America's Children: Economic Perspectives and Policy Options

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American children are worse off than those in the previous generation in several important dimensions of mental, physical, and emotional well-being. During the 1960s cultural changes adversely affected children while their material condition improved substantially. By contrast, material conditions deteriorated in the 1980s, especially among children at the lower end of the income distribution. Public policies to improve the material condition of children require a transfer of resources from households that do not have children to those that do. Government programs such as tax credits and child allowances are more efficient and equitable than employer-mandated programs.

AMERICAN CHILDREN ARE IN TROUBLE. NOT ALL CHILDREN, to be sure, but many observers consider today's children to be worse off than their parents' generation in several important dimensions of physical, mental, and emotional well-being. Has the status of children really worsened over the past three decades? If so, why? And what policy options are available that might help children?

Most explanations can be classified as cultural or material. In the cultural realm observers point to the waning influence of religion on the daily lives of most Americans, the fragmentation of the family through divorce and unwed motherhood, and the harmful influence of television on intellectual development and physical activity (*1*). In this vein, some observers relate the problems of children to a permissive society in which adults fail to set high standards or provide sufficient attention and discipline. In *Childhood's Future*, Louv argues that children today experience a freedom that is closer to abandonment (*2*).

The other set of explanations emphasizes changes in the material realm. Has government failed to provide the goods and services needed by children? Have changes in the distribution of household income (both earned and transfers from government) adversely affected the ability of parents to provide for their children? What has happened to the production of goods and services for children within the household (meals at home, childcare, and help with homework)?

In this article, we focus primarily on the material side, but also consider important interactions between the two sets of explanations. Cultural changes, such as the growing incidence of divorce and unwed motherhood, reduce the income available to children. Material changes, such as a decrease in household income—either absolute or relative to expectations—may induce both parents to seek paid jobs, with possible negative implications for families and neighborhoods.

One frequently mentioned explanation that can be dismissed at the outset is that children are increasingly born to women of low education. There is a significant gap between the schooling of women with children and those who are childless, but the relative gap was not appreciably greater in 1988 than in 1960. In absolute terms, today's parents have much more schooling than those of the previous generation. The proportion of children living in households with a woman who had not completed high school was 50% in 1960 but only 21% in 1988; the proportion where the woman had 4 years of college or more jumped from five to 15%.

The Status of Children

Between 1960 and 1990 the number of children in the United States remained roughly constant at about 64 million. During that same period the number of adults ages 18 to 64 increased from 100 million to 152 million, and the number of Americans 65 and older jumped from 17 to 31 million. With many more adults available to provide and care for children, a substantial increase in the well-being of children might have been expected. Instead, the reverse seems to have occurred. A national household survey of parents in 1988 reported that nearly 20% of children ages 3 to 17 had one or more developmental, learning, or behavioral disorders (*3*). By the time they reached ages 12 to 17, one in four adolescents had suffered at least one of these disorders. Comparable data for the previous generation are not available, but several other indicators suggest deteriorating conditions for children both absolutely and relative to adults (Table 1) (*4*).

Declining performance on standardized tests between 1960 and 1980 has been well documented and is only partially accounted for by the characteristics of those taking the tests. Between 1980 and 1988 test scores rose slightly, but then fell again between 1988 and 1991, with results on the verbal portion reaching an all-time low (*5*). The tripling of the teenage suicide rate occurred during a period when the age-adjusted suicide rate for adults 25 and older remained approximately constant. Homicide rates have increased at all ages, but more rapidly for teenagers than for adults. The sharp increase in obesity in children is of concern because it raises the risk of hypertension, psychosocial problems, respiratory disease, diabetes, and orthopedic problems (*6*). Poverty rates for children and adults dropped sharply between 1960 and 1970, but since then the incidence of poverty among children has increased while remaining roughly constant among adults (*7*).

Not all trends have been adverse. In particular, infant and child mortality has fallen by more than 50% since 1960. Life expectancy tables for that year show 41 of every 1000 newborns dying before their 20th birthday; by 1988 the comparable figure was only 19. On the other hand, reported rates of child abuse tripled between 1976 and

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Table 1. The status of children, selected years, 1960 to 1988. Children are under age 18 unless otherwise specified.

Variable	1960	1970	1980	1988
SAT scores				
Verbal	477	466	424	428
Math	498	488	466	476
Suicide rate, ages 15 to 19*	3.6	5.9	8.5	11.3
Homicide rate, ages 15 to 19*	4.0	8.1	10.6	11.7
Obese (%)				
Ages 6 to 11	18†		27§	
Ages 12 to 17		16‡	22§	
Children in poverty (%)	26.9	15.1	18.3	19.5
Children whose parents divorced during the year (%)	0.72	1.25	1.73	1.68¶
Births to unwed mothers (%)	5.3	10.7	18.4	25.7
Children in households with only one adult (%)	5.5	9.2	12.1	14.2
Married women in the labor force with children under age 6 (%)	18.6	30.3	45.1	57.1

*Rate per 100,000. †About 1964. ‡About 1968. §About 1978. ¶1986.

1986 (*8*); whether this reflects only better reporting is not known. A recent assessment of proficiency in mathematics revealed that only one in seven eighth graders could perform at the level that educators expect for that grade (*9*). Even at age 17, one-half of all high school students cannot "compute with decimals, fractions, and percentages; recognize geometric figures; and solve simple equations" (*10*). To what extent are these problems of children correlated with trends in government spending and household income and behavior?

Government Purchases of Goods and Services

In 1988 purchases of goods and services by government (federal, state, and local) amounted to $962 billion (Table 2). Some of these purchases were clearly intended for children—for example, public spending for elementary and secondary schools. Others were clearly intended for adults—for example, Medicare and higher education. We allocated to children or to adults all clearly identifiable purchases; some items (amounting to 57% of the total in 1988) such as national defense or general administration could not be allocated by age. Similar estimates for 1960, 1970, and 1980 were adjusted to 1988 dollars by a price index of goods and services purchased by government (*11*). Government transfers of money to households through programs such as Social Security retirement or Aid to Families with Dependent Children are not part of government purchases; they are included in the estimates of household income to be discussed below.

The data in Table 2 show that government purchases of goods and services for children (in real dollars) have risen throughout the period both in the aggregate and on a per child basis. Although the allocation of purchases by age is not precise, separate analyses of the most important components of government spending for children reveal the same upward trend. For instance, expenditures per pupil in public elementary and secondary schools adjusted by the input price index for education rose by 2% per annum between 1975 and 1987 (*12*). Government spending for personal health care per child, adjusted by the medical care component of the consumer price index, also rose by 2% per annum between 1977 and 1987 (*13*).

Although Table 2 gives no support to the notion that government purchases of goods and services for children have declined, it does show that purchases for adults have increased at a much faster pace, primarily as a result of the introduction of Medicare and Medicaid in 1965 and the subsequent rapid growth of those programs. Moreover, those who argue that children's problems result from insufficient government spending argue that the increase in purchases has not been sufficient to allow the schools and other publicly supported institutions to cope with the greater problems they now face. These problems are attributed to an increase in the percentage of children coming from non-English speaking homes, from one-parent homes, or from homes where both parents are in paid employment. Also, more resources are needed to "mainstream" children who were previously neglected by public institutions because of physical, mental, or emotional disabilities.

Money Income

Most goods and services consumed by children (and adults) depend on the money income received by households (Table 3) (*14*). Using public use samples of the 1960, 1970, and 1980 Censuses of Population, and the March 1988 Current Population Survey (*15*), we calculated the money income of each household, including wages and salaries, self-employment income, dividends, interest, and other nonwage income, transfers from government such as retirement income or welfare payments, and private transfer income received in the form of alimony or child support payments. Within each household, we allocated the money income equally on a per person basis to the adults and the children, if any, in the household (*16*). The children are then arrayed from the lowest to the highest income, and the income per child at various points in the array, such as the first quartile, the median, and the third quartile, is determined. Similar calculations are performed for adults as a whole and for adults divided into two age groups, those between 18 and 64, and those 65 and older. Income estimates in current prices for 1960, 1970, and 1980 are converted to 1988 dollars by a price index of goods and services purchased by households (*17*).

The first row of Table 3 shows a substantial increase in the median money income per child from $4133 in 1960 to $6917 in 1988. The rate of increase over the entire period in real dollars was 1.84% per annum. Although this was slightly lower than the 2.04% per annum increase experienced by adults, these data provide little support for the view that a fall in household income available to children is the cause of their declining well-being. This conclusion, however, needs to be qualified in three important ways.

First, the growth of median income per child was much more rapid between 1960 and 1970 (2.80% per annum) than between 1970 and 1988 (1.30% per annum).

Second, our calculations reveal that inequality in income among children increased appreciably, especially between 1980 and 1988. Thus, looking at income per child at the lower end of the distribution (first quartile) (B of Table 3), we see that the rate of growth was appreciably slower than at the median; between 1980 and 1988 there was no growth at all. By contrast, the rate of growth for children at the third quartile (not shown in the table) was 1.94% per annum between 1960 and 1988. Adults do not show any increase in inequality between 1960 and 1988; the rates of growth at the first quartile, median, and third quartile were all between 2.01% and 2.06% per annum.

The third important qualification concerns the source of income for children. Since 1960 there has been a huge increase in the proportion of mothers in paid jobs (Table 1) (*18*). The importance of their earnings in sustaining income for children can be seen in parts C and D of Table 3, where the calculations are identical to those in parts A and B, except that the earnings of women in

households with children have been subtracted from total income (*19*). That adjustment reduces the rate of growth of the median income per child to only 0.95% per annum, while the rate for adults remains at a sizeable 1.92% per annum. The earnings of women in households with children became most important at the first quartile; without them, the gains of the 1960s were completely offset by losses between 1970 and 1988 (*20*).

An important trend adversely affecting children's income is the increase in households without an adult male. In 1960 only 7% of children lived in such households; by 1988 that proportion had jumped to 19%. The median income per child in 1988 was $7640 with an adult male, but only $2397 without an adult male. As a rough approximation, if the proportion of children without an adult male had stayed at 7%, average income per child in all households would have been about 9% higher than it was in 1988 (*21*).

Figure 1 shows that income trends have varied by type of household and type of measure. With an adult male present, median and first quartile income rose in all three decades. These households, however, became increasingly dependent on women's earnings over time as evidenced by the widening gap between the curves that do not include women's earnings (dashed lines) from those that do (solid lines). This effect is particularly strong for children at the lower end of the income distribution: without women's earnings real income in 1988 was no higher than in 1970. In households without an adult male, median and first quartile income rose in the 1960s and 1970s, but declined between 1980 and 1988. No trend is shown for the first quartile in households without an adult male when women's earnings are subtracted because the value was zero in all 4 years (*22*).

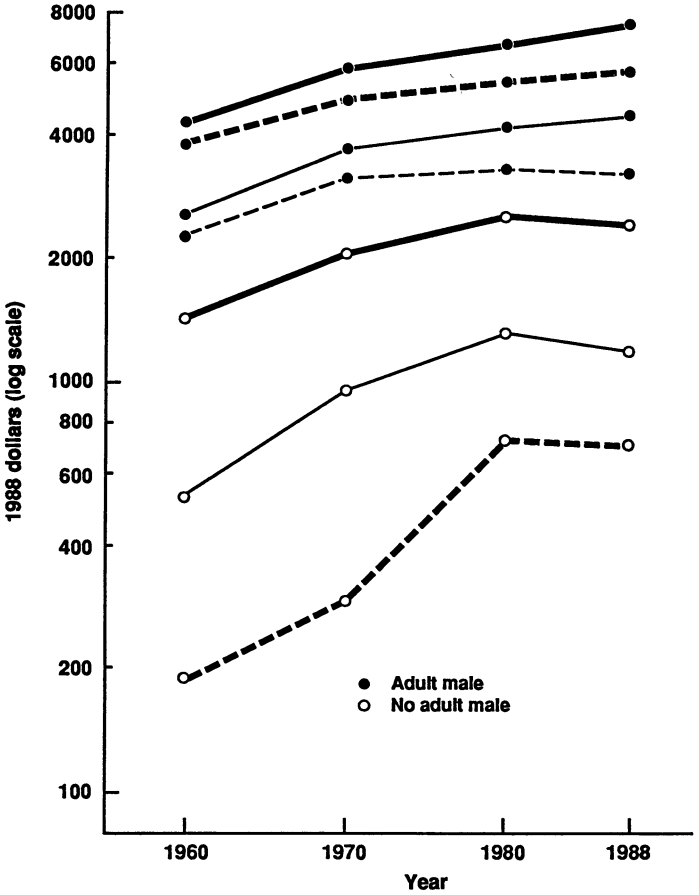

Fig. 1. Income per child in households with and without an adult male. Thick lines represent the median; thin lines, the first quartile; solid lines, all income; and dashed lines, minus women's earnings.

Nonmarket Production

Children's material well-being depends primarily on three sources: the goods and services provided by government, the goods and services purchased for them by their parents with household income, and the goods and services provided by adults to children within the household through so-called nonmarket production. Data on nonmarket production comparable to the government and money income time trends are not available. However, data on the proportion of children in one-adult households and the labor force participation rates of married mothers suggest a downward trend in nonmarket production.

We see in Table 1 that the percentage of children living in households with only one adult almost tripled between 1960 and 1988. Even more striking is the jump in the proportion of married women with one child or more under age six who are in the labor force. Such striking changes in the number of adults and in their employment status probably resulted in some decrease in home-cooked meals, help with homework, and other nonmarket goods and services since 1960. By 1986, in white households with

Table 2. Federal, state, and local government purchases of goods and services for children (<18) and adults (≥18), selected years, 1960 to 1988.

Variable	1960	1970	1980	1988	Rate of change 1960 to 1988 (percent per year)
Aggregate purchases (billions of dollars, 1988)*					
Children	83.1	141.6	154.3	188.1	2.92
Adults	34.0	102.8	160.2	228.7	6.81
Not allocated by age†	381.0	461.7	450.3	545.7	1.28
Number of persons (millions)					
Children	64.5	69.7	63.8	63.8	−0.04
Adults	116.1	133.5	162.8	182.0	1.60
All ages	180.7	203.2	226.5	245.8	1.10
Purchases per person (dollars 1988)*					
Children	1289	2032	2420	2946	2.95
Adults	292	770	984	1257	5.21
Not allocated by age†	2109	2272	1988	2220	0.18

*Adjusted by the GNP implicit deflator for government purchases of goods and services. †For example, national defense, general administration, and public safety.

children, there were about 10 hours less per week of potential parental time (total time minus time in paid work); the decrease for black households with children was approximately 12 hours per week (*23*). The principal reason for the decline was an increase in the proportion of mothers holding paid jobs, but the increase in one-parent households was also important, especially for black children.

Consideration of women's earnings, nonmarket production, and the presence of an adult male shows that the cultural and material explanations are not completely distinct. Divorce or birth to an unwed mother usually has an adverse effect on the material well-being of children quite apart from any psychological or social implications. The slow growth of the real earnings of young fathers since 1970 (especially for those at the first quartile of the income distribution) induced more mothers to take paid employment, with repercussions for the cultural realm. Interactions between the two realms need to be considered in any discussion of policy options to help children.

Policy Options

The menu of policy options to help children tends to divide into two categories similar to the cultural and the material explanations. There are those who argue that only a return to more traditional family structures and values can provide the combination of care and discipline that children need. Some advocate changes in public policy such as more stringent divorce laws or holding parents responsible for the antisocial acts of their children in order to reverse the cultural changes of recent decades.

Most advocates for children tend to emphasize the necessity to improve their material condition through new or expanded programs of education, health, childcare, and the like. Because society's resources are fixed at any given time, such programs must involve a reallocation of resources from adults to children, either within households that have children or between households that do not have children and those that do. The mechanisms for reallocation may involve business firms or the government, but ultimately all resources flow from and to households.

One possibility is for adults in households that have children to devote more money and time to the children and less to themselves. In practice it is difficult for public policy to compel such redistributions; except for extreme abuse, parents are free to treat their children as they wish. However, to the extent that parents care about their children's well-being, a well-chosen combination of taxes on adult consumption and subsidies of children's goods and services might induce some reallocation of household income toward children.

The most likely source of additional revenues for children is from households that do not have children. Such households have grown in relative importance from 49% of the total in 1960 to 62% in 1988. In households headed by someone between 25 and 44 (the prime ages for having children) the proportion without children has almost doubled—from 20% in 1960 to 37% in 1988. Given the present distribution of income in the United States, revenue transfers to households with children would be "progressive," from higher to lower income persons. Among all households without children, median income per person is 67% higher than among households with two children (1988). Holding the age of the householder constant, the differential is substantially larger.

Comparisons of income per person tend to exaggerate household differences in living standards for two reasons: first, a child may not require as much income as an adult; second, large households may not require as much income per person as small households in order to achieve the same level of material well-being. The official poverty rate calculations adjust for these factors; for example, a household with two adults and two children is assumed to require only twice as much income as a one-adult household in order to exceed the poverty level of living. Nevertheless, poverty is more likely in households with children, and the incidence rises sharply for households with three or more children. Regardless of the method of comparison, it is indisputable that a redistribution of income from households without children to those with children would result in greater equality. A corollary is that a general redistribution from

Table 3. Household income per child and per adult, selected years 1960 to 1988.

Variable	Household income (1988 dollars)*				Rate of change 1960 to 1988 (percent per year)
	1960	1970	1980	1988	
			Total income		
A. Median					
Child	4,133	5,470	6,220	6,917	1.84
Adult	6,201	8,145	9,342	10,992	2.04
18 to 64	6,375	8,513	9,665	11,281	2.04
≥65	4,924	6,232	7,687	9,831	2.47
B. First quartile					
Child	2,390	3,284	3,568	3,555	1.42
Adult	3,598	4,812	5,579	6,310	2.01
18 to 64	3,788	5,107	5,750	6,313	1.82
≥65	2,841	3,623	4,978	6,152	2.76
			Income minus earnings of women in households with children		
C. Median					
Child	3,726	4,603	4,839	4,866	0.95
Adult	5,568	7,273	8,249	9,539	1.92
18 to 64	5,708	7,383	8,416	9,511	1.82
≥65	4,719	6,031	7,554	9,679	2.57
D. First quartile					
Child	2,005	2,501	2,312	2,015	0.02
Adult	3,175	4,154	4,664	5,081	1.68
18 to 64	3,254	4,343	4,611	4,854	1.43
≥65	2,782	3,619	4,876	6,017	2.76

*Adjusted by GNP implicit deflator for personal consumption expenditures.

Table 4. Characteristics of households with one or more children under 6 years of age, by presence and employment status of adults, 1988. Employment is defined as paid employment for at least 1000 hours in year.

Adults in household	Children <6 (%)	Poor children <6 (%)	Median income per person (dollars)	Schooling of women (years)
One woman and one man				
Both employed	27.1	3.2	9956	13.5
Man employed	37.7	21.0	7028	12.8
Woman employed	2.5	2.1	5361	12.9
Neither employed	6.1	16.2	2535	11.9
One woman				
Employed	3.9	5.1	5233	12.7
Not employed	8.0	33.8	1388	11.0
Other*	14.7	18.7	5702	11.1

*Includes two or more women, three or more adults (with at least one man), and one or more men (with no women). Totals may not equal 100 because of rounding.

higher to lower income (without regard to the presence of children) would tend to benefit children.

One way of achieving redistribution to children is to require employers to offer benefits such as paid parental leave or subsidized child care with the costs of such benefits spread among all workers (in the form of lower wages or foregone other benefits) or among consumers (in the form of higher prices). The employer-mandate mechanism appeals to many in government because it avoids difficult budgetary choices, but it will usually be less efficient and less equitable than direct government programs supported by general taxation.

Mandated child-benefit programs reduce economic efficiency because the costs fall disproportionately on the consumers of particular products and on workers in particular industries and firms—those that employ relatively more women of childbearing age (*24*). These distortions in relative prices and wages cause consumers and workers to change their behavior and reduce the overall efficiency of the economy much as if the government put a special tax on commodities that were produced by women with small children. Moreover, firms would be less likely to hire women of child-bearing age or to promote them to higher level positions.

The distributional consequences of employment-based child benefit programs are particularly regressive, as may be seen in Table 4. Most poor children do not live in households that would be the chief beneficiaries of employer-mandated programs. Indeed, the households that would receive the bulk of the benefits (where both the woman and the man are employed) have the highest income and the smallest poverty rate. Paid parental leave would provide the greatest dollar benefits for children with the best paid parents; many of the poorest children would receive no benefit at all because their mothers are not employed and have poor job prospects. Those women who are raising children alone and are not currently employed have, on average, only 11 years of schooling.

An alternative way to help children is for government to provide tax credits, subsidies, or child allowances with the costs met by raising taxes or cutting spending for other programs. These benefits could be means tested (available only to children below a certain income level), or they could be available to all children. Even the latter approach, if financed by general revenue, would have a progressive distributional impact because so many children are in households with low income. A major challenge for government is to devise tax credits or allowances for children without exacerbating cultural changes (such as more divorce or more births to unwed mothers) that would increase the number of children in poverty.

Conclusion

Both cultural and material changes have probably contributed to the problems of America's children; the relative importance of the different explanations, however, varies over time. Between 1960 and 1970 the fall in test scores, the doubling of teenage suicide and homicide rates, and the doubling share of births to unwed mothers cannot be attributed to economic adversity. During that decade purchases of goods and services for children by government rose very rapidly, as did real household income per child, and the poverty rate of children plummeted. Thus, we must seek explanations for the rising problems of that period in the cultural realm.

By contrast, material conditions did deteriorate in the 1980s, especially among children in households at the lower end of the income distribution. Between 1980 and 1988 real income per child at the first quartile declined slightly, and even the gain of 1.0% per annum at the median was almost entirely accounted for by mothers taking on paid employment. At the first quartile, income per child fell at the rate of 1.4% per annum if women's earnings are excluded. Moreover, the sharp increase in the proportion of children living in households in which all adults are employed implies a decrease in time available for nonmarket production of goods and services.

What of the future? Expressions of concern about the well-being of children span the political spectrum (*25*), but no consensus has been reached regarding the causes of children's problems or the policies that would alleviate them. Some analysts seek to reverse the cultural changes of the past several decades by making divorce more difficult or holding parents responsible for their children's antisocial acts. Even those who emphasize cultural changes, however, experience difficulty devising public policies that would reverse them. How can government change the public's values and lifestyles without intruding on what many claim are fundamental individual rights?

Most policy discussions focus on improving the material well-being of children through government mandates on employers or direct government programs such as tax credits or child allowances. Implicit in many of the proposals is the hope that higher income for households with children will lead to more parental inputs at home and less time spent in paid employment. Alternatively, credits and allowances could facilitate the purchase of more services for children.

In order to formulate an efficient and equitable set of policies about children, society must reach some agreement concerning the objectives of such policies, the means to reach those objectives, and the distribution of the costs. There seems to be some truth to both conservative critiques of the cultural changes that were launched in the 1960s as well as liberal complaints about the uneven prosperity of the 1980s. But mutual recrimination does little to help children. All adults need to recognize that the nation's future depends critically on our willingness and ability to help America's children today (*26*).

REFERENCES AND NOTES

1. See, for instance, many of the papers in *Rebuilding the Nest*, D. Blankenhorn, S. Bayme, J. B. Elshtain, Eds. (Family Service America, Milwaukee, 1990).
2. R. Louv, *Childhood's Future* (Houghton Mifflin, Boston, 1990).
3. N. Zill and C. A. Schoenborn, "Developmental, learning, and emotional problems: Health of our nation's children, United States, 1988," in *Advance Data* (U.S. Department of Health and Human Services, no. 190, 1990).
4. Details on sources and methods for all tables available on request.
5. "College Board verbal scores decline to an all-time low," *New York Times*, 27 August 1991, p. 16.
6. "Health implications of obesity," National Institutes of Health, Consensus Development Conference Statement (U.S. Department of Health and Human Services, PHS, February 1985), vol. 5, no. 9.
7. M. J. Bane and D. T. Ellwood, *Science* **245**, 1047 (1989).
8. Bureau of the Census, *Statistical Abstract of the United States* (U.S. Government

Printing Office, Washington, DC, 1990), p. 176.
9. K. DeWitt, "Eighth graders' math survey shows no state is 'cutting it'," *New York Times*, 7 June 1991, p. 1.
10. A. N. Applebee, J. A. Langer, I. V. S. Mullis, "Crossroads in American education," (Educational Testing Service, Princeton, NJ, February 1989), p. 21.
11. That is, the GNP implicit deflator for government purchases; see *Economic Report of the President* (U.S. Government Printing Office, Washington, DC, January 1991), p. 291.
12. U.S. Department of Commerce, *Statistical Abstract* (U.S. Government Printing Office, Washington, DC, 1989), p. 172.
13. D. R. Waldo *et al.*, *Health Care Financing Rev.* **10**, 114 (1989), tables 2 and 3.
14. Reported money income is a good but not perfect measure of command over goods and services because it does not include fringe benefits, such as health insurance, or income from the underground economy, nor does it exclude personal income taxes. Estimation of the effects of these variables on the true net income available to households is very difficult, and even more difficult if separate estimates for children and adults are required.
15. Because the data gathered by the Bureau of the Census through the Current Population Surveys differs slightly from that gathered in the decennial censuses, the 1988 figures were adjusted to census levels by linking changes in the Current Population Survey results between 1980 and 1988 to the 1980 census levels. The number of persons in the samples are: 175,123 in 1960, 197,345 in 1970, 220,916 in 1980, and 155,654 in 1988.
16. Alternative calculations in which each child is weighted as some fraction of an adult, for example, 0.75 or 0.50, show that the trends over time that are discussed here are not sensitive to assumptions about the "adult equivalence" of children unless the assumption is changed appreciably from one year to another. We have no basis for making such changes.
17. That is, the GNP implicit deflator for personal consumption expenditures [*Economic Report of the President* (U.S. Government Printing Office, Washington DC, January 1991), p. 290].
18. The rapid growth in the female labor force participation rate since 1960 is accounted for primarily by women in households with children. Participation rates among childless women have always been high and show little change. Participation rates of older women whose children no longer live with them have shown only modest increases since 1960.
19. The purpose of this calculation is to show the contribution of women's earnings to the income available to children, not to suggest that women should not have paid jobs.
20. This statistical adjustment does not capture all the labor market and income effects of the increase in mothers taking paid jobs; to do so would require a complex model beyond the scope of this paper.
21. The weighted average of $7640 and $2397 is $7273 when the weights are 93% and 7%, but only $6644 when the weights are 81% and 19%.
22. That is, in more than 25% of the households without an adult male, women's earnings were the only source of income.
23. V. R. Fuchs, *Women's Quest for Economic Equality* (Harvard Univ. Press, Cambridge, 1988), p. 111.
24. Even if the mandate legislation is gender-neutral, the Swedish experience indicates that many more women than men will use the benefits ["A land where father (sometimes) is left holding the baby," *Sweden Now* **6**, 27 (1986)].
25. *Beyond Rhetoric: A New American Agenda for Children and Families*, Final Report of the National Commission on Children (U.S. Government Printing Office, Washington, DC, 1991).
26. Financial support for this work was provided by the Andrew W. Mellon Foundation. Helpful comments from V. Foster, A. Garber, E. King, E. Lewit, R. Olshen, and M. Shuchman are also gratefully acknowledged.

Fermi Surfaces, Fermi Liquids, and High-Temperature Superconductors

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Recent experimental results are beginning to limit seriously the theories that can be considered to explain high-temperature superconductivity. The unmistakable observations of a Fermi surface, by several groups and methods, make it the focus of realistic theories of the metallic phases. Data from angle-resolved photoemission, positron annihilation, and de Haas–van Alphen experiments are in agreement with band theory predictions, implying that the metallic phases cannot be pictured as doped insulators. The character of the low energy excitations ("quasiparticles"), which interact strongly with atomic motions, with magnetic fluctuations, and possibly with charge fluctuations, must be sorted out before the superconducting pairing mechanism can be given a microscopic basis.

OF ALL THE MACROSCOPIC PROPERTIES THAT ARISE FROM the quantum nature of electrons in solids, superconductivity is the most striking. The complete disappearance of electrical resistivity at and below the superconducting critical temperature T_c results from the appearance of a coherent, macroscopic quantum state in which individual electrons can no longer dissipate energy. Accompanying the onset of superconductivity is the expulsion of magnetic fields from the superconductor and the widely reported facility for levitation of superconductors above magnets, or vice versa. For the 75 years after superconductivity was discovered in 1911, the phenomenon required very cold temperatures, within 25 K of absolute zero. Nevertheless, concerted scientific study has provided us with a large family of superconducting materials, and the theory of conventional superconductivity (*1*) is well established.

The breakthrough in high temperature superconductivity (*2*) that has appeared in the perovskite-derived copper oxides (cuprates) and bismuth oxides (bismuthates) was remarkable and unexpected. At present the highest T_c is 125 K in $Tl_2Ba_2Ca_2Cu_3O_{10}$, which is easily achieved using liquid nitrogen. This value is five times higher than known before Bednorz and Müller (*2*) in 1986 discovered superconductivity in cuprates. The bismuthate $Ba_{0.6}K_{0.4}BiO_3$ has T_c ~35 K, 50% higher than previously known. During the previous several decades the maximum value of T_c had increased steadily but very slowly, and the breakthrough naturally raised a wide variety of speculations about its microscopic origin. More recently, theorists have returned to more fundamental questions: Do these materials present a "novel state of matter," or are they rather "novel materials" that manage to wring a much higher critical temperature from established processes? In this article we review the evidence concern

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