



The Educational and Early Occupational Attainment Process
Author(s): William H. Sewell, Archibald O. Haller, Alejandro Portes
Source: *American Sociological Review*, Vol. 34, No. 1 (Feb., 1969), pp. 82-92
Published by: American Sociological Association
Stable URL: <http://www.jstor.org/stable/2092789>
Accessed: 11/11/2009 15:06

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=asa>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



American Sociological Association is collaborating with JSTOR to digitize, preserve and extend access to *American Sociological Review*.

<http://www.jstor.org>

- McClelland, David C.
1961 *The Achieving Society*. New York: D. Van Nostrand.
- Miles, Matthew B.
1964 "Innovation in education: some generalizations." Pp. 631-662 in Matthew B. Miles (ed.), *Innovation in Education*. New York: Bureau of Publications, Teachers College, Columbia University.
- Rettig, Salomon.
1964 "Multiple discriminant analysis: an illustration." *American Sociological Review* 29:398-402.
- Rogers, Everett M.
1962 *Diffusion of Innovations*. New York: Free Press.
- Rogers, Everett M., and Erwin P. Bettinghaus.
1966 "Comparison of generalizations from diffusion research on agricultural and family planning innovations," (Paper presented at the American Sociological Association Annual Meeting, Miami Beach).
- Rogers, Everett M., and Elasy Bonilla de Ramos.
1965 "Prediction of the adoption of innovations: a progress report," (Paper presented at the Rural Sociological Society meetings, Chicago).
- Rulon, Phillip J.
1951 "Distinctions between discriminant and regression analyses and a geometric interpretation of the discriminant function." *Harvard Educational Review* 21 (Spring): 80-90.
- Smithells, Phillip A., and Peter E. Cameron.
1962 *Principles of Evaluation in Physical Education*. New York: Harper & Brothers.
- Straus, Murray A.
1956 "Personality testing the farm population." *Rural Sociology* 21:293-294.
- Taylor, Calvin W., and John Holland.
1964 "Predictors of creative performance." Pp. 15-48 in Calvin W. Taylor and John Holland (eds.), *Creativity: Progress and Potential*. New York: McGraw-Hill.
- Tiedeman, David V.
1951 "The utility of the discriminant function in psychological and guidance investigations." *Harvard Educational Review* 21 (Spring): 71-80.

THE EDUCATIONAL AND EARLY OCCUPATIONAL ATTAINMENT PROCESS *

WILLIAM H. SEWELL, ARCHIBALD O. HALLER AND ALEJANDRO PORTES

University of Wisconsin

This paper presents a path model emphasizing social psychological as well as social structural antecedents of educational and occupational attainment. A causal sequence is proposed which commences with the parents' stratification position and the individual's mental ability. From there it moves to performance in school, then to the influence of significant others, then to levels of educational and occupational aspiration, and, finally, to educational and occupational attainments. The model proves its utility when applied to longitudinal data for a large sample of Wisconsin farm-reared males.

BLAU and Duncan (1967:165-172) have recently presented a path model of the occupational attainment process of the American adult male population. This basic model begins with two variables describing the early stratification position of each person; these are his father's educational and

occupational attainment statuses. It then moves to two behavioral variables; these are the educational level the individual has completed and the prestige level of his first job. The dependent variable is the person's occupational prestige position in 1962. That the model is not without power is attested by the fact that it accounts for about 26 percent of the variance in educational attainment, 33 percent of the variance in first

* Revision of paper originally prepared for delivery at the joint sessions of the Rural Sociological Society and the American Sociological Association, San Francisco, August, 1967. The research reported here was supported by the University of Wisconsin Graduate School, by the Cooperative State Research Service and the University's College of Agriculture for North Central Regional Research Committee NC-86, by funds to the Institute for Research on Poverty at the University of Wisconsin provided by the Office of Economic Opportunity pursuant to

the provisions of the Economic Opportunity Act of 1964, and by a grant from the National Institute of Health, U. S. Public Health Service (M-6275). The writers wish to thank Otis Dudley Duncan for his careful reading and incisive criticisms and Vimal P. Shah for help in the statistical analysis. The conclusions are the full responsibility of the authors.

job, and 42 percent of the variance in 1962 level of occupational attainment. Various additions to the basic model are presented in the volume, but none is clearly shown to make much of an improvement in it. These include nativity, migration, farm origin, subgroup position, marriage, and assortative mating. Without detracting from the excellence of the Blau and Duncan analysis, we may make several observations.

1) Because the dependent behaviors are occupational prestige attainments—attainment levels in a stratification system, it is appropriate to single out variables indicating father's stratification position as the most relevant social structural inputs. It is unfortunate that practical considerations prevented the inclusion of psychological inputs in their model, especially considering the repeated references to one such—mental ability—in the literature on differential occupational attainment (Lipset and Bendix, 1959:203–226; Sewell and Armer, 1966). More recently, this gap has been partially filled (Duncan, 1968a).

2) Also omitted are social psychological factors which mediate the influence of the input variables on attainment. This, too, is unfortunate in view not only of the speculative theory but also the concrete research in social psychology, which suggests the importance of such intervening variables as reference groups (Merton, 1957:281–386), significant others (Gerth and Mills, 1953: 84–91), self-concept (Super, 1957:80–100), behavior expectations (Gross *et al.*, 1958), and levels of educational and occupational aspiration (Haller and Miller, 1963; Kuvlesky and Ohlendorf, 1967; Ohlendorf *et al.*, 1967), and experiences of success or failure in school (Parsons, 1959; Brookover *et al.*, 1965).

It remains to be seen whether the addition of such psychological and social psychological variables is worthwhile, although there are reasons for believing that at least some of them may be. First, an explanation of a behavior system requires a plausible causal argument, not just a set of path coefficients among temporally ordered variables. As indicated in Duncan's (1968b) recent work, the introduction of social psychological mediating variables offers this possibility, but it does not guarantee it. As it

stands, the Blau-Duncan model fails to indicate why any connection at all would be expected between the input variables, father's education and occupation, and the three subsequent factors: respondent's education, respondent's first job, and respondent's 1962 occupation. Granting differences among social psychological positions, they all agree that one's cognitions and motivations (including, among others, knowledge, self-concept and aspirations) are developed in structured situations (including the expectations of others), and that one's actions (attainments in this case) are a result of the cognitive and motivational orientations one brings to the action situation, as well as the factors in the new situation itself. Second, if valid, a social psychological model will suggest new points at which the causal system may be entered in order to change the attainment behaviors of persons, an issue not addressed by the Blau and Duncan volume. Variables such as the expectations of significant others offer other possibilities for manipulating the outcomes, including educational attainments. Third, in addition to the above advantages, a social psychological model of educational and occupational attainment might add to the explanation of variance in the dependent variables.

THE PROBLEM

The present report extends the attempts of the writers (Sewell and Armer, 1966; Sewell and Orenstein, 1965; Sewell and Shah, 1967; Sewell, 1964; Haller and Sewell, 1967; Portes *et al.*, 1968; Haller, 1966; Haller and Miller, 1963; Miller and Haller, 1964; Sewell *et al.*, 1957) to apply social psychological concepts to the explanation of variation in levels of educational and occupational attainment. We assume (1) that certain social structural and psychological factors—initial stratification position and mental ability, specifically—affect both the sets of significant others' influences bearing on the youth, and the youth's own observations of his ability; (2) that the influence of significant others, and possibly his estimates of his ability, affect the youth's levels of educational and occupational aspiration; (3) that the levels of aspiration affect subsequent levels of educational attainment; (4) that education in turn affects

levels of occupational attainment. In the present analysis we assume that all effects are linear; also, that the social psychological variables perform only mediating functions.

More specifically, we present theory and data regarding what we believe to be a logically consistent social psychological model. This provides a plausible causal argument to link stratification and mental ability inputs through a set of social psychological and behavioral mechanisms to educational and occupational attainments. One compelling feature of the model is that some of the inputs may be manipulated through experimental or other purposive interventions. This means that parts of it can be experimentally tested in future research and that practical policy agents can reasonably hope to use it in order to change educational and occupational attainments.

A SOCIAL PSYCHOLOGICAL MODEL

The model treats causal relationships among eight variables. X_1 is the occupational prestige level attained by the adult person, or *occupational attainment* (OccAtt); X_2 is the educational level he had previously attained, or *educational attainment* (EdAtt); X_3 is the occupational prestige level to which he aspired as a youth, or *level of occupational aspiration* (LOA); X_4 is his *level of educational aspiration* as a youth (LEA); X_5 is the influence for educational achievement exerted upon him by significant others while still in high school, or *significant others' influence* (SOI); X_6 is the quality of his *academic performance* in high school (AP); X_7 is the level of his family in the stratification system, or *socioeconomic status* (SES); and X_8 is his *mental ability* as measured while he was in high school (MA). Path models (Blau and Duncan, 1967:165-172; Wright, 1934; Wright, 1960; Heise, 1968) require a knowledge of the causal order among the variables. Beyond the causal arguments presented below, additional credibility is suggested by the existence of a plausible temporal order among variables. X_7 (SES) and X_8 (MA) precede everything else. X_5 (SOI) and X_6 (AP) precede both aspirations and attainments, and it can be assumed that for the most part X_6 precedes X_5 . Youthful aspirations obviously precede later educational and occupational

attainments. Pre-adult educational attainments precede adult occupational attainments.

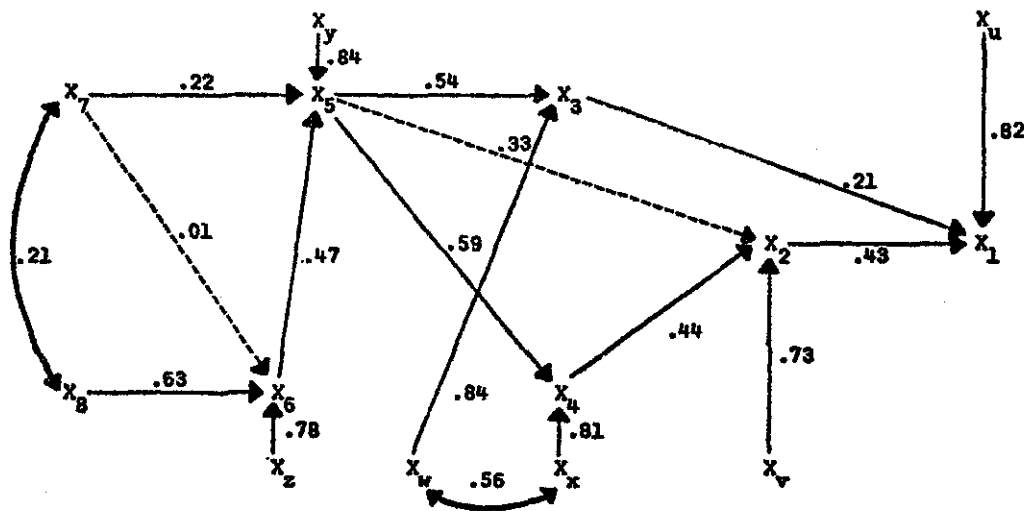
By no means do all of the possible causal linkages seem defensible. The most likely ones are indicated in Diagram 1. In it straight solid lines stand for causal lines that are to be theoretically expected, dotted lines stand for possible but theoretically debatable causal lines, and curved lines represent unanalyzed correlations among variables which cannot be assigned causal priority in present data.

Commencing from the left of the diagram, we assume, as has often been found before (Sewell and Shah, 1967; Sewell *et al.*, 1957), that a low positive correlation, r_{78} , exists between the youth's measured mental ability (MA) and his parents' socioeconomic status (SES). This is the case: $r_{78} = .21$. We anticipate the existence of substantial effect of MA on academic performance (AP). We theorize that significant others' influence (SOI) is controlled by AP, and by socioeconomic status, as well as by exogenous factors, that they exert profound effects on aspiration, and that the latter in turn influences later attainments. A more detailed examination of the theory follows.

Working with partial conceptions of SOI (and using different terminology), Bordua (1960) and Sewell and Shah (1968) have shown that parents' expectations for the youths' attainments are important influences on later aspirations and attainment. Similarly, Cramer (1967), Alexander and Campbell (1964), Campbell and Alexander (1965), Haller and Butterworth (1960), and Duncan *et al.* (1968) have investigated peer influences on aspirations and attainments. Each of these sets of actors, plus some others, may be seen as a special case of reference group influence. Building on such thinking, we have concluded that the key variable here is significant others' influence. Significant others are the specific persons from whom the individual obtains his level of aspiration, either because they serve as models or because they communicate to him their expectations for his behavior (Woelfel, 1967). The term "significant others" is more appropriate than that of "reference group" because it eliminates the implication that collectivities such as one's friends, or

DIAGRAM 1

PATH COEFFICIENTS OF ANTECEDENTS OF EDUCATIONAL AND OCCUPATIONAL ATTAINMENT LEVELS

 X_1 - Occupational Attainment X_2 - Educational Attainment X_3 - Level of Occupational Aspiration X_4 - Level of Educational Aspiration X_5 - Significant Others' Influence X_6 - Academic Performance X_7 - Socioeconomic Status X_8 - Mental Ability

work groups, or parents are necessarily the influential agents for all individuals. Experimental research, beginning with Sherif's work (1935), has shown the importance of other persons in defining one's own situation. One obtains his social behavior tendencies largely through the influence of others. Herriott (1963) has carried this line of thinking into the present area of research. He has shown that one's conception of the educational behavior others think appropriate to him is highly correlated with his level of educational aspiration. Thus, significant others' influence is a central variable in a social psychological explanation of educational and occupational attainment. It is obviously important to discover the causal paths determining SOI, as well as those by which it exerts its effects on attainment. We hypothesize a substantial direct path (p_{57}) from socioeconomic status (SES) to SOI. We also hypothesize a substantial effect of mental ability on SOI. This is because we expect that the significant others with whom the youth interacts base their expectations for his educational and occupational attainments in part on his demonstrated abilities. In turn, this implies that the path from

mental ability (MA) to SOI is indirect by way of academic performance (AP). Thus, we hypothesize the existence of a pronounced path from MA to AP (p_{68}) and another from AP to SOI (p_{65}). So far we assume that one's grades in school are based on the quality of his performance. A strong undercurrent in the literature seems to have held, however, that the youth's family's SES has a direct influence on his grades (Havighurst and Neugarten, 1957:236-237). To our knowledge, this has not been adequately demonstrated, and in large high schools, often far removed from the youth's home and neighborhood, this may well be debatable. Nevertheless, since it is at least possible that school grades (the evidences of performance) are partly determined by teachers' desires to please prestigious parents or to reward "middle-class" behavior, we have drawn a dotted path (p_{87}) from SES to AP, allowing for the possibility of such an influence.

We hypothesize that the major effects of significant others' influence (SOI) on attainment are mediated by its effects on levels of aspiration. Thus, we have indicated a path (p_{35}) from SOI to level of occupational

aspiration (LOA) and another (p_{45}) from SOI to level of educational aspiration (LEA). It is not inconsistent with this to suspect the possibility that SOI might have a direct influence on later educational attainment (EdAtt); we have thus included a dotted or debatable path (p_{25}) from SOI to EdAtt. Because we are here referring to SOI during late high school, it must necessarily refer largely to college education. There is, therefore, no reason to include such a path from SOI to occupational attainment.

Levels of educational aspiration (LEA) and occupational aspirations (LOA) are known to be highly correlated, since education is widely, and to some extent validly, considered to be a necessary condition for high occupational attainment (Haller and Miller, 1963:30, 39-42, 96). But LOA and LEA are not identical. (In these data, $r_{34.5} = r_{wx} = .56$.) We expect that LEA will have a pronounced effect on EdAtt (p_{24}), and that its entire effect on level of occupational attainment will be expressed through EdAtt. On the other hand, we do not hypothesize any effect of LOA on EdAtt which is not already contained in its correlation with LEA. Hence, there is no hypothetical path for LOA to EdAtt. A direct effect of LOA on OccAtt (p_{18}) is hypothesized, however.

There are 26 possible paths, given the sequence laid out above. As one can see by counting the paths (straight lines) in Diagram 1, we hypothesize noteworthy effects for only eight of these—ten if the dotted lines are counted. If this were a rigorous theoretical model, path coefficients would be calculated only for these eight (or ten) supposed causal connections. We believe that because of the fact that it is not rigorous, and at this stage of our knowledge probably cannot be, it would be well to calculate all of the possible 26 path coefficients, using the calculated values as rough indicators of the influences operating in the system. If the theoretic reasoning is a fair description of the reality to which it is addressed, the path coefficients for the eight (or ten) predicted causal lines should be considerably greater than those for the remainder where no causal prediction was made. Also, it is entirely possible that some unhypothesized causal lines might turn out to be of importance. This, too, argues for calculating the

whole set of 26. These data are presented in tabular form (Table 3) below.

METHOD

In 1957 all high school seniors in Wisconsin responded to an extensive questionnaire concerning their educational and occupational aspirations and a number of potentially related topics. In 1964 one of the authors (Sewell) directed a follow-up in which data on later educational and occupational attainments were collected from an approximately one-third random sample of the respondents in the original survey.

This study is concerned with those 929 subjects for whom data are available at both times, in 1957 and 1964, and who (a) are males and (b) whose fathers were farmers in 1957. Zero-order correlations are computed on all 929 cases, using a computer program which accepts missing data. All higher order coefficients are based on 739 cases for whom data on each variable were complete. (The matrices of zero-order correlations between all eight variables for those two sets of cases are practically identical.)

Variables

Level of occupational attainment (X_1 —OccAtt) was measured by Duncan's (1961) socioeconomic index of occupational status.

Level of educational attainment (X_2 —EdAtt) was operationalized with data obtained in 1964 by dividing the sample into those who have had at least some college education and those who have not had any at all.¹

¹ It is important to note that the timing of the follow-up was such as to allow most individuals to complete their education up to the bachelor's degree and beyond. It is unlikely that the educational attainment of the sample as a whole will change much in the years to come. On the other hand, while the span of seven years allowed those individuals who did not continue their education to find a stable position in the occupational structure and even improve upon it, there was not enough time for those who continued their education to do the same. A few of the latter were still in school; most had just begun their occupational careers. It is therefore possible that a follow-up taken five or ten years from now would show greater differentiation in attainments as the educated group gathers momentum and moves up in the occupational world.

Level of occupational aspiration (X_4 —LOA) was determined by assigning Duncan's (1961) socioeconomic index scores to the occupation indicated by the respondent as the one he desired to fill in the future.

Level of educational aspiration (X_5 —LEA) is a dichotomous variable corresponding to the respondent's statement in 1957 of whether or not he planned to attend college after graduating from high school.

Index of significant others' influence (X_6 —SOI) is a simple summated score (range: zero to three) of three variables: (a) The youth's report of his parents' encouragement for college, dichotomized according to whether or not the respondent perceived direct parental encouragement for going to

TABLE 1. Zero-Order Correlations Between
INDICATORS OF SIGNIFICANT OTHERS' INFLUENCE
IN THE RURAL HIGH SCHOOL

	Index of Sig- nificant Others' Influence		
	Parents' Influence	Friends' Influence	Others' Influence
Parental Influence	.37	.26	.74
Teachers' Influence32	.72
Friends' Influence68
Significant Others' Influence

college. (b) The youth's report of his teachers' encouragement for college, dichotomized in a similar manner, according to whether or not direct teacher encouragement for college was perceived by the respondent. (c) Friends' college plans, dichotomized according to the respondent's statement that most of his close friends planned or did not plan to go to college. These variables, all emphasizing education, were combined because they reflect the same conceptual dimension, and that dimension is theoretically more relevant than any of its component parts. That the three components do in fact measure the same dimension is attested by the positive correlations among them and a subsequent factor analysis. These correlations and the correlation of each with the summated variable, significant others' influence, are shown in Table 1. It may be relevant to point out the composition of this significant others' index in the light of Kelley's distinction (1952). Clearly,

the perceptions of direct parental and teacher pressures toward college conform to the classic case of normative reference groups. The educational plans of close friends, on the other hand, may be thought of as having mixed functions. First, close peer groups may exercise pressure toward conformity, and second, friends' plans also serve for the individual's cognitive comparison of himself with "people like himself." Therefore, though the main character of the dimension indicated by this index is clearly normative, it can be thought of as containing some elements of an evaluative function as well.

Quality of academic performance (X_7 —AP) is measured by a reflected arc sine transformation of each student's rank in his high school class.

Socioeconomic status (X_8 —SES) is measured by a factor-weighted combination of the education of the respondent's father and mother, his perception of the economic status of the family, his perception of possible parental support should he choose to go to college and the approximate amount of such support, and the occupation of his father.³

Measured mental ability (X_9 —MA) is indicated by Henmon-Nelson test scores (1942). The data were taken when the youths were in the junior year of high school. The scores, originally recorded as percentile-ranks, were treated with an arc sine transformation to approximate a normal distribution.⁴

³ Naturally, father's occupation is a constant in this subsample of farm-raised males. It is important to note that the SES mean and standard deviations for this subsample are considerably lower than for the total sample. The low and homogeneous SES levels of this subsample may yield atypical relations among the variables.

⁴ Our previous research (Sewell and Armer, 1966; Haller and Sewell, 1967) has led us to be skeptical of claims that local ecological and school class compositional factors influence aspirations and attainments. Nevertheless the zero-order intercorrelations of five such variables and their correlations with X_1 - X_8 are available (although they are not presented here). Two of these pertain to the county in which the youth attended high school: county level of living and degree of urbanization. Three pertain to his high school senior class: average SES of the class, percentage of the class members whose fathers attended college, and percentage of the class members whose fathers had professional-level occupa-

TABLE 2. ZERO-ORDER CORRELATIONS

	X ₁ Occupational Attainment (Prestige Scores— Duncan)	X ₂ Educa- tional Attain- ment (Years College)	X ₃ Level of Occu- pational Aspiration	X ₄ Level of Educa- tional Aspiration	X ₅ Significant Others' Influence	X ₆ Academic Perfor- mance (Grade Point)	X ₇ Socio- economic Status	X ₈ Measured Mental Ability
X ₁ -Occ. Att.52	.43	.38	.41	.37	.14	.33
X ₂ -Ed. Att.53	.61	.57	.48	.23	.40
X ₃ -LOA70	.53	.43	.15	.41
X ₄ -LEA59	.46	.26	.40
X ₅ -SOI49	.29	.41
X ₆ -AP16	.62
X ₇ -SES21
X ₈ -MA

RESULTS

The zero-order correlation coefficients among eight variables are presented in Table 2. A complete path diagram would involve too many lines to be intelligible, because path coefficients presented in Diagram 1 were calculated for all 26 possible lines implied in the causal order specified above. With the exception of the theoretically dubious direct path from SES to AP, which turned out to be $p_{87}=.01$, each of the path coefficients for causal lines hypothesized in Diagram 1 is larger than those not hypothesized. Both sets of standardized beta (or path) coefficients are presented in Table 3.

This table shows that the reasoning presented in the above section, offering a social psychological explanation for educational and occupational attainment, cannot be too far off the mark. We had hypothesized that SOI (significant others' influence) was of

tions. Though substantially correlated with each other, the variables are uncorrelated with the variables in the above model.

central importance. In fact, it has notable direct effects on three subsequent variables, each of which bears ultimately on prestige level of occupational attainment. Both theory and data agree that SOI has direct effects on levels of educational and occupational aspiration, as well as educational (*i.e.*, college) attainment. In turn, each aspiration variable appears to have the predicted substantial effects on its respective attainment variable. Looking at its antecedents, we note theory and data again agree that SOI is affected directly by SES and indirectly by measured mental ability through the latter's effect on the youth's academic performance. The latter variable is crucial because it provides (or is correlated with) palpable evidence that significant others can observe and, thus to a degree, align their expectations for the youth with his demonstrated ability.

None of the unpredicted paths is very strong, but we must recognize that there may be more operating in such a system than we

TABLE 3. STANDARDIZED BETA COEFFICIENTS FOR HYPOTHESIZED AND NON-HYPOTHESIZED CAUSAL PATHS *

Dependent Variables	Independent Variables						
	X ₂ EdAtt	X ₃ LOA	X ₄ LEA	X ₅ SOI	X ₆ AP	X ₇ SES	X ₈ MA
X ₆ AP	(.01)	.62
X ₅ SOI39	.21	.13
X ₄ LEA45	.18	.07	.08
X ₃ LOA42	.12	-.02	.16
X ₂ EdAtt07	.34	(.23)	.17	.05	.03
X ₁ OccAtt	.38	.19	-.10	.11	.06	.00	.04

* Figures in italics are coefficients for paths hypothesized in Diagram 1.

Figures in parentheses refer to theoretically debatable causal lines.

were able to anticipate from previous thinking. There is a pair of perhaps consequential direct paths from academic performance to educational aspiration ($p_{46}=.18$) and to educational attainment ($p_{26}=.17$). There are several possibilities. The data might imply the existence of a mediating factor, such as one's self conception of his ability, a factor which could influence both educational aspirations and attainment. They also suggest that not all of the effect of ability on educational aspiration and attainments is mediated by SOI. Finally, one's ability may exert a continuing effect on his educational attainments quite apart from the mediation of either significant others or aspirations—and therefore apart from one's conception of his ability. Arguments such as these, however, should not be pressed too far because the figures are small. Another unexpected but noteworthy path links mental ability directly to level of occupational aspiration. We offer no speculation regarding it.

So far we have seen that a consistent and plausible social psychological position is at least moderately well borne out by the analysis of lines of apparent influence of its variables when they are arranged in causal order. How well does the total set of independent variables work in accounting for variance in the attainment variables? In brief, $R^2_{1.2345678}=.34$ and $R^2_{2.845678}=.50$. Thus, the variables account for 34 percent of the variance in level of occupational attainment and 50 percent of the variance in level of educational attainment. Obviously, variables X_5 through X_8 are much more effective in accounting for educational attainment than in accounting for occupational attainment. Indeed, educational attainment alone accounts for 27 percent of the variance in occupational attainment (from Table 3, $r^2_{12}=.52^2=.27$). What we have here, then, is a plausible causal system functioning primarily to explain variation in educational attainment. This, in turn, has considerable effect on occupational attainment. The same set of variables adds a small but useful amount to the explanation of occupational attainment variance beyond that contributed by its explanation of educational attainment.⁴

⁴ Some readers will be interested in the path coefficients as calculated only for the lines hypothe-

DISCUSSION AND CONCLUSIONS

Using father's occupational prestige, the person's educational attainment, and his first job level, Blau and Duncan (1967:165-172) were able to account for 33 percent of the variance in occupational attainment of a nationwide sample of American men. Neither our sample nor our variables are identical with theirs; so it is impossible to assess the total contribution of this study to the state of knowledge as reflected in their work. Educational attainment is strategic in both studies and in this regard the studies are fairly comparable. The present model adds a great deal to the explanation of the social psychological factors affecting that variable. The prospects seem good, too, that if the present model were to be applied to a sample coming from a wider range of the American stratification system with greater age variation, it might prove to be more powerful than it appears with our sample of young farm-reared men. In general, the present take-off on the Blau-Duncan approach to occupational attainment levels seems worthy of further testing and elaboration.

Several comments are appropriate regarding the social psychological position and data presented here. (1) Clearly, the variable we have called significant others' influence is an important factor. The present evidence appears to show that once formed its effects are far-reaching. Also, besides being a powerful explanatory factor, significant others' influence should be amenable to manipulation. It thus suggests itself as a point at which external agents might intervene to change educational and occupational attainment levels. This means that at least part of the system is theoretically amenable to experimental testing. The parts of the

sized in the diagram. For this reason and because of the diagram's parsimony, we have calculated the values for each of its eight paths (or ten, including dubious ones). The restricted model explains 47 and 33 percent of the variance in X_2 and X_1 , respectively. Data not presented here show that the model reproduces the zero-order correlation matrix quite well. For this reason and because the model is an effective predictor of X_2 and X_1 , it may be considered to be fairly valid. Nonetheless, it seems more prudent to rest our case on the less presumptuous data already presented in Table 3. This is why the coefficients presented in the diagram are not discussed here.

present model which are hypothetically dependent upon this variable might be more securely tested if such experiments can be worked out. Also, practical change agents might be able to change levels of attainment, either by inserting themselves or others as new significant others or by changing the expectations existing significant others have for the individual. There may well be a substantial pay-off from more refined work with this variable.

(2) The results seem to indicate, too, that aspirations (a special class of attitudes) are in fact performing mediational functions in transmitting anterior factors into subsequent behaviors. This has been a subject of recent debate, much of which has in effect held that attitudinal variables are useless epiphenomena. This was recently discussed by Fendrich (1967).

Such encouraging results do not, however, mitigate the need for (a) general experimental determination of the supposed effects of attitudes on behaviors, and (b) specific experimental determination of the effects of aspirations on attainments.

(3) The question may be raised as to the extent to which this system is inherently culture-bound. One might wonder whether attainment behavior within an institutionalized pattern of "sponsored" rather than "contest" achievement (Turner, 1960) would change the path model. Besides this (and perhaps other institutionalized types of achievement patterns), there is also the question of the relevance of the model for ascribed occupational attainment systems. Obviously we do not have data bearing on these questions but we may at least discuss them. Let us suppose that the same eight variables are measured on youth in a "sponsored" achievement context. We speculate that if measured mental ability is the basis of selection of those who are to be advanced, then the direct path from mental ability to significant others' influence would increase because sponsors are significant others. (This would require a more general measure of significant others' influence than was used here.) If a variable other than mental ability or socioeconomic status is important to the sponsors, then the residual effect of unmeasured variables on significant others' influence would increase. Since one's

sponsors presumably influence one's aspirations and aspirations in turn mediate attainment, the rest of the model probably would not change much.

Consider the case of ascribed attainment. Here one's parents' position determines what one's significant others will expect of one; mental ability is either irrelevant or controlled by family position; and one's aspirations are controlled by the family. The importance of higher education may vary among basically ascribed systems: in one it may be unimportant, in another it may merely validate one's status, or in still another it may train ascribed elites to fulfill the key social roles in the society. If educational attainment is important within the social system, aspirations will mediate the influence of significant others upon it, and it in turn will mediate occupational attainment. If not, occupational aspirations will mediate occupational attainment and educational attainment will drop out of the path model. In short, by allowing for variations in the path coefficients, the same basic social psychological model might work well to describe attainment in stratification and mobility systems quite different from that of the present sample.

(4) The linear model used here seems to be an appropriate way to operationalize social psychological positions holding that the function of "intervening" attitudinal variables is to mediate the influence of more fundamental social structural and psychological variables on behavior. By assuming linear relations among variables and applying a path system to the analysis, we have cast the attainment problem in such a framework. It seems to have worked quite well. We are sufficiently encouraged by this attempt to recommend that a parallel tack might be made on problems in which the overt behavior variables are quite different from educational and occupational attainment.

(5) Nonetheless, satisfactory as such a linear model and its accompanying theory seems to be, there is still the possibility that other techniques flowing from somewhat different social psychological assumptions might be better. It is possible that, in the action situation, enduring attitudes (such as educational and occupational aspirations) may

function as independent forces which express themselves in relevant overt behaviors to the degree that other personality and situational variables permit. Linear models would thus be effective to the degree that the persons modify their aspirations to bring them in line with potentials for action offered by the latter variables. More importantly, the combined effects of aspirational and facilitational variables would produce nonlinear accelerating curves of influence on behavior variables. For the present types of data, this would imply that parental stratification position, mental ability, and significant others' influence not only produce aspirations, but also, to the extent to which these influences continue more or less unchanged on into early adulthood, they function as differential facilitators for the expression of aspirations in attainments. If this is true, a nonlinear system of statistical analysis handling interaction effects would be even more powerful than the one used in this paper.

of its key proximal antecedents, educational attainment.

REFERENCES

- Alexander, C. Norman, Jr., and Ernest Q. Campbell.
1964 "Peer influences on adolescent educational aspirations and attainments." *American Sociological Review* 29 (August):568-575.
- Bian, Peter M., and Otis Dudley Duncan.
1967 *The American Occupational Structure*. New York: Wiley.
- Borjas, David J.
1960 "Educational aspirations and parental stress on college." *Social Forces* 38 (March):262-269.
- Brookover, Wilbur B., Jean M. LaParo, Don E. Hamachek, Shirley Thomas, and Edsel L. Eskidson.
1965 Self-concept of ability and school achievement. East Lansing: Michigan State University, Bureau of Educational Research Service.
- Campbell, Ernest Q., and C. Norman Alexander.
1965 "Structural effects and interpersonal relationships." *American Journal of Sociology* 71 (November):284-289.
- Cramer, M. R.
1967 "The relationship between educational and occupational plans of high school students." Paper presented at the meeting of the Southern Sociological Society, Atlanta (unpublished).
- 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.
- 1968a "Ability and achievement." *Biogical Quarterly* 15 (March):1-11.
- 1968b "Contingencies in the construction of causal models." Edgar F. Borgatta, (ed.), *Sociological Methodology, forthcoming*.
- Duncan, Otis Dudley, Archibald O. Haller, and Alejandro Portes.
1968 "Peer influences on aspirations: a reinterpretation." *American Journal of Sociology* 74 (September):119-137.
- Fendlich, James M.
1967 "Perceived reference group support: racial attitudes and overt behavior." *American Sociological Review* 32 (December):960-970.
- Gerbh, Hans, and C. Wright Mills.
1953 *Character and Social Structure*. New York: Harcourt, Brace and World.
- Gross, Neal; Ward S. Mason; and Alexander W. McEachern.
1958 *Explorations in Role Analysis*. New York: Wiley.
- Haller, Archibald O.
1966 "Occupational choices of rural youth." *Journal of Cooperative Extension* 4 (Summer):93-102.

(6) It should be remembered that the most highly educated of these young men had just begun their careers when the final data were collected. If the distance between them and the less educated widens, the occupational attainment variance accounted for by the model may well increase. The direct relations of some of the antecedents to occupational attainment may also change. In particular, mental ability may show a higher path to occupational attainment.

(7) Finally, although the results reported in this paper indicate that the proposed model has considerable promise for explaining educational and early occupational attainment of farm boys, its adequacy should now be tested on populations with a more differentiated socioeconomic background. It is quite possible that in such populations the effects of socioeconomic status on subsequent variables may be significantly increased. The effects of other variables in the system may also be altered when the model is applied to less homogeneous populations.

The present research appears to have extended knowledge of the causal mechanism influencing occupational attainment. Most of this was accomplished by providing a consistent social psychological model which adds to our ability to explain what is surely one

- Haller, Archibald O., and Charles E. Butterworth.
1960 "Peer influences on levels of occupational and educational aspiration." *Social Forces* 38 (May):289-295.
- Haller, Archibald O., and Irwin W. Miller.
1963 *The Occupational Aspiration Scale: Theory, Structure and Correlates*. East Lansing: Michigan Agricultural Experiment Station Bulletin 288.
- Haller, Archibald O., and William H. Sewell.
1967 "Occupational choices of Wisconsin farm boys." *Rural Sociology* 32 (March):37-55.
- Havighurst, Robert J., and Bernice L. Neugarten.
1957 *Society and Education*. Boston: Allyn and Bacon.
- Heise, David R.
1968 "Problems in path analysis and causal inference." Edgar F. Borgatta, (ed.), *Sociological Methodology*, forthcoming.
- Hemmon, V. A. C., and M. J. Nelson.
1942 *The Hemmon-Nelson Test of Mental Ability*. Boston: Houghton Mifflin Company.
- Herriott, Robert E.
1963 "Some social determinants of educational aspiration." *Harvard Educational Review* 33 (Spring):157-177.
- Kelley, Harold H.
1952 "Two functions of reference groups." Pp. 410-414 in Guy E. Swanson, et al. (eds.), *Readings in Social Psychology*. New York: Henry Holt and Company.
- Kuvshinov, William P., and George W. Ohlendorf.
1967 *A Bibliography of Literature on Status Projections of Youth: I. Occupational Aspirations and Expectations*. College Station: Texas A&M University, Department of Agricultural Economics and Sociology.
- Lipset, Seymour M., and Reinhard Bendix.
1959 *Social Mobility in Industrial Society*. Berkeley: University of California Press.
- Merton, Robert K.
1957 *Social Theory and Social Structure*. New York: Free Press.
- Miller, I. W., and Archibald O. Haller.
1964 "The measurement of level of occupational aspiration." *Personnel and Guidance Journal* 42 (January):448-455.
- Ohlendorf, George W., Sherry Wages, and William P. Kuvshinov.
1967 *A Bibliography of Literature on Status Projections of Youth: II. Educational Aspirations and Expectations*. College Station: Texas A and M University, Department of Agricultural Economics and Sociology.
- Parsons, Talcott.
1939 "The school class as a social system." *Harvard Educational Review* 29 (Summer):297-318.
- Portes, Alejandro, Archibald O. Haller, and William H. Sewell.
1968 "Professional-executive vs. farming as unique occupational choices." *Rural Sociology* 33 (June):153-159.
- Sewell, William H.
1964 "Community of residence and college plans." *American Sociological Review* 29 (February):24-38.
- Sewell, William H., and J. Michael Armer.
1966 "Neighborhood context and college plans." *American Sociological Review* 31 (April):159-168.
- Sewell, William H., Archibald O. Haller, and Murray A. Strauss.
1967 "Social status and educational and occupational aspiration." *American Sociological Review* 32 (February):67-73.
- Sewell, William H., and Alan M. Orenstein.
1965 "Community of residence and occupational choice." *American Journal of Sociology* 70 (March):551-563.
- Sewell, William H., and Vimal P. Shah.
1967 "Socioeconomic status, intelligence, and the attainment of higher education." *Sociology of Education* 40 (Winter):1-23.
- 1968 "Social class, parental encouragement, and educational aspirations." *American Journal of Sociology* 73 (March):559-572.
- Sherif, Muzafer.
1936 "A study of some social factors in perception." *Archives of Psychology* Number 187.
- Super, Donald E.
1957 *The Psychology of Careers*. New York: Harper.
- Turner, Ralph H.
1960 "Sponsored and contest mobility and the school system." *American Sociological Review* 25 (December):855-867.
- Woolfel, Joseph.
1967 "A Paradigm for research on significant others." Paper presented at the Joint Session of the Society for the Study of Social Problems and the American Sociological Association, San Francisco (unpublished).
- Wright, Sewall.
1934 "The method of path coefficients." *Annals of Mathematical Statistics* 5 (September):161-215.
- 1960 "Path coefficients and regression coefficients: alternative or complementary concept?" *Biometrics* 16 (June):189-202.