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This paper suggests a model for occupational careers based on the outcome of job shifts. This outcome may be described by a difference equation, where the gain is a function of the prestige and income of the job left and a person's level of resources. The career model is obtained as a solution to this difference equation. The resulting age profile is governed by a parameter: b-sub-one. This parameter is interpreted to measure the degree to which the occupational structure provides opportunities for gains in occupational achievement, given unchanged resources of the individual. On the individual job shift level, this is argued as being reflected in the degree of control individuals have on their job shifts. The increment in return on resources due to job shifts is also argued to be determined by structural characteristics. The interpretation of the parameters is tested with satisfactory results. References are included. (Author)

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ABSTRACT

This paper suggests a model for occupational careers based on the outcome of job shifts. This outcome may be described by a difference equation, where the gain is a function of the prestige and income of the job left and a person's level of resources. The career model is obtained as a solution to this difference equation. The resulting age profile is governed by a parameter: b_1. This parameter is interpreted to measure the degree to which the occupational structure provides opportunities for gains in occupational achievement, given unchanged resources of the individual. On the individual job shift level, this is argued as being reflected in the degree of control individuals have on their job shifts. The increment in return on resources due to job shifts is also argued to be determined by structural characteristics. The interpretation of the parameters is tested with satisfactory results.

A Model for Occupational Careers

Occupational careers are defined here as age-variations in earnings and occupational prestige. The lack of suitable data is probably the main reason that relatively little research has been done on income or prestige patterns in relation to age. Economists have analyzed age-variations (in earnings) most extensively. Especially in the so-called Human Capital approach do age-variations play an important role. This research has mostly used cross-sectional data, however. Prestige or status variations over age have received very little attention. Svalastoga (1959) presents an estimated career line in terms of prestige, using a cross-sectional survey. Blau and Duncan (1967) construct synthetic cohorts to analyze the process of occupational achievement over age from cross-sectional data.

The process that generates prestige and income distributions is a process that takes place over time. It seems that a full understanding of this process must take this age variation into account. The use of cross-sectional data, however, has obvious drawbacks. Different age groups have been exposed to different economic and structural conditions, and growth in prestige and income for the same individual cannot be studied directly, however, the life history study conducted at Johns Hopkins University overcomes these problems. The data give complete job histories from the time the respondent enters the labor force until interviewed, that is between the ages of 30-39; together with educational, family and residential histories.[1]

The career model that will be presented in this paper was developed in the course of analysis of the life history data. One problem that immediately arises when confronting this analysis is whether the career-process shall be seen as a continuous or as a discontinuous process; that is, whether occupational prestige and income should be seen as a process continuously changing in time or as one that occurs in discrete jumps. The former approach is used in the economists' analysis of earnings streams and is implicit in Duncan and Blau's (1967) use of synthetic cohorts. It is a reasonable approach; career lines constructed for an aggregate of individuals exhibit a smooth growth curve[2] and it may be a fruitful approach for some purposes of analysis. However, the continuous approach ignores that careers represent a sequence of jobs held by the individual. Prestige is a characteristic of an occupational group and a person's prestige hence remains constant as long as the individual keeps his job. Except for secular (real and inflationary) increases in earnings, major variations in income may also be assumed to occur only through job shifts. Hence, a conception of the career process as a discontinuous one seems an equally, if not a more realistic conception of the career process.

There is another good reason to think of careers as being discontinuous, representing a succesion of job shifts. The sociological concern with occupational achievement arises out of the research tradition concerned with social mobility. There is an old notion in mobility research: mobility is a function of the supply of vacant jobs in relation to the demand for these jobs by individuals.[3] This means that the distribution of job opportunities and the level of employment will interact with individuals' characteristics in producing mobility and, in turn, leads to a certain level of prestige and income. Job shifts represent elementary acts of mobility. If we are to study the interaction between individual and structural characteristics, a concern with job shifts, therefore, seems highly appropriate. The conception of careers as continuous does not direct the attention to the analysis of the structural characteristics, since the notion of the career process being a mobility process is absent. The neglect of the influence of structural characteristics means that it is not possible to specify their impact on the achievement process. In comparative studies (over time or over places) it is, therefore, not possible to identify differences in the parameters of the achievement process due to differences in occupational structures. Such identification is needed if a comprehensive theory of the achievement process is to be developed, and the focus on job shift seems a fruitful step toward this goal.

Job shifts produce age-variations in occupational achievement because they result in losses or gains in achievement. Our career model therefore, takes the outcome of job shifts as points of departure.

The Model

The important individual characteristics for the occupational achievement processes are generally accepted to be variables such as education, family background (parental status and education, number of siblings), race, and ability. We shall in the rest of the paper denote all these variables as resource variables and assume that it is possible to obtain a single comprehensive measure of a person's level of resources--a measure that sums all individual characteristics which have a bearing on a person's value in the job market. We shall not be concerned with the interrelationship of resource variables, for example, the relative importance of ascribed and achieved characteristics, even though this is a major concern in the use of linear (path) models so predominant in recent research. In the following, we shall, also, talk about prestige and income interchangably and use the term occupational achievement for both variables.

The outcome of the job shift may be computed as the difference in achievement (prestige or income) of the job entered and job left. The simplest model for this outcome is a linear one:

$$\Delta X_1 = b_1 X_{11} + b_2 X_2 + b_0$$

where (1)

$$\Delta X_1 = X_{12} - X_{11}$$

In equation (1) X_{11} stands for the achievement of the job left, X_{12} the achievement of the job entered, ΔX_1 is the difference in achievement between the job entered and job left, and X_2 stands for (the assumed) comprehensive measure of a person's resources.

The outcome is seen as a function of resources and achievement. The influence of resources is determined by the coefficient b_2, that gives the increment in return on resources for this particular job shift. That resources should enter the equation is obvious. The reasons for introducing achievement (X_{11}) as an independent variable with an effect measured by b_1, may be less obvious. The remainder of the paper will provide several justifications for this choice. At this point, a rather technical justification may suffice. Whenever change in a variable is to be explained, that change in nearly all instances should be taken as a function of at least the variable itself. This is because measurement error will produce a regression effect that will show up as a negative effect of the variable itself on the change score; also unmeasured variables correlated with the change variable often will show a negative feedback and this adds to the negative effect (Coleman, 1968). Other independent variables (in our case resources) may be hypothesized to have a positive effect on the change. A positive intercorrelation among the change variable and other independent variables, therefore, will bias the effect of these independent variables, unless the change variable is included explicitly in the equation. In other words, if in our situation, only resources were used as explanatory variables, their relation to the gain in achievement will be estimated as too low, since, the unmeasured achievement of the job left is correlated positively with resources, but has a negative effect on the gain.

Equation (1) is a difference equation, although it is not an equation for differences per unit time, as difference equations are customarily. Rather, the difference is per job. Nevertheless, the equation may be solved to give the achievement of job number or solved as a function of a person's previous achievement and his resources. The solution is that function that has equation (1) as its difference equation, similar to the solution of a differential equation. The solution may be essentially obtained through a trial and error method.[4]

To obtain the solution we shall assume constant coefficients and shall further assume that the achievement of the first job and a person's level of resources are predetermined, that is they are not a function of the system. The assumption of constant resources is an important one and we shall return later to a discussion of what it implies to relax this assumption.

There will be two solutions to equation (1) depending on the value of b_1. If $b_1 = 0$, the solution is:

$$X_{1r} = X_{10} + r(b_2 X_2) \qquad (2)$$

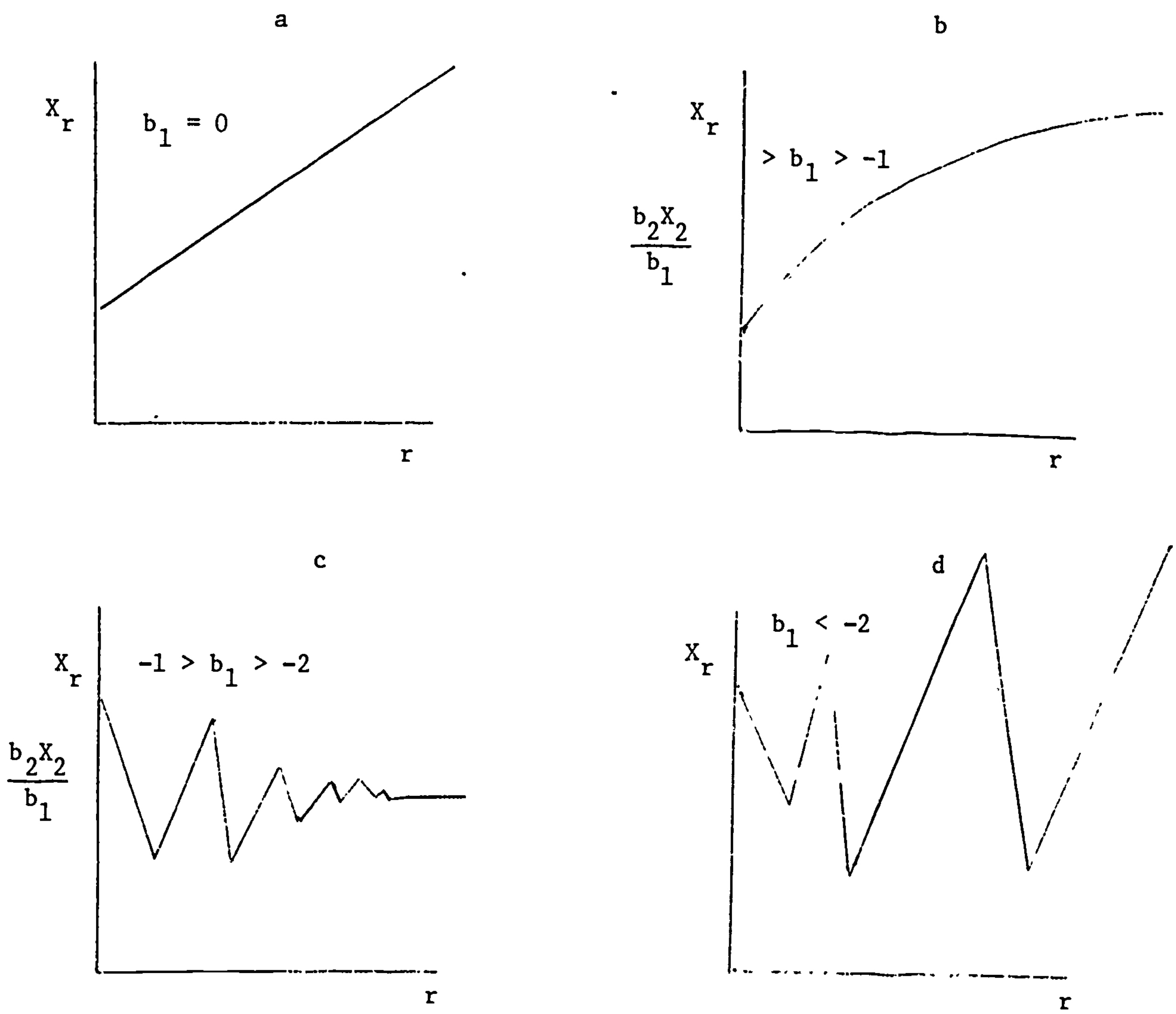
that is the achievement of job number r is a linear function of job number with a slope determined by a person's resources and an intercept equal to the achievement of the first job (X_{10}). If $b_1 \neq 0$, we get a solution:

$$X_{1r} = (1 + b_1)^r \left(X_{10} + \frac{b_2}{b_1} X_2\right) - \frac{b_2}{b_1} X_2 \qquad (3)$$

If we substitute X_{1r} and $X_{1,r-1}$ into (3), we can show that this solution indeed satisfies equation (1).

Whereas achievement is linearly related to job numbers in the case of $b_1 = 0$, the path is more complicated for $b_1 \neq 1$. In the case of $b_1 > 0$, the career line in jobs will be upwardly sloping as the term $(1 + b_1)$ will get larger and larger. This situation may be excluded as being unrealistic since a $b_1 > 0$ can occur only if every gain is larger than the achievement of the job left. The situation where $b_1 \leq 0$ remains. Here four different paths can be found depending on the size of b_1. These paths are illustrated in figure (1):

Figure 1



Let us first take the case where $-1 \leq b_1 < 0$. In this situation the career line will be concave with a declining slope. As a person's job number increases, his achievement will gradually approach an equilibrium. The equilibrium achievement will equal:

$$X_{1e} = - \frac{b_2}{b_1} X_2 \qquad (4)$$

Once the equilibrium is achieved, no further gain in prestige and income will be possible. The approach to equilibrium will be faster, the closer b_1 is to -1. If $b_1 = -1$, the equilibrium value will be reached with the first job. This situation may be contrasted to the one where $b_1 = 0$, where every job shift produces a gain and achievement apparently increases infinitely. It is important to realize at this point that we assume that a person's level of resources remains constant. A gain in achievement therefore presumes that the occupational structure is such that even without changing the level of resources an increase in achievement is possible. In other words, when $b_1 > -1$, there are job opportunities that make it possible to improve achievement. The opportunities are greater the closer b_1 is to 0; when $b_1 = 0$, the opportunities are infinite--occupational achievement will increase for every job shift. If alternatively $b_1 = -1$, there are no opportunities for improving achievement after the first jobs--job shifts aren't worth it under the assumption of unchanging resources. It is clear then that b_1 tells us about the opportunity structure in society, and we shall return later to a more exhaustive discussion of this point.

In the situation where $-2 \leq b_1 < -1$, the career again approaches an equilibrium, but this time oscillates until the equilibrium value is reached. The oscillations will be greater as b_1 decreases; when $b_1 < -2$ the career will no longer reach an equilibrium, but show larger and larger oscillations. A value of $b_1 < -1$ is not a realistic situation, since such repeated oscillations are hardly consistent with a society in which a certain level of stability exists. Such career patterns might, however, be possible in periods of drastic social change or if occupational achievement was not a very important attribute of a job--a kind of "Woodstock Society."

In general, we will expect a value of b_1 between zero and -1, a value that will be determined by characteristics of the occupational structure, in particular the opportunity structure. The parameter b_1 estimated from job shifts should therefore enable us to draw inferences on the importance of structural characteristics for the achievement process. Our model therefore fulfills the needs for identification of the operation of structural characteristics that the introduction argued to be important for the development of a satisfactory theory of careers. However, our model has an obvious defect, it gives the achievement by job number, not by age, as was our objective. The following section attempts to remedy this defect.

Career Patterns in Age

The career model developed is only considered a model for age variations in prestige and income if job shifts occur at equal intervals in age. This is evidently not the case; rather, the frequency of job shifts have repeatedly been shown to be strongly dependent on age. We need to transform job numbers into its age equivalent if we are to give the appropriate career models in age.

The transformation of job numbers into age can be carried out using a model for the relationship between age and the frequency of [illegible] shifts (and similar acts) developed elsewhere (Sørensen, 1972). This model relies on the assumption that the age dependency of job shifts is governed by an inner time scale--psychological time. The concept of psychological time can be thought of as a time scale in which the unit is the interval between successive impulses to leave a job. There is a constant probability to act on any one of these impulses, but the rate of impulses per unit (real) time declines exponentially as the person gets older. A person's psychological age can be defined as the total number of impulses that have reached the individual at real time t. According to the model (see Sørensen, 1972, for detail) the quantity will be given by

$$V_t = -\frac{1}{\gamma}\,(1-e^{-\gamma t}) \qquad (5)$$

where γ is a parameter that measures the rate of impulses to job shift per unit time. Since there is a constant probability of shifting jobs in psychological time, job number will be proportional to V_t. We may therefore substitute V_t for r in equations (2) and (3). For the situation where $b_1 = 0$ this gives:

$$X_{1t} = X_{10} + \frac{1}{\gamma}\,(1 - e^{-\gamma t})\, b_2 X_2 \qquad (6)$$

and for $b_1 \neq 0$

$$X_{1t} = (1 + b_1)^{\frac{1}{\gamma}(1 - e^{-\gamma t})}\,(X_{10} + \frac{b_1}{b_2} X_2) - \frac{b_1}{b_2} X_2 \qquad (7)$$

In the situation where $b_1 = 0$ this transformation results in a concave career curve that will reach equilibrium as t increases. The achievement will not improve forever as equation (2) seems to indicate, but age will give a gradually declining slope. If $b_1 \neq 0$ the career will retain the form outlined in Figure 1, but the approach to equilibrium clearly is more complicated (if $b_1 < 0$).

It may be noted that since durations of jobs are constant in psychological time, equation (1) is indeed a difference equation in time. The unit is, however, not units of physical time (year, month) but units of psychological time.

Since the main characteristics of the career model are retained in the age model, our previous discussion still applies. We may therefore now turn to a further elaboration of the properties of the model and a test of its main features.

Elaboration of the Model and Test of Interpretation of Parameters

We argued earlier that empirically the value of b_1 would likely be $-1 < b_1 < 0$. According to our interpretation of b_1 this means that there will be less than infinite opportunities for improving occupational achievement, but still some opportunities, i.e., career curves are probably not straight horizontal lines. The concave career curves that will come about in this situation (c.f. Figure 1b) do correspond to those found empirically. On the life history data this can be shown for both prestige and income (see for example Blum and Coleman (1970)), for income this age pattern has been argued and demonstrated (although on cross-sectional data) in Human Capital Analysis (Becker, 1964).[5]

The main feature of the model does correspond to observed career lines. This in itself is not a very strong support for the model.

A more precise test of the model could be given by testing the goodness of fit of the model to observed careers. This is not a very fruitful test. We argued that the parameter b_1 reflects characteristics of the occupational structures. These characteristics are, however, likely to change during the course of the career. Also, the assumption that a person's level of resources will remain constant is likely to present problems. Another type of test is called for.

The career model is a solution to a difference equation. We have a special interest in the parameter b_1 in this equation it governs the form of the career curve. This parameter has loosely been interpreted as reflecting the occupational structure. A specification of how b_1 depends on structural characteristics and a verification of this interpretation seems a more appropriate and promising strategy for demonstrating the usefulness of the model.

In order to produce the interpretation of b_1, we need to be able to specify the interaction between structural and individual characteristics in producing the outcome of job shifts. This may be done by making a simple assumption about individual behavior. The assumption is that individuals maximize occupational achievement, and engage in job shifts in order to improve their achievement. Individuals are, however, subject to restraints on their freedom of action, depending on the level of employment, they may be pressured out of their jobs and forced to engage involuntarily in a job shift. In other words, job holders may have more or less control over the decision to leave their jobs, depending on the level of employment: a structural characteristic.

When a person engages in a job shift, this shift will in general reflect the operation of structural forces as well as the maximizing behavior of the individual. Two situations may be distinguished. One in which the individual had full control over the decision to leave, another in which he had no control.

If a person has full control, then he should only leave when he can obtain a maximum gain on his resources. He will not be dependent on the availability of vacant jobs, since he is the one who determines when to leave. In this situation the achievement of the new job should equal the achievement of the old job plus an increment determined by the level of resources.

$$X_{12} = X_{11} + a_2X_2 + a_0 \qquad (8)$$

or

$$\Delta X_g = 0 \cdot X_{11} + a_2X_2 + a_0 \qquad (9)$$

when a_2 is the maximum increment in return on a person's resources.

In the situation where a person has no control, he should suffer a loss, since if he could have achieved a gain, he should have left his job before he got forced out. This loss will equal some fraction of the achievement already obtained, and the increment in return on resources will be zero:

$$\Delta X_f = -d_1X_{11} + 0\ X_2 + d_0 \qquad (10)$$

and the new job level will equal:

$$X_{12} = (1-d_1)X_{11} + d_0 \qquad (11)$$

The parameter d_1 will determine the magnitude of the loss. This parameter will be determined by the distribution of vacant jobs. The more skewed vacant jobs are distributed, the larger d_1, since a person then would have to go further down the occupational ladder. Also, the proportion of vacant jobs to filled jobs, that is the level of employment, may be expected to affect the magnitude of the loss and be reflected in d_1.

In general, we may express the amount of control by the parameter c which can take values from 0 if a person has no control, to 1 if he has full control. In most situations persons will have some control over the decision to leave. The expected outcome of the job shifts can then be expressed as:

$$\Delta X_1 = (1-c)\ \Delta X_f + c\Delta X_g \tag{12}$$

or if we insert equations (9) and (10):

$$X_1 = (1-c)(d_0-d_1X_{11}) + c(a_0+a_2X_2) \tag{13}$$

which can be written

$$\Delta X_1 = b_1X_{11} + b_2X_2 + b_0 \tag{14}$$

This derivation of equation (1) means that we have that

$$b_1 = -(1-c)d_1 \leq 0$$

and (15)

$$b_2 = ca_2 \geq 0$$

According to this argument b_1 should depend on the amount of control a person has over the decision to leave, c, and on the distribution of vacant jobs, measured by d_1. This interpretation is consistent with the one given earlier on the basis of the form of the career curve, as determined by b_1. It will be recalled that where $b_1 = 0$ every job shift produces a gain. We interpreted this to mean that there will be infinite job opportunities. In an occupational structure with this characteristic, individuals will have full control over the decision to leave as there will be no pressure on them to leave. Estimations of equation (1) for job shifts observed in such a structure should then give the value 0 for b_1, except for measurement error. If, on the other hand, b_1 is close to -1 the career line will approach a straight horizontal line. No opportunities for improving achievement exist. From the assumption that individuals maximize achievement, it then follows that nobody should undertake a job shift voluntarily. All shifts observed in such an occupational structure will be involuntary and we will estimate a maximum negative value for b_1. In the general case of $-1 < b_1 < 0$ we will obtain estimates of b_1 from single job shifts that reflect the amount of control over the decision to leave. This amount of control in turn reflects the pressure to leave a job holder experiences as a function of the level of employment and the distribution of job opportunities. Also the amount of control will affect the increment of return on resources since $b_2 = ca_2$ will vary with c.

These interpretations of the parameters can be tested on the life history data. For every job shift, respondents were asked in they left their job voluntarily or not. The retrospective character of the data and the possible ambiguity in the respondent's interpretation of this item may make the validity and reliability of the responses less than satisfactory. A test of the above argument using the item seems nevertheless desirable. Job shifts were consequently divided into those shifts where the job was left voluntarily and those where the job holder stated that this was not the case. Estimates of b_1 for the two groups are given in Table 1.

Table 1

Raw Regression Coefficient of Income and Prestige of Job Left on Gains in Achievement According to Stated Control over the Decision to Leave Job

	Prestige b_1	Income b_1
Own Decision	-.58	-.38
Not Own Decision	-.65	-.40
N	3179	689

We do find a difference in the expected direction--b_1 is smaller for those who stated that they had no control--but the difference is very small, especially for income. This result may be due to the operation of measurement error both in the indicator of control and in the measures of achievement. The latter measurement error will show up as a regression toward the mean that will contribute to b_1. Also b_1 is a function of both d_1 and c and this clearly presents an identification problem. There may be a difference in the two groups in the size of d_1 that cannot be separated out with the information available.

An alternative test is needed. Such a test may be derived by using information in differences in increments of return. It follows from the expression $b_2 = ca$ that the increment of return will vary with the amount of control. Since we actually do not have a single measure of resources available but must use a set of variables,[6] the amount of variance explained by resource variables is the appropriate measure to use. We predict then that the amount of variance explained will vary with stated control.

It is customary in evaluating amount of variance explained to rely on a comparison of the unique amount of variance and the maximum amount equal to the zero-order correlation squared. Equation (1) is, however, not well suited for this purpose. Resources and achievement are positively intercorrelated but have opposite effect on the gain. This produces a so-called suppressor effect as the effect of either variable alone will be biased due to the opposite effect of the positively correlated other variable. Only when both variables are introduced simultaneously in an equation will this be avoided. The result is that unique amount of variances will be greater than the zero-order correlation squared. A reformulation of equation (1) resolves this problem.

$$X_{12} = (1+b_1)X_{11} + b_2X_2 + b_0 \qquad (16)$$

In equation (16) the total amount of variance explained in X_{12} may actually be used to validate our argument about the importance of structural characteristics. This is because as the amount of control increases, $(1 + b_1)$ and b_2 will increase. A comparison of the total amount of variance explained for the voluntary and involuntary groups of job shift are given in Table 2.

Table 2

Amount of Variance Explained by Prestige and Income of Job Left and Resources, by Stated Control over the Decision to Leave Job

	Prestige Equations	Income Equations
Own Decision	.467	.504
Not Own Decision	.366	.416

There is a clear difference in the expected direction in R^2's. The test therefore lends support to our theory about the influence of structural characteristics in determining the outcome of job shifts and in determining occupational careers.

Further, although weaker support may be obtained by computing the R^2's of equations like (16) with the unemployment return in different industries. The unemployment rates should reflect the operation of the same structural characteristics that determine the amount of control over the decision to leave a job. Unemployment rates were computed as the percentage of job shifts ending in unemployment over the total number of job shifts in each industry. There is a difference between industries in the extent to which prestige rather than income is maximized in job shifts. This produces a nuisance variation in R^2 for prestige and income equations, when taken in isolation. Canonical correlations therefore were used to obtain measures of the amount of variance explained (see Sørensen, 1972 for detail). The correlation between unemployment rates and these canonical correlation coefficients over nine industries was found to be .67. This is less than unity but high enough, it seems, to substantiate our reasoning.

Discussion

A crucial assumption that we hitherto have not discussed is the assumption that a person's level of resources remains constant throughout his career. This is a questionable assumption. As a matter of fact, the major alternative theory of careers--Human Capital Theory--uses exactly the opposite assumption, that a person's level of resources is continuously changing as a result of experience and training received on the jobs passed through. That experience and on-the-job training adds to a person's level of resources can certainly not be denied, also it must be admitted that such additions to a person's level of resources takes place frequently. Our assumptions about constant resources is therefore not a very realistic one. The model should be revised accordingly. This revision could take place by adding an additional equation to equation (1). The second equation should give the change in level of resources as a function of characteristics of the job left.

The suggested extension of the model shall not be attempted here. This does not mean that the model is of no use as it stands. In fact, we will argue that a major use of the model stems from the assumption of a constant level of resources.

As mentioned, the assumption of constant resources contrasts with the assumption made in Human Capital Theory. Not only does this approach assume changing resources, but it is argued that such changes in resources are the sole contributors to age-variations in income. Concave curve lines similar to those shown in Figure 1a are predicted but from the assumption that changes in resources created by investment in training will taper off. This decline is explained by the diminishing life-time return on investments as the remaining time in the labor force shortens. The contrast between the theory of careers developed here and the human capital approach is very marked, but the empirical predictions are nevertheless similar.

Since in human capital analysis changes in resources are the sole source of variation in achievement a person with constant resources will have a constant level of achievement. In terms of our model, the human capitalist theorists assume a society with $b_1 = -1$. In other words, they assume that there are no opportunities for improvement of achievement other than through changes in resources, i.e., that the labor market is perfectly efficient. Insofar as this assumption is not valid estimates of return on investment in human capital will be influenced by the existence of job opportunities that allow for gains without changes in resources. In reality, such opportunities exist. Furthermore the opportunity structure will vary over time according to changes in the economy, and estimates of rates of return therefore will fluctuate. This fluctuation is explained by our model.

The model developed here and the human capital theory can be said to represent two contrasting ideal models of careers. Since opportunities for improving achievement for constant resources, as well as changes in resources, will exist empirically, neither model is completely realistic. Analysis of the degree to which the two models fit reality is however of major interest. Such analysis will tell to what extent changes in the distribution of resources rather than changes in the occupational structure produce changes in the occupational achievement process.[7] This is an important analysis to carry out. Naturally, a comprehensive theory of occupational achievement should take both sets of factors into account. Also, for policy purposes such analysis is important. Changes in occupational structure are brought about by policies very different from those that may affect the distribution of resources. An evaluation of such alternative policies needs indicators on the achievement process that separate out the contribution of structural opportunities from the contribution of resources in producing occupational achievement. The model developed here is a step toward the development of such indicators.

FOOTNOTES

[1] 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 1,589: 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.

[2] On the life history data, this is demonstrated in Coleman and Blum (1970).

[3] This notion dates back to Sorokin (1964).

[4] See Christ (1966) for a similar problem.

[5] The Human Capital argument for the concave career curve is however very different from ours as we shall discuss below.

[6] These variables are education, a measure of verbal ability, father's prestige, parental education, number of siblings, marital status, labor force experience, and race.

[7] This idea is the topic of a paper entitled "Occupational Achievement: Investment in Human Capital or Social Mobility?" (Sørensen, 1972).

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