THE NATIONAL INSURANCE INSTITUTE
BUREAU OF RESEARCH AND PLANNING

THE EFFECT OF CHILD ALLOWANCES ON FERTILITY

by
Marjorie Honig

DISCUSSION PAPER 3

Comments Invited

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INTRODUCTION

Child allowances in Israel are viewed primarily as an income maintenance measure. In 1969, 91% of poor children were in two-parent families, 96.5% in families whose head was below retirement age, and 80% in families whose head was employed. Most poor children, therefore, were not eligible for support through the other forms of insurance in the Israeli transfer system. For this reason a significant expansion of the child allowance system was proposed as a means of reducing the size of the poverty population.[1)]

It is possible, however, that a child allowance program may have an impact of fertility as well. Child allowances increase the incomes of families with children and reduce the costs of children relative to other items in the household budget. To the extent that actual family size bears a relation to desired family size, and to the extent that families consider the economic aspects of rearing children, a program of child allowances may have the effect of encouraging families to have more children.

The potential pro-natalist impact of a child allowance system may be desirable or not, depending on national goals with respect to fertility. Several countries, for example, have adopted child allowances primarily for their expected positive impact on fertility. It should be recognized, however, that the two goals of a child allowance program– income maintenance and the encouragement of larger family size – are not complementary. Governments which introduce child allowances as an income maintenance measure presumably have the goal of raising per-capita income in the family. The incentives to increase family size present in the program may thwart this objective. It is therefore important to know the impact on fertility of child allowances in order to estimate the probable success of the program as an anti-poverty measure.

The present study is a summary of research to date on the impact of child allowances on fertility. The first section is a discussion of the basic factors determining fertility, in particular the relevance of economic factors in the decisions of households regarding family size. This discussion is important since child allowances affect various economic parameters; the impact of child allowances on fertility will be negligible if families ignore these parameters in their decisions. An economic model of fertility is outlined, and child allowances are discussed in the context of this model.

1) In 1969, children constituted 50% of the poverty population after government transfers. See Jack Habib, **The Role of Child Allowances in a Tax-Transfer Structure** (Jerusalem: The Falk Institute, 1972), pp. 3--4. Estimates of poverty are based on a poverty line of IL 100 per standard adult, which is equivalent to 40% of the median disposable income per standard adult for families of four.

The next section discusses empirical estimates of the impact of child allowances on fertility. Shortcomings of the only multivariate analysis to date are discussed, as well as evidence from the experience of several countries which established child allowances following World War II. This evidence is insufficient for the purpose of arriving at firm conclusions about the effect of child allowances. However, combined with the results of several economic analyses of the significance of various income and price effects in general, it is possible to arrive at the tentative conclusion that child allowances are likely to have a positive but quite small impact on fertility.

The next section discusses the likely impact of child allowances in Israel, and contains some predictions about fertility patterns among the various population groups in the next few years. The last section summarizes the discussion.

This paper is in no way an original contribution to research in the field of fertility, but attempts instead to provide a basis for discussion of the determinants of fertility in general, the role of child allowances in particular, and a summary of research in the field. In fact, the underlying theme of the study is that the impact of child allowances on fertility has not been established empirically, and that additional empirical work is required before the tentative tone of the conclusions presented here can be withdrawn.

AN ECONOMIC MODEL OF FERTILITY

There is at present no complete theory of the determinants of individual reproductive behavior. In the past decade economists have made considerable progress in confirming the qualitative predictions of the rudimentary demand theory of fertility developed by Gary Becker.[2] Concurrently, research by sociologists has directly or indirectly confirmed the relevance of economic variables in household decisions regarding family size.[3] It probably is a fair estimate of the state of research in the field to conclude that the role of income and price effects has been confirmed (the income effect with less certainty); what remains is estimation of the quantitative importance of these effects within the context of a more complete model. A major constraint has been the lack of suitable data to minimize the influence of the taste factor, and to allow the incorporation of the life-cycle aspects of the family size decision. It is important for the purposes of the present study to outline the present state of economic research in the field, since the importance of economic variables for fertility clearly has implications for the effect of child allowances on fertility rates.[4]

An economic model of fertility is essentially a model of household demand for consumer durables.[5] Children are assumed to yield utility to parents over a period of years, in advanced economies primarily in the form of psychic income. Parents are assumed to make decisions which maximize their collective welfare. The household's demand for children is a function of the income of the household, its tastes, the price of children, the prices of com-

2) Gary S. Becker, "An Economic Analysis of Fertility," **Demographic and Economic Change in Developed Countries,** a conference of the Universities-National Bureau of Economic Research (Princeton University Press, 1960), pp.209–231. Essentially the same ideas were presented by a demographer, Norman Ryder, at the same time: "Fertility," , **The Study of Populations,** eds. Hansen and Duncan (Chicago: The University of Chicago Press, 1959) pp.426–427.

3) See, for example, Ronald Freedman and Doris P. Slesinger, "Fertility Differentials for the Indigenous Nonfarm Population of the United States," **Population Studies,** XV (November 1961), pp. 161–173; Ronald Freedman and Lolagine Coombs, "Economic Considerations in Family Growth Decisions," **Population Studies,** XX (November 1966), pp. 197–222; and Jeanne Clare Ridley, "Number of Children Expected in Relation to Non-Familial Activities of the Wife," **Milbank Memorial Fund Quarterly,** 37 (July 1959), pp. 277–296.

4) Child allowances increase income as well as reduce the price of children, both of which are predicted to affect household decisions regarding family size. It is also possible that child allowances may affect fertility outside of an economic context – for example, by creating a pro-natalist 'atmosphere.' French demographers are convinced that this has been the most important effect of the introduction of child allowances, although little evidence of this effect exists.

5) This model follows from the household production model developed by Gary Becker 'A Theory of the Allocation of Time," **Economic Journal,** LXXV (September 1965), pp. 493–517.

plementary and substitutable goods, and the prevailing institutional and cultural environment.[6]

The income effect is predicted to be positive, with the implication that children are "normal" goods. There is some controversy among economists as to the sign of the income effect, since increases in income may lead to the purchase of "higher quality" goods rather than larger quantities. In this case the partial income coefficient, where fertility rates are the dependent variable, may be zero. This remains one of the questions to be settled in the field, although the consensus on a priori reasoning seems to be that the coefficient should be positive although small.[7]

It should be noted at this point that a predicted positive income effect appears to contradict the evidence from time-series data which show decreasing fertility with increases in real incomes. This pattern is evident in advanced economies in this century, and is also present in the less developed countries. The simple negative correlation between income levels and fertility seems to imply that children are "inferior" goods. The source of the downward bias in the coefficient of the income variable is the omission of important variables which change over time along with income. With higher incomes there are important changes in the implicit prices attached to various activities such as childrearing, and the observed association between fertility and income is clouded by these price effects. Specifically, increases in income over time are correlated with increases in female wages, which indicate increases in the value of women's time. Since childrearing is a time-intensive activity, increases in the market wage of mothers raises the opportunity cost of children. If this negative price effect is larger than the positive income effect (indicated by the husband's wage) and if the secular increase in the market value of women's time is greater than or equal to that of men, there will be an observed secular decline in fertility.[8] The partial effect of income on fertility, however,

6) In a model explaining actual rather than desired number of children, a variable expressing the state of birth control technology must be added. Since knowledge of and sophistication in the use of birth control techniques is likely to be positively correlated with income, the omission of this variable results in biased estimates of income and wage coefficients. However, expenditures and knowledge about contraception which are endogenous and the result of high income — for example where high wages have induced women to adopt more effective contraceptive techniques — should not be held constant. Incidentally, the increased dissemination of birth control technology over time, by reducing the stochastic element in fertility, carries with it the implication that economic models should become increasingly relevant in predicting actual fertility rates.

7) See, for example, Glen G. Cain, "Issues in the Economics of a Population Policy for the U.S.," **American Economic Review**, 61 (May 1971), p. 412.

8) The negative bias in the simple correlation between income and fertility was first pointed out by Jacob Mincer, "Market Prices, Opportunity Costs, and Income Effects," C. Christ (ed.), **Measurement in Economics** (Stanford: Stanford University Press, 1963). His empirical results for the U.S. indicated that the absolute value of the negative estimate of the price elasticity was greater than the estimate of the positive income elasticity. Combined with the larger secular increase in the market value of women's time than in men's time, the result was a secular decrease in fertility.

is predicted to be positive.[9]

The price of children depends on the state of technology in the production of children and the prices of inputs into the production function. These inputs consist of market goods which are complements in production to children, such as education, medical services, food and housing, as well as "home-provided" inputs, the most important of which is the time of the mother. The price of a home-provided input is the value of the marginal product of the input in the best alternative use. To the extent that women who differ in their productivity in the labor market do not differ, or differ less in their productivity in raising children, *the cost of children will be higher for women with higher market productivity. Thus, the* observation above that the secular increase in the education of women, with the corollary increase in the market productivity of women and thus in the price of children, would lead to a substitution away from the production of children.[10]

In less developed countries infant mortality rates also have implications for the price of children. A reduction in infant mortality reduces the required number of births to produce a surviving child, thereby reducing the price of a surviving child. If the price elasticity of demand for children were zero, the elasticity of the birth rate with respect to mortality rates *could be expected to be plus one. A positive price elasticity would lead to an increase in the* number of survivors demanded. The increase in quantity demanded, however, is predicted to be not sufficiently large to offset the lower number of births required per surviving child. A positive relationship, therefore, is predicted between infant mortality rates and fertility.[11]

9) The gross negative relation between income and fertility may be observed in the cross-section as well for the same reasons. Wives in low-income families have low wages because of low levels of education and higher probabilities of living in rural areas where market opportunities are limited. In addition, the poor are less effective users of contraception. Once these factors are accounted for, the partial effect on income is predicted to be positive.

10) There is some evidence to support the hypothesis that education raises productivity within the home as well, including child rearing. See, for example, Robert T. Michael, **Education in Nonmarket Production,** mimeographed (New York: National Bureau of Economic Research, 1972). If the effect of schooling is neutral between home and market, the cost of children is not higher for families with more educated women. The assumption is usually made however that education is not neutral with respect to home and market production. To the extent, of course, that males participate in the production of children, the price of children rises with increases in male education as well. The elasticity of demand for children with respect to either spouse's education can be decomposed into the usual weighted combination of compensated price elasticity and an income elasticity. See Y. Ben-Porath, "Economic Analysis of Fertility in Israel: Point and Counterpoint," **Journal of Political Economy,** LXXXI (No. 2 part II, March/April 1973), pp. 207-208. Women's education affects the price of children but also, via its effect on women's wage, affects full family income. If the income elasticity is small, the substitution effect can be expected to dominate. (The education of the mother may reflect several additional factors as well, of course -- preferences for children, use of birth control, incidence of child mortality, for example). Since it is likely that men contribute relatively more to full income and relatively little to the production of *children, the coefficient of male education is predicted to be positive.*

11) See Y. Ben-Porath, **On Child Traits and the Choice of Family Size,** Discussion Paper 731 (Jerusalem: Falk Institute, June 1973). The secular decrease in infant and child mortality is an additional factor leading to the gross negative correlation between income and fertility in the less developed countries.

As in all household demand models, the unmeasured taste variables (the relative preferences for children compared to other goods) present difficult conceptual and empirical problems. Detecting trends in household preferences is difficult, especially in identifying changes in tastes which are causally prior, and not merely **responses** to price and income changes. The taste factor is particularly troublesome in cross-section data since preferences for family size are undoubtedly correlated with such relevant variables as family income and wife's wage. The identification of the taste factor remains one of the unsatisfactory elements of the *economic model.*

Empirical Tests of the Model

Cross-section data from countries at all levels of economic development have confirmed the qualitative predictions of the model outlined above. Consistent effects on fertility of estimates of the shadow price of the wife's time, as well as the effects of child mortality, account for a statistically significant share of the cross-section variation in aggregate and individual reproductive behavior. When fertility rates are regressed on the education levels of males and females, for example, the coefficient of the female education variable is negative and several times its standard error. The male education coefficient is less significant and appears with both negative and positive signs. This is not unexpected since male education is more likely to reflect the positive income effect rather than the importance of the cost of the husband's time in rearing children. [12]

The same high levels of significance are found when female earnings are used rather than female education levels. With earnings data the coefficient of the husband's earnings is usually positive, indicating the stronger relationship between the husband's earnings and family income than exists for husband's education and family income.[13] Furthermore, individual and

12) Education is often used as a proxy for the female wage rate due to the difficulties of measuring the market wage for women not currently in the labor force. For example, the association of the woman's price of time with the wage rate of working women with the same market characteristics neglects the fact that the wage rate of working women is net of general on-the-job training costs (R.T. Michael and E.P. Lazear, **On the Shadow Price of Children,** Mimeographed (New York: National Bureau of Economic Research, 1971). Furthermore, the large proportion of women who abstain from entering the labor force in any given week implies that they reject the wage offered to them by the market as adequate compensation for the loss of nonmarket productivity. Clearly the education level is not an adequate proxy for the shadow price of the woman's time, and much of current research is devoted to this problem. See, for example, R.Gronau, "The Effect of Children on the Housewife's Value of Time," **Journal of Political Economy,** LXXXI (No. 2, part II, March/April 1973), and "The Measurement of Output of the Non-Market Sector the Evaluation of the Housewife's Time," **Measurement of Economic and Social Performance,** Studies in Income and Wealth, No. 38 (New York: National Bureau of Economic Research, in press).

13) The generally lower levels of significance of the husband's earnings variable, as well as the occasional negative sign, throw some doubt on the size of the positive income effect.

aggregate evidence from a variety of low-income countries indicate that, as predicted, the partial relationship between fertility and infant mortality is positive and highly significant.[14]

What remains, however, is the incorporation of several aspects of the family size decision which have remained neglected due to insufficient data or to conceptual difficulties. One of the empirical problems, for example, is the dynamic nature of the fertility decision. The critical dependent variable is completed family size, but the income and price variables are not measured over the entire span of the childbearing period of women. In addition, the unmeasured taste factor remains a problem, particularly in the identification of changes in tastes which are truly exogeneous. Conceptually, there are difficulties regarding the child quality versus child quantity issue, the inclusion of risk and uncertainty, and the simultaneous nature of many of the family size decisions. There are, in other words, serious defects in the conceptual approach used in the economic model and in its current empirical application. Nevertheless, there is little doubt that the organization of the household fertility decision in an economic framework is valid, nor that the qualitative impact of the price variables in particular is evident.[15]

Child Allowances in the Model

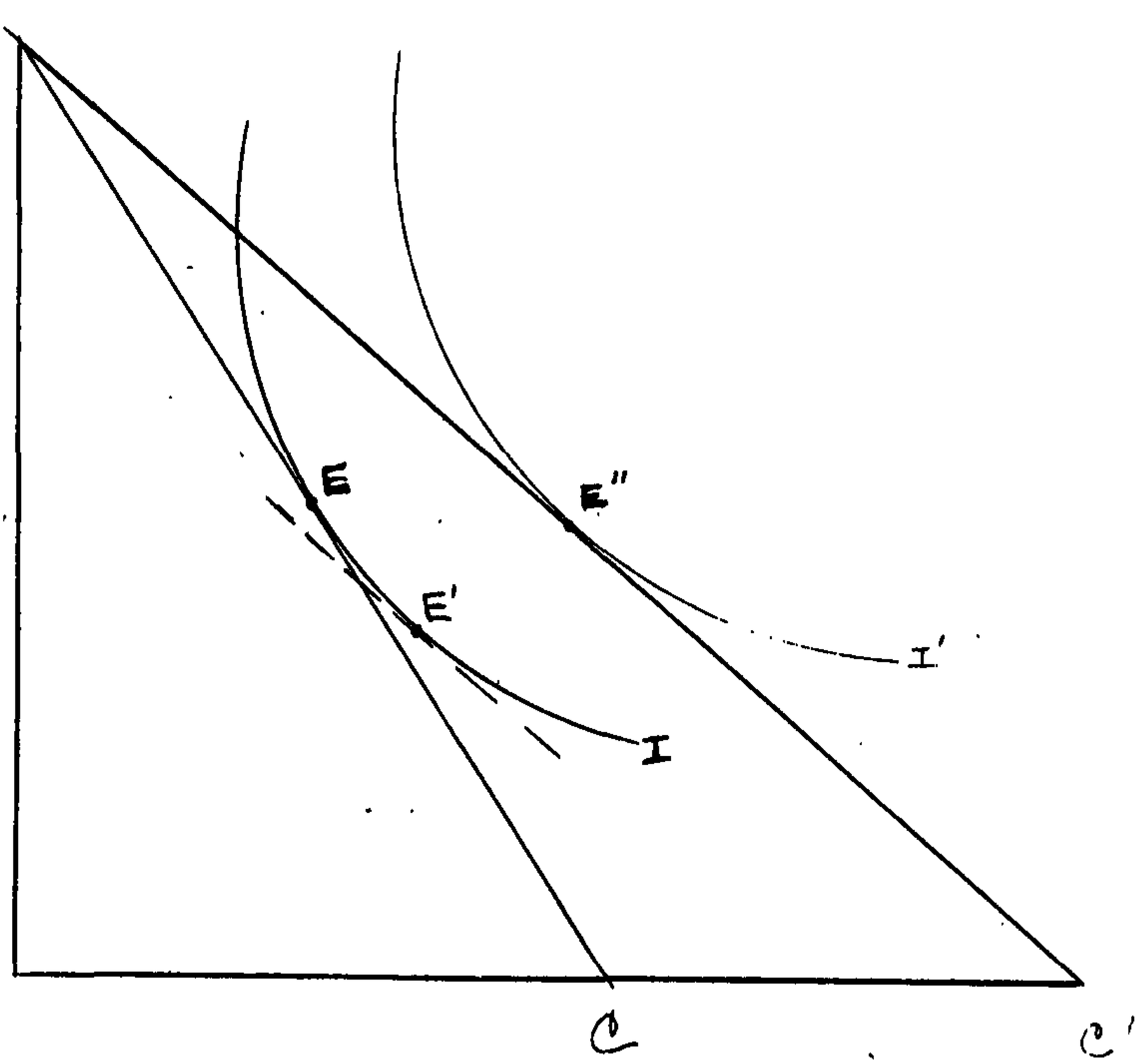
Having established the relevence of economic variables for household decisions regarding fertility, it is now possible to discuss the role of child allowances in the economic fertility model. A system of child allowances affects both the income of the household and the price of children relative to the prices of other goods. Under reasonable assumptions about the sign and magnitude of the income effect, the net effect of child allowances is likely to be pro-natalist. Consider Figure 1, where the household has a given set of preferences indicated by indifference curves I and I'. The household faces a set of relative prices for children (C) and all other goods (Y), and a given level of income. The household is initially in equilibrium at E, purchasing a given combination of children and other goods. Child allowances shift the budget line out and rotate it to the right, i.e., the income of the household is increased conditionally upon an increase in its consumption of children. The price of children relative to

14) See T. Paul Schultz, "A Preliminary Survey of Economic Analyses of Fertility," **American Economic Review**, 63 (May 1973) for a discussion of the empirical findings to date. Several studies by Ben-Porath on Israeli data have produced similar results. See, for example, **Fertility in Israel: A Mini-Survey and Some New Findings**, Discussion Paper 736 (Jerusalem: Falk Institute, 1973); "Fertility in Israel, An Economist's Interpretation: Differentials and Trends, 1950 1970," in C.A. Cooper and S.S. Alexander, eds. **Economic Development and Population Growth in the Middle East** (New York: Elsevier, 1972), and "Economic Analyses of Fertility in Israel: Point and Counterpoint," **op. cit.**

15) As Schultz comments in his review article: "Few would argue either that economic factors are pre-eminent among the determinants of individual reproductive behavior or that the economic constraints of households exert no appreciable effect on reproductive goals and behavior." "A Preliminary Survey of Economic Analyses of Fertility," **op. cit.**

other goods falls, and the compensated substitution effect (to E') leads unambiguously to an increase in the demand for children. Thus the net effect (to E'') on the demand for children will be positive, even if the income effect is zero or mildly negative. The assumption that children are normal goods, illustrated in Figure 1, implies a larger effect of child allowances on fertility, since both substitution and income effects result in increases in the demand for children.[16]

FIGURE 1. Income and Substitution Effects of Child Allowances.



16) There may be additional pro-natalist effects if the substitution of a child allowance program for a tax deduction system based on family size increases marginal tax rates (The loss of deductions, plus the receipt of taxable child allowances, pushes families into higher tax brackets). Higher marginal rates reduce the net wage rate of women, and thereby reduce the opportunity cost of children. See Jack Habib, **The Role of Child Allowances in a Tax-Transfer Structure,** for a discussion of the impact of a child allowance scheme on marginal tax rates **(op. cit.)** Changes in tax rates, as well as increases in income from child allowances, are likely to have labor supply effects as well for all family members. This issue will not be dealt with in this study.

CHILD ALLOWANCES AND FERTILITY RATES: EMPIRICAL EVIDENCE

None of the empirical analyses to date on the determinants of fertility behavior in individual countries has included transfer income such as child allowances.[17] There are therefore no direct estimates of the impact of child allowances on fertility rates within the context of fertility in a given cultural and institutional setting. Only one study to date has attempted to determine the impact of child allowances on fertility rates in a cross-country analysis.[18] The study suffers from serious empirical problems, however, and estimation results are ambiguous. In regressions on various combinations of 22 developed countries at a point in time, the coefficient of the child allowance variable is not always positive, and rarely statistically significant. In pooled cross-section and time-series data for five Nordic countries between 1952–1966, the results are improved, although far from conclusive. The coefficient of the child allowance variable is in most cases positive and often significant. One of the obvious problems is the difficulty of capturing inter-country differences in tastes and institutional settings which may account for significant variations in fertility rates. The improvement in results in the sample of Nordic countries, culturally more homogeneous than the larger sample of countries, suggests that this is indeed an important problem. Furthermore, it is crucial for tests of the fertility model that earnings opportunities of husbands and wives are accurately measured across countries, and it is not clear that the wages or other proxies available in an international study truly reflect the required measures. In addition, any errors in measuring the relative value of child allowances across countries bias the coefficient towards zero.

In the absence of adequate multivariate analyses of the effect of child allowance programs on fertility, it is necessary to resort to evidence of a somewhat journalistic nature. In doing so, this study follows a pattern established by previous research in the field of child allowance programs which has relied entirely on single-variate analyses, i.e., on inspection of the simple relationship between the introduction of child allowance programs and fertility rates in a given country. These studies do not provide evidence even of the qualitative impact of child

17) The inclusion of child allowances as an independent variable allows direct estimation of the price and income effects arising from transfer income of this type. Such studies in individual countries could be carried out either over time, or in the cross-section where there exist regional or metropolition variations in the size of allowances per child. The Aid to Familles with Dependent Children program in the U.S. at first glance offers such variations in the cross-section since size of payments varies by State. However, for several reasons the program is not suitable for this purpose, first among them the fact that the program provides assistance only to families in which a male is not present, a condition which obviously has implications for fertility. Undoubtedly the best test of the fertility impact of child allowances would be a controlled experiment in which relatively homogeneous families are offered various sizes of allowances over the lifetime of their children. An experiment of this sort would minimize the empirical difficulties encountered in analyzing variations in fertility rates. See Glen G. Cain, "Experimental Income Maintenance Programs to Assess the Effect on Fertility," **Income Maintenance**, eds. Orr, Hollister and Lefcowitz, Institute for Research on Poverty Monograph Series (Chicago: Markham Publishing, 1971), pp. 126--137 for a proposed experiment along these lines.

18) Cynthia B. Lloyd, **The Effect of Child Subsidies on Fertility: An International Study**, Unpublished Ph. D. Dissertation, Columbia University, 1972.

allowances on fertility, since they are unable to single out the effect on fertility of child allowances as opposed to other factors which are simultaneously affecting aggregate reproductive behavior. At most, they suggest that in the post-war period the impact of child allowances was not sufficiently large to produce patterns of fertility which were significantly different in countries which introduced child allowance programs.

Immediately following World War II, several industrialized countries established child allowance programs, many for the express purpose of reversing the decline in fertility rates which had begun in the 1920's. For families of three or more children in particular, the allowances constituted relatively large income increments in several countries. Table I below indicates the size of allowances as a percent of average monthly earnings in manufacturing in four European countries and Canada (data for Israel have been added for purposes of comparison. [19]

TABLE I. Child Allowances as Percent of Average Monthly Earnings, by Size of Family, for Selected Countries, 1969*

Country	Number of Children				
	One	Two	Three	Four	Five
Canada	1.3	2.5	3.8	5.0	6.3
France	**	9.8	22.8	36.8	50.8
Sweden	5.7	11.4	17.0	22.7	28.4
United Kingdom	–	4.5	9.5	14.6	19.6
West Germany	–	2.8	5.5	12.0	19.7
Israel: 1969	2.0	3.9	5.9	7.9	10.0
October 1973	2.5	5.0	8.6	15.5	22.6

Source: For Israel, **Quarterly Statistics**, the National Insurance Institute, October–December, 1973, Table E/4, p. 39

All others, from Leif Haanes-Olsen, "Children's Allowances: Their Size and Structure in Five Countries," **Social Security Bulletin**, U.S. Department of Health, Education, and Welfare, May 1972, p. 23.

* *For Israel, as percent of average monthly wage per employee post; for all others, as percent of average monthly earnings in* manufacturing.

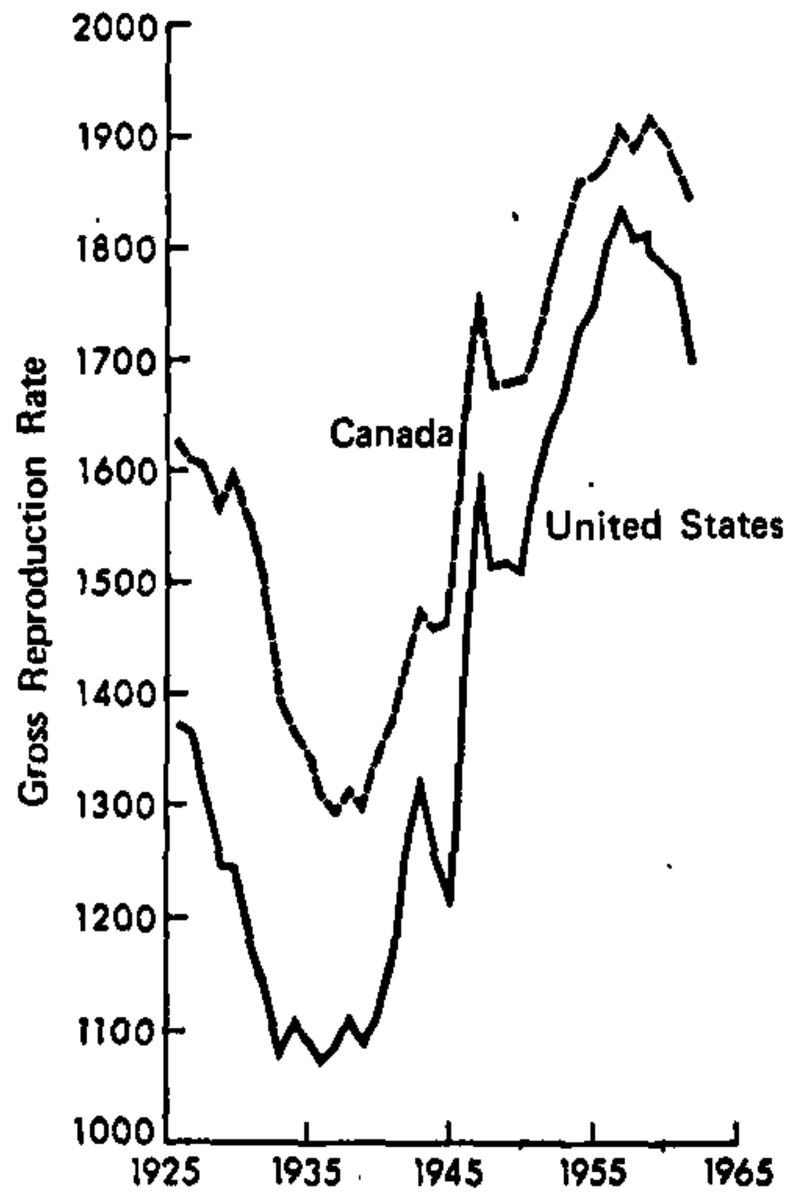
** Percentage is 10.8 for child under age 2; 4.3 for child aged 2 or older.

19) See appendix I for the size of child allowances as a percentage of national income for several countries in various stages of development. The relative size of allowances may be understated to the extent that countries subsidize large families by other measures, e.g., rent subsidies, provision of child care, etc. The Israeli data in Table I above are not directly comparable since they express child allowances as a proportion of the average wage for all sectors of the economy.

The consensus of government officials and public welfare administrators is that child allowances have had little effect on fertility in the post-war period. [20] Comparison of the fertility rates in various countries in the post-war period indicate that, if child allowances did influence fertility, their influence was small relative to the impact of other factors. Fertility patterns in countries with child allowances are remarkably similar to patterns in countries without such programs.

A simple illustration of this is the comparison of fertility trends in the U.S., the only advanced economy which does not have a program of universal child allowances, and Canada, which introduced a family allowance system in 1945. Figure 2 shows gross reproduction rates for both countries from 1925–1965. This figure is particularly useful since it indicates the secular trends in fertility which occurred in all advanced countries in this period, in particular the rapid decline in fertility from the 1920's onward, and the post-war baby boom which began levelling off in the mid–1950's. Comparison of long-term trends are also clearly more useful than comparison of fertility rates at a point in time for purposes of detecting changes due to the introduction of child allowance programs. There are likely to be lagged responses to the introduction of a family allowance program for several reasons: 1) the biological lag from

FIGURE 2. Gross Reproduction Rates in the U.S. & Canada, 1926–1962.



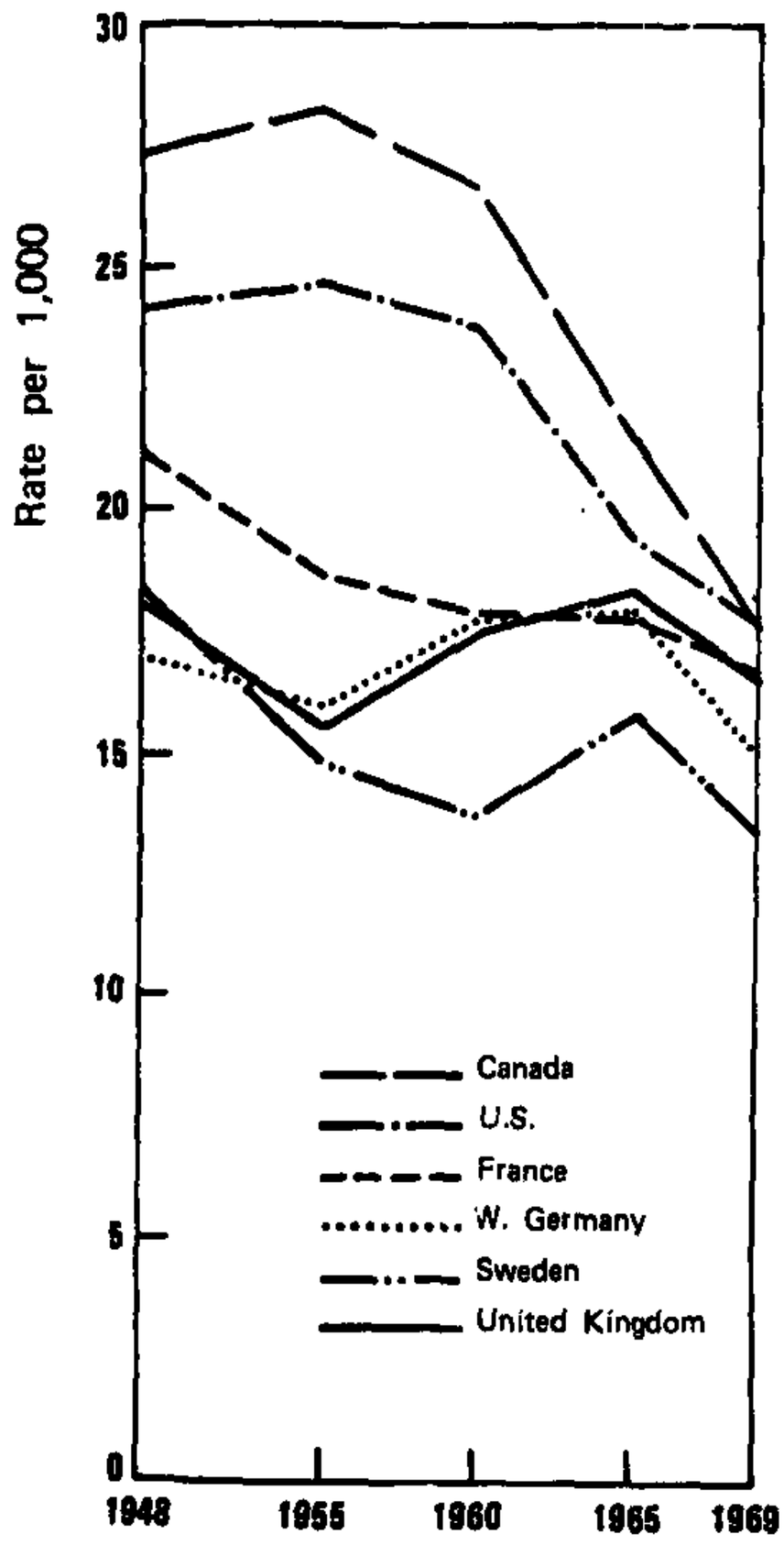
Source: Alvin L. Schorr, **Poor Kids** (New York: Basic Books, 1966), p. 69.

20) For summaries of these views see Ronald Freedman, "The Sociology of Human Fertility: A Trend Report and a Bibliography," **Current Sociology** (1961–62), p. 63; and V.H. Whitney, "Fertility Trend and Children's Allowances Programs," in **Children's Allowances and the Economic Welfare of Children**, E.M. Burns, ed. (New York: Citizens Committee for Children of New York, Inc., 1968). Some French demographers and officials hold that the allowances have had a positive effect on the birthrate in France, although there is no reliable evidence to substantiate their views. For a brief discussion, see **Measures, Policies and Programmes Affecting Fertility, with Particular Reference to National Family Planning Programmes**, ST/SOA/Series A/51 (New York: United Nations, 1972), pp. 24–5.

the decision to have another child to birth, 2) lags in the decision-making process of the household after introduction of child allowances, and 3) lags in the development of a pro-natalist climate, if allowances were established for these purposes and government policy pursues this objective.

Figure 2 indicates that not only did the Canadian rate follow very closely that of the U.S. from the time of the introduction of allowances in 1945, but the differential in reproduction rates actually decreased from 1945 on. Figure 3, comparing crude birth rates for the U.S., Canada, and four European countries, emphasizes this decline in the differential. By 1969, the Canadian birth rate equalled that of the U.S. (top two lines). Furthermore, the sizable increase in the size of child allowances in Canada in 1957 does not appear to have mitigated the sharp decline in fertility. A case could be made, however, that the apparent insignificant impact of the child allowance program could be attributed to the small size of the allowances relative to mean incomes. Table I above indicates that the allowance in Canada for a family

FIGURE 3. Crude Birth Rates for Selected Countries, 1948–1969.



Source: Leif Haanes-Olsen, "Children's Allowances: Their Size and Structure in Five Countries," **Social Security Bulletin**, U.S. Department of Health, Education, and Welfare, May 1972, p.27.

of five children, for example, was only 6.3 percent of the average monthly earnings in manufacturing. Although this undoubtedly understates the relative size of the allowance for families of five children, since large families tend to be in the lower end of the wage distribution, allowances in Canada are clearly small relative to those of the European countries shown in Table I.

Unlike Canada, children allowances for large families in Sweden are considerable. According to Table I, allowances are 28.4% of the average monthly earnings in manufacturing for a family of five children. Child allowances were introduced in Sweden in 1948 and increased in 1952. During this period, as Figure 3 indicates, the birth rate was falling continuously. When the allowances were again increased in 1964 the birth rate had already shown an upward trend for four years. Still another increase in the late 1960's did not visibly influence the already declining birth rate. A similar pattern is found in the United Kingdom. The introduction of children's allowances in 1946, followed by rate increases in 1952 and 1967, had no apparent effect on the declining birth rate.

The introduction of children's allowances in West Germany in 1954 similarly had no identifiable effect on the birth rate. Although fertility rates increased from 1955, they began a sharp decline in 1965, a year after allowances were increased.

The largest child allowances relative to earnings occur in France, where a child allowance system was made universal in 1945 for the express purpose of boosting lagging birth rates. For families of five children, allowances in 1969 amounted to 50.8% of the average earnings in manufacturing (Table I). Birth rates in France declined steadily during the 1930's, reached a low in 1941, and a subsequent high in 1947. Since then the decline has been slow but steady. The long-term trend in the rates indicated in Figure 3 suggests a negligible effect of the child allowance program. Rates were already increasing when the program was made universal in 1945, and the allowances do not appear to have prevented the decline which began in 1947. Similarly, the increase in the allowances in 1953 does not appear to have prevented the decline in the rates after that period. While French demographers claim that the decline would have been more rapid had it not been for the allowances, there is no proof for such claims. Furthermore, while the allowances for one or two child families amounted to only 4.3% – 10.8% of average earnings in manufacturing, compared to 50.8% for families of five children, the increases in the birth rate in France during the 40's was due to increases in the number of families with one, two, and three children, while the proportion of large families declined.[21] The trend in birth rates since World War II in France is particularly interesting since France did not experience the increase in births from 1955 to 1965 which, for example, W. Germany, the United Kingdom, and Sweden, countries with smaller child allowances, experienced.

21) These data are from French sources quoted in Alvin L. Schorr, **Poor Kids** (New York: Basic Books, 1966), p. 71.

The only possible conclusion to draw from the above comparisons is that, if child allowance programs did influence fertility, the effect was small relative to the factors common to all countries in the post-war period. Fertility patterns in countries with no child allowances, with small child allowances, and with substantial child allowances are too similar to warrant an alternative conclusion.[22]

A remaining source of information on the impact of child allowances on fertility is the various opinion surveys which have been taken from time to time. Some of these, however, must be suspect.[23] Probably the most reliable is a sample of 1,022 white married women under 50 years of age in Johannesburg, South Africa, which indicated a small positive impact of child allowances on the number of children desired. According to sample results: a) the median number of children desired if family allowances were made available was 4.4; b) the median number of children considered ideal, without family allowances, was 4.1; and c) the median number of children expected was 3.4, suggesting the potential for larger completed families.[24]

In summary, direct evidence to date on the impact of child allowances on fertility is inconclusive. There is some weak evidence of a positive effect on fertility of allowances, which accords with the predictions of the economic model; this effect, however, appears to be small.

In the absence of direct evidence, it is possible to estimate the impact of child allowances on fertility indirectly by making some calculations from estimated coefficients of income and price variables in the basic fertility model. This is a very rough procedure for many reasons. The statistically most consistent coefficient in the fertility model is the female wage variable, yet the most important effects of a universal child allowance program are likely to be the income effect and the reduction in the direct costs of children (assuming that marginal tax rates do not change radically with the introduction of child allowances). The size, and perhaps the sign of the income coefficient is yet to be confirmed, and the application of this coefficient to child allowances requires the questionable assumption that consumers treat transfer income no differently from earned income. It is possible to make some estimates of the size of the (as yet) unestimated direct price effect from the female wage coefficient, but this requires some assumptions about the substitution between time and goods in the production of children, as well as estimates of both direct and indirect costs of children.

22) It is of course possible, although improbable, that there may have been factors special to child allowance countries which would have led to **different** fertility patterns in the absence of child allowances.

23) The validity of a small sample of adults in the Netherlands which asked: "If people were given more child allowances, do you think there would be more children?" is somewhat questionable. Cited in **Measures, Policies and Programmes Affecting Fertility, op. cit.**, p. 24.

24) **Ibid.**

A calculation of this type was made for the U.S. by Glen Cain.[25] Cain estimated the impact on fertility in the U.S. of the proposed Family Assistance Plan, using estimates of price and income coefficients from a cross-section of U.S. metropolitan areas in 1960. The proposed Family Assistance Plan is not a universal child allowance system but rather a public assistance program available only to low-income families with children. The plan differs significantly from child allowance systems insofar as it provides a guaranteed minimum income, accompanied by implicit marginal tax rates ranging as high as 90%; in other words, increased earnings of recipients result in reductions in FAP grants almost to the full amount of the additional earnings. These high taxes on the wage of the female in particular reduce the price of children and can be expected to have a strong positive impact on fertility. Cain's estimated income coefficient, moreover, was positive and statistically significant, providing an additional source of increase in fertility. He estimated a 15% increase in fertility of the low-income population covered by the FAP, which would result in a 2.5% increase in fertility for the total population. At current levels of average completed family size in the U.S., this implies .57 more children for low-income families, raising their average number of children to 4.3, and an increase of .06 children for the total population, to a level of 2.63 children for the average U.S. family.

These calculations suggest that the impact on fertility of an FAP-type program – which contains much stronger incentives regarding fertility than those in a child allowance program – is likely to be relatively small. This result is consistent with the evidence available from the various sources discussed above.

Using Cain's assumptions, it is possible to estimate the probable effect on fertility in the U.S. of a universal child allowance program such as exists in Israel, at levels of support equivalent to those in Israel. Changes are calculated in the income of the average U.S. family and in the total costs of children proportional to the changes which occur in Israel for the average family due to child allowances. Account is taken of the basic differences between the FAP program with which Cain worked, and the child allowance program in Israel. For example, the FAP program reduces significantly the indirect costs of children by placing high marginal taxes on the wife's wage. This is due to the minimum income guarantee in the FAP program. While it is possible that the introduction of a child allowance program might lead to changes in the entire tax structure, such changes in marginal rates would be considerably smaller than those resulting from the introduction of a FAP-type program. The result of this difference between the two programs is that the indirect costs of children are reduced by a much smaller amount in the child allowance program (See Appendix IV for a discussion of the calculations involved).

25) Glen G. Cain, **The Effect of Income Maintenance Laws on Fertility in the United States**, Institute for Research on Poverty Discussion Paper 117- 72 (Madison: The University of Wisconsin, 1972).

These calculations suggest that a universal child allowance program in the U.S., similar in structure and size of allowances to that currently in effect in Israel, would lead to a 5.01% increase in fertility in the U.S. Average family size, therefore, would increase from 2.57 children to 2.70 children. This effect is smaller than the estimated effect on the low-income population of the FAP program since levels of support are significantly lower. The effect is somewhat larger than the effect on average fertility in the U.S. of an increase in fertility of low-income groups, since the entire population receives payments in a child allowance program.

This estimated effect on fertility in the U.S. is small – a 5% change in the average number of children – and is likely to be an over-estimate because of various assumptions used in the calculations (see Appendix IV for a discussion of the likely upward biases in this estimate). Within the constraints of the assumptions and estimates which Cain used in making his calculations for the FAP program, this estimate suggests that the impact of a child allowance program similar to Israel's would have a positive but relatively small effect on fertility rates in the U.S.

It is tempting to apply this estimate to the effect on fertility **in Israel** of the current child allowance program. This is risky for several reasons. The income and wage coefficients which Cain used in his calculations relate to the U.S. It is possible that different coefficients would be obtained in Israel. The Israeli and U.S. populations differ with respect to several demographic characteristics, for example; in addition, the impact of child mortality is still relevant in Israel, whereas it is not likely to be an important factor in the U.S.; and the high proportion of immigrants in the Israeli population may have implications for responses of fertility to various economic parameters. Furthermore, both direct and indirect costs of children may differ between the two countries.

At best, this exercise provides an estimate of the general magnitude of the effect of the current child allowance program on fertility.

CHILD ALLOWANCES AND FERTILITY IN ISRAEL

Discussion of the observed impact of the child allowance program on fertility in Israel is hampered by the same lack of relevant evidence as occurred with the countries of North America and Europe. In the absence of this evidence it is possible, although not very enlightening (as the last section demonstrated) to examine the simple relationship between increases in child allowances and fertility rates among the various populations in Israel. Table II indicates the size of child allowances by family size as a percent of the average monthly wage per employee post from 1960 to 1973. Significant increases in the relative size of allowances, especially for large families, occurred in April 1970, October 1972, and in July 1973.

TABLE II. Child Allowances as Percent of Average Monthly Wage per Employee Post in Israel, 1960–1973*

Year	Number of Children								
	1	2	3	4	5	6	7	8	9
1960	–	–	–	2.3	5.0	8.1	11.6	15.4	19.2
1965	1.8	3.6	5.3	7.4	9.8	12.3	15.1	18.2	21.3
1966	1.7	3.5	5.2	7.3	9.5	11.9	14.6	17.5	20.4
1967	1.7	3.5	5.2	7.4	9.8	12.4	15.2	18.3	21.3
1968	2.1	4.1	6.2	8.3	10.6	13.1	15.8	18.7	21.6
1969	2.0	3.9	5.9	7.9	10.0	12.4	14.9	17.7	20.4
1970	1.8	4.3	6.8	11.2	15.6	20.0	24.4	29.1	33.7
1971	2.2	4.4	7.2	11.8	16.5	20.8	25.2	29.5	33.9
1972	2.2	4.3	7.5	13.9	20.6	27.0	32.9	38.8	44.6
1973:									
January	2.1	4.2	7.4	13.7	20.3	26.6	32.4	38.2	44.0
October	2.5	5.0	8.6	15.5	22.6	29.5	35.9	42.2	48.6

Source: **Quarterly Statistics**, The National Insurance Institute, October–December, 1973, Table E/4, p. 39.

* *Allowances for Employee's Families.*

Table III indicates total fertility rates for various population groups in Israel from 1951 to 1972.[26] It is difficult to detect in this table any obvious impact of the availability of child allowance income on total fertility rates. The high fertility rates of the non-Jewish population continued to decline (slightly) despite increases in the relative size of family allowances. In 1969, the average number of children for a non-Jewish family was 7.7 (column 5 of table III). The relative size of the child allowances for a family of eight children increased from 17.7% in 1969 to 29.1% in 1970; the fertility rate of this group in 1971 and 1972 continued to decline however.

Similarly, rates for the Asia/Africa group among the Jewish population continued to decline from 1970 on. The only evidence of increases in fertility in 1970 and 1971 were in the Europe/America and born-in-Israel groups, although these increases may be part of the upswing in fertility after the low rates attained during the recession in 1966 and 1967. Moreover, rates for both these groups declined in 1972.[27]

It is clearly too early to make any estimates of the impact of the increases in allowances in 1972 or 1973. At most, it would appear that the increase in 1970 did not have a strong effect on fertility in the following years, an observation which does not run counter to the pattern observed for other countries.

26) Total fertility is a hypothetical measure of completed fertility, and indicates the average number of children which a woman is expected to bear during her lifetime. It is the unweighted summation of age-specific fertility rates of women from the ages of 15-49; as such, it is not a longitudinal measure of completed fertility for any specific group of women, but rather an expected measure of fertility which would occur if current age-specific birth rates persisted for all childbearing years of a surviving cohort. See Appendix II for crude birth rates (live births per 1,000 in the population).

27) It is interesting that fertility for the non-Jewish population also dipped significantly in 1967. It is often claimed that high fertility groups do not take economic factors into consideration, or do not practice even rudimentary forms of birth control. It is possible that much of the decline in fertility for the non-Jewish population was due to the decline in marriages in 1966 and 1967 (**Statistical Abstract of Israel**, 1970, Table C/3). However, postponement of marriage itself is a form of birth control, to the extent that the demand for marriage is a derived demand from the basic demand for children. See Ben-Porath, "Short-Term Fluctuations in Fertility and Economic Activity in Israel: 1951–69," **Demography** (May 1973) for evidence that short-term fluctuations in fertility are related to the level of economic activity among all population groups in Israel, including non-Jews.

TABLE III. Total Fertility Rates in Israel, by Population Group, 1951–1972*

	Jews				Non-Jews			
	Total	Born in Israel	Africa & Asia	Europe & America	Total	Moslems	Christians	Druze & others
1951	4.0	3.5	6.5	3.1	–	–	–	–
1956	3.7	2.7	5.6	2.6	7.3	7.6	4.7	6.9
1960–62	3.4	2.7	5.0	2.4	7.9	9.1	4.6	7.6
1964	3.4	2.8	4.6	2.6	8.5	9.9	4.8	7.9
1965	3.5	2.9	4.6	2.6	8.4	9.9	4.7	7.6
1966	3.4	2.8	4.5	2.5	8.2	9.7	4.4	7.4
1967	3.2	2.7	4.2	2.4	7.4	8.6	4.0	6.5
1968	3.4	2.9	4.3	2.6	7.7	8.9	4.1	7.6
1969	3.4	2.9	4.2	2.7	7.7	9.0	4.1	7.4
1970	3.4	3.1	4.1	2.8	7.7	9.0	3.6	7.5
1971	3.4	3.2	4.1	2.9	7.4	8.7	3.4	7.2
1972**	3.2	2.9	3.8	2.7	7.3	8.5	3.4	7.1

** Sum of age-specific birth ratios for all women aged 15–49. For Jewish population, by mother's continent of birth; for non-Jews, by mother's religion.*

*** Provisional.*

Source: **Statistical Abstract of Israel, 1973,** Central Bureau of Statistics, Tables iii/27, iii/28, pp. 84–85, and Y. Ben-Porath, **Fertility in Israel: A Mini-Survey and Some New Findings** (Jerusalem: Falk Institute, September 1973), p. 5.

Predicted Fertility in Israel

Lacking any real evidence of the impact of child allowances on fertility in Israel, it is of some interest to attempt to extrapolate observed fertility rates (which reflect the influence of child allowances in the past). This provides an estimate of fertility in the next few years on the assumptions 1) that the size of the allowances, and consumer response to allowances, does not change; 2) that all other factors affecting fertility in Israel do not deviate radically from their patterns of the past few years. These assumptions clearly limit the usefulness of such an exercise, but they provide a rough estimate of likely trends in fertility.

Predictions of fertility rates in Israel are most reasonably carried out on a group by group basis, since fertility patterns differ significantly among the different populations in the country. According to Table III, total fertility rates for mothers born in Asia or Africa (A/A), for example, have declined a full 40% in the twenty-year period from 1951 to 1972, from an average of 6.3 children per family to 3.8 children. Of the factors accounting for this decline, undoubtedly the significant increases in the educational level of women in this group, especially from the mid-1950's on, has had a major impact. Figure 4, an educational-age profile, indicates the increases in the education of women over time in the various population groups.[28] A strong negative (partial) relationship has been found between fertility and education for countries at all levels of development, in particular at low levels of education, and studies on Israeli data have confirmed this relationship among the various population groups.[29] It is not yet clear in the Israeli context the exact routes through which increases in education have lead to reductions in fertility for the A/A group. Increases in education raise market productivity, and thereby the opportunity cost of children. For the group of A/A women, however, labor force participation rates have increased but not substantially since the mid-fifties.[30] It is possible that for this group education worked primarily through its impact on the use of family planning techniques. There is evidence that the association between family planning and education in Israel among the Jewish population is very strong at low educational levels.[31] Given the relatively low level of educational attainment of the A/A population, it is possible that this factor may have been especially important in the last two decades.

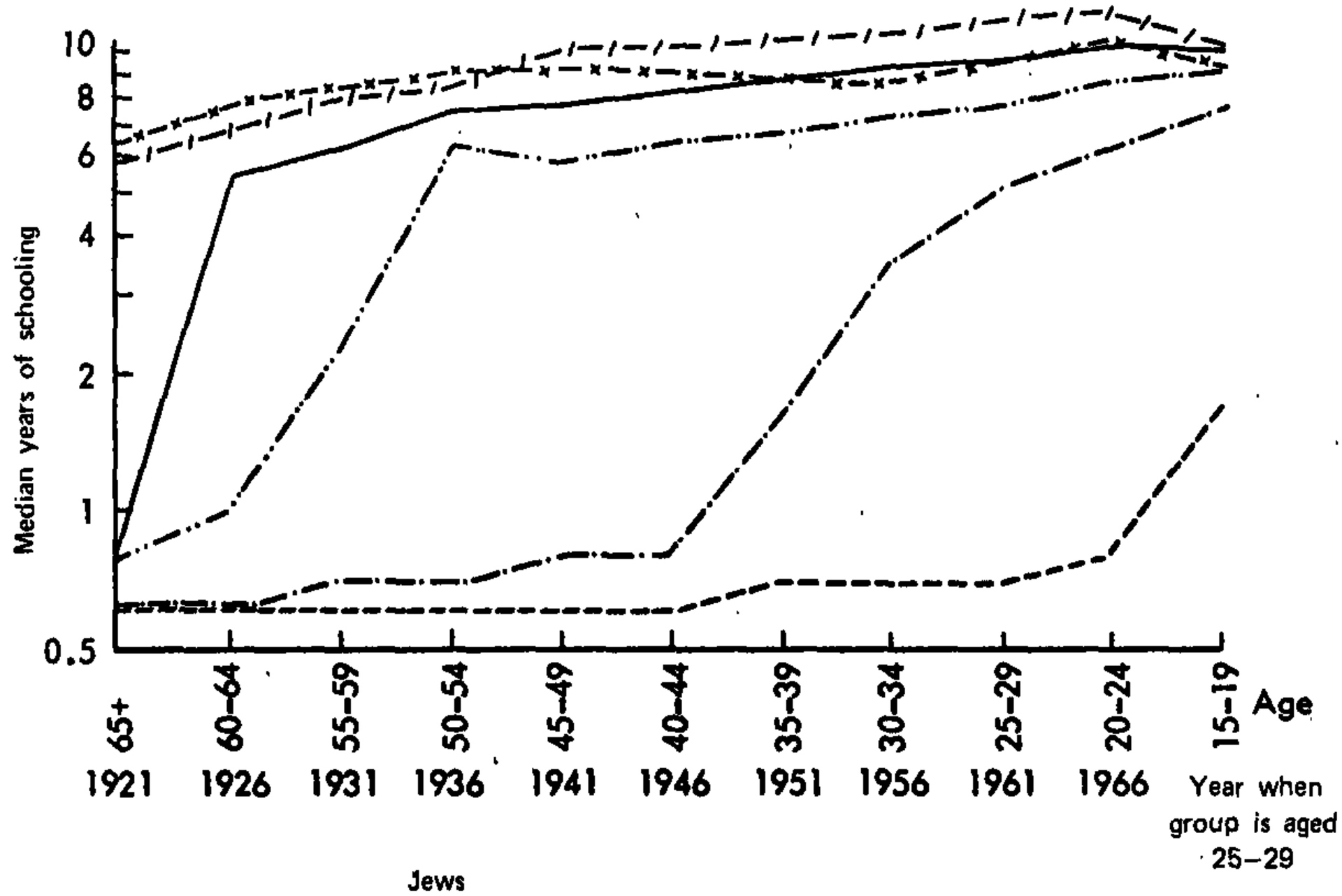
28) In 1961, for example, median schooling of 15-19 year old A/A women was roughly seven years, while that of women aged 35--39 was only one and one-half years.

29) See footnote 14, and the discussion in the text, concerning the relationship between education levels and fertility.

30) Y. Ben-Porath, **Fertility in Israel: A Mini-Survey . . . , op. cit.**, pp. 6--8.

31) R. Bachi and J. Matras, "Contraception and Induced Abortions among Jewish Maternity Cases in Israel, **Milbank Memorial Fund Quarterly** 40 (April 1962), pp. 207-29; and J. Matras and C. Auerbach, "On Rationalizations of Family Formations in Israel," **Milbank Memorial Fund Quarterly**, 40 (October 1962) pp. 453--80. See also the discussion on trends in fertility in Israel in Y. Ben-Porath, "Fertility in Israel, An Economist's Interpretation . . .," **op. cit., p. 527.**

FIGURE 4. Age Profiles of Women's Education, by Population Group in Israel: 1961—Median Years of Schooling (semi-log scale)



Source: Y. Ben-Porath, **Fertility in Israel: A Mini-Survey and Some New Findings,** Discussion Paper 736 (Jerusalem: Falk Institute, September 1973), p. 6a.

Another possible factor accounting for the decline in fertility of the A/A group is the lower level of infant mortality in Israel compared to Jewish communities in Asia and Africa. The result of several studies on the impact of child mortality rates indicate that families act to replace deceased children (although not necessarily fully), as discussed above. Thus, the experience of lower infant mortality rates in Israel may have been a significant factor in the decline in fertility in Israel of A/A women in the last twenty years. The initial impact of lower mortality rates in Israel may have been prolonged by the continued decline of infant mortality rates within Israel. Table IV indicates infant mortality rates for the Jewish and non-Jewish populations in Israel.

TABLE IV. Infant Mortality in Israel, by Population Group, 1951–1972*

	Jews	Non-Jews	(Moslems)
1951	39.2	48.8	–
1955	32.4	62.5	66.0
1960	27.2	48.0	49.7
1961	24.4	48.0	48.6
1962	28.3	47.5	47.2
1963	22.5	44.6	–
1964	24.0	42.6	–
1965	22.7	43.4	46.6
1966	21.7	41.8	–
1967	20.8	44.3	46.1
1968	20.3	42.4	43.0
1969	19.0	40.3	40.7
1970**	18.9	37.3	42.5
1971	18.6	32.3	38.7
1972	18.8	32.9	42.0

Source: Central Bureau of Statistics: **Statistical Abstract of Israel,**

1959/60, table 2. 1972, tables III/4, III/32.

1963, table 3. 1973, tables IIi/4, iii/33.

1970, tables C/2, C/3.

* *Mortality rates of non-Jews are per 1,000 live-births; for Jewish population, per 1,000 live infants (including infants of immigrants) according to a monthly life table.*

** *Includes East Jerusalem population from 1970.*

Although the Jewish population is not segregated into continent of origin, it is a reasonable hypothesis that much of the decline in Jewish mortality rates occurred in the A/A population. This may have accounted for some of the decline in fertility even in the last decade of the A/A group, although it is likely to have been a much stronger factor in the earlier period.[32]

The fertility rates of the A/A group can be expected to continue to decline, although probably at a lower rate as they approach the rates for other groups in the Jewish population. While the impact of child mortality is likely to become minimal, increases in both educational levels and the corollary increased use of family planning are likely to exert a strong influence on household fertility decisions. The educational level of women in the A/A group continues to increase, which implies higher market productivity and consequently, higher opportunity costs of children. This should predictably lead to significant changes in desired family size for this population.[33]

Fertility rates for both the Europe/America group and those born in Israel have remained fairly constant over the twenty year period (see Table III). There was a slight dip during 1966 and 1967, a response to cyclical changes in the economy, and an ensuing increase until 1972. There are no compelling reasons to predict significant changes in the fertility pattern of this group in the near future.[34] Educational levels are continuing to rise, but not steeply.

32) As Ben-Porath suggests, the weights of different factors behind fertility changes in Israel may have changed over time. See his discussion on the impact of child mortality on fertility in Israel in **Fertility in Israel, A Mini-Survey. . ., op. cit.** See also D. Friedlander, "The Fertility of Three Oriental Migration Groups in Israel: Stability and Change," **Papers in Jewish Demography 1969**, U.O. Schmelz, P. Glikson, and S. Della Pergola, eds. (Jerusalem: Institute of Contemporary Jewry, The Hebrew University, 1973), pp. 131-42. Friedlander reports similar declines in fertility among immigrants from three countries in Asia and Africa despite diverse experiences in Israel in terms of urbanization and labor force participation. He suggests that child mortality may be the explanation.

33) It is interesting, however, that the labor force participation rate for women in the A/A group has not changed since 1965 (see Appendix III). A sizable increase occurred from 1960 to 1965, but the percent in the civilian labor force levelled off from 1965 on despite the rapid rise in market opportunities following the Six-Day War. Rates for all other groups in the Jewish population increased from 1965 to 1972.

34) It is tempting to speculate on the impact of the recent war on fertility decisions of this group (as well as for other groups). One could think of changes in desired family size for replacement purposes (the expected loss of children in future wars) depending on whether the latest war altered expectations concerning the likelihood of additional wars.

A downturn in economic activity due to the war may produce another cyclical dip in fertility similar to that in 1966/1967. But neither of these factors is likely to alter fertility rates of this group radically. [35]

Fertility rates of the non-Jewish population in Israel (specifically the Moslem population) are among the highest in the world. They experienced a period of increase from 1956 through the mid-'sixties, and only recently seem to be in a period of decline (see Table III). Taking into consideration the factors influencing fertility discussed above, there is little reason to have expected declines in these rates until the most recent period. [36] Education levels, which have been shown to exert a strong negative impact on fertility, have remained low for this group until very recently (Figure 4). The increase in median education of non-Jewish women is occurring a full twenty years after the increase for the Israeli-born Jewish population. Similarly, infant mortality for the non-Jewish population, roughly twice the rate for the Jewish population, has begun a significant decline only in the last decade (see Table IV). [37]

Furthermore, the non-Jewish population in Israel has experienced significant increases in income in the past due to its penetration of the Jewish labor market. But it has remained isolated from the fertility-depressing influences which usually accompany increases in income, such as increases in education, exposure to family planning techniques, and demonstration effects resulting from contact with higher income populations. The non-Jewish population in the past has remained in rural areas, and has had only limited contact with the Jewish population even in the labor market. [38]

35) Fertility for the born-in-Israel group may change if there are changes in the composition of the group, e.g., an increased proportion of women born in Israel of A/A parents whose fertility may reflect that of their parents more closely than that of the current native-born group.

36) Several studies of fertility rates in the developing countries have demonstrated both the ability of families to exert some control over their family size, as well as the importance of economic factors in household fertility decisions. See, for example, the studies of post-World War II fertility patterns in Puerto Rico, Egypt, the Phillipines, Chile, Thailand, and Colombia cited in T. Paul Schultz, "Explanation of Birth Rate Changes over Space and Time: A Study of Taiwan," **Journal of Political Economy**, 81 (March/April 1973), Appendix, Table A1, as well as the Schultz study itself. These studies found statistically significant the education of females, as well as child mortality rates. For the non-Jewish population in Israel, Ben-Porath found that levels of female education were significantly (negatively) related to fertility rates of the non-Jewish population in 1961. Furthermore, much of the difference in fertility among the non-Jewish groups could be accounted for by differences in female educational levels. "Fertility in Israel, an Economist's Interpretation," **op. cit.**, pp. 518 and 528.

37) The significant differences in infant mortality rates for the Jewish and non-Jewish population in Israel may in fact go a long way in explaining the large fertility differential; there have been no studies to date to analyze these differences, however.

38) See the discussion in Ben-Porath, "Fertility in Israel, An Economist's Interpretation . . .," **op. cit.**, pp. 537–8.

For the same reasons, however, a continuation in the decline in fertility of the non-Jewish population can be expected within the next few years. Each of the factors leading to the heretofore high fertility rates is now beginning to show signs of change. For example, of non-Jewish women now entering the childbearing period, more than one-half have had five or more years of school, and the proportion is rising. This is to be compared with the second half of the 1960's, where less than one/third had the equivalent levels of education, and the early '50's, where only one/eighth had attained this level of education.[39] Similarly, as mentioned above, infant mortality rates have begun to decline only in the last decade. In addition, the non-Jewish population is coming into increased contact with the urbanized Jewish population, at the same time that the rise in incomes is levelling off due to the influx of labor from the territories. On the basis of the experiences of many populations exposed to the same patterns of development, there are sufficient grounds for expecting *a decline in non-Jewish fertility rates in the near future.*

39) **Ibid.**, p. 538.

SUMMARY

The recurring theme of this study has been the lack of adequate empirical evidence on the impact of a child allowance program on household reproductive behavior. Neither the experience of several industrialized countries following World War II, the recent experience of Israel, nor the single multivariate analysis completed to date can offer any firm conclusions on the influence on fertility of transfer programs of this type. The implications of the economic model of fertility are fairly straightforward: child allowances are predicted to increase fertility due to a reduction in the relative price of children, and possibly due to increased household incomes (plus any accompanying changes in marginal tax rates). The size of this effect remains to be determined, however.

Based on current estimates of the coefficients of the fertility model, as well as the evidence discussed above, it is probably safe to conclude that the recent increases in child allowances in Israel are likely to mitigate slightly the downward trends in fertility of the Asia/Africa and non-Jewish populations, and perhaps to increase fertility for the Europe/America and native born groups somewhat. It is unlikely, however, that the allowances will alter radically the fertility patterns which have been evident in the past decade or so. In other words, child allowances are likely to have a positive, but small effect on fertility in Israel.

This conclusion, furthermore, neglects two additional considerations, both of which are likely to diminish the effect of child allowances on fertility. To the extent that child allowances replace public welfare grants, low-income families no longer face the implicit 100% marginal tax rates on earnings which accompany the receipt of welfare income. Child allowances in this case serve to reduce marginal tax rates, and thereby to increase the opportunity costs of children. Secondly, and perhaps more important, the beneficial long-term effects of higher incomes due to child allowances have been neglected in the discussion thus far. It is reasonable to expect that the experience of higher incomes in the present generation may lead to higher levels of education, health, and general well-being of successive generations of children. These long-term changes may be expected to lower fertility levels, for the reasons discussed above.[40]

40) Indeed, the inter-generational aspects of income maintenance programs occupied a much more important position in the analyses of classical and neo-classical economists than is present in current discussions. A reading of the debates over the Poor Laws in England in the last century reveals the long-run perspective with which Marshall, for example, analyzed the potential effects of transfer programs. See the views of both Marshall and Malthus in D.V. Glass, ed., **Introduction to Malthus** (London: Watts and Co., 1953), especially pp. 62–63 and 177–192 (Quoted in Glen G. Cain and Harold W. Watts, eds., **Income Maintenance and Labor Supply,** Institute for Research on Poverty Monograph (Chicago: Rand McNally College Publishing, 1973), pp. 5--6.

Thus, on both short-term and longer-range considerations, a transfer system based on child allowances is likely to be an effective means of income maintenance, and to have a relative *minor effect on fertility levels.*

APPENDIX I

Table 1. Family allowance payments as a percentage of national income in selected countries

Country	Year	Currency	Total expenditure on family allowances (millions)	National income (millions)	Family allowances as percentage of national income
Australia	1962–1963	£A	66.7	7,214	0.92
Austria	1963	Schillings	4,416	152,600	2.89
Belgium	1963	B. francs	16,607	551,900	3.01
Bolivia	1963	B. pesos	44.98	5,001	0.98
Cameroon	1963	Francs CFA	448 a/	134,408 b/	0.33
Canada	1962–1963	Can. $	531.6	30,521	1.74
Chile	1963	Ch. escudos	185	8,246	2.24
Colombia	1963	C. pesos	150.34	35,533	0.42
Czechoslovakia	1963	Koruna	4,443	172,900 c/	2.57
Denmark	1962–1963	Krone	628.2	41,304	1.52
Finland	1963	Finnish marks	303.5	16,408	1.85
Federal Republic of Germany	1963	DM	1,513	288,200	0.52
France	1963	Francs	12,346	299,600	4.12
Hungary	1963	Forints	1,391	162,900 c/	0.85
Iceland	1963	Króna	183.6	10,361	0.18
Ireland	1962–1963	£ Ir.	7.1	623.5	1.14
Israel	1963–1964	I£	12.1	6,107	0.20
Italy	1963	Lire	561,953	22,193,000	2.53
Luxembourg	1963	Luxemburg francs	523.2	21,678	2.41
Madagascar	1958	Malagasy francs	118	110,084	0.11
Netherlands	1963	Guilders	955.2	42,560	2.24
New Zealand	1962–1963	£ NZ	32.3	1,253	2:58
Norway	1963	Krone	255.7	30,872	0.83
People's Republic of Congo	1958	Francs CFA	167.76 d/	25,200 b/	0.67
Poland	1963	Zlotys	8,496	460,100 c/	1.85
Portugal	1963	Portuguese escudos	853.4	74,407	1.15
South Africa	1959–1960	Rands	3.4	4,213	0.08
Spain	1963	Pesetas	2,244	821,700	0.27
Sweden	1963	Swedish krona	967	72,491	1.33
Switzerland d/	1963	Sw. francs	32.1	42,320	0.08
USSR	1963	Roubles	466	168,800 c/	0.28
United Kingdom	1963 1964	£	146.2	24,680	0.59
Uruguay	1963	U. pesos	171.99 a/	19,764	0.86
Upper Volta	1958	Francs CFA	45	33,390 b/	0.10
Yugoslavia	1963	Dinars	89,894	4,580,000 c/	1.96

Source: **Measures, Policies and Programmes Affecting Fertility, with Particular Reference to National Family Planning Programmes,** ST/SOA/Series A/51, (New York: United Nations, 1972), p. 21.

a/ Includes medical and/or maternity benefits.

b/ Gross domestic product at factory cost.

c/ Net material product at current prices.

d/ No information available on cantonal programmes.

APPENDIX II

Crude Birth Rates in Israel, 1954--1972*

	Non-Jews	(Moslems)	Jews
1954	45	49	27
1955	46	50	27
1956	47	52	27
1957	47	51	26
1958	48	51	24
1959	47	52	24
1960	50	55	24
1961	49	53	23
1962	51	57	22
1963	49	–	22
1964	51	–	22
1965	51	55	23
1966	50	–	22
1967	45	50	22
1968	45	49	23
1969	46	51	23
1970**	46	50.2	24
1971	46	50.4	25
1972	45	49.5	24

Source: Central Bureau of Statistics, **Statistical Abstract of Israel:**
1959/60 Tables pp. 32, 33. 1970 Table c/2, c/3, c/4
1963 Tables pp. 66, 67. 1973 Table iii/2, iii/3, iii/4.

* Live births per 1,000 population.

** Includes East Jerusalem population from 1970.

APPENDIX III

Female Labor Force Participation Rates in Israel, 1955–1972, Age 14+

	1955	1960	1965	1971	1972
All Jewish Women	27.9	24.5	31.3	32.5	33.4
Born in Israel	27.4	36.8	38.9	38.8	41.0
Born in Asia and Africa	20.2	21.8	25.7	25.1	25.6
Immigrated to 1947	21.8	19.2	20.0	22.0	20.7
" 1948–54	19.9	22.2	26.9	25.5	26.8
" 1955–60			25.0	27.7	26.5
" 1961 +	n.a.	n.a.		23.1	24.0
Born in Europe and America	29.8	32.5	32.7	34.1	34.4
Immigrated to 1947	31.2	34.1	34.1	34.2	33.7
" 1948–54	28.3	31.3	31.0	31.7	30.8
" 1955–60			33.6	39.0	40.8
" 1961 +	n.a.	n.a.		35.7	39.0
Non-Jewish Women	11.8	7.2	9.9	7.8	9.6

Source: Central Bureau of Statistics, **Statistical Abstract of Israel: 1972.** Table xii/6, p. 312.

APPENDIX IV

Calculations for the Estimated Effect of a Child Allowance Program on Fertility in the United States

The calculations used in estimating the effect of a child allowance program in the U.S., *similar in structure and size of benefits to that currently in effect in Israel, employ the* same assumptions and estimates utilized by Glen Cain in his analysis of the proposed Family Assistance Plan, except insofar as the plan differs from that a child allowance system (see Glen G. Cain, **The Effect of Income Maintenance Laws on Fertility in the United States,** op. cit.).

Cain's income and wage coefficients, derived from a cross-section analysis of SMSA's in 1960, are + 0.1 and –0.3, respectively. These coefficients were then applied to estimates of the percentage increase in incomes of low-income families due to the FAP program, and the percentage reduction in both direct and indirect costs of children due to the program.

*To calculate the percent increase in incomes of the average U.S. family due to a child allow*ance program rather than FAP, the amount of children's allowances for a family of three children as a percent of estimated gross income for a family of five persons in Israel in 1973 was used. This figure was 6.0% (total allowances for three children were IL 83, and estimated monthly income was IL 1,397). Rather than using discounted values, Cain made the simplifying assumption that the size of allowances as a percentage of incomes would remain constant over the 18 years in which children would be eligible for benefits. This assumption is retained for purposes of the present calculation. Thus, the percentage increase in the number of children in the average U.S. family due to income increases is 6.0% (+0.1), or .6%.

To calculate the percent reduction in the direct costs of children due to FAP, Cain used *estimates of the costs of a child in the U.S. made by the U.S. Commission on Population* Growth. He then estimated the additional stipend which an "average" low-income family would receive for the third child (the "elastic" child in the sense that the decision to have or not to have the third child is often considered to involve a good deal of discretion). The discounted value of both these estimates was calculated, resulting in an estimated percent reduction in direct costs due to the FAP program.

Cain's estimates for the direct costs of the third child were used for calculating the effect of a child allowance program. To calculate the reduction in direct costs, the yearly stipend which would be given in the U.S. for the third child was estimated by taking the allowance in Israel for the third child as a percent of the average wage, and applying this ratio to the average wage *in the U.S. After July 1973, the stipend for the third child was IL 43, or 3.8% of the* average wage. Thus the yearly stipend in the U.S. would be .038 of $8,200, the average wage

(in manufacturing), or $312. Following Cain, it was assumed that the family receives this amount for the first 18 years of the child's life. The discounted value of this amount is an estimate of the reduction in direct costs due to the child allowance program.

Cain estimated the indirect costs of the third child from tables of hours and weeks worked of women with two and three children. This, combined with estimates of the average wage of women with children, provided present value estimates of foregone earnings due to the third child. Estimates of the discounted value of leisure time foregone due to housework devoted to children were added (see Cain for the assumptions used in this latter calculation). Reductions in indirect costs of the third child from the FAP program arise from its guaranteed income provision. Women who drop out of the labor force do not lose the full value of their earnings since FAP grants increase with reduced incomes. This aspect of FAP does not apply to a child allowance system.

For the present calculations, the discounted value of after-tax foregone earnings (using Cain's estimates of foregone earnings and applying a marginal tax rate of 20%) and Cain's estimates of the discounted value of foregone leisure are used as estimates of the indirect costs of children. It was then assumed that a child allowance program would result in an increase of marginal tax rates to 25% from the previous (assumed) level of 20%. Thus the introduction of a child allowance program would lead to a reduction in the amount of after-tax earnings lost due to the third child, i.e., a reduction in the indirect costs of the third child.

The following table summarizes the calculations of the percentage reductions in total costs of the third child due to a child allowance program:

TABLE V. Reductions in Costs of the Third Child due to Hypothetical Child Allowance Program in the U.S.

I.	Total costs of the third child	
	A. Direct costs	$ 8,000
	B. Indirect costs	
	Net earnings foregone	5,760
	Leisure foregone	7,000
	Total costs	$20,760
II.	Reductions in total costs as a result of a child allowance program	
	A. Reduction in direct costs — payments for the third child	$ 2,660
	B. Reduction in indirect costs — reduction in net earnings foregone	360
	Total reduction in costs	$ 3,020
III.	Percent reductions in the total cost of the third child	
	A. *Reduction in direct costs* as a percent of total costs	13.0%
	B. Reduction in indirect costs as a percent of total costs	1.7%
	Total reduction in costs as a percent of total costs	14.7%

Applying the 14.7% reduction in total costs due to a child allowance program to Cain's wage coefficient of -0.3 results in an estimated 4.41% increase in the number of children of the average U.S. family (Cain assumes that the "price" effect from changes in wives' wage rates applies generally to all price changes, i.e., to the sum of direct and indirect price changes). Combining this with the .6% increase in children due to increases in income produces a 5.01% increase in the average number of children.

Several upward biases were built into this calculation, so that the estimate of 5.01% is likely to be an over-estimate rather than an under-estimate of the effect of a child allowance program on U.S. fertility rates. Use of the average wage in manufacturing (the most readily available data for 1973) is clearly an over-estimate of the average wage in the U.S. Thus, the estimated size of the allowance for the third child in the U.S. is too large. Consequently, the estimated percent reduction in direct costs of the third child is an over-estimate. Furthermore, a marginal tax rate of 20% is probably an over-estimate of the rate faced by a family of five receiving the average wage. This produces an under-estimate of foregone earnings and thus total costs, and consequently, an over-estimate of the reduction in costs due to the child allowance program. It is also unlikely that a child allowance program would lead to a full 25% increase in marginal tax rates (see Jack Habib, **The Role of Child Allowances in a Tax-Transfer Structure,** op. cit., for a discussion of the likely effects of child allowances on marginal tax rates). The reduction in indirect costs of a child is therefore an over-estimate. Lastly, the direct costs of a child are estimated as those for a family adopting a "low-cost" budget for children. This is appropriate for a FAP program but not for a universal child allowance system. This last point builds an additional upward bias into the estimates of the impact on fertility.

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