FATHERS' AGES AND THE SOCIAL STRATIFICATION OF SONS

Robert D. Mare
Meei-Shenn Tzeng

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Robert D. Mare Meei-Shenn Tzeng

University of Wisconsin-Madison

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ABSTRACT

The reproduction of social hierarchies depends not only on the rates at which parents transmit their statuses to their offspring, but also on the ages at which parents bear their offspring. The timing of childbearing within the lives of parents is an aspect of offspring's family background that varies among persons who are equivalent on other social characteristics. Parents of differing ages provide environments for their children of varying quality because parents' education, employment, and economic wealth tend to improve with age and because younger parents experience stronger competing role demands than older parents. Analyses of the 1973 Occupational Changes in a Generation Survey on the effects of father's age at son's birth on son's educational and occupational achievement show that sons born to older fathers enjoy significantly higher levels of socioeconomic success than sons born to younger fathers, even when other aspects of son's socioeconomic background are controlled. The analysis illustrates that the timing of childbearing in the parental life cycle is an important variable in the social stratification of offspring.

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INTRODUCTION

Social hierarchies persist and evolve through the demographic reproduction of individuals and the transmission of social positions and statuses between generations. Research on occupational and educational mobility and the intergenerational transmission of socioeconomic status reveals the associations between social characteristics of parents and their offspring. Demographic studies describe socioeconomic differences in levels of fertility and in the ages at which childbearing occurs. A neglected aspect of the process by which parents reproduce themselves and transmit their positions to succeeding generations is the link between the timing of fertility in the parental generation and the socioeconomic achievement of offspring. This paper reports an investigation of the effects of fathers' ages when their sons are born on their sons' educational and occupational achievements.

Parental Age and the Dynamics of Socioeconomic Transmission and Reproduction

The reproduction of a population depends not only on overall vital rates, but also on the ages at which individuals have children and die. Other things being equal, populations in which births occur to younger parents reproduce more rapidly than those in which births occur to older parents (e.g., Keyfitz 1985). Similarly, the reproduction of socioeconomic hierarchies depends not only on rates of social mobility, but also the timing and levels of fertility of parents of varying ages. Standard observations of social mobility, that is, cross-classifications of sons' positions in social hierarchies (e.g., occupation, educational attainment, etc.) with fathers' positions, do not

directly measure the reproduction of hierarchies. If distributions of sons' positions apply to specific birth cohorts of men or periods of time, distributions of fathers' positions do not. Because parents have children at varying ages, distributions of fathers' positions for a single cohort of sons are made up of parts of the distributions for several paternal cohorts; and distributions of the positions of fathers of men observed at a particular time are made up of parts of the distributions of a number of periods in the past. Moreover, because fathers' socioeconomic levels are associated with their number of sons, mobility tables based on samples of sons do not properly represent occupation distributions in the paternal generation. Likewise, tables based on samples of fathers do not represent properly the socioeconomic distributions in the filial generation (Duncan 1966). A complete picture of the evolution of socioeconomic hierarchies, therefore, includes a temporal sequence of hierarchies, and the associations among father's position, son's position, the number of sons born to fathers, and the ages of fathers at which sons are born (Matras 1961, 1967). The analyses reported in this paper contribute to this picture by describing the linkages between the ages of fathers and the achievements of sons.

The Organization of Adult Lives and their Consequences for Children

Children's family backgrounds affect their socioeconomic success. Studies of socioeconomic achievement typically measure family backgrounds by the socioeconomic levels of parents, as well as the size and structure of the families that children experience (e.g., Featherman and Hauser 1978; Hauser, Tsai, and Sewell 1983). Such studies usually ignore the dynamic aspect of family background, that is, that the socioeconomic environments provided by

parents are interdependent with their life cycle position. Individuals differ in the ages that they pursue alternative family roles. Families pursue a typical cycle of events and statuses, from marriage to childbearing, to childrearing, to the "empty nest," but, individuals vary considerably in how they fit the cycle into their lives (Elder 1978; Taeuber and Sweet 1976). Parents have discretion over both the ages at which they bear children and the kinds of other statuses and activities that they pursue before, during, and after childrearing. To the extent that the statuses and activities of parents provide constraints and opportunities for children, the way in which parents organize their lives in time may be an influential aspect of children's "family background."[2] To the extent that the timing of childbearing is not strictly a function of known sociodemographic characteristics of parents, demographically similar parents may nonetheless provide diverse environments for their children.

Relatively few empirical investigations of socioeconomic achievement take account of the changing social and economic circumstances that children may experience as result of parental aging, though a few do emphasize the effects of the timing of events for achievement and the dynamic aspects of family background. Hogan (1981) examines the consequences for men's socioeconomic achievement of the timing and ordering of events when they are young adults. Alwin and Thornton (1985) study the effects on educational attainment of offspring of their family background conditions at several points in their childhood. Featherman and Spenner (forthcoming) describe changes in class backgrounds of children over their first 18 years of life. The present investigation examines the consequences of age patterns of parental

socioeconomic status for stratification of offspring whose parents vary in age.

The balance of this paper first discusses potential effects of parents' ages on the socioeconomic achievement of offspring. Then it discusses our data, analytic methods, empirical findings, and conclusions.

THE EFFECTS OF PARENTAL AGE ON THE ACHIEVEMENT OF OFFSPRING

"Early" and "Delayed" Childbearing

Research on the effects of parents' ages on the welfare of their offspring emphasizes the special circumstances experienced by children born to teenage mothers (e.g., Chilman 1980; Hayes 1987; Hofferth 1987a; 1987b). Children born to teenage women suffer a number of handicaps. Compared to the children born to women in their twenties, children of teenagers score slightly lower on measures of IQ, intellectual achievement, and socio-emotional development. Such effects are mainly attributable to the lower socioeconomic levels of families in which women bear children early, although they may also be a result of the relatively poor quality of prenatal care obtained by teenage mothers. The effects, moreover, are typically small relative to other aspects of family structure and socioeconomic status. [See Hofferth (1987b) for a comprehensive review of this research.] Research on the effects of maternal age on child well-being has compared teenage mothers and those only somewhat older, rather than on systematic investigations of parental age effects. Such research, moreover, usually focusses on mothers to the exclusion of fathers and on children who are first born, rather than on all children. Nor has it examined the long run effects of parental age on the

welfare of offspring when the latter reach adulthood. While informative, therefore, this work does not resolve the more general issues of whether parental age effects can be detected among children not born to teenagers, and whether parental age affects the socioeconomic achievement of offspring when they become adults.

Researchers have also been concerned with the socioeconomic circumstances of families in which parents delay childbearing past their twenties, although this research is more limited (e.g., Baldwin and Nord 1984; Hofferth 1984). Women who bear children later are better off economically throughout the balance of their lives than women who bear children earlier, a benefit that presumably accrues to their offspring as well (Hofferth 1984). Children of older parents may also benefit from their greater emotional maturity compared to younger parents, but, on the other hand, older parents may have less flexibility and energy to face the rigors of childrearing than their younger counterparts. The possible advantages and disadvantages for parent-child relations that derive from older parenting are the subject of considerable speculation, but little systematic research (Baldwin and Nord 1984; Gerson 1985).

Age Patterns of Socioecononomic Status and Their Effects on Offspring

The effects of parents' ages on the achievement of their offspring may be partly expected from well known relationships between family background, socioeconomic achievement, and differential fertility. Additionally, parents' ages may affect offspring as a result of other mechanisms that are not attributable to the correlation between parents' ages when they give birth to children and their socioeconomic characteristics. To some degree, of course,

associations between parents' ages and the achievements of their offspring may be artifacts of differential timing and levels of fertility. Ages at childbearing and the achievements of children share a number of common correlates. For example, more highly educated parents typically both begin childbearing at later ages and also provide more advantages to children that facilitate their socioeconomic achievements. Alternatively, children born to older parents are usually higher order births, who suffer the handicaps for achievement of large sibship size (e.g., Hauser and Sewell 1985; Mare and Chen 1986).

To an important degree, however, parents' ages at children's births may affect children's socioeconomic success. Parents who bear children at different ages provide varying types of family environment for their offspring. Persons typically enjoy improving socioeconomic conditions from their teens to middle adulthood. Their average educational attainment rises throughout the childhood and teenage years, reaching a peak in the late twenties. Their earnings, incomes, and wealth typically rise, albeit at a decreasing rate from the teenage years into their fifties (e.g., Becker 1975; Hauser, forthcoming; Henretta and Campbell 1978; Ruggles and Ruggles 1977). They usually enjoy upward occupational mobility from their initial jobs in their teens or twenties to the jobs that they hold in their "prime" adult years (e.g., Featherman and Hauser 1978). Their chances of holding a job (avoiding joblessness) also rise with age, sharply during the teenage years and then more gradually through their twenties and thirties (e.g., Mare, Winship, and Kubitschek 1984). As is well known, sons and daughters benefit from growing up in families with relatively advantaged parents. Inasmuch as

the typical age patterns of parental education, occupational standing, earnings, and employment are increasing, the educational and occupational achievements of offspring born to relatively older parents may exceed those of children born to relatively young parents. Additionally, because most parental socioeconomic statuses peak during the prime ages of adulthood or increase only modestly during middle age, the rate of increase in benefits that children enjoy with rising parental ages may decline as parents age.

Roles Demands on Young and Old Parents

Beyond the differential advantages experienced by children that are attributable to increases in socioeconomic status enjoyed by parents as they age, are additional potential effects of parents' ages at offsprings' births. Adults of varying ages differ in the roles and statuses that they occupy and that may affect the way that they allocate their time and money between children and other demands. Young adults are more likely than older adults to experience a multiplicity of role demands that may affect the time that they can devote to children. One or both young parents may still be in school and thus face constraints on time and money that they can devote to children. Persons in their twenties may also be more likely than older persons to be at a point in their work careers where extra time investments are required to ensure job stability or advancement. Additionally, whether young adults have become parents or not, they are more involved than older adults in social and recreational activities (Hill 1985), which place further demands on their time and money. Taken together, these age patterns of role demand and time use suggest that resources available to parents for their children may increase with age, even within groups that are relatively homogeneous in socioeconomic

standing.

Some support for this conjecture is provided by research on parents' allocation of both time and money to children. Time use studies suggest that parents' average time spent with children rises steadily with parents' ages from the teenage years onward, reaching a peak for 45-54 year old men and 35-44 year old women (Juster 1985, pp. 194-196). This result holds in the presence of controls for the effects on time invested in children of family income, ethnicity, educational attainment, home ownership, and labor force participation, marital status, and childbearing status. With regard to the association between expenditures on children and ages of parents, evidence also shows an upward gradient with parents' age. Espenshade (1984, p. 62) shows that, controlling for age of child, mother's labor force participation, and socioeconomic status, average expenditures on children rise monotonically with age of mother at her first birth. These results indicate that even within groups that are relatively homogenous on socioeconomic standing, older parents do invest more time and money in their children. Such patterns may result in rising socioeconomic achievement of offspring as parents age, net of the effects of well known family socioeconomic background conditions.

Modelling the Role of Parents' Ages in the Intergenerational Transmission of Inequality

We would ideally like to specify the causal relationships between parents' ages when they bear children, parents' socioeconomic characteristics, and the educational and other socioeconomic characteristics of offspring. These relationships, however, are not straightforwardly embedded in standard recursive models of family background effects on socioeconomic achievement

(e.g., Hauser, Tsai, and Sewell 1983). The effects of parental ages can be understood from the perspectives of both offspring and parents. From the standpoint of offspring, the ages of their parents are among the numerous elements of "family background" that make up their environment during early life and that facilitate or constrain their success. Parent-child relations change both with age of child and age of parent, implying that the meaning of the effect of parental age may differ at different ages (e.g., Troll and Bengtson 1979). Because parental ages increase over time and potentially affect offpring in a variety of ways throughout their early lives, they bear no clear-cut causal relationship with other family or schooling factors that also affect socioeconomic success.

From the standpoint of parents, the ages when they bear their children have an unambiguous temporal ordering to other, later, events and characteristics that may affect their children's success. For example, a parent's age at a child's birth obviously occurs prior to the economic standing of the family when the child is a teenager, a common indicator of family socioeconomic standing. The temporal ordering, however, does not resolve the causal relationships among fertility, socioeconomic success, consumption, and provision for children in the parents' generation. When couples control both their timing and their level of fertility, parents implicitly plan jointly how many children to have and when to have them, the kinds of educational opportunities they will offer their children, their desired future work careers, and their own lifestyle and consumption patterns (e.g., Baldwin and Nord 1984; Becker 1981; Blake 1981). As a result, the different environments that parents of varying ages provide their children

result in part from joint decisions that also influence the other aspects of family background known to affect children's educational and economic success.

Given the complexity of the causal relations between parents' ages at children's birth and other aspects of family background, the analyses reported in this paper are confined to describing and explaining the associations between parents' ages, other family background factors, and the achievements of offspring. Thus we regard father's age at son's birth as one among many correlated aspects of son's background that affect his educational and occupational achievement.

Incorporating the role of parents' age into demographic or behavioral models of transformations of occupational, educational, and other social hierarchies is nonetheless an important activity for future research. Such models need to explain parents' timing and level of fertility and the environments that they provide their children, and to view parents' fertility patterns and family environments as opportunities and constraints for achievement for their offpring. These processes, along with those for the transmission and inheritance of socioeconomic status, which have been the focus of most mobility research, account for sequences of social hierarchies from period to period. This type of synthesis is implicit in the work of Becker (1981, Ch. 5-7), based on a framework of utility-maximization, and of Cavalli-Sforza and Feldman (1981), based on analogies between sociocultural and genetic transmission of traits. Although these approaches are promising, they do not provide direct guidance about how to analyze the kinds of data available to us in the present investigation. Whatever future direction theoretical efforts take, however, they can be informed by empirical

regularities such as those reported here.

DATA AND METHODS

Our analyses directly investigate some of the ideas discussed above and indirectly provide evidence on others. We rely on survey data that contain information on ages of fathers when sons were born, the socioeconomic characteristics of sons' families when they were children and teenagers, sons' numbers of siblings, and sons' educational and occupational achievements. Thus we interpret the gross effects of fathers' ages on sons' achievements and the net effects that remain after family socioeconomic and demographic characteristics are taken into account. A limitation of this study is that we lack data on age of mother at birth, which obviously limits our ability to draw unequivocal conclusions about parental age effects. Because assortative mating on ages of potential spouses is strong, however, it is likely that relationships between fathers' age and sons' achievements are similar to those that would be observed between mother's age and offspring's achievement.

Measurement and Sample Definition

Our analyses use the 1973 Occupational Changes in a Generation Survey (OCG), which represents men aged 20 to 65 in the civilian noninstitutional population of the United States (Featherman and Hauser 1975). The OCG data permit the kinds of analyses reported here because, in addition to standard measures of family background and socioeconomic achievement, they include a measure of father's age at son's birth. This measure is derived from responses to the question, "In what year was your father born?"

The main dependent variables in our analysis are several measures of

respondent's educational attainment, including his highest grade of school completed and a sequence of dichotomous variables that denote whether or not he made selected school transitions. These transitions include: (1) completes elementary school (completes 8th grade), (2) attends high school given completes elementary school (attends 9th given completes 8th grade), (3) completes high school given attends high school (completes 12th given attends 9th grade), and (4) attends college given graduates from high school (attends 13th given completes 12th grade), (5) completes college given attends college (completes 16th given attends 13th grade), and (6) attends post-college schooling given graduates from college (attends 17th given completes 16th). By partitioning schooling into transitions, we can investigate variation in the effects of father's age by stages of the schooling process, which may depend differentially on family resources and circumstances (Mare 1980, 1981a). We also report the effects of father's age on selected measures of son's occupational attainment, including the occupational statuses of his first full-time job after completing school and his job in March 1973. Occupational status is measured using the Duncan (1961) socioeconomic index (SEI).

In addition to father's age at son's birth, our analyses include the following independent variables: status of father's occupation when respondent was age 16 as measured by the Duncan SEI, father's and mother's highest grade of school completed, family income when respondent was age 16 measured in thousands of constant (1967) dollars, number of siblings, whether the respondent lived on a farm at age 16, whether the respondent was born in the southern region of the U.S., whether the respondent is black, and

respondent's birth cohort as measured by dichotomous variables that denote membership in one of nine 5-year cohorts (1907-11, 1912-16,...,1947-51).

Out of the 33,613 OCG respondents, our analysis of son's highest grade of school completed is based on 24,602 who (1) had complete and reasonable data on son's and father's year of birth, (2) were aged 21-65 in 1973, (3) reported that their fathers were between ages 15 and 70 when they were born, and (4) were living with their fathers most of the time up to when they were age 16. We excluded 20 year olds because many of them were still in school at the time of the survey. Sons reporting that, at their birth, their fathers were younger than 15 or older than 70 were excluded because their reports are likely to be in error. Although respondents reported the year of birth of family heads if they did not live with their fathers, we excluded such persons because they typically reported their mothers' ages at birth, which differ systematically from fathers' ages. To include such persons would confound the influences of being raised in a single parent household with the differences in levels and effects of maternal and paternal ages. As a result of this decision, our subsample somewhat underrepresents blacks and persons from lower socioeconomic groups. The analyses of son's first and 1973 occupations are based on slightly smaller sample sizes because of missing data on these two dependent variables. In the analyses of school transitions, we subsampled men eligible for each of the first five transitions to speed computations and obtain approximately equal statistical power for each transition.

Statistical Methods

To investigate the effects of father's age at son's birth on son's socioeconomic achievement we use linear and logistic regression models that

provide estimates of the net effects of father's age, family background, and son's birth cohort. Using the estimated coefficients from these models, we compute the means of the dependent variables for sons with varying ages of father, adjusted for differences in family background and cohort membership of sons whose fathers had different ages at their birth. For the i^{th} son ($i = 1,\ldots,N$), let Y_i denote highest grade of school completed; X_{ji} denote the son's value on the j^{th} family background variable; C_{ki} be a dummy variable denoting whether the son was both in the k^{th} 5-year birth cohort (k = 1907-11,..., 1947-51); F_{mi} be a dummy variable denoting whether at son's birth the father was in the m^{th} 5-year age group (m = 15-19, 20-24,...45-49, 50+); α, β_j, γ_k, δ_m be parameters; and ϵ_i be a random disturbance. Then the model is:

$$(1) \qquad Y_i = \alpha + \sum_j \beta_j X_{ji} + \sum_k \gamma_k C_{ki} + \sum_m \delta_m F_{mi} + \epsilon_i ,$$

which we estimate by ordinary least squares. Then we summarize the net effects of father's age by computing adjusted means. For sons born to fathers in the m^{th} 5-year age group, the adjusted mean is:

$$(2) \qquad Y_m = \alpha + \sum_j \beta_j \bar{X}_j + \sum_k \gamma_k \bar{C}_k + \delta_m ,$$

where $\bar{X}_j$ is the sample mean on the j^{th} family background variable and $\bar{C}_k$ is the proportion of the sample that is in the k^{th} birth cohort. The adjusted means are the levels of educational attainment that sons born to fathers in the m^{th} age group would achieve if their cohort and family background composition were that of the sample as a whole.[3]

We conduct corresponding analyses of school transitions in which we estimate an equation for each of the six transitions listed above. In these analyses the independent variables are the same as in equation (1), but the

dependent variable is the log odds that a respondent makes a school transition. If d_{yi} is a dummy variable that equals 1 if a son makes the school transition and 0 if he does not and "p" denotes probability then the adjusted log odds of making the school transition for sons born to fathers in the m^{th} age group is:

$$(3)\quad L_m^* = \log\{[p(d_y=1]/[1-p(d_y=1)]\}_m^* = \alpha + \sum_j \beta_j X_{ji} + \sum_k \gamma_k C_{ki} + \delta_m,$$

where all other notation is as defined above. The adjusted probability of making the transition is $p_m^* = \exp(L_m^*)/[1 + \exp(L_m^*)]$.

EMPIRICAL RESULTS

Father's Age, Social Background, and Achievement

Table 1 summarizes the average values of social characteristics of men classified by the ages of their fathers when they were born. The characteristics include socioeconomic background, schooling, and occupational statuses. All means are adjusted for son's birth cohort to take account of potential associations between father's age at son's birth, son's year of birth, and secular trends in social characteristics.[4] Many of these patterns are also shown in Figure 1. Educational attainment does indeed vary among sons with varying ages of fathers. Average number of years of school completed varies curvilinearly with father's age, rising from 10.8 years for sons of teenage fathers to 12.2 years for sons born to men in their early 30's and falling again to 10.8 years for sons of middle-aged fathers. Table 1 also shows that the status of sons' first and 1973 occcupations is also varies curvilinearly with father's age. The SEI scores for both occupations peak for sons born to 30-34 year old men, at approximately eight points above the

scores for sons born to either the youngest or oldest men. These differences can be illustrated with specific occupations. For example, 1970 Census occupational titles with SEI scores ranging from 41 to 44 include "electricians," "utility meter readers," and "statistical clerks;" scores from 33 to 36 include "sherriffs and bailiffs," "sheet metal apprentices," and "plumbers and pipe fitters;" and scores from 25 to 28 include "plasterers," "household appliance installers and mechanics," and "ushers, recreation and amusement" (Featherman, Sobel, and Dickens 1975). Differences this large in occupational standing are approximately the same as those produced by differences of two years of son's schooling (see below). Both son's educational and occupational attainment, therefore, vary substantially with father's age.

To investigate whether the effects of father's age at son's birth are attributable to differences in social background among sons with varying ages of father, we examine patterns of family background factors across fathers' age groups. In general, socioeconomic characteristics of sons' families of orientation vary curvilinearly with father's age at son's birth. Family socioeconomic characteristics are most favorable to sons born to 30-34 year old men and least favorable to sons born to fathers who are aged 50 and above. Sons born to the youngest fathers are also disadvantaged, though not as much as those born to middle-aged fathers. For example, average family incomes for 16-year old sons' families rise from $6900 for sons of teenage fathers to $8600 for 30-34 year old fathers, and fall to $5300 for middle-aged fathers. These income patterns, of course, measure family circumstances when the son was aged 16, that is, when the 15-19 year old fathers were 31-35, when the 30-

34 year old fathers were 46-50, and the 50 and older fathers were aged 66 and above. Thus, teenage sons whose fathers were teenagers when they were born benefit from higher family incomes than sons born to middle aged fathers because many of the latter fathers are retired when their sons are age 16.

Father's occupational status and mother's and father's schooling vary in a pattern and degree across fathers' age groups that are similar to the corresponding variation in educational and occupational attainments of sons themselves. The racial composition of father's age groups also varies curvilinearly with father's age. Black sons are born disproportionately to teenage and, to a somewhat lesser extent, middle-aged fathers. Conversely, blacks are underrepresented among sons born to men in their thirties. This pattern is mirrored in the proportions of sons born in the south for different father's age groups, mainly a result of the overrepresentation of blacks in that region. Unlike most of the family background measures, son's number of siblings varies directly with father's age at son's birth, rising from 2.5 for sons born to teenage fathers to 5.7 for sons born to men aged 50 and over. This pattern no doubt arises because men achieve high levels of fertility in part by having children over a broad span of ages. Finally, the age pattern of sibship size is mirrored by the age pattern of farm background composition of sons, which may reflect historically higher levels of farm fertility. In sum, differences in the social and economic backgrounds of sons born to men of varying ages are large, and may account for at least some of the association between educational and occupational achievements of sons and the ages of their fathers.

Net Effects of Father's Age on Son's Educational Achievement

Son's educational attainment varies with father's age, but many aspects of sons' families of orientation also vary systematically with parental age. Age patterns of fertility vary with parents' socioeconomic characteristics and socioeconomic welfare itself varies with parents'ages. The patterns in Table 1 suggest that the apparent effects of father's age at son's birth on son's educational attainment may arise because of the associations between father's age and family socioeconomic background. To investigate this, we examine regression models that include social background and father's age effects on son's schooling simultaneously (see Table 2). All models include the effects of son's birth cohort, although we do not report these. The first two columns of Table 2 present contrasts among father's age groups on son's schooling. These constrasts, which are the basis for the adjusted means of son's schooling by father's age group that are reported in Table 1 and line "2" of Figure 2, show the curvilinear pattern of son's educational attainment with father's age. They account for only a small proportion of the variance in son's schooling, but they are large and statistically significant. Figure 2 also shows that the pattern of son's educational attainment by father's age is similar irrespective of whether son's birth cohort is controlled. Observed and adjusted levels of son's education are almost identical for all fathers except teenagers, suggesting that the low levels of schooling for sons of teenage fathers are partially confounded with secular trends away from teenage parenthood and toward higher levels of educational attainment.

The last two columns of Table 2 present the effects of both father's age and eight social background characteristics of sons. The effects of social

background factors on son's educational attainment are well established and will not be discussed in detail here (Featherman and Hauser 1978; Hauser and Featherman 1976; Mare 1980, 1981a). The net effects of father's age differ substantially from those that are not adjusted for social background factors. In particular, father's age affects son's highest grade of schooling positively and, except for the oldest father's age group, monotonically. Line "4" in Figure 2 shows that son's schooling rises steeply from teenage fathers to those in their 20's, and more gradually thereafter. Levels of son's schooling that are adjusted for both son's cohort and social background vary from approximately 11.1 years of schooling for men with teenage fathers to 12.3 years for sons of middle-aged fathers. One can assess the importance of this difference of 1.2 years by comparing it to the effects of other social background factors in the model. For example, this difference is greater than would be expected between men whose fathers' levels of schooling differed by more than 10 years [1.2 > (10 * 0.113)] and greater than five times the expected difference between black and white men who were equivalent on other aspects of social background. In short, the effects of the timing of a son's birth within the father's lifetime is important to the son's educational achievement.

To investigate the degree to which specific social background differences among men with varying ages of fathers account for the observed curvilinear pattern of son's schooling effects, we use the model of father's age and social background effects to decompose differences in son's schooling between selected pairs of ages. Table 3 decomposes the differences in average levels of schooling between sons with fathers aged 15-19 and 30-34 and between sons

with fathers aged 30-34 and 50+.[5] The observed advantage in schooling to men born to 30-34 year olds relative to men born to teenagers is attributable in part to the more favorable background conditions as measured by variables included in the model. Approximately 35 percent of the difference in schooling is due to socioeconomic differences (father's and mother's schooling, father's occupation, and family income) between men with differing father's ages. The largest part of the difference, however, is unexplained. For the contrast between sons of fathers aged 50+ and those aged 30-34, however, a much larger part of the difference is accounted for. More than 80 percent of the difference is attributable to the less favorable socioeconomic conditions of sons born to middle-aged fathers. In addition, sons born to fathers aged 50+ suffer the handicap of larger sibships than men born to younger fathers. Differences in sibship size account for 35 percent of the total. These calculations imply that, taken alone, differences in family environments between those provided by fathers aged 30-34 and those aged 50+ would lead to an even greater educational disadvantage to sons of the oldest fathers than is observed. As indicated by the positive residual, unmeasured factors partially offset this disadvantage.

Although the effects of father's age on son's schooling are large and father's age is associated with social background, differences in fathers' ages among persons with varying socioeconomic backgrounds do not account for measured background effects. A comparison of the coefficients reported in column 5 of Table 2 with those for a model that excludes the effects of father's age (see column 3) shows that background effects are largely unchanged when adjusted for father's age. Only the effect of race is partly

explained by age differences of fathers. The overrepresentation of blacks among the youngest and oldest father's age groups explains approximately 20 percent of their educational handicap.

In summary, sons' educational achievement varies sharply with the timing of their births within their fathers' lives. Sons of men in their early 30's enjoy the highest levels of achievement, but this advantage is largely attributable to their highly favorable backgrounds, especially on parents' socioeconomic characteristics and sibship size. Once family background is controlled, son's schooling varies directly with father's age at son's birth, yielding a difference of about 1.2 grades of schooling between sons with the youngest and oldest fathers. Although little of the variance in son's educational attainment lies between father's age groups, the effect of father's age on son's years of school completed is large and equivalent to that produced by large differences on other well known determinants of educational attainment.

Father's Age and Son's School Continuation Decisions

A precise explanation of the positive effect of father's age on son's educational attainment is not attainable without richer information than OCG provides. The changing effects of father's age across levels of the schooling process nonetheless provide further information about how the timing of son's birth affects his achievement. Father's age may positively affect son's schooling because social and economic resources of families, which are not fully reflected in measured parental statuses, accumulate with age and thus provide a relatively better environment for offspring of older parents. Such resources may include wealth, which is poorly measured by family income, as

well as elements of "cultural capital" that may not be measured by parents' years of schooling. If such factors are important, then father's age may more strongly affect school transitions where family wealth is most important for educational success, that is, post-secondary school transitions.

Table 4 reports the effects of father's age and social background on son's (log) odds of making selected transitions between schooling levels (conditional upon his eligibility to make the transitions). Figure 3 plots the probabilities of school continuation at each of six transitions by father's age, which are adjusted for social background differences among father's age groups.[6] The evidence for stronger father's age effects at the college level is somewhat mixed. The effects of father's age are indeed stronger on the log odds that sons graduate from college given that they attend than on the odds of any other transition. For this transition, the father's age effects are statistically significant and imply that the probability of graduation from college given attendance ranges from approximately .3 for sons born to teenagers to .6 for sons born to middle aged fathers (a difference of about 1.4 in the logit scale). For the transition from high school graduation to college, however, where one might also expect the environment provided by older parents to be advantageous, the differences among father's age groups, although generally positive, are not statistically significant. Next to the transition from college attendance to graduation, the largest effects of father's age occur for the transition from high school attendance to graduation for which adjusted probabilities rise with father's age from approximately .7 to slightly less than .9, a difference of about 1.2 in the logit scale. The only other transition for which contrasts among

father's age groups are significant is for completion of elementary school, but there is little evidence of variation among sons born to fathers who are not teenagers.

These results suggest that the more favorable environments provided by older fathers are particularly advantageous for sons' persistence in high school and college, that is, when sons are aged 15-20, the youngest fathers are aged 30-35 and the oldest fathers are aged 65 and over. This is broadly consistent with the argument that net parental resources that benefit offspring accumulate with age. That father's age effects on son's probabilities of college attendance are weak, however, suggests that these parental resources should not be interpreted solely as levels of economic wealth. The financial resources that are potentially available to college-age sons of older fathers may also be needed to support the fathers themselves inasmuch as many such fathers retire just as their sons reach college age.

Net Effects of Father's Age on Son's Occupational Achievements

Having demonstrated a large effect of father's age at son's birth on son's educational attainment, we next inquire whether father's age also affects son's occupational achievement. We examine the effects of father's age on son's occupational status and see whether these effects persist when son's family background and schooling are taken into account. Tables 5 and 6 report the results of several regression models for the effects of selected combinations of father's age, family background, and son's schooling on son's first and current occupations respectively. All models include the effects of son's birth cohort, which we do not report. Figure 4 graphs the adjusted means of son's occupational status that are implied by these models. The

first two columns of each table report the effects of father's age at son's birth, controlling for son's year of birth. The curvilinear pattern of coefficients, which shows a maximum advantage for sons born to 30-34 year old men, is the same as that reported in Table 1.

The second two columns of each table report the net effects of father's age after taking account of family background characteristics of sons. The net coefficients for father's age and the corresponding adjusted means in Figure 4, which are plotted as line "2," indicate that the net effects of fathers' ages on sons' occupations are generally positive. Once family background characteristics are taken into account, son's current occupational status rises monotonically with father's age from approximately 37 points for sons born to teenage fathers to approximately 43 points for sons of middle-aged fathers. Father's age at son's birth affects the status of son's first occupation somewhat more strongly, although there is some departure from monotonicity. Once family background characteristics are controlled, sons of the oldest group of fathers enjoy an occupational status that averages more than 8 points higher than for sons of teenagers.

These patterns are consistent with the positive effects of father's age on son's educational attainment that are discussed above. They suggest that some of the economic and cultural advantages provided by older fathers that raise sons' educational attainment benefit their occupational standing as well. Alternatively, however, the effects of father's age on son's occupations may be transmitted entirely through their effect on son's schooling; that is, the net effects of father's age may be negligible. To investigate these possibilities, we include son's schooling in the regression

models reported in the fifth and sixth columns of Tables 5 and 6. The corresponding adjusted means of son's occupations by age of father are presented as lines "3" in Figure 4. Once son's educational attainment is taken into account, father's age has no net effect on son's current occupational status. Figure 4 shows that the adjusted means under this model are approximately invariant with father's age, and Table 6 shows that contrasts among father's age groups on son's occupation are statistically insignficant. For son's first occupation, in contrast, once son's schooling is controlled, there remains a small positive net effect of father's age. Between the oldest and the youngest fathers, the status of son's first occupation varies by slightly more than 3 SEI points, a difference in status that would be produced by a difference of three fourths of a year of schooling. At the point of entry into the occupational structure, therefore, sons with equivalent amounts of schooling will differ slightly in the status of their positions according to their fathers' ages. These differences, however, soon dissipate.

The final two columns of Tables 5 and 6 report regression models that include both son's schooling and family background, but exclude father's age at son's birth. In comparison with the models already discussed, these results show that inferences about schooling and background effects on occupational status are unaffected by statistical controls for father's age at son's birth. Father's age contributes negligible explained variance to the model and fails to alter significantly any estimated coefficients once it is taken into account.

CONCLUSION

This research has demonstrated a substantial positive effect of father's age at son's birth on son's educational achievement. An observed curvilinear pattern of father's age effects is attributable to the adverse distribution of family background characteristics for the oldest parents, especially on mother's schooling and number of siblings. Once family background composition of different father's age groups is taken into account, the effects of father's age on son's achievement is positive throughout all fathers' childbearing years. For sons' occupational achievements, similar patterns of paternal age effects are observable, but, once the effect of son's educational attainment on his occupation are taken into account, net effects of father's age on son's occupation are negligible. The educational advantages that we observe for sons of older fathers are consistent with the view that life cycle variation in socioeconomic welfare of parents affects offspring through differential timing of fertility. It is also consistent with the argument that the heavy and competing role demands of younger parents constrain the time and financial assets that they can provide their children.

As noted above, our research is limited in that it provides no direct information about the possible effects of mother's ages on the welfare of offspring. Because ages of parents are highly correlated, it is likely that the associations reported here also reflect the effects of mother's age. We are also forced to restrict analyses to men who lived with both parents while they were growing up, and have excluded men from female-headed families who may be least affected by father's age. Further research is needed to see whether the life cycle stage of each parent exerts an independent influence.

Additionally, the relationships that we report are based on cohorts of men born between 1907 and 1951, and thus may not apply to recent cohorts of children who are born to teenage parents, to parents who have delayed their childbearing into their thirties, and to parents who have remarried and are building second families. That the positive effect of parents' age is stable across the cohorts of men observed in the OCG survey and is consistent with research on smaller yet more recent samples of children (Hofferth 1987b), however, suggests that our findings are of contemporary as well as historical interest.

The results reported for educational and occupational achievement indicate that specific effects of father's age on son's occupational status are negligible once son's schooling is taken into account, which suggests that multivariate analyses of processes of achievement are not seriously biased when the effects of father's age are ignored. On the other hand, son's educational and occupational achievements vary substantially with father's age at son's birth, suggesting that analyses of the gross associations between the statuses of fathers and sons may be affected by the age heterogeneity of fathers within social mobility tables (Duncan, 1966). More generally, our findings suggest that across societies or periods of time that vary considerably in the norms about the appropriate ages to have children, both levels and distributions of socioeconomic achievements may vary.

Secular increases in parents' schooling and declines in average family size have been important sources of intercohort growth in average levels of educational attainment, despite rising costs of college education and occasional complaints about an "excess supply" of college educated persons

(Mare 1981b). The results reported here suggest yet another source of continued growth in schooling. Recent trends toward later fertility of American women have raised the average age of parents at which children are born (Baldwin and Nord 1984), and thus augur higher levels of achievement among offspring than implied by their other family background characteristics alone.

Our results also reinforce prior research on the handicaps suffered by children born to teenage parents. Throughout the period covered by the OCG data, sons born to teenagers have averaged approximately 1.5 years of schooling less than sons born to older adults, a difference that holds even among children whose parents are equivalent on educational attainment and other socioeconomic factors. Although it is likely that this deficit is attibutable to other aspects of family environment that are unmeasured in the present research, our results suggest that the handicaps faced by the offspring of young parents will be reduced but far from eliminated through improved levels of parental schooling.

FOOTNOTES

1. This research was supported by the National Institute of Aging (PO1 AG04877) and the Graduate School of the University of Wisconsin - Madison. Computations were performed using facilities of the Center for Demography and Ecology at the University of Wisconsin - Madison, which are supported by the Center for Population Research of the National Institute for Child Health and Human Development (HD-5876). The authors are grateful to Robert M. Hauser and Christine Winquist Nord for their suggestions about this research and to Judith A. Seltzer for helpful comments on an earlier draft of this paper.

2. Parents' ages at childbearing may also affect their offsprings' socioeconomic welfare later in life. Parents' ages determine the ages at which offspring can expect to look after their aged parents and to inherit parental wealth.

3. In this paper we present no results on possible interactions between father's age and social background factors. Analyses not reported here indicate that the effects of socioeconomic background and father's age are essentially additive (Tzeng 1987).

4. We adjust characteristics for son's birth cohort by regressing them on dummy variables for the eight 5-year categories of father's age and the nine 5-year son's birth cohorts. Applying equation (2), in which the social characteristic is the dependent variable, we compute means for each category of father's age evaluated at the average sample composition on son's birth cohort.

5. The component for each independent variable is $\beta_j(\bar{X}_{j2} - \bar{X}_{j1})$ where β_j

denotes the effect of the j^{th} social background variable in the model reported in column 5 of Table 2, and $\bar{X}_{j2}$ and $\bar{X}_{j1}$ are the means of the j^{th} social background variable for the older and the younger father's age groups respectively. The decomposition assumes the absence of interaction between father's age and the effects of social background.

6. Adjusted log odds are computed using equation (3) and the coefficients reported in Table 4. For each father's age group, these odds are smoothed to follow a third degree polynomial, converted to probabilities, and plotted on the logit scale in Figure 3.

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TABLE 1

Selected Characteristics of Sons by Father's Age at Son's Birth*

	Father's Age at Son's Birth							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+
Social Background								
Father's Schooling	8.2	8.7	8.9	8.8	8.2	7.6	7.2	6.1
Mother's Schooling	7.9	8.8	9.1	9.1	8.4	7.8	7.6	6.6
Father's SEI	25.7	28.3	30.6	32.1	29.9	28.2	26.1	22.3
%Farm Backgrd	2.1	2.2	2.1	2.2	2.6	2.9	3.6	4.4
Family Income ($1000's)	6.9	7.8	8.4	8.6	8.1	7.5	6.7	5.3
Number of Siblings	2.5	2.2	2.4	2.8	3.5	4.4	4.8	5.7
%Black	20.9	12.7	9.7	8.2	8.3	9.4	10.1	14.8
%Born in South	42.1	37.9	32.2	29.6	30.2	32.3	34.4	41.4
Socioeconomic Attainment								
Years of Schooling	10.8	11.7	12.0	12.2	12.1	11.8	11.6	10.8
SEI of First Occupation	25.0	30.8	33.5	34.7	33.7	32.5	29.6	27.6
SEI of 1973 Occupation	34.5	39.7	41.3	42.2	41.0	39.4	37.7	34.1
Percent of Observations								
Total	2.2	14.9	26.5	24.4	16.3	8.8	3.9	3.0
White	1.9	14.4	26.6	24.8	16.6	8.9	3.9	2.9
Black	4.7	18.9	25.9	20.2	13.6	8.4	3.9	4.5
N	543	3657	6522	5996	4010	2175	956	743

TABLE 2

Effects of Father's Age and Family Background on Son's Highest Grade of School Completed*

Variable	Selected Models					
	β	t	β	t	β	t
Constant	9.073	59.2	5.813	4.3	4.930	3.6
Father's Age at Son's Birth (15-19)						
20-24	0.883	6.0			0.451	3.8
25-29	1.248	8.8			0.663	5.7
30-34	1.448	10.2			0.843	7.3
35-39	1.287	8.8			1.060	9.0
40-44	1.047	6.8			1.200	9.6
45-49	0.791	4.6			1.222	8.7
50+	0.040	0.2			1.191	8.0
Father's Schooling			0.105	16.4	0.113	17.6
Mother's Schooling			0.191	28.7	0.191	28.9
Family Income			0.069	20.9	0.069	20.9
Father's SEI			0.016	15.8	0.015	14.8
Farm			-0.758	-16.6	-0.806	-17.7
Number of Siblings			-0.155	-25.4	-0.168	-27.3
Black			-0.284	-4.6	-0.224	-3.7
South			-0.333	-8.4	-0.298	-7.6
R^2	0.070		0.384		0.390	

* Analyses are based on 24602 observations. All models include dichotomous variables that denote son's 5-year birth cohort (1912-1916,..., 1947-51), and whether or not data are present on each of the social background variables except race and farm background which have no missing data. "t" is ratio of coefficient to its standard error.

TABLE 3

Decomposition of Differences Between Father's Age Groups in Son's Years of School Completed*

Component	15-19 to 30-34		30-34 to 50+	
	Difference (Years)	Percent	Difference (Years)	Percent
Father's Schooling	0.068	4.96	-0.305	22.37
Mother's Schooling	0.229	16.76	-0.478	35.00
Family Income	0.117	8.58	-0.228	16.69
Father's SEI	0.096	7.02	-0.147	10.78
Farm	-0.001	-0.06	-0.018	1.30
Number of Siblings	-0.050	-3.68	-0.487	35.71
Black	0.028	2.08	-0.015	1.08
South	0.037	2.72	-0.035	2.58
Residual	0.843	61.62	0.348	-25.51
Total	1.367	100.00	-1.365	100.00

* Decompositions are based on coefficients reported in column 5 of Table 2 and means reported in Table 1.

TABLE 4

Effects of Father's Age and Family Background on Son's School Transitions*

Independent Variable	School Transition											
	0-8		8-9		9-12		12-13		13-16		16-17	
	β	Z	β	Z	β	Z	β	Z	β	Z	β	Z
Constant	1.44	2.6	4.64	0.2	-9.02	-0.3	-0.91	2.0	-0.46	-0.8	-0.16	-0.3
Father's Age at Son's Birth (15-19)												
20-24	0.72	2.6	0.41	1.2	0.09	0.3	-0.06	-0.3	0.33	1.1	0.30	0.9
25-29	0.82	3.0	0.26	0.8	0.27	1.0	0.07	0.3	0.59	2.0	0.40	1.2
30-34	0.85	3.1	0.20	0.6	0.45	1.7	0.24	1.2	0.57	2.0	0.51	1.5
35-39	1.17	4.1	0.35	1.0	0.41	1.5	0.36	1.6	0.90	3.0	0.50	1.5
40-44	0.99	3.3	0.57	1.6	0.59	2.1	0.34	1.5	0.93	3.1	0.44	1.3
45-49	0.89	2.7	0.81	1.9	0.65	2.0	0.45	1.8	0.33	1.0	0.74	2.0
50+	0.76	2.3	0.70	1.7	1.16	3.3	0.43	1.6	1.41	3.9	0.67	1.7
Father's Schooling	0.09	4.6	0.03	1.2	0.07	4.9	0.06	5.6	0.02	2.2	-0.00	-0.3
Mother's Schooling	0.16	8.2	0.13	5.8	0.07	5.0	0.08	7.5	0.02	1.3	0.02	1.8
Family Income	0.16	7.7	0.06	3.6	0.07	6.2	0.05	9.7	0.02	3.1	-0.01	-2.6
Father's SEI (X 10)	0.21	4.0	0.20	4.1	0.18	6.4	0.14	9.5	0.10	6.2	0.09	5.6
Farm Background	-0.43	-3.7	-0.76	-6.0	0.02	0.2	-0.09	-1.2	0.23	2.1	0.21	1.8
Number of Siblings	-0.06	-3.9	-0.11	-6.3	-0.09	-6.8	-0.08	-7.2	-0.08	-5.4	-0.00	-0.2
Black	-0.14	-1.0	0.10	0.5	-0.33	-2.6	0.18	1.5	-0.07	-0.5	0.24	1.5
South	-0.67	-5.7	0.34	2.5	-0.13	-1.4	0.03	0.5	0.00	0.0	-0.25	-3.5
-2 Log L	2509		2209		4104		8148		5796		6113	
N (Subsample %)	6094 (25)		5567 (25)		5207 (25)		6833 (40)		6086 (40)		4499 (100)	

* All models include dichotomous variables that denote son's birth cohort and whether data are present on each social background variable, except black and farm background where no data are missing. "Z" is ratio of coefficient to its standard error.

TABLE 5

Effects of Father's Age, Family Background, and Educational Attainment on Occupational Status (SEI) of Son's First Job

Variable	Selected Models							
	β	t	β	t	β	t	β	t
Constant	20.01	16.1	21.12	2.0	0.65	0.1	2.83	0.3
Father's Age at Son's Birth (15-19)								
20-24	5.79	5.0	3.01	3.0	1.02	1.2		
25-29	8.48	7.5	4.72	4.8	1.78	2.1		
30-34	9.66	8.5	5.62	5.7	2.07	2.4		
35-39	8.68	7.5	6.82	6.8	2.26	2.6		
40-44	7.59	6.2	7.69	7.3	2.59	2.8		
45-49	4.61	3.4	6.62	5.5	1.50	1.5		
50+	2.55	1.8	8.25	6.5	3.15	2.9		
Father's Schooling			0.51	9.3	0.05	1.0	0.03	0.7
Mother's Schooling			0.69	12.1	-0.10	-2.0	-0.10	-2.1
Family Income			0.42	14.8	0.14	5.5	0.14	5.5
Father's SEI			0.24	28.3	0.18	23.9	0.18	24.2
Farm			-4.04	-10.4	-0.85	-2.5	-0.76	-2.3
Number of Siblings			-1.04	-19.8	-0.36	-7.7	-0.33	-7.3
Black			2.74	5.2	1.66	3.7	1.77	3.9
South			0.10	0.3	1.26	4.3	1.20	4.1
Son's Schooling					4.10	85.2	4.11	86.0
R^2	0.022		0.266		0.452		0.451	

* Analyses are based on 21391 observations. All models include dichotomous variables that denote son's 5-year birth cohort, and whether data are present on each of the social background variables, except race and farm background which have no missing data. "t" is ratio of coefficient to its standard error.

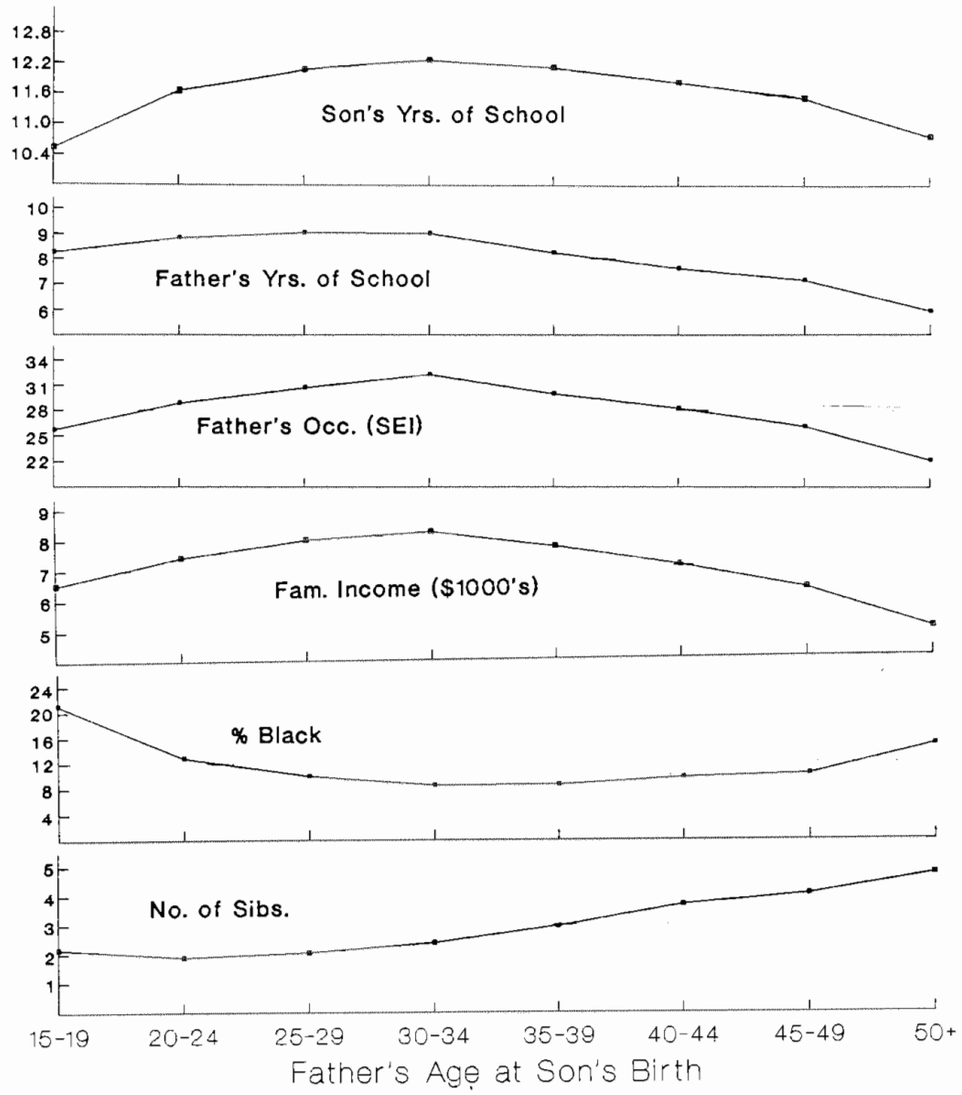
TABLE 6

Effects of Father's Age, Family Background, and Educational Attainment on Occupational Status (SEI) of Son's Job in 1973

Variable	Selected Models							
	β	t	β	t	β	t	β	t
Constant	30.52	23.1	15.54	1.4	-4.84	-0.5	-4.41	-0.4
Father's Age at Son's Birth (15-19)								
20-24	5.19	4.3	1.99	1.9	0.15	0.2		
25-29	6.76	5.8	2.65	2.6	-0.10	-0.1		
30-34	7.72	6.6	3.33	3.2	-0.14	-0.2		
35-39	6.54	5.5	4.40	4.2	0.12	0.1		
40-44	4.89	3.9	4.70	4.2	-0.23	-0.2		
45-49	3.16	2.2	4.85	3.9	-0.53	-0.5		
50+	-0.35	-0.2	5.67	4.7	0.86	0.7		
Father's Schooling			0.46	8.2	0.01	0.2	0.01	0.2
Mother's Schooling			0.78	13.5	0.03	0.6	0.03	0.6
Family Income			0.49	17.1	0.22	8.5	0.22	8.5
Father's SEI			0.18	20.9	0.12	15.8	0.12	15.8
Farm			-5.62	-14.1	-2.41	-6.8	-2.40	-6.8
Number of Siblings			-0.94	-17.4	-0.26	-5.5	-0.26	-5.6
Black			-7.12	-13.1	-6.41	-13.3	-6.40	-13.3
South			1.09	3.2	2.17	7.1	2.18	7.2
Son's Schooling					4.04	79.7	4.03	80.1
R^2	0.021		0.243		0.411		0.411	

* Analyses are based on 22407 observations. All models include dichotomous variables that denote son's 5-year birth cohort, and whether data are present on each of the social background variables, except race and farm background which have no missing data. "t" is ratio of coefficient to its standard error.

Fig. 1. Selected Characteristics of Sons by Father's Age at Son's Birth



All variables adjusted for son's year of birth. See text for definitions.

Fig. 2. Observed and Adjusted Means of Son's Schooling by Father's Age At Son's Birth

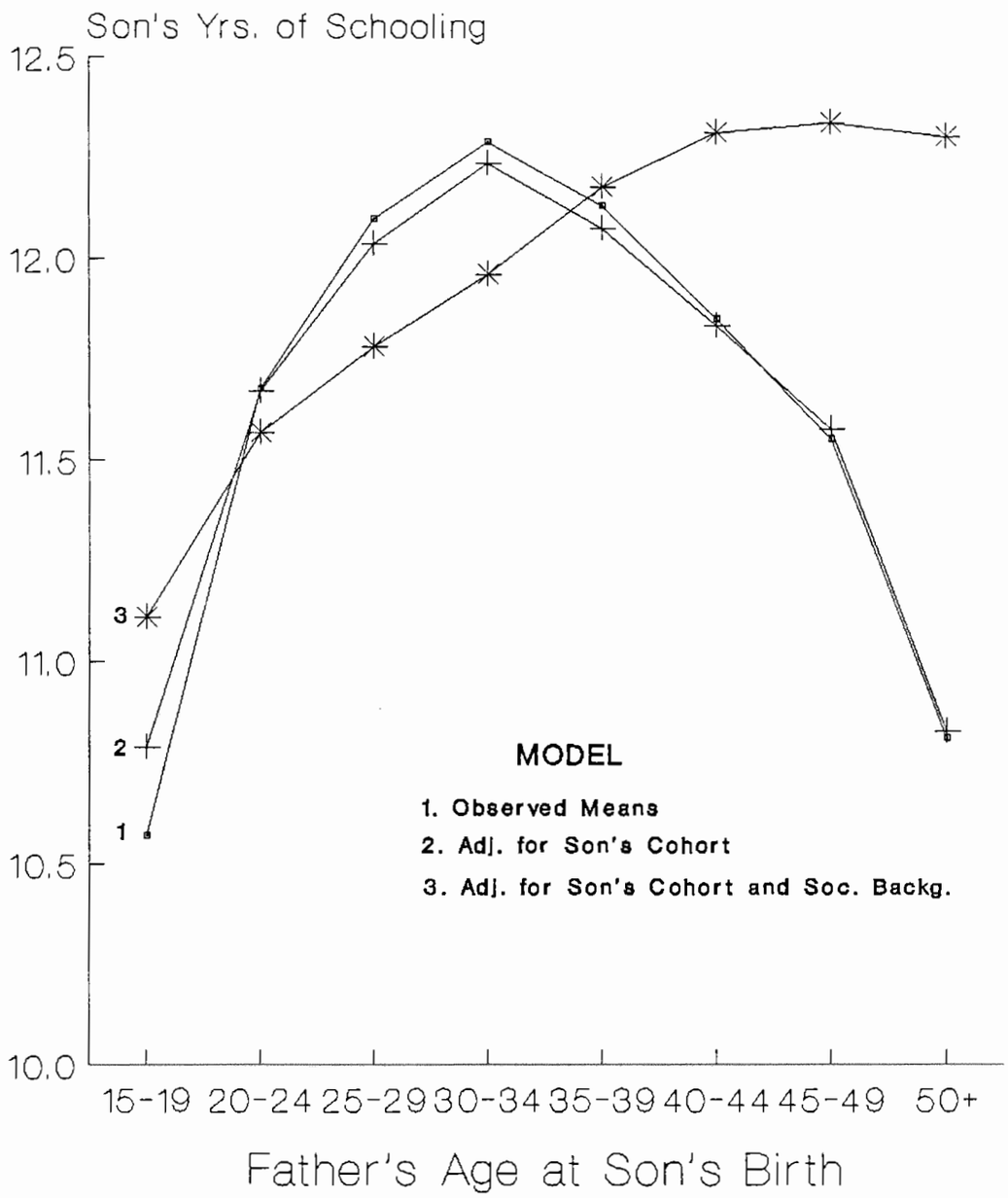
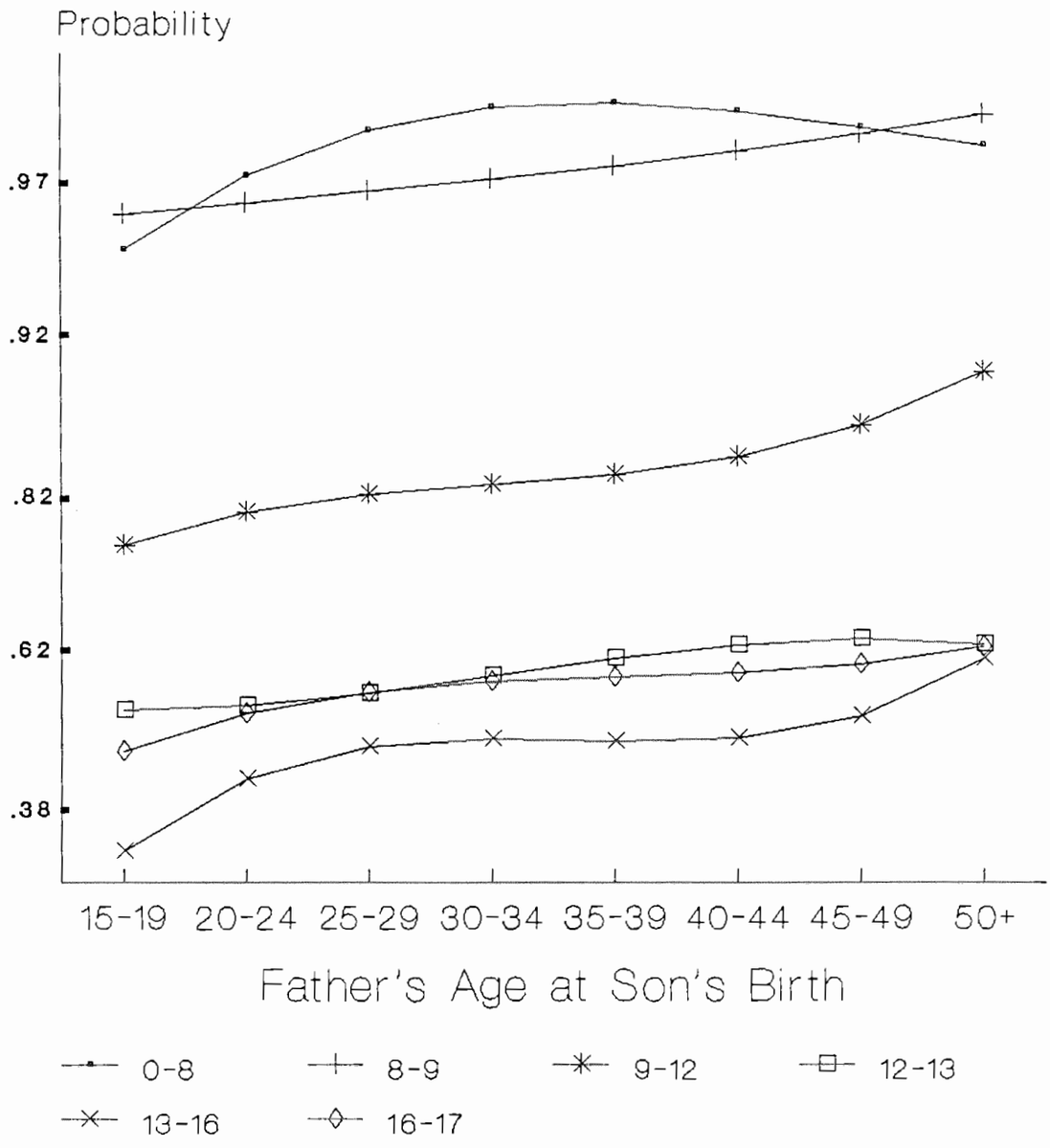
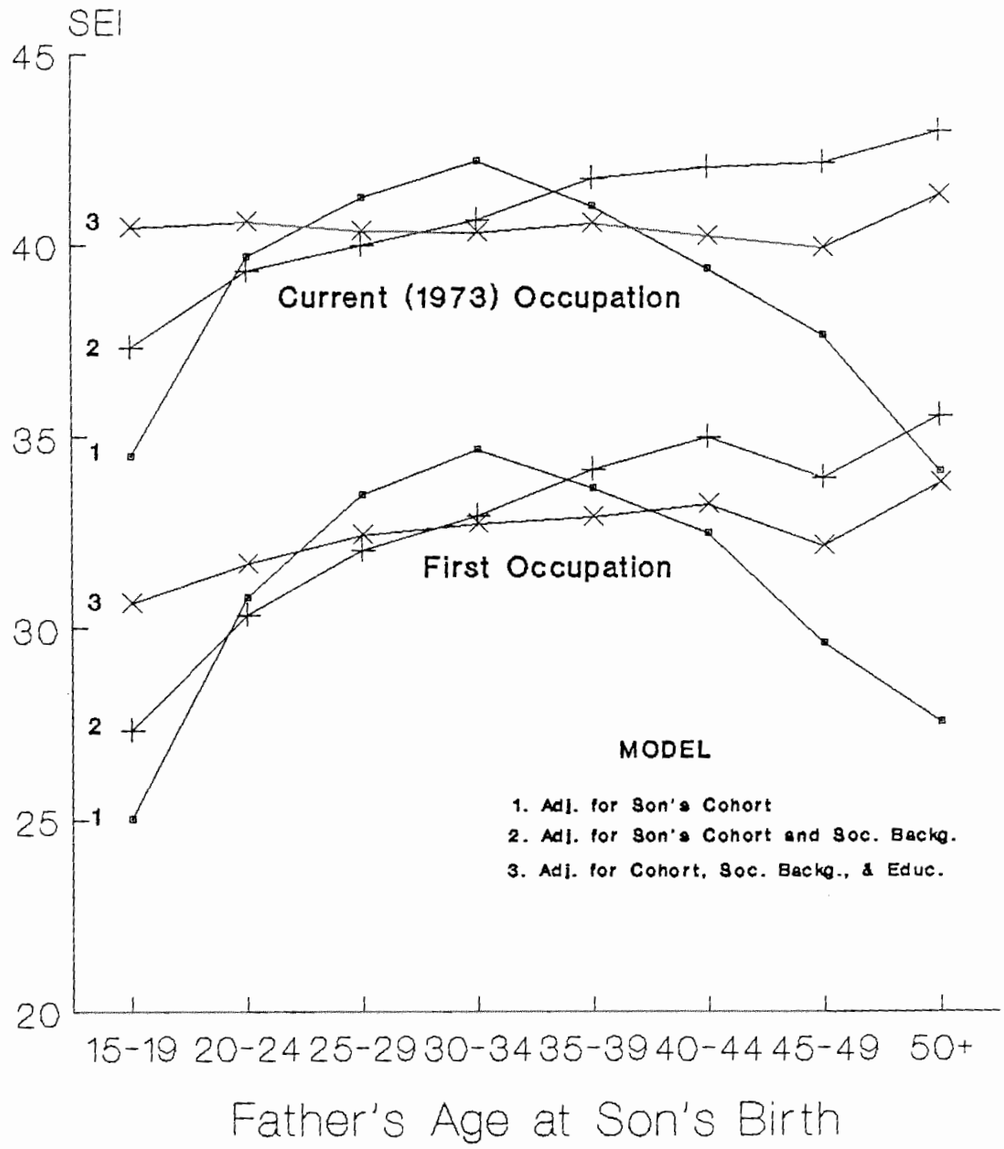


Fig. 3. Adjusted School Continuation Probabilities by Father's Age at Son's Birth



Effects of father's age are smoothed to follow a 3rd degree polynomial.

Fig. 4. Observed and Adjusted Means of Son's First and Current Occupation (SEI) by Father's Age at Son's Birth



Mailing Address:

Center for Demography and Ecology
University of Wisconsin
1180 Observatory Drive
Madison, Wisconsin 53706-1393
U.S.A.