and 8, relative to average male earnings, in Sterling purchasing power parities, 1994	Bradshaw et al. (1996), Table 5.1. Figure for Canada comes from Phipps (1999), p. 57
Benefits in tax & security to lone parents	Differences in tax and social security per month paid by lone parents compared with payments by married couples, in Sterling purchasing power parities, 1994, for parents with average earnings and with two children aged 7 and 8	Bradshaw et al. (1996), Table 5.4
Family transfers per child	Family transfers in cash per child under 15 years of age in 1984	Cornia and Danziger, Table 4.3
Social expenditure per GDP	Government social expenditure as percentage of GDP, 1990	Cornia and Danziger, Table 4.1
Maternity leave benefits	Benefits as a percentage of female worker salary, 1996	Lesthaeghe (2000)
Maternity leave in weeks	Maternal leave duration in weeks. Figures for the US and Norway, and Iceland are given in 2001. For all other countries, the figures are given in 1996	Lesthaeghe (2000) Table 4; figure for Canada, Phipps (1999), p. 58; for Iceland, Eydal (2001); for USA and Norway, Clearinghouse (2001)
Parental leave	Generosity of package of leave (for either mother or father); arrangements indicated by high, medium, or low	Bradshaw et al. (1996), Table 4.4

Note: GDP = gross domestic product.