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ABSTRACT

This paper argues that the occupational achievement process should be seen as a result of the interplay of structural and individual characteristics. Policies to affect the achievement of a population group may therefore act on either the occupational structure or on the distribution of personal resources. The evaluation of such policies needs indicators that will separate structural and individual contributions to occupational achievement. Common measures of the rate of social mobility between father and son do not enable such separation. Three solutions to the problem of identifying the true sources of variation in achievement are discussed. The most satisfying solution is argued to be one where indicators on the achievement process are developed from the study of job shifts. The influence of structural forces can be seen to determine a person's control over the job shift. The amount of control and a person's resources determines the frequency and outcome of job shifts, and measures of control may be derived from the analysis of both aspects of job shifts.

SOCIAL MOBILITY AS A SOCIAL INDICATOR

Introduction

Social mobility, especially in the form of father-son mobility is generally believed to be an important indicator of the state of a society. In Toward a Social Report (1969), chapter 2 is titled Social Mobility and subtitled "How much opportunity is there?" The degree of father-son mobility was used as a measure of the amount of equality of opportunity. Equality of opportunity is an important societal goal. Hence, social mobility became an indicator of how the society performs with respect to this goal.

Another use of social mobility research for policy purposes is exemplified by Coleman (1971). He uses research of the kind carried out by, for example, Blau and Duncan (1967), to assess the conversion of personal resources (such as education, family background, etc.) into occupational status or income. Mobility research is utilized to estimate parameters in the societal processes that may bring about desired goals (such as higher status for Blacks), rather than to assess the degree to which a given goal is realized.

This paper shall attempt to point to a problem that arises when mobility research is used for the afore mentioned purposes.

The problem, an old one, arises because mobility is generally conceived of as a function of individual, as well as structural, characteristics of society. In other words, a person's mobility (that will result in the attainment of a certain status) is considered a result of certain

characteristics relating to the individual--his ability, education and background--and certain characteristics relating to the occupational structure--the level of employment, the distribution of job-opportunities. The problem of how to separate out the two sources of influence on mobility has been treated by many,--Rogoff (1953), Kahl (1957), Duncan (1966) and most recently, White (1970), to mention some. Still, no satisfactory solution is provided. Measures and models that are supposed to separate individual from structural sources of mobility either do not do the trick very well or are not suitable for the data available (see, for example, Duncan (1966)).

The consequences of this state of affairs are most apparent when social mobility are used as indicators of equality of opportunity. We shall treat this issue first, and attempt to show how the confounding of individual and structural sources of mobility limits the policy inferences that may be made. The confounding also limits the uses of research on the conversion of resources into status attainment. More satisfying solutions are possible here, however, and the last part of the paper shall concentrate on those solutions.

Mobility rate as a social indicator

The chapter on mobility in Towards a Social Report contains an apparent paradox. The first section presents an analysis of change in inequality of opportunity that relies on the correlation between fathers' and sons' status for several cohorts. This correlation is understood to measure equality of opportunity so that the higher the correlation the less equality. This

measure shows virtually no change over the period focussed upon (the correlations are obtained from Blau and Duncan (1967)). The apparent paradox is found a few pages later when father-son mobility tables are presented for Blacks and Whites. The tables indicate that the correlation between the status of father and son is lower for Blacks than for Whites. By the same reasoning that leads the first section of the chapter to conclude that there has been no change in equality of opportunity, Blacks according to these tables, have more equality of opportunity than Whites.

It might be objected that the apparent paradox is only a paradox to the very naive. No one can ignore, from the distribution of Blacks compared to Whites, that race has a strong effect on occupational opportunity. However, this is an inference made on the basis of information not contained in the father-son correlation. If we compare mobility for different places or over time, it is often not clear what information will enable us to explain the observed variation. The attempts to carry out such comparative analysis [Lipset and Bendix (1959), Miller (1960)] testify strongly to the validity of this assertion.

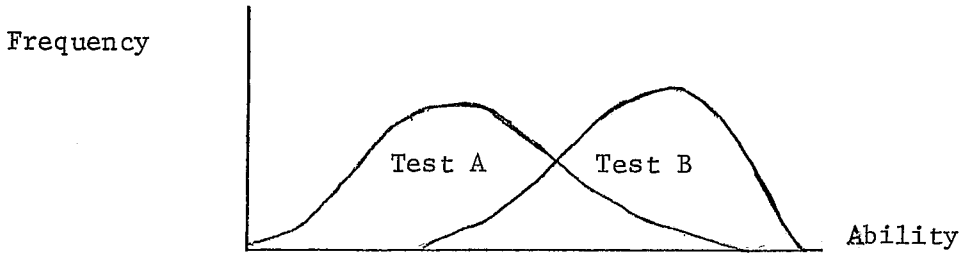
A social indicator that cannot be compared over time or over places is of no use. We need therefore, to know what additional information is necessary for making comparisons of mobility. A theory of mobility is asked for that would give the main causal agents for mobility and hence equality of opportunity. These causal variables would in turn be those on which information is needed.

According to the conceptualization of mobility outlined above, mobility is a function of individual and structural characteristics. Attainment of a

certain occupational status and income is produced by vertical mobility. On the individual level, this form of mobility may be seen as a result of various individual characteristics that determine a person's level of resources. However, the occupational position that will result from a given level of resources also depends on structural characteristics, such as the distribution of job-opportunities and the level of employment. The structural characteristics may vary independently from the distribution of resources. Hence, in general there will not be the same relationship between a person's level of resources and the occupational status he obtains in different societies and in different time periods.

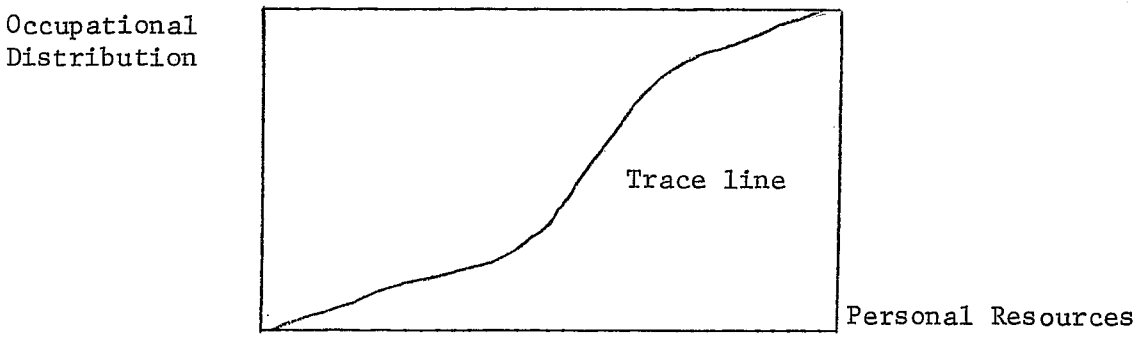
The idea alluded to can be expressed in a language developed in classical psychometrics test theory; a language that has been adopted into sociology in the form of latent structure analysis. [Lord (1953), Lazarsfeld (1966)]. In this language, an observed distribution of test scores is taken to be a function of an underlying distribution of ability that cannot be measured directly. The function that relates observed scores with the underlying distribution is called the operating characteristic or the "trace line." This function is determined by characteristics of the test, and the main problem in this theory is to identify the function. If the trace line can be identified, then inferences can be made on the underlying distribution, and comparisons can be made between populations tested with different tests. Figure 1 illustrates possible relationships between observed test scores and the underlying distribution.

Figure 1



Possible distributions of observed scores for same underlying ability distribution

Figure 2



A hypothetical occupational trace line

In the present context, the observed occupational distribution corresponds to the observed test scores. The underlying ability distribution has its counterpart in the distribution of personal resources. The trace line now is the function that determines the return on a given level of resources. This function is determined by the occupational structure.

Discussion of Figure 2

With this conceptualization, it is clear that the observed occupational distribution may change either because of changes in the underlying distribution of resources (for example through increased education) or because of changes in the occupational structure that determines the trace line. The latter would come about if economic changes created an increase in the size of an occupational group that would make it easier to obtain the corresponding occupational level with a given level of resources.

A person's level of resources is determined by a number of characteristics. Some of these are achieved, such as education; some are ascribed, such as a person's family background. The relationship of single resource variable, whether ascribed or achieved, to the overall level of resources may differ for different populations and in different time periods. In particular, in some societies ascribed characteristics may be more important, in others, achieved characteristics may be the most important for the overall level of resources. It is the relative importance of ascribed characteristics that determines equality of opportunity, as this concept is usually defined.

Social policies may attempt to affect the relative importance of resource variables. In particular, educational programs may be used to reduce the importance of ascribed characteristics for the overall level of resources, and thus increase equality of opportunity. But such programs may not affect the observed bivariate relationship between an ascriptive variable and a person's status in the desired way. The relationship between a given resource variable and a person's status is determined by the occupational trace line. This trace line might be so that there is an overall low return on a person's total resources, and hence also a low correlation of a single (ascriptive) resource variable, with status even though this variable is a dominant one among all resource variables. Obversely, the trace line may be so that the overall return is high and a high correlation of a single resource variable with status would be observed even though this resource variable only has a modest contribution to the overall level of resources.

The social policies that affect the occupational trace line would be very different from the policies that affect the relative contribution of various resource variables to the overall level of resources. The former would attempt a change in the occupational structure, the latter a redistribution of resources. Hence, it does seem important to be able to measure the contribution of resource variables to the overall level of resources independently of the occupational trace line. Only if this is done will it be possible to carry out comparisons over time or of different populations with respect to the contribution of, for example, ascriptive characteristics

to the overall level of resources, even though occupational trace lines differ. Such comparisons are needed to evaluate the success of a policy designed to affect resource distributions as for example are educational programs. An evaluation of policies designed to change the occupational trace line and hence acting on the occupational structure would on the other hand demand comparisons of occupational trace lines in isolation from variations in the distributions of resources. Mobility research in general should enable us to isolate the contribution of the trace line from the contribution of the distribution of resources to occupational achievement if such research is to result in the development of social indicators useful for policy purposes.

Comparisons of zero-order correlations or some other measure of the association between fathers' and sons' status does not enable us to identify differences due to different trace lines and differences due to a variation in the importance of fathers' status for the general level of resources. In the Black-White comparison of mobility rates cited earlier we cannot tell whether the lower association between fathers' and sons' status for Blacks reflects a difference in the trace line, that is a difference in the occupational return on a person's total resources, or whether it reflects a difference between Blacks and Whites in the relative importance of fathers' status as a resource variable. But if the difference is due to the trace lines, then the effective policy would be one that involved structural change. If the trace lines, on the other hand, are identical for Blacks and Whites then the different occupational distribution reflects different distributions of resources and a policy that remedied this would be the

most effective. The lower correlation for Blacks would then tell that fathers' status is not a very important resource for Blacks and a change in the distribution of resources for Blacks would not have to overcome an important effect of this ascriptive characteristic.

Our problem is, in other words, that the simple mobility rate does not enable us to identify the parameters of the causal mechanisms that produce this rate. This problem of identification can only be solved by adding more information to the information contained in the mobility rate. There are several strategies for doing so, and we shall outline three such approaches. One strategy is to make a rather strong assumption about the mechanism that produces occupational attainment and formulate a mathematical model that, if its assumptions are true, would enable us to make inferences on the trace line and the relative importance of resources. This model will be briefly outlined next. A second approach is to attempt a more comprehensive measurement of resources. If one then makes an assumption about the form of the trace line, it is possible to obtain more direct knowledge about the contribution of resource variables and about the magnitude of the difference in status due to variation in the parameters of the function that is assumed for the trace line. The third approach to be outlined is one in which one investigates more directly the forces that produce the occupational trace line in an attempt to determine ultimately, the actual form of this function.

A Model for Access to the Elite

This section describes a simple model that enables one to make inferences on the relative importance of resources for occupational attainment independently

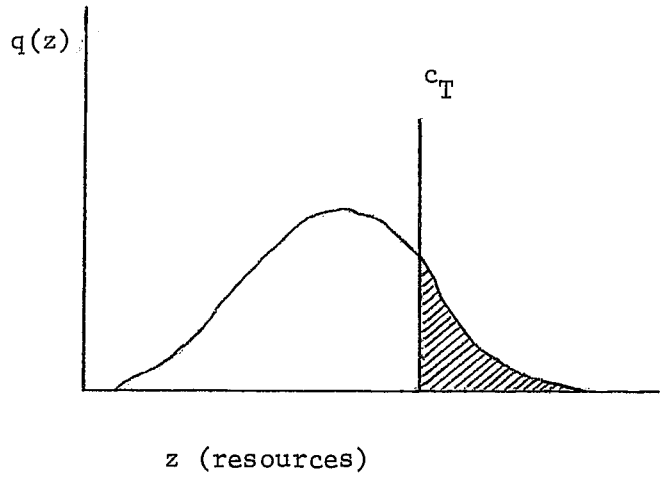
of the occupational trace line, and in particular to assess the contribution of fathers' status to the overall level of resources. The model has the virtue that it only uses the information contained in a father-son mobility table, if fathers' and sons' status is measured on an (approximate) interval scale. It has the defect that it makes some rather strong assumption about the process that generates occupational attainment. The model was originally developed in the context of educational attainment. Here a problem arises, similar to the one just outlined, if one wants to compare, the influence of social origin on a persons' overall level of educational resources over time or between places (Sørensen 1971a).

The model is most appropriate for the study of access to the elite, where by elite we mean the top stratum in a society. The size of this top stratum may vary over time for the same society or vary between societies. The relationship between personal resources, access to the elite and the size of the elite is illustrated in figure 3.

The shaded area to the right denotes the proportion of a given population that gained access to the elite. This proportion is dependent on the distribution of resources and on the minimum level of resources necessary to gain access to the elite. This quantity, denoted c_T on the graph, is determined by the number of positions available in the elite. The number of positions available would of course reflect the occupational trace line.

Suppose now that at any point in time in a person's career he is characterized by a probability p of gaining access to the elite. This

Figure 3



Hypothetical Relationship Between Personal Resources, Access to the Elite and Size of the Elite.

probability decreases over his life time according to the process:

$$\frac{dp}{dt} = -9p \qquad (1)$$

with the initial condition that p = 1 for t = 0 we obtain the solution to this differential equation

$$\log p = -qt \; . \qquad (2)$$

The transition rate q is a function of a person's level of rescources and of the minimum level of resources necessary to obtain access to the elite. Hence,

$$q = z - c_T \; . \qquad (3)$$

This means that the transition rate is seen as a linear function of the distance of a person's level of resources from the minimum necessary to obtain access to the elite. The overall level of resources, z, may be assumed a linear function of a specific resource variable: father's status, x, if only the information contained in a mobility table is used. The effect of this specific variable is measured by d, in the equation:

$$z = d_1 x + d_0 \qquad (4)$$

Inserting and collecting the constant terms including c_T we get:

$$q = b_1 x + b_0 \qquad (5)$$

when $b_1 = d_1$

and $b_0 = d_0 c_T + d_0$ (6)

and therefore: $\log p = -(b_1 x + b_0)t$ (7)

The quantity t may be taken as a constant, a generation. From this equation we predict a linear negative relation between log p and x. The slope of the line relating the two quantities, measures the contribution of x (father's status) to the overall level of resources independent of the size of elite, as c_T contributes to b_0 only. Hence, the model isolates the contribution of the trace line to occupational achievement.

This model has been tested elsewhere (Sørensen 1971b) on data from Denmark and Great Britain, where the resource variable was father's status. The predicted linear fit was good. However, it is a model that makes poor use of the information that may be available on individuals, since it does not allow for individual regression. Although the model need only use the information available in a traditional mobility table one should not make a virtue out of that. The next section illustrates a more satisfactory approach to separate out the influence of the occupational trace line from the contribution of resource variables in producing occupational status.

The Use of Linear Models for the Trace Line

The model just described makes it possible to evaluate the contribution of a single resource variable to the overall level of resources and to isolate the contribution of the trace line to the occupational achievement. This is accomplished only be making a very strong assumption about the mobility process. The main virtue of the model is that it only uses the information contained in a father-son mobility table. A more satisfactory approach would be one where more information about the process is utilized. The use of the more comprehensive measures of a persons resources is one

characteristic of the re-orientation of mobility research that took place in the sixties of which the best known example is the study by Blau and Duncan (1967).

Blau and Duncan, and others associated with this new approach, use linear equations for the relation of personal resources to occupational status. This amounts to assuming a linear model for the trace line that converts personal resources into occupational status. This is the simplest possible assumption about the function but, of course, an assumption that is frequently made.

Various investigators[1] have attempted using the linear model, to partition the difference between two populations in occupational achievement with a component due to differences in the distribution of rescources and a residual component inferred to be "occupational discriminative" or, what in our terminology would be a difference in trace lines. All have focussed on status difference between Blacks and Whites. The partitioning is obtained by manipulating the linear equations for the resource transformation for the two populations. In the case of Black-White comparisons the equations would be:

$$\begin{aligned} Y_B &= b_{0B} + \sum_i b_{iB} X_{iB} \\ Yw &= b_{0W} + \sum_i b_{iW} X_{iW} \end{aligned} \qquad (8)$$

When Y_B and Y_W denote the occupational achievement of Blacks and Whites respectively, b_i's are effects of the resource variables, on changing occupational status. The decomposition of the difference in occupational

achievement is done slightly differently by the various investigators. The common basic idea is to carry out "hypothetical experiments" where the values of the variables and parameters for one population are substituted in the equation for the other. One way to obtain the difference in status due to a difference in the distribution of resources is to substitute the resources of an average White into the equation of Blacks and obtain the predicted achievement. The difference between the predicted achievement and the actual achievements of Blacks is one estimate of the difference in status due to differences in the distribution of resources. A similar estimate may be obtained by substituting the resources of an average Black into the equation for Whites.

The difference in status due to differential distribution of resources leaves a residual difference that has been labelled "occupational discrimination" (e.g., Duncan, 1968). There are two contributions to this residual. One is the differences in the parameters b_i, the other is the constant term b_0. The part of the residual due to difference in b_i's may be obtained by interchanging the coefficients for the two equations keeping the mean values of independent variables. The difference between actual mean achievement and the one predicted by this hypothetical experiment again provides one measure of the component due to differential return on a person's resources. This component may be taken as a measure of the contribution of the differences in occupational trace lines to differences in occupational achievement. One difficulty here is as shown by Coleman and Blum (1970) due to arbitrary zero points in the independent variables. However, as we shall see below, they provide a solution to this problem. The component of the difference in achievement produced by different effect

parameters is only part of what could be explained by the occupational trace line. Also the constant term b_0 gives a contribution which is, however, only under very special circumstances interpretable as reflecting the trace lines exclusively.

The constant term or the intercept, b_0, depends on three factors: the degree to which the assumption about linearity is fulfilled; unmeasured variables; and, arbitrary zero-points in independent variables. Of these three components, the degree to which linearity is upheld should be the same in both populations compared. This component would therefore not affect the interpretation of the difference in occupational achievement not explained by distribution of resources. The contribution of unmeasured variables would depend partly on the distribution of these variables and partly on their effect. Only the latter part represents the trace lines. This component of the constant term therefore cannnot be allocated to the residual difference in occupational achievement due to the trace line without making the assumption that unmeasured variables either do not exist or have the same distribution in both populations. This seems a rather unreasonable assumption in most cases.

The contribution to the constant term due to arbitrary zero points in independent variables might be considered of no importance since it would affect both populations equally. Coleman and Blum (1970) however show that the arbitrary zero-points do affect the amount which is contributed by a difference in the b_i's to the difference in occupational achievement. They propose a solution to this by adjusting independent variables with their

standard-deviation. This solution gives a partitioning of the difference in occupational achievement into three components: a part due to differences in levels of resources, a part due to difference in b_i's after adjusting for arbitrary zero-points, and an unexplained part involving the constant term. Their solution does give a measure of the difference in occupational achievement due to the slopes of the trace line but this measure of course only reflects a differential operation of the trace line for those variables that are measured. The component involving the constant term still is determined by unmeasured variables and its interpretation therefore is ambiguous.

It appears that partitioning the difference in occupational achievement is best suited to establish how much of the observed difference is due to differential distribution of directly measured resources. The residual difference cannot, however, be interpreted as being produced only by differences in occupational trace lines between the populations compared, since the residual also will reflect unmeasured resource variables and their efficacy.

Linear models may be used to establish the relative contribution of specific resource variables in that the rank order of their contribution may be established and compared for the population analyzed. This is, of course, a major virtue of the use of linear models. However, since linear models do not isolate clearly the contribution of the trace line to the return on resources the inferences that can be drawn are dependent on the validity of the measurement of resources. This is often a problem, for example, when interpreting the contribution of education to the overall level

of resources. Here, it may be a problem to establish to what extent quality of schooling rather than differential returns on the same level of schooling accounts for an observed difference in return.

The major weakness of the use of linear models is the ambiguity of the interpretation of that part of the observed difference in occupational achievement not due to differential distribution of measured resources. Since this residual cannot be attributed exclusively to the trace line, a direct investigation of the trace line seems desirable. An illustration of how this may be done is given next.

Direct investigations of the occupational trace lines

The ambiguity that arises when partitioning the difference in occupational achievement between two populations is due to the confounding of unmeasured variables with the operation of the trace line. It is of course nearly always the case that measurement errors are present and presents difficulty for the analysis. The situation is however, especially bothersome in the models described above. This is because the partitioning of the difference in status with linear models has been developed without an explicit conceptualization of how the occupational trace line operates. There is therefore, no standard for evaluating the usefulness of various techniques and the meaningfulness of results. This absence of theory more than the use of linear models seems to be responsible for the ambiguity described above.

We need to be more explicit about the operation of the trace line; that is, we need to be able to specify the interaction of structural and individual characteristics in producing occupational achievement. This

section will present such an attempt at specifying the influence of structural characteristics on occupational achievement that may indicate one direction in which to go.

The reorientation of mobility research that produce the linear models for the conversion of resources into occupational achievement has not been concerned with the influence of structural characteristics on occupational achievement. Rather the concern has been to obtain precise estimates of the effect of resource variables on achievement. These estimates are obtained on a population aggregate of all ages and stages in the occupational achievement process--reflecting a variety of structural conditions. This aggregation seems to prohibit any detailed analysis of the structural forces, so the lack of concern for these forces is understandable. To overcome this obstacle it seems necessary to focus directly on the mechanisms that produce occupational achievement.

It can be reasonably assumed that all major variations in occupational achievement occur through job shifts. At the same time, job shifts are acts of mobility. It therefore appears that a focus on job shift might provide us with a link between the individual and structural characteristics that produces occupational achievement.

Detailed information on job shifts are hard to get, but the Hopkins Life-History study[2] gives data on all job shifts undertaken by a sample of a cohort of 30-39 year-old men from the time they entered the labor-force to the time of interview. These job shifts have been analyzed elsewhere (Sørensen, 1972). Some of the main results of this analysis are relevant, however, for the present argument.

The level of occupational achievement, at a point in time, is a result of the outcome and frequency of job shifts. Hence, the analysis of these two aspects of a person's job shifts are main components of an analysis that will explain occupational achievement by the job shifts he undertakes. For this analysis, a simple, but fruitful, basic assumption about individual occupational behavior is that individuals maximize occupational achievement and carry out job shifts whenever they perceive that they can realize a gain in prestige and income. Individuals are, however, subject to structural factors that constrain their attempts to maximize achievement. The distribution of job opportunities and the level of employment affects a person's opportunities for undertaking profitable job shifts, and may in fact lead him to carry out unprofitable shifts, if he is forced out of his previous job.

A person's value in the job market is determined by his resources. It follows that a person's chances for realizing a gain in a job shift will depend on the occupational achievement already obtained in relation to the level of resources. These factors will determine the decision to undertake a job shift so that, controlling for the level of achievement, the higher a person's level of resources, the more likely a job shift. Obversely, given the level of resources, the higher the achievement the less likely a job shift.

Other factors influence the decision to leave. In particular, persons may be exposed to varying degrees of pressure to leave their jobs, as a reflection of the level of employment. Such structural characteristics

may be seen to affect a person's control over the decisions to leave, that is the degree to which job-holders can voluntarily decide when to leave their job. If a person has no control then he is forced into a job shift against his will; if he has full control, then he can decide himself when to leave the job. The concept of control over the decision to leave in this way mediates the influence of structural characteristics.

The amount of control that a person had when undertaking the job shift will determine the outcome of the shift. If a person has full control over the decision to leave, then we will expect that the likelihood of leaving is determined by his resources in relation to the level of achievement already obtained. If, on the other hand, he has no control over the decision to leave, then we will expect that the likelihood of leaving cannot be explained by achievement and resources. It follows that a measure of the amount of variation we can explain by resources and achievement in the likelihood of leaving will be a measure of the amount of control over the decision to leave.

The likelihood of leaving a job can be found as a function of its duration. After being adjusted for its age dependency, this variable for each job, held by each respondent, may be used as a dependent variable with measures of achievement level of the job and resources of the job-holder as independent variables. It was found (Sørensen, 1972), using multiple regression on these variables, that the partial regression coefficients to resource variables were positive, and the coefficients to achievement measures negative as the above reasoning predicts. Furthermore, the amount of variance explained, R^2, gives a measure of the influence of structural characteristics on the amount of control.

The interpretation of R^2 may be verified by dividing the sample of jobs into those where the respondent stated that he left the job voluntarily and those where this was not the case. The R^2 for the group that left voluntarily was found to be .29 and for the involuntary group .20. This is a significant difference[3] and appears satisfactory in view of the quality of the information on the decision to leave a job in this retrospective study. Another way to demonstrate the interpretation of R^2 is to correlate it with unemployment rates in different industries. Here a correlation of .89 (9 observations) was established between the unemployment rate and R^2 in each industry. Finally, it may be noted that if we compute R^2's for Blacks and Whites, we obtain a R^2 of .22 for Blacks and a R^2 of .30 for Whites. This difference indicates a variation between Blacks and Whites in the level of control over the decision to leave a job that corresponds well to what is generally believed to be an important difference in the labor market situation of Blacks and Whites.

More information about the operation of the structural characteristics that determines the trace line can be obtained from the investigation of the outcome of job shifts. This outcome can be described with the difference equation:

$$\Delta X_1 = b_1 X_1 + b_2 X_2 \qquad (9)$$

where X_1 is the acheivement of the job left and X_2 is a (composite) measure of a person's resources and ΔX_1 is the gain in achievement.

Again the level of control over the decision to leave a job may be assumed the major variable to mediate the influence of structural characteristics on the achievement process. If a person has full control over the decision to leave then the outcome of the job shift should be a positive gain since a job shift should be undertaken only when it is

profitable. If, on the other hand, a person left this job against his will he should suffer a loss, since if a gain was available, he should have left the job before being forced out. In general then, the amount of control over the decision to leave determines the size of the gain realized in job shifts.

Again we can use the stated control by the respondent to verify this hypothesis. Table 1 shows the gains in prestige and income for job shifts where the respondent claimed control over the decision to leave and for those job shifts where the respondent claimed that he left the job involuntarily.

When the job is left involuntarily, an actual average loss of income is observed, for prestige, only a small gain is found for the job transition. We may combine prestige and income into a measure of occupational achievement (See Sørensen, 1972 for details) by using canonical correlations. Using the weights of prestige and income where they simultaneously are used as dependent variables, and measures of resources and prestige and income of the job left as independent variables, a composite measure of achievement was formed. This measure is given in the third row of Table 1. The gain in achievement depends, as expected, on the amount of control; that is on the impact of structural characteristics on achievement process.

Measures of the impact of structural characteristics can be constructed from equation (9) by reasoning similar to the one just presented. From the assumption that individuals maximize occupational achievement, it follows that when they have full control over the decision to leave the

TABLE 1

Mean Prestige and Income and Mean Gains in Presitge and Income According to Stated Control over the Decision to Leave

	Own Decision	Not Own Decision
Mean Prestige	336.59	288.35
Mean Gain in Prestige	20.26	1.47
Mean Income	397.96	378.79
Mean Gain in Income	28.39	-11.96
Mean Occupational Achievement	369.83	325.40
Mean Gain in Achievement	24.66	-5.80
N	3179	689

Note: Occupational acheivement is computed as a weighted average of income and prestige with weights obtained from a canonical analysis.

return on a person's resources should be at a maximum. With no control the return should be at a minimum, since individuals will have to take whatever job is available. Consequently the amount of variance in the gain in achievement explained by a person's resources provides a measure of the amount of control. This can be verified again by using the stated amount of control. For those who said they left their job voluntarily we explain 47% of the variance for prestige and 50% for income; while for those who left their job involuntarily, the percentages are 37% and 42%. Hence again a 10% difference, and believed satisfactory given the suspected low reliability of the indicator. With respect to Black-White differences, we find for prestige 46% of the variance explained for Whites, against 33% for Blacks. For income the difference is between 52% and 31%. The marked difference is consistent with widely held beliefs about differences in the job situation for Whites and Blacks.

Summary and Conclusions

This paper has argued that the occupational achievement process should be conceptualized as being the result of an interplay between structural and individual characteristics. Individual characteristics form a person's level of resources that is transformed into occupational achievement by the occupational structure. The function that determines the return in achievement on personal resources is referred to here as the occupational trace line. Since the trace line is determined by the occupational structure it varies independently from variations in the distribution of resources. Hence the trace line and the distribution of resources constitute the two major sources of variation in the occupational achievement of a population group.

Corresponding to the distinction between personal resources and the occupational trace line we may distinguish between two major kinds of policies that may be pursued in an attempt to affect the occupational achievement process for a population group. There are on the one hand, policies designed to affect the occupational trace line and therefore acting on the occupational structure. On the other hand, policies may attempt to affect the distribution of resources, either by acting on the overall level of resources or by attempting to affect the relative contribution of various resource variables. A policy designed to reduce inequality of opportunity would thus attempt to reduce the importance of ascriptive characteristics for the overall level of resources.

Evaluation of the two kinds of policies needs two different types of indicators: indicators on the distribution of resources in a population; and indicators that measure the occupational trace line. To develop such indicators it is necessary to be able to separate the operation of the trace line from the effect of the distribution of resources on the occupational achievement of a population group. The amount of social mobility, as measured for example by the correlation between fathers' and sons' status does not permit such identification of the mechanisms that produce achievement. Three possible solutions have been proposed. The first solution is a mathematical model that only uses the information contained in a single mobility table, but makes rather strong assumptions about the achievement process. The second solution involves a more comprehensive measure of a person's resources and the use of a linear model for the trace line. This approach enables us to establish the relative contribution of resources to

the overall level of resources. The separation of the contribution of resources from the contribution of the trace line to the occupational achievement is however ambiguous. The contribution of the trace line is measured on a residual contribution and confounded by unmeasured resource variables.

Instead of determining the operation of the trace line as a residual, direct investigation of the structural forces seems desirable. Such direct investigation constituted the last solution outlined. Here it was proposed to investigate job shifts. The occupational achievement process is formed by a series of job shifts that may be seen as results of an interplay between structural and individual characteristics.

By focussing on job shifts we were able to specify the concept of control over the decision to leave a job. This concept mediates the influence of structural characteristics on the occupational achievement process, and thus enables us to specify more precisely the forces in the occupational structure that produce the occupational trace line. Hence, by using an approach identical or similar to the one outlined in the last section one should be able to establish measures and hence indicators of the occupational achievement process that will tell, to what extent the distribution of personal resources and, to what extent the structural forces that determine the occupational trace line produce occupational achievement. Such indicators in turn, are the appropriate ones for public policy since they relate directly to the instruments of that policy--instruments for affecting resource distribution different from those that can be used to affect the occupational structure.

NOTES

[1]For example; Coleman, Blum and Sørensen (1970), Coleman and Blum (1970), Duncan (1969), McPartland and Sprehe (1968), Siegel (1965).

[2]The Life-History Study dealt with the occupational, educational, familial and residential experiences from age 14 to time of interview. The universe is the total population of males 30-39 years of age, in 1968, residing in households in the United States. Two samples were drawn: (a) A national sample; and (b) A supplementary sample of Blacks. The total number of interviews obtained was 1589: 738 Blacks and 851 Whites. The completion rates were 76.1 percent for sample (a) and 78.2 percent for sample (b). The 973 cases constituting the national sample are used below in the development of the model. The total sample is used in Tables 3 and 4. The Life-History Study was initiated by James S. Coleman and Peter H. Rossi of the Department of Social Relations, The Johns Hopkins University.

[3]Using a formula given by Kendall (1953) we obtain 95% confidence intervals of $R^2 = .29 \pm .02$ and $R^2 = .20 \pm .04$.

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