The Transition from Youth to Adult: Understanding the Age Pattern of Employment[1]

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This article examines the growth in probabilities of employment for American men between the ages of 16 and 29. A young man's probability of employment is strongly affected by his other roles, statuses, and activities, and a cohort's employment growth depends on its age distribution of these traits. This article considers two important activities in the lives of young men—school enrollment and enlistment in the armed forces—and examines mechanisms through which these affect employment. The mechanisms include the constraining effect of each activity on the others, the disruptive effects of leaving school or the armed forces on finding employment, and the selective retention of men with varying employment prospects by schools and the armed forces. A decomposition of changes in employment between ages 16 and 29—based on a multivariate model of employment, enrollment, and enlistment applied to Current Population Survey and Defense Department data—shows that approximately 80% of employment growth with age can be attributed to these mechanisms. The article discusses the relevance of this analysis to previous research on the early life cycle, to the problem

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of youth joblessness, and to intercohort changes in youth employment.

I. INTRODUCTION

The movement into full-time, continuous employment is a key part of men's transition from youth to adulthood (Coleman et al. 1974; Winsborough 1978). Virtually all men are expected to work by the time they reach their late twenties (if not before), and interruptions to employment by layoff, illness, or disability are typically considered exceptional and undesirable. The transition to full-time work also accompanies and often facilitates other transitions to adult status, such as school departure (Folk 1969), movement to a separate place of residence (McElroy 1982), geographical mobility, marriage, and childbearing.

The empirical age pattern of cohort employment parallels the norm. In 1980, 39.7% of 16–17-year-old men were employed, whereas 88.3% of 30–34-year-olds were employed (U.S. Department of Labor 1981). Employment grows monotonically from the teenage years to the thirties, remains approximately constant until the fifties, and then declines.

Much recent research has examined role transitions in the lives of young persons by focusing on their empirical ordering (Hogan 1978, 1981; Elder 1975), causal linkages (Marini 1978, 1982; Rindfuss, Bumpass, and St. John 1981), historical changes (Harevan 1978; Winsborough 1978), and age-gradedness (Featherman and Sørensen 1982). This article focuses on one transition, movement into work, and seeks to account for intracohort growth in employment for men aged 16–29 in the contemporary United States. It explores the linkages among three salient activities in the lives of young men—work, schooling, and military service—and shows how age variation in school enrollment and enlistment in the armed forces is related to age variation in employment. In considering a fundamental aspect of the transition to adulthood, it complements the research cited above by both describing and explaining the interaction of age and employment status. The explanations for the age pattern of employment proposed here are demographic rather than behavioral inasmuch as both our arguments and their implied statistical models define connections among social roles without specifying their causal relations. This approach fruitfully simplifies the modeling of a cohort's integration into the work force.

Section II reviews sociological models for intracohort change in other aspects of socioeconomic standing and achievement and finds these inadequate for explaining the transition into employment. Section III outlines mechanisms through which young men's enrollment in school and enlistment in the armed forces affect their employment probabilities. Sections

IV, V, and VI describe our data, statistical methods, and empirical specifications, respectively. Section VII presents empirical findings, and Section VIII summarizes and discusses the implications of the arguments and findings.

II. APPROACHES TO INTRACOHORT VARIATION IN SOCIOECONOMIC ACHIEVEMENT

Although few sociologists have systematically examined the determinants of individual employment probabilities or their intracohort variation (however, see DiPrete 1981), many have studied intracohort change in other aspects of socioeconomic achievement. Research on socioeconomic status, rooted in the concept of the "socioeconomic life cycle" (Duncan, Featherman, and Duncan 1972, p. 5), explores the associations among family background, schooling, and occupational and earnings achievement by viewing these statuses as sequential and causally dependent (Duncan and Hodge 1963; Blau and Duncan 1967; Duncan et al. 1972; Jencks et al. 1972; Sewell and Hauser 1975; Featherman and Hauser 1978). In describing the associations of achievements within a cohort, this research tradition typically views the temporal and causal ordering of achievements as unproblematic (Alexander and Pallas 1981) and is seldom explicit about either the social positions associated with particular statuses (White 1970) or the mechanisms that generate the observed relations among variables (Mare 1980*a*; Bielby 1981). Instead, models of socioeconomic achievement are descriptive and recognize a variety of possible mechanisms governing intragenerational mobility (Featherman and Hauser 1978; Hauser 1980).

Other approaches to the study of intracohort variation in achievement assume explicitly that occupational and earnings mobility results from "careers" of job shifts (e.g., Spilerman 1977; Tuma 1976; Sørensen 1975; Stinchcombe 1979). These approaches view socioeconomic achievement as a sequence of positions (rather than statuses) through which individuals move according to specific mechanisms and treat both the empirical identification of careers (Spilerman 1977; Kaufman and Spilerman 1982) and the mechanisms that govern movement between jobs as problematic. One such mechanism is the accumulation of "resources," including work experience, savvy about job hunting, and formal training. As individuals accumulate these resources they receive greater economic rewards, including higher-status jobs, higher earnings, and lower probabilities of unemployment (Tuma 1976; DiPrete 1981). An alternative mechanism is that the creation of job vacancies governs opportunities for worker movement among jobs (White 1970; Sørensen 1975, 1977; Stewman 1975).

Obviously, changes in both the resources individuals bring to the labor market and the opportunity structure can determine lifetime patterns of job mobility.

Both of these research traditions largely ignore the employment status of individuals. Work on job shifts and careers focuses on occupational careers, leaving undiscussed other elements of individuals' lives; and research on the "socioeconomic life cycle" treats employment status as inconsequential for the relationships among family background, schooling, occupational status, and earnings.

Neither of these approaches is easily extended to take account of the complexities of the employment experiences of young persons. Unlike occupational and earnings attainments of mature workers, which can be fruitfully abstracted from individuals' involvements with other institutions, employment is only one activity among others that are important in early life. Youth is a time of transition among a number of market and nonmarket activities that include work, schooling, military service, marriage, family formation, and experimentation with unconventional styles of life. Which of these activities are predominant in the lives of young persons varies both across and within the lives of individuals (Winsborough 1978; Sweet 1979*a*, 1979*b*). Young persons also differ in how they order these activities in time. Although cohorts of young men clearly move from school to work during this period, the nature and ordering of this transition is conceptually and empirically problematic (Coleman, 1976; Hogan 1978, 1981). The transition is not a single change of status because typically persons enter and leave schooling and employment a number of times. Moreover, as young persons become adults they need not pursue each of their principal activities serially. Instead, they may engage in several activities simultaneously, in varying degrees subject to temporal constraints. Finally, the timing of individuals' status changes varies with their social characteristics. As we argue below, for example, men who leave school when they are in their twenties differ systematically from men who leave in their teens, not only in the amount of schooling they have received, but also in other characteristics that affect their labor market success.

These complexities suggest that intracohort changes in employment should be closely linked to changes in other activities and events both in and out of the labor market. School attendance, employment, service in the armed forces, marriage, establishment of a separate place of residence, and the onset of childbearing are closely linked for young persons. This article examines a subset of these linkages, specifically, those among employment status, school enrollment, and participation in the armed forces. In particular, it explores the cross-sectional and temporal connection of these activities in the lives of young men and attempts to explain

age variation in employment by age variation in school attendance and military service.

In describing the linkages among work and nonwork roles through which young men pass with age, this article parallels research on the age-gradedness of occupations in the adult labor force (Kaufman and Spilerman 1982) and on occupational careers (Spilerman 1977). We provide a partial description of the temporal and cross-sectional connections among major statuses and roles in early life and extend understanding of the age pattern of statuses and transitions in the socioeconomic career to an earlier phase of life. Our approach, however, differs from this research in its emphasis on the overlapping, interrupted, irregular, and varied character of roles and role transitions in a population that is not yet fully integrated into adulthood.

III. ENROLLMENT, ENLISTMENT, AND EMPLOYMENT

The Transition to Employment

Much previous research has viewed transitions between social statuses and roles as single, irreversible events. Transitions that have been viewed in this way include entry into first marriage, departure from school, entry into first job, and onset of first birth (e.g., Marini 1978, 1982; Alexander and Reilly 1981; Rindfuss et al. 1981; Ornstein 1976). In the case of employment, the point at which young persons start to work is conceptually ambiguous (Coleman 1976). Many definitions, implying varying degrees of commitment to work, can be used, such as first work for pay, first regular job in a work organization, first full-time job, or first job after school completion. In the arguments and analyses presented below we avoid an arbitrary definition of entry into employment and view the transition simply as the increase in individuals' probabilities of employment. The "transition," therefore, is the continuous increase in employment probabilities and reflects, albeit abstractly, the various definitions of first entrance into employment mentioned above. An important consequence of this view is that the data required for analysis of intracohort change in employment for young persons are much simpler than those needed for analysis of specific events.

The armed forces affect the intracohort pattern of employment among young persons through three mechanisms. These include (1) the competition among schooling, the armed forces, and employment for young men's time; (2) the disruptive effects on employment of leaving school and the armed forces; and (3) the differential timing of movement into employment by men of varying social characteristics.

Competition between Work and Nonwork Roles

Young men enhance their employment chances by accumulating formal schooling and thereby obtaining credentials or knowledge and training useful in the labor market (Becker 1975; Mincer 1974). In the short run, however, school enrollment obviously delays their entrance into employment or reduces the hours they can work. Students work substantially less than nonstudents, whether work is measured by the proportions of each group employed or by the quantity of time each group works (Fearn 1968; Bowen and Finegan 1969; Lerman 1970; Parsons 1974; Gustman and Steinmeier 1979). Many students do not need to work because they receive economic support from parents or other sources. Others rely on part-time or intermittent employment to cover expenses. Students are also handicapped in competing with nonstudents for jobs inasmuch as their hours for work are fewer and less flexible (Lazear 1977).

As is well known, however, the proportion of a cohort that remains in school declines precipitously with age. Approximately half of each cohort has left school by the late teenage years, mostly as a result of high school graduation. For the half that remains in school, attrition is substantial in each of the college years, and by the mid-twenties, most of a cohort has left school (Duncan 1968; Mare 1980*b*). Thus, a significant part of the increase in employment with age results from departures from school. The rate of increase in employment with age, moreover, should vary directly with the rate of attrition from school; that is, the largest increases in proportions employed should occur during the ages when high school graduations and departures from college are most prevalent.

A smaller but still substantial proportion of young men enlist in the armed forces. Typically, men enlist in their late teens, usually following high school graduation, and are discharged in their early twenties. The "effect" of military enlistment on employment is largely definitional. If, as some analysts have recommended (National Commission on Employment and Unemployment Statistics 1979), the armed forces are counted as employed, then the age pattern of civilian employment overstates the degree to which proportions employed increase with age inasmuch as the proportion of persons in their late teens and early twenties counted as employed will be higher. If, however, the armed forces are counted as not employed, then the civilian age pattern is enhanced when the age pattern of the percentage employed in the civilian work force is calculated. In the latter case, military enlistment, like school enrollment, competes with civilian employment. Were service in the armed forces not available as an activity for young men, then proportions employed as civilians could be significantly higher.

Gaps between Work and Nonwork Roles

Some young men may already hold jobs when they leave school or the armed forces and others may have a job already "lined up." For many, however, initial withdrawal from school or the military is accompanied by unemployment, job search, and job experimentation (Folk 1969; Feldstein 1973; Gover and McEaddy 1974). During this period, men try various jobs and possibly experience high layoff rates resulting from their low seniority and potential employer dissatisfaction with their performance. Others find work difficult to obtain at first because of their lack of work experience and on-the-job training. Still others may be reluctant to work at prevailing wage rates and may engage in a "moratorium" from all legitimate activities (Osterman 1980). Work may also be relatively unattractive to school leavers who have not yet taken on the financial obligations of raising a family and paying for major purchases. Taken together, these styles of movement between schooling and armed forces on the one hand and employment on the other suggest that rising employment with age may reflect, in part, the differences among age groups in the amount of time young persons have been out of school or the armed forces. The decline with age in the proportion of a cohort that is made up of recent school leavers and veterans may partially explain the increase with age in the proportions of a cohort that is employed.

Employability and the Timing of Transitions

The arguments so far suggest how the intracohort rise in employment results from shifting composition with age on factors that change over the lives of individuals, such as enrollment and time out of school. This section considers the effect of changes with age in the composition of the out-of-school population on factors fixed within individual lives. It examines the tendency for men of varying degrees of "employability" to seek work at different ages. In particular, it argues that men who have the best prospects for success in the labor market typically enter the labor market at older ages than men with poorer prospects.

Prolonged schooling and service in the armed forces are two principal sources of delayed labor market entry. Delayed entry by men pursuing higher education affects the intracohort pattern of employment in two ways. First, persons who leave school later usually have more schooling than persons who leave earlier. As this segment of a cohort leaves school, the average level of schooling of persons who are not in school increases. Because the credentials and skills associated with formal schooling are attractive to employers, young men's probabilities of employment vary directly with their educational attainments (Katz 1974; Conley 1974;

Feldstein and Ellwood 1979; Nickell 1979). As the average education of the out-of-school population increases, therefore, the average probability of employment for a cohort also increases.

Second, in addition to having superior levels of education, persons leaving school later are more attractive to employers in other respects than are early leavers. That is, schools retain persons with the kind of characteristics that lead to relatively good employment prospects. The later entrance of these individuals into the ranks of the nonenrolled raises the average level of employability of this group. Persons with higher ability, motivation, and other learning skills stay in school longer than their less capable counterparts because of their more favorable family circumstances (Sewell and Hauser 1975) and the greater anticipated economic reward for their schooling (Willis and Rosen 1979). These persons may also obtain employment more easily, especially when they finally leave school, than persons who leave school earlier (Mare and Winship 1980; Clark and Summers 1982; Meyer and Wise 1982). If they were not enrolled in school, they would be more likely to be employed than persons who are actually out of school. Thus, at younger ages the youth labor force consists largely of persons of lower employability (Bowen and Finegan 1969; Feldstein and Ellwood 1982; Kalachek 1969). As a cohort ages, persons with more formal qualifications as well as greater employability leave school. As a cohort ages, the flow of more and more persons of higher employability out of school affects the composition of the group out of school. To the extent that timing of leaving school varies directly with employability, the average employability of persons out of school increases with age, thereby raising cohort employment rates.

School attrition affects the composition of the student population as well. Since, on average, the least capable students leave school first, the average ability of students also increases. This change in composition, however, may not increase student employment rates. Much more than that of out-of-school persons, student employment depends on factors other than educational attainment, motivation, qualifications, or ability. Students most likely to work may be those living away from home, those whose parents are unable to support them fully, or those who are least committed to school. Much student employment often depends on the availability of part-time jobs compatible with student schedules. Not only may employment for students rise less steeply with age, but it also may respond largely to factors independent of mechanisms affecting employment of out-of-school persons. This implies that the suppressing effect of school enrollment on employment is greatest for the most educated and employable members of the population.

Recruitment and withdrawal from the military may affect civilian employment in a manner that parallels the effect of school enrollment. Some

men enlist to avoid bleak civilian job market prospects. On balance, however, the armed forces recruit men of approximately average ability because those with higher ability either remain in school or find civilian jobs, and those of the lowest ability fail to qualify (Cooper 1978). Because the effect of ability on employment is most likely to be strongest in the below-average segment of the ability distribution, the armed forces may retain men with better civilian employment prospects than the civilians themselves have. Discharges from the military, therefore, may increase the employability of the civilian population and contribute to the positive relationship between age and employment for civilians between ages 21 and 29.

To summarize, this section has described three types of linkages between work, schooling, and service in the armed forces that affect the age profile of employment for young men. The quantitative importance of these mechanisms is examined in the analyses reported below.

IV. DATA

The analyses reported here use the October Current Population Surveys (U.S. Bureau of the Census 1978) (CPS) of 1973–78 and unpublished Department of Defense tabulations for the third quarter of each of these years. A total of 95,698 observations of civilian noninstitutional males aged 16–29 are selected from October CPS files. The number of independent observations, however, is approximately 50% of this because the rotation group structure of the CPS dictates that residents of one-half of the housing units in a given month of the survey are interviewed in the same month one year later (U.S. Bureau of the Census 1978). The CPS, moreover, is based on a multistage stratified cluster sample. Thus the assumption of simple random sampling made in the multivariate analyses reported here does not hold. Because reported test statistics do not allow for the nonrandomness of the CPS samples, the statistical significance of estimated parameters is overstated. To analyze the effects of military enlistment, the CPS data are augmented by cross tabulations of the armed forces, compiled by the Department of Defense, of age by race by grades of school completed. These tables are deflated to approximate the sampling fraction of the October CPS and are treated as sample data, although they are based on a census of the armed forces.

To reduce computation time, the CPS data are grouped in a table of the following dimensions: (1) employment status (employed, not employed); (2) schooling (less than 12 grades, 12 grades, greater than 12 grades); (3) age (seven two-year categories over the 14-year span 16–29);[2] (4) race

[2] All enlistees and veterans in the 16–17 age group are 17 years old.

(nonblack, black); (5) veteran status (nonveteran, veteran); and (6) enrollment status (enrolled, first year out of school, second or third year out of school, fourth or more year out of school). Years out of school is estimated from survey questions on dates of last attendance for high school dropouts and of graduation for graduates, on grades of schooling completed, and on age.[3] In most models, age is parameterized as a third-order orthogonalized polynomial, the terms of which are calculated by raising the midpoints of the two-year age categories to their appropriate powers and residualizing higher-order terms on lower-order terms to derive orthogonal variables. School enrollment is defined as either full-time enrollment only or as full- or part-time enrollment. For examining the effect of enrollment status on employment for the total population, enrollment is defined as full time only because the part-time enrolled are mostly full-time workers taking limited schooling, rather than persons dividing their time equally between schooling and work. In the analysis of employment for the not-enrolled population alone, part-time students are excluded because no information on their "time since leaving school" is available. For the not enrolled, however, estimates of the effects of other variables are unaffected by the enrollment definition.

V. STATISTICAL METHODS

The dependent variable in these analyses is a dichotomy, d_y, taking the value of 1 if an individual is employed and 0 otherwise. The multivariate analyses include single-equation probit models that predict employment and two-equation probit models that jointly predict employment for out-of-school men and a second dichotomy, d_z, indicating whether an individual is in the not-enrolled civilian population. The two-equation model thus comprises a "sample selection" equation (for enrollment and enlistment) and a structural equation (for employment) (Hanushek and Jackson 1977; Judge et al. 1980).

In the single-equation model, an individual's probability of employment is nonlinearly related to the independent variables. For the ith individual,

$$p(d_{y_i} = 1) = \int_{-\infty}^{c_{y_i}} \frac{1}{\sqrt{2\pi}} \exp\left(\frac{-t_y^2}{2}\right) dt_y, \tag{1}$$

[3] In the October CPS, high school dropouts are asked when they last attended school. Persons with 12 or more grades of schooling were asked when they graduated from high school but not when they last attended. We estimate years out of school as follows: survey year − year last attended + 1 (<12 grades), survey year − year of graduation + 1 (12 grades), survey year − year of graduation + (highest grade attended + 1) (>12 grades). For persons with at least some college education this measure will somewhat overestimate the time since leaving school.

where $c_{y_i} = \Sigma\beta_k X_{ik}$, X_{ik} denotes the kth independent variable ($k = 1, \ldots, K$), and β_k are the probit coefficients. This model is applied to young men as a whole to estimate age and enrollment effects on employment and to out-of-school men to estimate the effects of additional variables. The tables presented below report not the β_k in (1) but, rather, the related quantities $\partial p(d_y = 1)/\partial X_k$, which give the effect of the kth independent variable on the probability of employment evaluated at the sample proportion employed for out-of-school persons.[4]

In the two-equation model, equation (1) for out-of-school men is combined with a similar equation predicting whether an individual is enrolled in school for the in- and out-of-school populations combined. This model also allows for common unmeasured variables to effect the probabilities of employment and enrollment and assesses the degree to which these unmeasured variables are correlated. If unmeasured determinants of enrollment and employment are correlated positively, this suggests that common factors such as ability affect both enrollment and employment.

We consider two versions of the two-equation model. One applies to the civilian population only and contains a selection equation predicting whether an individual is enrolled. The second applies to the combined civilian and armed forces population and contains a selection equation predicting whether an individual is in one of two groups: (1) neither enrolled nor enlisted, or (2) either enrolled or enlisted.[5]

VI. EMPIRICAL SPECIFICATION

Because we lack longitudinal data for a single cohort that are well suited to this investigation, we adopt a synthetic cohort approach (Shryock and Siegel 1976) and infer intracohort processes from cross-sectional age variation.[6] The analyses focus on (1) the age pattern of employment for all young men and the contribution of age variation in school enrollment to the age effect on employment, (2) the determinants of employment status for out-of-school young men, and (3) the contribution of each factor to the age-employment profile of the total population.

[4] That is, $\partial p/\partial X_k = \beta_k \, 1/\sqrt{2\pi} \exp(-t_y^2/2)$, where t_y is the z-score corresponding to the sample proportion employed (Hanushek and Jackson 1977).

[5] It would be preferable both to treat the choices among enrollment, enlistment, and employment as simultaneous and to control for enrollment and enlistment selection with separate equations. Although such models are available (Domencich and McFadden 1975; Hausman and Wise 1978), reliable statistical software is available only for three-choice models such as the one considered here.

[6] Empirical results (not reported here) that incorporate statistical controls for cohort membership are almost identical to the results presented here.

Age and Enrollment Effects on Employment

To describe the age pattern of employment we summarize employment differences among two-year age groups within the 16–29 age range with the following model:

$$\Phi^{-1}[p(d_{y_i} = 1)] = \beta_0 + \sum_{k=18-19}^{28-29} \beta_k d_{ki},$$

where Φ is the standard normal distribution function, d_{ki} is a dummy variable that equals one if the ith individual is in the kth two-year age group ($k = 18–19, \ldots, 28–29$) and zero otherwise, and β_0 and the β_k are probit coefficients to be estimated. If school enrollment rates strongly affect employment, then age variation in employment approximately follows the age pattern of rates of school withdrawal. Since school attrition is relatively slight during the mid-teens, large in the late teens and early twenties, and more gradual thereafter, a simple curve, such as a third-degree polynomial, may describe the age pattern. Thus we consider a model

$$\Phi^{-1}[p(d_{y_i} = 1)] = \beta_0 + \beta_1 A_i + \beta_2 A_i^{2*} + \beta_3 A_i^{3*}, \qquad (2)$$

where A_i denotes the midpoint of the two-year age interval for the ith individual and A_i^{2*} and A_i^{3*} denote quadratic and cubic age terms constructed to be orthogonal to their respective lower-order terms. Because this third-degree polynomial model satisfactorily predicts observed employment rates (see below), we adopt it for the balance of the analysis.

To assess the effect of enrollment status on employment and its age pattern, we augment (2) with a dummy variable denoting whether an individual is enrolled in school full time. We can show how much of the increase in employment with age results from age variation in school enrollment by comparing age-specific employment probabilities under the simple age model (2) with the employment probabilities adjusted to a common level of school enrollment for all ages. We also investigate whether employment is more strongly age-graded among out-of-school young men than among students by allowing age effects to vary with enrollment status.

Determinants of Employment for Out-of-School Men: Measured Variables

After examining the age pattern of employment for out-of-school men using a model of the same form as (2), we consider additional independent variables in models of the form

$$\Phi^{-1}[p(d_y = 1)] = \beta_0 + \beta_1 A_i + \beta_2 A_i^{2*} + \beta_3 A_i^{3*} + \sum_{k=4}^{K} \beta_k X_{ik},$$

where X_{ik} denotes the value on the kth independent variable for the ith individual. In addition to age, the independent variables include race, grades of school completed, years out of school, veteran status, and age-veteran status interaction.[7]

Determinants of Employment for Out-of-School Men: Unmeasured Variables

The final stage of the analysis of employment for out-of-school men examines whether schools and the military retain the most employable young men for the longest period so that increases in employment with age for out-of-school men result in part from the influx of more employable men to the labor force at advanced ages. To investigate this question directly requires measures of personal attributes affecting employment that are not in the October CPS. Thus we model the probabilities of school enrollment/enlistment and employment as joint outcomes affected by common unmeasured variables. The employment equation includes the measured variables discussed above. The enrollment/enlistment equations include the effects of age, formal schooling, race, veteran status, and the interactions of age with the latter three variables on the probability of being enrolled in school and enlisting in the armed forces. Using the bivariate probit model, we estimate these two equations and the correlation between the probabilities of enrollment/enlistment and employment with the measured independent variables controlled.

VII. EMPIRICAL RESULTS

Age and Enrollment Effects for All Young Men

The first four columns in table 1 report the estimated effects of age and school enrollment on the probability of employment for civilian men for four models. Figure 1 displays the age-specific employment probabilities under these models. The first model classifies the employment probabilities into seven two-year age groups. The second model parameterizes this age pattern as an orthogonalized third-degree polynomial. (Since the linear term is uncorrelated by construction with the higher-order terms, its coefficient can be interpreted as the linear age effect.) The likelihood statistics for models 1A and 1B suggest that the data reject the polyno-

[7] We considered other factors such as two-way interactions between race, age, grades of schooling, and time out of school. Some of these interactions are statistically insignificant (race-age), and others, although significant, do not alter the interpretation of the lower-order effects considered here. We also examined alternative classifications of the independent variables (grades of schooling and years out of school), but these did not affect our conclusions.

TABLE 1

EFFECTS* OF AGE AND ENROLLMENT STATUS ON PROBABILITY OF EMPLOYMENT FOR MEN AGED 16–29, 1973–78

INDEPENDENT VARIABLE	CIVILIAN POPULATION				TOTAL POPULATION (Armed Forces Employed)			
	1A	2A	3A	4A	1B	2B	3B	4B
Constant	−.09	−.84	−.17	−.44	−.08	−.74	−.06	−6.95
18–19 (vs. 16–17)	.17				.18			
20–21 (vs. 16–17)	.27				.31			
22–23 (vs. 16–17)	.38				.37			
24–25 (vs. 16–17)	.46				.45			
26–27 (vs. 16–17)	.52				.50			
28–29 (vs. 16–17)	.56				.53			
Age†		.47	.23	.34		.43	.19	.28
Age²‡		−.27	.02‖	−.30		−.33	−.02‖	−.29
Age³§		.98	−2.57	3.79		3.09	−1.30	4.61
Enrolled full time (vs. not enrolled full time)			−.37	−.00‖			−.40	−.16
Enrolled × age†				−.16				−.11
Enrolled × age²‡				.43				.42
Enrolled × age³§				−5.59				−6.34
−2 log likelihood	97,474	97,506	88,799	88,325	102,674	102,705	91,499	91,063
df	621	624	623	620	663	666	665	662
Adjusted percentage employed:#								
16–17	39.4	39.3	64.1	52.2	40.8	41.0	68.0	57.4
22–23	80.3	80.4	76.8	77.3	81.5	83.0	79.6	80.1
28–29	91.9	92.1	86.9	86.8	92.1	92.4	87.3	87.7

* Effects are evaluated at the sample means of the dependent variables. For civilians, $p = .718$; for the total population with the armed forces defined as employed, $p = .740$.

† Age/10.

‡ Age²/100 (orthogonalized to age).

§ Age³/10,000 (orthogonalized to age and age²).

\# Percentage employed at selected ages adjusted to means of other independent variables.

‖ Coefficient less than twice its estimated SE.

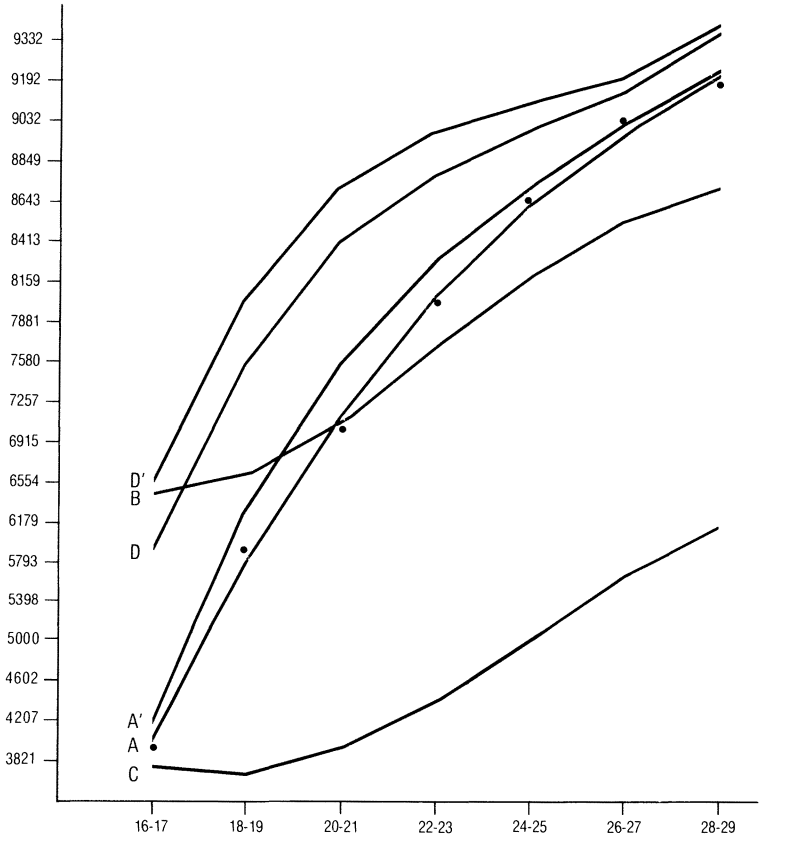

FIG. 1.—Predicted proportion employed (probit scale) by age for selected models. Models are: A = third-order age polynomial, civilians (model 2A, table 1); A' = third-order age polynomial, civilians and armed forces (model 2B, table 1); B = third-order age polynomial, controlling enrollment status, civilians (model 3A, table 1); C = third-order age polynomial, full-time enrolled, civilians (model 4A, table 1); D = third-order age polynomial, not full-time enrolled, civilians (model 4A, table 1); and D' = third-order age polynomial, not full-time enrolled, civilians and armed forces (model 4B, table 1). ● = Observed age-specific employment probabilities (model 1, table 1).

mial constraint inasmuch as their difference of 32—distributed as χ^2 with 3 degrees of freedom (*df*) under the assumption of random sampling—is statistically significant. Because the number of individual observations is so large and the random sampling assumption is violated in the CPS, however, we treat differences in the log likelihoods of nested models only as descriptive measures of relative fit. The proportionate change in χ^2

when the polynomial restriction is applied is trivial. As figure 1 shows, moreover, the polynomial accurately traces the observed employment probabilities which rise with age, most dramatically at the youngest ages when high school graduation and college attendance are prevalent, and then more gradually in the mid to late twenties.

Consider next the age pattern of employment adjusted for age variation in the proportion of young men enrolled in school full time. A model including an additive term for enrollment status (col. 3A) shows that the increase in employment between ages 16 and 29 results partly from age differentials in school enrollment. The enrollment term substantially reduces the positive linear effect of age on employment (from .47 to .23). As the last three rows of table 1 show, when enrollment is not controlled, employment varies from approximately 40% for 16–17-year-olds to approximately 90% for 28–29-year-olds. If the proportion enrolled is held at the level for the entire 16–29 population, however, employment varies only from 64% to 87%.

Column 4A of table 1 reports coefficients for a model in which the age pattern of employment differs for enrolled and not-enrolled young men. Age-enrollment interactions improve the fit of the employment model substantially. As figure 1 shows, employment increases more steeply with age for nonstudents than for students. Using this model, we can decompose the age pattern of employment into parts associated with (1) age differences in enrollment, (2) age differences in employment for students, and (3) age differences in employment for nonstudents.[8] Table 2 presents this decomposition for three age intervals. The growth in employment with age is much greater during the first half of the 16–29 age span than in the second. In the former interval, however, enrollment accounts for

[8] These three components are calculated according to the following formula (as applied to the 16–23 age interval):

$$r_{23} - r_{16} = \left[(p_{23} - p_{16})\left(\frac{r^e_{23} + r^e_{16}}{2}\right) + [(1 - p_{23}) - (1 - p_{16})]\left(\frac{r^n_{23} + r^n_{16}}{2}\right)\right]$$
$$+ \left[(r^e_{23} - r^e_{16})\left(\frac{p_{23} + p_{16}}{2}\right)\right]$$
$$+ \left[(r^n_{23} - r^n_{16})\left(\frac{(1 - p_{23}) + (1 - p_{16})}{2}\right)\right]$$

(Kitagawa 1955), where p_{23} and p_{16} are age-specific proportions enrolled in school, r_{23} and r_{16} are the age-specific (probits of the) proportions employed, and the superscripts e and n denote the enrolled and not-enrolled population, respectively. This formula is applied to the 16–23 and 23–29 intervals. The decomposition for the total 16–29 interval is the sum of the components from these two decompositions.

TABLE 2

COMPONENTS OF CHANGE IN EMPLOYMENT (Probit), CIVILIAN NONINSTITUTIONAL MALES

	AGE SPAN					
	16–17 to 22–23		22–23 to 28–29		16–17 to 28–29	
COMPONENT*	Change	Proportion of Change	Change	Proportion of Change	Change	Proportion of Change
Age difference in enrollment....	.632	.558	.146	.291	.778	.477
Age difference in employment for enrolled	.093	.082	.077	.170	.170	.104
Age difference in employment for not enrolled	.406	.359	.278	.684	.684	.419
Total.....	1.1316	1.000	.501	1.000	1.632	1.000

* Components derived from model 4A in table 1.

its largest share of the change in employment. Throughout the 16–29 age span, employment growth among nonstudents is a much greater proportion of the change in employment not accounted for by enrollment change than is employment growth among students.

Models 1B–4B in table 1 parallel the civilian models 1A–4A for the civilians and armed forces combined. In these models, the armed forces are defined as employed but not enrolled in school. As can be seen by comparing the linear age coefficients between the two sets of models, including individuals in the military among the employed modestly lowers the linear effect of age. Profiles A and A' in figure 1 show that counting those in the military as employed increases the slope of the age-employment profile between the ages of 16–17 and 20–21 and decreases it thereafter. A comparison of the civilian and total not-enrolled populations (profiles D and D') shows that inclusion of the military moves the curve for the 16–21-year-olds upward but leaves its slope largely unchanged for older men.

To summarize, changes in school enrollment and military service with age account for part of the changes in employment with age. Even within enrollment statuses, however, employment increases with age, especially for persons out of school. The next section focuses more closely on the age pattern of employment among nonenrolled young men.

Employment of Out-of-School Young Men: Effects of Observed Variables[9]

Table 3 reports the effects of observed independent variables on the probability of employment estimated by single-equation probit models. (For means on the independent variables, see Appendix table A1.) These models confirm a number of well-established relationships between social factors and the chances of employment. Blacks are less likely to be employed than whites, the probability of employment varies directly with the level of formal schooling, and veterans in this age group experience lower employment than nonveterans. The results also suggest that the critical educational distinction for employment is whether young men have a high school degree, not whether they have had postsecondary schooling. In addition, persons newly out of school have lower employment probabilities than persons out of school for a number of years.

Table 3 also shows the extent to which the independent variables account for increasing employment with age. The linear age coefficients and adjusted employment probabilities for models (1) and (2) indicate that age differences in racial composition of the out-of-school population account for little of the increase in employment with age. In contrast, age differences in educational composition explain approximately one-fourth of the increase (compare linear age terms of .20 and .16 in models [2] and [3]). Age differences in the distributions of times since leaving school account for an additional 10%–15% of the age effect that remains once education and race are taken into account.

To examine the argument that members of the armed forces experience a transitional period between discharge and integration into the civilian work force, we augment the final equation in table 3 with terms measuring the interaction of age with veteran status. Under this model, for which coefficient estimates are reported in column 1 of table 4, veterans' handicap is greatest for the youngest, who are experiencing the transition into civilian life, and gradually disappears with age. Figure 2 plots the age pattern of employment for veterans and nonveterans, using the coefficients of the model, and shows that the disadvantage of participation in the military is indeed concentrated among the youngest veterans. As veterans approach age 30, their employment probabilities converge with those of nonveterans. This shows that movement from military to civilian life, like departure from school, is often accompanied by high rates of joblessness.

The results presented thus far for out-of-school young men are summarized in profiles *A* and *B* in figure 3, which plot expected age-specific

[9] The measured and unmeasured variables that affect employment for out-of-school men have very weak effects on employment for students.

TABLE 3

EFFECTS* OF INDEPENDENT VARIABLES ON PROBABILITY OF EMPLOYMENT FOR SELECTED MODELS: OUT-OF-SCHOOL CIVILIAN NONINSTITUTIONAL MALES AGED 16–29 IN 1978

INDEPENDENT VARIABLE	MODEL				
	1	2	3	4	5
Constant	−.24	−.22	−.11	−.05	−.05
Black (vs. nonblack)		−.12	−.11	−.11	−.11
<12 grades (vs. 12 grades)			−.08	−.09	−.09
>12 grades (vs. 12 grades)			.01	.02	.02
Out 1 year (vs. out 4+ years)				−.03	−.03
Out 2–3 years (vs. out 4+ years)				−.01†	−.01
Veteran (vs. nonveteran)					−.02
Age‡	.20	.20	.16	.14	.14
Age²§	−.18	−.18	−.11	−.10	−.09
Age³‖	2.47	2.58	1.68	1.78	1.72
−2 log likelihood#	121,851	120,975	120,252	120,226	120,190
df	604	603	601	599	598
Adjusted percentage employed:**					
16–17	61.1	61.8	71.1	73.2	73.8
22–23	88.6	88.7	88.7	88.8	88.7
28–29	93.8	93.6	94.0	92.7	94.0

* Effects are evaluated at the sample means of the dependent variables ($\bar{p}$ = .8753).

† Coefficient less than twice its estimated SE.

‡ Age/10.

§ Age²/100 (orthogonalized to age).

‖ Age³/10,000 (orthogonalized to age²).

Log likelihoods and *df* adjusted to be comparable to two-equation estimates in table 4 on assumption of an auxiliary enrollment equation and correlation of zero between disturbances of employment and enrollment equations.

** Implied percentage employed at selected ages at means of other independent variables.

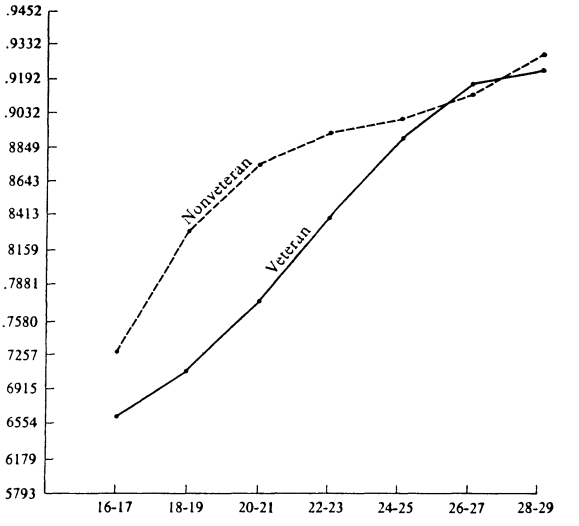

FIG. 2.—Predicted proportion employed (probit scale) by age and veteran status for out-of-school civilian noninstitutional males. Estimates are adjusted for age and veteran status differences in race, grades of schooling, and time out of school. Estimates are based on model 1 in table 4.

employment probabilities under the models of a third-order age polynomial and of age effects adjusted for race, veteran status, grades of schooling, time out of school, and age–veteran status interactions. The observed variables considered so far explain a substantial portion of the age pattern of employment. Most of the compression in the age difference results from the control for grades of schooling, although time out of school also accounts for some of the age difference. These effects are greatest where the increases in age-specific employment are largest, namely, for men under age 22, suggesting that age variation in the proportion of persons with high school diplomas is a key component of age variation in employment.

Employment of Out-of-School Young Men: Effects of Unmeasured Factors

A potentially important cause of rising employment with age is the influx into the labor force of more employable young persons from school and the military. The equations presented thus far fail to recognize that the out-of-school nonenlisted population differs systematically on unmeasured factors from the student and military populations. If persons who have remained in school for lengthy periods or have been in the military

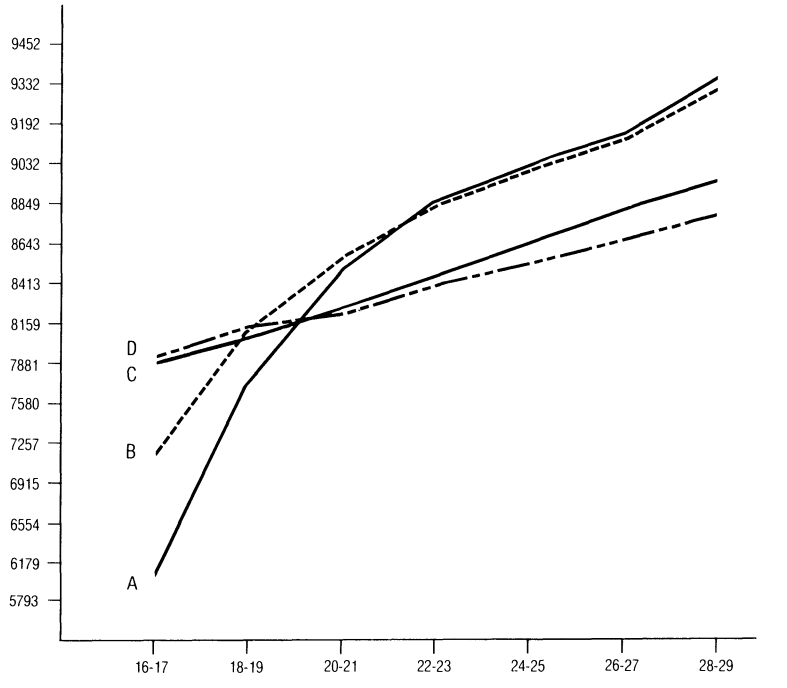

FIG. 3.—Predicted proportion employed (probit scale) by age for selected models for *out-of-school* civilian noninstitutional males. Models are: A = third-order age polynomial (model 1, table 3); B = third-order age polynomial with controls for race, grades of schooling, years out of school, veteran status, and age–veteran status interaction (model 1, table 4); C = third-order age polynomial with controls as in model B, plus adjustment for enrollment selection (model 2, table 4); D = third-order age polynomial with controls as in model B, plus adjustment for enrollment and enlistment selection (model 3, table 4).

have above-average chances of securing employment when they leave school or the military, then unmeasured determinants of whether an individual is enrolled or enlisted and of whether he is employed should have a positive correlation. Since the degree of selection in enrollment and the military varies with age, moreover, a control for systematic selection may also account for part of the positive association of age and the probability of employment.

To examine these conjectures, we estimate two two-equation models. Both consist of a "selection" equation which predicts whether an individual is a nonenrolled civilian and a structural equation which predicts the probability of employment for nonenrolled civilians. In the first model, which applies to civilians only, the selection equation predicts whether a

civilian is enrolled in school. In the second model, which applies to both civilians and the armed forces, the selection equation predicts whether an individual is enrolled or enlisted or is neither enrolled nor enlisted.

Models 2 and 3 in table 4 report estimates for the employment equation in the two models.[10] The estimates of ρ, which denote the resemblance of the employed to the enrolled and enlisted on unmeasured variables, strongly suggest that schools and the military retain the highly employable young men. In the civilian model (2), ρ is .270. In model 3 for both civilians and the military, ρ is .334.[11] The effect of receiving some college (relative to being awarded a high school diploma) increases markedly between the single- and two-equation models. This suggests that the schooling effect is underestimated in the single-equation model because those individuals who are most able to benefit from their investment in formal schooling are still in school.

The estimated effects of age are substantially attenuated when selection on unmeasured variables is taken into account. The linear increase in age, which drops from .2 to .136 when adjusted for measured variables, is reduced to .066 when enrollment selection is controlled and to .049 when both enrollment and enlistment selection are controlled. By this measure, fully three-fourths of the increase in employment with age for out-of-school men is explained by the mechanisms considered here. These effects are paralleled by changes in the predicted probabilities of employment shown at the bottoms of tables 3 and 4 and plotted in figure 3. The figures confirm that age differences on unmeasured variables common to employment, enrollment, and enlistment account for as much of the age pattern of employment as age differences on measured variables. Both measured and unmeasured variables explain a larger fraction of age variation in the 16–21 age range than for older men, but it is for younger men that the greatest age variation occurs.

Accounting for Age Variation in Employment: Summary

The sources of rising employment with age for out-of-school young men can be summarized through a decomposition based on the coefficients and

[10] To save space, the selection equations for these models are not reported here. Estimates are available from the authors on request.

[11] These correlations do not show directly whether individuals who are in the military resemble the employed more strongly than the not employed on unmeasured factors. A third two-equation model, in which the selection equation predicts whether an individual is in the military and the structural equation predicts school enrollment for civilians, combined with the two-equation estimates reported in table 4, yields the partial correlations among unmeasured determinants of employment, enlistment, and enrollment. The partial correlations are .135 between enlistment and employment, .733 between enlistment and enrollment, and .280 between employment and enrollment.

TABLE 4

EFFECTS* OF INDEPENDENT VARIABLES ON PROBABILITY OF EMPLOYMENT UNDER ALTERNATIVE ESTIMATION METHODS: OUT-OF-SCHOOL CIVILIAN MEN AGED 16–29.IN 1973–78

	SINGLE-EQUATION ESTIMATE		CIVILIANS		CIVILIANS AND ARMED FORCES	
	(1)		(2)		(3)	
INDEPENDENT VARIABLE	$\partial p/\partial X$	$\frac{\partial p/\partial X}{SE(\partial p/\partial X)}$	$\partial p/\partial X$	$\frac{\partial p/\partial X}{SE(\partial p/\partial X)}$	$\partial p/\partial X$	$\frac{\partial p/\partial X}{SE(\partial p/\partial X)}$
Constant	−.044	−2.5	.127	3.7	.170	4.4
Black (vs. nonblack)	−.107	−26.5	−.100	−25.3	−.099	−25.9
<12 grades (vs. 12 grades)	−.091	−24.0	−.857	−23.3	−.074	−17.8
>12 grades (vs. 12 grades)	.019	4.7	.041	7.8	.043	8.1
Out 1 year (vs. out 4+ years)	−.030	−5.6	−.029	−5.5	−.032	−6.4
Out 2–3 years (vs. out 4+ years)	−.008	−1.9	−.008	−1.8	−.010	−2.5
Veteran (vs. nonveteran)	−.167	−2.0	−.193	−2.5	−.183	−2.5
Age†	.136	19.6	.066	4.9	.049	3.3
Age²‡	−.113	−8.0	−.003	−.1	−.014	−.6
Age³§	2.290	5.8	.581	1.2	.868	2.0

Veteran × age†	.056	1.8	.067	2.2	.063	2.2
Veteran × age²‡	.070	.9	.039	.6	.053	.8
Veteran × age³§	−4.256	−3.1	−3.272	−2.5	−3.556	−2.7
ρ‖	.0	...	.270	5.5	.334	5.7
−2 log likelihood	120,900#		120,872		144,372	
df	595		594		636	
Adjusted percentage employed:**						
16–17	71.7		78.8		79.0	
22–23	88.3		84.6		84.0	
28–29	93.1		89.7		88.0	

* Effects are evaluated at the sample means of the dependent variables ($p = .8753$).

† Age/10.

‡ Age²/100 (orthogonalized to age).

§ Age³/10,000 (orthogonalized to age and age²).

‖ Disturbance correlation for equations predicting employment and enrollment (for civilians), or employment and enrollment or enlistment (for total population).

Log likelihoods and *df* adjusted to be comparable to models 2 and 3 on assumption of an auxiliary enrollment equation and zero disturbance correlation of employment and enrollment equations.

** Implied percentage employed at selected ages at means of other independent variables.

age differences in average values of the variables of model 3 in table 4. We first discuss this decomposition and then pool its results with those reported in table 2 to assess our success in accounting for rising employment with age in the enrolled and nonenrolled populations combined.

Table 5 decomposes change in the z-transformed employment probabilities for the age intervals 16–23, 23–29, and 16–29 (see Appendix). Two components account for most of the rise in employment between 16 and 23, namely, the increasingly favorable educational composition of the out-of-school population and the changing composition on unmeasured factors such as motivation, ability, and other common determinants of employment, enrollment, and military enlistment. The former component accounts for slightly more than one-third of the rise in employment, whereas the latter, termed "Selection on Employability," accounts for more than 40% of the change. Five percent of the change is attributable to a decline with age in the members of a cohort who are newly out of school. Reflecting the influx of new veterans into the out-of-school cohort over the ages 16–23, the net effect of the veteran composition on employment is slightly negative. Overall, these factors account for almost 90% of the change in employment from 16 to 23.

For the 23–29 interval, the influx of more desirable potential workers with respect to both unmeasured characteristics and formal educational attainment are again the most important components of change in employment with age. The increasing average time since cohort members have left school has a larger impact than for the earlier interval, accounting for over 10% of the increase in employment. The net contribution of veteran status, moreover, is positive for this interval, suggesting that the negative impact of the rising number of veterans is more than offset by the reduced handicap of veteran status with age. The model explains close to 60% of the increase in employment with age between 23 and 29, only two-thirds of the fraction explained for the earlier interval. This shows that the mechanisms associated with reduced school enrollment modeled here have their greatest impact when these reductions are largest, that is, during the years of high school graduation and college attendance. As noted above, however, much more of the increase in employment occurs between 16 and 23 than between 23 and 29. The totals in table 5 imply that 72.9% of the total change occurs in the first interval and 27.1% in the latter. Model 3 accounts for slightly over 80% of the total change in employment for out-of-school young men between 16 and 29.

The results of this decomposition for the out-of-school population can be combined with the decomposition presented in table 2 to estimate the approximate degree to which the mechanisms relating to the linkage of employment, schooling, and the armed forces examined in this article

TABLE 5

COMPONENTS OF CHANGE* IN EMPLOYMENT (Probit), OUT-OF-SCHOOL NONINSTITUTIONAL MALES

COMPONENT	16–17 to 22–23		22–23 to 28–29		16–17 to 28–29	
	Change	Proportion of Change	Change	Proportion of Change	Change	Proportion of Change
Race (means)	.014	.016	.009	.027	.023	.018
Grades of schooling (means)	.331	.364	.041	.121	.372	.299
Years out of school (means)	.053	.058	.040	.118	.093	.075
Veteran status† (means)	−.034	−.037	−.056	−.166	−.090	−.072
Veteran status† (coefficient)	.000	.000	.026	.077	.026	.021
Veteran status† (interaction)	.005	.006	.048	.142	.053	.043
Selection on employability (means)	.440	.485	.085	.251	.525	.421
Residual	.099	.109	.145	.429	.244	.196
Total‡	.908	1.000	.338	1.000	1.246	1.000

* Decomposition based on coefficients in two-equation model for total population (model B) in table 4.
† Veteran status components assume that the younger age is the base group.
‡ Components may not sum to reported totals because of rounding.

account for rising employment with age in the total population between ages 16 and 29. The decomposition presented in table 5 applies to the 42% of change in employment attributed in table 2 to age differences in employment among the not enrolled. These decompositions imply that intracohort change in proportions enrolled and the mechanisms examined in model 3 of table 4 for the not enrolled account for more than 81% of the change between 16 and 29 (100 × [.477 + (.419)(.805)]), 88% of the change from 16 to 23, and 68% of the change from 23 to 29.[12]

VIII. CONCLUSION

This article has described and accounted for intracohort growth in employment in the early lives of young men by focusing on the linkages of employment to roles, statuses, and activities associated with schooling and military service. These linkages include changes both within the lives of individuals and in the aggregate composition of cohorts. Schooling and the military affect employment through their competition for young men's time, through the disruptive effects of moving from one activity to another, and through their selective retention of more employable young men to relatively advanced ages.

Our analyses do not take account of the simultaneous nature of employment, enrollment, and enlistment decisions or of other activities potentially relevant to the growth of employment, such as family living arrangements, marital decisions, and childbearing (Winship 1982). In addition, we place heavy weight on latent variables assumed to measure the distribution of employability in the population and fail to measure such variables as ability, motivation, interpersonal skills, knowledge of the labor market, and personal contacts, at least some of which are central to the argument of the article.

Our findings nonetheless suggest that a substantial part of measured youth joblessness results from the absence from the labor force of young persons whose employment prospects are good. Whereas much commentary has stressed that many youths do not participate in the labor force because they are discouraged (e.g., Congressional Budget Office 1982), the employment potential of those withholding their labor during their teens and early twenties may be above average, and substantial joblessness for young persons may result from the pursuit of other activities.

These analyses also indicate, however, that once a young man is out of school or the armed forces for several years, his probability of employ-

[12] This decomposition is not unique inasmuch as the age effect on employment differs between the enrolled and the not enrolled. Alternative decompositions yield similar qualitative conclusions.

ment increases only slightly with age. This suggests that unemployed youth fall into two groups: recent leavers of school and the military who are not yet integrated into the stable work force and persons out of school for a longer period with persistent employment problems (Clark and Summers 1982). The latter group may not benefit from any "natural" increase in employment as they age.

Although this article focuses on the employment of a single birth cohort, its findings indicate that intercohort change in youth employment may arise from change in participation in other activities (Mare and Winship 1980, 1984). Rising school enrollment for all youths throughout the 20th century and for minorities in recent decades may have led young persons generally and blacks in particular to substitute school for work. In addition, schools may be retaining a larger fraction of persons with good employment prospects for longer periods of time, causing increasing rates of joblessness in the reduced number of youths who leave school early.

APPENDIX

Decomposition of Age Differences in Employment

The components in table 5 for race, grades of schooling, and years out of school are the differences in proportions of men in the categories listed in table 4 between men in pairs of age categories weighted by their respective parameters for model 3 in table 4. For the 16–29 interval, the veteran status components for "means," "coefficients," and "interaction," are, respectively, the three terms in the following expression:

$$\left[(p^v_{29} - p^v_{16})\beta^v + \sum_{r=1}^{3}(p^v_{29} - p^v_{16})(17^r\gamma_r)\right] + \sum_{r=1}^{3}\gamma_r(29^r - 17^r)p_{16}$$
$$+ \sum_{r=1}^{3}\gamma_r(29^r - 17^r)(p^v_{29} - p^v_{16}),$$

where p^v_{29} and p^v_{16} denote the proportions of out-of-school young men who are veterans at ages 28–29 and 16–17, respectively; the γ_r are the coefficients for the age polynomial–veteran status interaction; β^v is the coefficient for veteran status in the two-equation model; and 29 and 17 denote the midpoints of the 28–29 and 16–17 age intervals, respectively. The component for selection on employability is

$$\frac{\rho}{\sqrt{1 - \rho^2}}\left\{\left[\frac{\phi(c)}{1 - \Phi(c)}\right]_{29} - \left[\frac{\phi(c)}{1 - \Phi(c)}\right]_{17}\right\},$$

where ρ is the correlation between unmeasured determinants of enrollment and employment, c denotes predicted values in the selection equa-

TABLE A1

PROPORTIONS AND MEANS OF SELECTED VARIABLES BY AGE AND POPULATION

	NOT-ENROLLED CIVILIANS				ENROLLED CIVILIANS				ARMED FORCES			
	16–29	16–17	22–23	28–29	16–29	16–17	22–23	28–29	16–29	16–17	22–23	28–29
Black	.10	.13	.10	.09	.11	.13	.10	.09	.10	.16	.16	.12
<12 grades	.22	.83	.19	.16	.48	.97	.15	.03	.50	.39	.09	.06
>12 grades	.31	.00	.31	.46	.36	.00	.43	.81	.10	.00	.23	.37
Out 1 year	.18	.43	.18	.00	...	...	...	...	...	...	...	...
Out 2–3 years	.23	.46	.29	.04	...	...	...	...	...	...	...	...
Veteran	.21	.00	.14	.41	.08	.00	.14	.53	...	...	...	...
Age	24.20	17.00	23.00	29.00	19.90	17.00	23.00	29.00	21.90	17.00	23.00	29.00
Percentage employed	.88	.58	.88	.93	.46	.37	.56	.82	...	...	...	...
Percentage of male age group	.57	.09	.72	.85	.35	.89	.22	.12	.08	.02	.06	.03
λ*	−.77	−1.78	−.53	−.26	1.19	.17	1.47	1.76	...	...	...	...

* λ denotes the transformed probability of being a not-enrolled civilian estimated from the selection equations in table 4. For not-enrolled civilians $\lambda_i = -\phi(c_i)/[\Phi(c_i)]$, where ϕ and Φ are the normal probability and cumulative density functions, respectively, and c_i is the predicted value for the ith individual for the second equation reported in table 4. For enrolled civilians, $\lambda_i = \phi(c_i)/[1 - \Phi(c_i)]$, where the c_i are predicted values from the enrollment equations in table 4 (Heckman 1978, p. 938).

tion, ϕ and Φ are the standard normal density and distribution functions, respectively, and the subscripts 29 and 17 denote that the ratios are evaluated at their means for the 28–29 and 16–17 age groups (see table A1). The component for residual is

$$\sum_{r=1}^{3} \beta_r^a (29^r - 17^r) + \sum_{r=1}^{3} \gamma_r (29^r - 17^r) p_{16}^v,$$

where the β_r^a are the coefficients for the third-degree age polynomial.

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