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# FAMILY BACKGROUND AND OCCUPATIONAL ATTAINMENT: REPLICATION AND EXTENSION THROUGH A 24-YEAR FOLLOW-UP

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# CHAPTER I

## STATEMENT OF THE PROBLEM

Occupational attainment in American society has been of central interest in much sociological research (Kerckhoff, 1976). Moreover, the work has been cast largely in terms of path models revolving about the efforts of O. D. Duncan (1966; Blau and Duncan, 1967) and various University of Wisconsin sociologists (Sewell and Shah, 1967; Sewell et al., 1969; 1970; Sewell and Hauser, 1972; Haller and Portes, 1973; Featherman and Hauser, 1976). A succinct statement of the received tradition is this:

> Models of the mobility process typically begin with indices of origin position in the stratification system and indices of mental ability. These are then related to intervening social-psychological variables such as aspiration or ambition, personality, school performance, and significant others' influence. Lastly, the effect of all of these influences on educational and occupational attainment is considered. The resulting model expresses a plausible causal argument of how people of differing mental ability, beginning at one level in the system, are socialized such that they attain a subsequent occupational position (Porter, 1974: 303).

The present study accepts the fundamentals of the model and would attempt to further its utility by two routes. One, by a careful examination of past research results, along with the reporting of our own original investigation of occupational attainment among a large sample of rural-reared Pennsylvania males, we want to look at the matter of replication in the field. While replication is the cornerstone of scientific generalization, its consideration tends to be haphazard and largely absent from sociology (Bealer, 1975: 470-472). Second, within the received tradition of path analytic, causal modeling of status attainment in American society, the original research to be reported will assess the empirical efficacy of certain family input variables not previously used by other researchers.

## CHAPTER II

## RESEARCH METHODOLOGY AND FRAMEWORK FOR ANALYSIS

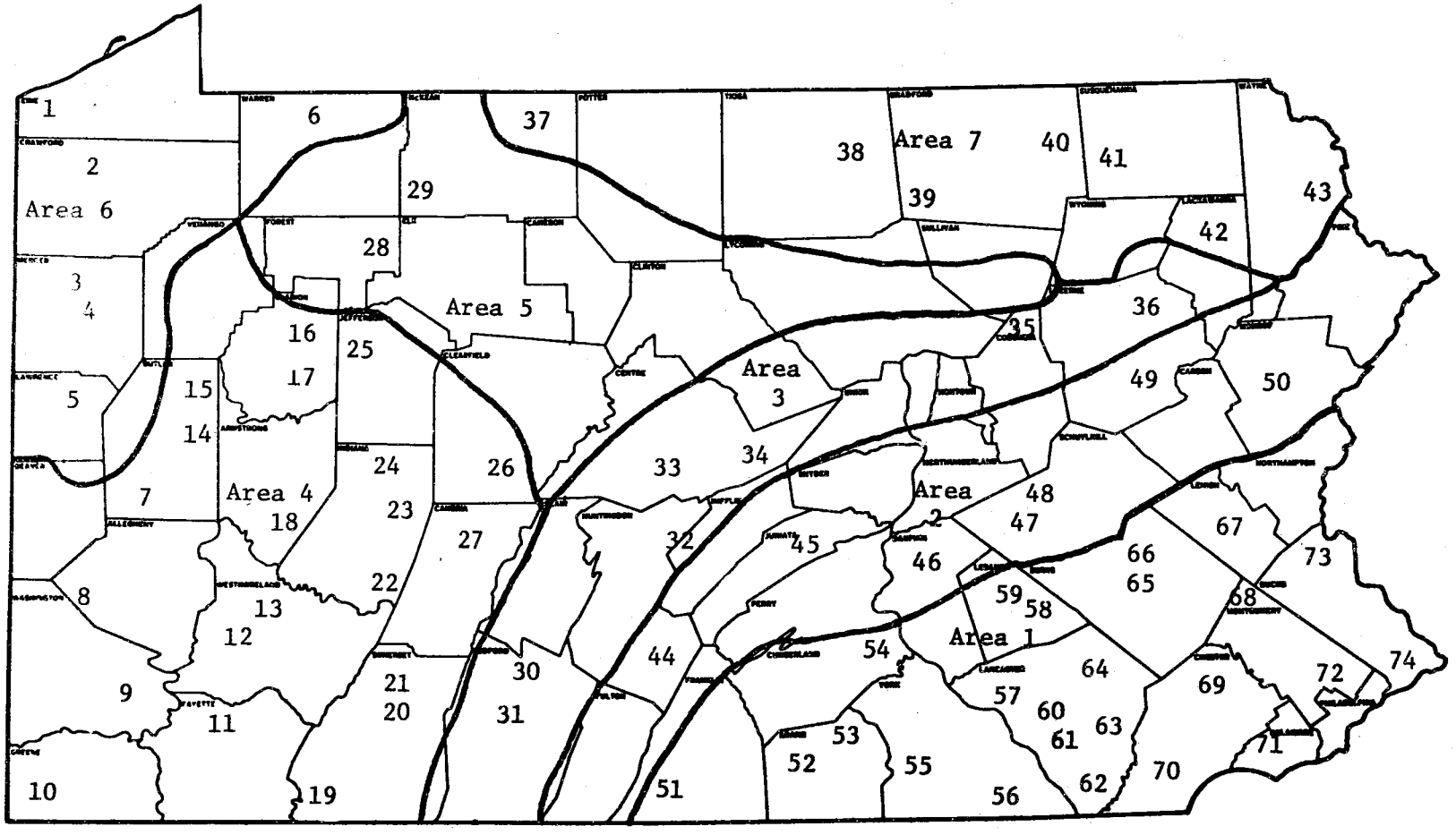
### The Sample Procedure

Data for the study were generated from the records of a cohort of rural-reared Pennsylvanians contacted three different times in the span 1947 to 1971. The respondents are part of an ongoing migration-occupational attainment project in the Department of Agricultural Economics and Rural Sociology at The Pennsylvania State University. Various members of that Department have participated in the administration of the three survey questionnaires.

In the spring of 1947, a sample of sophomore classes from 74 Pennsylvania rural high schools was drawn to determine differences in the patterns of interaction and personality development associated with residence (Buck, 1947: 2). Sophomores were chosen to avoid the possible biasing of information due to higher dropout rates among juniors and seniors (Fleming, 1969: 44). Seventy-four schools were estimated as needed to ensure a sample size of 3,000, large enough to survive anticipated long-term attrition rates. Because the results of the original 1947 analysis were "to be used in later farm management research dealing with an analysis of the human factor as it affects success in farming" (Buck, 1947: 4), a sample of fourth class (those located in towns with a population not exceeding 2,500 or in open country) high schools was selected to insure a heavy weighting of rural, farm-reared youth in the sample.

The schools constitute the primary sampling unit and were selected as follows. First, Pennsylvania was divided into seven areas based on the type of agriculture predominant in each (Figure 1). Second, the 74 schools were proportionally allocated according to the percentage of farm residents in each of the seven areas. Third, the specific schools within each of the seven areas which would comprise the quotas for them were then determined. A procedure was developed to ensure random selection: not all the fourth class districts in a stratum could be used. A sampling interval was required based on the total number of schools located in a given area. Thus (as a typical example) in Area I the sampling interval was $K=N_1/n_1$ or 5, where $N_1$ is in the words of Howell (1970: 39):

> the total number of fourth class school districts in the area (122) and $n_1$ is the weighted number of school districts required from that area (24). Out of the first five psu's




Source: Howell, 1970: 40.

Figure 1. A mapping of the approximate location of the 74 selected fourth class high schools within their respective strata.

(primary sampling unit), one was selected using a table of random numbers. Then, every fifth psu (primary sampling unit) thereafter was drawn into the sampling until 24 psu's were selected.

This same procedure was utilized in the selection process in the other six areas.

Data Collection

While questionnaires were administered to the entire sophomore class in each sampled school, only the male members were used as respondents in the present analysis. Until recently, the career orientations of women and subsequently, their participation in the U.S. labor force, were significantly more structurally determined than those of men. For most of the period of this research, men's careers were sufficiently differentiated from those of women to need separate analysis.

The respondents participated in the Department's administration of questionnaires at three different time-points: 1947, 1957, and 1971. The first survey in 1947 had 2,810 male and female respondents (Howell, 1970: 38). At the time of first contact, all of the persons were high school sophomores and, thus, nearly the same age. Elicited by the questionnaire was biological, attitudinal, personality, and social adjustment information. The 1947 questionnaire provided the data for two variables of the model, father's occupation, number of siblings, and parental expectations for offspring.

Ten years later (fall, 1957) a second, more elaborate questionnaire was administered. Of the 2,810 respondents in the 1947 survey, 2,344 (83 percent) participated in the personal interviews conducted during the second contact. The others either could not be located, refused to be interviewed, or had died. The reinterviewed persons comprised 1,282 females and 1,062 men. Brown and Buck (1961: 8) have shown that, in terms of residence of origin, intelligence quotient, and personality adjustment score, the 1,062 males interviewed did not differ significantly from those who could not be interviewed during the second contact in 1957. Similarly, Fleming (1969: 46, Table 1) showed that the active and inactive males of the original sample did not differ significantly by levels of parental education, expected occupations, number of siblings, adolescent occupational preferences, or father's occupation.

The 1957 questionnaire provided information for most of the independent variables analyzed: levels of parental education; home environment, 1947; adult income aspiration; financial management behavior; early adult occupational attainment; and participation in work-related associations.

Information relevant to respondent's measured intelligence and high school grade performance were collected from high school files in 1967 (Howell, 1970: 41).

The most recent contact with the respondents was made in 1971. A questionnaire was administered to both males and females. At this time, all of the respondents were about age 40 and in the middle stages of their occupational careers.

The 1971 interview elicited information on community and employment satisfaction, interaction with primary groups, membership affiliation, education, and occupational training. For the present analysis, two variables, respondent educational and occupational attainment as of January 1, 1971, were derived from this schedule.

Of the 1,062 males who were reinterviewed in 1957, 917 remained "active" in the 1971 interview, i.e., 87 percent of the 1957 "active" male respondents. However, not all of the appropriate male respondents gave complete information on all of the relevant variables. Excluding those respondents who had a missing value on one or more of the variables reduced the sample used for this research to 460 respondents. The 460 used had observed values on all of the model's variables.*

Table 1 contains the means and standard deviations for the 14 variables used in the ensuing analysis. A comparison can be made between the 460 respondents used in the following analyses and those 457 respondents who were active in the 1971 files (i.e., interviewed) but did not provide complete information for one or more of the variables to be used for testing the particular model. Using the .001 level-of-significance, no differences were found between the two groupings of respondents on any of the 14 variables. It can be inferred, therefore, that the sample employed to test the proposed model (N=460) is representative of the population from which it was drawn.

In turn, one can ask whether the cases to begin with were biased. That is, did the attrition between 1957 and 1971 aversely affect the representativeness of the remaining cases? Table 2 contains the means and standard deviations for 12 independent variables of interest to this research for two groupings of respondents - actives and inactives - and for which comparable data were reasonably available. Using the

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*All but one of the 14 variables used in the path model had measured values on 93 percent or more of the cases. The exception - what will be termed "parental achievement training" - had missing (nonavailable) values on 31 percent of the cases. For the problem at hand, calculating the total effects (Alwin and Hauser, 1975) of family background on attainments is facilitated and the estimates of the parameters for the multistage path model are made more reliable using only those cases with measured values on all of the variables.

Table 1. Comparison of means and standard deviations of the twice reinterviewed (active) respondents with observed values on all of the tested model's variables vs. those with missing data.

| Variable | | Means | | Standard Deviations | |
|---|---|---|---|---|---|
| | | No missing values (N=460) | Some missing values (N=457)* | No missing values | Some missing values |
| Father's education | $X_1$ | 8.85 | 8.45 (377) | 2.89 | 2.99 |
| Mother's education | $X_2$ | 9.67 | 9.11 (376) | 2.91 | 2.78 |
| Father's occupation | $X_3$ | 27.26 | 26.24 (410) | 19.01 | 18.72 |
| Number of siblings | $X_4$ | 3.15 | 3.54 (453) | 2.39 | 2.64 |
| Home environment, 1947 | $X_5$ | 3.89 | 3.66 (432) | 1.29 | 1.34 |
| Measured intelligence | $X_6$ | 102.11 | 100.65 (376) | 11.65 | 11.39 |
| Parental achievement training | $X_7$ | 48.26 | 48.48 (175) | 27.04 | 25.76 |
| High school performance | $X_8$ | 2.10 | 2.00 (399) | 0.64 | 0.63 |
| Educational attainment | $X_9$ | 3.55 | 3.32 (456) | 2.21 | 2.12 |
| Early adult occupational attainment | $X_{10}$ | 34.55 | 34.28 (450) | 20.73 | 20.27 |
| Financial management behavior | $X_{11}$ | 2.60 | 2.52 (457) | 1.01 | 1.09 |
| Adult income aspiration | $X_{12}$ | $7,872.93 | $7,136.94 (438) | $4,807.32 | $3,256.75 |
| Participation in work-related associations | $X_{13}$ | 0.01 | 0.01 (457) | 0.56 | 0.59 |
| Mid-life occupational attainment | $X_{14}$ | 44.29 | 43.30 (457) | 23.92 | 23.33 |

*Number of cases refers to those respondents who did not give a usable response to one or more questions which comprise the 14 variables of the model. The number of no responses for each variable is given in this column below the mean value.

Table 2. Comparison of the means and standard deviations of the twice reinterviewed (active) respondents who had observed values on all of the tested model's variables vs. those respondents who became inactive after the first follow-up.

| Variable | | Means | | Standard Deviations | |
|---|---|---|---|---|---|
| | | Active Participants (N=460) | Inactive Participants (N=137)* | Active Participants | Inactive Participants |
| Father's education | $X_1$ | 8.85 | 8.47 (113) | 2.89 | 2.61 |
| Mother's education | $X_2$ | 9.67 | 9.68 (117) | 2.91 | 2.70 |
| Father's occupation | $X_3$ | 27.26 | 23.88 (124) | 19.01 | 19.14 |
| Number of siblings | $X_4$ | 3.15 | 3.75 (123) | 2.39 | 2.82 |
| Home environment, 1947 | $X_5$ | 3.89 | 3.90 (135) | 1.29 | 1.26 |
| Measured intelligence | $X_6$ | 102.11 | 101.32 (113) | 11.65 | 10.99 |
| Parental achievement training | $X_7$ | 48.26 | 52.04 (71) | 27.04 | 26.09 |
| High school performance | $X_8$ | 2.10 | 1.98 (108) | 0.64 | 0.58 |
| Educational attainment | $X_9$ | 12.22 | 11.87 (75) | 1.74 | 1.50 |
| Early adult occupational attainment | $X_{10}$ | 34.55 | 33.92 (120) | 20.73 | 20.55 |
| Financial management behavior | $X_{11}$ | 2.60 | 2.98 (104) | 1.01 | 0.86 |
| Adult income aspiration | $X_{12}$ | $7,872.93 | $7,695.84 (82) | $4,807.32 | $4,991.38 |

*This figure is the number of male respondents who did not participate in the most recent contact in 1971. The number of respondents on which the means and standard deviations was computed are given in this column below the mean values.

.001 level of significance, no differences were found on any of the independent variables between the respondents who remained "active" in the 1971 interview and the 137 who did not.

## Framework for Analysis

The nature of the extant model girding research in occupational attainment, which forms the background to this study, is depicted in Figure 2. The model lists the broad variables comprising the research legacy cast within the time frame of the present research.

Most of the variables are readily apparent from their labels. A few, however, are less apparent. Four in particular need brief explication since they are also those not previously used by other researchers.

Home environment. Within societies, there are different rates of access to products or systems which allow households to perform adaptive functions with varying degrees of efficiency or which connect them to larger related community systems (e.g., systems for transportation of water to, and from, the house). Variation in the efficiency of performing household functions yields outcomes measureable as one's material level-of-living (Belcher, 1972: 211). Variations in household technologies among families are reflective, among other things, of the family's orientation toward convenience, its material capabilities and, possibly, its level of upward social mobility. The substitution of technically advanced infrastructures for labor-intensive systems in the home can free household members to engage in activities that foster the development of achievement behavior, e.g., overseeing offspring vocational and avocational pursuits. Further, the youngsters would have more time and comfort in which to do their school work, to interact with peers and parents, and to participate in recreational activities that lead to relations with outside reference groups. Another "outcome" of an ascribed higher level-of-living is a respondent's perception of "what is essential" for home comfort. Since this perception is relative, the more an adolescent experiences in the way of home comforts and technological facilities, the more he may perceive them to be essential for his future level-of-living, increasing, thereby, the positive valences of affluency and status symbols for him.

Given the notion that households can vary by the degree to which they provide an internal environment that encourages achievement socialization, it was expected that a multi-item measure of a respondent's parental home environment would directly increase the following: the amount of achievement training he would receive from his parents, the levels of his early adult occupational attainment and financial management behavior, and the degree of his participation in work-related associations.

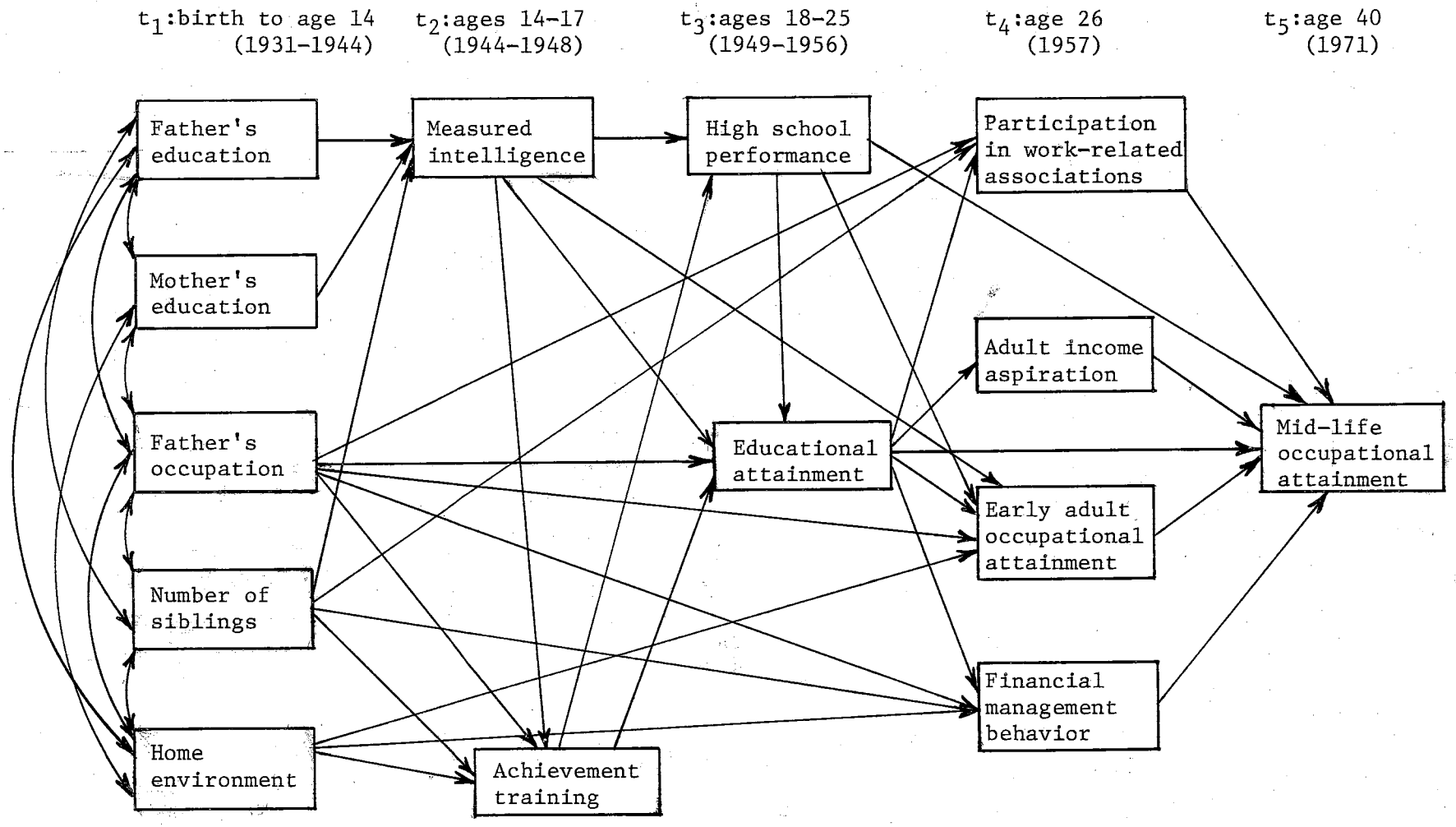


Figure 2. Multistage path diagram of the patterns of relationships among 13 predictors of occupational attainment for a sample of rural-reared Pennsylvania males.

Adult income aspiration. This refers to a respondent's desire for middle-age affluency, specifically, his early adult (age 26) specification of the level of income desired for himself at age 40. As so measured, it can be treated as an indicator of his economic aspirations. Although vocational aspirations have been intensely examined in past status attainment research, the specific effects of an income goal in the attainment process have not been treated. Status and income tend to covary but are by no means identical (Blalock, 1967).

Financial management behavior. Financial management behavior implies differential economic and psychological resources oriented to husbanding one's possessions. It is enhanced by an appreciation of the value of economic security and wealth and the desire to get the optimum return on one's capital investments and disposable family income. These factors could be expected to foster the attainment of a higher mid-life occupation in 1971.

Participation in work-related associations. A source of mid-life occupational attainment that has not been the focus of attainment research is the phenomenon of joining and participating in voluntary associations. To understand how occupational attainment, as a common personal goal, could be achieved by joining and participating in voluntary associations, one can examine some attainment-related functions they may perform.

It has been submitted that voluntary associations help to integrate a person with his or her community and the broader social environment. Thus, Hausknecht (1962: 94) concluded that membership "tends to be a part of a configuration which may be labeled 'interest in and contact with the environment.'" Given that mobility within occupational structures often requires technical information and that social contacts can increase knowledge of employment opportunities, voluntary association behavior could be a complementary means of obtaining this information and knowledge, especially among noncollege educated respondents. In brief, voluntary associations appear to disseminate information, increase social awareness and social contacts, and provide the option of acquiring some of the new role requirements of the occupational structure. An individual's assimilation of some of the information, contacts, values, and training acquired as a result of his participation in the activities of some voluntary associations could be expected to facilitate the development of his capacities and the control of his behavior and environment. One goal of this research was to explore the conjecture by viewing participation in occupationally or work-related associations in 1957 as an additional possible source of variation in occupational attainment in 1971.

The other variables in the model. Parental educational ranks have been shown to be important determinants of a respondent's cognitive

development and of his vocational aspirations and performances.* Subsequently, parental educational levels directly and indirectly effect the child's educational attainment. Analytically, parental education ranks can be viewed as cultural inequalities in the young person's generation. These cultural inequalities can take the form of parental achievement training and directly effect the development of functional values, aspirations, and behavior in the earlier stages of a respondent's life cycle. As internalized components of the dominant rational-scientific culture, they also enable the young person to differentially adapt to the competitive situations of high school and college. Thus, stated simply, our causal model assumes that cultural inequalities in time 1 (parent's generation) directly effect the development of differential functional characteristics in the respondent during the period of his maturation (time 2), which, in turn, directly increase educational attainment levels in his late teens or early adulthood (time 3). Operationally, it was expected that the educational ranks of the respondent's parents would increase the respondent's level of measured intelligence and parental achievement training in time 2 (ages 14-17). These relationships are shown as part of Figure 2.

Occupational rank of father usually has been treated as a single dimension variable. Its effects on attainment processes have been compared with those of parental educational ranks and with the respondent's measured intelligence, high school grades, and attained education. Such comparisons indicate that typically a respondent's father's occupational rank directly effects his levels of educational and occupational attainment irrespective of the respondent's intelligence or grade performance. Moreover, it continues to influence his occupational attainment well into his adult career.

Analytically, the occupational rank of a respondent's father can be viewed as an economic inequality in the father's generation. As an ascribed inequality, it often takes the form of parental economic assistance that can close the gap between aspirations and expectations and thus have functional consequences in an offspring's generation. It can be inferred that some of the usual persisting direct effects of father's occupation on a son's educational and occupational attainment derives from the differential incomes that are allocated to incumbents of white-collar or professional occupations. These incomes can be used to vary the "opportunity costs" of pursuing a college degree, increasing, thereby, its functional utility for the respondent. Economic inequalities in time 1 through 3 can directly effect vocational expectations and the responsibilities of earning an income in times 3 and 4. These expectations and responsibilities are functionally related to the cost-benefit ratio of pursuing a college education in time 3 or 4. The

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*See Gansemer (1976: 5-81) for an in-depth documentation of the relevant studies. That source is the implied reference for all substantive points made in this section.

occupational rank of a respondent's father effects the person somewhat later in his life cycle than does father's educational rank.

With reference to the present research, it was expected that the occupational rank of a respondent's father would directly increase his parental achievement training in time 2 (ages 14-17), his levels of educational attainment in time 3 (ages 18-25), his occupational attainment, financial management behavior, and participation in work-related associations in time 4 (age 26). These expected relationships were also shown in Figure 2.

Number of siblings was expected to decrease the level of measured intelligence (Zajonc and Markus, 1975) and parental achievement training in time 2 (ages 14-17). Since these latter two variables usually transmit, in part, the effects of number of siblings on attainment-related variables in time 3 and 4, it was not expected to directly and significantly affect any of them in time 4 or 5. Number of siblings was expected to also decrease participation in work-related associations in time 4.

As a measure of the material culture present in households, the home environment variable was expected to increase one level of parental achievement training in time 2 and, subsequently, indirectly increase the levels of high school performance and educational attainment in time 3. This variable was also expected to increase the levels of early adult occupational attainment and financial management behavior in time 4.

The first variable of relevance at time 2 in the proposed model is the respondent's measured intelligence. Past research has shown that it directly increases the person's levels of educational and early adult occupational attainment. Thus, measured intelligence was expected to increase the amount of achievement training received, the respondent's high school grade performance and educational attainment in time 3 (ages 18-25) and his early adult occupational attainment in time 4 (age 26).

As a mediating variable of ascribed cultural inequalities, parental achievement training was expected to increase high school grade performance and educational attainment in time 3 (ages 18-25) and early adult occupational attainment and participation in work-related associations in time 4 (age 26). It was not expected to influence directly mid-life occupational attainment in time 5 (age 40).

High school performance was expected to strongly increase educational attainment levels. It was also theorized to increase levels of adult income aspiration and early adult occupational attainment in time 4 and mid-life occupational attainment in time 5 (1971).

A respondent's educational attainment was hypothesized to increase his level of adult income aspiration, financial management

behavior, participation in work-related associations, and occupational attainment in both time 4 and time 5.

Four of the time 4 predictor variables (income aspiration, financial management behavior, occupational attainment, and participation in work-related associations) were expected to directly and significantly increase occupational attainment in time 5.

## Measurement of the Dependent Variable: Mid-life Occupational Attainment ($X_{14}$)

Attainment denotes the acquiring of a social reward or position. The acquiring of an occupational position occurs within the context of the occupational structure. This structure refers to the functional social positions through which various types of economic activity are performed. It is a hierarchically stratified system whose parts (ranks) are differentially evaluated. Measurement of occupational rank involves, therefore, the methodological problem of how best to order occupations.

Solutions have taken two directions. The less acceptable of the two is typified by Edwards (1938), who grouped occupations "by function, skill, training, prestige, and relation to the means of production" (Jackson and Curtis, 1968: 123). According to Otto (1975a: 320):

> Most manual occupations were classified according to levels of skill. White collar employees were differentiated primarily by type of work. The major occupational groupings were then ordered on socioeconomic grounds.

The major limitation of Edwards' rank system is that thousands of occupations must be ranked into only seven groupings. This kind of broad classification of all occupations is "so general it is highly inaccurate with respect to any given dimension" (Jackson and Curtis, 1968: 123).

A second, more viable, approach to measuring the social evaluation of occupation exists. Sociologists have used prestige as the best indicator of occupational rank and, subsequently, of an individual's location in the stratification system. This approach has a long history (Thomas, 1956).

A major limitation of the original National Opinion Research Center (NORC) survey was the relatively small number (N=90) of occupations for which ratings were derived. To remedy this limitation, Duncan (1961) developed an occupational scale that used the NORC prestige-scale in conjunction with other data. The Duncan Socioeconomic Index (SEI) is usually employed as an indicator of an individual's ascribed social status and/or his attained social status (Blau and Duncan, 1967; Sewell et al., 1970). The person's occupational prestige rank is argued to be the best available indicator of one's location in the society's system of stratification (Haller, 1968).

It should be noted that Duncan's Index is an inference about the prestige of occupations based on the educational level and income associated with a given job. This index is only inferentially a measure of an individual's rank in the community stratification structure which is correlated with but not coterminous to occupational status. Nonetheless, an individual's control over scarce resources (money, prestige, power) is so highly intercorrelated with his major occupation that most users of Duncan's scale employ it to index an incumbent's social status (Otto, 1975a).

A respondent's mid-life occupational attainment ($X_{14}$) denotes the occupation he held when he was age 39 or 40. The rank of this occupation was measured by the Duncan scale (0-96). The higher the score, the higher the rank of the occupation and, thus, the level of occupational attainment. The dependent variable of this research showed a mean score of 44.29 with a standard deviation of 23.92.

## Measurement of the Independent Variables

Father's education ($X_1$). This variable was operationally defined as the number of years of formal education that a respondent's father had achieved as reported by the respondent. Since that report was given when he was age 26 or 27, it allowed time in which his father may have acquired additional years of "adult education." The incidence of this was minimal.

Formal education denotes schooling which the fathers received in functionally specific educational institutions. Attendance in elementary, secondary, and higher educational institutions and their administered programs constitutes formal education. On-the-job training or correspondence courses from noneducational institutions do not constitute formal education, as construed in this study.

The relatively large numbers of fathers who had received less than a four year high school education is shown in Table 3. The mean level of attainment was 8.85 years with a standard deviation of 2.89 years.

The relatively low levels of educational attainment evidenced in the sample means that this variable did not show (in large numbers) the full range of desired cases for the concept of an ascribed differential cultural resource for the respondent. Subsequently, the direct effects of father's education on a respondent's attainment levels was expected to be less strong than in studies showing a fuller range of variation. Nevertheless, concern for replication required that this variable be retained in the model.

Table 3. Percentage distribution of fathers by types of educational attainment.

| Type of educational attainment | Percent |
|---|---|
| Less than six years of formal schooling | 7.2 |
| Six or seven years of formal schooling | 15.9 |
| Eight years of formal schooling | 41.7 |
| One or more years of high school but not a high school graduate | 13.9 |
| Twelve years of schooling (high school graduate) | 12.4 |
| Thirteen or more years of formal schooling | 4.6 |
| College graduate | 4.3 |
| Total | 100.0 |

Table 4. Percentage distribution of mothers by types of educational attainment.

| Type of educational attainment | Percent |
|---|---|
| Less than six years of formal schooling | 5.2 |
| Six or seven years of formal schooling | 7.8 |
| Eight years of formal schooling | 36.5 |
| One or more years of high school but not a high school graduate | 18.4 |
| Twelve years of schooling (high school graduate) | 19.8 |
| Thirteen or more years of formal schooling | 9.2 |
| College graduate | 3.0 |
| Total | 100.0 |

Mother's education ($X_2$). The operational definition of this variable was the number of years of formal education that a respondent's mother had achieved as reported by him. This variable derives from the same questionnaire as did father's education.

As with father's education, a relatively large number of the respondents' mothers did not attain a four-year high school education, Table 4. They did, however, attain a higher mean level of education and had a larger standard deviation (9.67 and 2.91 years, respectively). Although these two statistics showed more variation than those of $X_1$, the differences were not great enough to expect the direct effects of mother's education on attainment levels to be much stronger than the predicted effects of $X_1$.

Father's occupation ($X_3$). Information pertinent to this variable were generated from the 1947 questionnaire. Each respondent gave his father's occupation at the time of that survey. Answers were coded according to its appropriate rank value on the Duncan SEI scale.

As indicated previously, the sample used was purposively selected to yield an adequate representation of Pennsylvania's farm population. Additionally, the phenomenon of "part-time" farming (Fuguitt, 1961) was recognized. Sons whose fathers were farmers were asked to indicate: "What part of his time does he spend on farm work?" They were also asked to give the "name of the other occupation held by your father." Since the Duncan scale treats the rank of farmers homogeneously (Duncan and Hodge, 1963) and a large portion (24 percent) of the respondents reported "farming" or "farmer" (or similar categories) as their father's occupation, this extra information was a means of increasing the variability of $X_3$.

The scores of part-time farmers were modified according to the following procedures. First, the average amount of time which was spent on farm work was calculated. The respondents reported the amount of time their fathers spent on farm work either in terms of a fraction of the day or by number of hours. For those who reported the amount of time by fractions, the average amount of time spent on farm work by their fathers was .38 (N=29). For those who reported the amount of time in terms of hours per day, the mean was 5.46 hours per day (N=21). Apparently a 13 to 14-hour day was the image to which the sons referred when they reported their fathers' total work-day. A 14-hour work-day is a hard schedule but not too unlikely; for those fathers who held factory positions the mean number of time spent on farm work plus the regular eight-hour nonfarm shift add up to about a 14-hour day.

Second, it was assumed that the authors of the questionnaires considered most nonfarm jobs as full-time pursuits; at least they did not request the amount of time spent on them. It was assumed also that if a farmer spent six or fewer hours per day on farm work, allowing him eight or more hours on his reported second occupation, he should be

given full credit (in terms of the Duncan score) for his nonfarm job. That is, it was assumed that he had a full-time nonfarm job.

Unlike its provisions for varied nonfarm occupations, the Duncan SEI provides only one score for "farmers." All farmers are hardly alike. Indeed, a major reason for part-time farming, especially among low-income persons, is the need to supplement income. Part-time farmers tend to have lower incomes from their farming operations than do full-time farmers. Therefore, it was assumed that part-time farmers should not receive the same Duncan-scale score as did full-time farmers.

Third, a formula was used to rank the occupational status of part-time farmers. The fraction of time spent on the farm was multiplied by the Duncan SEI score for farmers. The remaining fraction of the day was multiplied by the rank-score of the second occupation and the two figures added together.

The application of the formula to the data reduced the portion of "farmers" in the total sample from 24 percent to 19 percent (N=88). This portion of fathers in one occupation was, however, still relatively large. It contributed to a high degree of invariability in $X_3$ and must be expected logically to reduce the differentiating effect of $X_3$ on attainment.

The 1957 questionnaire requested the respondents to list the "employment history of the main bread winner" in their parental family in the year 1947. As one might expect, the 1957 report of the main bread winner in the respondent's parental family for 1947 produced generally the same information requested on the 1947 questionnaire for "occupation of father." In some instances, however, the 10-year span allowed the respondents to have more detailed and functionally specific information of their father's 1947 occupational role. For example, a respondent who reported that his father was an "office worker" in 1947 indicated ten years later that his father had been a "district manager for a utility company." In all cases, the 1957 schedule offered the possibility of selecting more specific descriptions for the occupations of the respondents' fathers who were solely employed in the nonfarm sector and was used in measuring $X_3$. Seventy-six of the original 751 occupations of nonfarm fathers were recorded to reflect the updated report.

Duncan (1961: 159) has suggested the index value of 38.5 on his scale as the divide between "blue-collar" and "white-collar" workers. Using this value, 77 percent of the fathers held occupations ranked below it, yielding a relatively low mean of 27.26. The standard deviation was 19.01.

While the distribution of this variable spans nearly the entire range of the Duncan scale, it is skewed toward the lower end of the occupational structure. Bearing this in mind, the influence of father's occupation ($X_3$) on the attainment process was expected to be weaker than

if there were greater heterogeneity of occupations and less skewness in their rank distribution.

Number of siblings ($X_4$). Data for this variable were educed from four questions on the 1947 questionnaire. Each respondent was asked to list the "ages of his brothers . . . at home . . . and . . . away from home." He was asked similar questions regarding his sisters. No attempt was made to distinguish between biological or adopted siblings. For the purposes of this study, that distinction is relatively unimportant. The total number of brothers and sisters listed as living at home with him and/or away from home when he was a high school sophomore was the property under study. The number of siblings ranged from zero to twelve. Among the respondents, 8.7 percent reported that they did not have any brothers or sisters living at or away from their homes; 76.5 percent had four siblings or less. The mean number of siblings was 3.15 with a standard deviation of 2.39.

Home environment ($X_5$). Information on seven indoor household or housing facilities, to which respondents had access in their parental homes when they were high school sophomores, was elicited, and served to index this variable. Although information on these facilities were gathered in 1957, the respondents reported that they were available to them in their parental homes in 1947.

The seven facilities were: electricity in the house, water piped into the kitchen, indoor toilet and bath facilities, radio, television, telephone, and central heat. Responses were scored as follows: yes = 1, no = 0. Ninety-nine percent of the respondents reported a radio in their parental homes while only 3.4 percent had a television set in 1947. Ninety-nine percent also had electricity in their homes. These three items, since they were largely constants, were eliminated. The remaining four items were used in a simple composite index of summed positive responses. The range of this variable was from 0.0 to 4.0. Nearly 50 (47.4) percent of the respondents had all four items available; almost six (5.9) percent had none. The average level of parental home environment score was 2.89 with a standard deviation of 1.29.

Measured intelligence ($X_6$). Operationally, a respondent's measured intelligence was gauged by the scores generated on a series of standardized intelligence tests. Different schools in the sample used different standardized I.Q. tests - over the years psychologists have been quite prolific in generating various ways to presumably measure the same thing. Eleven different tests appeared in the academic records of the respondents. But, as noted by Howell (1970: 50):

> Each of these tests produces scores that fall into a similar pattern. Specialists in educational testing at The

Pennsylvania State University were consulted regarding the similarity of these tests and it was their evaluation that the tests are reasonably comparable.

The I.Q. tests were administered to the respondents from the time they were high school freshmen until they were sophomores in 1947. Plural scores for all respondents were available. Although the reliability coefficient of I.Q. tests administered to students at ages 9-15 has been shown to range from .85 to .95 (Thorndike and Hagen, 1961: 243), the use of an average for two or more scores rather than one has the advantage of reducing chance error factors. Two scores were used for each respondent. To insure for uniformity of time or age, the two scores selected for the present analysis were those nearest to 1945 and 1947. The reliability coefficient of these two scores was r=.91.

As one might hope - and expect - the mean I.Q. score for the sample was 102.11 with a standard deviation of 11.65. Given that 100 is normally construed as "average" intelligence, the sample appears to be not atypical on this trait.

Parental achievement training ($X_7$). The data available permitted only a limited test for the possible influences of this parental variable. Only one facet was measured, namely, parental occupational expectations for a respondent as reported by him. Operationally, parental achievement training was defined as the level of occupational attainment which a respondent's parents preferred him to achieve as an adult as perceived by him in 1947. The perceived level of occupational expectation was gauged by Duncan SEI scores.

The average parental expectation was 48.26 (about the rank of a "merchant," "salesman" or a "telephone lineman") with a standard deviation of 27.04. Thirty-eight percent of the parents expected their sons to achieve the rank of a farmer or below (e.g., a carpenter, mechanic or miner). On the other hand, 51 percent expected their sons to achieve occupations ranked above the suggested blue-collar/white-collar divide, including that of minister (3.7 percent), school teacher (4 percent), banker (2.6 percent) and doctor (9.3 percent). This variable had a relatively wide distribution.

High school performance ($X_8$). This variable was based on the conventional grading methods used in each school. Averages for all high school courses completed by each student were computed from the respondent's school file records. An "A" or a grade of 90 or above was weighted as 4; a "B" or grade 80 to 89 was scored as a 3; a "C" or grade 70 to 79 was weighted as a 2; and so on. The average overall high school grade was 2.10 (just above a "C") with a standard deviation of .64.

Educational attainment ($X_9$). Carter (1971) has shown that the relationship between years of schooling and social status is not direct and positive. "Employers," Carter (1971: 22) suggested, "tend to view education in terms of a set of ordered categories, with a discrete jump in the probabilities of getting a job, occurring at boundaries." Applicants with three years of high school are evaluated in the same category as are those with one or two years. However, a high school graduate is evaluated differently. Not all yearly increases in education produce the same increment in status. Consequently, an ordinal ranking of years of education may measure the relationship between this and occupational attainment more accurately than an interval scale.

This thinking was employed in treating the respondent's educational attainment. The coding of the respondent's education and training was: 1 - did not graduate from high school; 2 - did graduate from high school; 3 - attended vocational or technical school; 4 - two-year college attended - did not graduate; 5 - two-year college degree; 6 - four-year college, attended - did not graduate ; 7 - four-year college degree; 8 - graduate or professional training. The source of the relevant information was the most recent contact, i.e., 1971. Eighteen percent of the respondents attained a four year college degree and/or had graduate or professional training. Thirty-four percent were high school graduates without any additional post-high school education. Nine percent reported that they did not graduate from high school. Almost half of the respondents, therefore, did not have any specialized or advanced schooling. In a modern industrial society, and particularly in a state like Pennsylvania, this lack of post-high school education among a sizeable portion of the respondents may decrease the expected effects of education on the processes of adult occupational attainment.

Early adult occupational attainment ($X_{10}$). This variable was also gauged by the Duncan scale. It denotes the occupation a respondent held when he was contacted in the fall of 1957. At that time, he was aged approximately 26; hence, it is referred to as his "early adult" occupation in the present study.

The mean level of the respondents' occupational attainment was 34.55. This score is about equal to those ascribed to a machinist, sheet-metal worker, or a plumber. The respondents' mean score was nearly nine points above their fathers' mean occupational attainment. About 40 percent of the sons in comparison to their fathers attained more highly ranked occupations. Additionally, the sons' 1957 levels showed more variation than did their fathers'. Respectively, the standard deviations were 20.73 and 17.94. At the same time, the sons' 1957 levels were skewed toward the lower end of the occupational structure. Almost 60 percent (59.7) attained occupations ranked below the suggested blue-collar/white-collar division score of 39.

Adult income aspiration ($X_{11}$). This variable was taken from answers to the question: "What family income would satisfy you by the

time you are forty years old?" The responses were given in dollar amounts and were directly employed in operationalizing this variable. It had a mean of $7,872.00 and a standard deviation of $4,807.00. Eighty-nine percent of the respondents desired $10,000, or less income at age 40.

Financial management behavior ($X_{12}$). Five dichotomously coded responses to questions on the 1957 questionnaire provided data for this variable. The first was: "Do you have a checking account?" The remaining four items comprising the measure of $X_{12}$ were questions pertaining to the respondents' programs of savings: savings account, government bonds, annuities, and stocks. Each positive response to a given item was coded 1; each negative response, 0. A total score was obtained by counting the number of "yes" responses; it could vary, thus, from 0.0 - 5.0. The mean value was 1.60 with a standard deviation of 1.01. As suggested by the mean, only a small percentage of respondents participated in the more sophisticated forms of financial investment - 18 percent had a score of three or more. About 10 percent of the sample reported "no" for all types of behavior.

Participation in work-related associations ($X_{13}$). This variable was pursued by examining the behavior of respondents in voluntary organizations of all kinds, from unions and churches to lodges, fire companies, and hunting clubs. The disparity of types of organizations was reduced by factor analysis to three major clusters of groups: "religious," "social," and "occupationally or work-related."* It was expected that this third factor would directly increase the level of occupational attainment in 1971.

## Path Analysis as a Method for Testing the Relative Contributions of Predictor Variables

Path analysis is a statistical method of measuring the direct effect of an antecedently ordered predictor variable on a consequent variable (Wright, 1960: 191). It employs the statistical technique of multiple regression to determine the total amount of variance accounted for in a particular dependent variable by a set of predictor variables. When the dependent variable is regressed on this set of variables, the relative contribution of each of them to the amount of statistically accounted for variance can be known. Kim and Kohout (1975: 383) have characterized path analysis as "primarily a method of decomposing and interpreting linear relationships among a set of variable." The "causal ordering" of variables in a model requires that the generating

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*See Gansemer (1976: 127-131) for explication of the reduction process.

(i.e., causal) or determining variable precede the determined (or effect) variable in time. This temporal priority can be established on the basis of logic, theory, or prior statistical knowledge.

As suggested, path analysis is a method of decomposing bivariate correlations. Zero-order correlations are comprised of causal and non-causal elements. Alwin and Hauser (1975) have used the terms "total effects" to denote the former and "total association" for the latter. The total effect

> of one variable on another is the part of their total association which . . . tell us how much change in a consequent variable is induced by a given shift in an antecedent variable, irrespective of the mechanism by which the change may occur (Alwin and Hauser, 1975: 39).

The total effect is comprised of the parts of the total association which "is neither due to their common causes, to correlation among their causes, nor to unanalyzed (predetermined) correlation" (Alwin and Hauser, 1975: 38-39).

A total effect of one variable on another can be subdivided into "direct" and "indirect" components. The direct effect of one variable on another is simply that part "of its total effect which is <u>not</u> transmitted via intervening variables. It is the effect which remains when intervening variables have been held constant" (Alwin and Hauser, 1975: 39). It is measured by the unmediated standardized regression (beta) coefficient in path analysis, i.e., the path coefficient. According to Wright (1934: 162), the path coefficient

> measures the fraction of the standard deviation of the dependent variable (with the appropriate sign) for which the designated factor is directly responsible, in the sense of the fraction which would be found if this factor varies to the same extent as in the observed data while all others (including residual factors . . .) are constant.

The path coefficient is a measure of direct effect. These two terms are used synonymously in the remainder of the document.

Indirect effects of a variable on one or more consequent variables are

> those parts of a variable's total effect which are transmitted or mediated by variables specified as intervening between the cause and effect of interest in a model. That is, they tell us how much of a given effect occurs because the manipulation of the antecedent variable of interest leads to changes in other variables which in turn change the consequent variables (Alwin and Hauser, 1975: 39).

Although status attainment researchers have only recently begun to calculate the indirect effects of the variables in their models (Cf., Sewell and Hauser, 1972; Alexander et al., 1975; and Otto, 1975b) this aspect of path analysis is particularly relevant to the process of accounting for the possible roles of family background in occupational attainment over an extended time period. The calculation of indirect effects can help to yield insights into which intervening endogenous variables convey the effects of earlier exogenous (and endogenous) variables to later stages of a model. The calculation of indirect effects can show why some of the direct effects of earlier specified variables are not significant. The total effects of one variable on another is, therefore, a complete picture of its overall effect in a model.

Alwin and Hauser (1975: 40-42) have offered a method for decomposing total effects into their direct and indirect parts via a systematic application of multiple regression procedures. The technique entails the use of structural and reduced-form equations. In their use of these equations, Alwin and Hauser (1975) assumed that the residuals were not correlated among themselves or with any of their model's variables. This assumption allowed them to sequentially regress each of the endogenous variables on their exogenous variables, obtaining, thereby, reduced-form coefficients for each of the exogenous variables. In turn, these coefficients for each of the exogenous variables represent the total effect of each exogenous variable on the particular endogenous variable under consideration.

The decomposing of endogenous variables in terms of their exogenous determinants allows the researcher to know which combination of total, incomplete total, and direct effect coefficients generated by the regression equations comprise the indirect effects of a particular variable on another variable. The Alwin and Hauser (1975) decomposition-of-effect technique furnishes a relatively reliable guide for identifying all of the possible indirect effects of predictor variables. This technique was, therefore, used in the present analysis.

# CHAPTER III

# FINDINGS

## Overview

The zero-order correlation coefficients among all of the variables in the theoretical model are shown in Table 5. Most of the relationships tested were statistically significant and positive in direction - with one exception. Number of siblings ($X_4$) was negatively related to the 13 other variables considered.

For the predictor variables ($X_1$ - $X_{13}$), the range of r-values was from a low of .001 between father's occupation ($X_3$) and high school performance ($X_8$) to a high of .59 between the respondent's education ($X_9$) and early adult occupational attainment ($X_{10}$). Among the predictors ($X_1$ - $X_{13}$), the median r-value was .138. In general, they were, therefore, only moderately interrelated. For interpretive purposes, they can be taken as reasonably independent sources of possible influences on mid-life occupational attainment ($X_{14}$).

Descriptively, the r-values sketch the relationships between the selected indicators of early adult and mid-life occupational attainment and those of parental inputs and the respondent's characteristics. Whether the relationships support all of the hypothesized paths can be determined by applying an appropriate statistical criterion to each particular path in the theoretical model. For the typical case of path models, the criterion is that the standardized beta coefficients between two variables be twice the size of its standard error. We followed this rule.

Appendix A contains the values of the standard errors for all of the standardized beta coefficients (or path coefficients) for each independent variable in the regression equation(s) at each time-stage of the causal model. Using the above criterion, the significance of each independent variable on the dependent variable(s) at each stage was ascertained.

Most of the expected relationships of the theoretical model were supported. The paths or direct effects which were significant in the data are shown in Figure 3.

The results replicate certain findings, extend others, and, in some cases, are at variance with previous research. To determine to what degree the present analysis replicates or extends other findings,

Table 5. Correlation coefficients among the variables in a model of early- and mid-life occupational attainment: rural-reared Pennsylvania males, 1947-1971 (N=460).

| | | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ | $X_{11}$ | $X_{12}$ | $X_{13}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Father's education | $X_1$ | | | | | | | | | | | | | |
| Mother's education | $X_2$ | .518[a] | | | | | | | | | | | | |
| Father's occupation | $X_3$ | .436[a] | .250[a] | | | | | | | | | | | |
| Number of siblings | $X_4$ | -.225[a] | -.212[a] | -.125[b] | | | | | | | | | | |
| Home environment, 1947 | $X_5$ | .286[a] | .248[a] | .322[a] | -.204[a] | | | | | | | | | |
| Measured intelligence | $X_6$ | .203[a] | .151[a] | .055 | -.153[a] | .143[a] | | | | | | | | |
| Parental achievement training | $X_7$ | .147[a] | .073 | .116[b] | -.183[a] | .164[a] | .228[a] | | | | | | | |
| High school performance | $X_8$ | .121[b] | .074 | .001 | -.089 | .125[b] | .441[a] | .271[a] | | | | | | |
| Educational attainment | $X_9$ | .175[a] | .118[b] | .152[a] | -.101[b] | .183[a] | .329[a] | .301[a] | .445[a] | | | | | |
| Early adult occupational attainment | $X_{10}$ | .149[a] | .140[a] | .201[a] | -.103[b] | .239[a] | .306[a] | .366[a] | .396[a] | .594[a] | | | | |
| Adult income aspiration | $X_{11}$ | .088 | .072 | .052 | -.056 | .113[b] | .169[a] | .111[b] | .078 | .167[a] | .192[a] | | | |
| Financial management behavior | $X_{12}$ | .137[b] | .111[b] | .188[a] | -.111[b] | .239[a] | .107[b] | .138[b] | .138[a] | .202[a] | .201[a] | .093 | | |
| Participation in work-related associations | $X_{13}$ | .090[c] | .091[c] | .067 | -.078[c] | .106[b] | .104[b] | .193[a] | .228[a] | .367[a] | .312[a] | .208[a] | .110[b] | |
| Mid-life occupational attainment | $X_{14}$ | .141[a] | .102[b] | .150[a] | -.092[c] | .190[c] | .271[a] | .294[a] | .381[a] | .552[a] | .543[a] | .180[a] | .154[a] | .250[a] |

[a]Significant at the .001 level. [b]Significant at the .01 level. [c]Significant at the .05 level.

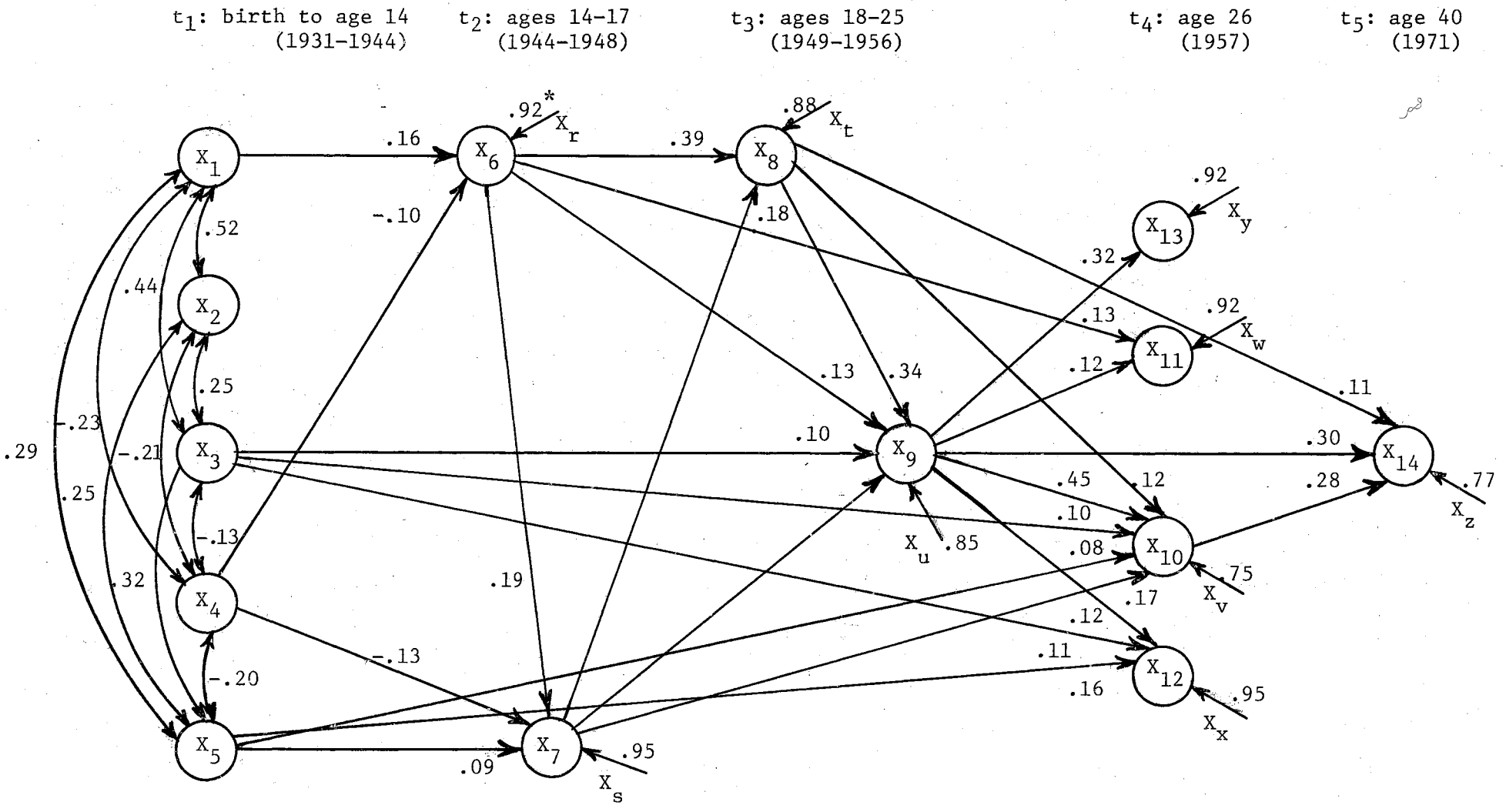


Figure 3. Path coefficients of 13 determinants of mid-life occupational attainment ($X_{14}$) among rural-reared Pennsylvania males. The determinants are father's education ($X_1$), mother's education ($X_2$), father's occupation ($X_3$), number of siblings ($X_4$), home environment ($X_5$), measured intelligence ($X_6$), parental achievement training ($X_7$), high school performance ($X_8$), educational attainment ($X_9$), early adult occupational attainment ($X_{10}$), adult income aspiration ($X_{11}$), financial management behavior ($X_{12}$), and participation in work-related associations ($X_{13}$).

* $\sqrt{(1 - R^2)}$

systematic comparisons will be made.* Tables will be used to summarize the direct effects of variables which were specified as inducing changes in particular dependent variables at various stages of the model. All of the exogenous and/or endogenous variables pertaining to a dependent endogenous variable will be presented in each table. The indirect effects will be considered later.

## Direct Effects

Measured intelligence ($X_6$). Table 6 contains the path coefficients of three independent variables which were expected to directly and significantly relate to a respondent's measured intelligence. The coefficients discerned in the present study are compared with those of three other surveys.

Like the comparison studies, the data supported the expected direct effect of father's education ($X_1$) on measured intelligence ($X_6$). The data did not support the expected direct effect of mother's education on $X_6$. While the path of mother's education was significant in Sewell and Hauser's (1972) survey, it was not in the national survey of Alexander et al. (1975). Although the size of the three paths of father's education are similar, the stronger paths of this variable in the present data and in Alexander et al. (1975) suggests that the relatively stronger effects of a father's educational rank on measured intelligence ($X_6$) may be just enough to reduce a significant effect of mother's educational rank on it. Like Hauser (1969), the data supported the expected negative

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*Difficulties arise in this task because opinion is not unanimous regarding the criterion to use. Among others (Blalock, 1968; Schoenberg, 1972), Kim and Mueller (1976: 423) have supported "the use of unstandardized coefficients when the objective is one of comparing causal relationships across populations." On the other side, Hargens (1976: 251) has asserted that in instances where it can be established that standardized coefficients function as structural parameters, the use of standardized coefficients is appropriate "because they adjust for the differences in the variances of variables across populations." We feel that the evaluation of an individual's performance is usually made in terms of population means and distributions, generating a degree of invariance across populations. Hargens (1976: 252) goes on to note: "If such an invariant relationship exists, it is more likely to be revealed by the standardized coefficient; thus, the latter should be used." The processes involved in the following analysis entail those in which standardized coefficients may be functioning as structural parameters. Standardized coefficients thus will be employed to compare the relative effects of predictors on similarly measured dependent variables across samples.

Table 6. Direct effects of three predictor variables on measured intelligence ($X_6$).

| Variable | | Study: Hauser (1969) | Sewell and Hauser (1972) | Alexander et al. (1975) | Data findings |
|---|---|---|---|---|---|
| Father's education | $X_1$ | .13 | .16 | .21 | .16 |
| Mother's education | $X_2$ | *[a] | .09 | n.s. | n.s. |
| Number of siblings | $X_4$ | -.11 | * | * | -.10 |

[a] An asterisk on this and following tables indicates that either the survey did not measure the relationship in question or, if it did, the value of the path coefficient was not given in the reported findings.

direct effect of number of siblings on $X_6$. In fact, the data yielded nearly the same value: p=-.11 and p=0.10, respectively. On most counts, the present data conform to the other three surveys. The present model accounted for five percent of the variance in measured intelligence, somewhat less than that of the other surveys.

Discussion and interpretation. It is pertinent to see education as the perceived experience that leads to changes in an individual's internal and external patterns. These patterns include change in cognitive and perceptual aptitudes and in differential abilities to symbolically interact. Standardized I.Q. tests attempt to measure underlying cognitive and perceptual aptitudes that require the ability to "make generalizations from, and to relate and organize ideas represented in symbolic form" (Thorndike and Hagen, 1961: 222). The observed positive relationship between performance on measured intelligence tests ($X_6$) and father's education ($X_1$) may be interpreted, therefore, as the possible effects of the father's psychological and behavioral patterns on a son's ability to perform favorably on verbally oriented standardized intelligence tests.

One of the mechanisms by which the father may transmit the content-effects of his education to his son entails his mode of spoken language and his ability to interact symbolically. It can be submitted that more highly educated fathers provide differential opportunities for offspring to internalize the skills of "interpretation," i.e., ascertaining the meaning of the actions or remarks of others in symbolic interactions. Since the youngster is likely to take account and gradually learn the complex sentence structure, vocabulary, and abstract reasoning of his

father's spoken language - all of which are standardized I.Q. test items - a father can, consciously or not, influence the development of his son's cognitive and perceptual aptitudes in conformity with the requirements of I.Q. tests and ultimately status attainment. In the sense of providing relevant cultural meaning in their interactions with children, differential educational levels of fathers is an understandable sociological determinant of the perceptual and cognitive development of offspring.

The absence of a significant direct effect of mother's education ($X_2$) on measured intelligence ($X_6$) suggests a sex-role differentiation. The father's role as "provider" which often engages him in various institutional sectors, may increase his awareness of the instrumental demands of status attainment. This knowledge may, in turn, alter the performance of his socialization function in the family. The father may be more frequently perceived as the transmitter of the relevant instrumental culture and subsequently, his speech and language may attain their intended ends more often than the mother's. Given the date of the measurement of $X_6$ (1945-1947), the "roles" of husbands and wives of rural Pennsylvanians were undoubtably more sharply differentiated along the expressive-instrumental axis (Parsons, 1951) than they are today. The mother's predominantly expressive role may have accounted for the absence of a direct effect of $X_2$ on $X_6$.

The negative relationship between number of siblings ($X_4$) and measured intelligence ($X_6$) confirms a relationship that Belmont and Marolla (1973) and Kennett (1973) have found to persist after controlling for ascribed SES. Although the possible confounding influence of SES indicators ($X_1$ - $X_3$) on the present relationship awaits the calculation of the "indirect effects," we can note that Zajonc and Markus (1975) have proposed a mathematical model that is congruent with the foregoing interactional interpretation of father's education ($X_1$) on $X_6$ and yields a plausible argument for the independent effects of family size on intellectual development. Their "confluence model" makes the following assumption:

> Children who grow up surrounded by people with higher intellectual levels have a better chance to achieve their maximum intellectual powers than children who develop in intellectually impoverished milieus. Thus, children from large families, who spend time in a world of child-sized minds, should develop more slowly and therefore attain lower I.Q.s than children from small families, who have more contacts with grown-up minds (Zajonc, 1975: 39).

Recognizing that the absolute intelligence levels of parents and newborn siblings vary, Zajonc and Markus (1975: 76-77) have argued that:

> to the extent that some portion of the intellectual growth of children is determined by an interaction with the intellectual levels of their parents and siblings, larger

> families will be associated with lower intellectual levels because the larger the family, the larger is the proportion of individuals with low absolute intelligence.

While birth-order, child-spacing, and SES levels influence showings on standardized I.Q. tests, an offspring's more frequent interactions with the lesser developed intellectual capacities of his siblings in a sizeable family may account for the negative effect of $X_4$ on $X_6$ in the present and in Hauser's (1969) data.

Parental achievement training ($X_7$). Table 7 displays the path coefficients of the six pertinent independent variables. The observed paths in the present study are compared with those of three other relevant surveys.

In conformity with the findings of Sewell and Hauser (1972), and of Alexander et al. (1975), the observed direct effects of father's education ($X_1$) on parental achievement training ($X_7$) were not significant. That is, since measured intelligence was expected to transmit the effects of $X_1$ on $X_7$, they should be largely indirect; hence, the remaining direct effects were not expected to be significant. The observed difference between Hauser's (1969) results and those of the other three surveys appear to be a function of the causal ordering of the variables in his model - as will be seen shortly.

Table 7. Direct effects of six independent variables on adolescent parental achievement training ($X_7$).

| | | Study | | | |
|---|---|---|---|---|---|
| Variable | | Hauser (1969) | Sewell and Hauser (1972) | Alexander et al. (1975) | Data findings |
| Father's education | $X_1$ | .20 | n.s. | n.s. | n.s. |
| Mother's education | $X_2$ | * | .09 | n.s. | n.s. |
| Father's occupation | $X_3$ | .10 | .12 | .12 | n.s. |
| Number of siblings | $X_4$ | -.12 | * | * | -.13 |
| Home environment, 1947 | $X_5$ | * | * | .21 | .09 |
| Measured intelligence | $X_6$ | .13 | .18 | n.s. | .19 |

The direct effect of mother's education ($X_2$) on parental achievement training ($X_7$) was not significant. The findings agree with that of the national survey of Alexander et al. (1975) but is at variance with that of the Wisconsin model (Sewell and Hauser, 1972). Unlike the other three relevant surveys, the present data did not support the expected direct effect of father's occupation ($X_3$) on $X_7$. While the paths for this relationship fell in the range of .10 to .12 in the three comparison studies, the path coefficient in the Pennsylvania sample was but .05. In comparison with the only other survey which measured the effect of number of siblings ($X_4$) on $X_7$, the observed result of the Pennsylvania sample was nearly identical to Hauser's (1969) findings: p=-.13 and p=-.12, respectively. On the other hand, the measure of $X_5$ had about half the direct effect on $X_7$ as Alexander and associates' (1975) "acquisition index of possessions" (p=.09 vs. p=.21). Nevertheless, the data supported the expected influences of $X_4$ and of $X_5$ on achievement socialization ($X_7$). Finally, the results from the present sample were comparable to the observed direct effects of measured intelligence ($X_6$) on $X_7$ seen in the Wisconsin model and in Hauser's (1969) Tennessee sample: p=.19, p=.18, and p=.13, respectively.

In sum, the findings of the present attainment model are congruent with the national survey of Alexander et al. (1975) on three counts. Excluding father's occupation ($X_3$) and mother's education ($X_2$), the results of the present sample confirm those of the Wisconsin and Tennessee models on the remaining two counts. The present model explained nine percent of the variance in a son's parental achievement training ($X_7$), slightly more than the Wisconsin model (8 percent) but less than that of model of Alexander et al. (1975) (14 percent).

Discussion and interpretation. The influence of SES on achievement training of an offspring may well occur continuously during his developmental history but for analytical purposes, two stages can be differentiated: pre-adolescent and adolescent. These stages correspond approximately to $t_1$ and $t_2$ in the model. The research of Hess and Shipman (1965) and of Rosen and D'Andrade (1959) employed pre-adolescent subjects, thus measuring the influence of SES indicators on achievement training practices in $t_1$. Their results revealed that $X_7$ varied positively by SES or "social class" in $t_1$. The parental achievement training ($X_7$) measured by the four studies reported in Table 7 pertain to training in the second stage ($t_2$). Here the picture is somewhat clouded.

As already suggested, some of the observed differences in results across the four surveys may derive from the causal ordering of variables within the various models, from measurement constraints, or from the data. Thus, the significant direct effect between father's education and measured intelligence in Hauser's (1969) model may stem from the causal ordering of his variable; measured intelligence ($X_6$) was treated as an exogenous independent variable along with father's education ($X_1$). Subsequently, some of the direct effects of measured intelligence on $X_7$ probably include indirect effects of father's education.

As with measured intelligence, treated above as a dependent variable, achievement socialization ($X_7$) was not directly related to parental educational ranks - largely because measured intelligence apparently mediated their direct effects on $X_7$. The observed significant effect of mother's education on $X_7$ in the Wisconsin model (Sewell and Hauser, 1972) may reflect a stronger maternal influence on a son's achievement socialization among the respondents of that study than was evidenced in either the national survey cited (Alexander et al., 1975) or the Pennsylvania sample. The limitation in the measurement of $X_7$ in the Pennsylvania sample may also be a factor accounting for differences in results. Achievement training ($X_7$) is claimed to entail at least three distinct facets (Rosen and D'Andrade, 1959; Rehberg et al., 1970). However, only one facet was available for measurement in the present study. It would not be surprising if a tri-part indicator of this training would increase the strength of the relationships.

In one instance, the present data findings were at variance with the results of the other three surveys. In the present data, father's occupation ($X_3$) did not significantly associate with the level of a respondent's achievement training. The homogeneity of the data on this variable and the skewness of the distribution of its values have already been noted. In this instance, the findings of the other three surveys are perhaps better measures of the general empirical relationship between father's occupation and a son's achievement socialization. They show $X_3$ positively related to $X_7$. Since $X_4$ was negatively related to $X_7$ and since $X_6$ appears to transmit the direct effects of $X_1$ on $X_7$, the present data furnish some empirical support for the expected influence of microstructural indicators on a specialized form of vocational socialization.

The possible understanding of $X_7$ can begin with a consideration of the interactional process between parents and offspring, whereby parents may indicate to their son the occupation they preferred or expected him to follow. Parental achievement training is taken to be an intrepretive process. It requires parents who have internalized achievement values and norms and who have the motivation, time and know-how to communicate and interpret such things to their offspring. High educational ranks of parents tend to foster the just noted interaction processes. Thus, some research has shown a tendency for middle-class fathers to expect the values of "self-direction" and "self-control" from their sons while working-class fathers tend to expect "obedience" alone (Pearlin and Kohn, 1966). Moreover, working-class fathers, under this line of thinking, would also be more restricted in their ability to communicate the meaning of their achievement and skills even if they have acquired them. Thus, they would tend to be at a relative disadvantage in transmitting future oriented goals to their progeny and would believe less frequently that their environments can be controlled so as to fulfill them. Subsequently, such a passive stance toward goal attainment would tend to lower their expectations for offspring. It may reduce their desire to set goals for them or to provide and enforce normative standards that would enable the process referred to by $X_7$ to emerge within the family. These social effects

of cultural differences among middle-class and working-class incumbents may help to explain the observed direct effects of father's occupation ($X_3$) on $X_7$ in the three comparison studies - two of which had higher mean levels of $X_3$ - and the absence of such effects between father's occupation and achievement training in the present data.

Another aspect of explanation for the observed differences in the $X_3$ - $X_7$ relationship may derive from the social effects of the economic differences among occupations. Varying responsibilities and income levels of occupations specify the amount of time incumbents have for achievement training and the economic power they have to furnish concrete incentives to influence their progeny's participation in that training. Lower occupational income levels may require the father to work expanded hours at his place of employment, reducing his time to interact with his children. On the other side, his children may be forced to earn supplementary family incomes through job holding, thereby, increasing their contact with other reference groups, role models, and value systems but also decreasing, in all likelihood, the amount of father-son interactions and time available for self-actualizing activities and achievement learning. As a result of an inability to take economic security for granted, this early thrust into an instrumental role may help to explain the covariation in types of ambition by social class (Turner, 1962). Similarly, some working-class parents may lower their expectations for their youngsters to fit available family resources. In this case, the family's remove from the dominant societally endorsed goals of attaining a college education and a prestigious occupation influence the options which young adults have available.

The significant effects of number of siblings ($X_4$) on $X_7$ can be further interpreted in terms of the constraints which a large family imposes. A large family increases the amount of income necessary to meet the sustenance needs of children. Earning a higher income may decrease the time available for parents to monitor the process of achievement training. Yet, without this extra income, the likelihood of being able to pay the costs of a higher education is reduced. In these conflicting circumstances, parents may lower their career expectations for their children, accounting, thereby, for part of the negative effects of $X_4$ on $X_7$. Additionally, parents of large-size families may relate to offspring on a group basis rather than concentrating on the development of individual aptitudes and aspirations. On the other hand, for families with limited incomes, a small family means as noted by Stacey (1965: 276):

> the children can be better cared for at home and supported at school. [It] heightens the interaction between parents and children within the family, . . . [promoting] a more rapid development of intellectual ability which, in turn, means a greater likelihood of a good education performance.

A smaller family also means that parents can serve more often as "reference points." Since "the parents of the upwardly mobile tend to have smaller families, to provide above-average home conditions, to

take an active interest in their children and to encourage them to work hard" (Stacey, 1965: 277), they may also set higher expectations for their adolescents, accounting, thereby, for another part of the negative effect of $X_4$ on $X_7$. It should be remembered, however, that since the size of this relationship was small (p=-.13), the goal attainment, social, and cultural effects of family size may be significant but would be hardly overwhelming.

Two general effects of home environment ($X_5$) on achievement training ($X_7$) may account for their relationship. First, the availability of the relevant household infrastructures may increase the amount of time and energy which parents would have had to oversee the career preparation of their offspring and which the latter would have had to do their school work and to appreciate it. Second, following a psychological axiom that behavior is a function of personality and environment, it can be suggested that a more technologically oriented home environment expresses the acceptance of the consumer products of the rational-scientific culture by the parents, their experience with them, and their realization of the status levels that are necessary to sustain a similar style of living for their progeny.

The social and cultural effects of parents' intuitive estimation of their adolescents' intelligence ($X_6$) can relate it to $X_7$. If, for example, parents find interactions with their son to be intellectually stimulating and note that his choice of friends and extracurricular activities as well as his school work and teacher involvement reflect an intellectual bent, they would tend to adjust their expectations for him accordingly. A respondent's mental ability may also influence that training by fostering a more accurate communication of his goals and talents to significant others and a better grasp of the purpose of their actions. The significant direct effects of $X_6$ and $X_7$ may, therefore, be interpreted as the effects of a bright youth on his parents' training of him.

High school performance ($X_8$). Table 8 presents the direct effects of measured intelligence and achievement socialization on high school grade rank ($X_8$). The data support the expected direct effect of measured intelligence ($X_6$) on $X_8$. The path (p=.39) is about the same as that observed in the model of Alexander et al. (1975) (p=.43). Both of these two paths are somewhat smaller than that shown in the Wisconsin model (p=.56). All the studies indicate a relatively strong influence of measured intelligence ($X_6$) on overall high school grade performance.

The data findings also supported the expected direct effect of a son's parental achievement training ($X_7$) on high school grade performance ($X_8$). The strength of the path (p=.18) is not overly strong. Since the causal ordering of $X_7$ and $X_8$ are reversed in the two other surveys listed in Table 8, this path cannot be compared with them.

Table 8. Direct effects of two independent variables on a respondent's high school performance ($X_8$).

| Variable | | Study: Sewell and Hauser (1972) | Study: Alexander et al. (1975) | Data findings |
|---|---|---|---|---|
| Measured intelligence | $X_6$ | .56 | .43 | .39 |
| Achievement socialization | $X_7$ | a | a | .18 |

[a]The causal ordering of $X_7$ and $X_8$ are reversed in these two models. The r-value between them (.32) in Sewell and Hauser's (1972) model suggests a moderate degree of association. The r-value for the other survey was not provided.

The present model explained 23 percent of the variance in overall high school grade performance. This percentage is below that of the Wisconsin model (31 percent) but nearly identical to that of the national survey (24 percent).

Discussion and interpretation. There are several things that may explain the significant direct effect of measured intelligence ($X_6$) on high school grade performance ($X_8$). Psychologically, a high level of measured I.Q. would likely yield a sense of capability for doing well on course assignments and tests. It can also foster an accurate selection of courses, majors, and teachers in light of one's aptitude. As a behavioral check on one's internalized career compass, these factors could account for part of the observed direct effect of $X_6$ on $X_8$ - the second strongest relationship in the empirical model. Socially, an adolescent with evident "brightness" may tend to select extracurricular activities and reference groups on the basis of their ability to challenge his acumen. Thus, Otto (1975b: 166) found a r-value of .25 between $X_6$ and extracurricular activities. Sewell and Hauser (1972: 856) showed a path of .11 between measured intelligence ($X_6$) and friends with college plans. Moreover, teachers may increase a bright student's motivation to perform by expecting more of him and by giving him additional study materials. Sewell and Hauser (1972: 856) also found the path of $X_8$ and inducement from teachers to attend college to be significant (p=.15). Culturally, owing partly to the influence of father's education on $X_6$ and the latter's effects of the differential assimilation of a more elaborate language form, an intelligent youth would be at a competitive advantage in performing in high

school. In sum, the data suggest that intelligence is still a scarce and valuable resource for adapting to extrafamilial channels of mobility.

It should be noted, of course, that in the present model there was no direct influence of parental attained ranks on offspring high school performance. This absence may reflect the application of universalistic norms by socializing agents in secondary schools, providing adolescents of whatever social origins an opportunity to develop their talents, skills, and values in conformity with the dominant achievement norms.

Educational attainment ($X_9$). Table 9 displays the path coefficients for eight predictor variables which significantly relate to the level of educational attainment ($X_9$) in five comparison surveys. The findings of the Pennsylvania sample will be compared with these.

Like the Michigan (Otto, 1975b) and national (Alexander et al., 1975) samples, the present data showed that father's education ($X_1$) did not increase a son's level of educational attainment ($X_9$). Yet, with some of the same intervening variables in their models, both Duncan et al. (1972) and Sewell and Hauser (1972) found a direct and significant effect of $X_1$ on $X_9$ ($p=.16$ and $p=.05$, respectively). An evaluation of these differences will be discussed below.

Table 9. Direct effects of eight independent variables on a respondent's level of educational attainment ($X_9$).

| | Study | | | | |
|---|---|---|---|---|---|
| Variable | Duncan et al. (1972) | Sewell and Hauser (1972) | Alexander et al. (1975) | Otto (1975b) | Data findings |
| $X_1$ | .16 | .05 | n.s. | n.s. | n.s. |
| $X_2$ | * | n.s. | n.s. | n.s. | n.s. |
| $X_3$ | .24 | .06 | .10 | .09 | .10 |
| $X_4$ | -.10 | * | * | * | n.s. |
| $X_5$ | * | * | * | * | n.s. |
| $X_6$ | .42 | .06 | .21 | .17 | .13 |
| $X_7$ | * | .09 | n.s. | * | .16 |
| $X_8$ | * | .21 | .24 | .42 | .34 |

Including the findings of the present Pennsylvania sample, none of the five surveys disclosed a significant direct effect of mother's education ($X_2$) on education ($X_9$). The path coefficient of the present sample was small (p=.02).

On the other hand, all of the surveys uncovered the presence of a significant direct effect of father's occupation ($X_3$) on $X_9$. The range of path coefficients was from p=.06 (Sewell and Hauser, 1972) to p=.24 (Duncan et al., 1972). As one would expect with the varying causal ordering and number of variables in different models, the strength of the path coefficients has not been invariant. The path in the Pennsylvania sample (p=.10) was about mid-way within the observed range.

Number of siblings ($X_4$) did not significantly decrease educational levels in the present sample. The path was practically nonexistent (p=.01); hence, it was smaller than the one observed in the model of Duncan et al. (1972) - the only other survey to measure it.

Parental household ($X_5$) did not significantly increase levels of education in the data. This path was also observed to be not significant in the model of Alexander et al. (1975).

Measured intelligence ($X_6$) has been shown in past research to significantly increase educational levels ($X_9$). The range of the paths found is from p=.06 (Sewell and Hauser, 1972) to p=.42 (Duncan et al., 1972). The former model contained several intervening "significant other" and vocational aspirational variables not included in the present model. The extra variables transmitted most of the direct effects of $X_6$ on $X_9$ in the Wisconsin model, hence, the smaller path in that model. Conversely, there were no intervening variables between $X_6$ and $X_9$ in the model of Duncan et al. (1972); subsequently, its path was relatively larger. The path in the present model was relatively small (p=.13) in comparison to the remaining two surveys, Otto (1975b; p=.17) and Alexander et al. (1975; p=.21). Given the absence of an additional intervening variable ($X_7$) in Otto's Michigan sample and the unreliability of the measurement of intelligence ($X_6$) done by Alexander et al. (1975), the observed path in the present data may not be atypical for a noncollege-oriented, rural-male sample.

As a transmitter of the direct effects of three exogenous variables ($X_3$, $X_4$, $X_5$) and measured intelligence ($X_6$), parental achievement training ($X_7$) was significantly related to education ($X_9$). Its measured direct effect (p=.16) was nearly twice the size of the path discerned in the Wisconsin model (p=.09) - perhaps because of its multiple transmitting roles in the present model.

Finally, the Pennsylvania findings supported the expected direct effect of high school grade performance ($X_8$) on level of education. The size of the path (p=.34) was mid-way between those which were smaller due to additional intervening variables, as in the Wisconsin

model and that of Alexander et al. (1975) (p=.21 and p=.24, respectively), and the path of Otto's Michigan sample (p=.42).

The present model explained 27 percent of the variance in a son's educational attainment ($X_9$). This compares favorably with the 25 percent which the Duncan et al. (1972) model explained. Their model was similar to the present one in its focus on social origins and adult occupational attainment. The other three models differ from the present one in their emphases on the social psychological aspects of educational and early adult occupational attainment. Subsequently, the amount of variance which those models have explained in educational attainment is larger than that explained by either the present model or that of Duncan et al. As an example, the model of Alexander and associates (1975) accounted for 45 percent of the variance in education.

Discussion and interpretation. The present data tend to be a largely working-class sample; still 18 percent of the respondents attained a four-year college degree or more. About 6 percent of the respondents started college but did not complete it. They may have been drafted into the armed forces during the Korean War period - about 20-30 percent of the total sample were - and did not return to college to graduate after their military years. About two-thirds of the sample either terminated their education with the achievement of a high school diploma or the attainment of a two-year technically oriented, low-cost, post-high school education. Given the ascribed social status as measured by father's occupation of a large percentage of these respondents, the educational effects of their social position can be designated as the "secondary effects of stratification" (Boudon, 1974: 30); they had, during the period 1949-1957, fewer options for pursuing a college education even though they may have wanted and valued it. Some respondents may have desired to conform to the middle-class norm of acquiring a college education but their objective conditions forestalled conformity; hence, the gap between aspirations and expectations (Kuvlesky and Bealer, 1967). On the other hand, due to differential types of preparatory and anticipatory socialization (Lane and Ellis, 1968) and home environments, they may not have had the desire to acquire a college education. This differential evaluation of goals as a result of ascribed cultural inequalities is the "primary effect of stratification" (Boudon, 1974: 30).

As an adaptive resource, measured intelligence ($X_6$) directly increased a respondent's level of educational attainment and probably his ability to perceive options in the opportunity structure and to score well on Scholastic Aptitude Tests - the latter being a necessary condition for matriculating into many colleges. It also implies a likelihood of perceiving the utility of a college education in his overall career plans and a greater appreciation of college as an end-in-itself or as a necessary credential for obtaining a prized occupation. These individual effects (along with the possible social effects described under $X_8$, e.g., teacher encouragement to attend college) furnish a rationale for the shown $X_6$ - $X_9$ relationship.

Blake and Davis's (1964) theoretical scheme suggests that achievement training ($X_7$) influences educational attainment by inculcating values, norms, and skills through meaningful interactions between parent and progeny which can increase the desire to go to college - as previously argued. It can be noted, however, that $X_7$ offers parents some variability in the culture they transmit; hence, the findings of Rehberg and his associates (1970) and Simpson (1962). In sum, parents are not always wedded to the culture of their social status. They can initiate "intergenerational changes in life styles" for their progeny (Johnson and Stokes, 1976).

High school performance ($X_8$) is a product of a respondent's ability to apply his intelligence ($X_6$) to various curricula, his interests, motivation and achievement training ($X_7$). It is also a summary score, averaging the grade scores over the four-year high school period. Since the ultimate curriculum of a respondent is usually decided by his demonstrated performance at the junior high levels, the effects of $X_8$ on $X_9$ are understandable. The process is cumulative.

Thus, if a junior high school student has achieved good grades, parents, teachers and peers would be likely to encourage him to go into the academic curriculum. On the other hand, if a junior high school student achieved average grades or less, his parents and teachers would, if they were operating with conventional "wisdom," suggest a presumably less intellectually demanding business or vocational curricula. This suggestion would be likely to yield a focus of the student's talents and motivation on acquiring a specific vocation or trade (e.g., mechanics, bookkeeping, or drafting), allowing him to have competency in a particular field upon graduation. Given the income demands placed upon some working-class teenagers suggested earlier, this orientation toward a high school curricula is not without logic. There are, however, some long-term effects of this option for occupational attainment.

First, by selecting a nonacademic curriculum, the student reduces his chances of participating in extracurricular activities that are directly related to $X_9$ (Otto, 1975b). Second, this decision significantly reduces the individual's chances of acquiring competency in academic areas that are requisites for college matriculation. Given the increasing technological demands of the occupational structure, educational closure at a noncollege level in the 1950's would explain the observed relationships between $X_8$ and $X_9$ but especially that between $X_8$ and early adult occupational attainment ($X_{10}$). Third, as noted, the receiving of scholarships and fellowships is dependent on grades; hence, for the youth who cannot rely on family support to finance the cost of a post-high school education, the decision to follow a nonacademic high school curriculum puts an upper limit on his career at an early age. Thus, high school performance as well as social status undoubtedly influence one's educational attainment, explaining in part the relatively strong effects of $X_8$ on $X_9$ ($p=.34$) and on $X_{10}$ and $X_{14}$ - as will be seen.

Early adult occupational attainment ($X_{10}$). Table 10 displays the direct effects of seven predictor variables on the occupational ranks ($X_{10}$) which men had attained when they were ages 24-34 in the comparison surveys and at about age 26 in the Pennsylvania sample. The seven predictor variables are comprised of four microstructural aspects of attainment - father's occupation ($X_3$), number of siblings ($X_4$), home environment ($X_5$), and parental achievement training ($X_7$) - and three characteristics of individuals - measured intelligence ($X_6$), high school performance ($X_8$), and education ($X_9$).

The data support the idea that father's occupational rank increased a son's chances of attaining a higher ranked occupation at about age 26. While the direct effect was not large (p=.10), it was larger than the significant path discerned in Sewell and Hauser's (1972) model (p=.07) but not as large as that of Duncan and his associates (1972) (p=.12). The nonsignificant path measured in the model of Alexander et al. (1975) work was at variance with the foregoing findings. The size of their path (p=.07) was, however, the same as that of Sewell and Hauser.

Table 10. Direct effects of seven independent variables on a respondent's level of early adult occupational attainment ($X_{10}$).

| | Study | | | |
|---|---|---|---|---|
| Variable | Duncan et al. (1972) | Sewell and Hauser (1972) | Alexander et al. (1975) | Data findings |
| $X_3$ | .12 | .07 | n.s. | .10 |
| $X_4$ | n.s. | * | * | n.s. |
| $X_5$ | * | * | -.03 | .08 |
| $X_6$ | .08 | .05 | n.s. | n.s. |
| $X_7$ | * | n.s. | n.s. | .17 |
| $X_8$ | * | .07 | n.s. | .12 |
| $X_9$ | .52 | .46 | .45 | .45 |

Number of siblings ($X_4$) did not lower the rank which young men had attained in the occupational structure or "labor market" at about age 26. This finding was true, also, as measured by Duncan and associates (1972) in their national survey for men, ages 25-34. The possible effects of number of siblings as seen in the present study are apparently transmitted via measured intelligence ($X_6$) and parental achievement training ($X_7$). The reader can recall that $X_4$ was directly and significantly related to decreased levels of those two variables.

Home environment, 1947 ($X_5$) was directly and significantly related to increased levels of early adult occupational attainment ($X_{10}$). The size of its effect (p=.08) was larger than the factor-weighted, 13-item household acquisition scale of Alexander et al. (p=-.033), and also in the expected direction, i.e., positive.

Measured intelligence ($X_6$) did not significantly relate to $X_{10}$. This finding conforms to that of the national survey of Alexander et al. (1975). Both of these results are at variance, however, with Sewell and Hauser's significant and direct path (p=.05) and that of Duncan and associates (1972) (p=.08). Since the latter model did not have any intervening variables between $X_6$, e.g., achievement training or high school rank, its significant direct effect would be expected to be higher.

Unlike the two other models in Table 10 which measured the direct effect of parental achievement training ($X_7$) on $X_{10}$, the present model did not have two intervening measures of aspirations between $X_7$ and $X_{10}$. These mediating variables convey the effects of $X_7$ on $X_{10}$ in those models; subsequently, the direct paths in those models were not significant. Since the direct effect of $X_7$ on $X_{10}$ in the present data (p=.17) was about the size of the paths on the mediating aspiration variables in the model of Sewell and Hauser (1972) and that of Alexander et al. (1975), the three surveys which measured the influence of significant other indicators on occupational attainment or predictors of it appear to be in agreement when the total context of variables and their measurement are considered. The nearly identical r-values between $X_7$ and $X_{10}$ in Sewell and Hauser's (1972) model and our model (.36 and .37, respectively) support such a conjecture.

The results supported the importance of individual high school performance ($X_8$) on early adult occupational attainment. In conformity with Sewell and Hauser's (1972) finding, overall high school grade rank was shown to relate significantly and directly to increased levels of $X_{10}$. The observed direct effects in the two state samples, Wisconsin and Pennsylvania, were at variance with that measured in the national one of Alexander et al. (1975).

The measured direct effects of education ($X_9$) on early adult occupational attainment in three of the four surveys compared were nearly identical. In fact, the path coefficient in the present study (p=.45) was identical to that observed in Alexander and associates' national sample and is only a fraction smaller than that of Sewell and

Hauser (p=.46). These nearly identical path coefficients are slightly smaller than that measured by Duncan and associates (1972). The latter's larger path (p=.52) from education to $X_{10}$ is, again, a likely function of the absence of a significant other or high school rank variable in their model.

The Pennsylvania model (N=460) explained 43 percent of the variance in early adult occupational attainment. This percentage is nearly identical to the amount (42 percent) explained by Alexander and associates' national model. That work (N=538) used two additional indicators of significant other influences and two intervening attitudinal variables (educational expectations and occupational aspirations) not employed in the present model. Moreover, it utilized a 15-year longitudinal data set for a national sample of males (Alexander et al., 1975: 324).

The Pennsylvania model also duplicated the 43 percent of explained variance in early adult occupational attainment measured by the Wisconsin model (Sewell and Hauser, 1972). The amount of variance explained in $X_{10}$ was considerably more than the 25 percent explained by the model of Duncan et al. (1972). The present model employed all five of the predictor variables used in their model, including number of siblings and measured intelligence at ages 14-17. In addition, it included three other parental family variables and overall high school rank.

Discussion and interpretation. In the present sample, the stronger correlation between father's occupation ($X_3$) and $X_{10}$ (r=.20) and $X_3$ and first-job (r=.12) suggests that while some sons with higher social origins may have taken lower-rank jobs at the beginning of their careers, e.g., during their college years, they were able to leave the lower entry occupations, accounting, in part, for the positive relationship between $X_3$ and $X_{10}$. Since the sons of fathers at the lower end of the occupational hierarchy would have fewer opportunities for social contact among men from higher occupational groupings, they would also have fewer opportunities to develop a strong positive valence toward these groupings. Additionally, their culture may place greater values on primary relationships, having a sense of belonging to a distinct community heavily populated by people whom they have "known all of their lives," and viewing their occupations as a "way of life" as well as a "means of earning a livelihood." Furthermore, the subordinate characteristics of their father's occupation may not have given the sons' a sense that one's future can be rationally planned, much less controlled - as will be seen in the next two discussion sections.

Among the intermediate occupational groupings, the potential for intergenerational mobility is much greater in that they have a relatively lower rate of inheritance. Blau and Duncan (1967: 47) reached this conclusion based on national data:

> Men in occupations in the middle of the occupational status hierarchy come from more dispersed backgrounds than those in the highest or the lowest occupations, and men originating in these intermediate strata also move to more dispersed occupations in their careers than men originating at either extreme of the occupational hierarchy.

Within the present data, forty-four percent of the sons attained occupations in the three highest intermediate occupational categories in 1957, i.e., in the rank-score range of a plumber (33) but below that of a professional (81). A moderate portion of the respondents had attained stable and moderately prestigious occupations early in their careers: 5.7 percent at rank-score 60 (foremen, express clerks, postmasters, etc.); 5 percent at rank-score 44 (electricians, office clerks, storekeepers, etc.); 3.9 percent at rank-score 39 (retail salesman, foremen-textiles). The 44 percent figure compares favorably with the 26.3 percent of the respondents' fathers who had attained occupations in the foresaid intermediate groupings. Conversely, in the lowest intermediate grouping (17-32), there were relatively fewer respondents (31.5 percent) compared to the percentage (44.8) of fathers who held occupations in that range, reflecting, at the structural level, a degree of upward mobility among the sons' occupational attainments in 1957.

In the three upper-intermediate occupational groupings, "particularistic [intuitive] skills acquired through apprenticeship and trial and error . . . [e.g., from] running a business in a competitive economy, selling, and the construction industry" (Blau and Duncan, 1967: 73) are necessary. Fathers in these occupations may have transmitted these skills and know-how to their offspring consciously or behaviorally. In the lowest intermediate grouping, which entails bricklayers, carpenters, plasterers, mechanics and other lower-ranked blue-collar positions in the service, operative and laborer categories, it is conceivable that fathers conveyed some of the related skills to their sons and otherwise helped them to get established in an occupation or craft. However, in light of the relatively weak path under consideration and the foregoing structural interpretation of the determination at the upper and lower levels of the occupational hierarchy, including the farm category, these ascribed occupational inputs are also interpreted as being transmitted via $X_5$ and $X_9$ and indirectly via the influence of $X_3$ on $X_9$.

The direct effect of home environment ($X_5$) on $X_{10}$ can be discussed in terms of the consumer life styles of the parents and the possible effects of these life styles on their offsprings' status orientations. One of those effects may have been the acquired motivation to strive to get ahead socially and economically. According to this reasoning, as index of level-of-living, $X_5$ should have raised the level of occupational aspirations. The r-value (.19) between $X_5$ and adolescent occupational aspirations supports this conjecture. Since the latter are also related to $X_{10}$ (r=.50), the $X_5$ - $X_{10}$ relationship becomes more intelligible.

Attainment in the intermediate occupational and professional categories demands, according to Pavalko (1971: 50):

> extensive formal preparation that must be obtained according to prescribed pattern or sequence . . . [requiring] a great deal of deliberate planning . . . [and] a substantial investment of both time and money. . . . [On the other hand] most semi-skilled and unskilled manual occupations . . . [do not demand] much planning and elaborate decision-making because such planning is unnecessary. Movement from one semi-skilled factory job to another may be done quite casually and routinely. . . . [Moreover], middle class youth are likely to enter into a great deal of anticipatory role-playing and weighing of the relative advantages, disadvantages and compatibility of high status occupations.

Since they were also trained to take an activistic approach to reality, they are more likely to aspire to occupations that fit their capabilities and interest. Again, the achievements of middle-class parents are concrete illustrations of what is possible. All of these factors would favor a rational approach toward career planning and preparation.

Conversely, Bender et al. (1967: 289) have submitted that the work experiences of high school seniors in low-income rural areas "do not make [a discriminating] impression on students or that the work experiences . . . in such an area do not provide an adequate basis for testing the reality of aspirations." Specifically, they discovered a significant gap between their respondents' capability scores (e.g., reading speed and comprehension levels) and aspirational levels. Further, the often seen inability of lower SES fathers to concretely provide home conveniences, an adequate and secure family income, and knowledge of the role expectations of intermediate occupations, or to teach offspring how to take intelligent risks would tend to make the son's visions of a higher occupation and its rewards more imaginary than real and his behavior more adaptive to "what is" rather than "what could be."

Adult income aspiration ($X_{11}$) and financial management behavior ($X_{12}$). The next two variables considered in 1957 were adult income aspiration ($X_{11}$) and financial management behavior ($X_{12}$). These two are conceptually related and will be considered together. Methodologically, since the literature reviewed did not investigate these variables within a multiple regression or path analytic framework, the results can not be compared directly with those of other surveys.

Measured intelligence ($X_6$) and educational attainment ($X_9$) were directly and positively related to the level of income which respondents desired for themselves at age 40 ($X_{11}$). The respective paths were nearly identical (p=.13 vs. p=,12).

Early adult occupational attainmnent ($X_{10}$) was significantly correlated with $X_{11}$ at the .001 level of statistical significance. Following the nonreciprocality assumption of path analysis (Miller and Stokes, 1975), this covariation is not legitimately treated as a causal path nor interpreted as such.

Father's occupation ($X_3$), home environment ($X_5$), and educational attainment ($X_9$) were directly and significantly related to variations in financial management behavior ($X_{12}$). The respective paths were .11, .16, and .12. As with $X_{11}$, the intercorrelations of $X_{12}$ with $X_{11}$, $X_{10}$, or $X_{15}$ will not be interpreted as causal paths due to the inability to establish a time-sequencing among these variables.

Discussion and interpretation. The direct effects of measured intelligence ($X_6$) and educational attainment ($X_9$) on adult income aspirations ($X_{11}$) suggest concern for higher levels of income to meet inflated costs-of-living over the years and an individual's awareness of his income-earning power given his levels of aptitude and education. In light of the influences of a small family ($X_4$) and parental home environment ($X_5$) on parental achievement training ($X_7$) and the combined influences of $X_7$ and father's occupation ($X_3$) on $X_9$, the direct effects of $X_9$ on $X_{11}$ may also measure a status-oriented value hierarchy among some respondents which may form a coherent outlook that shapes their adult goals.

Financial management behavior ($X_{12}$) was intended to index a rational orientation toward saving for the future, including the use of sophisticated investment practices. To the extent the intended end was reached, the direct effects of $X_3$ on $X_{12}$ may be interpreted as expressing possibly the differential capacities of fathers in the intermediate and professional categories which enable them to furnish the wherewithal - economic and motivational - to their sons, allowing them to execute sophisticated investment practices. Since the sons were born during the worst years of the Great Depression (1931-1935), it is likely that they would have grown up with some appreciation of the importance of money and a savings' program. Moreover, while the majority of the working-class fathers may not have been capable of giving their offspring the technical aspects of achievement training, the "scar of the depression" could have provided a lasting impression of the value of economic security, which they may have transmitted to their adolescent offspring.

Participation in work-related associations ($X_{13}$). The degree to which respondents participated in work-related associations ($X_{13}$) is the next variable to be considered. Since no other survey has measured the effects of participation in voluntary associations on occupational attainment, though many have studied the effects of occupational mobility on voluntary participation, the results could not be compared to other samples.

Participation in work-related associations ($X_{13}$) was significantly correlated at the .001 level of statistical significance with parental achievement training ($X_7$), high school performance ($X_8$), educational attainment ($X_9$), early adult occupational attainment ($X_{10}$), and adult income aspirations ($X_{11}$). The respective r-values are .19, .23, .37, .31, and .21. Education ($X_9$) had a significant and direct effect (p=.32) on $X_{13}$, accounting, thereby, for 15 percent of the explained variance in occupationally supportive participation.

Discussion and interpretation. The direct and significant influence of educational attainment ($X_9$) on $X_{13}$ is not easy to interpret. The intensity of participation among educational and non-agriculturally-related associations, which comprise $X_{13}$, was largely limited to "membership," "financial contribution," and to a lesser degree, "attendance." The relative absence of more intense or behavioral forms of participation, "committee membership" and "holding an office," implies that the respondents' involvements in the foresaid associations may have been less a means of learning specific adult roles than a way of keeping informed of the ongoing developments in their respective occupations; the direct effects of X9 on $X_{13}$ may express a greater awareness of the need for this information and an enhanced ability to participate in the production and diffusion of it.

Mid-life occupational attainment ($X_{14}$). Data pertaining to the direct effects of three independent variables on $X_{14}$ are presented in Table 11. Except for Blau and Duncan's (1967) one-shot, large (N=20,000) national sample, all of the others are longitudinal surveys following their respondents from adolescence to 10 years or more after college graduation. Since it covers the years from adolescence to about age 40, and combines all of the relationships observed individually among the other samples into one relatively large survey, the ongoing Pennsylvania survey is unique. Still the results of the other samples can be compared with those of this survey.

The data support the direct effects of high school performance ($X_8$) on mid-life occupational attainment ($X_{14}$) observed by Eckland (1965). The size of the path in the present sample is, however, smaller than Eckland's, .11 vs. .22.

Considerable variations in the size of the path of educational attainment ($X_9$) on $X_{14}$ is evident in Table 11. The strength of the relationship between $X_9$ and $X_{14}$ in the present data is relatively strong (p=.30). Although this path coefficient is not as large as Eckland's (1965) and Elder's (1968), it is about the same strength as that of Blau and Duncan's (1967) large sample (p=.39) but stronger than that of Kelley's (1973).

The direct effect (p=.28) of early adult occupational rank ($X_{10}$) on $X_{14}$ was nearly identical to the strength of $X_9$ on $X_{10}$. This path had the same slope as that of Blau and Duncan's coefficient (1967) (p=.28).

Table 11. Direct effects of three independent variables on mid-life occupational attainment ($X_{14}$).

| Variable | | Study: Eckland (1965) | Elder (1968) | Blau and Duncan (1967) | Kelley (1973) | Data findings |
|---|---|---|---|---|---|---|
| High School | ($X_8$) | .22 | * | * | * | .11 |
| Educational attainment | ($X_9$) | .45 | .58 | .39 | .18 | .30 |
| Early adult occupational attainment | ($X_{10}$) | * | * | .28 | .63 | .28 |

Both of them were, in turn, about half the power of the direct effect of an earlier occupation on a later occupational rank in Kelley's data (p=.63). Together with $X_9$, $X_{10}$ served to transmit the effects of the microstructural and the individual characteristics ($X_6$ and $X_8$) on adult social status.

The variables, $X_8$, $X_9$, and $X_{10}$ explained 40 percent of the variance in mid-life occupational status ($X_{14}$), nearly the same amount accounted for 14 years earlier i.e., on $X_{10}$. This percentage compares favorably with those percentages explained by the models of Blau and Duncan (1967: 170) and Elder (1968: 348). Both of these models explained 25 percent of the variance in occupational attainment. On the other hand, Kelley's (1973: 491) model accounted for 48 percent of the variance in his $X_{14}$ measure.

Three other variables, adult income aspiration ($X_{11}$), financial management behavior ($X_{12}$), and participation in work-related associations ($X_{13}$), did not directly and significantly increase the amount of explained variance in $X_{14}$.

Discussion and interpretation. All of the industrial categories (except government) in the "service-producing" sector of American society increased the size of their portion of the total employed labor force in the period, 1950-1968. Combined, the seven service-producing subsectors accounted for 64.1 percent of the labor force in 1968. At that time, nearly 50 percent (46.7) of the labor force was distributed among the white-collar occupational groupings. In brief, an expansion in the number of employment opportunities in the white-collar categories and a reduction of them among the blue-collar

groupings and in the agricultural sector characterized the period from 1950 to 1968.

In line with the structural changes in the labor force just noted, the combined distribution of the respondents among the two highest rank-score groupings (65-96) increased from 10.4 percent in 1957 to 29.8 percent in 1971 - a 180 percent increase. Conversely, the lowest rank-score grouping (1-16) decreased its share of the sample from 22.2 percent of the respondents in 1957 to 10.9 percent in 1971. Among the four intermediate groupings of blue-collar workers, changes in the percentage distribution of respondents were in the same direction and stronger than those in the larger labor force.

The foregoing sketched changes provide a context for appreciating the direct and positive bearing that high school performance ($X_8$), type of education ($X_9$), and early adult occupational rank ($X_{10}$) showed on $X_{14}$. This is most apparent at the upper end of the occupational hierarchy.

Attainment in the two highest groupings: upper-level, white-collar occupations and the professions, 1971. The occupational attainments of the respondents in 1971 ($X_{14}$) tended to a bimodal distribution. At the upper end of the occupational ladder (prestige scores 65-96), 29.8 percent of the respondents were distributed among two prestigious occupational groupings which underwent an increase in size of employment during the years, 1950-1968. These groupings entail such occupations as clothing store proprietors, insurance sales men, various commercial managers and production superintendents, teachers, bankers, engineers, doctors and other professionals. Although Blau and Duncan (1967) found a relatively high degree of occupational inheritance among these higher groupings, the fact that only 5.7 percent of the respondents had fathers who held occupations in them and that 29.8 percent of the respondents attained positions in these two groupings suggests a relatively permeable boundary between the groupings at the upper end of the occupational structure (Gansemer, 1976: 11, 13; Tables 1 and 2).

The role requirements for positions in this highest grouping includes a college education or graduate training. Given the positive influence of high school performance ($X_8$) on the selection of an academic curriculum and the positive effects of grades and type of curriculum on college matriculation, most of the effects of $X_8$ on $X_{14}$ appears to have been transmitted through educational attainment ($X_9$); hence the relatively weak path (.11) between $X_8$ and $X_{14}$.

In this light, Eckland's (1965) model and the present data provide an interesting contrast. All of Eckland's subjects attended college in comparison with only 18 percent of those in the Pennsylvania survey. If one assumes that subjects with some college education would be more likely to choose careers involving the cognitive skills associated with successful high school performance ($X_8$) than would respondents who did not attend college, the higher positive relationship

between $X_8$ and $X_{14}$ in the Eckland survey than in the present data makes sense. Also, $X_{14}$ was measured 12 years later in the life cycle of the Pennsylvania sample members, increasing, thereby, the chances that the effects of $X_8$ on $X_{14}$ may be conveyed by other mediating variables not included in the model. Eckland's data are enlightening in another sense. Using education as a control (measured by college graduation), he (1965: 544) discovered that the direct effect of $X_8$ on $X_{14}$ fell to .09, slightly lower than the path (.12) among the present noncollege-oriented subjects.

The direct effects of educational attainment ($X_9$) and early adult occupational rank ($X_{10}$) on $X_{14}$ (p=.30 and p=.28, respectively) show that technical qualifications and favorable career beginnings are not unimportant for attaining an upper-level, white-collar position at age 40. The foregoing interpretations of the determinants of $X_9$ and $X_{10}$ reveal that this attainment may be partly a product of consistent intergenerational support and direction along with favorable levels of measured intelligence ($X_6$) and performance capacities. While participation in occupationally related associations ($X_{13}$) was not significantly related to $X_{14}$, this behavior may have served to solidify the highly ranked attainment which they already had in 1957.

Attainment in the two highest intermediate groupings: middle-level, white-collar and upper-level, blue-collar occupations. Nearly 15 (14.8) percent of the respondents attained occupations in the rank-score range, 49-64. This range includes such white-collar occupations as real estate brokers, construction supervisers, rural mail carriers, ministers, and, at a slightly lower prestige-rank level, such roles as produce buyers and managers for grocery chains, bookkeepers, postal clerks and salesmen. Another 16.3 percent of the respondents attained upper-level, blue-collar occupations in the rank-score range, 33-48. This grouping entailed such occupations as sheet-metal workers, plumbers, electricians, television repairmen, air-craft mechanics, production line coordinators and foremen. In total, 21.1 percent of the respondents attained occupations in groupings in which the labor demand had been expanding or had remained relatively stable in the period of interest.

The middle-level, white-collar occupations characteristically demand entrepreneurial and public-relational skills that involve the processing and selling of consumer products to a variety of customers. They also tend to occur within different organizational and locational settings. The organizational setting of these occupations may demand a greater adherence to rational principles, a greater use of written correspondence, increased decision-making responsibilities, and greater formal interpersonal and group skills.

The vocational curriculum of the respondents' high school or programs would likely have been of less assistance in helping them to fit into these middle-level, nonmanual occupations which demand greater cognitive and interpersonal capabilities. The fact that nearly 50

percent of the respondents ended their education with the possession of a high school diploma or less likely would have decreased the number of them with the basic personal resources for these positions. By contrast, the respondents' high school performance and vocational and technical educational attainments may help to explain their ability to acquire these positions in 1971. Given that such occupations often demand apprenticeships in building and trade, along with craft and other specialized, unions, it is likely that the attainment of skilled blue-collar positions underlines the positive effects of the vocational and technical training of the respondents; hence, the relatively stronger direct effect of $X_9$ on $X_{14}$ as compared with the direct effect of $X_8$ on $X_{14}$ ($p=.30$ vs. $p=.11$).

The relatively strong path of $X_{10}$ (early adult occupation) also suggests the attainment of these skilled blue-collar positions may be the culmination of 14 years of work experience and promotions, yielding tenure rights and other competitive advantages arising from overall familiarity with an occupation. These advantages may make it harder for such persons to switch to other occupations where, in Kelley's words (1973: 483): "They don't know the ropes." This can help to explain the reluctance of men to move out of occupations that are declining at the societal level and into middle-level, white-collar occupations which had been expanding.

Lower-intermediate, blue-collar and agricultural producer attainment. Excluding farmers (about 7.2 percent), one fifth (21 percent) of the respondents had attained lower intermediate, blue-collar occupations. At reference are mainly semi-skilled jobs, crafts or trades, needing few specifically cognitive or entrepreneurial skills. The jobs do require a multiplicity of talents, for instance, the abilities to perform extremely specialized if nontechnical assembly-line tasks, or to monitor machines or semi-automated equipment in factories or to fill the shoes of a plasterer, a painter, an appliance repairman, or to do other such work. These capabilities often do not make much use of formal academic training. They may, however, have been fostered by a vocational-technical high school curriculum, especially if the respondent performed well within it.

The path from $X_8$ to $X_{14}$ may measure a respondent's capability of functioning within a work setting as well as in high school. Since high school performance is a function, in part, of his measured intelligence ($X_6$) and parental achievement training ($X_7$) along with other unmeasured variables (e.g., motivation), a gifted respondent may have pursued one of the aforementioned lower-ranked trades or crafts, especially if his parents reinforced this vocational choice and if a college education was not a realistic option for him. More likely, given the positive relationship between $X_8$ and $X_{14}$, the path expresses the occupational attainment levels of those respondents who have "average" high school performance. Since employers tend to hire in terms of fairly restrictive categories of educational achievement such that a particular threshold of schooling, e.g., a high school diploma, is seen as being

appropriate for a particular type of work, it is not out of place to note that many of the respondents who lacked the credentials of a two- or four-year college degree helped compose that grouping which had attained only lower-intermediate, blue-collar positions in 1971. Further, 22.5 percent of the respondents had aspired to become farmers - far less than those who became farmers. Haller and Sewell (1967) found that aspiring farmers generally had not planned to attend college in the period of interest. Since far fewer respondents became agricultural producers than the percentage of prospective farmers, the strong, positive relationship between education ($X_9$) and $X_{14}$ may also represent those sons who transferred into the nonfarm labor market with limited educational levels.

Low-skilled, blue-collar attainment. Attainment in this lowest rank-score grouping (1-16) normally involves few of the cognitive, activistic or entrepreneurial skills, social role characteristics, and technical qualifications found in the foregoing occupational groupings. The occupations in this category offer the respondents who have relatively average levels of measured intelligence, high school performance, and a limited education an opportunity to earn a relatively low income by doing manual labor. It may also reflect their failure to realistically plan their careers, to acquire the necessary technical qualifications for mobility, to strive to get ahead, or to leave a "dead end" industry or occupation. Seeing that the percentage of respondents distributed among this lowest blue-collar grouping declined 52 percent between 1957 and 1971, it may be concluded that the respondents, on the whole, were able to adapt to the upward shift in the occupational structure. For those 10.9 percent of the respondents who remained in these low-skilled, low-paying occupations, the positive effects of $X_8$, $X_9$, and $X_{10}$ suggest that the inability to perform in one institutional setting (e.g., high school), to attain a higher level of education, and to move out of a "distinctive entry occupation" at age 26 had lasting negative effects on mid-life occupational status.

Elder (1968) and Eckland (1965) furnish insights that would help to explain this outcome. Elder (1968) found that the relationship of measured intelligence ($X_6$) on adult occupational status varied positively by social class. He established that $X_6$ directly and significantly affected the occupational status of men of middle-class origins ($p=.11$). Among men of working-class origins, he discovered a negative path between these two variables (-.29). The present author found, however, that among those men of working-class origins who were able to attain a higher education, measured intelligence was related more strongly to occupational status than it had been to this status among men of middle-class origins. On the other hand, for the working-class men as a whole, Elder (1968) established a stronger relationship of achievement motivation and adult occupational status than he found among middle-class men ($p=.34$ vs. $p=.21$, respectively). Elder's (1968) decomposition of the direct effects of measured intelligence on adult status are similar to Eckland's (1965) examination of the effect of $X_8$ on $X_{14}$ with a control on education. He noted that the adult occupational

payoff of high school performance ($X_8$) depended on attaining a college diploma. The results of these two longitudinal surveys have revealed the occupational effects of not receiving a college education or of relying on a drive to excel, as a means of long-term status attainment. They have shown that measured intelligence ($X_6$) and high school performance ($X_8$) are not mobilized by the individual for his social advantage.

## Indirect Effects

Tables 12, 13, and 14 present the decomposition of the total effects of the predictor variables on the endogenous variables in the empirical model. They show which variables mediate the total of antecedent predictor variables and reveal also the percentage of the total that is indirect (i.e., mediated by subsequent intervening variables) and the percentage of the total effect that is direct (i.e., not mediated by an intervening variable). Using the criterion that the beta weight of a relationship between two variables is at least twice as large as its standard error, the tables also identify which of the total effects are statistically significant. It should be noted that while the direct effect of a predictor variable may not have been significant, e.g., the direct effect of father's education ($X_1$) on parental achievement training ($X_7$), calculation of the total effect of a predictor may reveal the existence of a statistically significant relationship. Examining total effects and their decomposition into direct and indirect components yields a more complete picture of relationships among the variables in the model.

Parental achievement training ($X_7$). The total effects of number of siblings ($X_4$) and home environment ($X_5$) on $X_7$ were statistically significant. The small indirect paths of $X_4$ and $X_5$ on $X_7$ via $X_6$ ($p=.02$ for both relationships) indicate that achievement training was mediated only slightly by measured intelligence. About eighty-five percent of the effects of $X_4$ and $X_5$ on achievement training was direct.

High school performance ($X_8$). Of the six predictor variables ($X_1$ - $X_6$) that showed indirect effects on high school performance ($X_8$), the total effects of three of them ($X_1$, $X_5$, and $X_6$) were statistically significant. As Table 12 shows, 59 percent of the total effect of father's education ($X_1$) on $X_8$ was conveyed via measured intelligence ($X_6$). Another nine percent of its total effect on $X_8$ was mediated by achievement training ($X_7$). About two-thirds of the total effect of $X_1$ on $X_8$ was thus indirect, indicating that father's education was not unimportant to the overall performance of an offspring in high school.

As an indicator of the comfort level of a respondent's physical household, the total effect of home environment ($X_5$) was significantly related to overall high school performance ($X_8$). Thirty-five percent of the total effect of $X_5$ on $X_8$ was mediated by measured intelligence ($X_6$); another 15 percent was transmitted by parental achievement

Table 12. Total effects, indirect effects, and direct effects (percentage estimates in parentheses) for parental achievement training ($X_7$), high school performance ($X_8$), and educational attainment ($X_9$) from five microstructural variables, measured intelligence ($X_6$) and $X_7$ and $X_8$ in sequence.

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_5$ via $X_6$ | $X_7$ | $X_8$ | Direct effect |
|---|---|---|---|---|---|
| | | Parental achievement training ($X_7$) | | | |
| $X_1$ | .0884 | .0310 (35%) | -- | -- | .0574 (65%) |
| $X_2$ | .0385 | .0076 | -- | -- | -.0461 |
| $X_3$ | .0337 | -.0126 | -- | -- | .0462 |
| $X_4$ | -.1449* | .0186 (13%) | -- | -- | -.1263 (87%) |
| $X_5$ | .1081* | .0169 (16%) | -- | -- | .0912 (84%) |
| $X_6$ | .1887* | -- | -- | -- | -- |
| | | High school performance ($X_8$) | | | |
| $X_1$ | .1185* | .0698 (59%) | .0102 (9%) | -- | .0385 (32%) |
| $X_2$ | -.0027 | -.0170 | -.0082 | -- | -.0115 |
| $X_3$ | -.0913 | -.0285 (31%) | .0083 (9%) | -- | -.0711 (78%) |
| $X_4$ | -.0511 | -.0418 | -.0224 | -- | .0132 |
| $X_5$ | .1113* | .0392 (35%) | .0163 (15%) | -- | .0580 (52%) |
| $X_6$ | .4256* | -- | .0335 (8%) | -- | .3921 (92%) |
| $X_7$ | .1773* | -- | -- | -- | .1773 |

Table 12. (Continued)

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_5$ via $X_6$ | $X_7$ | $X_8$ | Direct effect |
|---|---|---|---|---|---|
| | | Educational attainment ($X_9$) | | | |
| $X_1$ | .0891 | .0491 (55%) | .0125 (14%) | .0130 (15%) | .0144 (16%) |
| $X_2$ | .0157[a] | .0120 | -.0101 | -.0039 | .0177 |
| $X_3$ | .0639 | -.0200 (31%) | .0101 (16%) | -.0240 (38%) | .0977 (152%) |
| $X_4$ | -.0442 | -.0296 | -.0276 | .0045 | .0085 |
| $X_5$ | .1242* | .0261 (21%) | .0201 (16%) | .0195 (16%) | .0585 (47%) |
| $X_6$ | .2997* | -- | .0412 (14%) | .1321 (44%) | .1264 (42%) |
| $X_7$ | .2184* | -- | -- | .0597 (27%) | .1587 (73%) |
| $X_8$ | .3369* | -- | -- | -- | .3369 |

[a]The percentages of the distribution of indirect and direct effects of total effects with beta weights (path coefficients) of .05 or less will not be calculated.

*Absolute value for the coefficient is at least twice as large as the standard error.

training ($X_7$); the remaining 52 percent was direct. In contrast, 92 percent of the total effect of $X_6$ on $X_8$ was direct. Only eight percent was mediated by achievement training ($X_7$).

Educational attainment ($X_9$). The total effects of home environment ($X_5$) and parental achievement training ($X_7$) on $X_9$ were statistically significant. Fifty-three percent of the total effects of $X_5$ on $X_9$ was conveyed by three variables. Measured intelligence ($X_6$) transmitted 21 percent of the total effect of $X_5$ on $X_9$; parental achievement training ($X_7$) and high school performance ($X_8$) each mediate 16 percent of that effect. The remaining portion (47 percent) was direct. Twenty-seven percent of the total effects of $X_7$ on $X_9$ was transmitted by high school performance ($X_8$). This means that about one-fourth of the significant total effect of parental achievement training ($X_7$) on education ($X_9$) was conveyed by the offspring's overall performance in high school. In the present model, the remaining 73 percent of the total effect of $X_7$ on $X_9$ was direct. The significant total effects of $X_5$ and $X_7$ on $X_9$ underscore the importance of a respondent's parental family in his acquiring a post-high school education.

Measured intelligence ($X_6$) was also significantly related to the type of education a respondent had attained. While a relatively small percentage of its total effect on $X_9$ was mediated by $X_7$ (14 percent), 44 percent of its effect was transmitted by high school performance ($X_8$). The remaining 42 percent of the total effect of $X_6$ on $X_9$ was direct.

Early adult occupational attainment ($X_{10}$). The decomposition of the effects of nine predictor variables on early adult occupational attainment and related economic aspirations and behavior are displayed in Table 13. The four dependent variables in Table 13 ($X_{10}$, $X_{11}$, $X_{12}$, and $X_{13}$) were measured in 1957 during the early adult stage (age 26) of respondent life cycles. Although they are shown in a single table, the varying effects of the six family background variables ($X_1$ - $X_5$, $X_7$) and three individual characteristics of respondents ($X_6$, $X_8$, and $X_9$) on each of these four dependent variables will be interpreted separately.

The total effects of six of the nine predictors on $X_{10}$ were statistically significant. While some of the indirect effects of father's occupation ($X_3$) were in a slight negative direction, 84 percent of its positive effect on $X_{10}$ was direct. Thirty percent of the total effects of $X_3$ on $X_{10}$ was mediated by the effect that $X_3$ had on educational attainment.

Fifty-two percent of the total effects of home environment ($X_5$) on $X_{10}$ was conveyed rather evenly by intervening variables. Measured intelligence ($X_6$), achievement training ($X_7$) and educational attainment ($X_9$) each transmitted about 15 percent of the total effect of $X_5$; high school performance ($X_8$) mediated 8 percent of that effect. The direct

Table 13. Total effects, indirect effects, and direct effects (percentage estimates in parentheses) for early adult occupational attainment or occupationally related behavior by nine attainment predictors.

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_9$ via $X_6$ | $X_7$ | $X_8$ | $X_9$ | Direct effect |
|---|---|---|---|---|---|---|
| | | Early adult occupational attainment $X_{10}$ | | | | |
| $X_1$ | .0086 | .0453 | .0165 | .0105 | .0064 | -.0701 |
| $X_2$ | .0537 | .0110 | -.0133 | -.0031 | .0079 | .0512 |
| $X_3$ | .1217* | -.0184 (15%) | .0133 (11%) | -.0193 (16%) | .0437 (36%) | .1024 (84%) |
| $X_4$ | -.0389[a] | -.0272 | -.0364 | .0036 | .0038 | .0173 |
| $X_5$ | .1764* | .0241 (14%) | .0264 (15%) | .0158 (8%) | .0261 (15%) | .0841 (48%) |
| $X_6$ | .2754* | -- | .0544 (20%) | .1065 (39%) | .0565 (20%) | .0580 (21%) |
| $X_7$ | .2881* | -- | -- | .0482 (17%) | .0710 (25%) | .1689 (58%) |
| $X_8$ | .2717* | -- | -- | -- | .1506 (55%) | .1211 (45%) |
| $X_9$ | .4471* | -- | -- | -- | -- | .4471 |
| | | Adult income aspiration ($X_{11}$) | | | | |
| $X_1$ | .0486[a] | .0247 | .0039 | .0006 | .0017 | .0193 |
| $X_2$ | .0213[a] | .0060 | -.0031 | -.0001 | .0021 | .0159 |
| $X_3$ | -.0066[a] | -.0096 | -.0032 | .0011 | -.0118 | -.0124 |
| $X_4$ | -.0226[a] | -.0136 | -.0087 | .0002 | -.0003 | -.0007 |
| $X_5$ | .0916 | .0131 (14%) | .0063 (7%) | .0009 (1%) | .0071 (7%) | .0666 (72%) |

Table 13. (Continued)

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_9$ via $X_6$ | $X_7$ | $X_8$ | $X_9$ | Direct effect |
|---|---|---|---|---|---|---|
| | | Adult income aspiration ($X_{11}$) (Continued) | | | | |
| $X_6$ | .1631* | -- | .0129 (8%) | .0062 (4%) | .0152 (9%) | .1288 (79%) |
| $X_7$ | .0686 | -- | -- | .0028 (4%) | .0191 (28%) | .0467 (68%) |
| $X_8$ | -.0159 | -- | -- | -- | -.0405 | -.0564 |
| $X_9$ | .1203* | -- | -- | -- | -- | .1203 |
| | | Financial management behavior ($X_{12}$) | | | | |
| $X_1$ | .0144 | .0107 | .0044 | .0035 | .0017 | -.0058 |
| $X_2$ | .0194 | .0026 | -.0035 | -.0010 | .0021 | .0193 |
| $X_3$ | .1109* | -.0044 (4%) | .0036 (3%) | -.0064 (6%) | .0113 (10%) | .1067 (96%) |
| $X_4$ | -.0528 | -.0064 | -.0097 | .0012 | .0010 | -.0388 |
| $X_5$ | .1839* | .0057 (3%) | .0071 (4%) | .0052 (3%) | .0068 (3%) | .1592 (87%) |
| $X_6$ | .0650 | -- | .0145 (22%) | .0351 (54%) | .0146 (23%) | .0008 (1%) |
| $X_7$ | .0770 | -- | -- | .0159 (20%) | .0183 (24%) | .0428 (56%) |
| $X_8$ | .0895 | -- | -- | -- | .0389 (43%) | .0506 (57%) |
| $X_9$ | .1154* | -- | -- | -- | -- | .1154 |

Table 13. (Continued)

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_9$ via $X_6$ | $X_7$ | $X_8$ | $X_9$ | Direct effect |
|---|---|---|---|---|---|---|
| | Participation in work-related associations ($X_{13}$) | | | | | |
| $X_1$ | .0303 | .0129 | .0095 | .0075 | -.0036 | .0041 |
| $X_2$ | .0439 | .0031 | -.0075 | -.0022 | .0056 | .0450 |
| $X_3$ | .0141 | -.0053 | .0076 | -.0138 | .0310 | -.0055 |
| $X_4$ | -.0449 | -.0078 | -.0208 | .0026 | .0026 | -.0215 |
| $X_5$ | .0731 | .0068 (9%) | .0151 (21%) | .0113 (15%) | .0185 (25%) | .0214 (29%) |
| $X_6$ | .0784 | -- | .0311 (40%) | .0762 (97%) | .0401 (51%) | -.0690 (88%) |
| $X_7$ | .1650* | -- | -- | .0347 (21%) | .0503 (30%) | .0800 (49%) |
| $X_8$ | .1944* | -- | -- | -- | .1068 (55%) | .0876 (45%) |
| $X_9$ | .3171* | -- | -- | -- | -- | .3171 |

[a]The percentage of the distribution of the indirect and direct effects of total effects with beta weights (path coefficients) of .05 or less will not be calculated.

*Absolute value for the coefficient is at least twice as large as the standard error.

effect of $X_5$ on $X_{10}$ contributed the remaining 48 percent of this environmental determinant of early adult occupational attainment ($X_{10}$).

The strengths of the total effects of measured intelligence ($X_8$) on $X_{10}$ were nearly identical. They were also stronger than those of $X_3$ and $X_5$ on $X_{10}$. Twenty-five percent of the total effect of $X_7$ on $X_{10}$ is a product of $X_7$'s influence of $X_9$; another 17 percent is mediated by $X_8$. Together, the combined total effects (p=.5862) of the three family background variables ($X_3$, $X_5$, and $X_7$) explained 34 percent of the variance in early adult occupational attainment ($X_{10}$). Seventy-nine percent of the total impact of measured intelligence ($X_6$) on $X_{10}$ was a result of its considerable influences on $X_7$ - $X_9$; $X_7$ and $X_9$ each mediate 20 percent of $X_6$'s total effect of $X_{10}$ while $X_8$ conveyed another 39 percent, underlining, thereby, the pervasive and significant indirect influence of academic ability on reaching a favorable occupational status at an early stage in one's career. Fifty-five percent of the influence of high school performance ($X_8$) was passed on to $X_{10}$ via educational attainment ($X_9$). Together, academic ability ($X_6$) and academic performance ($X_8$) accounted for 30 percent of the variance in $X_{10}$.

Adult income aspiration ($X_{11}$). None of the six microstructural variables ($X_1$ - $X_5$, $X_7$) or high school performance ($X_8$) had total effects that were statistically significant in predicting the respondent's adult income aspiration ($X_{11}$). Although the path coefficients of parental home environment ($X_5$) and achievement training ($X_7$) (p=.09 and p=.08, respectively) were not significant, the size of these coefficients suggest that better indicators of these two parental factors might show that they are part of a level-of-living and orientation that is not unrelated to the desire for middle-aged affluency. High adult income aspirations were not affected by high school performance ($X_8$), which upholds the conventional awareness that aspirations are not always guided by behavioral capacities.

The total effects of measured intelligence ($X_6$) and educational attainment ($X_9$) were significant and positive contributors to the level of adult income aspirations ($X_{11}$). Most (79 percent) of the total effect of $X_6$ and $X_{11}$ was direct. Since there were no intervening variables between $X_9$ and $X_{11}$, all of the total effect here was direct. Combined, $X_6$ and $X_9$ accounted for a meagre proportion - six percent - of the variance in $X_{11}$.

Financial management behavior ($X_{12}$). Two of the six microstructural variables contributed significantly to the variations in $X_{12}$. Most of the effects of father's occupation ($X_3$) and home environment ($X_5$) were direct (96 percent and 87 percent, respectively). Given the number of related intervening variables, this pattern of influence is somewhat surprising. In any case, the decomposition of effects upholds the previously given interpretations of the role of father's occupation and family level-of-living and consumer behavior in transmitting

entrepreneurial know-how in financial matters. This expertise appears to develop independently of academic ability ($X_6$), achievement training ($X_7$) and academic performance ($X_8$). It was, however, significantly and directly influenced by a respondent's educational attainment ($X_9$).

Participation in work-related voluntary associations ($X_{13}$). The total effects of the first five parental family variables ($X_1$ - $X_5$) and measured intelligence ($X_6$) were not statistically significant. As with $X_{12}$, a more complex indicator of home environment ($X_5$) may show that it has a significant total effect on $X_{13}$. The nonsignificant direct effect (p=.07) of measured intelligence ($X_6$) on $X_{13}$ suppressed its positive total effect (p=.08) to a level of nonsignificance. Nevertheless, $X_6$ had some positive influence on $X_{13}$ via $X_7$ - $X_9$. The respective beta weights are p=.03, p=.08, and p=.04.

In terms of their total effects, achievement training ($X_7$), high school performance ($X_8$) and education attainment ($X_9$) contributed significantly to participation in occupationally related voluntary associations ($X_{13}$). Over half of the total influences of $X_7$ and $X_8$ were conveyed by subsequent, intervening variables. Twenty-one percent of the total effect of $X_7$ on $X_{13}$ was transmitted by way of its effect on $X_8$; another 30 percent of its total effect on $X_{13}$ was via its effect on $X_9$. Similarly, 55 percent of a respondent's overall grade performance in high school ($X_8$) on his early adult participation in purposeful and work-related associations ($X_{13}$) was mediated by his level of educational attainment ($X_9$). The remaining portions of the total effects of $X_7$ and $X_8$ on $X_{13}$ were direct, as was the total effect of $X_9$. The data suggest that participation in purposeful associations is part of a broader, active orientation toward life that is influenced by parental expectations, high school performance, and type of education.

Mid-life occupational attainment ($X_{14}$). Table 14 displays the decomposition of the total effects of 13 predictors of middle-adult occupational attainment ($X_{14}$) among the present sample of rural-reared Pennsylvania males. The two indicators of ascribed culture (father and mother's education, $X_1$ and $X_2$), father's occupation ($X_3$), and number of siblings ($X_4$) did not have significant total effects on $X_{14}$. The effects of these indicators of family background on the attainment process were exerted apparently during the earlier stages of the respondents' life cycles. Neither the indirect effects or the direct effects of the first four model variables contributed significantly to the variance in $X_{14}$.

Parental home environment ($X_5$) and achievement training ($X_7$), respectively, significantly increased $X_{14}$ via indirect and direct channels of influence. Eighty percent of the total effects of $X_5$ on $X_{14}$ was via mediating variables. Most of its indirect effect was conveyed by five variables: $X_6$ and $X_7$ each transmitted 15 percent of $X_5$'s total effect on $X_{14}$; $X_8$, $X_9$, and $X_{10}$ mediated 12 percent,18 percent, and 16 percent, respectively. The amount passed on by $X_{11}$, $X_{12}$, and $X_{13}$ was

Table 14. Total effects, indirect effects, and direct effects (percentage estimates in parentheses) for mid-life occupational attainment ($X_{14}$) by 13 predictor variables over a 24-year period.

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_9$ on $X_{14}$ via $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ | $X_{11}$ | $X_{12}$ | $X_{13}$ | Direct effect |
|---|---|---|---|---|---|---|---|---|---|---|
| $X_1$ | .0543 | .0403 | .0130 | .0011 | .0062 | -.0192 | .0005 | -.0002 | -.0000 | .0031 |
| $X_2$ | .0123 | .0098 | -.0104 | -.0033 | .0076 | .0141 | .0004 | .0005 | .0002 | -.0067 |
| $X_3$ | .0732 | -.0162 (22%) | .0104 (14%) | -.0204 (28%) | .0420 (57%) | .0281 (38%) | -.0003 | .0028 | -.0000 | .0269 (37%) |
| $X_4$ | -.0392 | -.0312 | .0284 | .0038 | .0037 | .0048 | .0000 | -.0010 | -.0001 | .0022 |
| $X_5$ | .1396* | .0213 (15%) | .0207 (15%) | .0167 (12%) | .0251 (18%) | .0231 (16%) | .0018 (1%) | .0042 (3%) | .0001 | .0270 (20%) |
| $X_6$ | .2021* | -- | .0424 (21%) | .0698 (34%) | .0543 (27%) | .0159 (8%) | .0034 (2%) | .0000 | -.0003 | .0166 (8%) |
| $X_7$ | .2239* | -- | -- | .0500 (22%) | .0682 (30%) | .0464 (21%) | .0013 (1%) | .0011 (1%) | .0004 | .0565 (25%) |
| $X_8$ | .2848* | -- | -- | -- | .1447 (51%) | .0332 (12%) | -.0015 | .0013 | .0004 | .1067 (37%) |
| $X_9$ | .4295* | -- | -- | -- | -- | .1227 (29%) | .0032 (.5%) | .0030 (.5%) | .0015 | .2991 (70%) |

Table 14. (Continued)

| Predictor variables | Total[a] effect | Indirect effects of $X_1$ - $X_9$ on $X_{14}$ via $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ | $X_{11}$ | $X_{12}$ | $X_{13}$ | Direct effect |
|---|---|---|---|---|---|---|---|---|---|---|
| $X_{10}$ | .2745* | -- | -- | -- | -- | --[b] | -- | -- | -- | .2745 |
| $X_{11}$ | .0267 | -- | -- | -- | -- | --[b] | -- | -- | -- | .0267 |
| $X_{12}$ | .0262 | -- | -- | -- | -- | --[b] | -- | -- | -- | .0262 |
| $X_{13}$ | .0049 | -- | -- | -- | -- | --[b] | -- | -- | -- | .0049 |

[a]The percentages of the distribution of indirect and direct effects of total effects with beta weights (path coefficients) of .05 or less will not be calculated.

[b]By definition, the indirect effect of one variable on a consequent variable requires the presence of an intervening variable between the antecedent causal variable and the latter. Since there were no variables intervening between $X_{10}$, $X_{11}$, $X_{12}$ and $X_{13}$ - they were all measured at a single point in time and subsequently were placed in the model at one point in time, 1957 - , the total effects of these four variables on $X_{14}$ are equal to their respective direct effects on it.

*Absolute value for the coefficient is at least twice as large as the standard error.

negligible. As with $X_5$, 75 percent of the total effect of $X_7$ on $X_{14}$ was indirect. High school performance ($X_8$), education ($X_9$), and early adult occupational rank ($X_{10}$) transferred the direct effects of parental achievement training ($X_7$) on them to tangible occupational benefits for the respondents at age 40. The percentage distribution of the total effect of $X_7$ on $X_{14}$ among $X_8$, $X_9$, and $X_{10}$ was as follows: $X_8$ (22 percent), $X_9$ (30 percent), and $X_{10}$ (21 percent). Again, $X_{11}$, $X_{12}$, and $X_{13}$ were not significant in the process of transferring the direct effects of parental inputs from an earlier stage of the model to a later one. In sum, the significant total effects of $X_5$ and $X_7$ on $X_{14}$ uphold the underlying assumption of this report, namely, that aspects of an individual's family background significantly influence his level of occupational attainment at the mid-point of his career.

The characteristics of individuals also showed themselves to be important predictors of attainment levels. The total effects of measured intelligence ($X_6$), high school performance ($X_8$), and educational attainment ($X_9$) were significantly related to mid-life occupational attainment ($X_{14}$). Ninety-two percent of the total effect of $X_6$ on $X_{14}$ was indirect. Most of it was mediated by immediately specified subsequent variables: $X_7$ (21 percent), $X_8$ (34 percent), $X_9$ (27 percent), and $X_{10}$ (8 percent). Only two percent of the total effects of $X_6$ on $X_{14}$ was mediated by variables in a later early adult stage of the model. Similarly, 63 percent of the total effect of $X_8$ on $X_{14}$ was mediated by immediately adjacent variables. Fifty-one percent of it was conveyed by educational attainment ($X_9$); another 12 percent was transmitted by early adult occupational attainment ($X_{10}$). The remaining portion (37 percent) was a result of high school performance's direct effect of $X_{14}$. Finally, $X_{10}$ mediated 29 percent of educational attainment's total effect on $X_{14}$. The remaining portion of that effect was direct.

The significant effects of $X_6$, $X_8$, and $X_9$ on mid-life occupational attainment ($X_{14}$) support Elder's (1968) and Eckland's (1965) separate observations that the long-term occupational payoffs of measured intelligence and high school performance depend on the attainment of some form of post-high school education. The data also uphold the role of differential early career occupational ranks ($X_{10}$) in translating the individual's characteristics into middle-aged occupational rank benefits. Along with parental home environment ($X_5$) and parental achievement training ($X_7$), measured intelligence ($X_6$), overall academic performance behavior ($X_8$), and educational attainment ($X_9$) explained 40 percent of the variation in mid-life occupational attainment ($X_{14}$).

## Conclusion

The research set two major goals for itself: 1) to focus the matter of replication in results among comparable studies; and 2) within the received tradition of path analytic, causal modeling efforts, to assess the empirical efficacy of certain variables not previously used by other researchers.

The present study attempted to further the utility of the Duncan-Wisconsin model of status attainment by comparing the findings of major past surveys with the present study. A relatively high degree of cross-validation emerged. As examples among others, the direct effects of father's education ($X_1$) on measured intelligence ($X_6$) in the Wisconsin model and the Pennsylvania model were identical (p=.16). The direct effects of number of siblings ($X_4$) on $X_6$ among Hauser's (1969) Tennessee sample and our Pennsylvania survey were nearly identical (p=-.10 vs. p=-.11). The direct effects of measured intelligence ($X_6$) on $X_7$ in the Wisconsin model and our model were very close (p=.18 and p=.19, respectively). The measured direct effects of $X_6$ on high school performance ($X_8$) in the national survey of Alexander and associates (1975) and the Pennsylvania survey had relatively the same weight (p=.43 and p=.39, respectively). In sum, the degree of confirmation among the various regional and national surveys furnishes an empirical basis supporting the significant role of the family in the development of individual human resources, an active orientation, and achievement behavior in the adolescent stages of respondent life cycles.

A degree of confirmation among the surveys compared was also present among the variable relationships in the early adult stages of respondent life cycles. Again, as examples among others, three surveys found nearly the same direct effect of father's occupation ($X_3$) on a respondent's educational attainment ($X_9$). Likewise, the direct effect of $X_3$ on early adult occupational attainment ($X_{10}$) in the national survey of Duncan and associates (1972) and the Pennsylvania survey were about the same strength (p=.12 and p=.10, respectively). Finally, the direct effect of $X_9$ on $X_{10}$ among the four surveys compared was scientifically impressive. Two of the surveys found an identical path coefficient (p=.45) with the other two surveys identifying coefficients that were only slightly higher (p=.46 and p=.52). Overall, the sampling procedures and measurement techniques employed by researchers of status attainment appear to have achieved fair reliability.

The second goal of the present research was to attempt to expand the predictive power of the occupational attainment paradigm. The results of that attempt were mixed. One of the new variables added to the paradigm contributed to a better understanding of the possible influence of a respondent's material home environment on the development of an active orientation and the attainment of a high social status. The direct and total effects of parental home environment ($X_5$) were significant on most of the attainment variables in the present model, underscoring its potential utility to future research efforts. On the other hand, the other new variables did not increase the amount of variance explained in mid-life occupational attainment ($X_{14}$). Financial management behavior ($X_{12}$) did not add greatly to an understanding of the processes of status attainment. In part, the result may reflect the peculiarity of the sample. There was not a wide array of difference in finer levels of management behavior. A similar remark could be applied also to participation in work-related associations ($X_{13}$). Finally, adult income aspiration ($X_{11}$) offered no apparent utility to the present paradigm. Why this occurred was not clear.

A final part of any conclusion about the present analysis needs to take an overview of all the goals simultaneously. The received tradition of path analyses for status attainment has an impressive volume of research and thought. The coherence of the approach is attested to by the realization of a high degree of replication of results. Despite problems in measurement, the ability in the present research to extend somewhat the received model of occupational via new variables adds to the sense of cumulation in the research areas. At the same time, however, one needs to be properly cautious. Of necessity, research on status attainment is historical, the referent is the state and conditions of the society past. We know that societies change. American society is no exception. Indeed, within the present analysis it is apparent that the social milieu for attainment between parents and offspring was dissimilar. A model of attainment that applies reasonably well to one era may not apply as well to another. Thus, there is a need for continued research and replication in this area as with others.

BIBLIOGRAPHY

Alexander, Karl L., Bruce K. Eckland, and Larry J. Griffin
1975 "The Wisconsin model of socioeconomic achievement: a replication." American Journal of Sociology 81 (September):324-342.

Alwin, Duane F., and Robert M. Hauser
1975 "The decomposition of effects in path analysis." American Sociological Review 40 (February):37-47.

Bealer, Robert C.
1975 "Theory and rural sociology." Rural Sociology 40 (Winter):455-477.

Belcher, John C.
1972 "A cross-cultural household level-of-living scale." Rural Sociology 37 (June):208-220.

Belmont, Lillian, and Francis A. Marolla
1973 "Birth order, family size, and intelligence." Science 14 (December):1096-1101.

Bender, Lloyd D., Daryl J. Hobbs, and James F. Golden
1967 "Congruence between aspirations and capabilities of youth in a low-income rural area." Rural Sociology 32 (September):278-289.

Blake, Judith, and Kingsley Davis
1964 "Norms, values, and sanctions." Pp. 456-484 in Robert E. L. Faris (ed.), Handbook of Modern Sociology. Chicago: Rand McNally and Company.

Blalock, Hubert M., Jr.
1967 "Status inconsistency, social mobility, status integration and structural effects." American Sociological Review 32 (October): 790-801.

Blalock, Hubert M., Jr.
1968 "The measurement problem: a gap between the languages of theory and research." Pp. 5-27 in Hubert M. Blalock, Jr. and Ann Blalock (eds.), Methodology in Social Research. New York: McGraw-Hill.

Blau, Peter M., and Otis Dudley Duncan
1967 The American Occupational Structure. New York: John Wiley & Sons, Inc.

Boudon, Raymond
1974 Education, Opportunity, and Social Inequality. New York: John Wiley & Sons, Inc.

Brown, C. Harold, and Roy C. Buck
1961 Factors Associated with the Migrant Status of Young Adult Males from Rural Pennsylvania. University Park: Pennsylvania Agricultural Experiment Station, Bulletin 676.

Buck, Roy Clair
1947 "The effect of the place of residence on personality development in rural areas of southeastern Pennsylvania, 1957." University Park: The Pennsylvania State University, unpublished Ph.D. dissertation.

Carter, Lewis F.
1971 "Inadvertent sociological theory." Social Forces 50 (September): 12-25.

Duncan, Otis Dudley
1961 "A socioeconomic index for all occupations." Pp. 109-138 in Albert J. Reiss, Jr. (ed.), Occupations and Social Status. New York: Free Press of Glencoe.

Duncan, Otis Dudley
1966 "Path analysis: sociological examples." American Journal of Sociology 72 (July):1-16.

Duncan, Otis Dudley, and Robert W. Hodge
1963 "Education and occupational mobility a regression analysis." The American Journal of Sociology 68 (May):629-643.

Duncan, Otis Dudley, David L. Featherman, and Beverly Duncan
1972 Socioeconomic Background and Achievement. New York: Seminar Press, Inc.

Eckland, Bruce K.
1965 "Academic ability, higher education, and occupational mobility." American Sociological Review 30 (October):735-746.

Edwards, Alba M.
1938 A Social-Economic Grouping of the Gainful Workers of the United States, 1930. Washington, D.C.: U.S. Government Printing Office.

Elder, Glen H., Jr.
1968 Children of the Great Depression. Chicago: The University of Chicago Press.

Featherman, David L., and Robert M. Hauser
1976 "Changes in the socioeconomic stratification of the races, 1962 - 1973." American Journal of Sociology 82 (November):621-651.

Fleming, Phyllis L.
1969 "Factors affecting changes in occupational aspirations from adolescence to adulthood." University Park: The Pennsylvania State University, unpublished Ph.D. dissertation.

Fuguitt, Glenn V.
1961 "A typology of the part-time farmer." Rural Sociology 26 (Spring):39-48.

Gansemer, Lawrence P.
1976 "Family background and occupational attainment: a longitudinal study of rural-reared Pennsylvania males." University Park: The Pennsylvania State University, unpublished Ph.D. dissertation.

Haller, A. O.
1968 "Education and the occupational achievement process." Pp. 149-169 in the President's National Advisory Commission on Rural Poverty, Rural Poverty in the United States. Washington, D.C.

Haller, Archibald O., and Alejandro Portes
1973 "Status attainment processes." Sociology of Education 46 (Winter):51-91.

Haller, Archibald O., and William H. Sewell
1967 "Occupational choices of Wisconsin farm boys." Rural Sociology 32 (March):37-55.

Hargens, Lowell L.
1976 "A note on standardized coefficients as structural parameters." Sociological Methods & Research 5 (November):247-256.

Hauser, Robert M.
1969 "Schools and the stratification process." American Journal of Sociology 74 (May):587-611.

Hausknecht, Murray
1962 The Joiners: A Sociological Description of Voluntary Association Membership in the United States. New York: The Bedminster Press.

Hess, Robert D., and Virginia C. Shipman
1965 "Early experience and the socialization of cognitive modes in children." Child Development 36 (September-December):869-886.

Howell, Robert E.
1970 "Factors influencing the occupational attainment of Pennsylvania young males from nonmetropolitan areas." University Park: The Pennsylvania State University, unpublished Ph.D. dissertation.

Jackson, Elton F., and Richard F. Curtis
1968 "Conceptualization and measurement in the study of social stratification." Pp. 112-149 in Hubert M. Blalock, Jr. and Ann B. Blalock (eds.), Methodology in Social Research. New York: McGraw-Hill.

Johnson, Nan E., and C. Shannon Stokes
1976 "Family size in successive generations: the effects of birth order, intergenerational change in lifestyle, and familial satisfaction." Demography 13 (May):175-187.

Kelley, Jonathan
1973 "Causal chain models for the socioeconomic career." American Sociological Review 38 (August):481-493.

Kennett, K. F.
1973 "Measured intelligence, family size and socio-economic status." The Alberta Journal of Educational Research 19 (December):314-320.

Kerckhoff, Alan
1976 "Socialization or allocation?" Social Forces 55 (December):368-381.

Kim, Jae-On, and Frank J. Kohout
1975 "Special topics in general linear models." Pp. 368-397 in Nie et al. (eds.), Statistical Package for the Social Sciences (second edition). New York: McGraw-Hill.

Kim, Jae-On, and Charles W. Mueller
1976 "Standardized and unstandardized coefficients in causal analysis." Sociological Methods & Research 4 (May):423-438.

Kuvlesky, William P., and Robert C. Bealer
1967 "The relevance of adolescents' occupational aspirations for subsequent job attainments." Rural Sociology 32 (September): 290-301.

Lane, W. Clayton, and Robert A. Ellis
1968 "Social mobility and anticipatory socialization." The Pacific Sociological Review 2 (Spring):5-14.

Miller, Michael K., and C. Shannon Stokes
1975 "Path analysis in sociological research." Rural Sociology 40 (Summer):193-201.

Otto, Luther B.
1975a "Class and status in family research." Journal of Marriage and Family 37 (May):315-332.

Otto, Luther B.
1975b "Extracurricular activities in the educational attainment process." Rural Sociology 40 (Summer):162-176.

Parsons, Talcott
1951 The Social System. New York: The Free Press.

Pavalko, Ronald M.
1971 Sociology of Occupations and Professions. Illinois: F. E. Peacock.

Pearlin, Leonard I., and Melvin L. Kohn
1966 "Occupation and parental values." American Sociological Review 31 (August):466-479.

Porter, James N.
1974 "Race, socialization and mobility in educational and early occupational attainment." American Sociological Review 39 (June):303-316.

Rehberg, Richard A., Judie Sinclair and Walter E. Schafer
1970 "Adolescent achievement behavior, family authority structure, and parental socialization practices." American Journal of Sociology 75 (May):1012-1034.

Rosen, Bernard C., and Roy D'Andrade
1959 "The psychosocial origins of achievement motivation." Sociometry 22 (September):185-218.

Schoenberg, Ronald
1972 "Strategies for meaningful comparison." Pp. 1-35 in Herbert L. Costner (ed.), Sociological Methodology. San Francisco: Jossey-Bass.

Sewell, William H., and Robert M. Hauser
1972 "Models of the status attainment process." American Journal Agricultural Economics 54 (December):851-861.

Sewell, William H., and Vimal P. Shah
1967 "Socioeconomic status, intelligence, and the attainment of higher education." Sociology of Education 40 (Winter):1-23.

Sewell, William H., Archibald O. Haller, and George W. Ohlendorf
1970 "The educational and early occupational status attainment process: replication and revision." American Sociological Review 35 (December):1014-1027.

Sewell, William H., Archibald O. Haller, and Alejandro Portes
1969 "The educational and early occupational attainment process." American Sociological Review 34 (February):82-92.

Simpson, Richard L.
1962 "Parental influence, anticipatory socialization, and social mobility." American Sociological Review 27 (August):511-522.

Stacey, B. G.
1965 "Some psychological aspects of inter-generation occupational mobility." British Journal of Social and Clinical Psychology 4 (December):275-286.

Thomas, Lawrence G.
1956 The Occupational Structure and Education. Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Thorndike, Robert L., and Elizabeth Hagen
1961 Measurement and Evaluation in Psychology and Education (Second edition). New York: John Wiley & Sons, Inc.

Turner, Ralph H.
1962 "Some family determinants of ambition." Sociology and Social Research 46 (July):397-411.

Wright, Sewall
1934 "The method of path coefficients." Annals of Mathematical Statistics 5 (March):161-183.

Wright, Sewall
1960 "Path coefficients and path regressions: alternative or complementary concepts?" Biometrics 16 (June):189-202.

Zajonc, Robert B.
1975 "Dumber by the dozen." Psychology Today 8 (January):37-43.

Zajonc, R. B., and Gregory B. Markus
1975 "Birth order and intellectual development." Psychological Review 82:74-88.

## APPENDIX A

The beta weights, the standard error coefficients of beta and an indication of those coefficients that were statistically significant for all of the regression equations that were used to generate the empirical model.

| Regression equations | | Beta | Standard error of beta | 2 x Standard error of beta |
|---|---|---|---|---|
| $X_6 = f$ | (X1 | .16412 | .05776 | .11552* |
| | X2 | .03999 | .05377 | .10754 |
| ($R^2 = .06$) | X3 | -.06683 | .05184 | .10368 |
| | X4 | -.09859 | .04738 | .09476* |
| | X5) | .08720 | .04949 | .09898 |
| $X_7 = f$ | (X1 | .05741 | .05745 | .11490 |
| | X2 | -.04607 | .05304 | .10608 |
| ($R^2 = .09$) | X3 | .04629 | .05120 | .10240 |
| | X4 | -.12631 | .04692 | .09384* |
| | X5 | .09166 | .04895 | .09790* |
| | X6) | .18869 | .04627 | .09254* |
| $X_8 = f$ | (X1 | .03852 | .05298 | .11960 |
| | X2 | -.01151 | .04890 | .09780 |
| ($R^2 = .23$) | X3 | -.07105 | .04721 | .09442 |
| | X4 | .01323 | .04358 | .08716 |
| | X5 | .05796 | .04527 | .09054 |
| | X6 | .39213 | .04340 | .08680* |
| | X7) | .17728 | .04329 | .08658* |
| $X_9 = f$ | (X1 | .01438 | .05174 | .10348 |
| | X2 | .01766 | .04773 | .09546 |
| ($R^2 = .27$) | X3 | .09774 | .04620 | .09240* |
| | X4 | .00848 | .04254 | .08508 |
| | X5 | .05848 | .04427 | .08854 |
| | X6 | .12638 | .04603 | .09206* |
| | X7 | .15870 | .04303 | .08606* |
| | X8) | .33687 | .04591 | .09182* |
| $X_{10} = f$ | (X1 | -.07009 | .04578 | .09156 |
| | X2 | .05118 | .04224 | .08448 |
| ($R^2 = .43$) | X3 | .10239 | .04108 | .08216* |
| | X4 | .01239 | .03763 | .07526 |
| | X5 | .08407 | .03924 | .07848* |
| | X6 | .05801 | .04106 | .08212 |
| | X7 | .16890 | .03864 | .07728* |
| | X8 | .12112 | .04297 | .08594* |
| | X9) | .44713 | .04166 | .08332* |

| Regression equations | | Beta | Standard error of beta | 2 x Standard error of beta |
|---|---|---|---|---|
| $X_{11} = f$ | (X1 | .01927 | .05897 | .11794 |
| | X2 | .01592 | .05440 | .10880 |
| ($R^2 = .05$) | X3 | -.01240 | .05291 | .10582 |
| | X4 | .00067 | .04848 | .09696 |
| | X5 | .06663 | .05054 | .10108 |
| | X6 | .12883 | .05289 | .10578* |
| | X7 | .04668 | .04977 | .09954 |
| | X8 | -.05641 | .05535 | .11074 |
| | X9) | .12029 | .05366 | .10732* |
| $X_{12} = f$ | (X1 | -.00577 | .05747 | .11494 |
| | X2 | .01934 | .05302 | .10604 |
| ($R^2 = .10$) | X3 | .10674 | .05156 | .10312* |
| | X4 | -.03879 | .04241 | .08482 |
| | X5 | .15922 | .04926 | .09852* |
| | X6 | .00084 | .05154 | .10308 |
| | X7 | .04276 | .04850 | .09700 |
| | X8 | .05059 | .05394 | .10118 |
| | X9) | .11543 | .05230 | .10264* |
| $X_{13} = f$ | (X1 | -.00406 | .05579 | .11158 |
| | X2 | .04496 | .05147 | .10294 |
| ($R^2 = .15$) | X3 | -.00549 | .05005 | .10010 |
| | X4 | -.02153 | .04586 | .09172 |
| | X5 | .02139 | .04782 | .09564 |
| | X6 | -.06895 | .05004 | .10008 |
| | X7 | .08000 | .04708 | .09416 |
| | X8 | .08758 | .05237 | .10474 |
| | X9) | .31706 | .05077 | .10154* |
| $X_{14} = f$ | (X1 | .00313 | .04825 | .09650 |
| | X2 | -.00667 | .04396 | .08792 |
| ($R^2 = .40$) | X3 | .02686 | .04303 | .08606 |
| | X4 | .00218 | .03917 | .07834 |
| | X5 | .02696 | .04150 | .08300 |
| | X6 | .01662 | .04295 | .08590 |
| | X7 | .05654 | .04114 | .08228 |
| | X8 | .10673 | .04539 | .09078* |
| | X9 | .29905 | .04986 | .09972* |
| | X10 | .27451 | .04922 | .09844* |
| | X11 | .02666 | .03926 | .07852 |
| | X12 | .02622 | .03809 | .07618 |
| | X13) | .00488 | .04066 | .88132 |

*The beta coefficient is statistically significant as determined by the criterion that it is twice the size of its standard error.

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