YEAR ONE REPORT

Crossing the Bridge:

GED Credentials and Postsecondary Educational Outcomes

GED® TESTING SERVICE

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Crossing the Bridge:

GED Credentials and Postsecondary Educational Outcomes

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Abstract

For most high school non-completers, the GED® credential provides a bridge to postsecondary education, but little is known about how successfully GED Test candidates make that transition and whether enrollment rates change with time. The American Council on Education (ACE) has begun a three-year longitudinal study to understand the effect of the GED credential on postsecondary enrollment, persistence, and completion. This study reports the latest data available from a 2003 cohort of GED candidates who tested shortly after the introduction of the current 2002 Series GED Tests.

This study is in support of a new effort to transition adults without a high school diploma to the GED credential and career and college readiness via accelerated learning. The initiative is a comprehensive, multiyear program designed to dramatically increase the numbers of individuals who earn the GED credential. It consists of three key components: education and preparation; enhanced career- and college-ready assessment aligned with the Common Core State Standards and enhanced credentialing process; and connections and transition services to postsecondary education and career opportunities.

The 148,649 GED Test passers in the 2003 cohort study attended 2,787 postsecondary institutions throughout the United States. The vast majority of students who had passed the GED Test initially enrolled in colleges offering programs of two years or fewer; 77.8 percent enrolled in public two-year or fewer-than-two-year institutions. The majority of passers in the 2003 cohort who enrolled in postsecondary institutions enrolled within the first three years after passing the test (i.e., 2003, 2004, or 2005) and tended to take their time to progress in postsecondary programs, perhaps at a less consistent pace than other adult learners. A majority (66.6 percent) who enrolled maintained enrollment for two or more semesters, yet only 11.8 percent of 2003 passers who enrolled graduated from a postsecondary program by September 2009.

Major findings of interest in this first year of a three-year study reflect a positive relationship between the GED credential and entering postsecondary education. Findings of predictive survival analyses for event occurrence of postsecondary enrollment and graduation are presented in this report. Other results include comparisons between postsecondary institutions that GED credential recipients attend and postsecondary institutions in general, and between GED credential recipients and traditional high school graduates. A discussion of findings and their implications for future longitudinal research follow.

Executive Summary

INTRODUCTION

Research shows that completing a high school education and pursuing a postsecondary degree are key to an individual's economic advancement and expanded social opportunities. For many adults who don't finish high school, the GED credential[1] provides a bridge to postsecondary education, but how successfully do they make that transition? GED Testing Service® (GEDTS) research has found that approximately 60 percent of GED passers report further education as a reason for testing, but do they follow up on their aspirations?

The American Council on Education (ACE) has begun a three-year longitudinal study to learn about the effect of the GED credential on postsecondary enrollment, persistence, and completion in the GED population. The findings presented here represent results from the first year of the project. Through this work, which has never been done at a national level, we seek to establish a baseline to measure the effectiveness of the new initiative. This new effort aims to transition adults without a high school diploma to a more rigorous GED credential that certifies career and college readiness via accelerated learning. This initiative has been developed in response to President Obama's call for an increase in adults with college degrees by the year 2020.

The initiative is a comprehensive, multiyear initiative designed to dramatically increase the numbers of individuals who earn the GED credential. It consists of three key components: education and preparation; enhanced career- and college-ready assessment aligned with the Common Core State Standards and enhanced credentialing process; and connections and transition services to postsecondary education and career opportunities. GEDTS will partner with instructional providers to build an integrated approach that focuses on accelerated development of core academic competencies for postsecondary success. Once candidates are prepared to test, they will likely take a computer-based test that aligns content with emerging national standards and provides colleges and employers with accurate information about the skill levels of credential recipients. Throughout preparation and after testing, they will have access to tools designed to point them to local educational and support resources and link them to a community of adult learners and educators who can help them realize their educational and career goals.

The data on postsecondary experiences will be critical for decision making for the initiative, as we identify how adults with GED credentials persist (or don't persist) in postsecondary education and what factors are associated with postsecondary completion. The results of our research also will inform the broader postsecondary community of expected postsecondary outcomes of adults with GED credentials and the support they need to continue in community colleges, technical colleges, and other postsecondary institutions. Specific findings that will be of use to state policy makers include the types of programs in which adults with GED credentials tend to enroll, whether they enroll in postsecondary education in the same state where they tested, whether their chosen majors reflect high-demand fields, and the types of services that promote student persistence.

Nearly 40 million U.S. adults aged 16 and older lack a high school diploma or GED credential (ACE, 2009). At the same time, a substantial gap exists in federal and state efforts toward the recruitment of adults into postsecondary education, with most effort going toward recruitment via the traditional pipeline of graduating high school seniors (Council for Adult and Experiential Learning [CAEL], 2008; Reder, 2007).

[1] Virtually all candidates who pass the GED Test—that is, meet their jurisdiction's minimum score requirements—receive a GED credential, unless the jurisdiction in which they test has additional requirements for receiving the credential (ACE, 2009). Throughout this paper, we use the term *GED passer* to identify GED Test candidates who tested and passed as a prerequisite to receiving a GED credential.

One way to close the gap is to focus more resources on individuals who pursue a GED credential and then enter postsecondary education.[2]

Since 1942, more than 17 million adults have passed the GED Test (ACE, 2009). Approximately 60 percent of candidates cited educational reasons for taking the GED Test (ACE, 2009), but many do not continue their education due to adverse life circumstances or other barriers,[3] even though participants in postsecondary experiences tend to show modest increases in earnings and graduates show even more.[4] They also may delay enrollment in postsecondary education.[5] Individuals with GED credentials need sufficient time after testing to make the decision and prepare to enroll in postsecondary programs (Boudett, Murnane, & Willett, 2000; Reder, 2007), many of whom tend to participate in a two-year program.[6]

Another important observation is that few enrollees complete the first year of postsecondary education or a degree program.[7] Previous studies show that GED credential recipients are more likely to enroll in postsecondary education than dropouts (Murnane, Willett, & Boudett, 1997), even with the availability of open admissions for both.

The number of GED credential recipients currently pursuing postsecondary education across the country remains unclear (CAEL, 2008; Maralani, 2006; Ou, 2008). One reason for the lack of clarity is the absence of large-scale national studies on the specific population of GED credential recipients; an earlier GEDTS study of postsecondary enrollment of GED examinees included responses from only 647 randomly selected GED Test candidates (Behal, 1983). Before the 2002 Series GED Tests, it was impossible to follow the postsecondary educational paths of GED credential recipients at a national level because individual-level data were not collected nationally. With the current availability of individual-level demographic, testing, and postsecondary data on GED candidates (Patterson, Song, & Zhang, 2009), a national large-scale, longitudinal study is now possible.

In summary, research indicates that the GED credential provides a pathway into postsecondary education, and finishing even a short-term program offers important economic benefits to GED credential recipients. To begin our longitudinal study, we looked at the experiences of the 2003 cohort of GED passers as a foundation. We compared postsecondary institutions that GED credential recipients chose to attend with postsecondary institutions in general, and compared the 2003 cohort of GED passers with traditional high school graduates.

We matched 2003 data on 540,031 adults from the GEDTS International Database (IDB) with postsecondary enrollment and completion records as of September 2009 from the National Student Clearinghouse (NSC), a nonprofit organization established in the early 1990s to serve the higher education community. NSC serves as a repository for data from approximately 3,000 postsecondary institutions[8] and currently holds records for 93 percent of the total postsecondary student enrollment in the nation. Using IDB and NSC data, we matched 188,243 adults who enrolled in postsecondary programs between 2003 and September 2009. We conducted descriptive analyses, predictive survival analyses, comparisons with institutional data from IPEDS (an institutional postsecondary database from the National Center for Educational Statistics–NCES/IPEDS, 2004), and comparisons with traditional high school graduate data from the national Beginning Postsecondary Students Longitudinal Study (NCES/BPS, 2004).

In the first chapter of this report, we present our research questions, related literature review, data sources, and methods. The second and third chapters provide descriptive statistics to capture the general trend of enrollment, persistence, and completion of postsecondary education for the 2003 cohort of GED passers, as well as relevant subgroups defined

[2] See Behal, 1983; CAEL, 2008; Duke & Ganzglass, 2007; Reder, 2007.

[3] See Behal, 1983; Maralani, 2006; Reder, 1999; Tyler, 2003.

[4] See Georges, 2001; Lofstrum & Tyler, 2005; Murnane, Willett, & Boudett, 1999; Song & Hsu, 2008.

[5] See Behal, 1983; Ou, 2008; Patterson, Song, & Zhang, 2009.

[6] See Ou, 2008; Patterson, Song, & Zhang, 2009.

[7] See Council for Advancement of Adult Literacy [CAAL], 2008; Duke & Ganzglass, 2007; Murnane, Willett, & Tyler, 2000; Patterson, Song, & Zhang, 2009; Reder, 1999; Tyler, 2003.

[8] The number of GED credential recipients who enroll in postsecondary education may be underreported. However, the percentage of enrollment that could not be matched through the NSC database is approximately 7 percent of all postsecondary students, and GED credential recipients represent only a fraction of that 7 percent.

by demographic characteristics. The fourth chapter presents our survival analyses of the event occurrence of postsecondary enrollment and graduation. The fifth chapter discusses general characteristics of institutions in which the 2003 cohort of GED passers enrolled by September 2009 and compares them with characteristics of institutions overall. Finally, in the sixth chapter we compare 2003 GED passers with their counterparts, traditional high school graduates, to investigate the differences in each group's postsecondary experiences.

KEY FINDINGS

- The 2003 cohort of GED Test passers enrolled in postsecondary education at more than twice the rate (42.9 percent) of non-passers (20.5 percent) by September 2009.

- In the population of the 2003 cohort of GED passers, 17,597 graduated from postsecondary programs, for a graduation rate of 11.8 percent among those who enrolled.

A first key finding of the study reveals that 42.9 percent of the 2003 cohort of GED passers enrolled in postsecondary education by September 2009, a much higher rate than literature from around the turn of the century suggested, but in keeping with recent studies.[9] The study findings suggest that, given enough time, most 2003 GED passers with postsecondary education goals (71.5 percent) followed up on those goals.

An initially promising finding was that adults with GED credentials enrolled in postsecondary education at a significantly higher rate than did non-passers. The advantage of having the GED credential supports previous research evidence (Murnane, Willett, & Boudett, 1997) and points to a positive relationship between holding a GED credential and entering postsecondary education. This result implies that earning the GED credential offers a key advantage to dropouts who want to pursue postsecondary education.

However, a very high percentage of postsecondary enrollees did not graduate, or at least have yet to do so.[10] Some adults with GED credentials may stop at various points along the educational pipeline—perhaps just short of the finish line, in the first leg, or even close to the end. Although 42.9 percent of 2003 GED passers chose to pursue further education, 57.1 percent did not choose to enter the pipeline at all. What features of postsecondary education might either attract or repel GED credential recipients, and how could local communities use this knowledge to recruit additional GED credential recipients to postsecondary programs (Behal, 1983)? The loss of nearly one-third of enrollees after a single semester—in the first leg—raises questions such as why they left, what supports might have made a difference, and what triggers would bring them back, perhaps at a later point in life. We also must learn even more about the circumstances leading to the low graduation rate. These findings remind us that much work remains to fill the postsecondary pipeline (CAEL, 2008; Reder, 2007).

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- Nearly 72 percent (71.8 percent) of the 2003 cohort of GED passers who enrolled in a postsecondary institution did so within the first three years after passing the test (i.e., 2003, 2004, or 2005); enrollment peaked in 2004 and remained steady from the fall 2006 semester through 2009.

- The 2003 cohort of GED passers may proceed unevenly through postsecondary programs; sizable percentages of students who stop out[11] indicate that GED credential recipients may continue postsecondary work, perhaps at a less consistent pace than a traditional postsecondary student[12] or other adult learners, and for a longer period of time.

GED credential recipients who aspire to further their education may not follow up immediately nor maintain a steady enrollment. Overall, the 2003 cohort of GED passers tended to enter postsecondary education within three years of passing the GED Test, but

[9] Studies include CAAL, 2008; Duke & Ganzglass, 2007; Hanni, 2008; Tyler & Berk, 2008; Tyler & Lofstrum, 2008.

[10] National Student Clearinghouse indicated that graduation may be underreported by some postsecondary institutions. However, only 2 percent of institutions in our dataset had more than 50 GED passers as students (a number at which we could reasonably expect at least some graduates) yet reported no graduates. Therefore, we concluded that any graduation underreporting was likely random and limited in scope.

[11] *Stop out* is a term used to define a student who leaves school for a period of time and later returns. *Drop out* is a term used to define a student who leaves school and does not return during the time of the study.

[12] We define a *traditional postsecondary student* as a young adult who has recently graduated from high school and enrolls in a postsecondary program continuously through graduation.

many took their time to progress in their postsecondary programs. The 2003 cohort of GED passers who *did* graduate took nearly three years to do so on average, even for programs that were ordinarily two years or fewer in duration, and some took up to seven years. These first-year findings indicate that allowing enough time to pass before expecting postsecondary outcomes remains critical.[13]

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- The majority (77.8 percent) of postsecondary students who had passed the GED Test enrolled in institutions offering programs of two years or fewer.
- The 2003 cohort of GED passers tended to enroll in institutions in the state in which they passed the GED Test—83.1 percent enrolled in the same state.
- More than one-third of the 2003 cohort of GED passers who enrolled in postsecondary education (39.7 percent) enrolled as full-time students by September 2009; another one-third (32.2 percent) enrolled on a half-time basis.
- The most popular major was nursing (686, or 9.7 percent of graduates with reported majors); other popular programs included nurse assistant/aide, criminal justice/law enforcement, emergency medical technician, and business administration.

Specific findings of use to state policy makers include the likelihood of adults with GED credentials to enroll in colleges offering programs of two years or fewer, to enroll in postsecondary education in the same state where they tested, to attend full time or half time, and to graduate with majors in such high-demand fields as nursing. As policy makers consider ways to increase the numbers of nontraditional students in the postsecondary pipeline and to focus precious resources within their state, a more detailed understanding of the population will benefit their decision-making process.

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- Approximately two-thirds (66.6 percent) of those who enrolled in postsecondary education maintained enrollment for two or more semesters; of those who enrolled in multiple semesters, 54.9 percent had not yet completed their programs by September 2009.
- Approximately half of GED passers who enrolled returned for a second semester; the first- to second-semester retention rate was 50.4 percent.
- 86.9 percent of those who graduated from programs that lasted for multiple semesters were retained from first to second semester; that is, they enrolled in both the first and second semesters consecutively.
- 32.6 percent dropped out after the first semester; some GED passers in the 2003 cohort stopped out between their first semester and a later semester, but they did return.

Although the 2003 cohort of GED passers enrolled in two semesters on average during the study, frequently at a public two-year college, and most attended full time or half time, approximately half remained enrolled after the first semester. These findings run counter to previous research suggesting that few enrollees complete the first year of postsecondary education,[14] which is viewed as the "tipping point" for earning wages that could support a family (Harris & Ganzglass, 2008, p. 6). The first semester appears critical for a 2003 GED passer's postsecondary

[13] See Boudett, Murnane, & Willett, 2000; Reder, 2007; Tyler & Lofstrum, 2008.

[14] See CAAL, 2008; Duke & Ganzglass, 2007; Murnane, Willett, & Tyler, 2000; Patterson, Song, & Zhang, 2009; Reder, 1999; Tyler, 2005.

education experience and especially for those who graduate from multiple-semester programs. Barriers that prevent nearly one-third of 2003 GED passers from dropping out after the first semester or affect a sizable percentage who stop out and return for a later semester may include a perception that college is too difficult or not for everyone (Behal, 1983), a lack of skills to succeed in college (Reder, 2007), first-generation college student status (Reder, 2007), or strong negative life experiences that interfere with persistence or prevent completion (Tyler & Lofstrum, 2008). Costs of a postsecondary education or competing time demands are other potential barriers.

Regardless of the barriers, the findings that more than half who enroll in multiple semesters had not completed as of 2009, along with the low graduation rate, affirm recent research that suggests few GED credential recipients complete a degree program,[15] or, perhaps, they have yet to complete one. When we compared persistence patterns, we noticed that there are hundreds of "unique" patterns that only a handful of students may have followed; therefore, persistence may be a genuinely individualized process. The finding that 2003 GED passers who stopped out often returned speaks to the passers' resilience. The presence of so many unique patterns of enrollment also caused us to reflect on the role of mentoring—whether in the family, community, college, or workplace—and the likely need for supports to overcome barriers that lead to stopping out, or even dropping out.

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- The institutions in which the 2003 cohort of GED passers enrolled had a mean of 8,249 students, a mean of 469 full-time faculty members, and a faculty-to-student ratio of 48.5 to 1.

- More women enrolled on average than men, and white and African-American students had the highest numbers of median enrollment; men with GED credentials tended to enroll full time at about the same rate as men overall in the same institutions; women with GED credentials enrolled full time at a lower rate than their peers overall.

- Undergraduate tuition and fees at these institutions averaged at approximately $8,431 for 2004 (compared with an average of $8,541 overall); the mean admission rate for schools in which 2003 GED passers enrolled was 61.9 percent, but only 40.3 percent of those admitted actually enrolled.

- Open-admissions policies were in effect at 41.8 percent of all institutions in which 2003 GED passers enrolled, yet 83.1 percent of 2003 GED passers enrolled in a school with open-admissions policies; that is, the enrollment of 2003 GED passers was heavily concentrated in approximately two-fifths of the 2003 GED passer institutions, where they could take advantage of open-admissions policies.

- 81.9 percent of institutions in which 2003 GED passers enrolled offered remedial services, and 39.6 percent offered daycare services for children of students; both of these rates were significantly higher than for institutions overall.

These results offer a first glimpse into where GED credential recipients choose to continue their education. Although much variability occurs, campuses on average are mid-size, and costs and admission policies reflect institutions overall. These findings may relate to the tendency of GED credential recipients to enroll in schools that offer postsecondary programs of two years or fewer. New enrollees may feel comfortable enrolling on a less-than-full-time basis and entering a school that is likely to offer remedial services. Low-cost, open-admission, two-year colleges have been the most popular choice for GED passers in the cohort.

The low graduation rate suggests that enrollees may not complete what they begin. Remedial courses and tutoring services at two-year or fewer-than-two-year colleges may be important to adults with GED credentials who lack confidence or have variable skill levels across subjects, but may not prepare them for major courses or may exhaust their financial aid before they reach major coursework. By concentrating mostly on institutions with open-admissions policies and short-term programs, students may restrict their educational options and choices of available programs. The pace of their enrollment may be too slow to maintain the needed momentum to finish. Although daycare services were more available in institutions in which GED passers enrolled than in institutions overall, too few daycare services may add a barrier to postsecondary enrollment. A deeper look into the characteristics of institutions and of their enrollees would help address these issues.

[15] See CAAL, 2008; Duke & Ganzglass, 2007; Murnane, Willett, & Tyler, 2000; Reder, 1999; Tyler, 2005.

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- When we compared the 2003 cohort of GED passers with traditional high school graduates, we found similarities in gender and ethnic background, and between the youngest (16 to 18 years) and oldest age groups (30 years and older); regardless of educational background, most students attended full or half time.

- Similar percentages of GED credential recipients and traditional high school graduates enrolled in institutions in their home state.

- Differences between the two groups included a higher proportion of students in their 20s with GED credentials in postsecondary education; more GED credential recipients completed associate degrees, and more traditional high school graduates earned bachelor's degrees.

Although it is tempting to focus on the differences between GED credential recipients and traditional high school graduates as they enter postsecondary education, the similarities may be more striking. Our initial reaction was that the message about pursuing postsecondary education seems to have reached across longstanding gender, ethnic, and age gaps, both for traditional high school graduates and GED credential recipients. The similarities gave us the most pause.

It may be more telling that for GED passers and traditional high school graduates alike, more females entered postsecondary education than males. Similarly, regardless of educational background, 16- to 18-year-olds enrolled at similar rates, as did students aged 30 years and older. More females have enrolled in college than males since the early 1980s (King, 2010; Planty, et al., 2009), and the balance appears similar for postsecondary students with GED credentials, although more males obtain GED credentials. It is also promising that attendance patterns were comparable and that in-state enrollment rates were similar.

The higher percentage of associate degrees and lower percentage of bachelor's degrees is not surprising given the tendency of adults with GED credentials to attend two-year institutions. The postsecondary enrollment rate for traditional high school graduates (63.9 percent) is certainly higher than that for GED credential recipients (42.9 percent). Part of the difference may be attributed to delays in taking the GED Test (for GED passers, a median two years passed after leaving K–12 education) and thus in postsecondary enrollment. More evidence is needed to understand the nature of similarities by educational background.

Our concern for subgroups of GED credential recipients led us to further examine demographic characteristics. Taking into account length of enrollment and completion status, the 2003 cohort of GED passers in the following categories tended to be in either enrollment status (single semester or multiple semester) or in either completion status (graduate or noncompleter): all age groups, white or African-American ethnic group, English as the primary language, taking an Official GED Practice Test, 10th or 11th grade as the highest grade completed, testing for personal satisfaction, or status as a full-time employee or part-time student when taking the GED Test.

When we observed subgroups of 2003 GED passers, we found many similarities. It is encouraging that those with GED credentials entered postsecondary education at similar rates, regardless of age group, most ethnic backgrounds, employment status, and numerous other demographic characteristics. Our research on ethnic background aligns with Reder's (2007) suggestion that the GED credential "may function as a gateway, especially for minority populations" (p. 8). Evidence that shows prospective postsecondary students with GED credentials and diverse backgrounds are likely to enroll is promising for the success of the new initiative.

The 2003 cohort of GED passers differed by gender in length of enrollment; males tended to enroll more frequently in and complete a program offered in a single semester and females tended to enroll in multiple semesters and graduate at higher rates.

More frequent enrollment of women with GED credentials in multiple-semester postsecondary education is in line with general postsecondary enrollment trends (King, 2010; Planty, et al., 2009). One potential reason could be economic (Georges, 2001; King, 2010). Women with low incomes who earn GED credentials may also see further education as an investment (Georges, 2001). Other reasons could reflect secondary education systems or social expectations that influence men and women differently; the reasons for the gender gap are complex (King, 2010). The higher rate of males completing single-semester programs also was intriguing. These findings may reflect greater caution of or time pressure on male GED credential recipients. Students who complete postsecondary programs to become a commercial

truck driver, corrections officer, or emergency medical technician in a single semester may meet short-term goals. More knowledge of those completing programs that only last a single semester could inform plans for accelerated learning as preparation and postsecondary recruitment efforts of those who "earn while they learn." This knowledge could also help postsecondary staff anticipate re-entry points for those single-semester completers who pursue further education later on.

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- Students whose primary language is one other than English tended to begin their college experiences much sooner after passing the GED Test than English-language passers.

- Those whose primary language is one other than English tended to graduate from multiple-semester programs more frequently than to be non-completers who enrolled for single or multiple-semesters.

Identifying GED credential recipients whose primary language is not English is important to the postsecondary institutions in which they enroll. Very little is known about this subgroup or the programs in which they are successful. Their eagerness to quickly begin postsecondary education after passing the GED Test may point to their reasons for testing: to get a credential immediately prior to admission in cases where credentials from their home countries are missing or not translated, or as U.S.-born, non-native English speakers with a sense of urgency to improve employment options through further education. Their persistence to pursue postsecondary graduation is encouraging, particularly if they persisted not only through English-language programs but also through GED preparation (Comings, Parrella, & Soricone, 1999).

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- Part-time employees who received a GED credential were more likely to become multiple-semester graduates than to drop out after a single semester or complete a single-semester program.

- 2003 GED passers with the goal of getting a better job were significantly less likely to enroll in postsecondary education than not to enroll.

Employment-related findings also are worth noting. The 2003 cohort of GED passers who worked part time while testing tended to graduate from multiple-semester programs more frequently. The 2003 cohort of GED passers with part-time jobs may have recognized the need to enhance their skills for the long term. However, 2003 GED passers who reported testing for a better job did not view postsecondary education as a means to get there. For many, the prospect of a better job may involve a promotion at work or to the next level of the same type of work at a different company. Getting a better job may be a short-term goal rather than a long-term investment in improving skills. Further research on the relationship among job aspirations, career improvements, and postsecondary education—along with how educational aspirations could be fostered—would be valuable.

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- We also identified which groups of GED passers tended to graduate from multiple-semester postsecondary programs: females, Asian Americans, and 12th-grade completers.[16]

- 12th-grade completers with GED credentials most frequently graduated after enrolling for multiple postsecondary semesters and least frequently dropped out after a single semester.

It was not surprising that 12th-grade completers with GED credentials or GED credential recipients with high GED Test standard scores planned to enroll for multiple semesters and complete postsecondary programs. We surmised that the 12th-grade completers could represent groups such as home schoolers or traditional 12th graders who have sufficient credits but do not meet other district or state requirements. Twelfth-grade completers in these groups may be likely to follow postsecondary enrollment and completion patterns similar to traditional high school diploma holders.

[16] Some GED candidates reported completing 12th grade, which would ordinarily imply no need for the GED Test. Examples of GED candidates who completed 12th grade and had legitimate reasons to take the GED Test include high school students who failed a state graduation examination or immigrants who need a U.S. secondary credential.

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- 2003 GED passers in the following groups had higher percentages of single-semester program completers: males, 8th- and 9th-grade completers, those with goals of skill certification or enrollment in trade or technical school, those with a goal of getting a better job, those whose employers required the GED Test, those who tested to become a role model for their families, or full-time students at the time of GED testing.

- 2003 GED passers with a goal of entering a two-year college more often enrolled for multiple semesters and graduated than completed a single-semester program; those with this goal who enrolled for only a single semester were more likely to drop out than to complete a single-semester program.

- 2003 GED passers with a goal of entering a four-year college more often became multiple-semester graduates than single-semester completers.

It was unexpected that those who completed eighth grade (or lower) would tend to complete single-semester programs. Did these GED credential recipients with relatively little formal education represent older adults who pursued certificate programs for their own sake or for the sake of their children or grandchildren? Or were they immigrants with little previous opportunity for education in their home country but who persisted not only through English-language programs but also through GED preparation (Comings, Parrella, & Soricone, 1999)? What types of intergenerational outreach and postsecondary programs would appeal to this group and support their success?

It may not seem surprising that GED credential recipients with specific educational aspirations would reach their goals, but doing so is by no means a given. Useful findings show that those with a reported goal to enter trade or technical school or to gain skill certification are likely to become single-semester completers, or those with reported two-year or four-year college goals are likely to enroll in multiple-semester postsecondary programs more frequently. Although GED credential recipients with two-year or four-year college goals enrolled in postsecondary education, and the small percent who graduated were more likely to have participated in multiple semesters, merely having either goal cannot be conclusively associated with graduation.

We also know very little about these students qualitatively that could point to motivation to enroll but not graduate. Further research would help us better understand the characteristics of those who realize their educational goals.

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- Survival analyses predicted a cumulative postsecondary enrollment rate of 41 percent for the 2003 cohort of GED passers.

- The 2003 cohort of GED passers were more likely to enroll in postsecondary education programs within one year after they passed the GED Test; one year after passing the GED Test, the likelihood of enrollment decreased and stayed low.

- Ethnicity did not make a difference in probability of enrollment or graduation. However, in regards to graduation by age, the 16- to 24-year-old age group displayed the lowest probability of graduating, and the 35-years-and-older age group had the highest probability of graduating.

- Analyses also predicted that females in the 2003 cohort of GED passers were more likely to make the transition from GED credential to college and to obtain a postsecondary education degree or certificate than were male GED recipients.

- The 2003 cohort of GED passers in the upper quartile group for GED Test standard scores were more likely to enroll in postsecondary education and graduate.

- Entering a two-year or a four-year college as reasons for testing were good predictors for enrollment, but there was no significant relationship between the goal to enter either a two-year college or a four-year college and graduation.

- Analyses predicted a cumulative graduation rate of 11 percent over time.

We also further examined demographic and test performance differences in our survival analyses (see Chapter 4). Overall, our models predicted that 41 percent of GED passers would likely enroll and 11 percent of those who enrolled would likely graduate. Enrollment probabilities were the highest for the first year after passing the GED Test. Our survival analysis models yield comparable results as descriptive analyses, yet that was not the purpose for examining them. These predictions allow us to estimate

enrollment and graduation likelihood for the 2003 cohort of GED passers who have not yet decided to pursue postsecondary education, or who have done so since September 2009.

Some group differences were associated with likelihoods for both enrollment and graduation; others related only to enrollment in postsecondary education. GED passers in the highest quartile standard score group were more likely to enroll and graduate. We found that women with GED credentials had a higher probability of both postsecondary enrollment and graduation than men with GED credentials. Although goals of entering a two-year college or a four-year college were good predictors of enrollment and suggest that most GED Test candidates may already see the GED credential as a vehicle to postsecondary education, they had no association with graduation.

We were intrigued by two additional predictive findings, for ethnicity and for age. It was encouraging to learn that enrollment or graduation likelihood did not vary by ethnic background. This finding does not suggest that the same numbers of ethnic groups enroll or graduate, but rather that one ethnic group is just as likely to do so as another, proportionate to group size. Our age models further suggested that although very young students (aged 16 to 24 years) are more likely to enroll, they are less likely to graduate, whereas the reverse is true for students of a nontraditional age (aged 30 and older). These models revealed that further study of the persistence of GED credential recipients of nontraditional age to graduation and less persistence of very young GED credential recipients would be valuable.

CONCLUSION

The 148,649 GED passers in the 2003 cohort attended a total of 2,787 postsecondary institutions throughout the United States. The vast majority of students who had passed the GED Test initially enrolled in colleges offering programs of two years or fewer. The 2003 cohort of GED passers who enrolled in postsecondary institutions mostly enrolled within the first three years after passing the test (i.e., 2003, 2004, or 2005) and took their time progressing in postsecondary programs. A majority (66.6 percent) who enrolled maintained enrollment for two or more semesters, yet only 11.8 percent of 2003 GED passers who enrolled graduated from a postsecondary program by September 2009.

We found a positive relationship between earning the GED credential and entering postsecondary education, and predicted event occurrence of postsecondary enrollment and graduation. We found numerous similarities between postsecondary institutions that GED credential recipients attend and postsecondary institutions in general, and between GED credential recipients and traditional high school graduates.

We realize that GED credential recipients form "a new consumer population for the postsecondary community" with much to offer if postsecondary institutions can tap into their academic potential. The "GED graduate and the postsecondary community would gain if each were more aware of the opportunities that the other could provide" (Behal, 1983, p. 10). Those words, written more than 25 years ago, still ring true. We offer our findings in support of the new initiative and to foster that awareness.

Crossing the Bridge

INTRODUCTION

Research shows that completing a high school education and pursuing a postsecondary degree are key to economic advancement and expanded social opportunities. For many adults who don't finish high school, the GED credential[17] is the bridge to postsecondary education, but how successfully do they make that transition? The American Council on Education (ACE) has begun a three-year longitudinal study to understand the effect of the GED credential on postsecondary enrollment, persistence, and completion. Through this work, which has never been done at a national level, we seek to establish a baseline to measure the effectiveness of the new initiative. This new initiative aims to transition adults without a high school diploma to a more rigorous GED credential that certifies career and college readiness via accelerated learning. The initiative has been developed in response to President Obama's call for an increase in adults with college degrees by the year 2020.

The new initiative is a comprehensive, multiyear program designed to dramatically increase the numbers of individuals who earn the GED credential. It consists of three key components: education and preparation; enhanced career- and college-ready assessment aligned with the Common Core State Standards and enhanced credentialing process; and connections and transition services to postsecondary education and career opportunities. GED Testing Service will partner with instructional providers to build an integrated approach that focuses on accelerated development of core academic competencies for postsecondary success. Once candidates are prepared to test, they will likely take a computer-based test that aligns content with emerging national standards and provides colleges and employers with accurate information about the skill levels of credential recipients. Throughout preparation and after testing, they will have access to tools designed to point them to local educational and support resources and link them to a community of adult learners and educators who can help them realize their educational and career goals.

The data on postsecondary experiences will be critical to informing decision making for the new initiative, as we identify how GED credential recipients persist (or don't persist) in postsecondary education and what factors are associated with postsecondary completion. The results of our research also will inform the broader postsecondary community of expected postsecondary outcomes of GED credential recipients and the supports they need to continue in community colleges, technical colleges, and other postsecondary institutions.

All existing studies that have examined longitudinal postsecondary outcomes for GED credential recipients included individuals who tested before 2002, when a new GED Test series with additional mathematics tasks and a new essay section was developed in response to the escalating rigor of secondary standards in U.S. schools. Postsecondary outcomes for 2002 series candidates could differ given the 2002 series' increased rigor. New longitudinal analyses involving 2002 series candidates are needed, and our research provides the most current evidence of postsecondary outcomes of adults who passed the GED Test in 2003.

This report aims to describe the full spectrum of postsecondary educational experiences of adults with GED credentials, from passing the GED Test to entering postsecondary education to graduating. What are their postsecondary experiences by demographic status, and in which postsecondary institutions do they enroll? Compared with traditional high school graduates in postsecondary education, what differences and similarities do they experience? This report presents a comprehensive, detailed picture of their academic path toward fulfilling a dream of postsecondary education after passing the GED Test.

Many of the research questions follow up on a pilot study (Patterson, Song, & Zhang, 2009), which relied on a sample of 1,000 randomly selected GED Test candidates from the 2003 cohort (as described in detail below). We found that out of the 1,000 GED candidates, 307 enrolled in postsecondary education.

[17] Virtually all candidates who pass the GED Test receive a GED credential, unless the jurisdiction in which they test has additional requirements for awarding the credential (ACE, 2009). Throughout this paper we refer to *GED passer* to identify GED Test candidates who tested and passed as a prerequisite to receiving a GED credential.

GED Test passers enrolled at a higher rate; nearly 37 percent of GED credential recipients enrolled in postsecondary education by fall 2008, which is in line with enrollment rates estimated by other researchers, as described in our literature review. The pilot also yielded information on GED candidates' enrollment starting and ending dates, enrollment status, attendance status (i.e., full time or less), degrees, and majors. Institutional information included name, location, institution type, and public or private status.

Major findings of the pilot study include the following:

- GED credential recipients enrolled in postsecondary education at a significantly higher rate (36.6 percent) than did non-passers (20.4 percent).
- Females with a GED credential enrolled at a higher rate than males with a GED credential.
- No significant differences for GED credential recipients occurred by ethnic group between enrollees and non-enrollees.
- Approximately half of GED credential recipients who indicated *enter two-year college* (48 percent) and/or *enter four-year college* (55 percent) as reasons for testing enrolled in postsecondary education after testing. These comparisons suggest that GED credential recipients with the intention to enroll in a two-year or four-year college when testing are more likely to actually do so, compared with GED credential recipients who do not state these goals.
- GED credential recipients who reported testing to obtain a better job tended to not view postsecondary education as a means to advancing their careers.
- Those who earned a GED credential while working part time were 1.7 times more likely to enroll in postsecondary education than those who were not working part time.
- GED credential recipients who enrolled in postsecondary education tended to have higher standard scores on the GED Test in all five content areas, and those with higher standard scores were more likely to enroll in postsecondary education.
- Although many GED candidates attended a semester, frequently at a public community college or technical college, and nearly half attended full time or half time, more than three-quarters (77 percent) withdrew after the first semester.

In the first chapter of this report, we present our research questions, related literature review, data sources, and methods. The second and third chapters provide descriptive statistics to capture the general trend of enrollment, persistence, and completion of postsecondary education for the 2003 cohort of GED passers, as well as relevant subgroups defined by demographic characteristics. The fourth chapter presents our survival analyses of the event occurrence of postsecondary enrollment and graduation. The fifth chapter discusses general characteristics of institutions in which the 2003 cohort of GED passers enroll and compares them with characteristics of institutions overall. Finally, in the sixth chapter we compare 2003 GED passers with their counterparts, traditional high school graduates, to investigate the differences in each group's postsecondary experiences.

LITERATURE REVIEW

Nontraditional adult learners are a growing resource for postsecondary education enrollment efforts. Nearly 40 million U.S. adults aged 16 and older lack a high school diploma or GED credential (ACE, 2009). At the same time, approximately 30 percent of U.S. adults remain "untouched by postsecondary education," and a substantial gap exists in federal and state efforts toward the recruitment of adults into postsecondary education (CAEL, 2008, p.7), with most of the effort going toward recruitment via the traditional pipeline of graduating high school seniors (CAEL, 2008; Reder, 2007). One way to close the gap is to focus more resources on individuals who pursue a GED credential and then enter postsecondary education (Behal, 1983; CAEL, 2008; Duke & Ganzglass, 2007; Reder, 2007).

"[The] effectiveness of GED [credential] acquisition as a route into postsecondary education is a woefully understudied area," Lofstrum and Tyler wrote (2005, p. 2). Since 1942, more than 17 million adults have passed the GED Test (ACE, 2009). Approximately 60 percent of candidates cited educational reasons for taking the GED Test (ACE, 2009), but many do not continue their education due to adverse life circumstances or other barriers (Behal, 1983; Maralani, 2006; Reder, 1999; Tyler, 2005), even though participants in postsecondary experiences tend to show modest increases in earnings (Georges, 2001; Lofstrum & Tyler, 2005; Murnane, Willett, & Boudett, 1999; Song & Hsu, 2008). Previous studies found that

GED credential recipients are more likely to enroll in postsecondary education than dropouts (Murnane, Willett, & Boudett, 1997), even with the availability of open admissions for both.

Individuals with GED credentials need sufficient time after testing to make the decision and prepare to enroll in postsecondary programs (Boudett, Murnane, & Willett, 2000; Reder, 2007). GED credential recipients may tend to participate in a two-year program, but they also may delay enrollment in postsecondary education (Behal, 1983; Ou, 2008; Patterson, Song, & Zhang, 2009). Another important observation is that few[18] enrollees complete the first year of postsecondary education or a degree program (Council for Advancement of Adult Literacy [CAAL], 2008; Duke & Ganzglass, 2007; Murnane, Willett, & Tyler, 2000; Patterson, Song, & Zhang, 2009; Reder, 1999; Reder, 2007; Tyler, 2003). The National Household Education Survey of 2001, 2003, and 2005 indicated that across the years of the study, approximately one-fourth of GED credential recipients attended some college or completed an undergraduate degree (National Center for Education Statistics, author calculations); according to Reder (2007), by the 2005 National Household Education Survey follow-up, an estimated 48 percent of GED credential recipients attended some college or completed an undergraduate degree.

Some individual states reported that up to half of GED recipients enrolled in postsecondary education (CAAL, 2008; Duke & Ganzglass, 2007; Hanni, 2008). However, the number of GED credential recipients who are currently pursuing postsecondary education nationally remains unclear (CAEL, 2008; Maralani, 2006; Ou, 2008). One reason for the lack of clarity is the absence of large-scale national studies on the specific population of GED credential recipients. An earlier GEDTS study of postsecondary enrollment of GED examinees, though containing informative findings, included responses from only 647 randomly selected GED Test candidates (Behal, 1983). Studies of GED credential recipients' postsecondary experiences are challenging to conduct as they typically feature incomplete samples or low-quality data (Hanni, 2008; Song & Hsu, 2008). Before the 2002 GED Test series, it was impossible to follow the postsecondary educational paths of GED credential recipients at a national level because individual-level data were not collected nationally. With the current availability of individual-level demographic, testing, and postsecondary data on GED candidates (Patterson, Song, & Zhang, 2009), a national large-scale, longitudinal study is possible.

An important comparison group for our study is traditional high school graduates who enter postsecondary education. Researchers have examined both the timing and results of enrollment and persistence. Barth (2001) reported that 66 percent of high school graduates enrolled in postsecondary education institutions immediately following high school. Wirt, et al. (2003) reported similar findings: Only 55 percent of students starting college in fall 1995 obtained a postsecondary education degree within six years.

Of freshmen at four-year colleges, 74 percent continued to their sophomore year, and only 55 percent of two-year freshmen continued to their sophomore year (Barth, 2001). Also, Barth reported "even at relatively selective (four)-year colleges and universities, only about half of college freshmen earn a bachelor's degree within six years—and the success rates vary for different groups, with fewer than 40 (percent) of African-American and Latino undergraduates persisting to a degree, compared to two-thirds of (whites) and Asians" (2001, p. 9).

Other study results revealed that there was a crucial time period (the first two years of college) for college student retention. Tinto, Russo, and Kadel (1994) found that 25 percent of the college students dropped out of school after their first year; among all the dropout students, 75 percent left college in the first two years (Tinto, 1988).

Just as there are gaps in high school graduation rates based on gender and ethnicity, research also has shown that there are gaps in high school graduates' postsecondary education rates based on their socioeconomic and demographic status (Barth, 2001). As for the college retention rate, many researchers have identified that demographic and academic achievement variables are related to college students' retention (Chimka, Reed-Rhoads, & Barker, 2007; Murtaugh, Burns, & Schuster, 1999). Using data from Oregon State University between 1991 and 1999, Murtaugh, Burns, and Schuster (1999) found that college students' attrition increased with age and

[18] In these studies, percentages of GED credential recipients who completed one year or less of postsecondary education varied from approximately 12 to 23 percent. Percentages of GED credential recipients who completed two-year or four-year degrees ranged from approximately 2 to 9 percent.

decreased with higher high school GPAs and first-quarter postsecondary GPAs. Chimka, Reed-Rhoads, and Barker (2007) found that science ACT scores and gender were significantly related to college students' graduation status.

In addition to academic and demographic factors, researchers also investigated how psychological factors play a role in college students' retention rate. Parker, Hogan, Eastabrook, Oke, and Wood (2006) created a unified theory of college student retention, suggesting that it is highly related to their emotional and social competencies. Ethington (1990) found that college students' attitudes toward schools influenced their college retention.

In summary, research indicates that the GED credential provides a pathway to postsecondary education, and finishing even a short-term postsecondary program offers important economic benefits to GED credential recipients. We began our longitudinal study by looking at the experiences of the 2003 GED Test passers/non-passers cohort as a foundation. We compared postsecondary institutions in which GED credential recipients enrolled with postsecondary institutions in general, as well as 2003 GED passers with traditional high school graduates.

RESEARCH QUESTIONS

This study examined effects of the GED credential on outcomes of those who, in pursuit of expanded social and economic opportunities, choose to cross the bridge to postsecondary education. First we aimed to fully describe the overall population of the 2003 cohort of GED Test passers and three relevant subgroups (representing differing genders, primary languages, and employment statuses). Second, we planned to model the event occurrence of entry into postsecondary education and of graduation, both for the general 2003 GED passer population and for specific subgroups. We also sought to frame their outcomes in the settings of the institutions they attended and in comparison with outcomes of traditional high school graduates. After reviewing the literature, we proposed to address questions in four areas that could contribute to a fuller understanding of postsecondary experiences of GED Test candidates, and more specifically, those who earn a GED credential.

Descriptive Questions (Chapters 2 and 3):

1. What percentage of GED candidates enrolls in postsecondary education? How does that percentage differ by GED Test pass status?
2. What are the demographic characteristics of GED passers and non-passers?
3. What is the GED Test performance of GED passers who enroll in postsecondary education?
4. What are the postsecondary enrollment patterns of GED passers? How do enrollment patterns of GED passers differ by subgroup (gender, primary language, and employment status at GED Testing)?
5. What are GED passers' persistence patterns in postsecondary education? How do the characteristics of GED passers who enroll for just one semester compare with characteristics of those who enroll for multiple semesters and with those who complete their postsecondary programs?
6. What are GED passers' completion patterns and the majors of graduates?
7. How is the goal to "get a better job" associated with GED passers' enrollment?

Event Occurrence Questions (Chapter 4):

1. What is the event occurrence, modeled by month, that a GED passer will enroll in postsecondary education? Are there any differences in event occurrence of enrollment among subgroups?
2. Is there a relationship between event occurrence of enrollment and GED passers' demographic and academic characteristics?
3. What is the event occurrence, modeled by month, that GED passers who enroll will persist to graduation? Do their enrollment patterns differ among subgroups?
4. Is there a relationship between the event occurrence of graduation and GED passers' demographic and academic characteristics?

Postsecondary Institutional Questions (Chapter 5):

1. What are the characteristics of postsecondary institutions that GED passers attend?

2. What percent of GED passer applicants to the institutions are admitted? What percent of those admitted actually enroll? How does enrollment status differ by gender?

3. How many of the institutions that GED passers attend have open-admissions policies? How does enrollment of GED passers and non-passers differ by open-admissions policies status?

4. Do GED passers attend institutions that offer remedial services and on-campus daycare?

5. What percent of staff is involved in instruction in institutions in which GED passers enroll?

Comparisons by Educational Background of Postsecondary Enrollees (Chapter 6):

1. How do characteristics of GED passers who enroll in postsecondary education compare with characteristics of traditional high school graduates who enroll, by age, gender, and ethnicity?

2. How does the type of institution differ by enrollees' educational background and gender?

3. How do the attendance patterns of GED passers compare, by educational background and gender?

4. How do postsecondary degree plans of GED passers compare, by educational background and gender?

5. How do institutional features such as tuition and fees, open-admissions policies, and remedial services compare, by educational background?

METHODOLOGY

Data

The study examined postsecondary outcomes of U.S. GED Test candidates from the first cohort during the 2003 calendar year. The 2003 cohort of candidates included all examinees who took the GED Test in 2003, regardless of whether they completed the GED Test—that is, they may have started in 2003 and completed in a later year. The 2003 cohort includes adults who passed the GED Test in 2003 in the United States (GED Test passers) as well as adults who tested but did not pass the GED Test in 2003 or in later years (non-passers). In addition, we considered subgroups reflecting key demographic groups for further analysis. Our analysis of postsecondary outcomes focused on enrollment, persistence, and degree completion. Our findings are presented below.

We provided data on the 2003 cohort of 540,031 candidates for potential matches for postsecondary enrollment and completion records from the National Student Clearinghouse (NSC), a nonprofit organization established in the early 1990s to serve the higher education community. NSC serves as a repository for data from approximately 3,000 postsecondary institutions[19] and currently holds records for 93 percent of the total postsecondary student enrollment in the nation.

In 2003, GEDTS tested 657,239 candidates in the United States. Not all candidates met the definition for membership in the 2003 cohort (such as those who started in 2003 and received a GED credential in later years, which represents approximately 8 percent of the difference between those tested and those available for matching), and not all records could be matched (which represents approximately 10 percent of the difference). Of the 2003 cohort of candidates, 540,031 GED Test candidates had records that could potentially match NSC records, which included 2003 GED passers (64.2 percent) and non-passers from 2003 through 2008 (approximately 35.8 percent). We matched 188,243 records out of the 540,031 candidates (see **Table 1** on page 10); therefore, we inferred that approximately 35 percent of the 2003 cohort of GED Test candidates, regard-

[19] The number of GED credential recipients enrolling in postsecondary may be underreported. Data from 4,239 institutions were not collected in the National Student Clearinghouse dataset and therefore could not be matched for our study. Still, the percentage of enrollment, which could not be matched through the NSC database, is approximately 7 percent of all postsecondary students, and GED credential recipients represent only a fraction of that 7 percent. For more information, see the "Limitations and Future Research" section at the end of this report.

less of pass status, were enrolled in postsecondary education by September 2009.

In addition, nearly 43 percent of the 2003 cohort of GED passers enrolled in postsecondary institutions, which is in line with enrollment rates estimated by other researchers, as described in our literature review. The match also yielded information on GED candidates' postsecondary enrollment starting and ending dates, enrollment status, attendance status (i.e., full time or less), degrees, and majors. Institutional information from NSC records included name, location, institution type, and public or private status.

Because research indicates that most GED candidates enter two-year (or shorter) postsecondary programs, we believed that six full calendar years was sufficient time to examine enrollment and persistence rates in programs of up to two years. (We plan to follow up on the same 2003 cohort in later years of the study to determine persistence and completion for four-year degree candidates.) For example, a 2003 GED Test candidate whose data we analyzed in 2009 might enroll in a postsecondary program between 2003 and 2009.

We also included data from the Integrated Postsecondary Education Data System (NCES/IPEDS, 2004) in our study to explain institutional characteristics, admission policies and enrollment trends, remedial and daycare services offered, and instructional staff in postsecondary institutions that the 2003 cohort of GED passers attended. These data come from "a system of interrelated surveys conducted annually by the U.S. Department's National Center for Education Statistics (NCES). IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. IPEDS provides basic data needed to describe—and analyze trends in—postsecondary education in the United States in terms of the numbers of students enrolled, staff employed, dollars expended, and degrees earned" (NCES/IPEDS, 2004).

One data source for comparisons by educational background was the NCES Beginning Postsecondary Students Longitudinal Study (BPS), both from the Data Analysis System (DAS) supply of data from BPS (NCES/BPS, 2004) and as included in a report by Berkner and Choy (2008). We used DAS data from BPS (NCES/BPS, 2004) to generate specific cross-tabulated reports from the same dataset that Berkner and Choy employed. We employed DAS data to make comparisons by educational background between GED credential recipients and first-time postsecondary students with traditional high school diplomas. The Berkner and Choy study included first-time postsecondary students who began their studies during the 2003–04 academic year. The study based its findings on a final sample of 23,090 students representing approximately 4 million first-time postsecondary students who began in 2003–04. The study followed up with the sample in 2006 and collected data on level and control of institutions they attended, their degree plans, enrollment status, and demographic characteristics.

To round out our comparisons at the institutional level, we also compared percentages, from the *Digest of Education Statistics: 2004*, of institutions with open-admissions policies with those that offer remedial services (Snyder & Tan, 2006), by educational background of the postsecondary enrollees. The digest also allowed us to estimate, by educational background, the percentage of enrollees who remained in their home state to begin their postsecondary programs. An additional source was the *Digest of Education Statistics: 2008* (Snyder, Dillow, & Hoffman, 2009), which provided limited information about postsecondary degrees earned.

Descriptive Analyses

To address the first two descriptive research questions, we identified which candidates had passed the GED Test and later enrolled in postsecondary education and which had not, and we described 2003 GED Test passers and non-passers by gender, age, ethnic group, primary language, hours of GED preparation, status of taking an Official GED Practice Test, last year of K–12 school attended, last grade completed, reasons for testing, and employment status at GED testing. We compared enrollment rates of passers with non-passers to identify the effects of the GED credential on postsecondary outcomes with a relevant control group in mind, that is, the group of dropouts who intended to pursue the GED credential and who believed their skill levels were close to GED readiness. However, our report primarily focuses on the postsecondary experiences of the 2003 cohort of GED passers to demonstrate the necessity of passing the GED Test to enter postsecondary education.

To answer the third, fourth, and fifth descriptive research questions, we considered the 2003 cohort of GED passers who enrolled in postsecondary education according to NSC data. To address our third descriptive question, we examined standard scores on all GED Test content areas for the 2003 cohort

of GED passers who enrolled in postsecondary education. Knowing these standard scores helps the reader estimate incoming skill levels of students with GED credentials.[20] We summarized retention and transfer rates and the types of institutions passers attended. We examined their enrollment patterns, including timing before enrollment, type of enrollment, and persistence. We needed to know if the 2003 cohort of GED passers persisted for one semester or multiple semesters, and how their persistence differed by demographic characteristics. We considered whether the 2003 cohort of GED passers tended to pursue postsecondary education in the state in which they tested. We also looked at number of graduates, time to degree, degree type, and college major.

Next, we repeated our analyses for questions 3, 4, and 6 for three important subgroups: by gender, primary language, and employment status. These subgroups represent groups whose postsecondary enrollment and completion have the potential to differ markedly: males and females, native English speakers and English-language learners, and adults who are unemployed, employed part time, or employed full time. We compared standard scores using Cohen's *d,* defined as the difference between two means divided by the pooled standard deviation for those means. Because each subgroup had a large number of enrollees to observe, any statistics based on this large sample size would be statistically significant (Cohen, 1988). Therefore, Cohen's *d* was calculated as a measure of effect size characterizing the magnitude of the differences between groups. Unlike significance tests, Cohen's *d* is independent of sample size. Also, calculating and reporting measures of effect size can assist researchers in distinguishing statistical and practical significance (Kirk, 1996), and effect sizes from larger samples are considered more reliable (Slavin & Smith, 2009).

In addition to descriptive summaries, we graphically examined patterns of enrollment and persistence. We anticipated that enrollment and persistence of the 2003 cohort of GED passers would not follow a linear pattern, so we analyzed persistence patterns for postsecondary graduates and non-completers. We identified a partial list of patterns from frequencies of enrollment by semester, for a first glimpse at how the 2003 cohort of GED passers was enrolling and persisting. We wanted to know if they enrolled consecutively or skipped semesters as they progressed toward a degree. Did the patterns appear different for non-completers compared with graduates?

We also recognized that calendar systems of postsecondary institutions could vary. Initially realizing that most institutions follow a semester system, we loosely defined semesters to include the "spring" months of January through May or June, and "fall" months of August or September through December. A 2003 GED passer had to have both a beginning and ending date of enrollment to be included in a semester. To include students whose fall semester started earlier, we included students who started in July, August, or September in the fall semester. We found that our approach included 81 percent of the 2003 cohort of GED passers who enrolled. No other system with smaller increments that we considered, such as quarters, trimesters, or months, allowed a higher percentage to be included, and we could not use year-long increments because the pilot data (Patterson, Song, & Zhang, 2009) showed that a large percentage did not enroll for longer than one semester.

Next, we assigned each 2003 GED passer who enrolled in postsecondary education to one or more of 14 possible semesters covering six-month

[20] A comparison of GED Test standard scores with high school senior percentile ranks is available from *Who Passed the GED Tests? 2003 GED Statistical Report* (ACE, 2005).

increments (that is, January 1 to June 30, or July 1 to December 31, for each of seven years from 2003 through 2009). This designation allowed us to look not only at intensity of enrollment in postsecondary education across time, at a summary level, but also at the most frequently occurring individual patterns. We hypothesized that a better understanding of patterns of persistence could inform institutional leaders not only when 2003 GED passers were likely to stop out and come back, but also during which semester they were likely to drop out. To add to the picture of who these GED credential recipients were, we also identified demographic characteristics for the following types of 2003 GED passers who enrolled for:

- A single semester and did not complete their postsecondary program.
- A single semester and did complete.
- Multiple semesters and did not complete.
- Multiple semesters and did complete their postsecondary program.

The demographic characteristics we considered for these groups were age, gender, ethnic group, primary language, status of taking an Official GED Practice Test, last grade completed, reasons for testing, and employment status. Cell sizes needed to contain at least 30 people for valid comparisons, and differences between groups needed to be of at least 30 percent magnitude (that is, the proportion of one group was 30 percent smaller or greater than the other).

With our seventh descriptive question, we considered how the goal to "get a better job" related to actual enrollment in postsecondary education. This question originated from pilot study results (Patterson, Song, & Zhang, 2009) in which the goal to get a better job inexplicably did not associate with postsecondary enrollment. Characteristics that displayed statistically significant differences were cross-tabulated to determine effect. For dichotomous data, odds ratios were calculated as a measure of the association's strength (Agresti, 1996; Grissom & Kim, 2005).

Survival Analyses

Survival analysis is an often-used method to describe whether events occur or when events occur. The most common feature for survival analysis data is censoring. A censored observation is defined as an observation with an unknown event time caused by the fact that (1) some individuals will never experience the target event and (2) others will experience the event, but not during the study's data collection. Employing logistic regression would not make censored data useful. Survival analysis takes advantage of those censored data as well as the noncensored data to identify relationships between survival probability and independent variables of interest.

We employed survival analyses to answer our research questions regarding the event occurrence of 2003 GED Test passers who enrolled in postsecondary education and the event occurrence of 2003 GED passers' graduation after enrolling in postsecondary education. There were three steps for survival analyses: (1) Map our data to survival analyses schema, (2) estimate the distribution of the survival times for one predictor variable at a time, which was to determine whether two or more samples could have risen from identical survivor functions, and (3) build up models to investigate the association between event occurrence and independent predictor variables.

In Chapter 4, we described how our data fit into the three features of survival analysis data. Second, we presented the estimation of the distribution of survival times and compared survival curves based on different subgroups, such as gender, ethnicity, age, and GED battery score. This stage was called univariate analyses, which investigated one predictor variable at a time. Finally, we employed the Cox proportional hazards regression models (Cox, 1972) for multiple-variable analyses (examining more than one predictor at a time). Two sets of equivalent survival analyses were conducted to study the event occurrence of 2003 GED passers' college enrollment and college graduation.

Postsecondary Institutional Analyses

In addition to a full description of the population of the 2003 cohort of GED Test passers and three relevant subgroups (representing differing genders, primary languages, and employment statuses), we planned to frame their postsecondary outcomes in the settings of the institutions they attended. We included data from the Integrated Postsecondary Education Data System (NCES/IPEDS, 2004) and the 2004 Digest (Snyder & Tan, 2006) into our study to describe institutional characteristics and features.

Data from IPEDS were matched with institutional data from the NSC database and 2003 GED passer data from GEDTS. Descriptive frequencies and averages were calculated to summarize institutional

characteristics, policies, and services. Where frequencies or averages would be expected to vary annually, we selected data from the 2003–04 academic year (unless otherwise indicated) because it represented the peak year for postsecondary enrollment of GED passers in the 2003 cohort. As with our descriptive analyses, characteristics displaying statistically significant differences were cross-tabulated to determine effect. For dichotomous data, odds ratios were calculated as a measure of strength of the association (Agresti, 1996; Grissom & Kim, 2005).

Comparisons by Educational Background

Our final set of analyses involved comparing postsecondary findings of GED Test passers with characteristics and outcomes of traditional high school graduates at the peak time period of 2003 GED passer enrollment in postsecondary education. The NCES Beginning Postsecondary Students Longitudinal Study (BPS; Berkner and Choy, 2008) included first-time postsecondary students who began their studies during the 2003–04 academic year. Berkner and Choy (2008) reported that approximately 90 percent of first-time postsecondary students that year had received a traditional high school diploma. The remaining 9.8 percent, which they referred to as "no regular diploma" (p. A-13), included GED credential recipients, certificate of completion recipients, homeschooled students, and dropouts.

After excluding the 9.8 percent of students with "no regular diploma," we employed data from BPS (NCES/BPS, 2004) to make comparisons, by educational background, between 2003 GED passers and the first-time postsecondary students with traditional high school graduates. For these comparisons, any practically significant differences between groups needed to be of at least 30 percent magnitude (that is, the proportion of one group was 30 percent smaller or greater than the other) to distinguish slight differences from truly meaningful ones.

Transitions to Postsecondary Education

POSTSECONDARY ENROLLMENT OF GED TEST PASSERS AND NON-PASSERS

Overall, 34.9 percent of GED Test candidates in the 2003 cohort enrolled in postsecondary education. To begin to understand the relationship between the 2003 cohort of GED Test passers and postsecondary enrollment, we first needed to compare their postsecondary enrollment percentages with those of GED Test non-passers (as shown in **Table 1**).

The 2003 cohort of GED passers enrolled in postsecondary education at more than twice the rate (42.9 percent) of non-passers (20.5 percent). Although the emphasis of this report is on postsecondary outcomes of GED credential recipients, the presence of nearly 40,000 non-passers in postsecondary institutions confirmed the importance of examining characteristics of both groups and institutional open-admissions policies.

CHARACTERISTICS OF GED TEST PASSERS AND NON-PASSERS

Regardless of their GED credential status, GED Test candidates differed according to some distinct demographic characteristics. **Table 2** (page 11) displays column percentages of the 2003 cohort of GED Test passers and non-passers within demographic groups. The 2003 cohort of GED passers were more frequently male (58.3 percent) than female (41.7 percent) as well as younger (20 years old) than non-passers (23 years old). Higher proportions of the 2003 cohort of GED passers were white, and non-passers were more frequently Hispanic or African American. Adults whose primary language was English tended to obtain GED credentials more frequently than those who reported another primary language. Most 2003 GED passers (68.0 percent) reported taking the Official GED Practice Test.

In keeping with the median age, 2003 GED passers tended to have left school more recently than non-passers did. Candidates who completed 10th or 11th grade obtained GED credentials more frequently than those who completed 8th grade or below. The 2003 GED passers more frequently indicated an educational reason, an employment-related reason, or a personal reason for testing than non-passers. The 2003 GED passers and non-passers reported similar employment statuses, either unemployed or employed part time or full time at the time of testing.

TABLE 1

Postsecondary Enrollment Status of the 2003 Cohort of GED® Test Passers and Non-Passers (2003–09)

	2003 Cohort of GED Passers		2003 Cohort of GED Non-Passers		Total
	Number	Percent	Number	Percent	Number
Postsecondary Enrollees	148,649	42.9	39,594	20.5	188,243
Non-enrollees	198,228	57.1	153,560	79.5	351,788
Total	**346,877**	**100.0**	**193,154**	**100.0**	**540,031**

TABLE 2

Characteristics of the 2003 Cohort of GED® Test Passers and Non-Passers

Characteristic	2003 Cohort of GED Passers	2003 Cohort of GED Non-Passers
Total 2003 Cohort of GED Test Passers and Non-passers (Number)	346,877	193,154
Gender (Percent):		
Male	58.3	48.8
Female	41.7	51.2
Age in 2003 (Median)	20.1 years	23.4 years
Ethnic Group (Percent):		
Hispanic	14.6	31.5
African American	15.8	30.0
White	65.2	33.5
American Indian/Alaska Native	2.2	2.7
Asian	1.7	1.7
Native Hawaiian/Pacific Islander	0.5	0.6
Primary Language (Percent):		
English	96.6	91.9
Language Other Than English	3.4	8.1
Hours of GED Test Preparation (Median)	24	30
Took Official GED Practice Test (Percent)	68.0	61.5
Years Since Leaving K–12 School (Median)	3	5
Highest Grade Completed (Percent):		
8th Grade (or below)	9.5	15.7
9th Grade	17.5	20.4
10th Grade	29.0	27.0
11th Grade	35.2	27.9
12th Grade	8.6	9.0
Reasons for GED Testing (Percent)[1]:		
Enroll in Trade/Technical	19.3	21.8
Enter Two-Year College	26.0	20.5
Enter Four-Year College	20.0	11.2
Skill Certification	7.6	6.9
Get First Job	5.9	5.1
Get Better Job	36.3	32.0
Employer Requirement	7.5	9.0
Public Assistance Requirement	0.8	2.3
Role Model for Family	17.5	14.3
Personal Satisfaction	50.4	32.8
Employment/Student Status at GED Testing (Percent):		
Employed Part-Time	12.3	9.6
Employed Full-Time	24.5	19.9
Unemployed	31.5	26.1
Full-Time Student	11.2	10.0
Part-Time Student	8.4	7.9

[1] Reasons for testing are not mutually exclusive; candidates could select more than one educational reason.

Notes: Missing n for gender=9,218.
Missing n for ethnic group=56,022.
Missing n for primary language=94,096.
Missing n for taking Official GED Practice Test=83,370.
Missing n for highest grade completed=65,577.

STANDARD SCORES OF GED TEST PASSERS WHO ENROLLED IN POSTSECONDARY EDUCATION BY SUBGROUP

Our pilot study found that GED credential recipients with higher standard scores were more likely to enroll in postsecondary education (Patterson, Song, & Zhang, 2009). In **Table 3** (page 12), the average scores of 2003 GED Test passers who enrolled in postsecondary education (n=148,649) are displayed. The overall mean GED standard score was 541 (standard deviation=63), with a median of 532. To compare these scores with standard scores of GED passers, consult *Who Passed the GED Tests? 2003 GED Statistical Report* (American Council on Education, 2005).

The purpose of presenting GED standard scores for postsecondary enrollees is to allow the reader to estimate what scores may be expected of 2003 GED passers who enroll in postsecondary programs. Although performance would vary for individuals, average standard scores for 2003 GED passers who enroll should be comparable with standard scores in Table 3.

Gender

In our next descriptive analysis, we considered standard scores, enrollment, persistence, and completion for important subgroups, namely by gender, primary language, and employment status at GED testing. We began by comparing the average score of male 2003 GED Test passers who enrolled with the average score of female GED passers. Mean and median standard scores are displayed in **Table 4** (page 12). The overall mean GED standard score for males was 545 (standard deviation=65), with a median of 534. The overall GED standard score for females was 538 (standard deviation=61), with a median of 528.

We compared standard scores using Cohen's *d* as a measure of effect size characterizing the magnitude of the differences within subgroups. Unlike significance tests, Cohen's *d* is independent of sample size. Males tended to score significantly higher in Science and Mathematics (*d*=0.34 and 0.31, respectively). Although performance overall varies for individuals, standard scores for male 2003 GED passers who enrolled were comparable with female GED passers (*d*=0.11).

TABLE 3

Standard Scores Statistics for the 2003 Cohort of GED® Test Passers Enrolled in Postsecondary Education

	Content Area				
	Language Arts, Writing	Social Studies	Science	Language Arts, Reading	Mathematics
2003 Cohort of GED Test Passers Enrolled (N=148,649)					
Mean	522	541	561	578	504
Standard Deviation	78	74	77	100	72
Median	510	540	550	560	490

TABLE 4

Standard Scores Statistics for the 2003 Cohort of GED® Test Passers Enrolled in Postsecondary Education, by Gender

	Content Area				
	Language Arts, Writing	Social Studies	Science	Language Arts, Reading	Mathematics
Male (N=75,487)					
Mean	514	549	574	571	515
Standard Deviation	77	78	80	99	76
Median	500	540	560	560	500
Female (N=71,616)					
Mean	530	533	548	585	493
Standard Deviation	78	70	72	101	67
Median	520	530	540	570	480
Mean Difference (*d*)	-0.21	0.22	0.34	-0.14	0.31

Note: Missing n=1,546.

Primary Language

We continued our analysis by considering standard scores, enrollment, persistence, and completion for passers' primary languages. We compared the average standard score of primary English-language GED Test passers who enrolled in postsecondary education with the average standard score of other-language GED passers from 2003. Mean and median standard scores are displayed for each content area in **Table 5** (page 13). The overall mean GED standard score for those whose primary language is English was 544 (standard deviation=63), with a median of 534. The overall GED standard score for those whose primary language is one other than English was 515 (standard deviation=56), with a median of 502.

English-language GED passers in the 2003 cohort tended to score higher in Social Studies, Science, and Language Arts, Reading. Although performance varies for individuals, overall standard scores for primary English-language GED credential recipients who enrolled were significantly higher (*d*=0.49) on average than for GED passers whose primary language is one other than English.

Employment Status at GED Testing

We also considered standard scores, enrollment, persistence, and completion for employment status at GED testing. We compared the average standard score of part-time employed 2003 GED Test passers who enrolled with the average standard score of full-time employed and unemployed GED passers (as reported at the time of testing). Mean and median standard scores are displayed in **Table 6** (page 13). The overall mean GED standard score for part-time employed passers was 547 (standard deviation=65), with a median of 538. The overall GED standard score for full-time employed passers was 546 (standard deviation=64), with a median of 538. The overall GED standard score for unemployed passers was 540 (standard deviation=61), with a median of 530.

Employed 2003 GED passers who enrolled in postsecondary education tended to score nearly the same in all content areas as unemployed GED passers. Although performance varies for individuals, overall standard scores for part-time employed (*d*=0.11) and full-time employed (*d*=0.10) 2003 GED passers who enrolled were nearly the same as for unemployed GED passers.

TABLE 5

Standard Scores Statistics for the 2003 Cohort of GED® Test Passers Enrolled in Postsecondary Education, by Primary Language

Primary Language	Content Area				
	Language Arts, Writing	Social Studies	Science	Language Arts, Reading	Mathematics
English (N=125,604)					
Mean	524	544	564	582	505
Standard Deviation	78	75	77	100	72
Median	510	540	550	560	490
Language Other Than English (N=4,945)					
Mean	504	512	526	526	505
Standard Deviation	72	65	66	89	76
Median	490	500	520	500	490
Mean Difference (*d*)	0.27	0.46	0.53	0.59	0.00

Note: Missing n=18,100.

TABLE 6

Standard Scores of the 2003 Cohort of GED® Test Passers Enrolled in Postsecondary Education, by Employment Status at GED® Testing

Employment Status at GED Testing[1]	Content Area				
	Language Arts, Writing	Social Studies	Science	Language Arts, Reading	Mathematics
Employed Part-Time (N=21,590)					
Mean	530	545	566	583	511
Standard Deviation	81	75	79	102	75
Median	520	540	550	560	500
Employed Full-Time (N=36,627)					
Mean	524	548	567	584	507
Standard Deviation	78	76	78	102	72
Median	510	540	550	570	500
Unemployed (N=46,439)					
Mean	520	540	560	576	502
Standard Deviation	76	73	76	98	70
Median	510	530	550	560	490
Mean Difference (d)–PT/UN	0.13	0.07	0.08	0.07	0.12
Mean Difference (d)–FT/UN	0.05	0.11	0.09	0.08	0.07

[1] Employment status was reported at the time of GED testing and may have changed before or during postsecondary enrollment.

POSTSECONDARY ENROLLMENT PATTERNS BY SUBGROUP

As a first consideration for postsecondary enrollment patterns, we looked at important demographic characteristics of the 2003 cohort of GED Test passers who enrolled and who did not enroll in postsecondary education: gender, age, ethnic group, primary language, hours of preparation, status of taking an Official GED Practice Test, years since school, highest grade completed, reasons for testing, and employment/student status when testing. **Table 7** (page 14) displays percentages for 2003 GED passers who enrolled and for those who did not enroll. Proportionately, male 2003 GED passers enrolled less frequently than females (see Table 7).

Descriptive statistics are presented for individual ethnic groups in Table 7; no significant differences for 2003 GED passers occurred by ethnic group between enrollees and non-enrollees, with the exception of Asians, who had a higher rate of enrollment than other ethnic groups. The percentage of 2003 GED passers who took an Official GED Practice Test was higher for non-enrollees.

A frequent concern about GED credential recipients who state educational reasons for testing is whether they follow up and actually pursue their educational goals after earning the credential. More than half (53.9 percent) of 2003 GED passers who indicated "enter two-year college" and 59.9 percent of 2003 GED passers who indicated "enter four-year college"

TABLE 7

Postsecondary Enrollment Status of the 2003 Cohort of GED® Test Passers, by Demographic Characteristics

Characteristic	2003 Cohort of GED Test Passers Who Enrolled	2003 Cohort of GED Test Passers Who Did Not Enroll
Total 2003 Cohort of GED Test Passers (N=346,877)	148,649	198,228
Gender (Percent):		
Male	37.8	62.2
Female	49.9	50.1
Age in 2003 (Median)	19.5 years	20.7 years
Ethnic Group (Percent):		
Hispanic	42.3	57.7
African American	46.1	53.9
White	41.5	58.5
American Indian/Alaska Native	38.1	61.9
Asian	60.8	39.2
Native Hawaiian/Pacific Islander	47.8	52.2
Primary Language (Percent):		
English	42.5	57.5
Language Other Than English	48.0	52.0
Hours of GED Test Preparation (Median)	20	28
Took Official GED Practice Test (Percent)	40.3	59.7
Years Since Leaving K–12 School (Median)	2	4
Highest Grade Completed (Percent):		
8th Grade (or below)	34.7	65.3
9th Grade	38.1	61.9
10th Grade	41.9	58.1
11th Grade	45.1	54.9
12th Grade	53.5	46.5
Reasons for GED Testing (Percent):		
Enroll in Trade/Technical	38.3	61.7
Enter Two-Year College	53.9	46.1
Enter Four-Year College	59.9	40.1
Skill Certification	38.0	62.0
Get First Job	39.4	60.6
Get Better Job	38.7	61.3
Employer Requirement	35.3	64.7
Public Assistance Requirement	41.6	58.4
Role Model for Family	38.7	61.3
Personal Satisfaction	39.2	60.8
Employment/Student Status at GED Testing (Percent):		
Employed Part-Time	50.6	49.4
Employed Full-Time	43.1	56.9
Unemployed	42.5	57.5
Full-Time Student	43.7	56.3
Part-Time Student	44.0	56.0

Notes: Percentages represent row percents for the 2003 cohort of GED Test passers who were either enrollees or non-enrollees in postsecondary education.
Missing n for gender=3,894.
Missing n for ethnicity=35,061.
Missing n for primary language=41,006.
Missing n for Official GED Practice Test=35,499.
Missing n for highest grade completed=30,772.

as reasons for testing later enrolled; these rates are much higher than the 35 to 39 percent enrollment rate of those who indicated employment reasons or interest in trade/technical programs as reasons for testing. These comparisons suggest that GED credential recipients with the intention to enroll in a two-year college or a four-year college when testing are more likely to actually do so, compared with GED credential recipients who do not state these goals.

The 2003 cohort of GED passers who enrolled spent an average of 20 hours preparing for the GED Test, in contrast to non-enrollees who spent an average 28 hours preparing. The 2003 cohort of GED passers did not differ significantly in enrollment status by age, primary language, years since last attended school, highest grade completed, most reasons for testing, and employment status besides part-time work.

The 148,649 GED passers enrolled in a total of 2,787 postsecondary institutions. The decision to enroll in postsecondary education after GED testing was generally not immediate, but it tended to occur within three years of passing the test. Most 2003 GED passers (71.8 percent) who enrolled in a postsecondary institution did so within the first three years after passing the GED Test (that is, 2003, 2004, or 2005, as shown in **Table 8** [page 15]). The median number of months from completion of the GED Test through enrollment in postsecondary education was 14, with a range of one to 80 months. After initial decreases through the fourth year, annual enrollment rates remained steady between 6 and 8 percent annually through 2009.

The vast majority (77.8 percent) of students who passed the GED Test initially enrolled in colleges that offer programs of two years or less; 21.6 percent attended four-year institutions initially. Less than 1 percent attended colleges that offer programs of fewer than two years.

What were the initial postsecondary enrollment patterns of the 2003 cohort of GED passers who enrolled for the first time? Most attended at least half time. More than one-third of 2003 GED passers who enrolled in postsecondary education (39.7 percent) opted for full-time attendance when enrolling in a college or university by September 2009; another third (32.2 percent) enrolled on a half-time basis, and 17.6 percent enrolled less than half time. Approximately 10.5 percent had withdrawn from their institutions.

TABLE 8

Postsecondary Enrollment of the 2003 Cohort of GED® Test Passers, by Year (2003–09)

Year	2003 Cohort of GED Test Passers Enrolled in Year	
	Number	Percent
2003	46,967	31.7
2004	41,893	28.2
2005	17,647	11.9
2006	12,372	8.3
2007	10,283	6.9
2008	9,795	6.6
2009	8,897	6.0
Total	147,854	100.0

Note: Missing n=795.

Policy makers and institutional leaders often are interested in whether prospective students come to their institutions from within the state or from outside the state. The percentage of the 2003 cohort of GED passers who enrolled in institutions in the state in which they passed the GED Test was 83.1. Only 16.9 percent left the state to enroll in a college or university.

Gender

For both males and females, the decision to enroll in postsecondary education after GED testing generally was not immediate. Most male (68.9 percent) and female (70.7 percent) 2003 GED Test passers enrolled in a postsecondary institution within the first three years after passing the GED Test (2003, 2004, or 2005). From 2006 on, enrollment rates remained steady at approximately 6 to 8 percent annually through 2009. The median number of months from completion of the GED Test through enrollment in postsecondary education was 16 for males and 14 for females, with a range of one to 80 months for both.

We were interested in the levels of institutions where male and female students with GED credentials enrolled. Most male (77.1 percent) and female (78.4 percent) students who had passed the GED Test enrolled in colleges that offer programs of two years or less initially; 22.1 percent of males and 21.1 percent of females enrolled in four-year institutions initially. Less than 1 percent of either gender enrolled in colleges that offer programs of less than two years.

What were the initial postsecondary attendance patterns of males and females in the 2003 cohort of GED passers? There was no difference by gender for attendance patterns. Most attended at least half time. More than one-third (38.4 percent of males and 38.1 percent of females) enrolled full time in a college or university by September 2009. Another third (31.1 percent of males and 34.8 percent of females) enrolled half time, and 20.6 percent of males and 16.4 percent of females enrolled less than half time. Approximately 12.2 percent of males and 10.8 percent of females had withdrawn from their institutions during the semester of enrollment. Both male (81.6 percent) and female (84.8 percent) 2003 GED passers tended to enroll in institutions in the state in which they passed the GED Test.

Primary Language

When did 2003 GED Test passers with different primary languages enroll in a college or university? The decision to enroll in postsecondary education after GED testing occurred sooner for those GED passers whose primary language is one other than English than for those whose primary language is English. Most English-language (69.2 percent) and other-language (76.8 percent) GED passers enrolled in a postsecondary institution within the first three years after passing the GED Test (2003, 2004, or 2005). However, a higher percentage (38.9 percent) of other-language passers enrolled in the first year (2003) than English-language passers (29.4 percent). Higher percentages of other-language passers continued to enroll in 2004 and 2005. From 2006 on, annual enrollment rates decreased steadily from 6.9 percent to 4.6 percent through 2009. Other-language students began their college experiences much sooner than their English-language counterparts. The median number of months from completion of the GED Test through enrollment in postsecondary education was 15 for English-language passers and 11 for other-language passers, with a range of one to 80 months for English-language passers and 1 to 79 months for other-language passers.

We also were interested in learning the levels of institutions where students with GED credentials enrolled, by their primary language status. Most English-language (78.1 percent) and other-language (78.0 percent) students who had passed the GED Test attended colleges that offer programs of two years or less initially; 21.2 percent of English-language and 21.6 percent of other-language students attended four-year institutions initially. Less than 1 percent of either language type attended colleges that offer programs of less than two years.

What were the initial postsecondary attendance patterns of the 2003 cohort of GED passers whose primary language is English or one other than English? Approximately two-thirds attended at least

half time, but other-language students tended to enroll less than half time at a much higher rate than English-language students. More than one-third and one-fourth, respectively (36.4 percent of English-language students and 28.6 percent of other-language students), enrolled full time in a college or university by September 2009. Another third (33.2 percent of English-language students and 37.8 percent of other-language students) enrolled half time, and 18.8 percent of English-language students and 24.7 percent of other-language students enrolled less than half time. Approximately 11.6 percent of English-language students and 8.9 percent of other-language students had withdrawn from their institutions. Both English-language (82.5 percent) and other-language (88.0 percent) GED passers from the 2003 cohort tended to enroll in institutions in the state in which where they passed the GED Test; other-language passers were even less likely to enroll in a different state.

Employment Status at GED Testing

When did 2003 GED Test passers with varying employment statuses enroll in a college or university? Most part-time employed (73.6 percent), full-time employed (70.2 percent), and unemployed (68.4 percent) GED passers enrolled in a postsecondary institution within the first three years after passing the GED Test (2003, 2004, or 2005). From 2006 on, annual enrollment rates for all three groups remained steady from 6 percent to 9 percent through 2009. The median number of months from completion of the GED Test through enrollment in postsecondary education was 13 for part-time employed students, 15 for full-time employed students, and 16 for unemployed students, with a range of one to 80 months for all three groups.

Most part-time employed (77.9 percent) and full-time employed (77.7 percent) 2003 GED passers enrolled in colleges that offer programs of two years initially; 78.9 percent of unemployed GED passers enrolled in two-year programs (or less). The remaining one-fourth of employed and unemployed 2003 GED passers enrolled in four-year institutions initially. Less than one percent of those with GED credentials in any employment status enrolled in colleges that offer programs of less than two years.

What were the initial postsecondary attendance patterns by employment status at GED testing? The majority attended at least half time in all three groups (part time, full time, and unemployed). More than one-third (37.5 percent of part-time employed, 34.2 percent of full-time employed, and 31.6 percent of unemployed students) enrolled full time in a college or university by September 2009. Approximately 10.9 percent of part-time employed, 10.3 percent of full-time employed, and 12.4 percent of unemployed students had withdrawn from their institutions. The majority of part-time, full-time, and unemployed (85.7, 83.2, and 83.1 percent, respectively) 2003 GED passers enrolled in institutions in the state in which they passed the GED Test.

IMPROVING JOBS AND POSTSECONDARY ENROLLMENT

Our seventh descriptive research question considered the relationship between the goal to get a better job and postsecondary enrollment. When testing, 48,719 of the 2003 cohort of GED Test passers reported that their reason for testing was to get a better and later enrolled in postsecondary education. This number represents 32.8 percent of all 2003 GED passers who enrolled. Another 77,224 of the 2003 cohort of GED passers who expressed the same goal did not enroll. This number represents 39.0 percent of non-enrollees. The 2003 cohort of GED passers with the goal of getting a better job were significantly less likely to enroll in postsecondary education (odds ratio=0.76, $p<0.001$) than to not enroll.

DISCUSSION

- The 2003 cohort of GED Test passers differed demographically from non-passers.
- 2003 GED passers enrolled in postsecondary education at more than twice the rate (42.9 percent) of non-passers (20.5 percent).

A first key finding of the study reveals that 42.9 percent of 2003 GED passers enrolled in postsecondary education by September 2009, a much higher rate than literature from around the turn of the century suggested, but in keeping with recent studies (CAAL, 2008; Duke & Ganzglass, 2007; Hanni, 2008; Tyler & Berk, 2008; Tyler & Lofstrum, 2008). Before beginning the study, we knew that approximately 60 percent of 2003 GED passers reported further education as a reason for testing (ACE, 2009). The study findings suggest that, given enough time, most of the passers (71.5 percent) followed up on their further education aspirations.

An initially promising finding was that 2003 GED passers enrolled in postsecondary education at a significantly higher rate than did non-passers (42.9 percent and 20.5 percent, respectively). Tyler & Lofstrum (2008) pointed out that non-passers may enroll at lower rates because without open-admissions policies, they would be barred from enrolling, so we planned to consider open-admissions policies as part of our study of institutional characteristics (see Chapter 5). If both GED credential recipients and non-passers alike opt to primarily attend institutions with open-admissions policies, then this finding adds to previous research that GED recipients are more likely to enroll in postsecondary education than dropouts (Murnane, Willett, & Boudett, 1997). It also points to a positive relationship between obtaining a GED credential and entering postsecondary education. This result implies that earning the GED credential offers a key advantage to dropouts who want to pursue postsecondary education.

- Nearly 72 percent (71.8 percent) of 2003 GED passers who enrolled in a postsecondary institution did so within the first three years after passing the test (2003, 2004, or 2005).

- Enrollment peaked in 2004 and after an initial decline remained steady from 2006 to 2009.

GED credential recipients aspiring to further their education may not follow up immediately. The 2003 cohort of GED passers overall tended to enter postsecondary education within three years of passing the GED Test. These first-year findings indicate that allowing enough time to pass before expecting entry into postsecondary programs is important (Boudett, Murnane, & Willett, 2000; Reder, 2007; Tyler & Lofstrum, 2008).

- The vast majority (77.8 percent) of students who passed the GED Test enrolled in colleges that offer programs of two years or less.

- The majority (83.1 percent) of the 2003 cohort of GED passers tended to enroll in institutions in the state where they passed the GED Test.

- More than one-third of 2003 GED passers who enrolled in postsecondary education (39.7 percent) opted for full-time attendance when enrolling in a college or university by September 2009; another third (32.2 percent) enrolled on a half-time basis.

Findings specifically of use to state policy makers include the likelihood of GED credential recipients to enroll in colleges that offer programs of two years or less, to enroll in postsecondary education in the same state where they tested, and to attend full time or half time. As policy makers consider ways to increase the numbers of nontraditional students in the postsecondary pipeline and to focus precious resources in their state, a more detailed understanding of the population will benefit their decision-making process.

- Students whose primary language was one other than English tended to begin their college experiences much sooner after passing the GED Test than their English-language counterparts.

Identifying GED credential recipients whose primary language is not English is important to the postsecondary institutions in which they enroll. Very little is known about this subgroup or the programs in which they are successful. Their eagerness to begin postsecondary education quickly after passing the GED Test may point to their reasons for testing, which may include getting a credential immediately prior to admission in cases where credentials from their home countries are missing or not translated, or as U.S.-born, non-native English speakers with a sense of urgency to improve employment options through further education.

- The 2003 cohort of GED passers whose goal was to get a better job were significantly less likely to enroll in postsecondary education than to not enroll.

Employment-related findings also were worth noting. The 2003 cohort of GED passers who reported testing for a better job tended to not view postsecondary education as a means to get there. For many, the prospect of a better job may involve a promotion at work or a promotion to the next level of the same type of work at a different company. Getting a better job may be seen as a short-term goal rather than a long-term investment in improving skills. Further research into the relationship of job aspirations, career improvements, and postsecondary education—along with how educational aspirations could be fostered—would be valuable.

Chapter Summary

A key finding from this chapter was that 2003 GED Test passers differed demographically from non-passers and enrolled in postsecondary education at more than twice the rate of non-passers. Another key finding is that almost 72 percent of 2003 GED passers

who enrolled in a postsecondary institution did so within the first three years after passing the test.

More than three-fourths of students who had passed the GED Test enrolled in colleges that offer programs of two years or less. More than one-third of 2003 GED passers who enrolled in postsecondary education opted for full-time attendance. Students whose primary language was one other than English tended to begin their college experiences much sooner after passing the GED Test than their English-language counterparts. The 2003 cohort of GED passers whose goal was to get a better job were significantly less likely to enroll in postsecondary education than to not enroll.

In this chapter, we considered the transitions GED credential recipients made to postsecondary education, and we noticed that enrollment patterns differed between random sample and population. In our pilot report of 1,000 randomly selected GED Test candidates, we wrote that we did not "have any known reason to believe the postsecondary enrollment patterns of those GED candidates in the sample would vary considerably from the population of GED candidates" in 2003 (Patterson, Song, & Zhang, 2009, p. 16-17). However, because the population of GED candidates had not been fully examined until this report, we realized that population results are, in many ways, remarkably different from sample results.

For example, the enrollment rate of GED passers was higher in the 2003 population than in the sample. The gender balance for enrollment also differed between sample and population, and the contrast of 2003 GED passers seeking a better job without seeking postsecondary education, while still significant, was less marked. An advantage of the population research is that we had sufficient responses to demographic items for further and more thorough analyses of subgroups.

From our consideration of transition to postsecondary enrollment, we next examine persistence in postsecondary education. Chapter 3 features information regarding persistence, transfer rates, completion, and graduate majors for the 2003 cohort of GED passers.

Persistence in Postsecondary Education

POSTSECONDARY PERSISTENCE PATTERNS

As we observed overall patterns of enrollment to better understand persistence in postsecondary education, we noticed that persistence patterns varied by subgroup (again, gender, primary language, and employment status). However, we also observed persistence patterns for those enrolling for single semesters and those enrolling for multiple semesters.

Approximately one-third (33.4 percent) of all 2003 GED Test passers who entered postsecondary education enrolled in a single semester only; only 2.4 percent of all single-semester enrollees completed a short-term certificate program during that semester. Certificate programs varied from customer service to nursing to commercial truck driving. The 32.6 percent of all 2003 GED passers who entered postsecondary education were considered to have dropped out, as they did not return during the study period.

Approximately half (50.4 percent) of 2003 GED passers who enrolled continued from the first semester they enrolled to the next consecutive semester, regardless of their graduation status. Therefore, we concluded that the first- to second-semester retention rate for 2003 GED passers was 50.4 percent.

Of those who graduated from multiple-semester programs, 86.9 percent continued from their first to second semesters, and 13.1 percent stopped out of their second semester yet returned later to finish. We also found that 73.4 percent of those who enrolled in multiple semesters continued from their first semester to their second semester. The remaining 26.6 percent left after their first semester but enrolled in a later semester. These percentages of students who stop out (whether ultimately completing or not) indicate that GED credential recipients may take longer to complete degree programs. Those 2003 GED passers who did not complete a degree during the study period may continue postsecondary work, perhaps at a less consistent pace than other adult learners and for a longer period of time.

Table 9 shows the number of 2003 GED passers who enrolled in each of 14 semesters. (Note that enrollment in a semester means not only beginning enrollment but also includes later semester enrollments, and that 2003 GED passers had to have both a beginning and ending enrollment date to be included.) **Figure 1** (page 20) provides a graphic display of Table 9 data. Enrollment peaked at more than 45,500 in 2004, gradually decreased through 2005, and remained steady at approximately 30,000 from the 2006 fall semester through 2009.

Approximately two-thirds (66.6 percent) of those who enrolled maintained enrollment for two or more semesters, and the median number of semesters enrolled was two (range one to 14 semesters). It was clear that some 2003 GED passers stopped out between their first semester and a later semester, but they did return. Of the 2003 GED passers who enrolled in multiple semesters, 54.9 percent did not graduate by September 2009. **Table 10** (page 20) displays the postsecondary enrollment statuses for the 2003 cohort of GED passers, by total number of semesters enrolled.

Before drawing any further conclusions about dropout or stopout rates, it is important to know that

TABLE 9

Postsecondary Enrollment of the 2003 Cohort of GED® Test Passers, by Semester (2003–09)

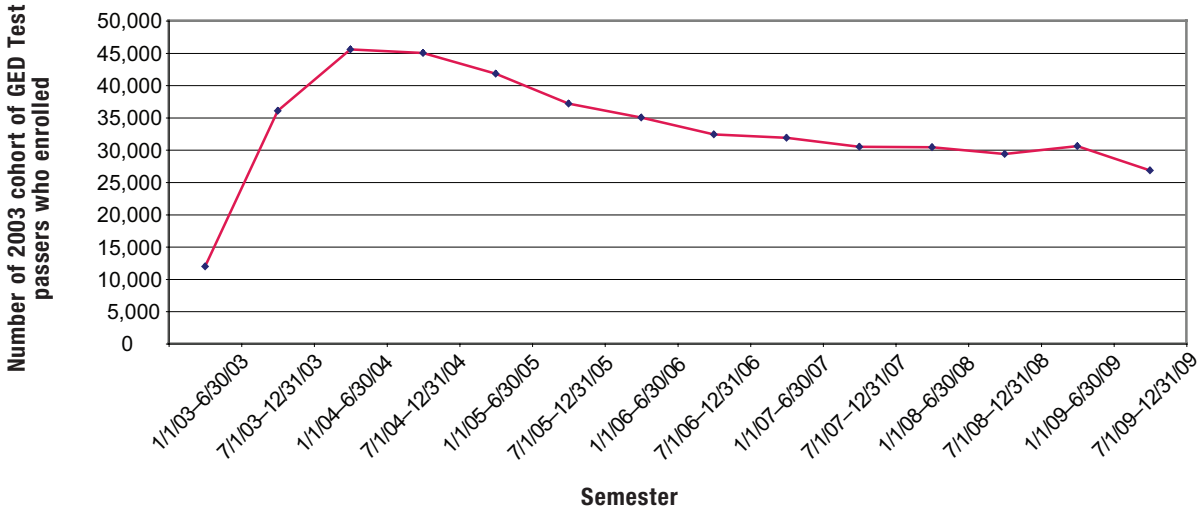
Semester	Semester Number	2003 Cohort of GED Test Passers Enrolled in Semester[1]	
		Number	Percent
1/1/03–6/30/03	1	11,937	8.0
7/1/03–12/31/03	2	36,030	24.2
1/1/04–6/30/04	3	45,547	30.6
7/1/04–12/31/04	4	44,990	30.3
1/1/05–6/30/05	5	41,781	28.1
7/1/05–12/31/05	6	37,151	25.0
1/1/06–6/30/06	7	35,002	23.5
7/1/06–12/31/06	8	32,390	21.8
1/1/07–6/30/07	9	31,861	21.4
7/1/07–12/31/07	10	30,467	20.5
1/1/08–6/30/08	11	30,386	20.4
7/1/08–12/31/08	12	29,362	19.8
1/1/09–6/30/09	13	30,555	20.6
7/1/09–12/31/09	14	26,805	18.0

[1] Percentages do not sum to 100 percent as the 2003 cohort of GED Test passers could be enrolled in multiple semesters.

Note: Because data were collected in September 2009, the semester labeled 7/1/09–12/31/09 is lower than actual enrollment counts.

FIGURE 1

Postsecondary Enrollment of the 2003 Cohort of GED® Test Passers, by Semester (2003–09)



approximately 19 percent of 2003 GED passers enrolled in semesters during 2008 or 2009, either for the first time or as a repeat student. Some of those enrollees were new enrollees, that is, they had waited for five or six years after receiving the credential to enroll. Therefore, not enough time could have passed for them to be considered dropouts, and for those who enrolled in 2009, even their stopout status is questionable. Although this percentage is likely very small, it should be considered in interpretation.

A final analysis focused on persistence patterns for postsecondary graduates and non-completers. We identified a partial[21] list of patterns from frequencies of enrollment by semester for a first glimpse at how 2003 GED passers were enrolling and persisting. We wanted to know if they enrolled consecutively or skipped semesters as they progressed toward a degree, and whether the patterns are different for non-completers compared with graduates. We examined enrollment of 8,455 graduates and 30,487 non-completers, approximately 47.0 percent of multiple-semester enrollees, for identified patterns between three and 13 semesters in length. Semesters were numbered according to the second column of Table 9.

TABLE 10

Postsecondary Enrollment of the 2003 Cohort of GED® Test Passers, by Total Number of Semesters Enrolled (2003–09)

Total Number of Semesters Enrolled	2003 Cohort of GED Test Passers Enrolled	
	Number	Percent
1	45,865	33.4
2	26,669	19.4
3	16,869	12.3
4	12,101	8.8
5	8,720	6.4
6	6,578	4.8
7	5,339	3.9
8	4,394	3.2
9	3,568	2.6
10	2,929	2.1
11	2,152	1.6
12	1,248	0.9
13	667	0.5
14	124	0.1
Total	**137,223**	**100.0**

Note: Missing n=11,426.

The top 10 patterns for graduates (n=2,660, representing 31.5 percent of available patterns for graduates) included consecutive semesters of enrollment. The top-ranked pattern for graduates, for example (see **Figure 2** [page 21]), indicated a 2003 GED passer enrolling in Semester 2 (7/1/03 to 12/31/03) and continuing through Semesters 3, 4, and 5. The second most frequently occurring pattern also began in Semester 2 and continued to Semester 11 (1/1/08 to 6/30/08). The range was three to 13 consecutive semesters, and the modes were either four, eight, or 10 consecutive semesters in length for graduates. All the patterns for graduates started with a semester in 2003 or 2004, as shown in Figure 2.

In the top 10 patterns for non-completers (n=9,939, representing 32.6 percent of available patterns for non-completers), all involved consecutive semesters of enrollment. **Figure 3** (page 21) displays the

[21] Hundreds of patterns were available for analysis, but we focused on the most frequently occurring patterns for a first look.

FIGURE 2

Top 10 Ranked Semester Enrollment Patterns for the 2003 Cohort of GED® Test Passers Who Graduated from a Postsecondary Program (2003–09)

Semester	Semester Number	Pattern Rank										
		1	2	3	4	5	6	7	8	9[1]	9[1]	10
1/1/03–6/30/03	1											
7/1/03–12/31/03	2	E	E	E	E	E	E					
1/1/04–6/30/04	3	E	E	E	E	E	E	E			E	
7/1/04–12/31/04	4	E	E	E	E	E	E	E	E	E	E	E
1/1/05–6/30/05	5	E	E	E	E	E	E	E	E	E	E	E
7/1/05–12/31/05	6		E	E	E	E	E	E	E	E		E
1/1/06–6/30/06	7		E	E	E	E	E	E	E	E		E
7/1/06–12/31/06	8		E	E		E	E		E			E
1/1/07–6/30/07	9		E	E		E	E		E			E
7/1/07–12/31/07	10			E		E	E		E			E
1/1/08–6/30/08	11			E		E	E		E			E
7/1/08–12/31/08	12					E	E		E			
1/1/09–6/30/09	13					E	E		E			
7/1/09–12/31/09	14					E						

E=semester in which a 2003 cohort GED Test passer was enrolled.

[1] Patterns ranked "9" had the same frequency of graduates and were therefore tied.

FIGURE 3

Top 10 Ranked Semester Enrollment Patterns for the 2003 Cohort of GED® Test Passers Who Did Not Complete a Postsecondary Program (2003–09)

Semester	Semester Number	Pattern Rank									
		1	2	3	4	5	6	7	8	9	10
1/1/03–6/30/03	1										E
7/1/03–12/31/03	2		E	E					E		E
1/1/04–6/30/04	3		E	E	E				E		E
7/1/04–12/31/04	4		E	E	E	E		E	E		
1/1/05–6/30/05	5			E	E	E		E	E		
7/1/05–12/31/05	6					E		E	E		
1/1/06–6/30/06	7							E	E		
7/1/06–12/31/06	8										
1/1/07–6/30/07	9										
7/1/07–12/31/07	10						E				
1/1/08–6/30/08	11						E			E	
7/1/08–12/31/08	12	E					E			E	
1/1/09–6/30/09	13	E					E			E	
7/1/09–12/31/09	14	E					E			E	

E=semester in which a 2003 cohort GED Test passer was enrolled.

top 10 patterns for non-completers. The most frequently occurring pattern for non-completers began in Semester 12 (7/1/08 to 12/31/08) and continued through Semesters 13 and 14. The range was three to six consecutive semesters, and the mode was three consecutive semesters for non-completers. Seven of the 10 patterns started during a semester in 2003 or 2004. Even though some non-completers started later or enrolled for shorter lengths, the patterns for non-completers were similar to the patterns of graduates, but generally shorter.

When we compared patterns between graduates and non-completers for the top 10 frequencies, six patterns occurred much more often for graduates than for non-completers: Semesters 2 through 9, 2 through 11, 2 through 13, 2 through 14, 4 through 11, and 4 through 13. These patterns for graduates were at least eight semesters in length, and these graduates tended to start early (in 2003 or 2004).

The only pattern in the top 10 that favored non-completers was for Semesters 3, 4, and 5. This pattern could simply reflect that most students enrolled within the first year after GED testing. We observed that three of the top 10 patterns for non-completers did not begin until 2007 or 2008, which would likely not allow enough time to pass for program completion. This pattern may reflect a realization of GED credential recipients that they need further education in response to the economic downturn, which began approximately during that time. Although the top 10 patterns showed consistent enrollment, an estimated two-thirds of both graduates and non-completers did

TABLE 11

Characteristics of the 2003 Cohort of GED® Test Passers Enrolling in a Single Semester or in Multiple Semesters (2003–09)

Characteristic	2003 Cohort of GED Test Passers Enrolling in a Single Semester	2003 Cohort of GED Test Passers Enrolling in Multiple Semesters
Total 2003 Cohort of GED Test Passers (N=137,223)	N=45,865	N=91,358
Gender (Percent):		
Male	57.8	47.1
Female	42.2	52.9
Age in 2003 (Median)	19.5 years	19.5 years
Ethnic Group (Percent):		
Hispanic	14.4	14.4
African American	17.0	17.0
White	64.0	63.4
American Indian/Alaska Native	2.4	1.8
Asian	1.6	2.9
Native Hawaiian/Pacific Islander	0.6	0.6
Primary Language (Percent):		
English	97.3	95.3
Language Other Than English	2.7	4.5
Took Official GED Practice Test (Percent)	68.2	62.0
Highest Grade Completed (Percent):		
8th Grade (or below)	8.7	7.0
9th Grade	17.3	14.5
10th Grade	29.6	27.8
11th Grade	36.1	38.2
12th Grade	8.3	12.6
Reasons for GED Testing (Percent):		
Enroll in Trade/Technical	18.7	16.3
Enter Two-Year College	29.6	34.8
Enter Four-Year College	22.6	31.4
Skill Certification	7.5	6.3
Get First Job	5.9	5.0
Get Better Job	35.0	31.4
Employer Requirement	7.0	5.7
Public Assistance Requirement	1.5	1.1
Role Model for Family	16.9	15.1
Personal Satisfaction	49.0	44.2
Employment/Student Status at GED Testing (Percent):		
Employed Part-Time	12.8	15.8
Employed Full-Time	23.3	25.7
Unemployed	33.4	29.9
Full-Time Student	11.8	11.2
Part-Time Student	8.6	8.8

Notes: Percentages reflect sample sizes with missing data already excluded.
Missing n for gender=1,426.
Missing n for ethnic group=14,716.
Missing n for primary language=16,370.
Missing n for taking an Official GED Practice Test=14,763.
Missing n for highest grade completed=12,490.

not follow these patterns. We noticed that there are likely hundreds more "unique" patterns that only a handful of students may have followed. Persistence may genuinely be an individual process. Further identification and analysis of patterns must occur before drawing definite conclusions.

Comparing Characteristics of Single-Semester and Multiple-Semester Enrollees

To help clarify the identity and characteristic of these GED credential recipients, we also identified column percentages of demographic characteristics (that is, the percent within each demographic group) for 2003 GED Test passers who enrolled for only one semester compared with those who enrolled for multiple semesters, regardless of completion status, as displayed in **Table 11**. Additionally, as displayed in **Table 12** (page 23), we examined characteristics of the following types of 2003 GED passers who enrolled for:

- A single semester and did not complete their postsecondary program.
- A single semester and did complete.
- Multiple semesters and did not complete.
- Multiple semesters and did complete their postsecondary program.

Persistence for single- and multiple-semester enrollees overall did not vary by age, employment status, primary language status, taking an Official GED Practice Test, most levels of highest grade completed, most reasons for testing, or White, African-American, or Hispanic ethnic groups. In the 2003 cohort of male GED passers (57.8 percent), Native American GED passers (2.4 percent) or those who tested because of a public assistance requirement (1.5 percent) enrolled in single semesters more frequently than in multiple semesters. Female GED passers (52.9 percent) and Asian GED passers (2.9 percent) from the 2003 cohort enrolled more often in multiple semesters. The 2003 cohort of GED passers who tested in a language other than English (4.5 percent), who have completed 12th grade (12.6 percent), or who have a goal of entering a four-year college or university (31.4 percent) also enrolled more frequently in multiple semesters.

TABLE 12

Characteristics of the 2003 Cohort of GED® Test Passers Enrolling in a Single Semester or Multiple Semesters, by Postsecondary Program Completion Status (2003–09)

Characteristic	2003 Cohort of GED Test Passers Enrolling in a Single Semester		2003 Cohort of GED Test Passers Enrolling in Multiple Semesters	
	Without Completing	Completing	Without Completing	Completing
Total 2003 Cohort of GED Test Passers (N=137,233)	N=44,758	N=1,107	N=75,315	N=16,043
Gender (Percent):				
Male	57.8	58.8	47.9	43.2
Female	42.2	41.2	52.1	56.8
Age in 2003 (Median)	19.5 years	22.4 years	19.4 years	20.2 years
Ethnic Group (Percent):				
Hispanic	14.5	10.5	14.7	12.9
African American	17.0	19.4	17.3	15.5
White	64.0	66.4	62.8	65.8
American Indian/Alaska Native	2.4	*	1.9	1.3
Asian	1.6	*	2.6	4.1
Native Hawaiian/Pacific Islander	0.6	*	0.7	0.4
Primary Language (Percent):				
English	97.3	96.2	96.1	92.8
Language Other Than English	2.7	3.8	3.9	7.2
Took Official GED Practice Test (Percent)	68.2	67.6	62.6	59.1
Highest Grade Completed (Percent):				
8th Grade (or below)	8.6	11.6	6.9	7.2
9th Grade	17.3	16.6	15.9	12.9
10th Grade	29.7	27.5	28.2	25.7
11th Grade	36.2	32.0	38.9	34.7
12th Grade	8.2	12.4	11.1	19.6
Reasons for GED Testing (Percent):				
Enroll in Trade/Technical	18.5	26.3	16.0	17.7
Enter Two-Year College	29.8	22.0	34.9	34.0
Enter Four-Year College	22.9	14.3	31.4	31.4
Skill Certification	7.5	9.7	6.3	6.3
Get First Job	5.9	4.2	5.2	4.5
Get Better Job	34.9	39.8	32.0	29.0
Employer Requirement	7.0	7.7	5.9	4.9
Public Assistance Requirement	1.5	*	1.1	1.1
Role Model for Family	16.8	20.7	15.3	13.8
Personal Satisfaction	49.0	51.8	44.9	41.2
Employment/Student Status at GED Testing (Percent):				
Employed Part-Time	12.8	11.4	15.5	17.0
Employed Full-Time	23.3	23.7	25.7	25.6
Unemployed	33.4	27.6	30.8	25.6
Full-Time Student	11.7	16.0	10.5	14.4
Part-Time Student	8.6	8.5	8.7	9.1

* Cell size was too small to allow for a meaningful comparison of percentages.

Notes: Percentages reflect sample sizes with missing data already excluded.

For single-semester completers: Age range was 16 to 63 years. Missing n for gender=465. Missing n for ethnic group=5,049. Missing n for primary language=5,291. Missing n for taking an Official GED Practice Test=5,002. Missing n for highest grade completed=4,170.

For multiple-semester non-completers: Age range was 16 to 100 years. Missing n for gender=1,204. Missing n for ethnic group=12,945. Missing n for primary language=14,130. Missing n for taking an Official GED Practice Test=12,829. Missing n for highest grade completed=10,753.

For multiple-semester completers: Age range was 16 to 99 years. Missing n for gender=663. Missing n for ethnic group=6,598. Missing n for primary language=7,307. Missing n for taking an Official GED Practice Test=6,648. Missing n for highest grade completed=5,685.

Comparing Characteristics of Enrollees by Length of Enrollment and Completion Status

Although these characteristics were informative for GED Test passers as a whole, we questioned whether those who completed had different characteristics from those who did not, and more specifically, at what point—either through further enrollment or through completion—characteristics were likely to change, if at all. Our comparison of in-group characteristics were between those 2003 GED passers who enrolled for a single semester without completing and those who completed their postsecondary program during that single semester or after multiple semesters. Table 12 includes percentages for each demographic group.

Considering completion status, we found no in-group differences by age, ethnic group, primary language, taking an Official GED Practice Test, 10th or 11th grade as highest grade completed, testing for personal satisfaction, or status as a full-time employee or part-time student when taking the GED Test. The 2003 cohort of GED passers in these categories tended to fall under either enrollment status (single semester or multiple semesters) and either completion status (graduate or non-completer).

The 2003 cohort of GED passers in the following groups had higher percentages of single-semester program completers: males, 8th- and 9th-grade completers, those with goals of skill certification or enrollment in trade or technical school, those with a goal of getting a better job, those whose employers required the GED Test, those who tested to become a role model for their families, and those who were full-time students when taking the GED Test.

The most popular programs for the 777 single-semester program completers with GED credentials were: nurse aide (9.7 percent), commercial truck driver (8.4 percent), customer service (8.1 percent), emergency medical technician (4.0 percent), and corrections officer (3.0 percent). Others opted for certificates in short-term programs in occupations such as manufacturing, food service, computer science, welding, and masonry.

We also identified which groups were likely to graduate from multiple-semester postsecondary programs. These groups included females, Asians, 12th-grade completers, and those who were part-time employees during GED testing.

Specific differences we noted include the following:

- The 2003 cohort of GED passers differed by gender in length of enrollment; males tended to enroll in a single semester at a higher rate and females in multiple semesters.
- The percentages of American Indians and Native Hawaiians/Pacific Islanders with GED credentials who did not complete (regardless of enrollment length) were higher than the percentage of multiple-semester graduates for the respective groups.
- In the 2003 cohort, Asian GED passers or those whose primary language was one other than English had higher rates of graduation from multiple-semester programs than non-completers.
- Twelfth-grade completers with GED credentials who enroll for multiple postsecondary semesters graduated at a higher rate than non-completers or single-semester completers.
- 2003 GED passers with a goal of entering trade or technical school, or with a skill certification goal had higher rates for single-semester completion.
- 2003 GED passers with a goal of entering a two-year college had a higher multiple-semester graduation rate than those who completed a single-semester program.
- 2003 GED passers with a goal of entering a four-year college enrolled in multiple semesters and graduated at higher rates than in a single semester.
- Those who took the GED Test to get their first job had higher dropout rates after a single semester than completion rates.
- Part-time employees and full-time students who received a GED credential graduated from multiple-semester programs at a higher rate than single-semester programs.

TRANSFER RATES

Approximately three-fourths (75.4 percent) of 2003 GED Test passers remained in the same postsecondary institution where they initially enrolled. The remaining fourth (24.6 percent) transferred to other institutions. Therefore, we concluded that the transfer rate was 24.6 percent. In future studies, we plan to examine

additional aspects of transfer during a longer period of time (Berkner & Choy, 2008), such as the number and direction of transfers, differences in institutional costs, and institutional type and location.

POSTSECONDARY COMPLETION OF GED TEST PASSERS BY SUBGROUP

In the population of 2003 GED Test passers who entered postsecondary education, 17,597 graduated, for a graduation rate of 11.8 percent. Of these graduates, 17,150 graduated with a first degree,[22] 1,107 (6.5 percent) completed single-semester programs, and 16,043 (93.5 percent) graduated with multiple-semester degrees. We calculated the number of months as the time from the date of first enrollment in postsecondary education to the date the student first graduated (in situations where the student pursued more than one degree). It took graduates an average of two years and nine months (standard deviation=18.9 months) to complete a degree program. Some 2003 GED passers who graduated took up to seven years to complete a degree program.

Table 13 shows the types of degrees that the 2003 cohort of GED passers earned. Approximately half (47.5 percent) of all degrees were associate degrees. Approximately one-fourth of degrees were certificates (26.0 percent) or bachelor's degrees (25.4 percent). An additional 106 passers earned an advanced degree beyond a bachelor's degree, including two doctorates and one honorary degree.

Gender

In the sample of 2003 GED Test passers who entered postsecondary education, more females (n=9,374) than males (n=7,374) graduated. As for the entire sample of graduates, we calculated the number of months as the time from the date of first enrollment in postsecondary education to the date the student first graduated. In general, the completion rates of males and females were similar. It took male graduates an average of two years and six months (standard deviation=19.8 months) to complete a degree program. On average, female graduates took two years and nine months (standard deviation=18.5 months). Some female 2003 GED passers who graduated took up to seven years to complete a degree program, but the maximum for males was six years and seven months.

Table 14 shows the types of degrees earned by male and female 2003 GED passers who graduated. The most frequent degree category for both genders was associate degree. Although the numbers were comparatively small, male 2003 GED passers earned more than twice as many advanced degrees as females.

Primary Language

In the sample of 2003 GED Test passers who entered postsecondary education, more English-language students (n=13,693) than other-language students (n=1,025) graduated. It took English-language graduates an average of two years and nine months (standard deviation=19.1 months) to complete a degree program. On average, other-language graduates took three years (standard deviation=17.6 months). Some English-language GED passers from the 2003 cohort who graduated took up to seven years to complete a degree program, but the maximum for other-language GED passers was six years and five months. In general, the completion rate for both language types is similar.

TABLE 13

Postsecondary Degree Titles of the 2003 Cohort of GED® Test Passers Who Graduated

Degree Title	2003 Cohort of GED Test Passers Who Graduated With Degree	
	Number	Percent
Certificate	2,480	26.0
Associate	4,535	47.5
Bachelor	2,429	25.4
Master	103	1.1
Total	**9,547**	**100.0**

Note: Missing n for degree type=8,047.

TABLE 14

Postsecondary Degree Titles of the 2003 Cohort of GED® Test Passers Who Graduated, by Gender

Degree Title	Gender of the 2003 Cohort of GED Test Passers Who Graduated With Degree	
	Male (%)	Female (%)
Certificate	28.4	24.1
Associate	41.3	52.4
Bachelor	28.6	22.9
Master	1.6	0.7
Total	**100.0**	**100.0**

Note: Missing n for degree type=8,158.

[22] Some graduates earned more than one certificate or degree.

TABLE 15

Postsecondary Degree Titles of the 2003 Cohort of GED® Test Passers Who Graduated, by Primary Language

Degree Title	Primary Language of the 2003 Cohort of GED Test Passers Who Graduated With Degree	
	English (%)	Language Other Than English (%)
Certificate	28.0	16.6
Associate	45.2	57.1
Bachelor	25.6	25.3
Master	1.1	*
Total	**100.0**	**100.0**

* Number too small for meaningful comparison.

Note: Missing n for degree type=9,268.

Table 15 shows the types of degrees earned by both language types. The most frequent degree category for both types was associate degree. English-language students more frequently earned postsecondary certificates than other-language students. Both language types earned the same percentage of bachelor's degrees.

Employment Status at GED Testing

In the sample of 2003 GED Test passers who entered postsecondary education, fewer part-time employed students (n=2,829) graduated than full-time employed (n=4,353) or unemployed students (n=4,358). It took part-time employed 2003 GED passers who graduated an average of two years and 11 months (standard deviation=18.9 months) to complete a degree program. On average, full-time employed 2003 GED passers took two years and nine months (standard deviation=18.7 months) to complete a degree. Unemployed GED passers from 2003 took two years and seven months (standard deviation=18.7) on average to complete a degree program. In general, the completion rate of all three groups is similar.

Table 16 shows the types of degrees by employment status. The most frequent degree category for all three groups was associate degree. Unemployed 2003 GED passers who graduated tended to earn a certificate more than employed passers, and full-time employed passers tended to earn a certificate more than part-time employed passers. Part-time employed passers more frequently earned a bachelor's degree than unemployed 2003 GED passers.

TABLE 16

Postsecondary Degree Titles of the 2003 Cohort of GED® Test Passers Who Graduated, by Employment Status at GED® Testing

Degree Title	Employment Status at GED Testing of 2003 Cohort of GED Test Passers Who Graduated With Degree		
	Employed Part-Time (%)	Employed Full-Time (%)	Unemployed (%)
Certificate	18.3	24.3	33.0
Associate	50.9	51.1	45.3
Bachelor	30.1	23.3	20.4
Master	*	1.3	*
Total	**100.0**	**100.0**	**100.0**

* Number too small for meaningful comparison.

Notes: Missing n for degree type=8,047.

Postsecondary Enrollment and Completion of GED Test Passers: A Summary by Subgroup

To summarize information presented about the three relevant subgroups, we constructed a table of the major features: mean GED Test standard scores, postsecondary enrollment rate, and average months to completion. The purpose of **Table 17** is to allow the interested reader to consider similarities and differences for all three subgroups.

MAJORS OF GRADUATES

Next we looked at postsecondary majors of 2003 GED Test passers. Majors were available only for those who had completed their postsecondary program. We categorized majors according to the *Occupational Outlook Handbook: 2010–2011,* published by the Bureau of Labor Statistics (2009),

TABLE 17

Standard Scores, Postsecondary Enrollment Rates, and Months to Degree of the 2003 Cohort of GED® Test Passers Who Graduated, by Subgroup

Subgroup	GED Test Standard Score	Enrollment Rate	Months to Degree
	Mean	Percent	Mean
All 2003 Cohort of GED Test Passers	541	42.9	33
Gender:			
Male	545	37.8	30
Female	538	50.1	33
Primary Language:			
English	544	42.5	33
Language Other Than English	515	48.0	36
Employment Status at GED Testing:			
Employed Part-Time	547	50.6	35
Employed Full-Time	546	43.1	33
Unemployed	540	42.5	34

TABLE 18

Most Common Postsecondary Majors of the 2003 Cohort of GED® Test Passers Who Graduated, by Occupational Category

Occupational Category (Total Number in Category)	Major	2003 Cohort of GED Test Passers who Graduated in the Major (Number)
Professional and Related Occupations (3,889)	Nursing	686
	General Studies	520
	Liberal Arts/Liberal Studies	415
	Emergency Medical Technician	342
	Arts	226
	Education	199
	Psychology	195
	English	95
	Biology	91
	Political Science	69
	Social Sciences	59
	Human Services	54
	Phlebotomy	51
Service Occupations (1,326)	Nurse Assistant/Aide	452
	Criminal Justice/Law Enforcement	308
	Cosmetology	179
	Medical Assistant	82
	Health Care/Patient Care Assistant	62
	Dental Assistant	51
Management and Business and Financial Occupations (816)	Business Administration	257
	Accounting	195
	Management	100
	Computer Information Systems	88
	Business	79
	Finance	50
Transportation and Material Moving Occupations (132)	Commercial Truck Driving	112

including majors with a frequency of at least four graduates. The resulting sample of 7,065 represents 58.3 percent of reported majors. **Table 18** displays the most common postsecondary majors of graduates according to the *Occupational Outlook Handbook* categories.

The majors most often chosen were in the categories of professional occupations, service occupations, or management and business. The single most popular major was nursing (686 graduates, or 9.7 percent of graduates with reported majors); other popular majors included nurse assistant/aide, criminal justice/law enforcement, emergency medical technician, and business administration. In addition to the categories presented in Table 18, some 2003 GED passers graduated from postsecondary programs in sales (n=18), construction trades (n=143), and agriculture (n=30). Further analysis of majors is planned for future studies.

DISCUSSION

- Approximately two-thirds of 2003 GED Test passers (66.6 percent) who enrolled maintained enrollment for two or more semesters; of those who enrolled in multiple semesters, 54.9 percent had not yet completed their programs by September 2009.
- Enrollment remained steady at approximately 30,000 from the 2006 fall semester through 2009.
- Approximately half of GED passers who enrolled returned for a second semester; the first- to second-semester retention rate for 2003 GED passers was 50.4 percent; we noticed that there are likely hundreds of "unique" persistence patterns that only a handful of students may have followed, and we believe persistence may genuinely be an individualized process.
- 32.6 percent dropped out after the first semester, and the transfer rate was 24.6 percent; some 2003 GED passers already stopped out between their first semester and a later semester, but they did return.

Although 2003 GED passers enrolled in two semesters on average, frequently at a public community college or technical college and most as full-time or half-time students, approximately half continued past the first semester. These findings run counter to previous research that indicates that few enrollees complete the first year of postsecondary education (CAAL, 2008; Duke & Ganzglass, 2007; Murnane,

Willett, & Tyler, 2000; Patterson, Song, & Zhang, 2009; Reder, 1999; Tyler, 2005), which is viewed as the "tipping point" for earning wages that could support a family (Harris & Ganzglass, 2008, p. 6). The first semester seems to be critical for a GED credential recipient's postsecondary education experience. We do not know what barriers lead nearly one-third of 2003 GED passers to drop out after the first semester, or affect a sizable percentage who stop out and return for a later second semester. These barriers may include: a perception that college is too difficult or not for everyone (Behal, 1983), a lack of skills to succeed in college (Reder, 2007), first-generation college student status (Reder, 2007), or strong negative life experiences that interfere with persistence or prevent completion (Tyler & Lofstrum, 2008).

Costs of a postsecondary education or competing time demands also could be barriers. Courses to acquire remedial skills could discourage the GED passer and quickly consume any available funding. Enrollees with GED credentials may not be referred to courses with integrated, contextualized curricula and may begin to feel they are not progressing quickly enough.

Whatever the barriers, the findings that more than half who enroll in multiple semesters had not completed as of 2009, along with the low graduation rate, affirm recent research that suggests few GED credential recipients complete a degree program (CAAL, 2008; Duke & Ganzglass, 2007; Murnane, Willett, & Tyler, 2000; Reder, 1999; Tyler, 2005), or, perhaps, they simply have yet to complete a program. The finding that GED credential recipients who stopped out often returned speaks to their resilience. The presence of so many unique patterns of enrollment also made us reflect on the role of mentoring—whether in the family, community, college, or workplace—and the likely need for supports. What supports do GED credential recipients need to get past barriers that lead to stopping out, or even dropping out? Further research is needed to understand barriers and identify workarounds at the critical times when they present themselves.

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- It appears that the 2003 cohort of GED passers take their time to work on postsecondary programs; sizable percentages of students who stop out[23] indicate that GED credential recipients may continue postsecondary work, perhaps at a less consistent pace than a traditional postsecondary student[24] or other adult learners, and for a longer period of time.

GED credential recipients aspiring to further their education may not maintain a steady enrollment. Although 2003 GED passers overall tended to enter postsecondary education within three years of passing the GED Test (as noted in Chapter 2), many take their time to progress in their postsecondary programs. Candidates who did graduate took an average of nearly three years to do so, even for programs that were ordinarily two years or less in duration, and some took up to seven years. These first-year findings indicate that allowing enough time to pass before expecting postsecondary outcomes remains critical (Boudett, Murnane, & Willett, 2000; Reder, 2007; Tyler & Lofstrum, 2008).

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- Single-semester enrollees tended to be male (57.8 percent); multiple-semester enrollees tended to be female (52.9 percent).

- 2003 GED passers differed by gender in length of enrollment; males tended to enroll more frequently in a single semester and females tended to enroll in multiple semesters at higher rates.

More frequent enrollment of women GED credential recipients in multiple-semester postsecondary education is in line with general postsecondary enrollment trends (Georges, 2001; King, 2010). Women with low incomes who earn GED credentials may see further education as an investment leading to "higher growth in income and hence a lower poverty rate," as Georges (2001, p. 58) suggested. We also further examined gender differences in our survival analyses (see Chapter 4).

[23] *Stop out* is a term used to define a student who leaves school for a period of time and later returns. *Drop out* is a term used to define a student who leaves school and does not return during the time of the study.

[24] We define a *traditional postsecondary student* as a young adult who has just recently graduated from high school and enrolls in a postsecondary program continuously through graduation.

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- With length of enrollment and completion status taken into account, we found no in-group differences by age, white or African-American ethnic group, English as primary language, taking an Official GED Practice Test, 10th or 11th grade as highest grade completed, testing for personal satisfaction, or status of full-time employee or part-time student when taking the GED Test; 2003 GED passers in these categories tended to be in either enrollment status and either completion status.

It is promising that those with GED credentials entered postsecondary education at similar rates, regardless of age, most ethnic backgrounds, employment status, and other demographic characteristics. Our findings on ethnic background align with Reder's (2007) suggestion that the GED credential "may function as a gateway, especially for minority populations" (p. 8). Promising evidence for the success of The GED Initiative indicates that prospective postsecondary students with GED credentials with diverse backgrounds are likely to enroll in postsecondary education.

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- The 2003 cohort of GED passers differed by gender in length of enrollment: Males tended to enroll more frequently in and complete a single semester, and females tended to enroll in multiple semesters and graduate at higher rates.

Similar to enrollment, the more frequent graduation of women from postsecondary education may reflect general postsecondary enrollment trends (King, 2010; Planty, et al., 2009). One potential reason could be economic (Georges, 2001; King, 2010): Earning low wages with only a secondary education might "create a special incentive for women who might not otherwise attend college out of choice or because of special concerns about academic preparation or finances" (King, 2010, p. 20). Other reasons could reflect secondary education systems or social expectations that influence men and women differently; the reasons for the gender gap are complex (King, 2010).

The higher rate of males completing single-semester programs may reflect greater caution of or time pressure on male GED passers (Behal, 1983). It may not be coincidence that single-semester–program completers included not only males but also those with short-term postsecondary goals, those whose employers required the GED credential, or those who wanted a better job. Completing programs for occupations such as commercial truck driver, corrections officer, or emergency medical technician in a single semester may meet all or some of these goals. Although we cannot assume that these characteristics are necessarily related, further research on the characteristics of males who complete single-semester programs—including age, employment status, and majors—would be valuable. More information regarding passers who complete programs that last only a single semester also could inform plans for accelerated learning as preparation, recruitment efforts of those who "earn while they learn," and anticipating re-entry points for those who pursue further education later on.

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- Those whose primary language is one other than English tended to graduate from multiple-semester programs more frequently compared with single- and multiple-semester non-completers.

Postsecondary students whose primary language is one other than English had higher rates of persistence. Their persistence to postsecondary graduation is encouraging, particularly if they persisted not only through English-language programs but also through GED preparation (Comings, Parrella, & Soricone, 1999). Further qualitative research on this subgroup would benefit staff at institutions in which they enroll.

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- Part-time employees and full-time students who received a GED credential were more likely to become multiple-semester graduates than to drop out after a single semester or complete a single-semester program.

- Unemployed 2003 GED passers who graduated were more likely to earn a certificate than employed passers, and full-time employed passers were more likely to earn a certificate than part-time employed GED passers; part-time employed passers more frequently earned a bachelor's degree than unemployed 2003 GED passers.

Employment-related findings also are worth noting: The 2003 cohort of GED passers who worked part time while testing tended to graduate from multiple-semester programs more frequently. It is possible that GED passers with part-time positions recognized

the need to enhance their skills for the long term, particularly to meet the demands of future full-time employment. Yet 2003 GED passers who reported testing for a better job tended to not view postsecondary education as a means to get there.

★ ★ ★

- We also identified which groups were more likely to graduate from multiple-semester postsecondary programs: females, Asians, 12th-grade completers, or part-time employees when GED testing.

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- Twelfth-grade completers with GED credentials most frequently graduated after enrolling for multiple postsecondary semesters and least frequently dropped out after a single semester.

It was not surprising that 12th-grade completers with GED credentials would enroll for multiple semesters and complete postsecondary programs. We surmised that the 12th-grade completers could be home schoolers, high school completers with learning or other disabilities who wanted to demonstrate basic skills, or traditional 12th graders who have sufficient credits but do not meet other district or state requirements. Twelfth-grade completers in these groups may be likely to follow postsecondary enrollment and completion patterns similar to traditional high school diploma holders.

★ ★ ★

- 2003 GED passers in the following groups had higher percentages of single-semester program completers: males, 8th- and 9th-grade completers, those with goals of skill certification or enrollment in trade or technical school, those with a goal of getting a better job, those whose employers required the GED Test, those who tested to become a role model for their families, or those who were full-time students when GED testing.

- 2003 GED passers with a goal of entering trade or technical school, or with a skill-certification goal, most frequently became single-semester completers.

- 2003 GED passers with a goal of entering a two-year college were more likely to enroll for multiple semesters and graduate than complete a single-semester program; those with this goal who enrolled for only a single semester were more likely to drop out than complete a single-semester program.

- 2003 GED passers with a goal of entering a four-year college became multiple-semester graduates more frequently than single-semester completers.

It was unexpected that those who had completed eighth grade (or below) would be more likely to complete single-semester programs. Did these GED credential recipients with relatively little formal education represent older adults who persisted in certificate programs for their own sake or for the sake of their children or grandchildren? Or were they immigrants with little previous opportunity for education in their home country but who persisted not only through English-language programs but also through GED preparation (Comings, Parrella, & Soricone, 1999)? What types of intergenerational outreach and postsecondary programs would appeal to this group and support their success?

It may not seem surprising that GED credential recipients with specific educational aspirations would tend to reach them, but doing so is by no means a given. It is unclear whether employers who require the GED Test would also encourage further education. It is useful to know that those with a reported goal to enter trade or technical school, or to gain skill certification, tend to become single-semester completers, or that those with reported two-year or four-year college goals would graduate from multiple-semester postsecondary programs more frequently. Further research would help us better understand the characteristics of those who realize their educational goals. We further examine educational reasons for testing in Chapter 4.

★ ★ ★

- We found that 11.8 percent of 2003 GED passers who enrolled in postsecondary programs later graduated.

- In the population of 2003 GED passers who graduated from postsecondary education, the single most popular major was nursing (n=686, or 9.7 percent of graduates with reported majors); other popular programs included nurse assistant/aid, criminal justice/law enforcement, emergency medical technician, and business administration.

The most frequently occurring patterns for graduates showed that they started early (within 2003 or 2004) and enrolled for at least eight consecutive semesters, which may reflect the momentum of having prepared for the GED Test or the efforts of transition programs. However, a very high percentage of

postsecondary enrollees did not graduate, or at least had yet to do so.

Some GED credential recipients may stop at various points along the educational pipeline—perhaps just short of it, in the first leg, or even close to the end. Although 42.9 percent of 2003 GED passers chose to pursue further education, 57.1 percent did not choose to enter the pipeline at all. What features of postsecondary education might either attract or repel GED credential recipients, and how could local communities use this knowledge to recruit additional GED credential recipients to postsecondary programs (Behal, 1983)? The loss of nearly one-third of enrollees after a single semester—in the first leg—presents many questions, such as why they left, what supports might have made a difference, and what triggers would bring them back, perhaps at a later point in life. We also need to know even more about the circumstances leading to the very low graduation rate.[25] These findings remind us that much work remains to be done to fill the postsecondary pipeline (CAEL, 2008; Reder, 2007).

Chapter Summary

A key finding from this chapter was that approximately two-thirds of 2003 GED Test passers who enrolled maintained enrollment for two or more semesters. We also found hundreds of persistence patterns that a small number of postsecondary enrollees may have followed. GED credential recipients may continue postsecondary work, perhaps at a less consistent pace than a traditional postsecondary student[26] or other adult learners, and for a longer period of time. They may stop out between their first semester and a later semester, but they tend to return.

It is also promising that those with GED credentials entered postsecondary education at similar rates, regardless of multiple demographic characteristics. The 2003 cohort of GED passers differed by gender in length of enrollment: males tended to enroll more frequently in a single semester and females tended to enroll in multiple semesters at higher rates. Postsecondary students whose primary language was one other than English had higher rates of persistence in multiple-semester programs. It is useful to know that those with reported two-year or four-year college goals would graduate from multiple-semester postsecondary programs more frequently.

Similar to enrollment, more frequent graduation rates for women from postsecondary education may reflect general postsecondary enrollment trends. It may not be coincidence that single-semester program completers included not only males but also those with short-term postsecondary goals, those whose employers required the GED credential, or those who wanted a better job. Completing programs for occupations such as commercial truck driver, corrections officer, or emergency medical technician in a single semester may meet all or some of these goals.

A final key finding is that only 11.8 percent of 2003 GED passers who enrolled in postsecondary programs later graduated. The most frequently occurring patterns for graduates showed that they started early (in 2003 or 2004) and enrolled for at least eight consecutive semesters, which may reflect the momentum of having prepared for the GED Test or the efforts of transition programs. However, a very high percentage of postsecondary enrollees did not graduate, or at least have yet to do so.

We also need to know even more about the circumstances leading to the very low graduation rate. Another example of the difference between the pilot sample and the population was that the graduation rate of GED passers, though still very low, was higher in the 2003 population than in the sample. We plan to continue to follow up with the 2003 cohort of GED passers to monitor changes with the passage of additional time.

Next, we determine event occurrence of enrollment (Chapter 4) and identify postsecondary institutions that serve GED credential recipients and the characteristics of those institutions (Chapter 5). We also model event occurrence of graduation (Chapter 4). We compare the postsecondary enrollment and outcomes of GED credential recipients with those of traditional high school graduates (Chapter 6).

[25] Although graduation data were reported more fully in 2009 than in the 2008 pilot, National Student Clearinghouse data indicated that graduation may be underreported by some postsecondary institutions. Our analyses noted that 593 postsecondary institutions from the 2003 GED passer match reported no graduates. However, nearly three-fourths of the 593 institutions had very small GED passer enrollment (10 students or fewer), so a lack of graduates might be expected. Only 59 institutions had more than 50 GED passers as students (a number at which we could reasonably expect at least some graduates) yet reported no graduates. Therefore, we concluded that any underreporting of graduation was likely random and limited in scope.

[26] We define a *traditional postsecondary student* as a young adult who has just recently graduated from high school and enrolls in a postsecondary program continuously through graduation.

Survival Analyses

METHODS

Survival analysis is an often-used method to describe whether events occur or when events occur. Initially, survival analysis was primarily used in medical studies to examine survival times of patients. However, during the last 20 years, the methodology has been applied to educational research in a variety of contexts, such as teachers' retention time (Singer & Willett, 1993) and college students' graduation rate over time (Murtaugh, Burns, & Schuster, 1999).

There are three methodological features for data eligible for survival analysis: "(1) target event—whose occurrence is being studied, (2) beginning of time—an initial starting point when no one under study has yet experienced the target event, and (3) metric for clocking time—a meaningful scale in which event occurrence is recorded" (Singer & Willet, 2003, p. 310). The most common feature for survival analysis data is censoring. A censored observation is defined as an observation with an unknown event time because some individuals will never experience the target event, and others will experience the event, but not during the study's data collection. However, those censored observations are still as important as observed data. Employing logistic regression, which is not designed to rely on time points, would not make those censored data useful. Survival analysis takes advantage of those censored data as well as the uncensored data to identify relationships between survival probability and independent variables of interest.

This chapter presents survival analyses results to answer our research questions regarding the event occurrence of the 2003 cohort of GED Test passers' enrollment in postsecondary education and the event occurrence of the 2003 cohort of GED passers' graduation after enrolling in postsecondary education. There were three steps for survival analyses: (1) mapping our data to survival analyses schemas, (2) estimating the distribution of the survival times for one predictor variable at a time to determine whether two or more samples may have arisen from identical survivor functions, and (3) building multivariate models to investigate the association between event occurrence and independent predictor variables.

First, we described how our data fit into the three methodological features of survival analysis. Second, we estimated the distribution of survival times and compared survival curves based on different subgroups, such as gender, ethnicity, age, and overall GED Test score. This stage was called univariate analysis, which investigated one predictor variable at a time. Finally, we employed the Cox proportional hazards regression models (Cox, 1972) for multiple-variable analyses (examining more than one predictor at a time). Two sets of equivalent survival analyses were conducted to study the event occurrence of college enrollment and college graduation for the 2003 cohort of GED passers.

Event Occurrence of GED Test Passers' Enrollment in Postsecondary Education

The target event in our first set of analyses was whether 2003 GED Test passers enrolled in postsecondary education programs. The starting time was the date GED Test candidates from the 2003 cohort passed the GED Test. The time scale used to record the occurrence of enrollment was months. The total length of our investigated time for this study was 80 months, from January 2003 to September 2009. If a 2003 GED passer enrolled in a postsecondary education program during the observed time period, the event time was the date he or she enrolled in the program. Some GED candidates enrolled in postsecondary education programs before they passed the GED Test. The purpose of the study was to model the occurrence of enrollment after passing the GED Test. Therefore, those candidates who enrolled before passing the GED Test were not included in our analyses. All other 2003 GED passers were censored in September 2009, which was the cutoff date for data collection.

For survival analyses, the total number of 2003 GED passers was 327,993,[27] which represents 94.6 percent

[27] For survival analyses, the calculation of GED passers enrolling in postsecondary education included GED passers who enrolled in postsecondary education in the same month they tested or later. The count included GED passers with an enrollment date and an enrollment status of full time, half time, or less than half time. The count does not include non-passers or a small number of GED passers who had withdrawn or were deceased.

of all 2003 GED passers in the dataset, as described in Chapter 1. During the investigation period, 40 percent (132,119) of them enrolled in postsecondary education programs, and the censored observations accounted for 60 percent of the data.

Estimates of Survivor Function

The survivor function is used to describe the "probability that individual i will survive past time period t" (Singer & Willett, 2003, p. 472), that is

$$S(t_{it}) = \Pr(T_i > t),$$

where $S(t_{it})$ denotes the survivor function and T is the randomly selected time unit t. In our case, "survival" implies that an individual GED Test passer i will *not* enroll in a postsecondary education program by the end of month t.

Three functions are closely related to survivor function: the hazard function, the cumulative distribution function, and the probability density function. For the purpose of this part of the study (the event of enrollment occurrence), we defined $f(t)$ as the enrollment probability density function and $F(t)$ as the cumulative enrollment density function, which is $1-S(t)$. The GED passer enrollment hazard function is $H(t) = f(t)/S(t)$, defined in our context as instantaneous enrollment rate, a measure of the likelihood of a GED passer enrolling in a postsecondary education program at time t. Again, the GED passer survivor function is $S(t) = 1-F(t)$, the probability of a GED passer still not enrolling in a postsecondary education program.

We were interested in investigating enrollment probabilities of subgroups of 2003 GED passers categorized by gender, ethnicity, age group, GED Test score group, and their reasons for testing, in addition to the enrollment probabilities of 2003 GED passers overall. Gender was categorized as male and female, and ethnicity as white and non-white. Age was divided into three groups: 16 to 24 years old, 25 to 34 years old, and 35 years and older. Overall GED Test standard scores were classified into three quartile groups: lower quartile, both middle quartiles, and upper quartile. GED passers' reasons for testing were goals to enter either a two-year or a four-year college.[28]

Therefore, univariate analyses were employed to address our research questions. The Kaplan-Meier method (Kaplan and Meier, 1958) was used to provide a non-parametric estimate of non-enrollment probability over time, with appropriate adjustment for students censored at study closure. The log-rank test (Peto & Peto, 1972) was used to test for significant differences in non-enrollment probabilities among predictor categories. Because of the size of the probabilities, our data were reported to three decimal places instead of a single decimal place as in other chapters.

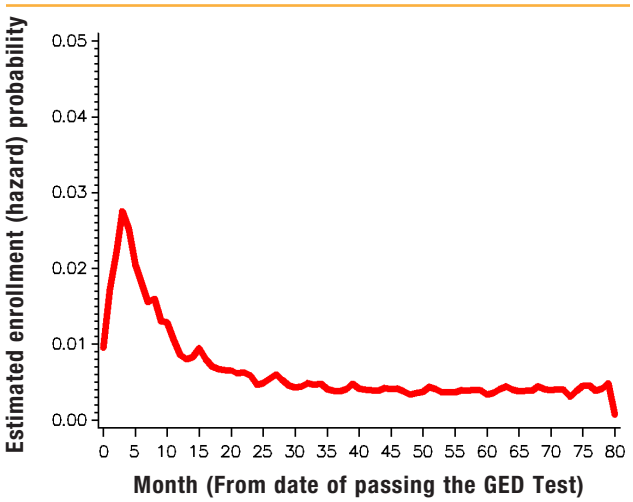
POSTSECONDARY ENROLLMENT: RESULTS OF UNIVARIATE ANALYSES

Hazard and Survivor Functions

Figure 4 shows the estimated enrollment (hazard) probabilities over time for the entire GED Test passer cohort from 2003 (N=327,993). *Month 0* refers to 2003 GED passers enrolled in a postsecondary education program in the same month after passing the GED Test. As shown from the hazard curve, the estimated enrollment function peaked in the first five months after passing the GED Test and declined thereafter. After the 10th month since passing the GED Test, the probability of entering a postsecondary education program was approximately the same for all time periods. At the end of our study period

FIGURE 4

Hazard Curve for the 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education (2003–09)



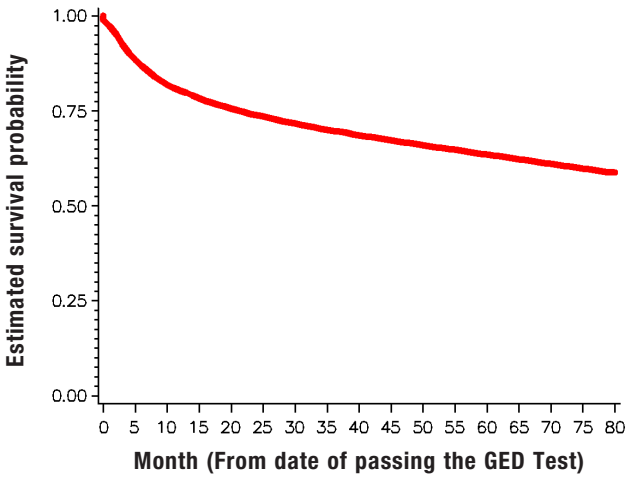
[28] Reasons for testing were not mutually exclusive; GED candidates could indicate either reason or both.

(80 months), there was a big drop of the curve, which was attributed to the large size of censored data. In summary, the overall postsecondary enrollment rate for 2003 GED passers was 41.2 percent, as summed through the cumulative density function. As we saw in Figure 1 (in Chapter 2), 2003 GED passers were more likely to make a transition to postsecondary education shortly after they passed the GED Test. Over time, if they continued to wait after passing the GED Test, the probability of enrolling in a postsecondary education program declined.

Figure 5 shows a Kaplan-Meier curve of estimated survivor function, which indicates the likelihood of the 2003 cohort of GED passers not enrolling in postsecondary education programs. As was apparent in Figure 4, the survivor function curve displayed a monotonically decreasing function of time. At the starting time, it took on the value of 1.00. Over time, as enrollment occurred, the curve dropped toward 0.00. Because of censoring, and because some 2003 GED passers may never make the transition to postsecondary education no matter how long data collection lasts, the value would never show 0.00. The value of the survivor function at the "end of time (80 months)" estimated the proportion of the population that would not enroll in postsecondary education past September 2009. By the end of 80 months and beyond, the survivor probability was 58.8 percent, which indicated that 58.8 percent GED recipients would not enroll in the postsecondary education system.

FIGURE 5

Survival Curve for the 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education (2003–09)



Figures of survivor and hazard curves illustrate an advantage of survival analyses over some other methods. Unlike logistic regression and other techniques based on only whether the event happens, survival analyses make use of the timing of events and when the event is happening. In our analyses, the Kaplan-Meier curve and the estimated hazard function curve provided a detailed look at the dynamics of enrollment and non-enrollment through time.

Table 19 presents the estimated probabilities of non-enrollment (survival), enrollment (hazard), and cumulative enrollment over time. As shown in the

TABLE 19

Estimated Survival, Hazard, and Cumulative Distribution Function of the 2003 Cohort of GED® Test Passers' Enrollment (Aggregated Time Periods)

Month	Enrolled (Number)	Not Enrolled (Number)	Survival Probability	Hazard Probability	Cumulative Distribution Function (CDF)
0	0	331,732	1	.	.
0*	3,158	328,574	0.991	0.010	0.009
6	43,733	287,999	0.868	0.018	0.132
12	65,108	266,624	0.804	0.009	0.196
18	77,532	254,200	0.766	0.007	0.234
24	86,546	245,186	0.739	0.005	0.261
30	93,924	237,808	0.717	0.004	0.283
36	100,199	231,533	0.698	0.004	0.302
42	105,830	225,902	0.681	0.004	0.319
48	111,043	220,689	0.665	0.003	0.335
54	116,051	215,681	0.650	0.004	0.350
60	120,897	210,835	0.636	0.003	0.364
66	125,826	205,906	0.621	0.004	0.379
72	130,589	168,691	0.606	0.004	0.394
78	133,252	68,468	0.591	0.004	0.409
80	133,510	29,837	0.588	0.001	0.412

* The second row with month 0 includes the 2003 cohort of GED Test passers who enrolled the same month they passed the GED Test.

. No event occurrence as it is the observation starting time.

FIGURE 6

Hazard Curve for the Male and Female 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education (2003–09)

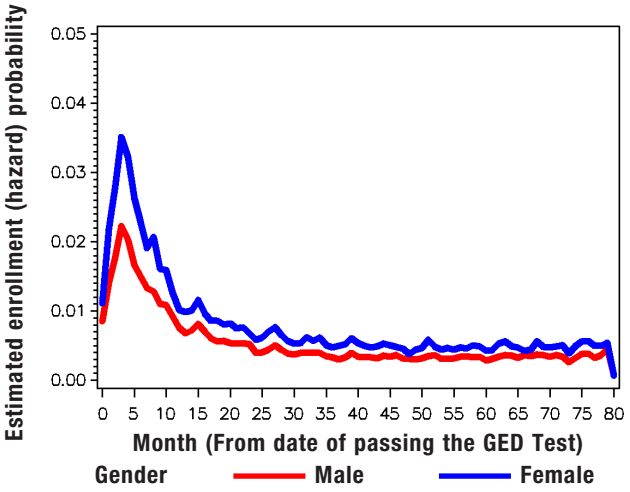
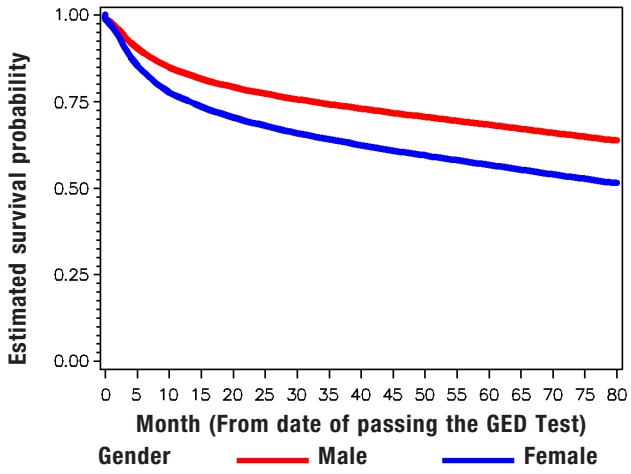


FIGURE 7

Survival Curve for the Male and Female 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education (2003–09)



table, the value of survivor probability decreases over time, which corresponds to the Kaplan-Meier hazard curve and survivor function curve above.

Postsecondary Enrollment: Hazard and Survivor Functions by Subgroup

We were interested in investigating how probabilities of enrollment differ among groups based on 2003 GED Test passers' demographic characteristics (gender, ethnicity, and age group), academic achievement on the GED Test overall (lower 25 percent, middle 25 to 50 percent, and upper 75 percent of standard scores), and their reasons for testing (goal to enter a two-year college or a four-year college). All predictors showed statistically significant associations with enrollment. Because p-values are strongly influenced by sample size, the large number of 2003 GED passers in our study indicated that even weak associations may be judged as statistically significant yet are not practically significant. Therefore, as in Chapter 2, we needed to estimate the magnitude of the differences between survivor and hazard estimates presented in the tables and figures.

Gender

Overall, there were statistically and practically significant differences of enrollment rates between male and female 2003 GED Test passers over time: The cumulative enrollment rate was 36 percent for males and 48 percent for females.

As shown in **Figure 6**, the shape of the estimated enrollment (hazard) curve for males and females was similar. Peaks for both groups were during the third month after they passed the GED Test. After 10 to 15 months, the enrollment probability stayed nearly the same. The hazard function for females was consistently higher than for males. The biggest gap in enrollment rate between males and females occurred during the third month after passing the GED Test; the hazard probability was 0.035 for female 2003 GED passers and 0.022 for male 2003 GED passers. Starting from the 15th month, the relative magnitude of the differential in enrollment (hazard) between males and females was consistent and small over time.

The survivor probability curve, as displayed in **Figure 7**, showed that the estimated non-enrollment rate was 64 percent for males and 52 percent for females. Male GED passers had a significantly higher overall probability of not enrolling in postsecondary education than did females.

Table 20 (page 36) displays the number of male and female 2003 GED passers who enroll and did not enroll in postsecondary education programs at every six-month time period, as well as survivor, hazard, and cumulative distribution functions.

TABLE 20

Estimated Survival, Hazard, and Cumulative Distribution Function of the 2003 Cohort of GED® Test Passers' Enrollment (Aggregated Time Periods), by Gender

Gender	Month	Enrolled (Number)	Not Enrolled (Number)	Survival Probability	Hazard Probability	Cumulative Distribution Function (CDF)
Male	0	0	192,112	1	.	.
	0*	1,631	190,481	0.992	0.008	0.008
	6	20,966	171,146	0.891	0.015	0.109
	12	31,791	160,321	0.835	0.008	0.166
	18	38,215	153,897	0.801	0.006	0.199
	24	42,910	149,202	0.777	0.004	0.223
	30	46,673	145,439	0.757	0.004	0.243
	36	49,940	142,172	0.740	0.003	0.260
	42	52,816	139,296	0.725	0.003	0.275
	48	55,597	136,515	0.711	0.003	0.289
	54	58,222	133,890	0.697	0.003	0.303
	60	60,831	131,281	0.683	0.003	0.317
	66	63,502	128,610	0.670	0.004	0.331
	72	66,113	105,738	0.655	0.003	0.345
	78	67,541	43,641	0.642	0.004	0.358
	80	67,699	19,313	0.639	0.001	0.361
Female	0	0	135,881	1	.	.
	0*	1,507	134,374	0.989	0.011	0.011
	6	22,367	113,514	0.835	0.023	0.165
	12	32,690	103,191	0.759	0.010	0.241
	18	38,561	97,320	0.716	0.009	0.284
	24	42,772	93,109	0.685	0.006	0.315
	30	46,291	89,590	0.659	0.005	0.341
	36	49,228	86,653	0.638	0.005	0.362
	42	51,912	83,969	0.618	0.005	0.382
	48	54,277	81,604	0.601	0.004	0.399
	54	56,604	79,277	0.583	0.005	0.417
	60	58,795	77,086	0.567	0.004	0.433
	66	61,011	74,870	0.551	0.004	0.449
	72	63,112	60,991	0.535	0.005	0.465
	78	64,321	24,095	0.519	0.005	0.481
	80	64,420	10,268	0.516	0.001	0.484

* The second row with month 0 includes the 2003 cohort of GED Test passers who enrolled the same month they passed the GED Test.

. No event occurrence as it is the observation starting time.

Ethnicity

There were 194,701 white 2003 GED Test passers, and 75,765 of them, or 39.1 percent, enrolled in postsecondary education by September 2009; 44,098 of 104,140 non-white 2003 GED passers, or 43.4 percent, enrolled in postsecondary education. There were 32,891 passers whose ethnicity status was not indicated. Although the log-rank test indicated that there was a statistically significant difference in the event occurrence of enrollment for white and non-white 2003 GED passers, the curves and tables indicated that the magnitude of the difference was small. The cumulative enrollment rates for white and non-white passers were 40.0 percent and 43.3 percent, respectively.

As observed from the estimated enrollment (hazard) curve **Figure 8** (page 37), the shape of the curve for white and non-white 2003 GED passers was similar. The peak for both groups was during the third month; the value of estimated hazard was 0.026 for white passers and 0.031 for non-white passers. We interpreted these values to indicate no practically meaningful difference in postsecondary enrollment probability between white and non-white 2003 GED passers.

As **Figure 9** (page 37) displays, the survival probability curves for both groups started to show gaps around the fifth month, and the small gap between the groups remained approximately the same for all later time periods.

Table 21 (page 37) presents the number of 2003 GED passers, enrollment and non-enrollment, and survivor, hazard, and cumulative distribution functions, which could be explained by the Kaplan-Meier curves.

FIGURE 8

Hazard Curve for the White and Non-White 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education (2003–09)

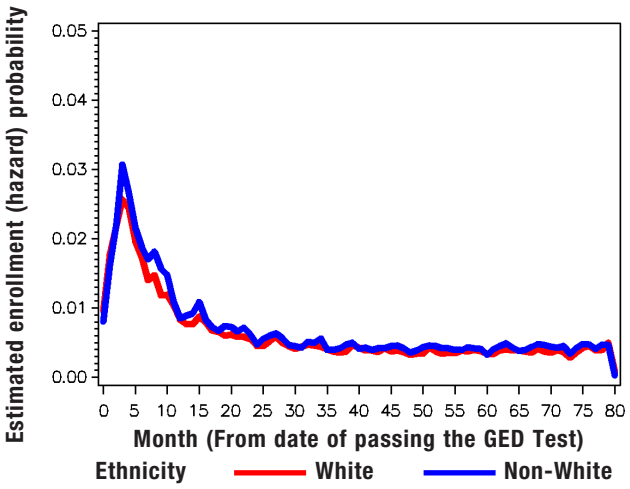


FIGURE 9

Survival Curve for the White and Non-White 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education (2003–09)

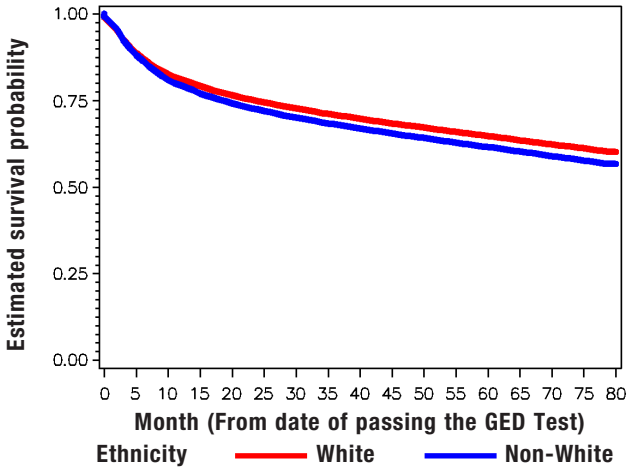


TABLE 21

Estimated Survival, Hazard, and Cumulative Distribution Function of the 2003 Cohort of GED® Test Passers' Enrollment (Aggregated Time Periods), by Ethnicity

Ethnicity	Month	Enrolled (Number)	Not Enrolled (Number)	Survival Probability	Hazard Probability	Cumulative Distribution Function (CDF)
White	0	0	194,701	1	.	.
	0*	1,869	192,832	0.990	0.010	0.010
	6	25,043	169,658	0.871	0.017	0.129
	12	36,755	157,946	0.811	0.008	0.189
	18	43,789	150,912	0.775	0.007	0.225
	24	48,838	145,863	0.749	0.005	0.251
	30	53,032	141,669	0.728	0.004	0.272
	36	56,652	138,049	0.709	0.004	0.291
	42	59,912	134,789	0.692	0.004	0.308
	48	62,882	131,819	0.677	0.003	0.323
	54	65,719	128,982	0.663	0.004	0.338
	60	68,561	126,140	0.648	0.003	0.352
	66	71,403	123,298	0.633	0.004	0.367
	72	74,062	101,416	0.619	0.004	0.381
	78	75,603	41,538	0.605	0.004	0.395
	80	75,765	17,918	0.601	0.001	0.399
Non-White	0	0	104,140	1	.	.
	0*	837	103,303	0.992	0.008	0.008
	6	14,103	90,037	0.865	0.019	0.135
	12	21,504	82,636	0.794	0.008	0.207
	18	25,647	78,493	0.754	0.007	0.246
	24	28,686	75,454	0.725	0.005	0.276
	30	31,120	73,020	0.701	0.004	0.299
	36	33,132	71,008	0.682	0.004	0.318
	42	34,976	69,164	0.664	0.004	0.336
	48	36,703	67,437	0.648	0.004	0.352
	54	38,418	65,722	0.631	0.004	0.369
	60	39,966	64,174	0.616	0.003	0.384
	66	41,584	62,556	0.601	0.004	0.399
	72	43,190	50,090	0.585	0.005	0.415
	78	44,032	19,453	0.570	0.005	0.431
	80	44,098	8,461	0.567	0.000	0.433

* The second row with month 0 includes the 2003 cohort of GED Test passers who enrolled the same month they passed the GED Test.

. No event occurrence as it is the observation starting time.

Age Group

Next, the 2003 cohort of GED Test passers was divided into three age groups: 16 to 24 years old, 25 to 34 years old, and 35 years and older. The youngest age group had the largest sample size of 248,754 GED credential recipients; 44.0 percent (109,332) enrolled in postsecondary education programs. The 25-to-34 age group had 51,520 recipients; 32.7 percent entered the postsecondary education system. The 35-years-and-older age group had the smallest number of people, 30,808 in total; 23.1 percent (7,117) entered postsecondary education. The log-rank test showed statistically and practically significant differences in the enrollment rate among the three age groups, compared with the 16- to 24-year-old group.

The enrollment (hazard) curves in **Figure 10** display a similar pattern for all three groups. All peaked during the third month; the hazard probability was 0.029 for the youngest group, 0.025 for the group of 25- to 34-year-olds, and 0.019 for the 35-years-and-older group. Compared with both other groups, the 16- to 24-year-old group was more likely to enroll in a postsecondary education program. The 35-years-and-older group was significantly less likely to enroll than either younger group.

The estimated cumulative enrollment rate was 45.0 percent for the youngest group, 33.5 percent for the 25- to 34-year-old group, and 23.5 percent for the oldest group, as estimated in Figure 10. **Figure 11** presents the survival curves for all three age groups.

Again, the youngest group has the lowest probability of not enrolling in postsecondary education, compared with the 25- to 34-year-old group and the 35-years-and-older group. Differences among all three groups were practically and statistically significant.

Quartiles of Overall GED Test Standard Scores

Next we examined how GED credential recipients' enrollment differed in terms of academic achievement as measured by the mean standard score on the GED Test overall. The 2003 cohort of GED Test passers was divided into three groups based on quartiles of their average overall standard scores. The mean overall standard score for the GED Test ranged from 450 to 800. The lower quartile (25th percentile and below) of scores for our sample was from 450 to 486, the middle quartiles (25th to 75th percentiles) of scores distributed were from 488 to 570, and the upper quartile (75th percentile and above) of scores was from 572 to 800. By the end of 80 months, 36.1 percent of 2003 GED passers from the lower quartile group, 39.7 percent from the middle quartiles, and 49.4 percent from the upper quartile group entered postsecondary education.

The log-rank test indicated a statistically significant difference in the 2003 GED passers' enrollment probabilities among three groups, yet the differences were only practically significant between the upper quartile and the lower quartile groups. **Figure 12** (page 39) indicates that the shape of the

FIGURE 10

Hazard Curve for the 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education, by Age Group (2003–09)

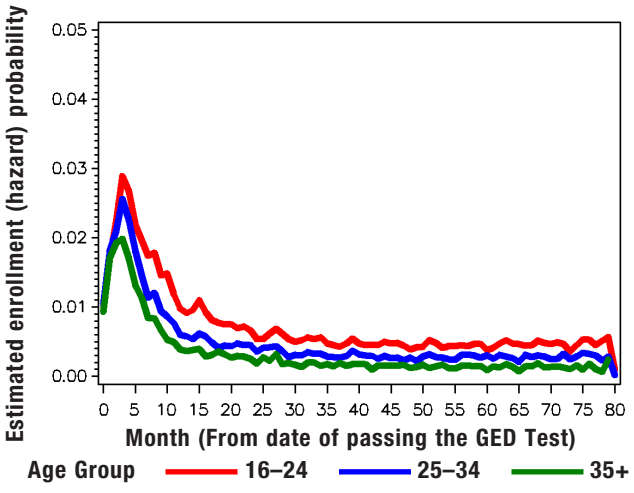
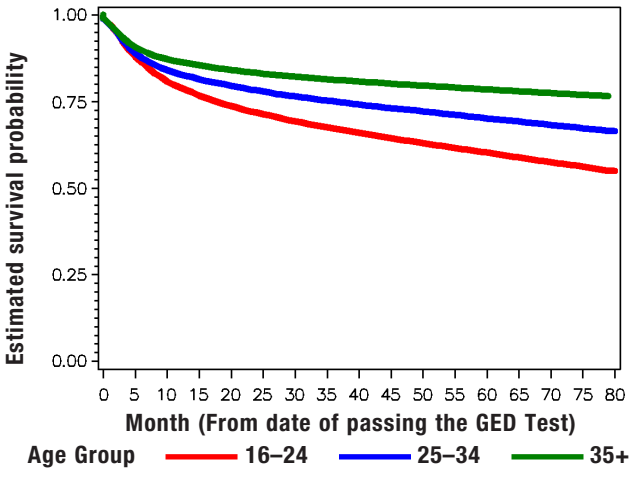


FIGURE 11

Survival Curve for the 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education, by Age Group (2003–09)



Kaplan-Meier curves of the estimated hazard probability was very similar for the three groups: All peaked during the third month. The hazard probability was 0.037 for the upper quartile group, 0.025 for the middle quartiles, and 0.023 for the lower quartile group. The gap of enrollment probability differed most during the third month between the upper and the lower quartile. The middle quartiles group did not distinguish itself from the lower quartile group. However, there were nearly no differences in the estimated enrollment probability among three groups after the 30th month. We interpreted these differences to mean that 2003 GED Test passers with overall GED Test standard scores of 572 or higher had a significantly higher probability of enrolling in postsecondary education than did those with standard scores between 450 and 486, especially within 30 months of passing the GED Test. Differences in enrollment probability were not practically meaningful for 2003 GED Test passers with overall standard scores between 488 and 570, compared with the other quartile score groups.

The estimated survival probabilities at the end of the 80th month were 0.506 for the upper quartile group, 0.603 for the middle quartiles, and 0.638 for the lower quartile group, which can be seen in **Figure 13** and **Table 22** (page 40). Within the first 10 months, the survival curve for the upper score group dropped a lot, which indicated that many GED credential recipients made the transition to postsecondary education. After the 10th month, the probability decreased gradually over time. Differences among 2003 GED Test passers by score groups to not enroll were not practically meaningful, however, and may reflect the closeness of patterns after 10 months.

Reasons for Testing: Goals to Enter a Two-Year College or a Four-Year College

In order to examine how GED Test candidates' reasons for testing influenced their decisions about postsecondary enrollment, we chose two responses from a GED Test demographic form item on reasons for testing, which directly asked respondents whether they tested with a goal to enter either a two-year college or a four-year college.[29] Log-rank tests indicated that there were statistically significant differences in enrollment probabilities between GED credential recipients who indicated 'Yes' for testing to enter a two-year college or a four-year college and that of those who reported 'No' for either reason.

FIGURE 12

Hazard Curve for the 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education, by GED® Test Score Group (2003–09)

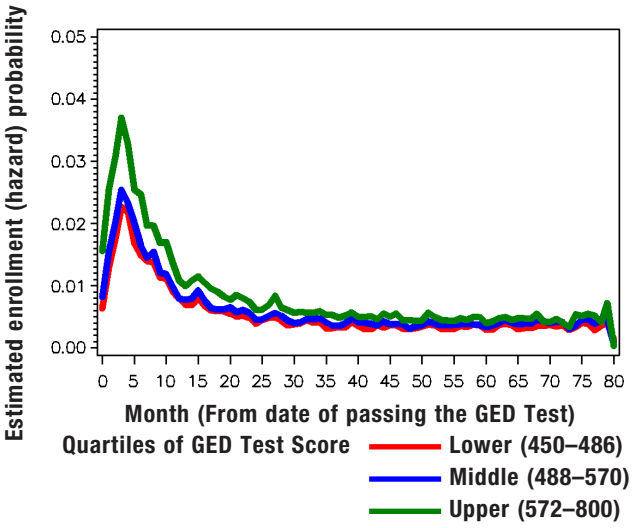
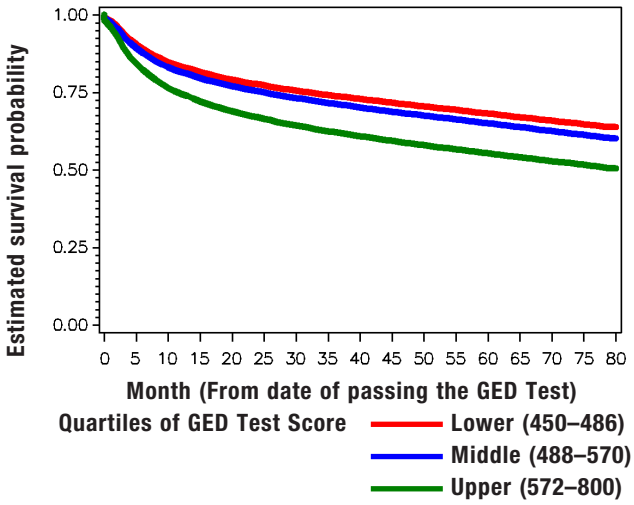


FIGURE 13

Survival Curve for the 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education, by GED® Test Score Group (2003–09)



[29] GED credential candidates could select multiple educational reasons for testing. Some candidates may have selected both *Enter a Two-Year College* and *Enter a Four-Year College* as a reason for testing. We did not include interactions in our analysis but plan to examine interactions in future survival analyses.

TABLE 22

Estimated Survival, Hazard, and Cumulative Distribution Function of the 2003 Cohort of GED® Test Passers' Enrollment (Aggregated Time Periods), by Quartiles of Mean GED® Test Standard Scores

Quartiles of Mean GED Test Standard Scores	Month	Enrolled (Number)	Not Enrolled (Number)	Survival Probability	Hazard Probability	Cumulative Distribution Function (CDF)
Lower (450–486)	0	0	85,758	1	.	.
	0*	541	85,217	0.994	0.006	0.006
	6	9,229	76,529	0.892	0.015	0.108
	12	14,236	71,522	0.834	0.008	0.166
	18	17,090	68,668	0.801	0.006	0.199
	24	19,142	66,616	0.777	0.004	0.223
	30	20,856	64,902	0.757	0.004	0.243
	36	22,311	63,447	0.740	0.003	0.260
	42	23,583	62,175	0.725	0.003	0.275
	48	24,825	60,933	0.711	0.003	0.290
	54	26,035	59,723	0.696	0.003	0.304
	60	27,224	58,534	0.683	0.003	0.318
	66	28,405	57,353	0.669	0.003	0.331
	72	29,550	47,012	0.655	0.004	0.345
	78	30,193	18,985	0.642	0.004	0.358
	80	30,256	8,362	0.638	0.001	0.362
Middle (480–570)	0	0	164,041	1	.	.
	0*	1,343	162,698	0.992	0.008	0.008
	6	20,024	144,017	0.878	0.016	0.122
	12	30,057	133,984	0.817	0.008	0.183
	18	35,971	128,070	0.781	0.006	0.219
	24	40,346	123,695	0.754	0.004	0.246
	30	43,874	120,167	0.733	0.004	0.268
	36	46,952	117,089	0.714	0.004	0.286
	42	49,763	114,278	0.697	0.004	0.303
	48	52,289	111,752	0.681	0.003	0.319
	54	54,757	109,284	0.666	0.004	0.334
	60	57,153	106,888	0.652	0.003	0.348
	66	59,653	104,388	0.636	0.004	0.364
	72	62,129	85,338	0.621	0.004	0.379
	78	63,460	34,532	0.606	0.004	0.394
	80	63,576	14,954	0.603	0.001	0.397
Upper (572–800)	0	0	81,933	1	.	.
	0*	1,274	80,659	0.985	0.016	0.016
	6	14,480	67,453	0.823	0.025	0.177
	12	20,815	61,118	0.746	0.011	0.254
	18	24,471	57,462	0.701	0.009	0.299
	24	27,058	54,875	0.670	0.006	0.330
	30	29,194	52,739	0.644	0.006	0.356
	36	30,936	50,997	0.622	0.005	0.378
	42	32,484	49,449	0.604	0.005	0.397
	48	33,929	48,004	0.586	0.005	0.414
	54	35,259	46,674	0.570	0.004	0.430
	60	36,520	45,413	0.554	0.004	0.446
	66	37,768	44,165	0.539	0.005	0.461
	72	38,910	36,341	0.525	0.004	0.475
	78	39,599	14,951	0.510	0.004	0.490
	80	39,678	6,521	0.506	0.000	0.494

* The second row with month 0 includes the 2003 cohort of GED Test passers who enrolled the same month they passed the GED Test.

. No event occurrence as it is the observation starting time.

FIGURE 14

Hazard Curve for the 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education, by Two-Year College Goal (2003–09)

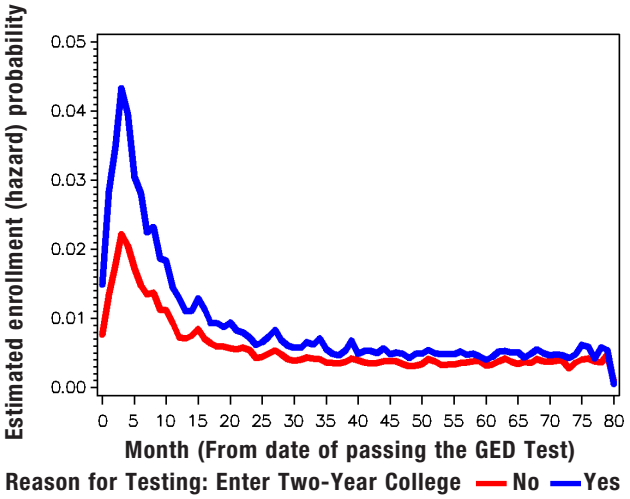
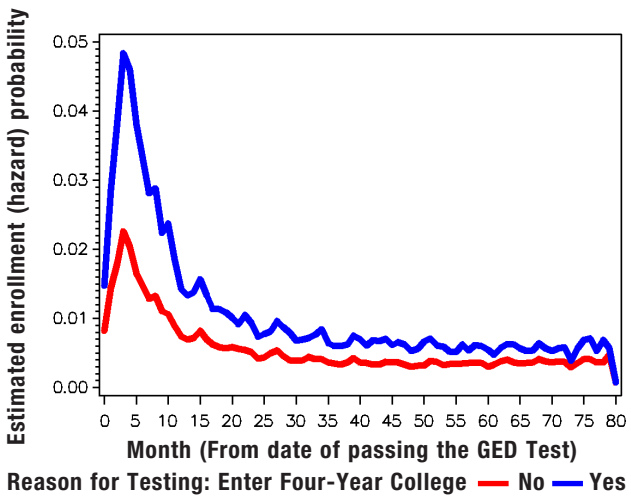


FIGURE 15

Hazard Curve for the 2003 Cohort of GED® Test Passers Who Enrolled in Postsecondary Education, by Four-Year College Goal (2003–09)



Figures 14 and **15** display the estimated enrollment (hazard) probability curves for GED credential recipients who tested to enter a two-year or a four-year college. Earlier, we defined the cumulative enrollment density function as $1-S(t)$, where $S(t)$ was the survivor function; the cumulative enrollment density function, therefore, gives us the cumulative probability across time that members of a group will enroll. The cumulative enrollment probability was 0.524 for GED credential recipients who indicated testing to enter a two-year college and 0.373 for those who did not report a goal to enter a two-year college. For those who indicated entering a four-year college as the reason for testing, the cumulative enrollment probability was 0.584 and for those who responded 'No,' it was 0.369. The 2003 GED Test passers who indicated a goal to enter either a two-year or a four-year college were more likely to enroll in postsecondary education than those who did not report the goal; differences were both statistically and practically significant.

As is apparent in Figure 14, the shape of the enrollment probability was similar for GED credential recipients reporting 'Yes' or 'No' for testing to enter a two-year college. The hazard function for the 'Yes' group was consistently higher than the 'No' group. However, the relative magnitude of the differential in hazard between two groups was more pronounced in the first five months. After the 10th month, the magnitude was small. For both groups, the peak was during the third month. The enrollment (hazard) probability was 0.043 for the 'Yes' group and 0.022 for the 'No' group, which indicated that 2003 GED Test passers who answered 'Yes' for testing to enter a two-year college were 95.5 percent more likely to enroll in postsecondary education programs than those who reported 'No.'

The curves for testing to enter a four-year college were very similar to those for testing to enter a two-year college. However, the magnitude of the differential in hazard between groups was more pronounced at the peak time period, compared with those curves for testing to enter a two-year college. For both groups, the peak was at the third month, the enrollment (hazard) probability was 0.048 for the 'Yes' group and 0.022 for the 'No' group, which indicated that 2003 GED Test passers who answered 'Yes' for testing to enter a four-year college were 118.8 percent more likely to enroll in postsecondary education programs than those who answered 'No.'

As seen in the following survival probability curves presented in **Figures 16** and **17** (page 42), there were large differences of non-enrollment probabilities, depending on whether they reported 'Yes' or 'No' for testing to enter a two-year or four-year college. We interpreted these differences to mean that 2003 GED Test passers with a goal to enter either a two-year or a four-year college were likely to do so, in contrast to passers without the goal; GED Test passers who did not report either goal had a meaningfully higher probability of not enrolling in postsecondary education.

FIGURE 16

Survival Curve for the 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education, by Two-Year College Goal (2003–09)

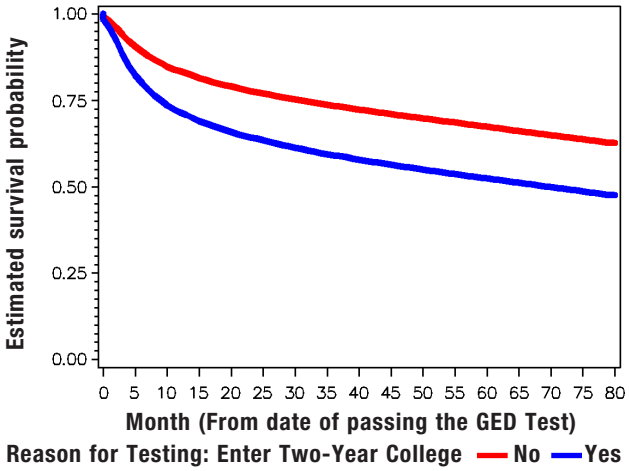
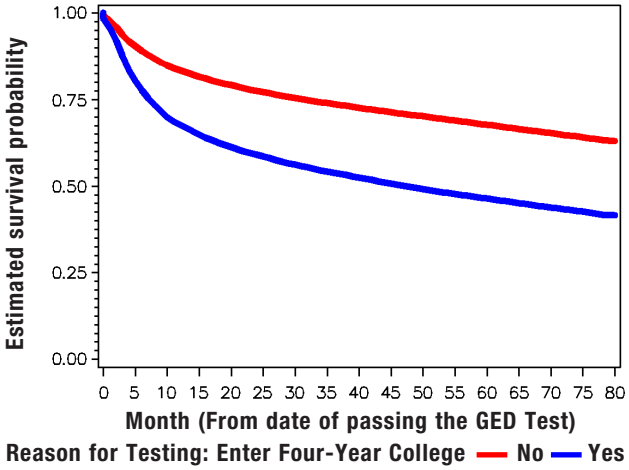


FIGURE 17

Survival Curve for the 2003 Cohort of GED® Test Passers Who Did Not Enroll in Postsecondary Education, by Four-Year College Goal (2003–09)



POSTSECONDARY ENROLLMENT: MULTIVARIATE ANALYSES

Not only were we interested in how enrollment probabilities differed within categories for a single predictor, but we also were concerned about how all predictors together might estimate enrollment probabilities of 2003 GED Test passers.

For multivariate analyses (that is, analyzing two or more predictors simultaneously in a single model), we used the Cox proportional hazards regression model (Cox, 1972). The Cox model predicts the probability that a case will terminate at time t. In our study, the model predicted the probability that an individual 2003 GED passer would enroll at time t. At time t for an individual GED passer with a vector of explanatory variables $x = (x_1 \ldots x_k)$, the Cox model defines the hazard for enrolling in a postsecondary education program h at time t as $H(t;x) = h_0(t)\exp(x^T\beta)$.

In this equation, the term $h_0(t)$ represents the baseline hazard that may vary over time; it is the hazard for a GED passer to enroll in postsecondary education at time t when all independent variable values are equal to zero. The factor $\exp(x^T\beta)$ is time independent. $\beta = (\beta_1 \ldots \beta_k)$ is a vector of regression coefficients reflecting the effects of the vector of explanatory variables on survival.

There are several reasons for using the Cox model for this study. First, it uses censored data. Second, it makes no assumptions on the nature or shape of the hazard function. The model assumes only that changes in levels of the independent variables will produce proportionate changes in the hazard function, independent of time. Third, hazard ratios reported here have the standard normal distribution, and hypotheses about significant factors are tested the way they are with linear regression.

The dependent variable for the Cox model was the event of enrollment in postsecondary education programs for 2003 GED passers. The time scale was measured beginning from the month after a candidate passed the GED Test. The predictors in our study were basic demographic and academic achievement variables, including gender, age group, ethnicity, quartiles of scores, and reasons for testing, as described in Chapter 4. For model building, we first conducted univariate analyses with each predictor to determine whether the individual predictor is relevant to our final model, based on the statistical significance criterion of a p-value less than 0.05.

Results of Multivariate Analysis

The log-rank tests for each of the six predictors showed p-values less than 0.05. Therefore, all six predictors were entered simultaneously in the final model. **Table 23** (page 43) presents results of fitting the final Cox proportional hazard regression model, displaying parameter estimates and hazard ratios.

As is apparent in Table 23, all predictors were statistically significantly associated with the 2003 GED Test passers' enrollment in postsecondary education.

TABLE 23

Postsecondary Enrollment of the 2003 Cohort of GED® Test Passers: Estimated Parameters and Hazard Ratios for the Cox Proportional Hazard Model

Variable	Parameter Estimate	Standard Error	Chi-Square	P-Value (Pr > Chi Square)	Hazard Ratio
Female	0.389	0.006	4,459.260	<0.0001	1.476
Non-White	0.158	0.006	650.772	<0.0001	1.171
25–34 Years Old	-0.320	0.009	1,334.111	<0.0001	0.726
35+ Years Old	-0.666	0.013	2,634.601	<0.0001	0.514
Middle Quartiles of Mean GED Test Standard Scores (488–570)	0.113	0.007	229.138	<0.0001	1.120
Upper Quartiles of Mean GED Test Standard Scores (572–800)	0.412	0.008	2,418.142	<0.0001	1.509
Tested to Enter a Two-Year College	0.365	0.006	3,511.808	<0.0001	1.441
Tested to Enter a Four-Year College	0.515	0.006	6,290.038	<0.0001	1.673

We had a large dataset, which would tend to make even trivial differences statistically significant. Interpretations of practical significance of hazard ratios would be more meaningful to apply to the study findings. Hazard ratio (also called relative risk) is defined as the antilog of each raw coefficient, e^{β}, which describes the effect of a one-unit difference in the associated predictor on raw hazard. Hazard ratios greater than one yield increases in likelihood of enrollment, and hazard ratios less than one yield decreases in likelihood. The effect is stronger the further the hazard ratio is from a value of one.

The model indicated that the estimated enrollment of female GED credential recipients was 1.48 times that of male 2003 GED passers, while all other variables were held constant. In other words, the hazard probability of postsecondary enrollment for female credential recipients was 47.6 percent higher than for male GED credential recipients.

The model indicated that the estimated enrollment of non-white GED passers was 1.17 times that of white GED passers when all other variables are held constant. Therefore, the probability of postsecondary enrollment for non-white recipients was 17 percent higher than for white GED recipients.

Compared with the youngest age group (16 to 24 years old), the rate of enrollment decreased by 27.4 percent for the 25- to 34-year-old age group and by 48.6 percent for the 35-years-and-older age group. That is, the estimated hazard of enrollment for the 25- to 34-year-old age group was 0.73 times that for the reference group (16 to 24 years old).

For quartiles of overall GED Test standard scores, compared with the lower quartile score group, the rate of enrollment increased by 50.9 percent for the upper quartile score group, while all other variables were held constant.

For reasons for testing, the rate of enrollment increased by 44.1 percent for 2003 GED passers who tested to enter a two-year college when all other variables were held constant. The rate of enrollment increased by 67.3 percent if a 2003 GED passer reported 'Yes' for testing to enter a four-year college, holding all other variables constant.[30]

EVENT OCCURRENCE OF GED TEST PASSERS' GRADUATION FROM POSTSECONDARY EDUCATION

After considering event occurrence for postsecondary enrollment, we examined graduation outcomes for 2003 GED Test passers who enrolled. The target event in our analyses was whether 2003 GED passers graduated after enrolling in postsecondary education programs. The starting time was the date GED passers from the 2003 cohort enrolled in postsecondary education programs. Again, the time scale used to record the occurrence of graduation was months. The total length of our investigated time for this study was 80 months, from January 2003 to September 2009. If a 2003 GED passer graduated during the observed time period, the event time was the date he or she graduated from the program. All other 2003 GED passers were censored in September 2009, which was the cutoff date for our data collection.

[30] Because educational reasons for testing are not mutually exclusive, an overlap may exist between goals to enter a two-year college and goals to enter a four-year college. Our models did not take a possible overlap into account.

For survival analyses, the total number of 2003 GED passers who enrolled in postsecondary education[31] was 133,171. During the time of investigation, 10.5 percent (14,047) of them graduated from a postsecondary education program, and the censored observations accounted for 89.5 percent of the data.

Graduation: Estimates of Survivor Function

The definition of survivor function ($S(t_{it}) = \Pr(T_i > t)$) is the same as for the analysis of enrollment event occurrence. For the graduation event occurrence, survival implies that an individual 2003 GED Test passer i will *not* graduate from a postsecondary education program by the end of month t. We measured time to graduation from the GED passer's postsecondary enrollment date to ensure enough time was allotted after enrollment for the GED passer to graduate.[32]

Correspondingly, we defined the cumulative distribution function, $f(t)$ as the graduation probability density function and $F(t)$ as the cumulative graduation density function, which is $1-S(t)$. GED passer graduation hazard function is $H(t) = f(t)/S(t)$, defined in our context as graduation rate, a measure of the likelihood of a GED passer graduating from a postsecondary education program at time t. Again, the GED passer survivor function is $S(t) = 1-F(t)$, the probability of a GED passer still not graduating from a postsecondary education program.

We were interested in investigating graduation probabilities of subgroups of 2003 GED passers categorized by gender, ethnicity, age group, GED Test score group, and their reasons for testing, in addition to overall 2003 GED passers. As with the analyses for the event occurrence of enrollment, non-parametric Kaplan-Meier tests were used for univariate analyses.

GRADUATION: RESULTS OF UNIVARIATE ANALYSES

Hazard and Survivor Functions

Figure 18 shows the estimated graduation (hazard) probabilities over time for the entire GED Test passer cohort from 2003 (n=133,171) who enrolled in postsecondary education. *Month 0* indicates the starting time of 2003 GED passers' entrance into postsecondary education. As shown from the hazard curve, there were multiple peaks and valleys—the curve was nonmonotonic. Unlike the event occurrence of enrollment, in which the enrollment tended to peak right after GED Test candidates passed the GED Test, there was no predominant pattern for graduation. After 25 months of enrollment in a postsecondary education program, the enrollment hazard displayed in Figure 18 peaks every 10 to 12 months, which corresponds roughly to the academic year.

FIGURE 18

Hazard Function for the 2003 Cohort of GED® Test Passers Who Graduated from Postsecondary Education (2003–09)

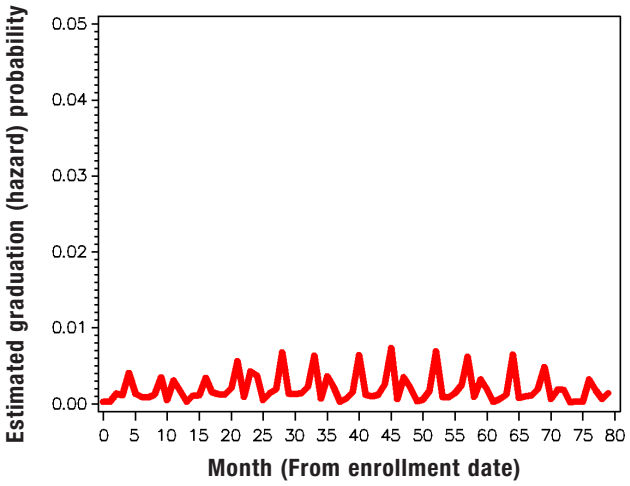


Figure 19 (page 45) shows a Kaplan-Meier curve of estimated survivor function, which indicates the probability of 2003 GED passers not graduating from postsecondary education programs. The survivor function curve in Figure 19 displays a monotonically decreasing function over time. For our study, the survivor function (that is, the probability of not graduating) stayed very high over time. At the beginning of time, it took on the value of 1.00. Over time, as graduation occurred, the curve dropped slightly toward 0.00. Because of censoring and because some 2003 GED passers may never graduate no matter how long data collection lasts, the value would never show 0.00. The value of the survivor function at the end of the time period (80 months) estimated the proportion of the population that would not

[31] For survival analyses, the calculation of GED passers enrolling in postsecondary education included GED passers who enrolled in postsecondary education within the same month they tested or later. The count included GED passers with an enrollment date and an enrollment status of full time, half time, or less than half time. The count does not include non-passers or a small number of GED passers who had withdrawn or were deceased.

[32] Our graduation models did not consider any existing delays from the GED pass date to postsecondary enrollment date as a covariate.

FIGURE 19

Survival Function for the 2003 Cohort of GED® Test Passers Who Did Not Graduate from Postsecondary Education (2003–09)

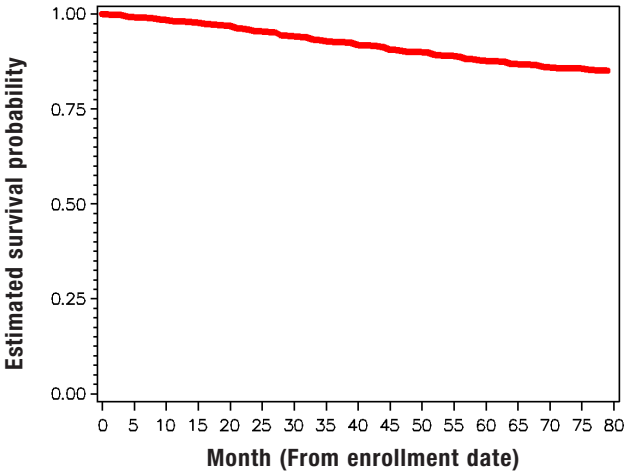
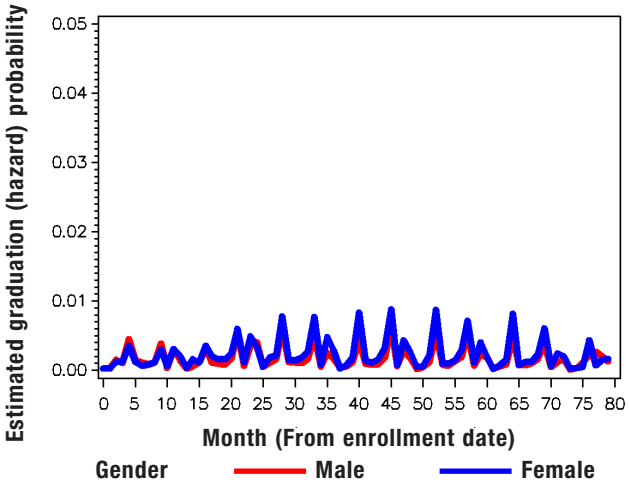


FIGURE 20

Hazard Function for the 2003 Cohort of GED® Test Passers Who Graduated from Postsecondary Education, by Gender (2003–09)



graduate from a postsecondary education program past September 2009. By the end of 80 months and beyond, the survivor probability was 85.0 percent, which indicated that 85.0 percent of 2003 GED passers would not obtain a postsecondary education degree or certificate. The overall cumulative graduation rate for 2003 GED passers was 15.0 by the end of 80 months and beyond.

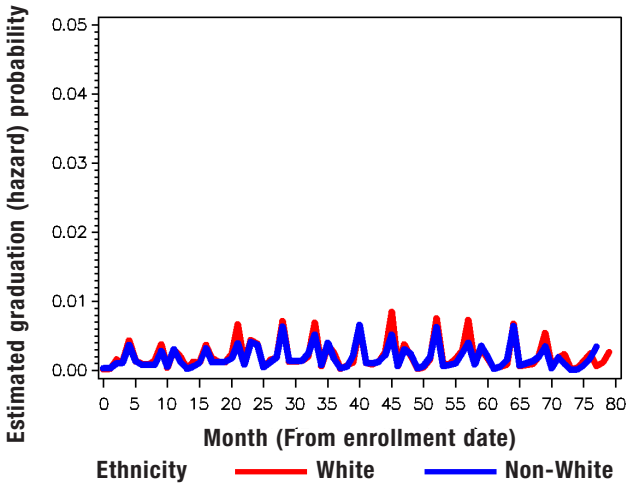
Graduation Probability by Subgroup

Gender and Ethnicity

Although log-rank tests indicated significant differences of survivor function between male and female 2003 GED Test passers, as well as white and non-white GED passers due to large sample size, the magnitude of differences were minor by observing the graduation hazard curve and the Kaplan-Meier curve of survival probability. **Figures 20** and **21** present hazard functions by gender and ethnicity. As is apparent in these figures, the curves of graduation hazard functions were almost overlapping for male and female, white and non-white 2003 GED passers. The cumulative graduation rate was 12.7 percent for males and 17.2 percent for females, and 15.7 and 13.8 percent for white and non-white passers, respectively. We concluded that graduation rate does not differ by ethnicity. Despite the visual overlap for both gender and ethnicity, the magnitude of the difference by gender indicates that female 2003 GED passers are more likely to graduate from postsecondary programs than male GED passers, especially from programs lasting multiple semesters.

FIGURE 21

Hazard Function for the 2003 Cohort of GED® Test Passers Who Graduated from Postsecondary Education, by Ethnic Group (2003–09)



Age Group and Quartiles of Overall GED Test Standard Scores

For age group and score group, we observed that curves for the graduation hazard functions nearly overlapped, which indicated that the probabilities of graduation for 2003 GED Test passers were similar at different time periods. The survivor function curves, as displayed in **Figure 22** (page 46), showed that the oldest age group (35 years and older) had the lowest survival probability; this age group displayed the highest cumulative graduation rate, at 22.6 percent. The cumulative graduation rates were

FIGURE 22

Survival Function for the 2003 Cohort of GED® Test Passers Who Did Not Graduate from Postsecondary Education, by Age Group (2003–09)

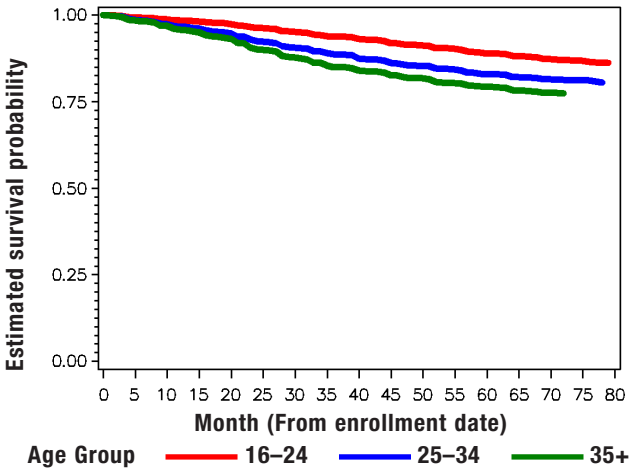


FIGURE 23

Survival Function for the 2003 Cohort of GED® Test Passers Who Did Not Graduate from Postsecondary Education, by GED® Test Score Group (2003–09)

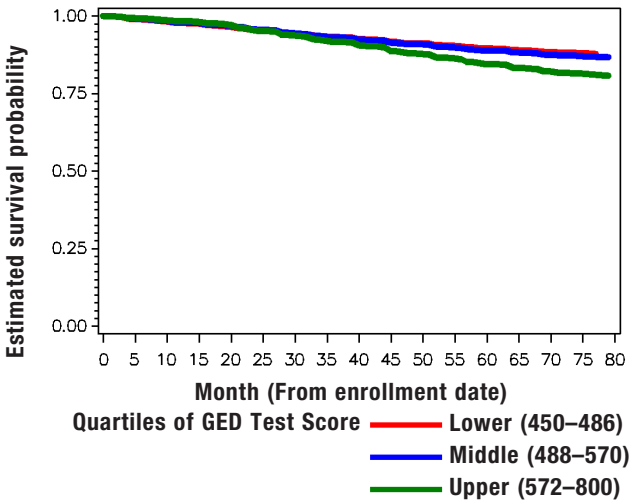


FIGURE 24

Survival Function for the 2003 Cohort of GED® Test Passers Who Did Not Graduate from Postsecondary Education, by Two-Year College Goal (2003–09)

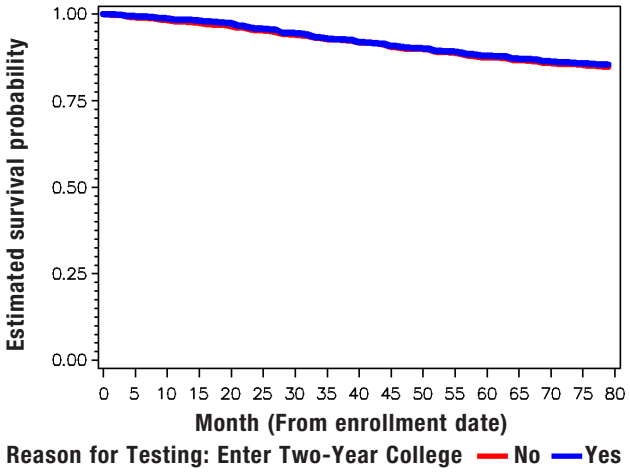
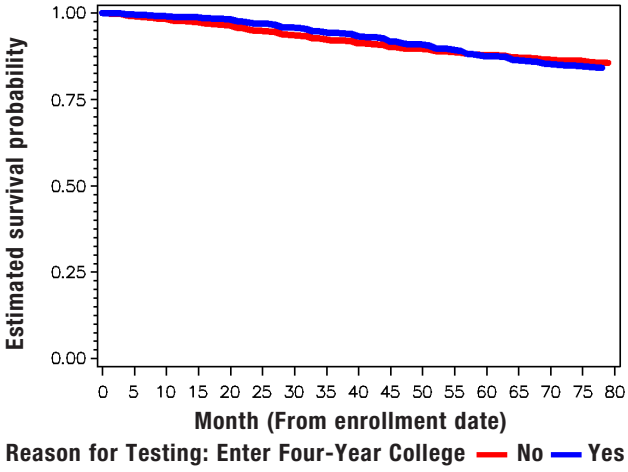


FIGURE 25

Survival Function for the 2003 Cohort of GED® Test Passers Who Did Not Graduate from Postsecondary Education, by Four-Year College Goal (2003–09)



13.8 percent and 19.6 percent for the youngest age group (16 to 24 years old) and the 25- to 34-year-old age group, respectively. The upper quartile score group had the highest cumulative graduation rate at 19.3 percent (see **Figure 23**). The cumulative graduation rate was 12.2 percent for the lower quartile group and 13.3 percent for the middle quartile group. We interpreted these data to mean that the probability of graduating was significantly lower for the youngest age group compared with both older groups, yet there were no practical differences regarding the cumulative graduation probability based on GED Test score group.

Reasons for Testing: Goals to Enter a Two-Year College or a Four-Year College

Figures 24 and **25** present the Kaplan-Meier curves for reasons for testing to enter a two-year or a four-year college. As shown in the figures, the survivor functions for 2003 GED Test passers were the same regardless of whether they tested to enter a two-year college, a four-year college, or neither. We

concluded that the goals of entering a two-year or a four-year college when testing would not influence whether the GED credential recipient actually graduated after enrolling.

GRADUATION: MULTIVARIATE ANALYSES

Results of Multivariate Analyses

The log-rank tests for all predictors showed p-values less than 0.05, except for reasons for testing to enter a four-year college. Therefore, five of the six predictors were entered in the final model. **Table 24** presents results of fitting[33] the final Cox proportional hazards regression model and displays parameter estimates, standard errors, and hazard ratios.

Results from the Cox model indicate that all five predictors show significant associations with the graduation probability over time. Like the analyses for the enrollment event occurrence, we emphasized the hazard ratios rather than statistical significance.

The model indicated that the estimated graduation probability (hazard) of female 2003 GED passers was 1.3 times that of male GED passers, while all other variables were held constant. In other words, female passers were 30.0 percent more likely to graduate than male GED recipients.

The model also indicated that the estimated graduation probability (hazard) of non-white 2003 GED passers was 0.9 times that of white GED passers, when all other variables were held constant. Therefore, the hazard probability of graduation for white 2003 GED passers was 7.4 percent higher than that of non-white GED passers.

Compared with the youngest age group (16 to 24 years old), the rate of graduation increased by 60.5 percent for the 25-to-34-year-old age group, and by 96.3 percent for the 35-years-and-older age group. The oldest group was the most likely to graduate compared with the other two age groups.

For quartiles of GED Test standard scores, compared with the lower quartile score group, the rate of graduation increased by 7 percent for the middle quartiles score group, but the rate of graduation increased by 54 percent for the upper quartile score group, with all other variables held constant. The higher a 2003 GED passer's overall standard score in the upper quartile group, the higher the probability to graduate.

For reasons for testing, the likelihood of graduation decreased by 8 percent for 2003 GED passers who tested to enter a two-year college compared with those who did not test to enter a two-year college, when all other variables were held constant.

POSTSECONDARY ENROLLMENT AND GRADUATION: SUMMARY OF SURVIVAL ANALYSES

For the enrollment event occurrence, the overall cumulative enrollment rate for the 2003 GED Test passers was 41 percent. The 2003 cohort of GED passers tended to enroll in postsecondary education programs right after they passed the GED Test. One year after passing the GED Test, the probability

TABLE 24

Graduation of the 2003 Cohort of GED® Test Passers: Estimated Parameters and Hazard Ratios for the Cox Proportional Hazard Model

Variable	Parameter Estimate	Standard Error	Chi-Square	P-Value (Pr > Chi Square)	Hazard Ratio
Female	0.262	0.018	207.689	<0.0001	1.300
Non-White	-0.077	0.020	15.541	<0.0001	0.926
25–34 Years Old	0.473	0.024	399.558	<0.0001	1.605
35+ Years Old	0.674	0.031	478.667	<0.0001	1.963
Middle Quartiles of Mean GED Test Standard Scores (488–570)	0.069	0.025	7.697	0.006	1.072
Upper Quartiles of Mean GED Test Standard Scores (572–800)	0.428	0.026	271.939	<0.0001	1.535
Tested to Enter a Two-Year College	-0.082	0.019	19.341	<0.0001	0.921

[33] *Fitting* a model in this context means identifying parameter estimates of predictors that are significant and then determining how closely they align with the graduation outcome. A model that fits the data well has predictors that more fully and accurately predict the outcome than a model with poor fit.

of enrollment decreased and stayed low over time. For the graduation event occurrence, the overall cumulative graduation rate was 11 percent over time. Female 2003 GED passers were more likely to make the transition from GED credential to college and to obtain a postsecondary degree or certificate than were male GED passers. Ethnicity did not make a significant difference in probability of enrollment or graduation.

Younger 2003 GED passers (aged 16 to 24 years) were more likely to enroll in postsecondary education programs, and the oldest group (35 years and older) was the least likely to enroll. However, in regards to graduation, the youngest group displayed the lowest probability and the oldest group had the highest probability of graduating. The 2003 cohort of GED passers in the upper quartile group for GED Test standard scores was more likely to enroll in postsecondary education and to graduate. Reasons for testing to enter a two-year or a four-year college were good predictors for enrollment, but there was no significant relationship between testing to enter either a two-year college or a four-year college and graduation.

Discussion and Implications

Survival analyses have important implications for current efforts to move more Americans into the postsecondary education pipeline and improve college students' persistence and completion in postsecondary institutions. Taken in conjunction with other analyses on 2003 GED Test passers, our results from survival analyses point to both opportunities and areas for improvement for helping GED credential recipients make a successful transition to postsecondary education and complete a postsecondary degree.

First, analysis of enrollment event occurrence identified the critical time window for the 2003 cohort of GED passers to enroll in postsecondary education, which was within the 15 months after passing the GED Test. The probability of enrollment stayed flat and low after 15 months. By passing the GED Test, GED Test candidates may become more confident academically and their motivation for achievement in postsecondary education may be lifted, which could lead to a fast transition to postsecondary education. In time, their aspirations for postsecondary education wane. Awareness of this critical time period for enrollment could help adult educators connect with and provide guidance to GED credential recipients by helping them find information to apply to postsecondary institutions right after GED candidates pass the test.

Second, our analyses indicated that male 2003 GED passers are likely to have a lower enrollment rate than female GED passers, even though more males pass the GED Test than females. Adult educators may provide male GED credential recipients with more support to help them make a successful transition to postsecondary education. Also, more research needs to be conducted to investigate reasons for the lower enrollment rate for males, such as whether there might be a gender difference in what they intend to do once they have the GED credential.

Third, the youngest age group (16 to 24 years), while most likely to enroll, is least likely to graduate, according to our analyses. This finding is a concern because they represent a very large group of potential enrollees. Zhang, Han, and Patterson (2009) reported that candidates between 16 and 19 years old accounted for approximately 40 percent of all GED candidates during the last decade. By adding at least another 20 percent of candidates who are between 20 and 24 years old (American Council on Education, 2009), the total proportion of this youngest group (16 to 24 years) becomes more than 60 percent. This age group may enroll in college inconsistently or stop out and later return. Further analyses by age should help clarify the circumstances under which they enroll and graduate (or don't).

Fourth, our data showed that the oldest age group (35 years and older) had the lowest enrollment rate yet the highest graduation rate. One explanation could be that members of this age group may not initially see themselves as "college material" and may be less aware of postsecondary outreach efforts or of available funding to pursue further education, yet once they envision themselves in the program, they recognize the benefits and persist. Adult educators may seek a better understanding of difficulties or barriers preventing more mature learners from entering postsecondary education. Policy makers must consider policies to help those with the least chance of enrolling in postsecondary education. Also, our study found that the 2003 cohort of GED passers with the highest scores are more likely to participate in postsecondary education. Adult educators must encourage GED candidates to try their best to prepare for the GED Test and to aim for high scores.

Fifth, our study demonstrated that most of our 2003 cohort of GED passers followed their academic aspirations if they initially took the GED Test to enter postsecondary education. We discovered meaningful differences in enrollment rates between those who reported "Yes" for testing for postsecondary

education and those who indicated "No." Based on this result, one major task for the education world is to continue to advocate for postsecondary education for the whole society and help people realize the importance of getting a postsecondary diploma and of lifelong learning. This finding also provides evidence that the GED credential is a vehicle to postsecondary education for those seeking a second chance.

Finally, survival analyses of the graduation event occurrence designated an area of great concern—lower graduation rates for the 2003 cohort of GED passers regardless of demographic status. What happened after GED credential recipients made the transition to postsecondary education that barred them from graduating? What caused the dropout rate for postsecondary education of GED credential recipients who have already displayed educational resilience by passing the GED Test and enrolling in postsecondary education? More qualitative studies are needed to unveil the dynamics of GED credential recipients and their postsecondary experiences.

Postsecondary Institutions

POSTSECONDARY INSTITUTIONS IN WHICH GED TEST PASSERS ENROLLED

Following our description of the population of the 2003 cohort of GED Test passers, we proposed examining the settings of the institutions the passers attended and compared them with settings of all postsecondary institutions. We extracted data from the Integrated Postsecondary Education Data System (NCES/IPEDS, 2004) to describe institutional characteristics, admission policies and enrollment trends, remedial and daycare services offered, and instructional staff in postsecondary institutions in which GED credential recipients enrolled and in institutions overall. A secondary source was the *Digest of Education Statistics: 2004* (Snyder & Tan, 2006), which allowed us a more in-depth look at the differences between percentages for open-admissions policies and for remedial services by institution level.

Institutional Characteristics

We sought to describe the characteristics of postsecondary institutions in which the 2003 cohort of GED Test passers tended to enroll, compared with postsecondary institutions overall. We wanted to know more about the calendar system institutions tended to use, the geographic regions in which institutions were located, educational offerings of the institutions, institutional size, tuition rates and fees, and gender and ethnic balance in the institutions.

In total, the 2003 cohort of GED passers attended 2,787 institutions between 2003 and September 2009. Among these institutions, 80.1 percent adopted a semester academic calendar system; 12.5 percent adopted quarter systems; the rest (7.4 percent) used a trimester, a four-one-four plan, or other academic calendar systems. These percentages are in contrast to overall percents for calendar systems: 48.6 percent for semesters, 12.9 percent for quarters, and 38.5 percent for other.

In terms of geographic distribution, 25.1 percent of the institutions in which the 2003 cohort of GED passers enrolled were in the Southeast, and 17.9 percent were in the Mideast, as shown in **Table 25**. Other concentrated percentages were in the Great Lakes area, the West, and the Plains. The remaining institutions were located in New England, the Southwest, the Rocky Mountains, and the Insular Areas. Regional percents for the 2003 cohort of

TABLE 25

Geographic Region of Postsecondary Institutions in Which the 2003 Cohort of GED® Test Passers Enrolled and of All IPEDS Institutions

Geographic Region	Institutions in Which the 2003 Cohort of GED Test Passers Enrolled		All IPEDS Institutions
	Number	Percent	Percent
Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	642	25.1	23.1
Mideast (DE, DC, MD, NJ, NY, PA)	456	17.9	17.1
Great Lakes (IL, IN, MI, OH, WI)	359	14.1	14.8
Far West (AK, CA, HI, NV, OR, WA)	339	13.3	14.0
Plains (IA, KS, MN, MO, NE, ND, SD)	271	10.6	9.0
Southwest (AZ, NM, OK, TX)	217	8.5	10.2
New England (CT, ME, MA, NH, RI, VT)	182	7.1	5.9
Rocky Mountains (CO, ID, MT, UT, WY)	86	3.4	3.3
Total	2,552		

Sources: Source for the institutions in which the 2003 cohort of GED Test passers enrolled is IDB/NSC/NCES/IPEDS match. Source for all IPEDS institutions is NCES/IPEDS Data, 2004.

Notes: Missing n's are for institution data.
Missing n=232.
Passers also attended two institutions in the insular areas and one U.S. service school.

GED passers were comparable with overall regional percents.

The IPEDS database also reported a variety of educational offerings for postsecondary institutions. The most frequent type offered was academic (96.7 percent). Approximately half (48.8 percent) of the institutions also offered occupational courses. Approximately one-third (36.2 percent) offered adult basic remedial or high school–equivalent programs.

The mean enrollment for institutions that the 2003 cohort of GED passers chose was 8,249 students. Institutional size ranged from 24 to 94,561 students. In contrast, the mean overall institutional size was much smaller, at 3,192. The mean cost per credit hour for part-time, in-state undergraduates was $294 (standard deviation=$333), with a maximum of $4,210. Overall, the mean cost per credit hour was approximately the same, at $292.

The 2004 average full-time, in-state, undergraduate tuition at institutions in which the 2003 cohort of GED passers enrolled was $8,626 (standard deviation=$7,956). The maximum full-time, in-state, undergraduate tuition that year was $36,000. The mean full-time, in-state tuition for institutions overall was approximately the same, at $8,541.

However, tuition and fees vary widely by sector (that is, institutional type and control), and it is more informative to compare institutions GED passers chose with institutions overall by disaggregating by sector. Published tuition and fees rates by sector are displayed in **Table 26** to give the reader an estimate of costs for institutions in which 2003 GED passers enrolled and for institutions overall. Overall institutional tuition and fees were very similar. An exception[34] was the cost for GED passers to attend a four-year, private (not-for-profit) institution; tuition and fees were approximately 16.1 percent higher.

TABLE 26

Published In-State Tuition and Fees in Postsecondary Institutions in Which the 2003 Cohort of GED® Test Passers Enrolled and of All IPEDS Institutions, by Sector of Institution

Sector of Institution	Published In-State Tuition and Fees			
	Number of Institutions	Mean Cost	Standard Deviation	Maximum Cost
Institutions in Which the 2003 Cohort of GED Test Passers Enrolled:				
Public, Four-Year or Above	515	$4,361	$1,563	$11,950
Private Not-For-Profit, Four-Year or Above	787	$17,288	$5,731	$30,330
Private For-Profit, Four-Year or Above	100	$11,882	$1,948	$18,200
Public, Two-Year	883	$2,266	$1,347	$8,672
Private Not-For-Profit, Two-Year	40	$10,316	$4,968	$35,750
Private For-Profit, Two-Year	70	$10,612	$2,571	$17,995
Public, Less-Than-Two-Year	5	$6,776	$3,720	$10,718
Private Not-For-Profit, Less-Than-Two-Year	1	$7,326	*	$7,326
Private For-Profit, Less-Than-Two-Year	2	$11,664	*	$15,828
All IPEDS Institutions:				
Public, Four-Year or Above	599	$4,393	N/A	N/A
Private Not-For-Profit, Four-Year or Above	1,281	$14,895	N/A	N/A
Private For-Profit, Four-Year or Above	301	$11,926	N/A	N/A
Public, Two-Year	1,097	$2,216	N/A	N/A
Private Not-For-Profit, Two-Year	186	$7,767	N/A	N/A
Private For-Profit, Two-Year	387	$10,245	N/A	N/A
Public, Less-Than-Two-Year	64	$4,755	N/A	N/A
Private Not-For-Profit, Less-Than-Two-Year	30	$7,550	N/A	N/A
Private For-Profit, Less-Than-Two-Year	164	$8,862	N/A	N/A

Sources: Source for institutions in which the 2003 cohort of GED Test passers enrolled is IDB/NSC/NCES/IPEDS match. Source for all IPEDS institutions is NCES/IPEDS Data, 2004.

* Standard deviation was not calculated because of small n.

N/A=standard deviation and maximum cost not provided in NCES/IPEDS dataset.

Notes: Missing n's are for institution data.
Missing n=384.

[34] Exceptions occurred in other sectors, but because of the small sample size of institutions, cost differences were not considered reliable.

The majority of institutions reported the number of men and women who enrolled in 2003–04 (missing n=241). Approximately half again as many women (median=2,605, or 59.2 percent) enrolled as men (median=1,700, or 40.8 percent) in institutions in which 2003 GED passers enrolled. The range of enrollment for women was 0 to 57,092 students, and the range for men was 0 to 39,387 students. The enrollment rates for institutions overall were 42.5 percent for males and 57.5 percent for females.

The same number of institutions reported ethnic balance of their students as well as gender (n=2,546). **Table 27** presents the ethnic balance of institutions overall and those in which 2003 GED passers enrolled. White and African-American 2003 GED passers enrolled most frequently. Institutions in which 2003 GED passers enrolled had a lower percent of Asian and Hispanic students; other percentages are comparable.

Postsecondary Admissions and Enrollment

In approximately half of the institutions in which 2003 GED Test passers enrolled (n=1,431), we could observe further detail on application, admission, and enrollment. In these postsecondary institutions in 2004, a mean of 3,599 prospective students applied, and a mean of 2,222 were admitted, for an admission rate of 61.7 percent. The number of applications ranged up to 44,981, and the number of admissions to 22,297. This rate is important because it provides a measure of how challenging it was for 2003 GED passers to meet admissions criteria.

Of 2,222 admitted students, a mean of 895 enrolled, with a range from 2 to 7,607 enrollees. On average, 1,327 admitted students either enrolled in another institution or did not enroll at all. The mean enrollment rate reported in the IPEDS data for those admitted to institutions in which 2003 GED passers enrolled in 2004 was 40.3 percent. Although 61.7 percent of those who applied were offered a place in one of the institution's postsecondary programs, only one-fourth (24.9 percent) of those who applied actually enrolled. The sizable drop from application to enrollment may stem from a variety of barriers, ranging from eligibility to cost to greater interest in other opportunities. For comparison purposes, the mean number of students who applied overall was 2,118, and the mean number admitted was 1,292. The mean overall admission rate of 61.0 percent is close to the mean admission rate for institutions in which 2003 GED passers enrolled.

We next compared the IPEDS data on enrollment by gender and enrollment status with the data we matched for 2003 GED passers from the GEDTS IDB and the NSC databases. Most of the institutions in which 2003 GED passers enrolled also reported enrollment by gender and enrollment status (that is, full-time or part-time enrollment). More women (mean=492) than men (mean=408) enrolled in fall 2004. Women who enrolled did so on a full-time basis (mean=466) more often than men who enrolled full time (mean=389), but the rates of full-time enrollment are very close.

According to the IDB/NSC data, 38.4 percent of men and 38.1 percent of women with GED credentials enrolled full time, nearly the same rate as the approximated 42.5 percent of men overall and lower than the rate of 57.5 percent for women overall who enrolled full time in postsecondary institutions as reported in the IPEDS data. Although some of the difference could be attributed to the low number of institutions responding to this item in IPEDS

TABLE 27

Ethnic Balance of Postsecondary Institutions in Which the 2003 Cohort of GED® Test Passers Enrolled and of All IPEDS Institutions

Ethnic Group	Postsecondary Institutions in Which the 2003 Cohort of GED Test Passers Enrolled			All IPEDS Institutions
	Median Number	Mean Percent	Standard Deviation	Mean Percent
Black, Non-Hispanic	286	13.2	17.9	12.0
American Indian/Alaska Native	21	1.0	3.5	1.0
Asian/Pacific Islander	71	4.0	6.9	5.9
Hispanic	111	6.8	11.0	11.0
White, Non-Hispanic	2,774	65.5	22.8	59.5

Sources: Source for institutions in which the 2003 cohort of GED Test passers enrolled is IDB/NSC/NCES/IPEDS match. Source for all IPEDS institutions is NCES/IPEDS Data, 2004.

Notes: Missing n's are for institution data.
Missing n for ethnicity=241.

(n=1,416), and enrollment percentages can vary from semester to semester, it appears that the female GED passers from the 2003 cohort enrolled full time less often than their peers in the same institutions.

Open Admissions, Remedial Services, and Daycare Services

Another set of questions we considered addressed open-admissions policies, remedial services, and daycare services. Open-admissions policies were in effect in 41.8 percent of all institutions in which the 2003 cohort of GED Test passers enrolled, yet 83.1 percent of 2003 GED passers enrolled in a school with open-admissions policies; that is, the enrollment of 2003 GED passers was heavily concentrated in approximately two-fifths of the 2003 GED passer institutions, where they could take advantage of open-admissions policies. According to the IPEDS data matched with 2003 GED passer data, 1,027, or 41.8 percent (as shown in **Table 28**), of the institutions in which 2003 GED passers enrolled had open-admissions policies, and according to NCES/IPEDS data (2004), 54.2 percent of institutions overall had them. When we compared open-admissions frequencies from IPEDS with the IDB/NSC data, we observed that 120,041 2003 GED passers, or 83.1 percent of GED passers who enrolled in a postsecondary institution that reported its admissions policies status, enrolled in institutions with open-admissions policies.

Correspondingly, 24,426 GED passers, or 16.9 percent, enrolled in institutions without these policies. The 2003 cohort of GED passers was significantly more likely (odds ratio=1.5, $p<0.001$) to enroll in institutions without open-admissions policies than were non-passers. Non-passers enrolled in institutions with open-admissions policies at a rate of 88.2 percent.

Next, we considered the availability of remedial services and daycare services in the postsecondary institutions serving 2003 GED passers. Remedial courses and other services, such as tutoring, are important to GED credential recipients who may lack confidence or have variable skill levels across subjects. We found that 81.9 percent of institutions in which 2003 GED passers enrolled offered remedial services, compared with 57.6 percent for institutions overall, as displayed in Table 28.

At first glance, the difference between rates for institutions in which 2003 GED passers enrolled and rates for institutions overall appears to be large. However, when we considered that more than three-fourths of students with GED credentials enrolled in two-year colleges, and 77.3 percent of two-year colleges overall that year offered open admissions, the two-year college rate offered a possible explanation for the concentration of 2003 GED passers. Similarly, institutions overall offered remedial services at a rate of 72.1 percent, and students with GED credentials chose institutions where 81.9 percent had remedial services. When we considered the institutional type, the rate for 2003 GED passers was much closer to the two-year college rate of 79.7 percent that offer remedial services. Postsecondary institutions in which 2003 GED passers enrolled and two-year colleges overall had very similar rates for remedial services.

TABLE 28

Features of Postsecondary Institutions in Which the 2003 Cohort of GED® Test Passers Enrolled and of All IPEDS Institutions, by Institutional Group and Level

Feature	Institutional Group	Level of Institution	
		Two-Year Colleges	Four-Year Colleges
Open Admissions (Percent):			
Postsecondary Institutions in Which the 2003 Cohort of GED Test Passers Enrolled	41.8	*	*
All IPEDS Institutions	43.6	77.3	16.9
Remedial Services (Percent):			
Postsecondary Institutions in Which the 2003 Cohort of GED Test Passers Enrolled	81.9	*	*
All IPEDS Institutions	72.1	79.7	67.1

Sources: Source for institutions in which the 2003 cohort of GED Test passers enrolled is IDB/NSC/NCES/IPEDS match. Source for all IPEDS institutions data is Snyder and Tan (2006).

* Not calculated for the 2003 cohort of GED passers.

Notes: Missing n's are for institution data.
Missing n for open admissions=327.
Missing n for remedial services=235.

An additional barrier to further education may be lack of child care, particularly for postsecondary students who are older than the traditional college age, but also for teenagers. The IPEDS data reported whether the institution offered on-campus daycare for students' children. Compared with just 19.4 percent of institutions overall, 39.6 percent of institutions in which 2003 GED passers enrolled offered such daycare services.

Instructional Staff

Our final question concerning postsecondary institutions had to do with instructional staff. The mean number of total staff members in 1,257 of the institutions in which 2003 GED Test passers enrolled was 1,259 (standard deviation=2,384), with a range from 15 to 25,762 on staff. Most staff (mean=799, standard deviation 1,657) were full-time staff.

The mean number of faculty was 469 (standard deviation=604). The mean number of full-time faculty was 247 (standard deviation=430). The mean faculty-to-student ratio was 48.5 to 1 (standard deviation=15.1). In contrast, for institutions overall, the mean number of full-time staff was 333, with 115 full-time faculty members.

DISCUSSION

Chapter Summary

The institutions in which the 2003 cohort of GED Test passers enrolled followed a semester calendar system at a higher rate than institutions overall. The 2003 cohort of GED passer institutions were more than twice as large (mean of 8,249 students) as institutions overall (mean of 3,192 students), and both types were dispersed comparably across the United States. The 2003 cohort of GED passer institutions had a mean of 469 full-time faculty members, significantly higher than for institutions overall, and a faculty-to-student ratio of 48.5 to 1.

More women enrolled in 2003 GED passer institutions than men, and white and African-American students enrolled most frequently. GED passer institutions did not differ significantly from overall institutions by gender or by admission rates. Tuition and fees for 2003 GED passer institutions averaged approximately $8,431 per year in 2004, compared with an $8,541 average for institutions overall. When we looked at differences by sector, only four-year, private (not-for-profit) institutions cost more for institutions in which 2003 GED passers enrolled than for institutions overall.

The mean admission rate for schools in which 2003 GED passers enrolled was 61.7 percent, nearly the same as for institutions overall, but on average only 40.3 percent of those admitted actually enrolled. Men with GED credentials tended to enroll full time at nearly the same rate as men overall in the same institutions; women with GED credentials enrolled full time at a lower rate than their peers overall.

Open-admissions policies were in effect in 41.8 percent of institutions in which GED passers enrolled, a significantly lower rate than for institutions overall, yet 83.1 percent of 2003 GED passers enrolled in a school with open-admissions policies. However, the 2003 cohort of GED passers were significantly more likely to enroll in a school without open admissions than their counterparts who did not pass the GED Test.

We found that 81.9 percent of institutions in which 2003 GED passers enrolled offered remedial services, and 39.6 percent offered daycare services for children of students, rates that were significantly higher than for institutions overall.

Discussion and Implications

The summary of results above offers a first glimpse into the settings in which GED credential recipients chose to continue their education. Although much variability occurs, campuses are mid-size on average, and costs and admission policies reflect institutions overall. In Chapter 2, we discussed the fact that many of the schools tend to offer postsecondary programs of two years or fewer. New enrollees may feel comfortable enrolling on a less-than-full-time basis and entering a school that is likely to offer remedial services. Low-cost, open-admission, two-year colleges may have been the most popular choice for GED Test passers in the cohort.

Postsecondary institutions in which 2003 GED passers enrolled and two-year colleges overall had similar rates for open admissions and remedial services features. Remedial courses and tutoring found in two-year or fewer-than-two-year colleges might be important to adults with GED credentials who may lack confidence or have variable skill levels across subjects, but may not prepare them for their major courses or may exhaust their financial aid before they reach major coursework. By concentrating themselves in institutions with open-admissions policies and

short-term programs, they may restrict their educational options and choices of available programs at the same time. Perhaps the pace of their enrollment is too slow to maintain the momentum needed to finish. Although daycare services were more available in institutions in which GED passers enrolled than in institutions overall, too few daycare services may add a barrier to postsecondary enrollment.

By choosing to enroll in institutions with open admissions, low costs, plentiful faculty, and available remedial services, students with GED credentials may have identified ways to work around barriers that would prevent them from beginning and persisting in college. But the low graduation rate suggests that they do not complete what they begin. A deeper look into the characteristics of institutions and their enrollees would help address these issues.

Educational Background of Postsecondary Enrollees

COMPARISONS BY EDUCATIONAL BACKGROUND

In our final set of analyses, we compared postsecondary findings of GED credential recipients with characteristics and outcomes of traditional high school graduates at the peak time of GED credential recipient enrollment in postsecondary education. According to a recent NCES study (Planty, et al., 2009), approximately 63.9 percent of high school graduates in 2003 enrolled in postsecondary programs at two-year and four-year colleges by the following October.

One data source for these comparisons was the NCES longitudinal study of Beginning Postsecondary Students Longitudinal Study (BPS), as described in Berkner and Choy (2008). The Berkner and Choy report based its findings on a final sample of 23,090 students representing approximately 4 million first-time postsecondary students who began in 2003–04. The study features collected data from 2006 on level and control of institutions they attended, their degree plans, enrollment status, and demographic characteristics. We used Data Analysis System (DAS) data from BPS (NCES/BPS, 2004) to generate specific cross-tabulated reports from the same dataset Berkner and Choy employed. We employed DAS data to make comparisons by educational background between GED credential recipients and the first-time postsecondary students with traditional high school diplomas. Other sources were the *Digest of Education Statistics: 2004* (Snyder & Tan, 2006), which allowed us to estimate, by educational background, the percentage of enrollees who remained in state to begin their postsecondary programs, and the *Digest of Education Statistics: 2008* (Snyder, Dillow, & Hoffman, 2009), which provided limited information about postsecondary degrees earned.

Table 29 displays column percentages of gender, age, and ethnic group for postsecondary students, by educational background. We identified 19,023 postsecondary students with GED credentials who enrolled in the 2003–04 academic year.[35] The balance of gender and all ethnic groups, except American Indian/Alaska Native, was similar. Proportionately more American Indian GED credential recipients enrolled in postsecondary programs than did traditional high school graduates. Approximately the same percentages of students aged 16 to 18 years and 30 years and older enrolled by educational background. However, more GED credential recipients enrolled in their 20s, and more traditional high school graduates enrolled at age 19.

TABLE 29

Gender, Age, and Ethnic Group of Postsecondary Students, by Educational Background (2003–04 Academic Year)

Demographic Characteristics	Educational Background	
	2003 Cohort of GED® Test Passers	Traditional High School Graduates
Total Number of Students	19,023	3,833
Gender (Percent):		
Male	45.9	42.5
Female	54.1	57.5
Age in 2003 (Percent):		
16 to 18 Years[1]	40.8	46.0
19 Years	11.5	25.2
20 to 23 Years	20.2	11.4
24 to 29 Years	12.8	6.3
30 Years and Older	14.7	11.2
Ethnic Group (Percent):		
Hispanic	13.8	14.4
African American	16.2	13.1
White	64.2	63.5
American Indian/Alaska Native	1.5	0.6
Asian	3.8	4.1
Native Hawaiian/Pacific Islander	0.6	0.4

Sources: GED Testing Service Data, 2003; National Student Clearinghouse Data, 2009; NCES/BPS Data, 2004.

[1] NCES data for traditional high school graduates include ages 15 to 18 years.

Notes: Missing n's are for GED Testing Service data.
Missing n for gender=179.
Missing n for age=26.
Missing n for ethnic group=2,036.

[35] These 19,023 postsecondary students with GED credentials were not necessarily first-time enrollees.

Next we questioned how type of institution differed for GED credential recipients and for traditional high school graduates who entered postsecondary education. In addition to considering two-year, four-year, and less-than-two-year institutions in the aggregate, we examined differences by gender. **Table 30** displays percentages of GED credential recipients and traditional high school graduates (in columns) and percentages of each gender (in rows) within each institutional type. GED credential recipients tended to enroll in two-year colleges nearly twice as often as traditional high school graduates; traditional high school graduates enrolled more than twice as often in four-year and more than 20 times as often in less-than-two-year colleges.

When disaggregated by gender, two-year colleges had similar gender balances, with more females enrolling, whether they were GED credential recipients or traditional high school graduates. In four-year colleges, the gender balance was even for GED credential recipients, but more female traditional high school graduates enrolled. In fewer-than-two-year colleges, there were more male GED credential recipients and more female traditional high school graduates.

An additional question addressed whether attendance patterns differed for GED credential recipients and for traditional high school graduates. We again looked at categories (full-time, half-time, and less-than-half-time) in the aggregate and checked for differences by gender. **Table 31** displays column percents for GED credential recipients and traditional high school graduates and row percents for gender within each attendance pattern. Although GED credential–recipient percentages differ from attendance percentages by gender presented in Chapter 2 because of the smaller sample enrolling in 2003–04, more students attended full time, regardless of educational background. Gender balances were comparable for both educational backgrounds.

For our fourth analysis question, we sought to compare traditional high school graduates with GED credential recipients for degree attainment.[36] As shown in Table 13, the number of GED credential recipients who received associate degrees was nearly twice the number who received bachelor's degrees between 2003 and 2009. According to the most recent *Digest* (Snyder, Dillow, & Hoffman, 2009), the latest data available show that from 2003 to 2007, more than twice the number of bachelor's degrees compared with associate degrees were earned. Although the exact breakdown by educational background was not available, it is reasonable to expect that the digest would contain a much higher proportion of traditional high school graduates than GED credential recipients. If that is the case, it is reasonable to conclude that GED credential recipients tend to earn a higher proportion of associate degrees, and

TABLE 30

Level of Institutions in Which Postsecondary Students Enrolled, by Educational Background and by Gender (2003–04 Academic Year)

Level of Institutions	Educational Background	Gender	
		Male	Female
2003 Cohort of GED® Test Passers (Percent):			
Four-Year College	22.2	50.5	49.5
Two-Year College	77.4	44.5	55.5
Less-Than-Two-Year College	0.4	72.7	27.3
Traditional High School Graduates (Percent):			
Four-Year College	48.1	44.0	56.0
Two-Year College	43.6	44.0	56.0
Less-Than-Two-Year College	8.3	26.9	73.1

Sources: GED Testing Service Data, 2003; National Student Clearinghouse Data, 2009; NCES/BPS Data, 2004.

Notes: Missing n's are for GED Testing Service data. Missing n for gender with level of institution=179.

TABLE 31

Attendance Patterns of Postsecondary Students, by Educational Background and by Gender (2003–04 Academic Year)

Attendance Pattern	Educational Background	Gender	
		Male	Female
2003 Cohort of GED® Test Passers (Percent):			
Full-Time	55.2	48.1	51.9
Half-Time	33.3	41.6	58.4
Less-Than-Half-Time	11.5	49.6	50.4
Traditional High School Graduates (Percent)[1]:			
Full-Time	69.4	42.9	57.1
Half-Time	19.5	40.9	59.1
Less-Than-Half-Time	11.1	43.6	56.4

Sources: GED Testing Service Data, 2003; National Student Clearinghouse Data, 2009; NCES/BPS Data, 2004.

[1] Attendance patterns categories for traditional high school graduates are "always full-time," "part-time," and "mixed."

Notes: Missing n's are for GED Testing Service data. Missing n for gender with attendance=5,970.

[36] National Student Clearinghouse collected degree type only for postsecondary students who graduated. Neither Snyder, Dillow, and Hoffman (2009) nor Snyder and Tan (2006) reported numbers of certificates earned.

traditional high school graduates earn a higher proportion of bachelor's degrees.

Our final comparisons by educational background were for state of enrollment and postsecondary tuition and fees. In Chapter 2, we noted that 83.1 percent of 2003 GED Test passers enrolled in a postsecondary institution in the same state in which they passed the GED Test. Only 16.9 percent left the state to enroll in college or university. According to Snyder and Tan (2006), in fall 2002[37] 84.0 percent of all freshmen students enrolled in postsecondary education in their home state; 16.0 percent enrolled outside their home state. We concluded that percentages of in-state enrollment were comparable by educational background.

Using the NCES/BPS (2004) data, we attempted to compare 2003–04 tuition and fees by sector for institutions in which GED credential recipients enrolled in contrast with costs for those with traditional high school diplomas. However, because of the small number of GED credential recipients, the average tuition cost by sector was not as reliable as when we compared cost by sector using institution-level data. We therefore reported only the institutional-level costs, as shown in Table 26.

DISCUSSION

Although it is tempting to focus on the differences between GED credential recipients and traditional high school graduates as they enter postsecondary education, the similarities are even more striking. Our initial reaction was that the message about pursuing postsecondary education seems to have reached across longstanding gender, ethnic, and age gaps, both for regular high school graduates and GED credential recipients. Even though we were intrigued with the higher proportion of American Indian GED credential recipients and some differences by age, the similarities gave us the most pause.

It may be more telling that, for GED Test passers and traditional high school graduates alike, more females entered postsecondary education than males. Similarly, regardless of educational background, 16- to 18-year-olds enrolled at similar rates, as did students who were aged 30 and older. More females have enrolled in college than males since the early 1980s (King, 2010; Planty, et al., 2009), and the balance appears similar for postsecondary students with GED credentials, even though more males obtain GED credentials (ACE, 2009). It is also promising that attendance patterns were comparable and that in-state enrollment is similar.

The higher percentage of associate degrees and lower percentage of bachelor's degrees is not surprising given the likelihood of adults with GED credentials to attend two-year or fewer-than-two-year institutions. The postsecondary enrollment rate for traditional high school graduates (63.9 percent) is certainly higher than that for GED credential recipients (42.9 percent). More traditional high school graduates than GED passers entered at age 19, but the reverse was true for students in their 20s. A greater percentage of adults in their 20s with GED credentials pursued postsecondary programs, which may not be surprising considering the average age of GED credential recipients was 23.8 years in 2003 (ACE, 2005). Yet the differences of the GED credential recipient population are generally not reflected in common characteristics and are not as alarming as Tyler and Lofstrum (2008) found for at-risk 8th graders. More evidence is needed to better understand the nature of these similarities by educational background.

Chapter Summary

Our remaining task was to compare GED credential recipient demographic characteristics, attendance, degrees earned, and institutional characteristics with those of traditional high school graduates. How did they differ and how were they similar?

We found similarities in gender and ethnic background. Very young students enrolled in similar proportions from either educational background, as did adults aged 30 and older. Regardless of educational background, more students attended full time than any other attendance pattern. Similar percentages of GED credential recipients and traditional high school graduates enrolled in their home state.

Differences included a higher proportion of American Indians with GED credentials and of students in their 20s with GED credentials entering postsecondary education. Students with GED credentials tended to enroll in two-year colleges and pursue associate degrees more often than traditional high school graduates. They also tended to pursue bachelor's degrees less often than traditional high school graduates.

[37] Data for fall 2003 were not provided; the corresponding percentage for fall 2004 was 83.0 percent.

Limitations and Future Research

A first limitation of the study is missing data. Although GED Testing Service datasets were as complete as possible, some data were unmatchable from the outset. Some demographic variables had sizable percentages of missing data that GED Test candidates did not supply when testing; an analysis of recent GED testing demographic data indicated that records with missing data did not differ systematically from records with no missing data (Medhanie & Patterson, 2009). In addition, data from the National Student Clearinghouse were missing for a number of variables. These data (less than 3 percent) were either not supplied from the postsecondary institution, were blocked by the institution, or were blocked by individual students. We have no evidence that these missing data would bias study results; the occurrence of missing data appears to be random. Amounts of missing data were supplied for each table of data in this report as available so that the reader may interpret results accordingly.

As noted earlier, the number of GED credential recipients who enrolled in postsecondary education may be underreported. Data from 4,239 institutions were not collected in the National Student Clearinghouse dataset and therefore could not be matched for our study. Of institutional data from 4,239 U.S. and outlying area institutions identified in IPEDS (NCES/IPEDS, 2004) for 2003–04 but not in NSC, 70.5 percent came from postsecondary schools that offer programs of two years or less. Further, 71.7 percent of those 4,239 schools with programs of two years or fewer were private, for-profit schools, and 17.9 percent were public institutions. This lack of data was concentrated in 14 states that have at least 100 institutions that could not be matched through the NSC database; 62.4 percent of the 4,239 schools were located in these 14 states: California, Florida, Illinois, Louisiana, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, and Texas. Although the number of unmatched schools is large and concentrated in a small number of states, enrollment that could not be matched through the NSC database accounts for approximately 7 percent of all postsecondary students, and GED credential recipients represent only a fraction of that 7 percent.

Another limitation of the study is that it was not designed as an experimental study, and therefore no causal inferences may be made from the data. Although we provided numerous descriptive and predictive results, these results must be interpreted in the context of association and explanation, not as cause and effect. We have identified many significant relationships and differences, either at the individual or institutional level, but the reasons they occur could be numerous and varied.

For survival analyses of enrollment and graduation, we estimated only the main effects of each predictor variable. There may be some interactions among predictors which could differently influence the relationship between predictors and the possibility of enrollment and graduation. Also, our graduation models did not consider any existing delays from the GED Test pass date to the postsecondary enrollment date as a covariate. Future analyses could also include possible interactions and covariates in the multivariate models.

Our suggestions for future research are noted throughout the paper. We plan to produce additional papers from the datasets employed in this study to provide more description and detail on several topics. These topics include barriers to persistence, lower male enrollment and males completing single-semester programs, the relationship between getting a better job and postsecondary education, persistence of GED Test passers who have a primary language other than English, and how GED passers with educational reasons for GED testing realize (or don't realize) their goals. Another topic involves further analysis of enrollment patterns for GED passers enrolling in programs of two years or shorter, particularly for those who stop out of postsecondary programs and later return. A comparison of characteristics of GED passers who enter postsecondary programs with other nontraditional adult learners, particularly considering age and gender, also would be informative.

We also plan further predictive analysis using multilevel analysis techniques to model the retention of GED passers in two-year programs. We plan to look at a cross-section of individual-level characteristics and institutional characteristics as they change across time. Using survival analysis, we plan to predict retention rate of GED passers in two-year programs or shorter, with particular consideration of gender, age, ethnicity, and primary language. Another proposed study would examine the patterns of educational resilience of GED credential recipients from secondary through postsecondary education.

In the future, we plan to follow up with the 2003 cohort of GED passers to determine if additional GED passers have enrolled, returned from stopping out, or graduated. Our report on the second cohort year, 2004, from the population data is planned for early 2011 and will provide even further insights into the postsecondary experiences of GED credential recipients.

References

Agresti, A. (1996). *An introduction to categorical data analysis*. New York, NY: John Wiley & Sons.

American Council on Education (ACE). (2005). *Who passed the GED Tests? 2003 GED statistical report*. Washington, DC: GED Testing Service.

American Council on Education (ACE). (2009). *2008 GED testing program statistical report*. Washington, DC: Author.

Barth, P. (2001). Youth at the crossroads: Facing high school and beyond. *Thinking K–16*. Washington, DC: Education Trust.

Behal, E. (1983). *After the GED Tests: Postsecondary education enrollment patterns and perceptions of GED examinees*. GED Testing Service Research Studies No. 5. Washington, DC: American Council on Education.

Berkner, L., & Choy, S. (2008). *Descriptive summary of 2003–04 beginning postsecondary students: Three years later* (NCES 2008-174). Washington, DC: National Center for Education Statistics.

Boudett, K., Murnane, R., & Willett, J. (2000). "Second-chance" strategies for women who drop out of school. *Monthly Labor Review, 123*(12), 19-32.

Bureau of Labor Statistics. (2009). *Occupational outlook handbook: 2010–2011*. Washington, DC: U.S. Department of Labor. Retrieved January 14, 2010, from www.bls.gov/oco/oco1001.htm.

Chimka, J., Reed-Rhoads, T., & Barker, K. (2007). Proportional hazards models of graduation. *Journal of College Student Retention, 9*(2), 221-232.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Comings, J., Parrella, A., & Soricone, L. (1999). *Persistence among adult basic education students in pre-GED classes*. Cambridge, MA: National Center for the Study of Adult Learning and Literacy (NCSALL).

Council for Adult and Experiential Learning (CAEL). (2008). *Adult learning in focus: National and state-by-state data*. Chicago, IL: Author. Retrieved May 15, 2008, from www.cael.org.

Council for Advancement of Adult Literacy (CAAL). (2008). *Reach higher, America: Overcoming crisis in the U.S. workforce*. New York, NY: Author.

Cox, D. (1972). Regression models and life tables (with discussion). *Journal of the Royal Statistical Society, Series B, 34*(2), 187-220.

Duke, A., & Ganzglass, E. (2007). *Strengthening state adult education policies for low-skilled workers*. Retrieved August 21, 2008, from www.workingpoorfamilies.org.

Ethington, C. (1990). A psychological model of student persistence. *Research in Higher Education, 31*, 279-293.

Georges, A. (2001). The GED certificate and the poverty status of adult women. *Journal of Children & Poverty, 7*(1), 49-61.

Grissom, R., & Kim, J. (2005). *Effect sizes for research: A broad practical approach*. Mahwah, NJ: Lawrence Erlbaum Associates.

Hanni, M. (2008). *The economic value of the GED: Data from Utah*. Salt Lake City, UT: Department of Workforce Services.

Harris, L., & Ganzglass, E. (2008). *Creating postsecondary pathways to good jobs for young high school dropouts: The possibilities and the challenges*. Washington, DC: Center for American Progress.

Kaplan, E., & Meier, P. (1958). Nonparametric estimation from incomplete observations. *Journal of the American Statistical Association, 53*, 457-481.

King, J. (2010). *Gender equity in higher education: 2010*. Washington, DC: American Council on Education, Center for Policy Analysis.

Kirk, R. E. (1996). Practical significance: A concept whose time has come. *Educational and Psychological Measurement*, 56, 746-759.

Lofstrum, M., & Tyler, J. (2005). *Is the GED an effective route to postsecondary education?* Unpublished manuscript.

Maralani, V. (2006). *From GED to college: The role of age and timing in educational stratification*. Los Angeles, CA: California Center for Population Research. Retrieved August 22, 2008, from www.ccpr.ucla.edu/ccprwpseries/ccpr_005_03.pdf.

Medhanie, A., & Patterson, M. (2009). *Policies of test centers and jurisdictions and GED candidate test performance*. Research Studies 2009-6. Washington, DC: GED Testing Service. Retrieved January 4, 2010, from www.gedtest.org.

Murnane, R., Willett, J., & Boudett, K. (1997). Does a GED lead to more training, postsecondary education, and military service for school dropouts? *Industrial and Labor Relations Review, 51*(1), 100-116.

Murnane, R., Willett, J., & Boudett, K. (1999). Do male dropouts benefit from obtaining a GED, postsecondary education, and training? *Evaluation Review, 23*(5), 475-503.

Murnane, R., Willett, J., & Tyler, J. (2000). Who benefits from obtaining a GED? Evidence from high school and beyond. *The Review of Economics and Statistics, 82*(1), 23-37.

Murtaugh, P., Burns, L., & Schuster, J. (1999). Predicting the retention of university students. *Research in Higher Education, 40*(3), 355-371.

National Center for Education Statistics (NCES/BPS). (2004). *Beginning postsecondary students longitudinal study*. Retrieved February 4, 2010, from http://nces.ed.gov/dasol/index.asp.

National Center for Education Statistics (NCES/IPEDS). (2004). *Integrated postsecondary education data system*. Retrieved December 8, 2009, from http://nces.ed.gov/ipeds/.

Ou, S. (2008). Do GED recipients differ from graduates and school dropouts? Findings from an inner-city cohort. *Urban Education, 43*(1), 83-117.

Parker, J., Hogan, M., Eastabrook, J., Oke, A., & Wood, L. (2006). Emotional intelligence and student retention: Predicting the successful transition from high school to university. *Personality and Individual Differences, 41*(7), 1329-1336.

Patterson, M., Song, W., & Zhang, J. (2009). *GED candidates and postsecondary educational outcomes: A pilot study*. Research Studies 2009-5. Washington, DC: GED Testing Service. Retrieved January 4, 2010, from www.gedtest.org.

Peto, R., & Peto, J. (1972). Asymptotically efficient rank invariant procedures. *Journal of the Royal Statistical Society*, A135, 185-207.

Planty, M., Hussar, W., Snyder, T., Kena, G., KewalRamani, A., Kemp, J., Bianco, K., & Dinkes, R. (2009). *The condition of education 2009* (NCES 2009-081). Washington, DC: National Center for Education Statistics.

Reder, S. (1999). Adult literacy and postsecondary education students: Overlapping trajectories. *Review of Adult Literacy and Learning,* Vol. 1. Retrieved August 21, 2008, from www.ncsall.net/?id=523.

Reder, S. (2007). *Adult education and postsecondary success*. New York, NY: Council for Advancement of Adult Literacy. Retrieved June 5, 2009, from www.nationalcommissiononadultliteracy.org/content/rederpolicybriefrev10807.pdf.

Singer, J., & Willett, J. (1993). It's about time: Using discrete-time survival analysis to study duration and the timing of events. *Journal of Educational Statistics, 18*, 155-195.

Singer, J., & Willett, J. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York, NY: Oxford University Press.

Slavin, R., & Smith, D. (2009). The relationship between sample sizes and effect sizes in systematic reviews in education. *Educational Evaluation and Policy Analysis, 31*(4), 500-506.

Snyder, T., Dillow, S., & Hoffman, C. (2009). *Digest of education statistics: 2008* (NCES 2009-020). Washington, DC: NCES.

Snyder, T., & Tan, A. (2006). *Digest of education statistics: 2004* (NCES 2006-005). Washington, DC: NCES.

Song, W., & Hsu, Y. (2008). *Economic and noneconomic outcomes for GED credential recipients*. Research Studies 2008-2. Washington, DC: GED Testing Service. Retrieved May 4, 2008, from www.gedtest.org.

Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student leaving. *Journal of Higher Education, 59*(4), 438-455.

Tinto, V., Russo, P., & Kadel, S. (1994). Constructing educational communities: Increasing retention in challenging circumstances. *Community College Journal, 64*, 26-30.

Tyler, J. (2003). Economic benefits of the GED: Lessons from recent research. *Review of Educational Research, 73*(3), 369-403.

Tyler, J. (2005). The General Educational Development (GED) credential: History, current research, and directions for policy and practice. In Comings, J., Garner, B., & Smith, C. (Eds.), *Review of Adult Learning and Literacy*, *Vol. 5: Connecting Research, Policy, and Practice* (pp. 45-84). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Tyler, J., & Berk, J. (2008). *Low-skilled workers and the Rhode Island labor market: The role of education credentials*. Unpublished manuscript, Providence, Rhode Island: Brown University.

Tyler, J., & Lofstrum, M. (2008). *Is the GED an effective route to postsecondary education for school dropouts?* National Bureau of Economic Research. Retrieved December 22, 2009, from www.nber.org/papers/w13816.

Wirt, J., Choy, S., Provasnik, S., Rooney, P., Sen, A., & Tobin, R. (2003). *The condition of education 2003*. Washington, DC: National Center for Education Statistics.

Zhang, J., Han, M., & Patterson, M. (2009). *Young GED examinees and their performance on the GED Tests*. Research Studies 2009-1. Washington, DC: GED Testing Service. Retrieved August 10, 2009, from www.gedtest.org.

www.GEDtest.org