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From GED to College: Age Trajectories of Nontraditional Educational Paths

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Age patterns of secondary certification and college entry differ in complex and surprising ways for traditional graduates and GED recipients. Although GED recipients are less likely to enter college in their late teens, they catch up to traditional graduates in their 20s. Results show that adjusting for differences in the age trajectories of school continuation accounts for a substantial portion of the differences observed between the two groups. Important differences remain, however, in the type of college attended and the likelihood of college entry before age 21. Nonetheless, more GED recipients enroll in college than previous studies have suggested, and this interest in college identifies a useful place for policy to intervene to encourage school continuation for this group.

KEYWORDS: college entry, GED, school trajectories

Educational attainment is a central component of social mobility and a correlate of opportunity and inequality within and across generations. As a result, social scientists have devoted considerable energy to understanding differences in educational attainment and school progress across groups, changes in educational patterns over time and place, and the relationship between education and other life outcomes. High school certification by passing the battery of General Educational Development (GED) tests, an alternative credential to a traditional diploma, represents an important option in the path through school. Between 1971 and 1981, the number of people with a GED more than doubled. By 2001, about 11% of people age 15 to 34 with a secondary credential held a GED (U.S. Census Bureau, Survey of Income and Program Participation (SIPP), 2001 panel). This increase in GED certification has generated growing interest in the costs

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and benefits of the GED, as well as numerous estimates of whether the GED and traditional diploma are in fact equivalent.[1]

This growth in GED certification is part of a larger pattern of increasing educational attainment in the United States. In recent decades, this trend has been fueled by increases in average levels of schooling among traditionally disadvantaged groups such as racial/ethnic minorities and people from economically disadvantaged backgrounds. The GED has contributed to this process by providing an alternative route to secondary school certification that allows those who might not otherwise complete high school an additional opportunity to reach this educational milestone. Most dropouts resume their schooling at a later time, and many go on to earn a GED. GED certification also serves as a gateway to postsecondary schooling. Dropouts who later earn a high school diploma or GED certificate are 3 times more likely to enter a postsecondary institution than dropouts who do not earn a secondary school credential (U.S. Department of Education, 1998). The GED is promoted and legitimated by federal and state governments and educational institutions that equate it with a high school diploma, that offer it as a form of basic education in public welfare programs or prisons, or that use it as a screening tool for financial aid eligibility (Friedlander and Martinson, 1996; Smith, 2003). The GED serves an important social function as well. It gives individuals without a secondary degree a way to ameliorate the stigma of being a dropout at any point in their adult lives.

Although the growth in GED certification has increased overall secondary school completion rates over time, it has at the same time introduced substantial heterogeneity within that level of schooling. While the GED is accepted by colleges and employers as a credential of high school completion and the Census Bureau classifies regular diplomas and GEDs in the same educational category ("high school graduates"), research shows that a GED does not offer the same economic opportunities as a regular diploma (see Tyler, 2003, for a review). Results show that completing a GED may benefit those dropouts with the lowest cognitive skills. For dropouts with stronger skills, however, GED completion is not associated with higher earnings (Boesel, Alsalam, & Smith, 1998; Heckman, Hsse, & Rubinstein, 2000; Murnane, Willett, & Tyler, 2000; Tyler, Murnane, & Willett, 2000). The evidence concerning whether GED recipients and traditional graduates achieve similar labor market success is more consistent. Most studies show that getting a GED instead of a regular diploma results in lower earnings later in life (Cameron & Heckman, 1993; Murnane et al., 2000; but see Cao, Stromsdorfer, & Weeks, 1996.)

The studies also show that differences in labor market outcomes disappear once years of schooling is controlled. GED recipients, however, spend substantially less time in college than do traditional graduates, even though college pays off equally well for both groups. Murnane et al. (2000) estimate that 30% of GED recipients had entered college by age 27 compared to 69%

of those with a regular diploma. This estimate is substantially less than one might expect given that two-thirds of GED recipients report that they plan to continue their schooling after completing the GED (Murnane, Willett, & Boudett, 1997). Moreover, when they do attend, GED recipients complete postsecondary education at lower rates than traditional graduates. This trend is apparent across different types of postsecondary training, including 4-year, 2-year, and less than 2-year institutions (Boesel et al., 1998; Cameron & Heckman, 1993; Murnane et al., 1997). Thus, a deeper understanding of how the school trajectories of traditional high school graduates and GED recipients differ is a central part of understanding the economic disadvantages associated with GED certification.

The following analyses examine differences between traditional graduates and GED recipients in age patterns of secondary school certification and college entry. Access to college is a key condition for getting a college degree and a GED is the primary path for those who do not complete a high school diploma to continue their educational careers—both in terms of completing their secondary credential and pursuing postsecondary schooling. The analyses examine whether GED recipients indeed continue their educational careers and if so, the ages at which they do so. The analyses highlight the unique features of GED certification, in particular the more complicated age patterns of educational transitions. Many GED recipients complete their secondary credential and enter college at later ages than traditional graduates. Thus, it is important to minimize the effect of censoring, both in relation to how long individuals are observed and how the sample of individuals eligible to make a particular educational transition is defined. The magnitude of the effect of censoring is substantial. In the sample analyzed in the following, when schooling is measured at age 25, 65% of those with a regular diploma had entered college compared to 31% of GED recipients. When measured at age 35, however, 70% of traditional graduates had entered college compared to 43% of GED recipients. Observing people to age 35 increases the proportion of GED recipients who enter college by nearly 40%.

The results show that GED certification introduces substantial heterogeneity in the timing of educational transitions. But the age patterns of college entry differ in complex and surprising ways. Although GED recipients are less likely to enter college in their late teens (i.e. "on time"), they catch up to traditional graduates in their 20s, at least with regards to adjusted rates of first-time college entry. By age 20, age-specific rates of first-time college entry converge between the two groups and GED recipients have higher adjusted rates of college entry from age 21 to 30. By failing to account for these different age trajectories, previous studies have not adequately described the educational careers of GED recipients. These differing age patterns of school transitions represent two qualitatively distinct paths through school. More GED recipients enroll in college than previous studies have

suggested, and this interest in college may serve as a useful place for policy to intervene to encourage school continuation for this group. The hurdle seems to be one of postsecondary retention, rather than a disinterest in pursuing any higher education.

The GED, Labor Market Experiences, and Educational Processes

The GED tests were developed during World War II as a tool to help veterans and service members gain access to college. After the war, civilians were allowed to take the tests as well, and states began to recognize the GED certificate as an acceptable credential of secondary school completion. By 1963, the tests were administered in all 50 states and civilians comprised a larger proportion of GED test takers than did veterans and service members (Boesel et al., 1998). The tests cover five subject areas—writing skills, reading skills, social studies, science, and mathematics—and although the standards required for passing the tests vary across states, these standards are generally similar.

One of the central differences between the traditional high school diploma and the GED is the age pattern that characterizes each path. Most youth complete regular high school between age 17.5 and 18.5, often precisely in May or June of that year. The GED lacks this level of institutional structure. Individuals may take the exam if they are not enrolled in high school, are at least age 16, and meet any additional state-specific requirements regarding age or length of time since leaving school. The GED is offered throughout the year, can be taken again if not passed, and sets no upper age limit for potential candidates. For most people, the GED certifies accumulated academic and cognitive skills as opposed to a substantial gain in human capital since departure from high school. Most GED candidates spend relatively little time preparing for the exams—substantially less time than is spent in a typical year in high school (Boesel et al., 1998; Cameron & Heckman, 1993). This investment is unlikely to produce substantial gains in human capital, though it may help dropouts with very weak reading and math skills make some gains in these areas (Murnane et al., 2000).

Differences in labor market outcomes and postsecondary schooling between GED recipients and traditional graduates have been explained by several factors. Some studies show that GED recipients do not perform as well on tests of cognitive skills (Cameron & Heckman, 1993; Murnane et al., 2000; but see Boesel et al., 1998). A similar argument can be made for more difficult to measure concepts such as motivation or noncognitive skills that are valued by employers (Bowles & Gintis, 2000). In this perspective, a regular diploma is a signal that identifies those applicants who possess more of these qualities by their ability to persevere in traditional high school while the GED identifies dropouts who have higher cognitive skills but lack the noncognitive skills that would have helped them complete high school

(Heckman et al., 2000; Heckman & Rubinstein, 2001). The two groups also differ in social background characteristics such as family income or socioeconomic status (Cameron & Heckman, 1993; Murnane et al., 1997, 2000). GED recipients come from more disadvantaged backgrounds and these characteristics are associated with lower educational attainment.

But no studies have considered differences in age patterns of school transitions between traditional graduates and GED recipients, which reveal important differences in the *process* of schooling across groups. Economic research that focuses solely on the costs and benefits of the GED misses this broader perspective. Beyond differences in family background and cognitive skills, examining differences in age patterns of school transitions might reveal important clues about why GED recipients complete less postsecondary schooling and suggest a promising place for policy to intervene for individuals who choose this credential.

Age and school attainment are closely tied. Factors such as grade retention, repeated suspensions or expulsions, motivation or dislike of school, childbearing, employment, health issues, or family crises can cause some individuals to get a high school credential at later ages. Similarly, these factors might cause some individuals to wait longer before entering college. The effects of these factors are reflected in differences in age between individuals at key educational transitions, namely, secondary completion and college entry.[2]

Once delayed, future transitions out of secondary school or into college might coincide with the young adult years, which mark a part of the life course that often includes peak fertility, first marriage, migration, and the start of career trajectories for those who take their first post-school job (Rindfuss, 1991). In this part of the life course, the order or sequence of activities or statuses is organized by certain normative, age-specific patterns (Hogan, 1978; Marini, 1984). Some sequences (college, first job, marriage, first child) are more common and less difficult than other sequences (first child, college, first job). Postsecondary schooling as an institution is organized around the assumption that people attend college at ages when school will be their primary activity versus at older ages, when family and work responsibilities might compete for students' attention.[3] As a result, continued schooling may be more difficult in this part of the life course regardless of the type of secondary degree.

Chronological age also has a social dimension. Individuals have informal yet shared notions about the right and wrong ages at which to experience different life events. These age-specific norms shape a shared definition of age-appropriate roles, behaviors, and time schedules (Binstock & Shanas, 1976; Elder, 1975). Expectations about particular age-specific norms are reinforced by the fact that formal schooling is largely organized by age. Most children enter kindergarten around age 5 and complete high school by age 17 or 18. Among those who ever attend college,

most enter college for the first time in the months following high school completion. The completion of high school and the transition to college occur at a juncture in life, namely, at the cusp of adolescence and adulthood, when even 1 or 2 years difference in age can be associated with different social and educational norms (Pallas, 1993). If GED recipients are off the age-graded track by even a few years, they might be obtaining their credential and becoming eligible to enter college at a time in life that is both "demographically dense" and subject to age-specific norms. In this way, the timing of school transitions might influence the likelihood of college-going net of family background and cognitive skills. For all these reasons, then, the association of age and college entry is an important dimension overlooked by past research on the GED.

The timing of educational transitions matters both for the labor market rewards gained by completed schooling and in predicting the total quantity of schooling obtained. Individuals who interrupt their schooling in order to work earn less than those who obtain the same completed level of schooling without any interruptions (Elman & O'Rand, 2004). Similarly, delays in the transition from high school to college are associated with lower rates of postsecondary completion (Bozick & DeLuca, 2005; Kempner & Kinnick, 1990). The literature on adult education also includes a focus on age patterns of schooling (see Jacobs & King, 2002, for a review). This literature, however, rarely focuses on the role of timing specifically and generally ignores differences in age and timing at earlier educational stages that may underlie age differences in college persistence and completion. Those studies that do focus on describing differences in timing of school transitions in adulthood treat GED receipt as a factor to be controlled rather than a dimension along which differences in timing might be fruitfully explored. As the following analyses reveal, however, age patterns of school transitions differ qualitatively for traditional and nontraditional graduates.

The analyses that follow are organized in three parts. Because individuals are only eligible to enter college if they hold a secondary school credential, I begin by describing differences in the timing of secondary school completion/certification as well as the time elapsed between secondary degree and college entry for traditional graduates and GED recipients. Next, I describe differences in the age-specific likelihood of college entry for these two groups, controlling for family background and cognitive skills. Finally, using these models I calculate the cumulated predicted likelihood of college entry by age 35 for traditional graduates and GED recipients. As represented here, age serves as a proxy both for those life events that may delay school transitions and for the social dimensions of age-appropriate roles. These different components are all collapsed into a simple measure of chronological age. The intention is not to argue that age is itself the central explanatory variable, but rather to show that whatever the complex underlying mechanisms, they result in distinct age patterns. The analyses

do show, however, that controlling for the two most obvious underlying mechanisms—fertility and marriage histories—does not suffice to explain the age patterns described.

Data and Method

The analyses use the National Longitudinal Survey of Youth 1979 (NLSY), a nationally representative sample of respondents ages 14 to 22 when first surveyed in 1979. After excluding those with missing information or inconsistent educational histories (illogical patterns that could not be resolved with reasonable assumptions), the sample includes 8,432 youth. I use 1979 sample probability weights to correct for differences in the probability of selection and report robust standard errors in the results. I calculate age at high school certification (whether by diploma or GED) and age at college entry in whole year intervals. Calibrating age in whole years loses some precision but minimizes recall error and allows me to keep cases with missing month of school transition but valid data on year. This approach also allows me to develop a general rule for handling concurrent enrollment in secondary school and college of the sort that might happen in a student's last year in secondary school.

For analyses of educational transitions, I use discrete time hazard models to estimate the likelihood that a particular transition (secondary school completion or college entry) occurs within a given period of time (Allison, 1984; Singer & Willett, 2003; Vermunt, 1997). Using these models, I estimate predicted probabilities of high school certification by age for traditional graduates and GED recipients. In the analysis of the transition to college, I restrict the sample to people with either a regular diploma or GED and again use discrete time hazard models to estimate the predicted probability of college entry between ages 17 and 35 by type of high school credential.[4] The models for predicting high school completion and college are estimated separately. That is, conditional on age and degree type, the processes are assumed to be independent.

Event history models are more susceptible to the effects of unobserved heterogeneity than standard static models because omitted variables can influence the estimated parameters even if these are uncorrelated with the explanatory variables at the time of entry into the risk set (Vermunt, 1997). These models also require careful specification of the time dimension. The most general specification is to represent time periods using a full set of dummy variables. Singer and Willett (2003) argue that this specification puts no constraints on the shape of the baseline hazard, is easy to interpret, and is informative for describing the shape of the hazard. This approach is less feasible when the hazard nears zero or when some time periods have small risk sets. In this case, alternative specifications such as collapsing adjacent time categories or parametric functional forms, such as polynomials,

can help address these issues (Singer & Willett, 2003). In the following analyses, I specify age in single-year dummies whenever possible and collapse adjacent categories at older ages, when school transitions become more infrequent. I also tested the sensitivity of the results to fitting a polynomial specification rather than discrete categories and the substantive results do not differ from those shown reported.

The Appendix describes the variables used in the analysis. The analysis controls for factors that are strongly associated with how much schooling one completes (parent's schooling, nativity status, race/ethnicity, gender) and family background characteristics that describe respondents' life conditions when growing up (occupation of household head at age 14, whether lived in female-headed household at age 14, whether the respondent's father lived in the household at age 14). The analysis also includes scores on the Armed Forces Qualifying Test (AFQT) as a measure of cognitive skills. To these variables, I add detailed measures of age and timing. The analytic logic is to start with a basic model that controls for family background, cognitive skills, and age and then extend the approach to describe how the timing of college entry differs for GED recipients and traditional graduates.

As discussed earlier, age serves as a proxy for many factors that may delay or compete with schooling such as fertility, marriage, work, poor health, suspensions or probations, family crises, and so on. The relationship between these factors and schooling is complex and difficult to disentangle in a causal way. It is possible, however, to describe the correlations between these factors and completed schooling or educational transitions, and numerous existing studies describe these associations (see Astone & Upchurch, 1994; McElroy, 1996, on fertility and marriage; Lee & Staff, 2007; Warren, 2002, on work; Case, Fertig, & Paxson, 2005, on health; and Elman & O'Rand, 2007, on adult school entry). The advantage of the NLSY is that the sample is old enough to be followed into their mid-30s, the key point of the current analysis. The disadvantage is that these respondents were ages 14 to 22 when first interviewed, so many of the potential mechanisms of possible interest such as work histories, educational aspirations, school track, family relationships, and health are either measured only for the subset of respondents still in school, retrospectively, or not at all. The NLSY does include full marriage and fertility histories—two important factors that compete with school—and I include these variables in the analyses to show whether the association between age and college entry is sensitive to controls for these life experiences.

In studies of educational attainment, measures of cognitive skills are problematic because when measured at later ages, these are both a cause and a consequence of schooling (Winship & Korenman, 1997). It is important to include such a measure for theoretical reasons because cognitive skills play a role in how much education one obtains. But if the test score is in part a proxy for schooling, then its use as a control variable in models

predicting college entry may be incorrect. The following analyses use a transformation of the AFQT variable to address this issue. Using ordinary least squares (OLS), I regress the original AFQT score on year of birth indicators and a linear term for years of school completed at the time the AFQT was taken. I then use the residual from this regression as the measure of "cognitive skills" in the models predicting college entry. This residual reflects the part of the AFQT score not explained by age or years of school completed.[5]

Results

Table 1 describes the family and educational characteristics of traditional graduates, GED recipients, and permanent dropouts for this NLSY sample (all differences highlighted in the text are significant at the .05 level). The parents of GED recipients have about 1½ years less schooling than the parents of traditional graduates. GED recipients are more likely to have lived in a female-headed household at age 14 and nearly twice as likely to live in a family in which the household head did not work when the respondent was age 14. GED recipients also have lower average cognitive skills than do traditional graduates. In contrast, GED recipients fare better than dropouts on all these dimensions except for living in a female-headed household. Overall, GED recipients tend to come from more disadvantaged backgrounds than those with a traditional diploma but more advantaged ones than permanent dropouts.

The two groups also differ in the timing of their educational trajectories. On average, GED recipients complete their high school credential about 3.6 years later than do traditional graduates (age 21.3 vs. 17.7). Those GED recipients who go on to college earn their GED credential almost 1½ years earlier than their non–college-bound counterparts. While 7 out of 10 traditional graduates have entered college by age 35, less than half of GED recipients have entered college by that age. Among those who ever enter college, GED recipients enroll at substantially later ages than traditional graduates (23 vs. 19). Important differences also exist in the types of postsecondary institutions entered. Among those who ever entered college, 58% of traditional graduates entered 4-year colleges compared to 33% of GED recipients. These differences in the timing of school transitions and the types of college entered are substantively important and serve as the starting point for the analyses that follow.

Differences between traditional graduates and GED recipients in life experiences are also substantial. In this sample, 41% of GED recipients had their first child by age 20 compared to 12% of traditional graduates, and 26% had a nonmarital first birth compared to 11% of traditional graduates. In addition, 43% of GED recipients had been married by age 20 versus 20% of traditional graduates. Among respondents age 18 and older in 1980, 16% of those with a regular diploma had been suspended at least

Table 1

Summary Statistics: Means, Proportions, and Standard Errors by Type of Secondary Credential, National Longitudinal Survey of Youth 1979 (*N* = 8,394)

	Has Diploma	*SE*	Has GED	*SE*	Has No Secondary Credential[a]	*SE*
Highest education of either parent (years)	13.0	.04	11.4[b,c]	.11	10.4	.11
Lived in female-head household (age 14)	.10	.004	.18[b]	.02	.20	.01
Lived with biological father (age 14)	.83	.01	.65[b]	.02	.63	.02
Born in the United States	.96	.003	.95	.01	.94	.01
Male	.48	.01	.52[c]	.02	.58	.02
Occupation of household head (age 14)						
Professional/technical/kindred	.15	.01	.04[b]	.01	.05	.01
Manager/proprietor/officer	.15	.01	.08[b]	.01	.05	.01
Sales worker	.06	.004	.04	.01	.03	.01
Clerical	.07	.004	.08[c]	.01	.04	.01
Crafts/foremen	.19	.01	.23[b]	.02	.23	.02
Armed forces	.02	.002	.02	.01	.01	.004
Operative	.15	.01	.20[b]	.02	.22	.02
Non-farm laborer	.03	.002	.04	.01	.06	.01
Farmer	.02	.002	.01[b]	.005	.02	.004
Farm laborer	.01	.001	.02[b,c]	.003	.04	.005
Non-household service worker	.07	.003	.11[b]	.01	.09	.01
Household service worker	.005	.001	.01	.003	.01	.003
Did not work	.07	.003	.12[b,c]	.01	.16	.01
Armed Forces Qualifying Test (AFQT) percentile	54.3	.39	35.9[b,c]	.99	19.3	.81
Year of birth	1960.5	.03	1960.9[b]	.10	1960.7	.09
Age at high school degree	17.7	.01	21.3[b]	.20	—	

(continued)

Table 1 **(continued)**

	Has Diploma	*SE*	Has GED	*SE*	Has No Secondary Credential[a]	*SE*
Age at high school degree if entered college	17.6	.01	19.8[b]	.22	—	
Entered college by age 35	.70	.01	.43[b,c]	.02	.06	.01
Age at college entry	19.1	.05	22.9[b,c]	.30	19.5	.41
Years elapsed between high school and college	1.4	.06	3.3[b]	.27	—	
Enter 4-year college	.58	.01	.33[b]	.03	.26[e]	.08
Have first birth before first marriage	.11	.004	.26[b,c]	.02	.32	.02
Average age at first marriage[d]	24.6	.08	22.2[b]	.30	22.5	.26
Average age at first birth[d]	25.9	.09	21.7[b]	.24	21.4	.20
First birth by age 20	.12	.004	.41[b]	.02	.43	.02
First marriage by age 20	.20	.01	.43[b]	.02	.38	.02
Number in sample	6,445		810		1,139	

Note. Means and proportions shown are weighted using sample probability weights.
[a]Of these individuals, 94% are observed at least to age 30.
[b]Significantly different from the "has diploma" group at the .05 level.
[c]Significantly different from the "has no secondary credential" group at the .05 level.
[d]Computed only for those ever married or who ever had a child.
[e]Estimate based on only 14 individuals.

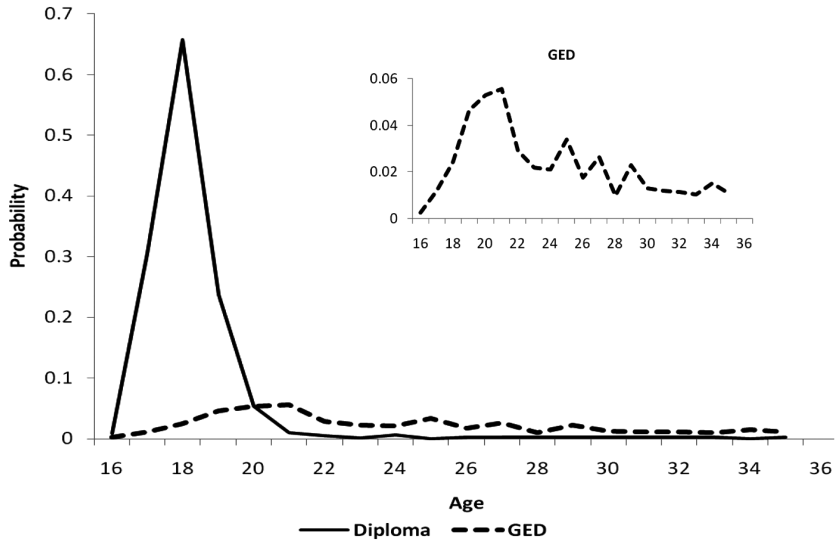

Figure 1. **Discrete hazard of high school degree by age, National Longitudinal Survey of Youth 1979 (*N* = 44,864 person years). GED hazard magnified in inset box.**

once in high school compared to 42% of GED recipients and 47% of dropouts. Similarly, 3% of traditional graduates report having been on probation compared to 17% of GED recipients and 14% of dropouts.[6] Although GED recipients fall between traditional graduates and permanent dropouts in terms of social background and cognitive skills, their early marriage and fertility patterns and school suspension and probation experiences are similar to those of dropouts and quite different from those of traditional graduates. These summary statistics suggest that GED recipients and permanent dropouts are more likely to have other factors competing with school during their young adult years.

The Timing of Secondary School Completion

Figure 1 shows the discrete time hazard of getting a traditional diploma or GED by age using a model in which getting each credential is the dependent variable and ages at risk (treated as single year dummies) are the independent variables. No other variables are included in the model. I show the hazards for each degree on the same graph to highlight differences in age densities and prevalence between the two groups. The timing of getting a high school diploma is homogeneous and concentrated. People are very

likely to get a traditional diploma between ages 17 and 19 (age-specific conditional probability spikes at age 18 at about 0.66) and quite unlikely to get a regular diploma at any other age. There are few transitions in social life as highly age structured as this educational milestone. Moreover, the likelihood of getting a traditional diploma at ages 17, 18, or 19 far exceeds that of getting a GED at those ages. The inset box in Figure 1 shows a magnification of the GED hazard. Unlike the age trajectory for getting a traditional diploma, the trajectory for getting a GED is heterogeneous in age. The conditional probability of getting a GED peaks at age 21, but is relatively high from ages 19 to 21. The likelihood of getting a GED tapers off slowly, with people receiving the credential into their 20s and 30s.

The top panel of Table 2 presents the distribution and density of age at high school certification in more detail. More than 90% of those with a regular diploma graduate at age 17 or 18 (column 1). The mean age of graduation for this group is 17.7 years and the median age is 18. In contrast, the mean age of completion for GED recipients is 21.3, with a median age of 20 (column 3). Only one-third (37%) of GED recipients received their credential by age 18. The middle quartiles cover a range of 7 years, from ages 18 to 24, compared to only 2 (17 and 18) for traditional graduates. GED certification changes the timing of high school certification by allowing people to get a high school credential at much later ages than allowed by the path of traditional high school. Columns 2 and 4 in the top panel of Table 2 show the age distributions of high school completion for those who ever enter college. For traditional graduates, the distribution of age at high school certification is similar for those who do and do not enter college. Among GED recipients, in contrast, the age distribution for secondary certification for those who ever enter college is shifted to younger ages. The mean age of certification is 19.8 (vs. 21.3) and the median age is 18 (vs. 20), which matches the median of the traditional graduates. Nonetheless, even among the college goers, a sizeable proportion of GED recipients complete their secondary credential in their mid- to late 20s.

Differences in Age Trajectories of College Entry

The previous results show that GED certification is associated with a substantially different age pattern of secondary school completion. How does the timing of high school certification influence the timing of college entry? Age at high school certification determines when one is "eligible" to enter college. This, plus the time that elapses between high school and college, determines the timing of college entry. The middle and bottom panels of Table 2 show the age distributions of college entry and time elapsed between high school and college in more detail.

For traditional graduates, age patterns of college entry look quite similar to age patterns of high school completion. When they go to college, nearly

Table 2

Distribution of Age (%) at School Transitions and Time Elapsed Between Secondary School Completion and College Entry by Degree Type, National Longitudinal Survey of Youth 1979 (*N* = 7,255)

	Regular Diploma		GED	
	All	Enter College	All	Enter College
Age at high school certification				
Age 16	1.0	1.1	3.0	4.6
Age 17	37.0	40.2	13.9	20.4
Age 18	54.2	54.0	19.6	25.1
Age 19	6.2	4.1	11.9	12.1
Age 20	1.0	0.6	9.7	8.0
Age 21	0.2	0.1	9.1	10.1
Age 22	0.1	0.0	4.4	4.6
Age 23-25	0.1	0.0	10.9	6.6
Age 26-30	0.2	0.0	11.3	7.0
Age 31+	0.1	0.0	6.2	1.6
Median age in years	18	18	20	18
Mean age in years (*SE*)	17.7 (.01)	17.6 (.01)	21.3 (.20)	19.8 (.22)
Interquartile range in years	17-18	17-18	18-24	18-21
Total *N*	6,445	4,397	810	324
Age at college entry				
Age 16		0.4		0.3
Age 17		14.7		4.9
Age 18		54.4		9.9
Age 19		11.3		12.5
Age 20		4.8		8.0

(continued)

Table 2 **(continued)**

	Regular Diploma		GED	
	All	Enter College	All	Enter College
Age 21		2.5		12.7
Age 22		1.9		9.3
Age 23-25		3.8		15.1
Age 26-30		3.8		19.2
Age 31+		2.3		8.2
Median age in years		18		22
Mean age in years (*SE*)		19.1 (.05)		23.0 (.30)
Interquartile range in years		18-19		19-26
Total *N*		4,397		324
Time elapsed between high school and college				
Less than 1 year		68.9		26.8
1 year		11.7		19.2
2 years		4.5		11.0
3 years		2.7		8.2
4 years		1.8		7.7
5+ years		10.5		27.2
Median number of years		0		2
Mean number of years (*SE*)		1.3 (.05)		3.2 (.25)
Interquartile range in years		0-1		0-5

Note. Percentages are weighted using sample probability weights. "All" subsample excludes those with no secondary degree (*N* = 1,139).

70% of traditional graduates enroll in the months immediately following high school graduation. GED recipients, in contrast, are both older at the time of high school certification and take longer to make the transition from high school to college. For this group, the age distribution of college entry is quite heterogeneous. Only 28% of those who ever enter college have entered by age 19. About 30% enter between ages 20 and 22, 34% enter between ages 23 and 30, and 8% enter between ages 30 and 35. The average time elapsed between GED certification and college entry is about 3.2 years (vs. 1.3 years for traditional graduates). These patterns suggest that GED recipients are far more likely to enter college at later ages than traditional graduates. The following analyses examine these patterns in a multivariate framework, controlling for the many background factors that also differ between the groups.

Table 3 and Figure 2 show results from a set of multinomial discrete time hazard models that predict the odds of college entry from age 17 to 35 for those with a regular diploma and GED. These multivariate models omit age 16 because there are too few transitions to estimate these rates (see Table 2). The dependent variable has three categories: enters a 4-year college, enters a 2-year college, or does not enter college while observed. Model 3.A estimates the gross effect of having a GED on the odds of college entry. Based on this model, GED recipients are 73% less likely to enter a 4-year college (vs. no college) than are traditional graduates (odds ratio of 0.265). In comparison, differences in the likelihood of entering a 2-year college are smaller. GED recipients are 31% less likely to enter a 2-year college than those with a regular diploma. Model 3.B controls for differences in family characteristics and cognitive skills, which somewhat increases the disadvantage associated with having a GED. Once background characteristics are controlled, GED recipients are 77% less likely to enter a 4-year college and 36% less likely to enter a 2-year college than are traditional graduates. These models reproduce the results shown in the existing literature. Even after adjusting for differences in family background and cognitive skills, substantial differences remain in the likelihood of college entry between GED recipients and traditional graduates.

Model 3.C allows for differences in age patterns of college entry. Age is specified as single year dummies from 17 to 22 (ages in which there are many transitions), then grouped into multiyear categories (ages 23-25, 26-30, and 31-35) for the ages when transitions are less frequent. The age patterns show that the likelihood of college entry peaks at age 18 and then diminishes greatly by age 20. This model also accounts for a second dimension of timing by controlling for the number of years that elapse between secondary certification and college entry—the time when individuals are eligible for college but have yet to make that transition. Rates of college entry fall with each year that passes after high school certification. All else being equal, rates of entry are 14% lower 1 year after secondary certification (vs. less than 1 year) for 4-year colleges and 26% lower for 2-year colleges. Rates

Table 3

Multinomial Logistic Discrete Time Hazard of College Entry by Age (Odds Ratios Shown), National Longitudinal Survey of Youth 1979 (*N* = 53,482 Person-Years)

	3.A		3.B		3.C		3.D		3.E	
Model	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year
Has GED (1 = yes)	0.265*	0.693*	0.229*	0.638*	0.512*	0.970	0.049*	0.400*	0.056*	0.440*
	(0.03)	(0.06)	(0.03)	(0.06)	(0.07)	(0.10)	(0.02)	(0.11)	(0.03)	(0.12)
Age in categories (18 years reference group)										
17					0.322*	0.339*	0.319*	0.328*	0.311*	0.321*
					(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
19					0.275*	0.560*	0.254*	0.539*	0.268*	0.560*
					(0.03)	(0.06)	(0.02)	(0.06)	(0.03)	(0.06)
20					0.246*	0.419*	0.201*	0.403*	0.220*	0.431*
					(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.07)
21					0.146*	0.330*	0.100*	0.266*	0.115*	0.294*
					(0.03)	(0.06)	(0.02)	(0.05)	(0.03)	(0.06)
22					0.145*	0.236*	0.086*	0.207*	0.103*	0.235*
					(0.03)	(0.05)	(0.02)	(0.04)	(0.03)	(0.05)
23-25					0.092*	0.173*	0.060*	0.152*	0.076*	0.178*
					(0.02)	(0.03)	(0.01)	(0.03)	(0.02)	(0.03)
26-30					0.069*	0.114*	0.047*	0.092*	0.062*	0.110*
					(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
31-35					0.033*	0.089*	0.024*	0.080*	0.032*	0.093*

(continued)

Table 3 **(continued)**

Model	3.A		3.B		3.C		3.D		3.E	
	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year
					(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Years since high school (<1 year reference group)										
1 year					0.855*	0.741*	0.875†	0.748*	0.882†	0.754*
					(0.06)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)
2 or more years					0.279*	0.385*	0.347*	0.413*	0.358*	0.424*
					(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
Age 17 × GED							2.852	2.484†	2.871	2.500†
							(2.57)	(1.21)	(2.59)	(1.21)
Age 19 × GED							9.372*	1.931†	9.134*	1.930†
							(5.64)	(0.75)	(5.53)	(0.75)
Age 20 × GED							10.990*	1.525	10.790*	1.533
							(6.93)	(0.68)	(6.89)	(0.68)
Age 21 × GED							27.242*	4.528*	25.811*	4.410*
							(17.40)	(1.80)	(16.55)	(1.74)
Age 22 × GED							45.680*	2.995*	42.156*	2.845*
							(28.79)	(1.41)	(26.75)	(1.34)
Age 23-25 × GED							33.313*	2.901*	28.461*	2.614*
							(19.32)	(1.09)	(16.51)	(0.98)
Age 26-30 × GED							26.223*	4.226*	21.521*	3.742*
							(14.76)	(1.48)	(12.12)	(1.32)
Age 31-35 × GED							16.603*	2.584*	13.666*	2.307*
							(11.88)	(1.04)	(9.80)	(0.93)
Married at previous age									0.694*	0.801*

(continued)

Table 3 **(continued)**

	3.A		3.B		3.C		3.D		3.E	
Model	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year	4-Year	2-Year
									(0.08)	(0.07)
Has baby 2 or younger									0.352*	0.517*
									(0.05)	(0.06)
Family background and Armed Forces Qualifying Test	No		Yes		Yes		Yes		Yes	
Log likelihood	–19,863		–17,503		–14,139		–14,068		–13,979	
Tests of joint significance										
Age dummies										
χ^2 (8)					485.2	347.4				
$p > \chi^2$					0.00	0.00				
Age Dummies × GED										
χ^2 (8)							56.9	25.0	51.5	21.7
$p > \chi^2$							0.00	0.00	0.00	.01
Years elapsed dummies										
χ^2 (2)					60.1	48.2	48.0	42.3	45.2	39.8
$p > \chi^2$					0.00	0.00	0.00	0.00	0.00	0.00

Note. Robust standard errors shown in parentheses. Background controls include sex, race/ethnicity, parent's education, father in household at age 14, occupation of household head (in categories) measured at age 14, whether respondent lived in a female-headed household at age 14, whether respondent was born in the United States, and Armed Forces Qualifying Test score (residualized, see text for details).
*$p \leq .05$. †$p \leq .10$.

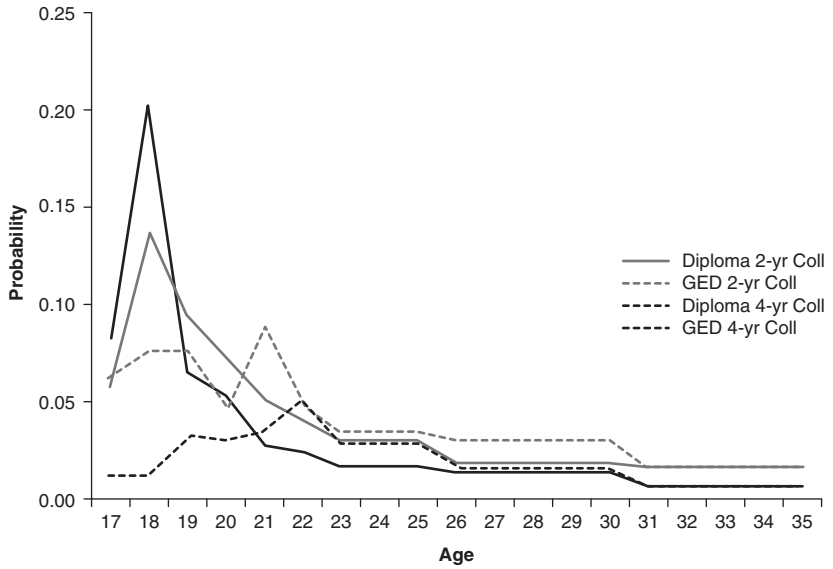

Figure 2. **Predicted discrete hazard (conditional probability) of entry to a 2-year or 4-college by age, based on Model 3.D in Table 3 (covariates held at sample mean, *N* = 53,482 person years, National Longitudinal Survey of Youth 1979).**

of entry are 72% lower 2 or more years after certification for 4-year schools and 61% lower for 2-year schools. Once social background, cognitive skills, age, and time between high school and college are controlled, there is no significant effect of having a GED for entry into a 2-year college. The disadvantage of having a GED, however, is large and significant for entering a 4-year college (odds ratio of 0.51). But this model assumes that the age pattern of college entry does not differ between the two groups. This overestimates the GED likelihood at earlier ages, when GED recipients appear to have a large deficit, and potentially underestimates it at older ages.

Model 3.D examines whether age patterns of college entry differ for those with a regular diploma and a GED, net of differences in social background and cognitive skills. Predicted values from this model are shown in Figure 2 (probabilities are estimated holding the covariates at the sample mean and the residualized AFQT at zero). Each age-specific probability applies to individuals who had completed their degree at these ages and were at risk of entering college at these ages. Thus, when we compare the points at age 18, we are comparing traditional graduates and GED recipients who had obtained their secondary certificate at age 18 or earlier. At the later

ages, some will have graduated or received their GED many years prior and others may have just completed their GED.

Before age 21, differences in the probability of college entry are large even after adjusting for family background and cognitive skills. At age 18, the probability that a traditional graduate will enter a 4-year college is 20 times that of a GED recipient with similar characteristics who earned the GED "on time" (0.2 versus 0.01). Differences in the probability of entering a 2-year college are smaller but still considerable (0.14 vs. 0.08). There are also important differences in the type of college entered. At age 18, traditional graduates are most likely to enter a 4-year college while GED recipients are much more likely to enter a 2-year college than a 4-year one. Age trajectories of college entry also differ for these groups. The probability of college entry peaks for traditional graduates at age 18, while for GED recipients, the probability of entering a 4-year college peaks at age 22 and the probability of entering a 2-year college peaks at age 21.

By age 21, the pattern reverses. For both types of college, the likelihood of college entry is higher for GED recipients than traditional graduates, a pattern that continues throughout their 20s. Although GED recipients are at a considerable disadvantage at earlier ages, they make educational gains later in life at ages when traditional graduates are less likely to enter college for the first time. Between ages 21 and 30, GED recipients are more likely to enter 2-year colleges (conditional on social background and cognitive skills with covariates held at sample mean). At age 22, the adjusted probability of entering a 4-year college is higher for GED recipients than that of entering a 2-year college for traditional graduates. From ages 22 to 26, GED recipients' adjusted probability of entering a 4-year college is about the same as traditional graduates' probability of entering a 2-year college and higher than traditional graduates' probability of entering a 4-year college. GED recipients' probability of entering a 2-year college is the highest of all. Holding all else constant, GED recipients are more likely than traditional graduates to enter college for the first time at later ages, and when they do, they are likely to choose 2-year institutions as their point of entry.[7]

Prior research suggests that family formation processes such as marriage and childbearing are closely tied up with whether one gets a GED or continues on to college (Astone & Upchurch, 1994; McElroy, 1996). The age effects described previously proxy for a complex set of life experiences, but it is descriptively important to check the sensitivity of the results presented by controlling for two of the primary life experiences that might constitute much of these age patterns observed. Model 3.E includes a lagged indicator for whether the individual was married at the prior age (vs. not married) and an indicator for whether the individual had a child age 2 or younger at the start of the age interval. For both types of college, being married in the prior year is associated with a lower likelihood of entering college. Having a young child is associated with a 65% decrease in the odds of entering a 4-year

college and a 48% decrease in the odds of entering a 2-year college. Including these demographic controls, however, does not change the age patterns shown.[8] Although marriage and fertility experiences are significantly correlated with college entry, the age patterns shown in Figure 2 are not simply a function of differences in family formation patterns between the groups.

Cumulative Probability of College Entry by Age 35

The previous results suggest that from ages 21 to 30, GED recipients make up for some of their early deficits in rates of college entry. One way to examine this hypothesis further is to calculate the cumulative adjusted probability of college entry by age 35 for each group, if they experienced the age-specific rates predicted by the models estimated in Table 3. The cumulative probability can be calculated as follows:

$$\text{Cumulative Pr} = 1 - \prod_{a=17}^{35} (1 - (\hat{P}_a{}^{4yr} + \hat{P}_a{}^{2yr})), \qquad (1)$$

where $\hat{P}_a{}^{4yr}$ equals the predicted conditional probability of first entry to a 4-year college at each age and $\hat{P}_a{}^{2yr}$ equals the predicted conditional probability of first entry to a 2-year college at each age. The multinomial models described in Table 3 provide these estimates for each age between 17 and 35. At each age, the probability of not entering college is one minus the sum of the probabilities of entering a 2- or 4-year college at that age. The probability of not entering college by age 35 is the product of the individual probabilities of not entering college at each age between 17 and 35. Since this product calculates the probability of not entering college by age 35, then one minus this quantity is the probability of entering college by age 35 (that is, one minus the product of the probabilities of *not* going to college at each age). For a traditional graduate and GED recipient who complete their credential by age 17, these estimates show the cumulative likelihood of ever entering college by age 35. Table 4 presents these results. For baseline comparison, Table 4 also includes the proportions attending college that are observed in the data. The model-based cumulative probabilities shown are adjusted probabilities, estimated by assessing covariates at the sample means.

When individuals are only observed until age 25, 65% of those with a regular diploma and 31% of GED recipients attend college (Table 4, row 1). Simply observing people to age 35 increases these proportions to 70% and 43%, respectively (row 3). Table 4, row 4 shows the estimated overall probability that someone with a regular diploma versus a GED will go to college by age 35, taking account of censoring at each discrete age. Based on this simple model, the adjusted probability of college entry by age 35 is 0.86 for a traditional graduate and 0.60 for a GED recipient. Rows 5 through

Table 4

Cumulative Predicted Probabilities of College Entry, National Longitudinal Survey of Youth 1979

	Traditional Diploma	GED	Difference	Ratio of GED to High School Diploma (%)
Observed proportions[a]				
(1) Observe until age 25	.65	.31	.34	48
(2) Observe until age 30	.68	.38	.30	56
(3) Observe until age 35	.70	.43	.27	61
Model-based estimates[b]				
(4) GED only	.86	.60	.26	70
(5) GED + Family Background + AFQT	.88	.60	.28	68
(6) GED + Family Background + AFQT + Age + Years Since High School Completion	.78	.69	.09	88
(7) GED × Age + Family Background + AFQT + Years Since High School Completion	.77	.69	.08	90
(8) GED × Age + Family Background + AFQT + Years Since High School Completion + Marriage/Fertility Lags	.73	.68	.05	93
(9) GED × Age + Controls + AFQT + Years Since High School Completion for Entry to a 4-Year College Only	.48	.32	.16	67
(10) GED × Age + Family Background + AFQT + Years Since High School Completion + Marriage/Fertility Lags for Entry to a 4-Year College Only	.43	.30	.13	70

Note. AFQT = Armed Forces Qualifying Test.

[a]Proportions are weighted using sample probability weights.

[b]Model parameters are shown in Table 3. Models account for censoring, covariates, and observe individuals to age 35. Predicted values estimated holding covariates at overall sample means.

10 show the cumulative probability of college entry by age 35 controlling for various characteristics. Adjusting for differences in family background and cognitive skills (row 5) widens slightly the gap in the overall likelihood of college entry. Controlling for age, the time that passes between high school certification and college entry, and other covariates (row 6) narrows the gap considerably, predicting a cumulative probability of college entry of 0.78 for traditional graduates and 0.69 for GED recipients. But this model does not allow age patterns to differ for traditional graduates and GED recipients, which greatly overstates the likelihood of GED recipients entering college at earlier ages.

We might expect that allowing the age patterns to differ for the two groups would increase the gap considerably because GED recipients have far lower rates of college entry at earlier ages. But these differences are also offset after age 21, when GED recipients have higher conditional probabilities of entering college. The results shown in row 7 suggest that early deficits are offset by higher rates of college entry at later ages. The estimated cumulative probabilities are nearly identical to those shown in row 6. Including controls for marriage and fertility experiences (row 8) narrows the gap even further (0.68 vs. 0.73). That the adjusted cumulative probability of entering college approaches parity in the full model does not mean that there are no qualitative differences between the two groups. Traditional graduates are much more likely to enter a 4-year college. The estimates in row 9 (based on Model 3.D) show that after controlling for age, family background, cognitive skills, and differences in both age and timing, GED recipients' cumulative probability of first entering a 4-year college by age 35 is only 67% of the estimate for traditional graduates.

Figure 3 shows the cumulative probability of ever entering college by age 35 based on Model 3.D computed for every age. This graph allows us to compare the cumulative probabilities for different groups at different starting ages. The points at age 17 are the values shown in Table 4, rows (7) and (9), that is, the cumulative probabilities computed starting at age 17. The remaining points show the cumulative probabilities computed from different starting points. The points at age 18, for example, show the predicted cumulative probabilities for those who had completed their secondary credential at age 18 or younger but had not entered college by age 18. Similarly, the points at age 21 show the cumulative probabilities for those who had completed their secondary credential by age 21 but had not ever entered college by that age. This could be someone who graduated high school at 18 but never went to college before age 21, or a GED recipient who earned the GED at 19 but never entered college before 21, or someone who earned the GED at age 21. We could also compare different groups at different points, for example, a traditional graduate at age 18 and a GED recipient at age 21.

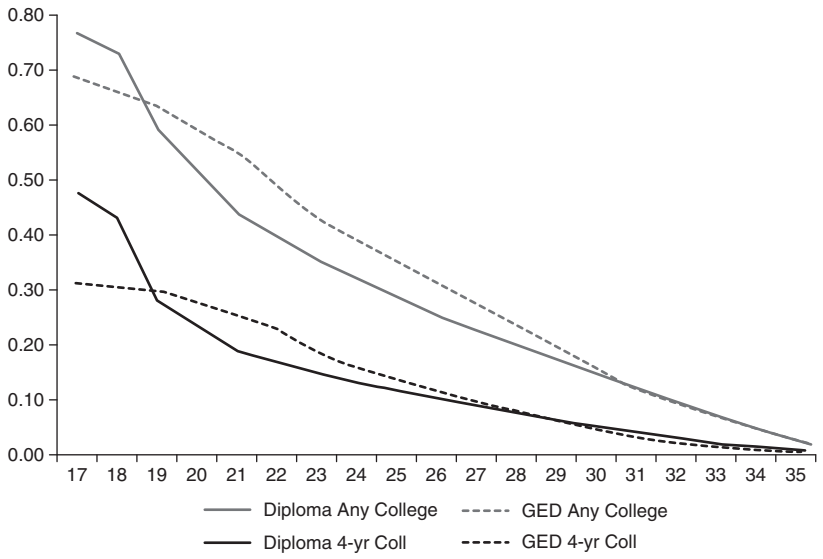

Figure 3. **Cumulative probability of college entry by age, based on Model 3.E in Table 3 (covariates held at sample mean, *N* = 53,482 person years, National Longitudinal Survey of Youth 1979).**

The graph highlights several important findings. First, because nearly all traditional graduates get their diplomas by age 18, they are predominantly expected to experience the highest cumulative rates predicted by the models. In contrast, only half of GED recipients who go to college earn their credential by age 18. Second, when we consider any type of college, GED recipients who get their credential by age 18 have somewhat lower cumulative probabilities at early ages. In the case of 4-year colleges, GED recipients have considerably lower cumulative probabilities of entering at these younger ages. But for those who had not entered college by age 19, then GED recipients have consistently higher cumulative probabilities of ever entering college throughout their 20s. Conditional on not having entered by age 19, GED recipients also have higher cumulative probabilities of entering a 4-year college from age 19 to 25. Overall, traditional graduates who do not make an immediate transition to college are less likely than GED recipients to enter college at older ages.

Summary and Conclusion

GED certification has introduced substantial heterogeneity in quality and timing within a pivotal level of schooling. Differences in quality are well

documented by numerous studies that show that GED recipients have poorer labor market outcomes than those with a traditional diploma. Differences in timing, however, have been overlooked by past research. Differences in the timing of educational transitions have become increasingly important as educational careers have become more diverse, for example, as the average time spent earning a BA extends beyond 4 years or adults increasingly return to school later in life (Elman & O'Rand, 2007; Willet & Singer, 1991). The previous analyses fill this gap in the literature by describing differences in age trajectories of secondary school certification and college entry between GED recipients and traditional graduates.

GED certification is an important educational and institutional problem in the U.S. schooling system because the GED is the primary way for those who have left high school without a diploma to restart their educational careers. And the fact that most GED recipients come from disadvantaged backgrounds makes it an important social problem as well. But GED recipients earn lower wages than traditional graduates and much of this is explained by differences in completed schooling. Therefore, whether and when GED recipients enter college is an important educational problem to understand. Past accounts of low achievement of GED recipients have placed a strong emphasis on human capital and background factors, ignoring differences in age trajectories of school transitions between the two groups.

Differences in age trajectories of college entry show a complex and offsetting pattern. Before age 21, GED recipients are less likely to enter college overall and substantially less likely to enter a 4-year college. But GED recipients catch up later in life. From age 21 to 30, GED recipients are more likely to enter a 2-year school and from age 22 to 26 they enter 4-year colleges at a higher rate than traditional graduates. Differences in adjusted cumulative probabilities of college entry also reveal an unexpected pattern. Before age 19, cumulative probabilities of ever entering college favor traditional graduates, especially in the case of 4-year colleges. But conditional on having not entered college by age 19, the cumulative probabilities are higher for GED recipients from ages 20 to 30 for any college and from ages 20 to 25 for entering a 4-year college. Although not included here, a fruitful extension of this study is to examine if a similar pattern exists with regard to college completion.

These compositional differences in age and timing are closely tied to many of the underlying mechanisms that shape schooling trajectories such as work, family, health, involvement in the juvenile justice system, as well as factors such as aspirations and time horizons. These dynamics are correlated with age and timing, some leading to differences in age and timing and others the consequence of these. Although not the focus here, these factors lurk behind the more complicated schooling trajectories of those who leave the traditional path of high school. The previous analyses control for a comprehensive list of background characteristics, cognitive skills, and two major

life experiences, marriage and childbearing, that compete with schooling. A remaining limitation, however, is that the analyses leave many other potential underlying mechanisms unexamined and do not attempt to sort out more complex patterns of joint determination, reverse causation, or selection bias.

What might explain these age patterns? Two explanations seem likely. First, because the patterns reveal a complex combination of early disadvantage and later catch-up, these likely represent a complex bundle of underlying factors rather than any particular one. Differences in early aspirations and noncognitive skills, for example, may explain early deficits while differences in preferences regarding age or family norms may explain later gains. Thus, these age patterns are not directly due to chronological age per se but do seem to be happening in step with age. Second, these patterns also seem to reflect differences in social norms regarding the timing of the "college student" role. The GED identifies a group of people who are less tied to traditional paths through school, whether determined by the age-graded nature of schooling or by norms regarding the order of schooling and family formation. This group leaves school before the normative ages of school-leaving and, not surprisingly, is also willing to reenter school at nontraditional ages. These educational patterns reflect a consistent and nontraditional set of time and age preferences, which traditional graduates are less likely to share. This second explanation suggests an important place where policy might intervene to encourage GED recipients to acquire more postsecondary schooling by explicitly focusing on college retention for this group. The GED pattern of low-but-steady interest in entering college at later ages suggests a promising hook for policy interventions aimed at increasing the total schooling these individuals obtain—a strategy that might ameliorate the economic disadvantages associated with the GED.

Describing differences in age patterns of schooling does not answer an important related issue, namely, the cost of these differences. Differences in time spent without a secondary degree or acquiring postsecondary schooling may represent losing key years of potential benefits in earnings and experience (Elman & O'Rand, 2004). This is a potential cost not measured here, and one that may itself be highly age-specific. For example, the cost of taking more time to enter college may be quite high for GED recipients if there are substantial differences in wages and experience in the late teens and early 20s or if disparities accumulate quickly early in career trajectories. But if the cost of having no college experience is particularly high in the late 20s (or at a different point in the career trajectory), then GED recipients may gain some ground despite their early disadvantage given their higher rates of college entry after age 21. This is an important issue left for future research.

This higher propensity to enter college later in life and to choose a 2-year college as the point of entry supports the argument that the GED introduces qualitative differences in the schooling process. On the one hand, each additional year of postsecondary schooling increases earnings

regardless of whether accrued in a 2-year or 4-year school (Kane & Rouse, 1999). On the other hand, those who attend 2-year colleges are more likely to attend school part-time and less likely to complete their degree. GED recipients higher rates of entry into 4-year schools during their 20s is encouraging, but these rates are low overall and much lower than the rates observed for traditional graduates at ages 17, 18, and 19. Moreover, the highest rewards are associated with college completion and GED recipients have much lower rates in this regard. Nor do the results diminish the importance of the economic benefits that are associated with a traditional diploma versus a GED. Instead, they highlight a unique characteristic of GED recipients that might be used to address these disadvantages. Although it seems better to encourage all young people to complete a traditional diploma, some proportion will leave school and want to resume their educational careers after the age-graded window of traditional high school has passed. Although these individuals are currently unlikely to complete many more years of schooling after earning their GED, their propensity to enter college at older ages is a silver lining that suggests they at least aspire to get more schooling. This suggests that GED recipients are completing less schooling because they fail to stay in college, rather than having a disinterest in pursuing higher education in the first place. This identifies a useful place to intervene in hopes of increasing the postsecondary schooling of GED recipients.

Appendix

Variables Included in Analyses, National Longitudinal Survey of Youth 1979

Variables	Description	Notes
Male	1 = yes, 0 = no	
Hispanic	1 = yes, 0 = no	
Black	1 = yes, 0 = no	
GED	1 = yes, 0 = no	Having a GED and having a regular high school diploma are mutually exclusive states.
High school diploma	1 = yes, 0 = no	
College	1 = yes, 0 = no	First report of college entry (i.e., attending Grade 13). Respondent asked month and year of entry. Includes only a regular 2- or 4-year postsecondary institution as "college." The survey instrument does not assume that those who attempted Grade 13 completed Grade 12. Respondents were asked both about grades attempted and those completed. Respondents who enter college after age 35 are censored (coded as having never entered college).
Parent's education	0 to 20 years	Years of schooling of parent with most schooling, or if one missing, parent with valid information
Father in household at age 14	1 = yes, 0 = no	Whether biological father was present in household at age 14 based on respondent report of who he or she lived with at that time
Female-headed household	1 = yes, 0 = no	Whether household in which respondent lived at 14 only had adult female present
Armed Forces Qualifying Test (AFQT)	Coded in percentiles	Used as a measure of cognitive skills
Year of birth	1957 to 1964	Respondent's year of birth, used to adjust for differences in ages at which AFQT was taken.

(continued)

Appendix **(continued)**

Variables	Description	Notes
Occupation of household head at age 14	Coded in categories: 1 = professional, technical, kindred; 2 = manager, proprietor, officer; 3 = sales worker; 4 = clerical; 5 = crafts, foremen; 6 = armed forces; 7 = operatives; 8 = non-farm laborer; 9 = farmer; 10 = farm laborer; 11 = non-household service worker 12 = household service worker; 13 = did not work	Household occupation is coded as male adult's occupation unless male was not working, household had adult female only, or male adult's information is missing. It is used as a proxy for income when respondent was age 14.
Respondent born in the United States	1 = yes, 0 = no	
Age at high school degree	Rounded to integer: 18.2 and 18.8 are both coded as 18.	Respondent provides month and year of high school certification. Age at degree is computed by subtracting date of birth from graduation date and rounding to integers.
Age at college entry	Rounded to integer: 18.2 and 18.8 are both coded as 18.	Respondent provides month and year of college entry. Age at entry computed by subtracting date of birth from college entry date and rounding to integers.
Time elapsed between high school graduation and college entry	Rounded to whole years. Categorized at 0, 1, or 2+ year dummy variables.	Age at college entry minus age at high school certification. Approximately 135 cases report college entry date that precedes graduation date. Cases in which difference exceeds 9 months dropped (46). Otherwise, college entry date recoded to the day after reported date of high school certification.
Have first birth before first marriage	1 = yes, 0 = no	
Average age at first marriage		Only measured for those who ever marry
Average age at first birth		Only measured for those who ever have first birth
First marriage by age 20	1 = yes, 0 = no	

Notes

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[1]There is some inconsistency in exactly how much GED rates have increased. Data from the SIPP and the GED testing service provide estimates that match fairly well while estimates from the Current Population Survey (CPS) appear to be too low in the mid-1990s and too high in the late 1990s. Moreover, the CPS changed the wording of its GED question in 2000 and the estimate of GED holders in 2000 was half the number in 1999 (down from 14% to 7%, a number that again appears to be too low).

[2]It is difficult to disentangle the direction of causation between many of these life experiences and GED certification. For example, working full-time may lead someone to leave school and eventually get a GED, or someone may get a GED in order to facilitate working full-time. The analyses presented here describe the age patterns but do not disentangle the complex underlying mechanisms that may explain the patterns shown.

[3]Although this is truer of 4-year universities than community colleges, the larger point applies to both.

[4]Although a small fraction of permanent dropouts also enter college (about 5%), this sample includes too few such cases to include in the analysis.

[5]A traditional graduate and GED recipient with the same Armed Forces Qualifying Test (AFQT) score have, on average, different years of school completed (with the former having completed more years). Thus, if the test score reflects a bundle of skills, some endowment and some learned in school, then equalizing the groups on the original AFQT score means that we identify GED recipients who are positively selected on endowment since they achieve similar AFQT scores with fewer years of school completed. The data support this conclusion. Models that use the original AFQT variable produce more favorable results for GED recipients than those using the residualized version.

[6]Data on suspensions/probations were collected in 1980 only and are not shown in Table 1. I report means for those age 19 and older to standardize for age bias but means are similar for the full age range and at higher age cutoffs.

[7]The association between the number of years that elapse between secondary certification and college entry does not differ by GED status (model not shown).

[8]Including interactions for marriage and fertility by gender or marriage and fertility by age does not change the substantive results shown (models not shown).

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