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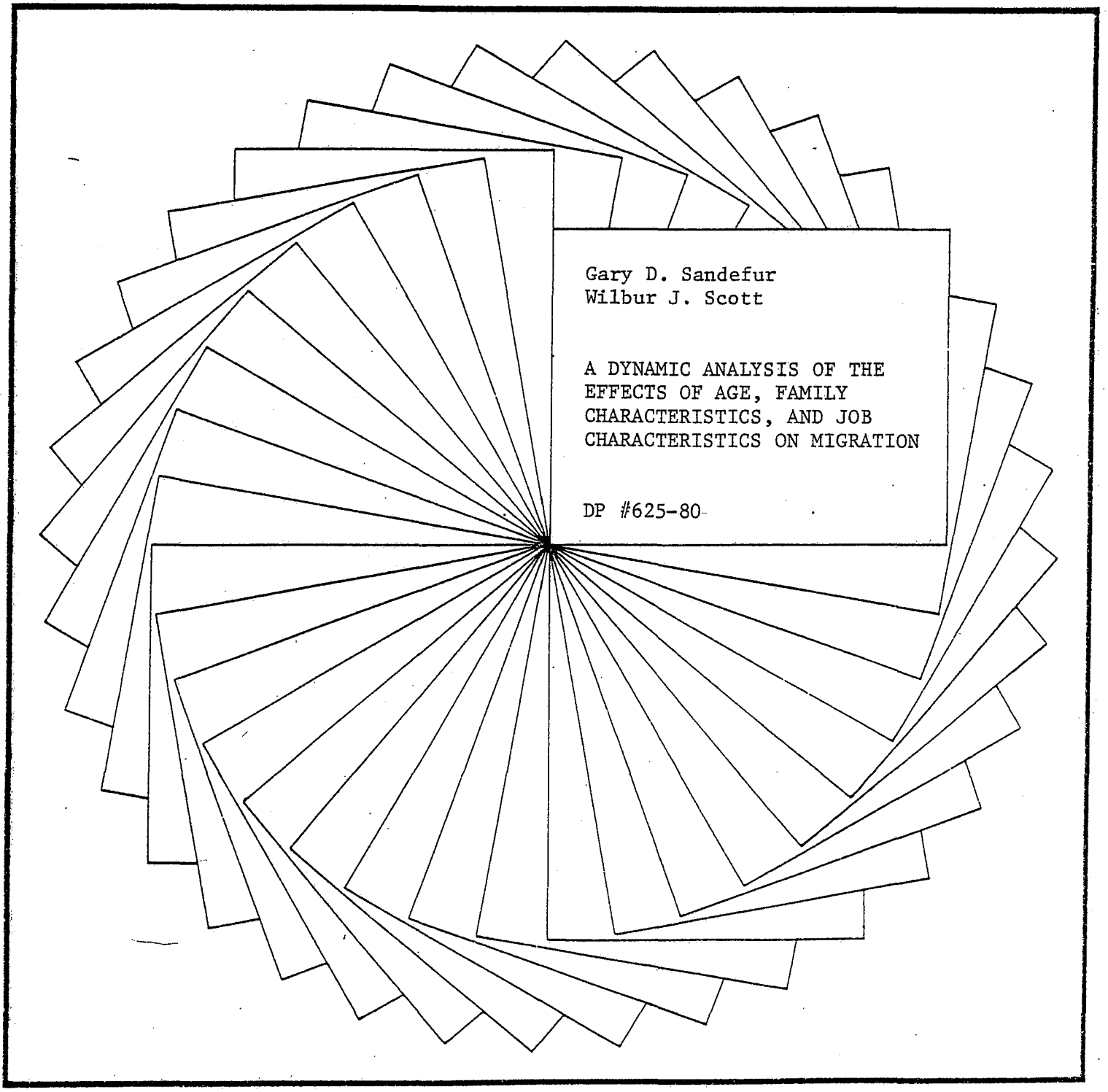

A Dynamic Analysis of the Effects of Age, Family Characteristics, and Job Characteristics on Migration

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August 1980

Part of this paper was completed while the first author was a Visiting Assistant Professor at the Institute for Research on Poverty, University of Wisconsin--Madison; the research was funded in part by funds granted to the Institute by the Department of Health and Human Services, pursuant to the provisions of the Equal Opportunity Act of 1964. The first author also benefited from the use of the computational resources of the Center for Demography and Ecology, University of Wisconsin-Madison.

ABSTRACT

This paper examines the utility of viewing migration in the context of careers and family life cycles by studying migration as a discrete-state, continuous-time process. We find that the inverse relationship between age and migration is due almost completely to the effects of family life cycle and career variables, and further, that job- or location-specific resources, prestige, and wage deter migration.

A Dynamic Analysis of the Effects of Age, Family Characteristics, and Job Characteristics on Migration

Research on migration has examined a number of economic and social determinants of migration. Though some of the empirical evidence is contradictory, researchers have been almost unanimous in their assertion that migration can be fruitfully studied as an event that occurs in the context of a career and family life cycle (Greenwood, 1975; Leslie and Richardson, 1961; Ritchey, 1976; Shaw, 1975). This view is supported by the one relationship that consistently emerges in migration research: the inverse relationship between age and geographic mobility. Research indicates that the most geographically mobile sectors of the U.S. population are in the age groups 25-29 (Miller, 1977) or 25-34 (Long, 1973). The incidence of geographic mobility declines steadily with each successive age group beyond these. This relationship is usually attributed to the association between age and unmeasured characteristics and aspects of the family life cycle and individual careers.

However, no one has investigated migration explicitly in the context of the family life cycle and career, nor has anyone fully evaluated the extent to which the effects of age are explained by life cycle and career variables. Perhaps the major reasons for this are methodological. First, because of data limitations, few studies have considered age simultaneously with other classes of variables known to affect migration (Ritchey). Second, as Greenwood points out, many studies of migration are plagued by a "simultaneity bias," i.e., the use of postmigration factors to predict migration may distort our view

of antecedent variables which influence migration. Third, most studies of migration rely on cross-sectional data and techniques of analysis (DaVanzo, 1976). However, cross-sectional analyses of processes that are not in equilibrium can produce very misleading results: the effects of independent variables on migration can be either under- or overestimated.

Dynamic analyses contribute solutions to these problems by permitting distinctions between pre- and postmigration characteristics, and by making no assumptions about equilibrium. In particular, the dynamic analysis of event-histories is aptly suited for handling these problems (Tuma et al., 1979). Therefore, in this paper we examine life- and work-history data for a sample of males aged 30-39 for the period since each completed his full-time education and entered the labor force. Our basic purpose is to investigate the utility of viewing migration as part of the family life cycle and individual career, and thereby establish the extent to which this accounts for the relationship between age and migration.

INTERCOUNTY AND INTERSTATE GEOGRAPHICAL MOBILITY: A DYNAMIC MODEL

There are a number of different criteria which may be used to construct typologies of geographical mobility. If county and state boundaries are used to differentiate types of moves, three basic categories may be identified: intracounty (or residential) moves, intercounty moves, and interstate moves. We do not regard residential moves as instances of migration since these generally do not require disengagement from a given community or lead to a change in jobs.

Insofar as intercounty and interstate moves both typically are accompanied by such changes, family life cycle and individual career variables should have similar effects on each type of move.[1]

The usual way to study migration at the individual level is to focus on whether a move has taken place over some period of time. Consequently, the dependent variable is a measure of whether the individual is a migrant or not. Such an analysis ignores the fact that some individuals change counties or states once, whereas others may change counties or states several times during the period of time under consideration. Event-history analysis, however, takes this into consideration by allowing us to account for migration activity throughout the period in question. This is accomplished by utilizing the instantaneous rates of intercounty and interstate migration as the dependent variables.

A rate is defined in the following way. Let $P_{jk}(t, t + \Delta t)$ denote the probability of a change from state (geographical place) j at time t to state (geographical place) k at time $t + \Delta t$; such probabilities are usually called transition probabilities. The limit of a transition probability as Δt approaches zero is called the instantaneous rate of a transition:

$$r_{jk}(t) = \lim_{\Delta t \to 0} \frac{P_{jk}(t, t + \Delta t)}{\Delta t} . \qquad (1)$$

A variety of observable variables--including the duration in a state, the number of state changes in a period, and the state occupied at a given time--are random variables whose probability densities (or

probabilities) are functions of the unobservable transition rates. Knowledge of the relationship between observable variables and transition rates allows the transition rates to be estimated from data.

The differences between this form of analysis and cross-sectional analyses can be illustrated through a simple example. Suppose we have one individual who has the migration, marital and job histories indicated in Figure 1. This individual has changed counties four times and states twice during a ten-year period. In the usual analysis of migration, this individual would be regarded as an intercounty and interstate migrant who is married with one child, and would be assigned the characteristics of job (4). On the other hand, in event-history analysis, the timing and number of moves is taken into consideration. Furthermore, age, marital status, family size, job characteristics prior to each move rather than postmigration characteristics, and the length of each residence are analyzed as determinants of migration.[2]

Determinants of Migration: Family Characteristics

There are a number of features of the family life cycle that vary with age, and act as important determinants of migration. In this analysis we include marital status and family size.[3] These variables are related to age as characteristics of a "maturation" or "aging" process. Simply put, they tend to change with age in each successive generation. Previous research shows that married individuals are less likely to have migrated during a given period of time than unmarried individuals. Also, the larger the size of the family, the less likely

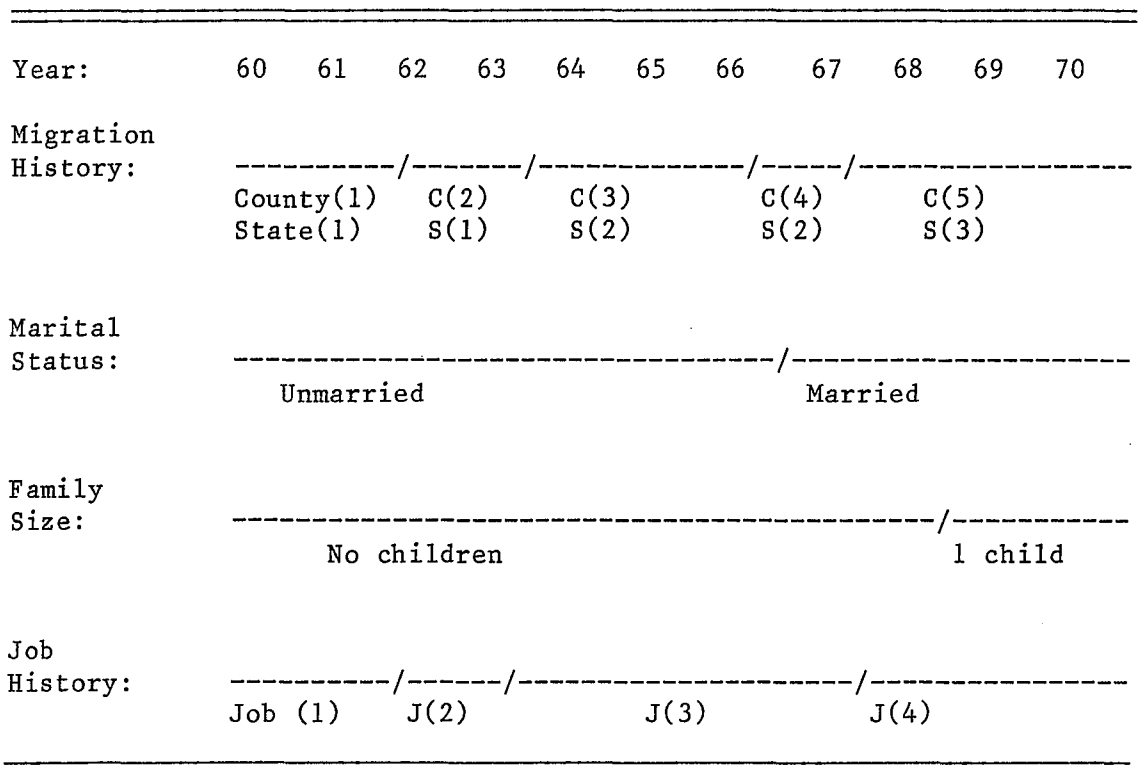

Figure 1. Example of a multiple event-history.

individuals are to have migrated during a given period of time (Ladinsky, 1967a; Leslie and Richardson, 1961; Long, 1972, 1973). The link between these family life cycle variables and migration probably is due to two factors. One, the economic costs of a move increase to some extent with the number of persons in the family unit. More importantly, the presence of additional persons in the family means that participation must be withdrawn in more and more varied structures at the point of origin and then renegotiated at the point of destination. These findings suggest that married individuals should have lower rates of intercounty and interstate mobility than unmarried individuals. Also, the rates of migration should decrease as family size increases. To the extent that these variables are associated with age, the effects of age should decline with their inclusion in the analysis.

Job Characteristics

Most geographical moves also involve job changes (Greenwood, 1975; Lansing and Mueller, 1967; Long, 1973). Consequently, characteristics of individual careers at particular points in time--such as educational attainment, self-employment, experience with employer, wages, and occupational prestige--constitute resources and rewards which serve either to facilitate or undermine migration impulses.[4] All of these, with the exception of education, should vary with age, and may help account for the inverse relationship between age and migration. Much research shows that the higher the level of education, the greater the likelihood that individuals will have migrated

during a given period of time. Education is said to facilitate migration because it increases employment opportunities, expands an awareness of alternative opportunities in other geographical places, and inculcates skills which ease the severing and establishing of social ties (Greenwood, Long). Further, education is a general resource, i.e., one that can be transferred from job to job and from geographical location to geographical location (Becker, 1975). For these reasons, the rates of intercounty and interstate mobility should vary directly with education.

In contrast, self-employment and experience with employer are specific resources that cannot be readily transferred (Becker). Individuals who are self-employed generally rely on an established clientele for their livelihood. Moving, especially to another state, usually means giving up or losing this clientele. Consequently, the rates of intercounty and interstate mobility should be lower for self-employed individuals than for individuals employed by someone else. Likewise, individuals with a history of employment with one employer should have lower rates of intercounty and interstate mobility than individuals whose only experience with their employer is their present job. This reflects the reluctance of individuals to give up an investment--in this case, in an organization rather than in a clientele.

Most evidence regarding the link between job rewards and migration suggests that individuals in more prestigious and in higher paying positions are more likely to have moved during a given period than those in less prestigious and lower paying positions (Blau and Duncan,

1967; Gallaway, 1967a; 1969; Ladinsky, 1967a; Lansing and Mueller, 1967; Long, 1973; Tarver, 1964). The argument is that individuals in more highly rewarded occupations operate in a more geographically dispersed market. Hence, upward social mobility often requires geographical mobility. However, this positive relationship between job rewards and migration has not always held up when other variables are included in the analysis (Ladinsky, 1967a). Further, research on job shifts also has shown that as occupational prestige and wage increase, the rates of upward job shifts decrease. The negative effect of job rewards is said to take place because extremely beneficial arrangements often are difficult to duplicate elsewhere and because highly rewarded individuals have an almost perfect match between resources and rewards (Sorensen and Tuma, 1978; Tuma, 1976). For these reasons, we expect the rates of intercounty and interstate mobility to decline as prestige and income increase.

Length of Residence

A final factor that is associated with age, and with the family life cycle and individual careers is length of residence or duration in the residence. Length of residence is a measure of the extent of local ties (Kasarda and Janowitz, 1974; McGinnis, 1968; Morrison, 1967; Toney, 1976; Uhlenberg, 1973), and of satisfaction with community. Research shows that satisfaction with community is one of the most important deterrents of migration (Bach and Smith, 1977; Speare, 1970; Toney, 1976). Including length of residence also has another special theoretical significance: If we exclude it from the model, we

are assuming time-independence, i.e., the probability or rate of moving remains constant over the duration of the residence. However, this is not a realistic assumption (McGinnis; Morrison). Including duration in the analysis allows us to disentangle the effects of age, length of residence, and other variables on migration.

RESEARCH DESIGN

The data consist of retrospective life histories of a random sample of U.S. white males between the ages of 30 and 39 inclusive, and were collected in 1969 under the direction of the National Opinion Research Center. This undertaking was the first and only collection of retrospective life histories for a national sample in this country.

Individuals were selected through standard multistage area probability methods as described in Blum et al. (1969). The total number of respondents was 851. After excluding person-place matches with missing information, military residences, and foreign residences 2,144 person-place matches remained.

The retrospective life histories contain information on a number of variables from age 14 to the date of the interview in 1969. Most respondents entered the labor force following World War II and had some labor force experience by 1969. One of the most appealing features of these data is that they contain information on the exact time of geographical moves.

Method

A variety of statistical techniques can be utilized to analyze life-history (and other event-history) data because such data provide information on the states (geographical places) occupied by every individual in the sample continuously over some interval of time. However, the most common methods (e.g., panel analysis) do not use all available information in event-history data and have other disadvantages as well. We use a method of event-history analysis described in detail by Tuma et al. (1979), which has many desirable properties and does use all information on geographical residences, the sequence of residences, and the timing of residential changes.

In using this method, we first allow transition rates (defined earlier) to be functions of age (a) in a simple stationary model. We assume that the transition rates are log-linear functions of a:

$$\ln r_{jk} = ba \tag{2}$$

or

$$r_{jk} = \exp(ba). \tag{3}$$

Second, we examine a nonstationary model in which the transition rates are log-linear functions of age (a) and duration in residence (d). We assume that the rates decline exponentially over the duration of the match:

$$r_{jk} = \exp(ba + cd). \tag{4}$$

Next, we estimate a nonstationary model in which the rates are log-linear functions of age (a), duration (d), and a vector of variables $\underline{X}$ describing family life cycle variables:

$$r_{jk} = \exp(ba + cd + \underline{E}\underline{X}). \tag{5}$$

Finally, we estimate a nonstationary model in which the transition rates are log-linear functions of age (a), duration (d), $\underline{X}$, and a vector of variables $\underline{Y}$ describing career variables:

$$r_{jk} = \exp(ba + cd + \underline{E}\underline{X} + \underline{F}\underline{Y}). \tag{6}$$

Under these assumptions both the probability distribution of the duration in a state (geographical place) j and the probability of entering a particular state (geographical place) k after leaving a place are functions of a, d, $\underline{X}$, $\underline{Y}$, b, c, $\underline{E}$, and $\underline{F}$. Because event-history data provide information on the duration in each place and on the place moved to after leaving a former place, the method of maximum likelihood (ML) can readily be used to provide estimates of b, C, E, and F that have the usual desirable properties of ML estimators--namely, consistency and asymptotic normality. Furthermore, standard errors of estimates can be obtained, allowing tests of hypotheses about individual coefficients. In addition, a likelihood ratio test can be used to compare nested models, for example, to test whether the model represented in equation (5) significantly improves the explanation of the transition rates over the model represented in equation (4). In applying this form of event-history analysis, the only data that are needed are information on a, d, $\underline{X}$, and $\underline{Y}$, including the time

that places are entered and left (so that duration [d] in a residence can be computed), and the description of the states that are entered after leaving each place.

Measuring of Variables

Table 1 contains the measures of the variables that are utilized in this analysis. With the exception of duration or length of residence, all variables are measured at the beginning of the person-place match. Wage, prestige, same emp, and self-emp refer to characteristics of the job held by the individual at the beginning of the person-place match. Though it might seem desirable to use measures from other points during the person-place match, this would result in the use of information that would be correlated with the duration of the match. Thus, the only technically correct way to measure the variables is at the beginning of the match.

RESULTS[5]

Age and rates of migration

Table 2 contains the results of estimating a stationary model in which age, coded as a set of dummy variables, is the only independent variable, and the results of estimating a nonstationary model in which age and duration are the independent variables. To be assigned a value of 1 for the dummy variable 14-19, the person-place match must have begun when the individual was between the ages of 14 and 20. The comparison group (0-13) consists of person-place matches that began

Table 1

Measures of Variables

Variable	Indicator
Age	Age in years
Education[a]	0-Less than grade school 1-Grade school diploma 2-Some high school 3-High school diploma 4-Post-high school, vocational 5-Some college 6-College degree 7-M.A. or some graduate school 8-Ph.D. or professional degree
Duration (length of residence)	Years lived in a geographical place
Wage	Dollars per hour
Prestige	Siegel (1971) prestige score
Self-emp	0-not self-employed 1-self-employed
Same Emp	0-not previously employed by this employer 1-previously employed by this employer
Mar Stat	0-single 1-married or cohabiting
Fam Size[b]	Number of individuals in household

[a]The measure of education uses the categories in which the data were originally coded. Analyses with education transformed into years produced results that were not significantly different from those using this measure.

[b]Residences involving group living were excluded from the analysis.

Table 2

Age as a Determinant of Intercounty and Interstate Mobility
(N=2144)

	Intercounty		Interstate	
Variables	Stationary[a]	Nonstationary	Stationary	Nonstationary
14-19	1.017*	.847*	1.437*	1.158*
	(.143)[b]	(.144)	(.177)	(.178)
20-24	.840*	.667*	.920*	.643*
	(.117)	(.119)	(.157)	(.158)
25-29	.960*	.688*	.994*	.552*
	(.122)	(.126)	(.164)	(.167)
30-34	.741*	.399*	.821*	.259
	(.159)	(.163)	(.210)	(.213)
35-40	.819*	.397	1.014*	.306
	(.349)	(.352)	(.432)	(.434)
Duration	---	-.076*	---	-.151*
		(.010)		(.016)
Constant	-3.280*	-2.774*	-3.880*	-3.010*
	(.104)	(.119)	(.140)	(.155)
Likelihood Ratio Test	87.47 (df=5)	148.14* (df=6)	78.41* (df=5)	197.91* (df=6)
Test of Improvement		60.67* (df=1)		119.50* (df=1)

*$p \leq .05$.

[a]In the stationary model, we are assuming that the rate of mobility remains constant over the duration of the residence. In the nonstationary model, we are assuming that the rate of mobility declines exponentially over the duration of the residence.

[b]The numbers in parentheses are standard errors of the coefficients.

fairly early in an individual's life. Furthermore, since we are looking only at person-place matches for individuals who have completed their full-time education and entered the labor force, the group (0-13) consists of individuals who have completed their education and entered the labor force in the geographical place they have lived in since some point in their childhood.

Examining the stationary model first, we find that the likelihood ratio tests indicate that the stationary model represents a substantial improvement over an assumption of the same rates for all individuals. Given the nature in which the dummy variables are defined, it is not surprising that the coefficients for each dummy variable are positive. These positive effects indicate that individuals who have moved at least once are more likely to move than individuals who have never moved. What is surprising is that there is no consistent decline in mobility with age. The results seem to indicate that individuals who are 35-39 are just as likely to move as individuals who are 20-24.

Age, Length of Residence, and Rates of Migration

The failure of the rates of intercounty and interstate mobility to decline with age in this type of analysis could be due to the longer duration of some residences that begin with the younger ages. Given the nature of the sample, residences that are entered when the individual is 14 have a possible length of 26 years, whereas those that are entered when the individual is 35 could last only 5 years until the end of observation. We can explore this possibility by examining the

nonstationary model in Table 2 in which both age and duration are included in the analysis. The likelihood ratio tests indicate that this model and set of variables represent a significant improvement over the stationary model. The coefficients for the age dummies support the argument that the effects of age are confounded with the effects of duration. Controlling for duration, we find that the rates of intercounty and interstate mobility decline fairly consistently with age. In fact, the rates of intercounty mobility for individuals aged 35-40 are not significantly different from the rates of individuals who have never moved, nor are the rates of interstate mobility for individuals aged 30-34 and 35-40.

These findings suggest that it is quite inappropriate to assume that migration is a stationary process, or that the rate of migration remains constant throughout the duration of a person-place match. Furthermore, we find that duration has a larger effect on interstate mobility (-.151) than on intercounty mobility (-.076). This supports the view of length of residence as an indicator of social integration into the community. Local ties would not usually be as devastated by intercounty moves as they would by interstate moves.

The Family Life Cycle and Rates of Migration

As we argued above, part of the effects of age could be due to the relationship between age and aspects of the family life cycle. Table 3 contains the results of estimating a nonstationary model in which age, duration, marital status, and family size are the independent variables. The likelihood ratio tests indicate that this set of

Table 3

Nonstationary Model of Intercounty and Interstate Mobility--
Age, Duration, and Family Life Cycle
(N=2144)

Variables	Intercounty	Interstate
14-19	.910*(.145)[a]	1.219*(.179)
20-24	.909*(.123)	.955*(.163)
25-29	.990*(.132)	.951*(.175)
30-34	.728*(.168)	.687*(.219)
35-40	.772*(.355)	.780 (.438)
Duration	-.054*(.010)	-.120*(.016)
Mar Stat	-.694*(.086)	-.899*(.106)
Fam Size	-.060*(.016)	-.057*(.021)
Constant	-2.333*(.127)	-2.534*(.165)
Likelihood Ratio Test (df=8)	257.04*	303.99*
Test of Improvement[b] (df=2)	108.90*	106.08*

*$p \leq .05$

[a]Numbers in parentheses represent the standard errors of the coefficients.

[b]Test of improvement compares this model to the nonstationary model in Table 2.

variables represents a substantial improvement over the nonstationary model of Table 2. As one can see from a glance at the coefficients for the age variables, the addition of marital status and family size reduces, but does not eliminate, the differences across age groups. This demonstrates that marital status and family size account for part of the inverse relationship between age and migration. The addition of these variables also reduces the effect of duration on migration. This suggests that what might be attributed to nonstationarity is partially due to heterogeneity in terms of marital status and family size. Apparently, being married is associated with longer residences. Also, length of residence may increase with family size.

The effects of marital status and family size are exactly what one would predict from a view of migration as related to aspects of the family life cycle. Married individuals have lower rates of intercounty and interstate mobility; the rates of intercounty and interstate mobility decline as family size increases. However, it is important to remember that these effects do not capture all aspects of the relationship between family life cycle and migration. For example, a change in marital status is an event that is likely to be positively associated with migration. Individuals often move immediately after marriage or prior to a divorce. Further, changes in the number of children and migration are also likely to be interdependent events. People often move in response to an existing or expected addition to the family. A full exploration of these relationships requires additional analyses in which migration, marital status, and births are treated as interrelated endogenous events. However, the

present analysis conclusively demonstrates the importance of the family life cycle for understanding migration.

Career Variables and Rates of Migration

Table 4 contains the results of estimating a nonstationary model in which all the independent variables are included. The likelihood ratio tests indicate that this model represents a substantial improvement over the model of Table 3. The addition of the remaining variables to the analysis decreases the differences between the coefficients for the age dummies. This suggests that once family life cycle and career variables are taken into consideration, rates of migration do not decline monotonically with age. In order to perform a more rigorous test of the differences across age categories, we computed the differences between the coefficients for the age dummies and the standard errors of these differences.[6] None of the differences between the age coefficients of Table 4 are significant at or below the .05 level. For example, in the case of intercounty mobility, the only decline occurs from 25-29 (1.144) to 30-34 (.920)--a difference of .224 with a standard error of .218. In the case of interstate mobility, the largest difference is between 14-19 and 30-34 (.314 with a standard error of .287). Thus, not only is there no monotonic decline in rates with age, but there are no significant differences in any of the age categories.

If we briefly look back to the nonstationary model of Table 2, where there is a monotonic decline in the rates of migration with age, we find that in the case of intercounty mobility, the coefficient for

Table 4

Nonstationary Model of Intercounty and Interstate Mobility--
All Variables
(N=2144)

Variables	Intercounty	Interstate
14-19	.959*(.146)[a]	1.250*(.180)
20-24	1.034*(.124)	1.109*(.180)
25-29	1.144*(.136)	1.155*(.180)
30-34	.920*(.171)	.936*(.224)
35-40	1.068*(.359)	1.146*(.443)
Duration	-.040*(.015)	-.100*(.016)
Mar Stat	-.574*(.087)	-.726*(.107)
Fam Size	-.061*(.016)	-.060*(.021)
Education	.024 (.023)	.038 (.029)
Self Emp	-.371*(.172)	-1.570*(.411)
Same Emp	-.465*(.080)	-.591*(.108)
Prestige	-.046 (.031)	-.098*(.040)
Wage	-.140*(.029)	-.161*(.039)
Constant	-2.012*(.154)	-2.049*(.199)
Likelihood Ratio Test (df=13)	335.55*	398.22*
Test of Improvement[b] (df=5)	78.51*	94.23*

*$p \leq .05$.

[a]The numbers in parentheses are standard errors of the coefficients.

[b]The test of improvement compares this model to the model of Table 3.

30-34 is significantly smaller than the coefficient for 14-19 (a difference of .448 with a standard error of .217). In the case of interstate mobility, three coefficients are significantly smaller than the coefficient for 14-19: 20-24 (a difference of .515 with a standard error of .238); 25-29 (a difference of .606 with a standard error of .244); and 30-34 (a difference of .899 with a standard error of .277).

Given the results in these two tables, we feel confident in saying that much of the negative effect of age on migration is due to the association of age with marital status, family size, and career variables. However, it would be inappropriate to argue that the age dummies have no effect. Obviously, the significant coefficients in Table 4 indicate the presence of a positive effect compared to the excluded category; to reiterate, this demonstrates that individuals who have moved at least once are more likely to move than individuals who completed their full-time education and entered the labor force in the place they have lived since childhood. Among individuals who have moved at least once, there is no evidence of an age effect.

The addition of employment characteristics also reduces the effects of duration and marital status on both intercounty and interstate mobility. The effects of family size are not changed at all. All three continue to have significant negative effects on both intercounty and interstate mobility.

We divided occupational career variables into two kinds--resources and rewards. The results in Table 4 indicate that education, a general resource, has no significant effects on rates of intercounty

and interstate migration. These results are inconsistent with the findings of past cross-sectional research. This suggests that cross-sectional research overestimates the effect of education on migration.

On the other hand, both specific resources (self-emp and same emp) have negative and significant effects on the rates of migration. The results for self-employment indicate that individuals who are self-employed have lower rates of both intercounty and interstate mobility than individuals who are not self-employed. Also, the effect of self-employment on interstate mobility (-1.570) is substantially larger than the effect on intercounty mobility (-.371). This suggests that moving to another county, e.g., a contiguous county, does not always involve the loss of an established clientele, or even necessarily a change in the location of the business, whereas an interstate move almost always results in the loss of old customers. The results for same emp, which is our measure of experience with an employer, indicates that individuals who have "invested" in an organization are reluctant to give up this investment and move to another county or state.

The results of our analysis suggest that it is important to recognize the specificity of some resources. Individuals with high levels of resources will not always be the most geographically mobile individuals. This results from the fact that some resources, including clientele and experience with an employer, and probably others such as on-the-job training, are not easily transferable to other geographical locations. Further, individuals acquire more job- and location-specific resources as they grow older and as length of residence increases, and these help account for the relationship between age and migration.

The results for rewards (prestige and wage) in Table 4 indicate that the rates of intercounty and interstate mobility decline as rewards increase. The coefficients are all statistically significant at the .05 level with the exception of the effect of prestige on intercounty mobility. These results are consistent with research on job shifts, but do not seem to be consistent with past research on occupational and income migration differentials. However, we argued that these apparent discrepancies are due to the different manner in which income and prestige are conceptualized and measured in the two types of analysis. Thus, the findings should be treated as complementary rather than contradictory. Some occupations and industries do require more geographical mobility as part of a career pattern. Income can also serve as a resource allowing some individuals to be more mobile. This should not obscure the fact, though, that individuals with comparatively high levels of rewards are both less likely to seek better positions and to have fewer positions open to them. This does not mean that these individuals receive no future increases in wage or salary. In fact, they probably receive more than satisfactory increases in rewards without changing jobs or geographical locations.

SUMMARY AND CONCLUSIONS

Examining migration as an event that occurs in continuous time is a substantial theoretical and methodological improvement over most past studies of migration. The results of our investigation of the extent to which the effects of age are due to family life cycle and

career variables indicate that once the latter variables are included in the analysis, the inverse relationship between age and migration disappears, at least for the age range under consideration. Further, the analysis provides additional information concerning the ways in which family life cycle and career variables, especially job- or location-specific resources and job rewards, affect migration.

We believe that the results suggest three additional sets of questions that deserve a great deal of attention in the future. First, migration histories of individuals beyond the age of 39 should be collected and analyzed. The results in this analysis give us a more complete picture of the impact of life cycle and career variables on migration during the period from labor force entry to age 39. However, this analysis does not provide any information about what happens beyond that point.

Second, future research should address the extent to which the time-dependent nature of migration is due to the heretofore unmeasured heterogeneity of individuals. Such research requires data that includes measures of community satisfaction and local ties, as well as the variables utilized in this analysis. It seems reasonable to assume that length of residence, lacking any real theoretical significance, serves as a surrogate for other variables, as does age.

Finally, studies of migration could benefit from an explicit consideration of the structural contexts within which migration takes place. Labor market structures, whether conceptualized in terms of occupations or industries, probably have an impact on the effects of both life cycle and career variables on migration. In our future

research, we hope to explicitly consider the impact of labor market segmentation on the process of migration. We expect to find significant variations on the effects of career variables, including education, across labor markets.

NOTES

[1]Intercounty and interstate moves are also quite different in many respects. In most cases interstate moves involve greater distances than intercounty moves. Past research has shown that the "stringency" of migration selectivity increases as distance increases (Bacon, 1973; Folger and Nam, 1967). In our data, we have no measures of the distances of the moves. Consequently, we are not able to evaluate this argument.

[2]One unresolved problem with event-history analysis is the lack of independence among different events for the same individual. In our analysis, residences and residential changes become the units of analysis and these are not independent within each individual. Consequently, some caution must be employed in interpreting the results. However, we believe the gains to be obtained through event-history outweigh the risks created by this problem.

[3]There are other aspects of the family life cycle for which we have no information that are related to migration. For example, extended family ties are important determinants of migration (Balan et al., 1973; Brown et al., 1963; Choldin, 1973).

[4]There are other important economic variables for which we have no measures. These include indicators of economic conditions of the origin and destination areas. Though these variables are not attributes of an individual's career, it is likely that the match between an individual's career goals (broadly defined) and economic conditions of different areas are an important determinant of migration (Frey, 1978).

[5]We report the results as metric coefficients.

[6]The standard error of the difference between coefficients b_i and b_j--$(s_{b_j-b_i})$--is equal to $\sqrt{s^2_{b_i} + s^2_{b_j} - 2\mathrm{cov}(b_i b_j)}$. Unfortunately, the covariance matrix of coefficients is not generated by the program used to estimate the coefficients and is not easily calculated. Consequently, the standard errors reported in this paper were computed using only the squared standard errors ($s^2_{b_i}$ and $s^2_{b_j}$) of the coefficients in question. It is easy to see what would happen if the covariances were used in calculating the standard errors. Since we are dealing with a set of dummies, the covariances would be negative. Thus, $-2\mathrm{cov}(b_i b_j)$ would be positive and this would increase the size of the standard errors. (Thanks to Rob Mare for pointing this out.) However, we do not feel this would change our findings in regard to the effects of age.

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