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**THE RELATIONSHIP BETWEEN NON-EMPLOYMENT AND RESPONDENT
PERSONAL CHARACTERISTICS, COLLEGE MAJOR, GPA AND WORK
EXPERIENCE AMONG 1992-1993 COLLEGE GRADUATES**

A Thesis in

Workforce Education and Development

by

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ABSTRACT

This study used event history and multinomial logistic regression analysis to determine whether a relationship exists between both the number of spells and the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally-representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year.

Longitudinal data from the National Center for Education Statistics called Baccalaureate and Beyond were used. Retrospective work history for four years after graduation was examined and the frequency and duration of non-employment spells were totaled for a subsample of 8254 college graduates. Six research questions were developed to examine the B&B:93/97 data by using two statistical procedures and by drilling down into the data by different personal characteristics such as race and gender. With the exception of GPA, significant relationships were discovered between non-employment and the independent variables. Surprisingly-strong relationships were discovered between both the duration and number of spells of non-employment and the number of jobs held prior to graduation. Implications based on these findings and areas for further research are included.

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Chapter 1

INTRODUCTION

Overview

Choosing to go to college can be one of the most important decisions made by a high school graduate, yet it is reported (Sewell & Shah, 1976; Chronicle of Higher Education, 2001; Kroc, Howard & Woodward, 1997; Strasser, Ozgur, & Schroeder, 2002) that the decision-making process students go through both before and after matriculation is often a complex process. According to the U.S. Department of Labor, Bureau of Labor Statistics (2002a), slightly more than 61% of 2001 high school graduates were enrolled in colleges or universities during the fall semester of 2001.

The two most frequently-proffered reasons for choosing to attend college, as indicated in a 1998 survey conducted by the Higher Education Research Institute (1999) at UCLA's Graduate School of Education and Information Studies, were "to be able to get a better job" (76.9%) and "to be able to make more money" (74.6%). With such a large percentage of high school students matriculating to college immediately following high school, and with so many indicating that they are doing so to get a better job, the relationship between employment outcomes and college completion should be of high interest to students, educators and policy-makers.

The Purpose of the Study

Outcomes of education are often reported using factors such as average salary and employment status (U.S. Department of Labor Bureau of Labor Statistics [USDOL BLS], 2000; U.S. Department of Education National Center for Education Statistics [USDOE NCES], 2000). If they were made aware of these statistics, graduating high school seniors should be in a better position to make reasonable judgments about when and whether or not to go to college, which major to choose, and possibly what career paths to follow.

However, another factor that may provide an even greater insight into the benefits of a college education is gaining and keeping employment. The purpose of this study is to determine whether a relationship exists between the duration and the number of spells of non-employment and personal characteristics, college major, GPA and work experience among a nationally-representative sample of graduates who received bachelor's degrees in the 1992-1993 academic year.

The Conceptual Framework

In order to understand the basis and rationale for this study, it is important to clearly describe the conceptual framework which underlies this particular type of research. If results of the research are to be used to make better policy for postsecondary education, student outcomes should be defined and analyzed in a structured and in a format comparable to other NCES studies. To this end, the National Postsecondary

Education Cooperative (NPEC) was formed to “improve the utility of information for policy-making at all levels and in all sectors of the postsecondary education enterprise.” (USDOE NCES, 1997, p. 2) The Student Outcomes from a Policy Perspective Working Group of the NPEC developed a report which identified policy issues facing American higher education and proposed a twelve-domain student outcomes taxonomy which postsecondary institutions hope to achieve during the educational process (see Table 1).

A model with much greater detail is Lenning’s (1977) structure for the outcomes of postsecondary education. However, Lenning’s National Center for Higher Education Management Systems (NCHEMS) structure, which was used by the NPEC working group to develop their taxonomy, is complex and well beyond the scope of the analysis in this thesis. Further, only a subcomponent of what the working group proposes will be explored in this focused analysis.

The NPEC taxonomy of student outcomes is important from at least two perspectives. First, it was developed for use by postsecondary institutions as a foundation on which to base and create policy. Second, some items identified in the taxonomy are also identified by students as the top two reasons for choosing to attend college (Higher Education Research Institute, 1999). As listed in Table 1, there are both occupational achievement outcomes (preparing the student for work and giving them workplace skills) and attainment of student goals (success in transitioning from education to work, economic impacts such as income, and quality of life such as a sense of well-being). Though there are many items in this outcomes taxonomy, those related to occupational outcomes and attainment of certain student goals are what are the focus of this study. The probability of employment will be measured since “getting a better job” is both the number-one reason for choosing college (Higher Education Research Institute,

1999) and is also identified as an important student outcome for postsecondary institutions (USDOE NCES, 1997).

Table 1. *A Taxonomy of Student Outcomes*

Educational/Training Achievement

Academic

Communication and Computational Skills: Reading, writing, and oral communication; quantitative/computational skills; information acquisition skills (technological and otherwise)

Higher-Order Cognitive and Intellectual Development: Critical thinking, problem solving, analytical

and evaluative skills, formal and postformal reasoning, conceptual complexity, creativity, moral reasoning (as a process)

Content Learning: General (breadth) and specific (depth) of knowledge

Occupational

Occupational Preparation: Knowledge and skills specific to an occupation; occupational choice; occupational status; job placement; licensure; job satisfaction; performance; productivity; promotability; occupational mobility; employer satisfaction, occupational aspirations

Workplace Skills: Motivation to perform in the workplace, dependability, adaptability, persistence, initiative, leadership skills, ability to work independently and in groups

Developmental

Psychosocial Development: Autonomy, tolerance for diversity, intellectual orientation, interpersonal skills and maturity, motivation (generic), identity development, self-concept and self-esteem, personal adjustment

Attitudes, Values, and Beliefs: Occupational, educational, cultural (arts), social, political, religious, interpersonal (e.g., diversity), standards of conduct, orientation to life-long learning

Civic Development: Group affiliations/memberships, citizenship, community involvement, voting Participation

Attainment of Student Goals

Educational Success: Retention/persistence, educational aspirations, educational attainment, course/program/ degree completion, time-to-degree, satisfaction

Success in Transitions: Education-to-work, education-to-education, work-to-education

Economic Impacts: Income, return on investment, standard of living, geographic mobility, educationally-related financial indebtedness

Quality of Life: Sense of well-being, health, consumer behaviors, savings and investment behaviors, leisure activity

Source: USDOE NCES, 1997, p. 8.

Organization of the Thesis

This thesis is divided into five chapters. Chapter 1 is an introduction and describes the purpose, the research questions and the conceptual framework on which this study is based.

Chapter 2 contains a review of the related literature on employment outcomes for those with a baccalaureate degree. The second chapter also describes the process that students follow when making decisions about college both before and after matriculation. The purpose of chapter 2 is to provide background information that will enable the reader to better understand the employment outcomes experienced by college graduates and to lay the foundation for the research conducted in this study.

Chapter 3 describes the following: the source of the data used in this analysis; the target population; the refinement of the data to derive a representative sample; the independent and dependent variables; the research questions; and the type of analysis performed.

Chapter 4 presents findings from this study organized around the research questions hypothesized in the third chapter.

Finally, chapter 5 highlights and summarizes the results of the study, presents conclusions, and outlines recommendations for further research.

Chapter 2

REVIEW OF THE LITERATURE

Introduction

According to the U.S. Department of Education, National Center for Education Statistics (2001), college costs continue to rise at both public and private institutions. For the 2000-01 academic year, average annual costs for undergraduate tuition, plus room and board were estimated to be \$7,621 at public colleges and \$21,423 at private colleges. These costs are not insignificant and can create a huge financial burden for both the college student and/or their family.

The *human capital theory* views education as an investment whereby education and training should make a worker more productive and thus have a positive effect on earnings (Strober, 1990). If college costs continue to rise and if these financial investments in human capital are supposed to make a worker more productive and wealthy, one would hope to find that the productivity and financial gains are realized and are consistent for all of those who choose to earn a postsecondary degree. One would also hope that students contemplating college and that those who have influence on the student make informed decisions about the myriad of options facing them and the implications that those decisions might have for their future.

Outcomes after college such as labor force status and earnings are measured and are commonly reported by many government agencies, including the Department of

Labor and Department of Education. This review of literature examines many of the reports by these government agencies as well as research related to postsecondary education outcomes. Many of the studies reviewed involve differences in outcomes based upon variables such as race, gender, and age as well as outcomes based on the decisions students make, such as choice of major and delayed entrance into college. Studies that determined why students chose to go to college and how and why they made decisions after matriculation were also reviewed to provide the reader with a better understanding of the decision-making processes followed by the students. These processes are important if students, those who influence students, and relevant policy-makers are to make more informed decisions about the value of investments in college education and about the potential benefits that may be realized once the graduate enters the labor market.

Matriculation to College

According to the U.S. Department of Labor, Bureau of Labor Statistics (2002a), slightly more than 61% of 2001 high school graduates were enrolled in colleges or universities during the Fall semester immediately following graduation. This rate changed little from the previous two years but was down from a high of 67% in 1997. Further, the enrollment rate of young women was 63.6% compared with 59.8% for young men, while the percentage of white high school graduates (63.1%) exceeded both black (54.8%) and Hispanic (51.5%) graduates by at least eight percentage points.

The primary two reasons for choosing college, as indicated in a 1998 survey conducted by the Higher Education Research Institute (1999) at UCLA's Graduate School of Education and Information Studies, were "to be able to get a better job" (76.9%) and "to be able to make more money" (74.6%). The aforementioned number one reason for entering college remained unchanged as cited by Gray (1996) who described the phenomenon as a "desire to gain an advantage in the labor market."

College Choices

Although the research indicates that the number one reason cited by students for entering college was to get a better job, it is interesting to note what factors were found to have influenced students to go to college in the first place and what processes they went through when making important decisions such as choice of major. In 1976, Sewell and Shah studied a randomly-selected cohort of 10,318 Wisconsin high school seniors. The researchers found many factors that influenced a high school graduate to matriculate to college. While variables such as gender and high school achievement were controlled for, social class, intelligence, parental encouragement and educational aspirations were the main variables studied. Sewell and Shah confirmed previous studies and concluded that socioeconomic status, intelligence and parental encouragement all significantly affected the college plans of both males and females. Of the three factors, parental encouragement was found to be the strongest, explaining about 25% of the variance in college plans in males and about 33% in females.

Once in college, students often admit that they do not have a clear vision for the future, with 8% indicating that they were undecided and 15% of entering freshmen expressing the possibility that they will change their major (Chronicle of Higher Education, 2001). Kroc, Howard and Woodward (1997) as cited in Strasser, Ozgur and Schroeder (2002), found that 72% of freshman who initially chose a major changed their major before graduating. This is a remarkably high percentage of students who ultimately changed pathways.

In order to help business colleges predict what majors students will choose, Strasser, et al. (2002) analyzed the decision criteria used by students when choosing a major. They developed a model that predicted a student's first choice of major with 88% accuracy for sophomores and seniors. Though these results are impressive, the sample size was only 112 students in one college and at one period in time. However, Strasser states that this study compared favorably to previous studies that were able to classify 80% of their students.

The outcomes of Strasser's study developed three levels of criteria using priority scores as indicated by the student. Level one, the main subset, ranks the following criteria: *interest in the subject*, *influence of others*, and *career*, where career included compensation, job availability and growth. Interest in the subject was the highest student-ranked factor followed by influence of others and career.

It appears as though the factors that affect students and the rationale they use shift dramatically once the students have enrolled in college courses. Prior to matriculating, parents' influence and the students' desire to get a job are the top reasons mentioned by students. Once enrolled, at least for business majors, interest in the subject outweighs

both career outcomes and influence from others combined as the reason for choosing a major. Further, 72% of freshmen change their majors at least once, which could imply that students, at such an early age, do not have a clear vision for their future.

A question that arises from these facts is, “Are college graduates able to find better jobs than non-graduates?” Although it is difficult to determine if a “better” job was obtained after college, there are some measures that can be made on the outcomes of receiving a bachelor’s degree and the investment in human capital.

Baccalaureate Degree Employment Outcomes

After students graduate, what lies ahead? The U.S. Department of Labor’s Bureau of Labor Statistics (2000) paints a promising picture for future jobseekers. The following is the abstract from a report titled *The outlook for college graduates, 1998-2008*:

Through 2008, jobseekers with bachelor’s degrees should expect a graduation gift from baby boomers: a promising job market. For the first time in many years, a Bureau of Labor Statistics analysis finds that total college-level job openings between 1998 and 2008 will nearly equal the number of college educated entrants to the labor force. In addition to encountering a more favorable job market, college graduates usually enjoy other benefits associated with more education. Notably, college graduates as a whole have lower unemployment and higher median earnings than do less-educated members of the labor force. (p. 3)

In the final pages of the same report, projected figures show that there will be approximately 462,000 job openings each year between 1998 and 2008, but estimate that an annual average of more than 90,000 college graduates will enter positions that do not require skills learned in a bachelor’s degree program. According to these government statistics, almost 20% of college graduates each year until 2008 will be employed but that

they will be working as a “retail sales worker, waiter and waitress, mechanic and repairer, information clerk, records processing clerk and adjuster and investigator and in miscellaneous support occupations such as bank teller.” (p. 9)

A similar USDOL BLS report published in 2002 projected the outlook and earnings for college students graduating between 2000 and 2010. Having a college degree is listed as one of the best ways to gain and maintain a competitive advantage over non-college-educated adults of the same age. Benefits of a college degree include more career options, better promotion opportunities, higher earnings, and lower unemployment.

Earnings were clearly higher for those with college degrees (USDOL BLS, 2002), with real earnings (median earnings adjusted for inflation) rising 6% between 1992 and 2000 for workers with a bachelor’s degree compared to an increase of only 2% for those with only a high school diploma. In the same period, however, there were greater differences in earnings between the lowest 10% and highest 10% of wage earners. For those whose wages were in the top 10%, earnings rose 16% more in 2000 compared to 1992 while earnings for those whose wages were in the lowest 10% increased by only 5% in the same period.

Unemployment was 1.7% lower for those with a bachelor’s degree during 2000 compared to those with only a high school diploma. This difference in the employment rate may be due to the fact that employers often view college graduates as their first choice, feeling that “compared to non-college-educated workers, college graduates are more motivated, learn tasks more quickly, are better able to meet deadlines, and have better problemsolving and communication skills.” (USDOL BLS, 2002, p. 13)

The Bureau of Labor Statistics (2002) projects that both earnings and employment through 2010 are also particularly favorable for college graduates compared to those without a degree. However, some of the increase in employment (or decrease in underemployment) may be attributed to both a revision of the occupational classification system used by the agency and what is called “educational upgrading.” Educational upgrading is the process of filling positions that typically do not require a college degree with college graduates. For instance, in the year 2000, 44% of flight attendants aged 25 to 34 held a college degree compared to 28% of flight attendants overall (USDOL BLS, 2002).

Do some of the projections to 2010 mean that a college degree is the only way to achieve high wages and employment? According to both Gray (1996) and the Department of Labor’s Bureau of Labor Statistics (1999a), this is not the case. The BLS reported that over 9 million, or 15%, of workers age 25 or older who didn’t have a bachelor’s degree in 1998 earned more than the median earnings of college graduates. Gray asserts that education at the certificate or associate’s degree level can create “another way to win” in a high-skills job or industry which can generate high wages and lifetime earnings “equal to or greater than those earned by four-year college graduates.” A question that arises is whether parents, who exert the greatest influence on their children in terms of deciding to go to college, influence their children to choose to obtain something other than a four-year baccalaureate degree.

In a separate study, the USDOL BLS (1998b) also analyzed historical trends. The study found that, between the ages of 18 and 32, people hold an average of 8.6 jobs, and that those who eventually obtained a college degree usually held more jobs between the

ages of 18 and 22 than did those who ended their formal education after high school graduation or before. Although reasons for this turnover were not identified, it is plausible to theorize that college graduates are either not prepared for the types of positions that are available to them, or are unwilling to remain in jobs that do not require a college degree.

Gender, Race and Age Differences

Several personal attributes have been studied in relation to employment outcomes. One of the most commonly reported is gender differences (USDOL BLS, 1997; USDOL BLS, 1998a; USDOL BLS, 1998b; USDOL BLS, 1999b; Williams & Segal, 2002; Gullason, 1999; Gill & Leigh, 2000). According to the Bureau of Labor Statistics (1999b), in 1969, a total of 27.5% of women age 25 to 54 worked full-time in contrast to 50.2% in 1997. The percentage of men similarly employed decreased from 80.6% to 75.4% for the same period.

By educational attainment (high school diploma, some college, and college degree or higher), all age groups of women experienced a rise in the percentage working full-time year round while men experienced declines in all groups. During the same time period, the number of men with high school diplomas decreased 10.5 percentage points, which was the largest decrease among all groups. With the increased number of women in the workplace, these trends may have led to a new legal phenomenon. As the primary caregiver role continues to evolve, working fathers are joining workplace mothers in filing discrimination charges (Williams & Segal, 2002).

According to the U.S. Department of Labor's Bureau of Labor Statistics (1997), gender distributions for many occupations have shifted substantially and, despite these shifts, women and men still tend to be concentrated in different occupations. In general, however, the higher the level of education attained, the smaller the occupational differences between males and females. College graduates had a lower degree of occupational gender differences in 1995 (37.2%) than did high school graduates (52.3%).

In addition to the previously-cited gender differences in type of occupation, researchers found significant gender differences in earnings. In 1993, women earned only 73% as much as men, at least until factors such as major field of study, degree level, and age were considered (USDOL BLS, 1998a). When controlling for these factors, research has shown that women's earnings were still only 87% of those of men. The differences were also less for those who had more recently entered the workforce (see Table 2). In another study (Gill & Leigh, 2000), researchers concluded that explaining the narrowing gender wage gap depends crucially on the specification of educational variables including attendance at community colleges. Though the variable "some college" provided essentially no explanation of the gender gap decline, breaking this category up by degree status, type of college and major field of study improved the ability to account for the declining gender wage gap.

Table 2. *Median annual earnings of women as a percent of men's for bachelor's degree holders in all major fields, 1993.*

	Median Annual Earnings		Women's Earnings as a Percent of Men's
	Women	Men	
Age 25 - 34	\$29,660	\$35,694	83
Age 35 - 44	\$32,155	\$43,200	74
Age 45 - 64	\$32,093	\$49,392	65

Source: USDOL BLS, 1998.

While not yet equal, wage differences are narrowing and are improving even more significantly when comparing equal groups. The United States Department of Education's National Center for Education Statistics (1999b), using data from the Bureau of the Census, tabulated the labor force participation rates presented in Table 3. As can be seen in Table 3, males and females with a bachelor's degree had equal labor force participation rates in the 20-to-24 year-old category and demonstrated similar labor force participation rates if they had obtained an associate degree.

Table 3. *Labor force participation of persons 20 years old and over by age, sex, race/ethnicity and highest level of education, 1998.*

Age, gender and race/ethnicity	Total	Less than high school graduate	High school graduate	Some college, no degree	Associate degree	Bachelor's degree or higher
20 to 24 years old	77.5	68.0	82.3	73.6	86.1	84.6
Men	82.0	80.8	89.5	74.2	86.8	84.6
Women	94.5	51.2	74.2	73.1	85.6	84.6
White	79.5	70.8	83.9	75.9	86.5	86.0
Black	70.6	58.3	76.0	67.3	90.2	81.2
Hispanic	76.1	70.2	81.2	76.1	80.2	85.3
25 and older	67.3	42.8	65.1	72.2	79.3	80.2
Men	76.2	55.2	76.2	79.3	86.4	85.0
Women	59.2	31.5	55.9	65.8	73.7	75.0
White	67.1	43.1	64.3	71.2	78.9	79.8
Black	67.9	40.0	70.4	78.0	83.3	84.8
Hispanic	69.6	58.7	74.4	79.7	83.9	83.5

Source: USDOL NCES, 1999.

Table 3 also shows that those with a bachelor's degree or higher consistently had higher labor force participation rates than those in the same race and ethnic group who had earned only a high school diploma. However, those with an associate degree were often very close or, in some cases, higher than those with a bachelor's degree or higher.

With the exception of those with an associate degree, whites had the highest labor force participation rates among race and ethnic groups in the 20-to-24 year-old age group.

However, whites had lower rates compared to blacks and Hispanics in the 25-and-older category when examining those who had any level of college education.

According to Bellas (2001), occupational outcomes and earnings for women and racial / ethnic minorities with a college degree are less advantageous than they are for men and whites with the same education level. Utilizing data from the Baccalaureate and Beyond Longitudinal Study (B&B:93), Bellas conducted a study to compare the returns on educational investment for 8,837 college graduates. Though the focus of the research was on age-related differences, the researcher was able to conclude that gender and race did not directly affect the number of job interviews nor the number of job offers received. While race was not shown to be a factor in determining salary, “being female depressed salary despite the array of control variables.” (p. 16)

Not surprisingly, the results of Bellas’s study did determine that there were age differences in occupational outcomes. Older graduates (23 or older while a senior) had fewer post-graduate job interviews and fewer job offers. However, older graduates had significantly higher salaries during the survey period, were more likely to have job benefits, were more satisfied with their jobs but viewed their promotional opportunities as being more limited. Bellas asserts that there may be many reasons for the decrease in the number of job interviews and increase in salary including maturity and previous labor market experience. With the exception of less satisfaction with promotional opportunities possibly caused by the perception that age limits opportunity, Bellas concludes that the returns on investments in education are not markedly different between

the older and typically-aged graduate and that this “bodes well for individuals contemplating a return to school in later life.”

College Major and GPA Differences

Thomas (2000) concludes that “all things being equal, if one desired to maximize postgraduate earnings, she would choose a high quality college or university, major in a lucrative area such as health or engineering, and strive to attain a high grade point average over the course of her studies.” (p. 283) Although this may be true from the results of the study and previous research, Thomas understands the laws of supply and demand and only uses this comment for emphasis. Using data from the first follow-up of the Baccalaureate and Beyond Study (BB:93/94), Thomas studied the differences in outcomes by academic major and determined that there were wide variances in earnings among full-time employed college graduates. Average annual earnings ranged from \$19,233 for majors in the areas of education and \$20,537 for majors in the areas of humanities to \$30,627 for engineering and \$30,917 for health-related majors. Thomas also determined that women earned roughly 86% of what men did but that this could be partially explained by the fact that women were under-represented in higher-earnings majors such as business and engineering.

Using the same B&B:93/97 data, the National Center for Education Statistics (1999b) prepared Figure 1 which details the employment status of these graduates. Though all information presented in this table is directly related to both this literature

Status in April 1994	Arts and sciences														Other fields	
	Professional/technical fields							Arts and sciences								
	2	3	4	5	6	7	8	9	10	11	12	13	14			
All fields of study	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total 1992-93 graduates	31.1	27.5	28.0	21.4	18.0	24.3	47.7	35.0	45.1	43.2	34.3	36.6	29.9	29.9	34.3	36.6
Time between high school graduation and degree completion																
4 years or less	27.6	27.2	30.9	35.2	26.2	28.3	22.7	22.8	24.7	16.8	11.0	7.2	5.2	5.2	11.0	7.2
More than 4, up to 5 years	11.2	9.4	10.5	16.2	12.7	14.5	16.6	11.1	12.7	6.5	14.1	9.8	11.7	11.7	14.1	9.8
More than 5, up to 6 years	12.7	15.3	16.5	13.8	28.1	21.0	11.1	15.9	7.4	14.3	14.6	20.0	14.7	14.7	14.6	20.0
More than 6, up to 10 years	17.4	22.8														
More than 10 years																
Enrollment status in April 1994																
Enrolled full-time	12.0	5.0	10.9	14.6	10.5	8.7	26.6	20.5	14.4	18.2	14.2	18.4	10.5	10.5	14.2	18.4
Enrolled part-time	5.8	4.7	8.2	6.6	8.2	6.6	6.6	5.7	4.4	5.3	5.1	9.9	4.5	4.5	5.1	9.9
Not enrolled	62.2	90.3	80.9	78.8	82.7	85.9	64.9	75.1	80.7	76.6	80.7	71.7	85.0	85.0	80.7	71.7
Employment status																
Employed	87.0	92.4	89.4	85.0	88.7	87.9	68.8	81.6	95.5	96.1	84.3	81.4	88.3	88.3	84.3	81.4
Full time	73.1	84.7	73.4	75.8	88.3	73.4	51.5	69.9	12.3	14.4	20.2	14.5	13.8	13.8	20.2	14.5
Part time	13.9	7.7	21.1	9.2	4.3	4.6	7.4	11.9	4.8	5.4	4.9	5.1	4.5	4.5	4.9	5.1
Unemployed ¹	12.7	15.3	16.5	13.8	28.1	21.0	11.1	15.9	7.4	14.3	14.6	20.0	14.7	14.7	14.6	20.0
Not in labor force ²	8.5	3.9	7.3	8.8	6.7	7.6	23.8	13.5	9.8	8.5	10.8	13.6	7.2	7.2	10.8	13.6
Unemployment experiences since graduation																
Experienced any unemployment	28.7	27.2	34.0	33.1	19.1	28.9	28.3	28.7	31.3	34.8	30.0	23.8	28.8	28.8	30.0	23.8
Average number of consecutive months unemployed	5.1	3.6	3.6	6.8	4.9	4.9	9.7	5.7	5.3	5.0	4.8	5.8	4.6	4.6	4.8	5.8
April 1994 unemployment rate ³	4.9	3.6	3.6	6.8	4.9	4.9	9.7	5.7	5.3	5.0	4.8	5.8	4.6	4.6	4.8	5.8
Total employed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Occupation																
Business management	20.1	31.4	9.2	12.2	7.2	16.3	9.3	8.0	26.4	23.9	16.7	25.6	26.9	26.9	16.7	25.6
School teacher	11.7	1.2	57.1	64.5	2.0	1.2	0.7	1.9	0.2	15.7	1.7	6.9	6.0	6.0	1.7	6.9
Engineering	4.4	0.5	1.0	2.7	6.2	1.2	6.6	1.3	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Health professions	15.5	19.6	7.0	7.9	5.3	27.5	14.5	11.3	15.5	12.6	24.5	19.5	20.2	20.2	24.5	19.5
Computer science/programming	3.9	3.9	0.8	0.8	0.7	0.6	0.5	2.5	2.3	1.4	3.4	1.5	3.4	3.4	1.5	3.4
Non-computer technician	3.0	1.1	0.7	5.4	7.9	1.7	13.9	4.8	26.7	18.0	21.3	22.2	16.2	16.2	21.3	22.2
Administrative/clerical/support	17.9	23.6	13.3	5.9	1.2	14.1	8.1	4.8	3.4	7.7	5.1	4.2	6.7	6.7	5.1	4.2
Mechanic/operator/laborer	7.1	11.7	2.5	2.1	2.3	4.4	9.0	4.8	10.0	7.7	7.8	4.4	7.9	7.9	7.8	4.4
Sales	2.5	2.4	4.5	1.3	3.7	5.4	6.2	3.0	4.2	6.8	5.4	8.7	5.4	5.4	5.4	8.7
Military/protective service	4.2	1.1	0.7	1.5	0.6	2.1	2.1	1.1	4.3	8.9	1.2	0.7	2.1	2.1	1.2	0.7
Job characteristics in April 1994																
Definite/probable career potential	72.0	77.2	75.4	81.5	80.0	67.8	57.4	75.1	68.0	66.5	65.5	52.6	67.6	67.6	65.5	52.6
Definite/probable career potential in same job	55.9	51.4	65.7	78.6	73.0	49.4	48.8	67.7	46.5	41.2	44.6	45.3	51.5	51.5	44.6	45.3
Job related to bachelor's degree	75.1	85.1	78.5	87.4	90.5	71.6	64.3	82.3	57.2	41.6	58.2	57.3	73.6	73.6	58.2	57.3
Annual salaries ⁶																
Less than \$5,000	1.0	0.4	0.4	0.6	1.0	0.6	1.5	0.2	0.7	5.9	1.5	1.5	1.6	1.6	1.5	1.5
\$5,000 to \$9,999	3.5	1.7	5.8	0.8	3.1	1.8	3.7	3.5	4.8	7.4	5.7	7.4	3.4	3.4	5.7	7.4
\$10,000 to \$14,999	17.8	12.5	29.8	3.4	6.3	24.7	26.3	14.5	19.3	21.1	24.3	25.4	19.5	19.5	24.3	25.4
\$15,000 to \$19,999	22.7	14.9	21.3	4.5	5.5	24.6	17.6	12.8	20.2	19.2	17.9	23.4	23.1	23.1	17.9	23.4
\$20,000 to \$24,999	22.5	22.5	27.5	12.6	13.6	21.4	24.2	20.2	20.1	22.8	14.4	14.7	19.1	19.1	14.4	14.7
\$25,000 to \$34,999	24.5	31.3	10.9	24.1	17.8	17.8	3.9	14.2	20.1	22.8	14.4	14.7	19.1	19.1	14.4	14.7
\$35,000 to \$49,999	2.5	3.9	0.9	1.2	2.1	2.0	1.8	2.1	1.7	4.8	7.3	4.8	4.4	4.4	7.3	4.8
\$50,000 to \$74,999	0.7	1.1	0.4	0.4	0.6	0.4	0.4	0.4	0.9	0.9	0.5	0.4	1.8	1.8	0.5	0.4
\$75,000 or more	0.7	1.1	0.4	0.4	0.6	0.4	0.4	0.4	0.9	0.9	0.5	0.4	1.8	1.8	0.5	0.4
Average annual salary ⁷	\$24,195	\$27,069	\$19,280	\$30,948	\$31,302	\$22,042	\$22,763	\$25,414	\$22,082	\$21,047	\$21,307	\$19,465	\$21,619	\$21,619	\$21,307	\$19,465

NOTE:—Because of rounding, details may not add to totals.
SOURCE: U.S. Department of Education, National Center for Education Statistics, "Baccalaureate and Beyond Longitudinal Study, First Follow-up" survey. (This table was prepared August 1997.)

¹ Percent not working, but looking for work.
² Percent not working and not looking for work.
³ Excluding those not in the labor force.
⁴ Less than 0.05 percent.
⁵ All other professional occupations excluding business, teaching, engineering, and health.
⁶ Salaries for those employed full time in April 1994.
⁷ Respondents reporting salaries less than \$1,000 or more than \$500,000 were excluded.

Figure 1. Employment status of 1992–93 bachelor's degree recipients 1 year after graduation, by field of study and occupational area: 1994. (NCES, 1999b)

review and to the analysis conducted here, the tabulation of employment status by major is especially relevant. Research has demonstrated significant differences in employment rates by major, with Business and Management majors having the highest employment rate of 92.4% while those from the Biological Sciences, with an employment rate of 68.8%, had the lowest. It is important to note, however, that those in the biological sciences also had the highest rate of being enrolled full time in school, which could lead one to conclude that many in the biological sciences often seek an advanced degree. While analyzing the results from the Baccalaureate and Beyond Study, the NCES also determined that, overall, only about 56% of the employees surveyed reported that their bachelor's degree was necessary to obtain their current job, with a range of 78.6% for graduates of Engineering programs to 41.2% for graduates in History. Finally, only 75.1% of respondents overall indicated that their job was related to their bachelor's degree, with a range of 90.5% of those with degrees in Health Professions to 41.6% with undergraduate degrees in History.

In trying to predict future earnings based upon the quality of a college, James, Nabell, Conaty & To (1989) also included college major in their model which analyzed 1241 male college graduates who were represented in the *National Longitudinal Study of the High School Class of 1972* (NLS-72). Since James, et al. were only interested in the subset of 1241 male college graduates in this paper, the results may not be representative of all college graduates. Using weighted least squares as a descriptive tool, it is possible that selection bias occurred with their sample since only males were studied, or that possible problems with multicollinearity may exist since, for example, it has been shown that males earn more than females (USDOL BLS, 1998a). However, their model

determined that Humanities students earned 10% less than students in a “vocational” category, and that Natural Science and Social Science students earned 3% to 8% more than students in a “vocational” category. Within the vocational group, Business and Engineering students earned 10% more than many of the other majors but Education students earned about 15% less than those same majors. Interestingly, James et al. determined that Education majors received a low wage whether or not they function as teachers, but that their wage was especially low if they did become teachers.

Through an extensive review of the literature on the topic, Hearn and Bunton (2001) report that the body of literature concurs with what the aforementioned researchers have concluded in that graduates with baccalaureate degrees in psychology, education and the humanities typically earn significantly less than other graduates, and that graduates in programs in engineering, the health fields, computer science and certain sciences typically earn significantly more than other graduates. A summary of Hearn and Bunton’s findings related to job market placement and earnings over the life course for different baccalaureate majors is presented in Figure 2. This table in this figure was created by Hearn and Bunton from the available literature on employment and earnings returns to specific majors. However, information was not provided on how the table was compiled nor on the criteria that were used to create the scale.

Baccalaureate Major	Likelihood of Job Related to Major	Employment Rates	Initial Earnings	Earnings Growth	Lifetime Earnings
Business	2	1	2	2	1
<i>Accounting</i>	**	**	2	2	2
<i>Business</i>	2	**	2	2	1
<i>Business Technology</i>	2	**	2	2-3	2
<i>Financial Management</i>	**	**	2	1-2	2
<i>Human Resources</i>	3	**	3	3	3
<i>Marketing & Distribution</i>	2-3	**	2-3	1-2	2
<i>Public Administration</i>	**	**	4	2	3
Education	2	1-2	5	2-3	4
Engineering	1-2	1	1	3	1
<i>Aerospace Engineering</i>	3-4	**	2	1	**
<i>Architecture</i>	2	**	4	**	3-4
<i>Chemical Engineering</i>	2	**	1-2	2	2
<i>Civil Engineering</i>	2	**	2	2	**
Liberal Arts	3	3	4	1	2-3
<i>Anthropology</i>	2-3	**	3	3	3
<i>Economics</i>	2	2	2	2	2
<i>Foreign Languages</i>	3	4	5	**	**
<i>History</i>	4	3-4	4	2-3	3
<i>Humanities</i>	3	3	5	2	2-3
<i>Journalism</i>	2	**	4	2	3
<i>Psychology</i>	3	3-4	4	3	3
<i>Social Science</i>	4	3	4-5	2	2-3
Pre-professional fields	1-2	1-2	2	3	2
<i>Health</i>	1-2	2	2	2	2
<i>Management</i>	**	1-2	2	**	2
<i>Nursing</i>	**	1-2	2	3-4	3
<i>Pharmacy</i>	1	**	1	2	2-3
<i>Public Affairs</i>	**	**	3	**	**
<i>Social Services</i>	3	2	3-4	3-4	3-4
Science	1-2	3	2	3	2-3
<i>Agriculture</i>	**	**	3	**	3-4
<i>Biological</i>	1	3-4	2	3-4	3
<i>Chemistry</i>	3	**	2	3	**
<i>Computer Science</i>	2	2	2	2	2
<i>Mathematics(Applied)</i>	2	3	2	**	2
<i>Physical</i>	1	**	2	1-2	**

Scale: well above average = 1
above average = 2
average = 3
below average = 4
well below average = 5

** not enough information to determine

Figure 2. Job placement and earnings over the life course for baccalaureate graduates in various fields: A comparative summary. (Hearn and Button, 2001)

Work Experience Differences

During the period from 1970 and 1974, between 33.8 and 36.6 percent of full-time college students were employed while attending school. These percentages rose to between 45.7 and 47.6 percent during the period from 1990 to 1994 (USDOE NCES, 1996b) and reached 51.7 percent in 1998 (USDOL BLS, 1999c). Although the reasons for the increase are beyond the scope of this paper, the effects of work experience on employment outcomes are relevant to this study.

According to Gibala and Stuhldreher (2001), students seeking employment in the professional world often hear comments like “we are really looking for someone with experience.” There are a variety of ways in which students can formally or informally gain that desired experience. One is by completing internships and the researchers state that internships are often a part of the college curriculum at Slippery Rock University. The authors indicate that “the internship experience is a valuable way to bridge the gap between academic preparation and employment” and “proves to be an excellent segue into the work world”. Many Slippery Rock students were later hired to fill positions in the companies where they had interned. Further, respondents to a survey of the University’s alumni unanimously recommended mandatory internships as part of students’ academic experience as a way to develop their professional entry-level skills.

Sagen and Laferty (2000) used logistic regression to analyze 1,012 responses to a questionnaire of baccalaureate graduates from one university one month after graduation. The questionnaire was designed to determine success in securing baccalaureate-level employment. Though “employment success” was rather loosely defined and could have

had varying meaning to the respondents, career preparation experiences proved to have a positive effect. The results showed that 54 percent of the respondents had relevant work experience and that 29 percent had participated in an internship while attending college. Both “related work experience” and “internships” were highly significant ($p < .01$) and were 44% and 46% successful in helping graduates to secure employment. However, career preparation experiences contributed to a lesser extent for those students with “higher ability”, and those with a higher GPA were 40% more successful in securing employment. Given this fact, one could conclude that career preparation experiences are even more important for those who have not demonstrated high academic achievement. The researchers state that employers tend to screen graduates for desired basic characteristics and past achievement (GPA) and then focus on those candidates with the desired supplementary qualifications such as related work experience and internships.

Summary

As indicated by the research, students have clearly-defined reasons for choosing to attend college, but are often influenced to enroll by their parents and find themselves being less decisive once enrolled. Though the most often-cited reason for enrolling in college was “to get a better job”, the results of at least one study indicate that interest in the subject is the greatest factor when choosing a major, and that career outcomes are only a secondary priority. Further, it has been reported that 72% of freshman who initially choose a major change their major at least once before graduating.

Upon graduating, college graduates are presented with adequate job openings but up to 20% will be employed in positions that do not require a four-year college degree (USDOL BLS, 2000). Further, occupational and wage differences between males and females have been demonstrated, but these gaps narrow when comparing similar groups and when looking at more recent data. Also when comparing similar groups and looking at more recent data, differences by race are less apparent. It should be noted, however, that in several of the studies conducted, the number of minorities included in the sample was limited. On a positive note, returns on investments in education are not shown to be markedly different with age, which is positive news for returning adult students.

According to the National Center for Education Statistics (1999a) and other researchers (Thomas, 2000), there are wide differences in earnings and employment by academic major among full-time employed college graduates. These differences are especially clear in the business, engineering and health professions. As shown in Figure 2, Hearn and Button (2001) summarized the literature on the effects of field of study on employment outcomes. Their research indicated that graduates with baccalaureate degrees in psychology, education and the humanities typically earn significantly less than other graduates, and that graduates in programs in engineering, the health fields, computer science and certain sciences typically earn significantly more.

In Gibala and Stuhldreher's (2001) study, related work experience and internships were the most significant contributors to obtaining employment. While work experience and internships are valuable, they may be even more valuable for those without "higher ability" (as demonstrated by college GPA) as employers tend to use internships and experience as factors when hiring.

A question posed in this chapter was, “Are college graduates able to find better jobs than non-graduates?” It appears from the literature that a qualified “yes” is the answer. There are wide variations by demographic variables and by choices that the students make both before and during college, and employers are hiring college graduates for positions that may not require a college degree. It also appears as though there are other choices that offer viable alternatives to the typical four-year college degree and that these choices offer another way to “win”.

Based upon the information from the literature, in many cases college graduates are able to get better jobs than non-graduates. However, this study approaches the topic from a slightly different perspective and investigates employment in such a way as to determine whether college graduates are able to get and keep those jobs.

Chapter 3

METHODOLOGY

This chapter is organized into three main sections: sample and target population, research design and variables, and data analysis.

Sample and Target Population

This study sampled data from the Baccalaureate and Beyond Longitudinal Study: 1993/97 Second Follow-up (B&B:93/97) from the Department of Education National Center for Education Statistics. The B&B:93/97 survey was the second in a series of four planned follow-up interviews of persons who received a bachelor's degree in the 1992-1993 academic year. Baseline data for the B&B cohort were collected as a part of the National Postsecondary Student Aid Study (NPSAS:93) which is a nationally-representative sample of all postsecondary students.

The first survey, B&B:93/94, which was administered to a subsample of the students selected for the 1993 National Postsecondary Student Aid Study sample, collected data one year after graduation, while the B&B:93/97 collected data four years after graduation. The B&B:93/97 cohort was composed of 11,192 individuals representative of all postsecondary students in the United States who completed a bachelor's degree in the 1992-93 academic year (USDOE NCES, 1999a). More information on the sampling and response for all three studies can be found in figure 3.

Description	Response status, by study			Frequency	Percent
	NPSAS:93	B&B:93/94	B&B:93/97		
Total	--	--	--	11,192	100.0
Respondents to all three rounds	Yes	Yes	Yes	9,274	82.9
NPSAS:93 and B&B:93/94 only	Yes	Yes	No	436	3.9
NPSAS:93 and B&B:93/97 only	Yes	No	Yes	468	4.2
B&B:93/94 and B&B:93/97 only	No	Yes	Yes	318	2.8
NPSAS:93 only	Yes	No	No	565	5.0
B&B:93/94 only	No	Yes	No	29	0.3
B&B:93/97 only	No	No	Yes	33	0.3
B&B:93/97 deceased* (B&B:93/94 respondents)	Yes	Yes	--	23	0.2
B&B:93/97 deceased* (B&B:93/94 nonrespondents)	Yes	No	--	7	0.1
Nonrespondents to all three rounds	No	No	No	39	0.3

*B&B:93/97 discovered 29 deceased eligibles, and one ineligible previously undiscovered.

NOTE: Due to rounding, details may not add up to 100 percent.
SOURCE: U.S. Department of Education, National Center for Education Statistics, *Baccalaureate and Beyond Longitudinal Study: 1993/94 First Follow-up Methodology Report* (NCES 96-149); *Baccalaureate and Beyond:93/97*.

Figure 3. Table of response patterns from the B&B sample. (USDOE NCES, 1999a)

Respondents to the B&B:93/97 study were interviewed using one of two computer-assisted interview (CAI) systems. The majority of interviews were conducted by telephone interviewers located at a central facility using a computer-assisted telephone interviewing (CATI) system and were completed between April and July of 1997. The remaining cases were completed by field interviewers using computer-assisted personal interviewing (CAPI) and case management system (CMS) software and were completed between July and December of 1997 (NCES, 1999a). For more information on the

methodology of the B&B:93/94 and the B&B:93/97 studies, please refer to the *Baccalaureate and Beyond Longitudinal Study: 1993/94 First Follow-up Methodology Report* (USDOE NCES, 1996) and the *Baccalaureate and Beyond Longitudinal Study: 1993/97 Second Follow-up Methodology Report* (USDOE NCES, 1999a).

The target population of this study was persons in the United States who received a bachelor's degree in the 1992-1993 academic year. As stated previously, there were 11,192 respondents to the (B&B:93/97) secondary follow-up study. However, in order to study the retrospective work measures collected, the sample size was reduced utilizing several criteria.

First, those who did not respond to the employment history questions in the secondary follow-up were dropped from the sample. This reduced the sample size from 11,192 to 10,792. Second, if there were missing or unavailable data for any employment history variable, the case was dropped from the sample since employment status could not be determined. Though missing or unavailable monthly employment data was a break between recorded periods of employment, it did not indicate that the subject was not employed. Eliminating records with missing or unavailable employment history data further reduced the sample size to 9,658. Finally, if there were missing or unavailable data for any independent variable, the case was dropped from the sample since it could not be used in the analysis being performed. The final sample size for this study was 8,254.

The final reduced sample represents a cohort of students from whom data were collected on three separate occasions. Though the original NPSAS:93 study was designed to be a nationally-representative sample of all postsecondary students, due to

B&B:93/94 subsampling and further elimination of cases from this study, sampling weights were utilized so that references to the entire target population could be drawn. Four sampling weights were included with the data, with the most appropriate variable in the data to use for the current study (BNBWT2) being provided by A. M. D'Amico from the National Center for Education Statistics (personal communication, November 5, 2002).

Each case in the sample was multiplied by this sampling weight to estimate the target population. The sample totaling 8,254 in this study represents 961,882 postsecondary students in the United States who completed a bachelor's degree in the 1992-93 academic year. The actual number of bachelor's degrees awarded in the 1992-93 academic year was 1,165,178 (USDOE NCES, 1996a, Table 239). Since the main procedure in the SAS system for Windows (version 8.02) used to analyze these data does not include an option for using sampling weights, Table 4 was developed to compare non-weighted and weighted frequencies and percentages for the variables used in the analysis. Generally, the values for non-weighted percentages compare to their weighted counterparts.

Utilizing the independent variable GENDER, a logistic regression analysis comparing those who were in the sample of $n = 8,254$ and those who were in dropped from this sample but were in the sample with complete employment history data of $n = 9,658$ was performed. No relationship was found.

Table 4. *Non-Weighted and Weighted Frequency and Percent for Variables used in Event History Analysis of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year*

	Non-Weighted (n = 8,254)		Weighted (n = 961,882)	
	Frequency	Percent	Frequency	Percent
RACE				
Non-White	1010	12.24	120775	12.56
White	7244	87.76	841107	87.44
GENDER				
Female	4670	56.58	525731	54.66
Male	3584	43.42	436151	45.34
TYPAGE				
Older	4484	54.33	510616	53.09
Typical	3770	45.67	451265	46.91
NEEDAIDY				
None	4640	56.22	599862	62.36
Any	3614	43.78	362020	37.64
Normalized GPA Categories				
GPA0TO2I	78	0.94	11569	1.2
GPA3TO4I	4613	55.89	527268	54.82
GPA2TO3I	3563	43.17	423044	43.98
Number of Jobs 1992-93				
JOBNUM1	3932	47.64	471648	49.03
JOBNUM2	2646	32.06	303806	31.58
JOBNUM3	1095	13.27	123886	12.88
JOBNUM4G	581	7.04	62541	6.5
BAMAJOR				
Business and Management	1102	13.35	225437	23.44
Education	1299	15.74	124186	12.91
Engineering	575	6.97	60193	6.26
Health Professions	691	8.37	71221	7.4
Public Affairs / Social Service	313	3.79	32697	3.4
Biological Sciences	410	4.97	38674	4.02
Mathematics and Science	511	6.19	52841	5.49
Social Science	856	10.37	91054	9.47
History	161	1.95	15356	1.6
Humanities	832	10.08	86981	9.04
Psychology	313	3.79	32403	3.37
Other	1191	14.43	130833	13.6

Source : United States Department of Education, National Center for Education Statistics, 1999c

Variables

The current study utilizes variables that contain retrospective work measure responses used for the purpose of directly examining change in employment status over a longitudinal, four-year period after graduation where the unit of measurement is one month. During both the first and secondary follow-up in the B&B study, respondents were asked if they were employed full or part-time for each month during the survey period. Respondents who worked multiple part-time jobs were still considered to be employed part-time and no formal definitions of employment, underemployment, unemployment or non-employment were offered to the respondent to assist in determining status. Respondents were also asked whether they were enrolled in school full or part-time for each month during the same period. Determination of enrollment status was necessary since the employment status of those who were enrolled in school full-time was not examined.

Personal characteristics, academic, and work experience variables were obtained from student transcript data, from the 93/94 student Computer Assisted Telephone Interview (CATI) which was conducted shortly after graduation, and from variables created and reclassified by the NCES for the B&B:93/97 study. These variables are important not only to compare to similar research but also to determine the presence or absence of significant differences based upon individual characteristics such as gender, race, or college GPA.

Dependent Variables

Dependent variables were created from reorganized and recategorized monthly enrollment and employment variables in the B&B:93/97 data. In the B&B:93/97 study, respondents were simply asked whether they were employed full or part time and whether or not they were enrolled in school full or part time. Utilizing the responses to these questions, the variable DURATION was created whenever there was a change from an employed status (either full-time or part-time) to a non-employed status between any two contiguous survey months, and is a count of the contiguous months of non-employment. Since there were multiple periods of non-employment over the survey period for many cases, multiple records for each of those cases were created.

For those respondents who indicated full-time enrollment in school, employment status for that period was not evaluated or included in the study. Further, there were 1731 instances where an individual moved from a non-employed state to an in-school (full or part-time) state rather than to an employed state. These records were dropped from the analysis even if the subject returned to a non-employed state after school since individual characteristics may have changed during that period.

A record was generated in each case where the subject was employed immediately after graduation. This record was considered to be the first spell of non-employment and was given a DURATION of 1 month. The final number of records analyzed was 12,125 or an average of 1.5 spells of non-employment for each case.

The variable CENSORED was created by examining the recategorized employment / enrollment variables at the end of the survey period. As stated previously,

the survey was completed between April and December of 1997. The final month of employment data does not contain information on all cases since it was not the end of the study for all respondents. Therefore, if a respondent was not employed during the final month of the study for which they were surveyed, CENSORED was set to 1. Otherwise, CENSORED was set to 0. There were 560 instances of respondents being in a non-employed state at the end of the survey period.

The variable NONCOUNT was created by counting the number of spells of non-employment. This was used to develop descriptive statistics on the respondents. SPELL1 and SPELL2 were created and are the duration of non-employment for the first and second spells respectively.

The continuous, categorical variable CATEGORY was created for multinomial logistic regression analysis and has 4 mutually-exclusive categories:

- 1 spell of non-employment of 1 month duration (reference category)
- 1 spell of non-employment of more than 1 month duration
- 2 spells of non-employment of any duration
- 3 or more spells of non-employment of any duration.

Independent Variables

All independent variables were recoded dichotomously to assist with the type of analyses being performed. The variable RACE was recoded because of the small percentages of those in non-white categories. The weighted percentage of those classified as white was 86.48% while black was 6.06%, Asian or Pacific Islander was 4.31%, “other” race was 2.56% and American Indian / Alaskan native was 0.59%. The variable BAMAJOR is a baccalaureate major category and was reclassified by the NCES

from all majors so that comparisons could be made to other national studies. For BAMAJOR, a category of “other major” was used for those who did not fit into the existing major categories. A listing of these majors, as well as their frequency and percentages can be found in Table 18 in Appendix B. It should be noted that of the 39 majors in the “other major” category, Communications is the largest major comprising over 27% of the total number of cases. The variable NORMGPA was categorized to compare what is typically an A (3.00 to 4.00) and a B (2.00 to 2.99) to those with other grades (0 to 1.99). Finally, JOBNUM was categorized based upon the distribution of the data with 43.7% holding one job, 19.1% holding two jobs, 11.8% holding three jobs and 23.6% holding four or more jobs. Only 1.8% of the respondents in the analysis subsample indicated that they held no jobs and this category was not utilized in the analysis. All independent variables and those used to derive them are listed in Table 5.

Table 5. *Independent Variables*

Variable	Description	Category	Reference
Personal Characteristics:			
RACE	Respondent race reclassified and recoded from B2RRACE	White	Non-White
GENDER	Respondent gender recoded from B2RSEX	Male	Female
TYPAGE	Respondent age classification derived from the variable TYPAGE2. Freshman 20 or older, sophomores who were 21 or older, juniors who were 22 or older, and seniors who were 23 or older were assigned a value of 1. All others were assigned a value of 0.	Older	Typical
NEEDAIDY	Derived from NEEDAID	Any Aid	No Aid
Reclassified Bachelor's Degree in BAMAJOR:			
MAJBIZ	Business and Management	MAJBIZ	MAJOTHER
MAJEDUC	Education	MAJEDUC	MAJOTHER
MAJENGN	Engineering	MAJENGN	MAJOTHER
MAJHEALT	Health Professions	MAJHEALT	MAJOTHER
MAJPA_SS	Public Affairs / Social Services	MAJPA_SS	MAJOTHER
MAJBISCI	Biological Sciences	MAJBISCI	MAJOTHER
MAJMATH	Mathematics & Science	MAJMATH	MAJOTHER
MAJSOCSI	Social Science	MAJSOCSI	MAJOTHER
MAJHIST	History	MAJHIST	MAJOTHER
MAJHUMAN	Humanities	MAJHUMAN	MAJOTHER
MAJPSYCH	Psychology	MAJPSYCH	MAJOTHER
MAJOTHER	Reference Category - Other Major		
Grade Point Average from NORMGPA:			
GPA3TO4I	Category of normalized GPA	3.00 to 4.00	GPA0TO2I
GPA2TO3I	" "	2.00 to 2.99	GPA0TO2I
GPA0TO2I	Reference Category	0 to 1.99	
Work Experience from JOBNUM^a:			
JOBNUM4G	Number of jobs held for pay between between July 1, 1992 and June 30, 1993	4 or more jobs	JOBNUM1
JOBNUM3	" "	3 jobs	JOBNUM1
JOBNUM2	" "	2 jobs	JOBNUM1
JOBNUM1	Reference Category	1 job	

Source: United States Department of Education National Center for Education Statistics, 1999c

^a There are two JOBNUM variables in the data set and this is from the N93 Student CATI

Analysis

The objective of this research is to determine whether there was a significant relationship between the duration and number of non-employment spells and the independent variables using retrospective employment history measures. An initial descriptive analysis was done to further detail the data and subsampling that was done and Tables 11 through 17 in Appendix A were developed. These tables list the number and duration of spells of non-employment by each sample type, detailing each independent variable on a separate table. This was done to identify any particular group experiencing an inordinate number or duration of non-employment spells and to identify fluctuations in the number of records that might have occurred as the sample was refined. No wide variances were observed. In the final sample, the maximum number of spells of non-employment for any respondent was seven. However, subjects with three or more spells of non-employment represented only 8.2% of the total and only one case had seven spells.

Research questions one through five examine the relationships between respondent personal characteristics, college major, GPA and number of jobs held and the *duration* of non-employment spells using event history analysis. Research question six, while similar, determines and measures the overall relationship between the same characteristics and the *number* of non-employment spells using multinomial logistic regression. All research questions were evaluated at a $\alpha = .05$ level of significance.

Research Question One

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year?

Research Question Two

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for males?

Research Question Three

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for females?

Research Question Four

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for whites?

Research Question Five

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for non-whites?

Research Question Six

Is there a relationship between the number of spells of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year?

Statistical Technique

Both event history analysis (survival analysis) and multinomial logistic regression analysis were used to analyze relationships between the independent and dependent variables.

Since retrospective work measures were used and there was the possibility that a respondent was in a state of non-employment at the end of the survey period (right censored), the statistical procedure PROC PHREG in the SAS Analysis System for Windows was used to calculate the overall significance and to determine relationships among the variables in the equation. The significance was tested through the evaluation of the likelihood-ratio (Allison, 1995, page 85).

The likelihood ratio test examines whether the full set of independent variables in the equation accounts for survival better than just the intercept term in the equation. First, the log likelihood is calculated for a model with only an intercept term. Then, the log likelihood is calculated for a model with all independent variables. Last, -2 times the difference between the log likelihoods with only the intercept term and with all independent variables is calculated, which is distributed approximately as a χ^2 with as many degrees of freedom as there are independent variables (David Passmore, personal communication, January 12, 2004).

The hazard function of the equation was used to describe the probability distribution of the variable and is the probability or risk that the event will occur at time t . The hazard describes the individual instead of the sample at any given time, with one month being the interval of time measured in this study. Individuals are categorized

generally by the independent variables. Therefore, the event in this case is the probability of an individual moving from a non-employed state to an employed state in any given month during the survey period as generally categorized by the independent variables.

The hazard function (Allison, 1995, page 15) is defined as

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{\Pr\{t \leq T < t + \Delta t \mid T \geq t\}}{\Delta t}.$$

The significance of each independent variable in the event history analysis was determined by evaluating the Wald χ^2 statistic. The Wald statistic tests for the null hypothesis that all the coefficients associated with the variable are 0 (Allison, 1995, page 85) and were considered significant at the $\alpha = .05$ level.

In research question six, there are dichotomous independent variables and a continuous, categorical dependent variable with four mutually-exclusive categories using one as a reference category as follows:

- 1 spell of non-employment of 1 month duration (reference category)
- 1 spell of non-employment of more than 1 month duration
- 2 spells of non-employment of any duration
- 3 or more spells of non-employment of any duration.

In SAS, PROC CATMOD was used to perform multinomial logistic regression due to the unordered response categories of the dependent variable (Hair, Anderson, Tatham & Black, 1998; Haberman, 1978; Glynn, Sohoni, & Leith, 2002). Multinomial logistic regression estimates the effects of independent variables on this type of dependent variable (Liao, 1994). The significance of the equation was tested through the evaluation of the likelihood-ratio and the equation was considered significant at the $\alpha = .05$ level. One category of the dependent variable was used as the reference category and the three remaining categories were individually and separately compared to it.

A parameter estimate, standard error and an odds ratio were calculated for each independent variable and were also considered significant at the $\alpha = .05$ level. The odds ratio is an estimation of the change in probability for every increase in a category of independent variable compared to the reference category while holding all other variables in the equation constant. In this analysis, the reference category is one spell of non-employment of one month duration with each independent variable being dichotomous. The estimate's direction (either positive or negative) determined how to interpret the odds ratio compared to the reference category.

There were 136 cases not included in this analysis since they moved from a non-employed to an in-school state after graduating from college and this was their only spell of non-employment. Entering school could change other attributes about the individual that were not controlled for. Specific career-related training could have been undertaken which helped the individual obtain a job.

Summary

Six research questions were developed that examine the sample of B&B:93/97 data both from different statistical techniques and by drilling down into the data for personal characteristics such as race and gender. Since the main focus of the analysis is non-employment and the data are retrospective work measures where a respondent may be in a state of non-employment at the end of the survey period (right censored), event history analysis in SAS was used to conduct the analysis. Further, four categories of duration of non-employment were created and multinomial logistic regression was used

to determine if differences existed between three of the categories and the reference category for the independent variables in the equation.

Chapter 4

FINDINGS

As described in detail in the previous chapter, both event history and multinomial logistic regression analyses were performed to determine whether significant relationships existed between the duration and number of spells of non-employment and the studied independent variables. A research question was developed and five more were refined by gender, race, and by type of analysis being performed.

For the event history analysis, the following were calculated: a hazard ratio estimate; hazard ratio 95% confidence intervals; and the mean duration of non-employment for both the category and the reference group for each independent variable. The hazard ratio estimate is the probability of moving from a non-employed state to an employed state for the independent variable compared to the reference category while holding all other variables in the equation constant. The estimate's direction (either positive or negative) determined how to interpret the hazard ratio compared to the reference category.

Using multinomial logistic regression, the parameter estimate, standard error and an odds ratio were calculated for each independent variable. In this analysis, the reference category is defined as one spell of non-employment of one month duration and each independent variable is dichotomous. The estimate's direction (either positive or negative) determines how to interpret the odds ratio compared to the reference category.

Research Question One

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year?

The results of the event history analysis are presented in Table 6 and the equation is significant ($L^2 = 137.14$, $df = 20$, $p < .0001$). Significant survival coefficients for independent variables exist for RACE, GENDER, for Engineering, Health and Humanities majors, as well as for those students who held two jobs, three jobs and four or more jobs during the year prior to graduation.

Variables shown to be positively or negatively related to employment are listed below. Those variables that are positively related are characteristics of graduates more likely to indicate movement from a non-employed state to an employed state, while those that are negatively related are characteristics of graduates less likely to do so compared to the reference category.

Positively-related variables:

- White versus Non-White
- Male versus Female
- Engineering versus Other Major
- Health Professions versus Other Major
- 2 Jobs versus 1 Job
- 3 Jobs versus 1 Job
- 4 or More Jobs versus 1 Job

Negatively related variables:

- Humanities versus Other Major

Table 6. *Event History Analysis and Mean Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year*

Variable	Parameter Estimate	Standard Error	Hazard Ratio		Mean Duration of Non-Employment		Comparisons Within Variable
			Estimate	95% CI	Category	Reference	
RACE	0.10***	0.03	1.10	(1.04, 1.17)	3.26	3.86	White vs. Non-White
GENDER	0.06***	0.02	1.07	(1.03, 1.11)	3.12	3.49	Male vs. Female
TYPAGE	-0.01	0.02	ns ^a				Older vs. Typical
NEEDAIDY	0.02	0.02	ns				Any Need Aid vs. No Need Aid
MAJBIZ	0.02	0.04	ns				Business and Management vs. Other
MAJEDUC	-0.05	0.03	ns				Education vs. Other
MAJENGN	0.10*	0.05	1.11	(1.01, 1.21)	2.86	3.19	Engineering vs. Other
MAJHEALT	0.09*	0.04	1.10	(1.01, 1.19)	3.08	3.19	Health Professions vs. Other
MAJPA_SS	-0.02	0.05	ns				Public Affairs / Social Services vs.
MAJBISCI	-0.07	0.05	ns				Biological Sciences vs. Other
MAJMATH	0.03	0.05	ns				Mathematics & Science vs. Other
MAJSOCSI	-0.02	0.04	ns				Social Science vs. Other
MAJHIST	-0.11	0.07	ns				History vs. Other
MAJHUMAN	-0.09**	0.04	0.92	(0.85, 0.98)	3.55	3.19	Humanities vs. Other
MAJPSYCH	-0.05	0.05	ns				Psychology vs. Other
GPA3TO4I	0.07	0.10	ns				GPA of 3 to 4 vs. GPA of 0 to 2
GPA2TO3I	0.05	0.10	ns				GPA of 2 to 3 vs. GPA of 0 to 2
JOBNUM2	0.12***	0.02	1.12	(1.08, 1.17)	3.15	3.83	2 Jobs vs. 1 Job
JOBNUM3	0.21***	0.03	1.23	(1.17, 1.30)	2.75	3.83	3 Jobs vs. 1 Job
JOBNUM4G	0.24***	0.04	1.27	(1.18, 1.36)	2.63	3.83	4 or More Jobs vs. 1 Job

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

Notes : $L^2 = 137.14$, $df = 20$, $p < .0001$;

^ans = Not significant;

* Significant at .05 level; ** Significant at .01 level; *** Significant at .001 level

In Table 6, the results are first evaluated by examining the p-value for the equation. The p-value was found to be less than .0001 therefore the overall equation is considered significant. Individual variables that are not significant are marked with “ns”. Significant variables are listed and marked with asterisks to indicate a significance level. Relevant information is derived by looking at the hazard ratio estimates where the hazard ratio, combined with the direction of the estimate, indicates the likelihood for an individual in the comparison category of the independent variable to move from a non-employed state to an employed state as compared to the reference category of the independent variable while holding all other variables constant. Confidence intervals for the hazard ratio and the mean duration of non-employment were calculated for both the category and reference of the independent variables. The confidence intervals are used as general guidance on the distribution of the mean of the hazard ratios, while the mean duration of non-employment allows one to visually compare how long the category of interest was in a non-employed state as compared to the reference category.

The variable JOBNUM4G, which is defined as four or more jobs versus one job, had the highest hazard ratio ($S = 1.27$). It is positively related to its reference category and it therefore can be stated that those students who held four or more jobs one year prior to graduation were 1.27 times more likely to move from a non-employed state to an employed state during the survey period, while holding all of the other variables constant. Those who had four or more jobs also had a mean duration of non-employment of 2.63 months compared to 3.83 months for those who held only one job, 3.15 months for those who held two jobs, and 2.75 months for those who held three jobs.

Based upon these findings, it is possible to conclude that there is a relationship between the duration of non-employment and the aforementioned independent variables.

Research Question Two

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for males?

The results of event history analysis are presented in Table 7, with the equation being significant ($L^2 = 98.22$, $df = 19$, $p < .0001$). Significant survival coefficients for independent variables exist for RACE, for Biological Sciences majors, as well as for those male students who held two jobs, three jobs, and four or more jobs during the year prior to graduation.

Variables shown to be positively or negatively related to employment are listed below. Those variables that are positively related are characteristics of graduates more likely to indicate movement from a non-employed state to an employed state, while those that are negatively related are characteristics of graduates less likely to do so compared to the reference category.

Positively-related variables:

- White versus Non-White
- 2 Jobs versus 1 Job
- 3 Jobs versus 1 Job
- 4 or More Jobs versus 1 Job

Negatively-related variables:

- Biological Sciences versus Other Major

Table 7. *Event History Analysis and Mean Duration of Spells of Non-Employment of Males among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year*

Variable	Parameter Estimate	Standard Error	Hazard Ratio		Mean Duration of Non-Employment		Comparisons Within Variable
			Estimate	95% CI	Category	Reference	
RACE	0.18***	0.05	1.19	(1.09, 1.31)	3.03	3.87	White vs. Non-White
TYPAGE	0.04	0.03	ns ^a				Older vs. Typical
NEEDAIDY	0.04	0.03	ns				Any Need Aid vs. No Need Aid
MAJBIZ	-0.04	0.05	ns				Business and Management vs. Other
MAJEDUC	-0.04	0.06	ns				Education vs. Other
MAJENGN	0.08	0.06	ns				Engineering vs. Other
MAJHEALT	0.02	0.08	ns				Health Professions vs. Other
MAJPA_SS	-0.03	0.09	ns				Public Affairs / Social Services vs.
MAJBISCI	-0.14*	0.07	0.87	(0.76, 1.00)	3.43	2.94	Biological Sciences vs. Other
MAJMATH	0.01	0.06	ns				Mathematics & Science vs. Other
MAJSOCSI	-0.06	0.06	ns				Social Science vs. Other
MAJHIST	-0.18	0.10	ns				History vs. Other
MAJHUMAN	-0.09	0.06	ns				Humanities vs. Other
MAJPSYCH	-0.05	0.10	ns				Psychology vs. Other
GPA3TO4I	0.1	0.12	ns				GPA of 3 to 4 vs. GPA of 0 to 2
GPA2TO3I	0.08	0.12	ns				GPA of 2 to 3 vs. GPA of 0 to 2
JOBNUM2	0.06*	0.03	1.07	(1.00, 1.14)	3.07	3.38	2 Jobs vs. 1 Job
JOBNUM3	0.14***	0.05	1.15	(1.05, 1.26)	2.74	3.38	3 Jobs vs. 1 Job
JOBNUM4G	0.17**	0.06	1.19	(1.06, 1.33)	2.59	3.38	4 or More Jobs vs. 1 Job

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

Notes : $L^2 = 47.34$, $df = 19$, $p < .001$;

^ans = Not significant;

* Significant at .05 level; ** Significant at .01 level; *** Significant at .001 level

The variables RACE and JOBNUM4G had the highest hazard ratios ($S = 1.19$). They are positively related to their reference categories and it therefore can be separately stated that those students who had held four or more jobs during the year prior to graduation and those that were white were 1.19 times more likely to move from a non-employed state to an employed state during the survey period while holding all of the other variables constant. Those who had held four or more jobs also had a mean duration of non-employment of 2.59 months compared to 3.38 months for those who held only one job. Those who were white had a mean duration of non-employment of 3.03 months compared to 3.87 months for non-whites.

Based upon these findings, it is possible to conclude that there is a relationship between the duration of non-employment and the aforementioned independent variables for males.

Research Question Three

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for females?

The results of the event history analysis are presented in Table 8 and the equation is significant ($L^2 = 47.76$, $df = 19$, $p < .001$). Significant survival coefficients for independent variables exist for Health Professions majors as well as for those female students who held two jobs, three jobs, and four or more jobs during the year prior to graduation.

Table 8. *Event History Analysis and Mean Duration of Spells of Non-Employment of Females among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year*

Variable	Parameter Estimate	Standard Error	Hazard Ratio		Mean Duration of Non-Employment		Comparisons Within Variable
			Estimate	95% CI	Category	Reference	
RACE	0.048	0.04	ns ^a				White vs. Non-White
TYPAGE	-0.03	0.03	ns				Older vs. Typical
NEEDAIDY	0.00	0.02	ns				Any Need Aid vs. No Need Aid
MAJBIZ	0.08	0.05	ns				Business and Management vs. Other
MAJEDUC	-0.03	0.04	ns				Education vs. Other
MAJENGN	0.06	0.11	ns				Engineering vs. Other
MAJHEALT	0.13**	0.05	1.14	(1.04, 1.26)	3.14	3.36	Health Professions vs. Other
MAJPA_SS	-0.02	0.07	ns				Public Affairs / Social Services vs.
MAJBISCI	-0.01	0.07	ns				Biological Sciences vs. Other
MAJMATH	0.02	0.07	ns				Mathematics & Science vs. Other
MAJSOCSI	0.01	0.05	ns				Social Science vs. Other
MAJHIST	-0.03	0.10	ns				History vs. Other
MAJHUMAN	-0.09	0.05	ns				Humanities vs. Other
MAJPSYCH	-0.04	0.06	ns				Psychology vs. Other
GPA3TO4I	0.04	0.16	ns				GPA of 3 to 4 vs. GPA of 0 to 2
GPA2TO3I	0.02	0.16	ns				GPA of 2 to 3 vs. GPA of 0 to 2
JOBNUM2	0.16***	0.03	1.18	(1.11, 1.24)	3.21	4.16	2 Jobs vs. 1 Job
JOBNUM3	0.25***	0.04	1.29	(1.20, 1.39)	2.76	4.16	3 Jobs vs. 1 Job
JOBNUM4G	0.28***	0.04	1.32	(1.21, 1.44)	2.65	4.16	4 or More Jobs vs. 1 Job

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

Notes : $L^2 = 98.22$, $df = 19$, $p < .0001$;

^ans = Not significant;

* Significant at .05 level; ** Significant at .01 level; *** Significant at .001 level

Variables shown to be positively or negatively related to employment are listed below. Those variables that are positively related are characteristics of graduates more likely to indicate movement from a non-employed state to an employed state, while those that are negatively related are characteristics of graduates less likely to do so compared to the reference category.

Positively-related variables:

- Health Professions versus Other Major
- 2 Jobs versus 1 Job
- 3 Jobs versus 1 Job
- 4 or More Jobs versus 1 Job

Negatively-related variables:

- None

The variable JOBNUM4G, which is defined as four or more jobs versus one job, had the highest hazard ratio ($S = 1.32$). It is positively related to its reference category and it therefore can be stated that those female students who held four or more jobs during the year prior to graduation were 1.32 times more likely to move from a non-employed state to an employed state during the survey period while holding all of the other variables constant. Those who held four or more jobs also had a mean duration of non-employment of 2.65 months compared to 4.16 months for those who held only one job, 3.21 months for those who held two jobs and 2.76 months for those who held three jobs.

Based upon these findings, it is possible to conclude that there is a relationship between the duration of non-employment and the aforementioned independent variables for females.

Research Question Four

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for whites?

The results of the event history analysis are presented in Table 9 and the equation is significant ($L^2 = 111.11$, $df = 19$, $p < .0001$). Significant survival coefficients for independent variables exist for GENDER, for Engineering, Health Professions and Humanities majors as well as for those white students who held two jobs, three jobs and four or more jobs during the year prior to graduation.

Variables shown to be positively or negatively related to employment are listed below. Those variables that are positively related are characteristics of graduates more likely to indicate movement from a non-employed state to an employed state, while those that are negatively related are characteristics of graduates less likely to do so compared to the reference category.

Positively-related variables:

- Male versus Female
- Engineering versus Other Major
- Health Professions versus Other Major
- 2 Jobs versus 1 Job
- 3 Jobs versus 1 Job
- 4 or More Jobs versus 1 Job

Negatively-related variables:

- Humanities versus Other Major

Table 9. *Event History Analysis and Mean Duration of Spells of Non-Employment of Whites among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year*

Variable	Parameter Estimate	Standard Error	Hazard Ratio		Mean Duration of Non-Employment		Comparisons Within Variable
			Estimate	95% CI	Category	Reference	
GENDER	0.08***	0.02	1.08	(1.03, 1.13)	3.03	3.43	Male vs. Female
TYPAGE	-0.00439	0.02	ns ^a				Older vs. Typical
NEEDAIDY	0.02796	0.02	ns				Any Need Aid vs. No Need Aid
MAJBIZ	0.03044	0.04	ns				Business and Management vs. Other
MAJEDUC	-0.04893	0.04	ns				Education vs. Other
MAJENGN	0.11*	0.05	1.12	(1.02, 1.24)	2.66	3.14	Engineering vs. Other
MAJHEALT	0.09*	0.05	1.10	(1.01, 1.20)	3.01	3.14	Health Professions vs. Other
MAJPA_SS	-0.01828	0.06	ns				Public Affairs / Social Services vs.
MAJBISCI	-0.07235	0.05	ns				Biological Sciences vs. Other
MAJMATH	0.03968	0.05	ns				Mathematics & Science vs. Other
MAJSOCSI	-0.03251	0.04	ns				Social Science vs. Other
MAJHIST	-0.125	0.07	ns				History vs. Other
MAJHUMAN	-0.10**	0.04	0.91	(0.84, 0.98)	3.55	3.14	Humanities vs. Other
MAJPSYCH	-0.04645	0.06	ns				Psychology vs. Other
GPA3TO4I	0.00927	0.11	ns				GPA of 3 to 4 vs. GPA of 0 to 2
GPA2TO3I	-0.01118	0.11	ns				GPA of 2 to 3 vs. GPA of 0 to 2
JOBNUM2	0.10***	0.02	1.11	(1.06, 1.16)	3.14	3.70	2 Jobs vs. 1 Job
JOBNUM3	0.20***	0.03	1.22	(1.15, 1.30)	2.72	3.70	3 Jobs vs. 1 Job
JOBNUM4G	0.23***	0.04	1.26	(1.17, 1.35)	2.62	3.70	4 or More Jobs vs. 1 Job

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

Notes : $L^2 = 111.11$, $df = 19$, $p < .0001$;

^ans = Not significant;

* Significant at .05 level; ** Significant at .01 level; *** Significant at .001 level

The variable JOBNUM4G had the highest hazard ratio ($S = 1.26$). It is positively related to its reference category and it therefore can be stated that those white students who held four or more jobs during the year prior to graduation were 1.26 times more likely to move from a non-employed state to an employed state during the survey period while holding all of the other variables constant. Those who held four or more jobs also had a mean duration of non-employment of 2.62 months compared to 3.70 months for those who held only one job, 3.14 months for those that held two jobs or 2.72 months for those who held three jobs.

Based upon these findings, it is possible to conclude that there is a relationship between the duration of non-employment and the aforementioned independent variables for whites.

Research Question Five

Is there a relationship between the duration of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year for non-whites?

The results of event history analysis were evaluated and the equation was not significant ($L^2 = 28.03$, $df = 19$, $p = .08$). Based on these findings, it is not possible to conclude that there is a relationship between the duration of non-employment and the independent variables for non-whites.

Research Question Six

Is there a relationship between the number of spells of non-employment and respondent personal characteristics, college major, GPA and work experience among a nationally representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year?

The results of multinomial logistic analysis are presented in Table 10 and the equation is significant ($L^2 = 111.11$, $df = 19$, $p < .0001$). Almost all independent variables in at least one category show significant relationships with the number of spells of non-employment compared to the reference category. Those that do not are the majors Public Affairs / Social Services, Social Sciences, Psychology, and the GPA categories. Similar to the previous analyses, whites, males, Business majors, Engineering majors, Health Professions majors, Math majors and those who held more jobs all fared better than their comparison category in terms of non employment. Education, Biological Sciences, History and Humanities majors all fared worse than their comparison categories.

The greatest odds ratios were associated with the independent variables categorizing the number of jobs. As in the previous analyses, students who held many jobs fared better in terms of non-employment as compared to those students who held only one job. Students who held four or more jobs compared to one job were .36 times as likely to have three or more spells of non-employment compared to one spell of one month duration of non-employment. In the same comparison to students who only held one job, students who held 3 jobs were .45 times as likely, and students who held two jobs were .62 times as likely, to have three or more spells of non-employment compared to one spell of one month duration.

Table 10. *Effects of Personal Characteristics, College Major, GPA and Number of Jobs Held on the Number of Spells of Non-Employment: Results of Multinomial Logistic Regression among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year (n = 8,118)*

Variable	1 Spell of 1 Month Duration (n = 3394) is Compared with the Following								
	1 Spell > 1 Mo. (n = 1,709)			2 Spells (n = 2,222)			> 2 Spells (n = 793)		
	Estimate	SE	Odds ^a (95% CI)	Estimate	SE	Odds (95% CI)	Estimate	SE	Odds (95% CI)
RACE	-0.3*	0.13	0.74	-0.41***	0.09	0.66	-0.33***	0.09	0.72
White vs. Non-White			(0.58, 0.95)			(0.56, 0.78)			(0.60, 0.86)
GENDER	-0.33***	0.09	0.72	-0.27***	0.06	0.76	ns ^b		
Male vs. Female			(0.61, 0.86)			(0.68, 0.86)			
TYPAGE	-0.19*	0.08	0.82	-0.26***	0.06	0.77	-0.55***	0.06	0.58
Older vs. Typical			(0.70, 0.97)			(0.69, 0.86)			(0.51, 0.65)
NEEDAIDY	ns			ns			0.14*	0.06	1.15
Need Aid vs. None									(1.02, 1.30)
MAJBIZ	-0.38*	0.16	0.68	-0.3**	0.10	0.74	ns		
Bus. & Mgmt. vs. Other			(0.49, 0.94)			(0.60, 0.91)			
MAJEDUC	0.51***	0.14	1.66	0.26**	0.10	1.3	0.44***	0.11	1.56
Ed. vs. Other			(1.26, 2.19)			(1.07, 1.59)			(1.25, 1.94)
MAJENGN	-1.09***	0.28	0.34	-0.36**	0.13	0.7	ns		
Engn. vs. Other			(0.19, 0.58)			(0.54, 0.91)			
MAJHEALT	-0.81***	0.21	0.45	-0.67***	0.12	0.51	-0.38**	0.13	0.68
Hlth. Prof. vs. Other			(0.30, 0.67)			(0.40, 0.65)			(0.52, 0.89)
MAJPA_SS	ns			ns			ns		
Pub. Aff. vs. Other									

Table 10. *Effects of Personal Characteristics, College Major, GPA and Number of Jobs Held on the Number of Spells of Non-Employment: Results of Multinomial Logistic Regression among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year (n = 8,118) – Continued.*

Variable	1 Spell of 1 Month Duration (n = 3394) is Compared with the Following								
	1 Spell > 1 Mo. (n = 1,709)			2 Spells (n = 2,222)			> 2 Spells (n = 793)		
	Estimate	SE	Odds ^a (95% CI)	Estimate	SE	Odds (95% CI)	Estimate	SE	Odds (95% CI)
MAJBISCI Bio. Sciences vs. Other	0.41*	0.19	1.51 (1.03, 2.21)	ns			ns		
MAJMATH Math & Sci. vs. Other	ns			-0.28*	0.13	0.76 (0.58, 0.99)	ns		
MAJSOCSI Social Science vs. Other	ns			ns			ns		
MAJHIST History vs. Other	ns			ns			0.54**	0.13	1.72 (1.12, 2.66)
MAJHUMAN Humanities vs. Other	0.57***	0.15	1.77 (1.32, 2.38)	ns			ns		
MAJPSYCH Psychology vs. Other	ns			ns			ns		
GPA3TO4I GPA 3 to 4 vs. 0 to 2	ns			ns			ns		
GPA2TO3I GPA 3 to 4 vs. 0 to 2	ns			ns			ns		

Table 10. *Effects of Personal Characteristics, College Major, GPA and Number of Jobs Held on the Number of Spells of Non-Employment: Results of Multinomial Logistic Regression among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year (n = 8,118) – Continued.*

Variable	1 Spell of 1 Month Duration (n = 3394) is Compared with the Following								
	1 Spell > 1 Mo. (n = 1,709)			2 Spells (n = 2,222)			> 2 Spells (n = 793)		
	Estimate	SE	Odds ^a (95% CI)	Estimate	SE	Odds (95% CI)	Estimate	SE	Odds (95% CI)
JOBNUM2	0.76***	0.10	2.13	0.27*	0.06	1.31	-0.48***	0.07	0.62
2 Jobs vs. 1			(1.75, 2.60)			(1.16, 1.48)			(0.54, 0.71)
JOBNUM3	0.89***	0.12	2.43	0.21***	0.09	1.23	-0.8***	0.11	0.45
3 Jobs vs. 1			(1.91, 3.07)			(1.04, 1.45)			(0.37, 0.55)
JOBNUM4G	1.27***	0.14	3.57	0.35***	0.11	1.42	-1.01***	0.16	0.36
4 or > Jobs vs. 1			(2.71, 4.69)			(1.14, 1.76)			(0.27, 0.49)

Source : United States Department of Education, National Center for Education Statistics, 1999c.

Notes : $L^2 = 3588$, $df = 60$, $p < .01$.

^a The odds ratio is the exponent of the estimate (Glynn, Sohoni & Leith, 2002, p. 2);

^b ns = not significant;

Frequency missing = 136;

* Significant at .05 level; ** Significant at .01 level; *** Significant at .001 level

It is important to note 67% or 2,284 out of the 3,394 cases that are in the reference category of one spell of non-employment at one month duration were employed immediately following graduation from college. Further, those same 2,284 out of 8,118 in this analysis remained employed during the entire survey period since graduating from college.

Based upon these findings, it is possible to conclude that there is a relationship between the number of spells of non-employment and most of the independent variables in the analysis.

Follow-up Analysis

A follow-up analysis was performed to determine whether the first spell of non-employment somehow caused or influenced the second spell of non-employment. To determine whether a relationship existed between the spells of non employment, an event history analysis was done using the duration of SPELL1 of non-employment as the only independent variable and the duration of SPELL2 of non-employment as the dependent variable. There were no significant relationships observed. A second analysis was done which included all other independent variables in the equation. Again, no significant relationships were observed and it was concluded that relationships between the spells of non-employment did not influence the results in the research questions posed in this study.

Summary

Six research questions were developed and both event history and multinomial logistic regression analysis were performed to determine whether significant relationships could be found between both the number of spells and duration of non-employment and respondent personal characteristics, college major, GPA, and work experience among a nationally-representative sample of graduates who received a bachelor's degree in the 1992-1993 academic year. With the exception of GPA, significant relationships were discovered between almost all of the independent variables and non-employment. Surprisingly strong relationships were discovered between non-employment and the number of jobs held prior to graduation.

Chapter 5

DISCUSSION, CONCLUSIONS AND IMPLICATIONS

Using data from the Department of Education's National Center for Education Statistics, the current study was conducted to identify relationships between either the duration or number of spells of non-employment and the survey respondents' personal characteristics, college major, GPA, or work experience. The data used were from the Baccalaureate and Beyond Longitudinal Study: 1993/97 Second Follow-up (B&B:93/97), which was designed to provide information concerning education and work experiences among a nationally-representative sample of all postsecondary students in the United States who completed a bachelor's degree during the 1992-93 academic year (USDOE NCES, 1999a).

The conceptual framework of the current study is based upon a structured taxonomy of student outcomes as defined by the National Postsecondary Education Cooperative (NPEC). This taxonomy is relevant to the current study and is important as it was developed for use by postsecondary institutions as a structure on which to base and create policy. Also, some of the variables identified in the taxonomy have been identified by students as reasons for choosing to attend college (Higher Education Research Institute, 1999). The primary two reasons cited were "to be able to get a better job" and "to be able to make more money" (Higher Education Research Institute, 1999). While this study is not designed to determine whether or not a "better" job was obtained, and while salaries were not observed, a measurement and analysis of employment and non-

employment was performed to determine whether the students' top two reasons for choosing to go to college and whether or not some of the NPEC's listed outcomes for postsecondary institutions are being experienced.

Chapter 5 is composed of three main sections. In the discussions sections, comparisons are made between the results of the current research study and the literature reviewed. Second, opportunities for further research are suggested for those who may want to examine the data further. Finally, in the implications and conclusions section, the results of the study are examined from the perspective of their impact on policy or on interested parties such as postsecondary institutions, students, and parents of students.

Employment Outcomes

The literature review conducted for this study centered on students' personal characteristics, college major, and work experience in relation to employment outcomes. While the literature reviewed does not specifically measure the probability of employment in the same manner as this study, general comparisons can be made to similar employment outcomes such as labor force participation rates and earnings of baccalaureate degree graduates in the workforce.

Gender, Race and Age Differences

In both the event history and multinomial logistic regression analyses, significant differences were observed between males and females in both the duration and the number of spells of non-employment. Overall, males were 7% more likely than females to move from a non-employed state to an employed state and had a mean duration of non-employment of 3.12 months compared to 3.49 months for females. Females were also found to be more likely than males to have a higher number of spells of non employment. Though significant differences were found, the magnitude of the differences was not large and the results of this study generally correspond to the employment outcomes in the literature.

According to the Bureau of Labor Statistics (1998a), women earned 73% as much as men in 1993 until aspects such as major field of study, degree level and age group were factored in. When the groups of men and women were similar with respect to these groups, women earned at least 87% as much as men. Differences were also less for those who more recently entered the workforce. In another study (Gill & Leigh, 2000), researchers also concluded that, while not yet equal, wage differences are narrowing and are declining even more significantly when equal groups are compared. Further, for both males and females in the 20-to-24 year-old age group who had earned a bachelor's degree, labor force participation rates were found to be equal at 84.6% according to the National Center for Education Statistics (1999b).

With respect to employment outcomes, racial differences were found to be slightly greater than gender differences. Whites were 10% more likely than non-whites

to move from a non-employed state to an employed state, and whites experienced a mean duration of non-employment of 3.12 months compared to 3.49 months for non-whites. Non-whites were also more likely to have experienced a greater number of spells of non-employment as compared to whites. The results of this study were similar in nature to the results in the literature when comparing similar age groups.

The Department of Education's National Center for Education Statistics (1999b) concluded that for those with a Bachelor's degree, whites at 86.0% had higher labor force participation rates in the 20-to-24 year-old age group than blacks (81.2%) or Hispanics (85.3%). However, in the 25-and-older category, whites had lower participation rates (79.8%) than both blacks (84.8%) and Hispanics (83.5%). Bellas (2001) also concluded that occupational outcomes and earnings for racial / ethnic minorities with a college degree were less advantageous than for whites with the same education level, while race did not directly affect the number of job interviews nor the number of job offers received.

While the NCES statistics were presented as a digest and no explanation for the differences was provided, differences by race are understandable (but not defensible), given both history and the biases that still exist in society. Given that there was less difference between the races in the older category, it can be hoped that better hiring and promoting practices are in place. However, it is troubling that both in the 20-to-24 year-old category of the NCES data and in this study, racial differences were found.

Bellas's (2001) study also determined that there were age differences in occupational outcomes. Older graduates had fewer post-graduate job interviews and fewer job offers. Also, older graduates had significantly higher salaries, were more likely

to have job benefits, were more satisfied with their jobs, but viewed their promotional opportunities as being more limited than did younger graduates.

In this study, no significant differences were observed between an older and a traditional student in the event history analysis. However, older was defined as a freshman who was 20 or older to a senior who was 23 or older. If a different and more distinctly older age classification category had been defined, significant differences may have been observed. Regarding age, significant differences were observed in the multinomial logistic regression for all three categories of spells of non-employment as compared to the reference category. In all three categories, older students were more likely to have fewer spells of non-employment and were .58 times as likely to have three or more spells than to have one spell of one month duration.

This is understandable due to the fact that older and more mature students have more work and life experiences as compared to those who enter college directly following graduation from high school. Work and life experiences are often attractive to an employer. In addition, the older student may have a better idea of what career and what employer to seek out after graduation and may have a more targeted job search. However, what may not be factored into the findings in regard to older students is their amount of career experience. As is described later in this chapter, the number of jobs worked is significantly related to non-employment and multicollinearity may exist in this independent variable. It may be true, at least in part, that older students are hired because they have more work experience and not because of maturity or other characteristics.

College Major and GPA Differences

In both event history and multinomial logistic regression analyses, significant differences were observed between some college majors when compared to the reference category of “other major” (see Appendix B). Overall and for whites, Humanities majors were less likely to move from a non-employed state to an employed state while Engineering and Health Professions majors were more likely to do the same as compared to the reference category. Male Biological Science majors were less likely to move from a non-employed state to an employed state while Females in Health Professions were more likely compared to the reference category.

In the multinomial logistic analysis on the number of spells of non-employment, Education, History and Humanities majors compared to other majors were more likely in some categories to experience a greater number of spells of non-employment. Business and Management, Engineering, Health Professions, and Math majors compared to other majors in some categories were not as likely to demonstrate an increased number of spells of non-employment. In the finding of relationship to student’s major course of study, the results of the current study generally correspond to those cited in the literature in that students in Business and Management, Engineering, Health Professions often enjoyed higher earnings and higher labor force participation rates while students in other majors did not.

Performance measures, such as average earnings calculated by Thomas (2000), ranged from \$19,233 for majors in the areas of education and \$20,537 for majors in the areas of Humanities to \$30,627 for Engineering and \$30,917 for Health-related majors.

James, Nabell, Conaty & To (1989) as well as Hearn and Bunton (2001) determined that Humanities, Education and Psychology majors earned less while Business, Engineering, Health Professions, Computer Science and certain other sciences typically earn significantly more than other majors.

In both types of analyses, there were no significant differences observed for duration or the number of spells of non-employment for any of the GPA categories. However, it is possible that the categories were too broad. While comparing an A versus a C or lower makes sense as a general estimate of performance, some careers and employers may more heavily value an “outstanding performer” who has earned a 3.50 or higher GPA. This study is dissimilar to the literature in that no differences were found among the GPA categories. However, more tightly-defined GPA categories could yield results that are similar to other studies.

Thomas (2000) concludes that “all things being equal, if one desired to maximize postgraduate earnings, she would choose a high quality college or university, major in a lucrative area such as health or engineering, and strive to attain a high grade point average over the course of her studies.” (p. 283) Sagen and Laferty (2000) asked students what contributed to their employment success and determined that those students with “higher ability” as evidenced by a higher GPA were 40% more successful in securing employment than those with a lower GPA. Sagen and Laferty also assert that employers tend to screen graduates for desired basic characteristics and past achievement (GPA) and then focus on those candidates with the desired supplementary qualifications such as related work experience and internships. Therefore, GPA may help to overcome

the barriers to entry for the initial position but may not help significantly with later job searches.

As stated previously, differences in employment outcomes by college major are understandable. For the most part, it is understood and well advertised that some careers are much more lucrative than others due simply to supply and demand. Whether or not a student chooses a major in college due to career decisions could be the focus of other research. Sewell and Shah (1976) confirmed previous studies and concluded that socioeconomic status, intelligence and parental encouragement all significantly affect the college plans of both males and females. Parental encouragement was found to be the strongest factor, explaining about one-fourth of the variance in college plans in males and about one-third in females. The Chronicle of Higher Education (2001) reported that 8% of entering freshman are undecided about a college major. When in college, 72% of freshman who initially chose a major changed their major at least once before graduating (Kroc, Howard & Woodward, 1997 as cited in Strasser, Ozgur & Schroeder, 2002).

If students are entering college "to be able to get a better job" and "to be able to make more money" (Higher Education Research Institute, 1999), one would hope that they make good decisions about their college major and career path prior to entering and while enrolled in college. It is also apparent from both this study and from the literature that some majors lead to lucrative careers while others offer low wages and a higher probability of increased spells and longer duration of non-employment. If 72% of freshmen change their majors while in college, it is unlikely that the decisions that led to college or to a major were well researched or thought out ahead of time and that the path from college to work may be somewhat haphazard.

Work Experience Differences

The relationships that were most significant were in the categories of number of jobs held for pay during the year prior to graduation. As the number of jobs held increased during this period compared to the reference category of one job, the probability of moving from a non-employed state to an employed state during the survey period increased. Further, students who had held four or more jobs had a mean duration of non-employment of only 2.63 months compared to 3.83 for those who had held only one job. When compared to those who had held only one job, students who held four or more jobs were also .36 times as likely to have three or more spells of non-employment compared to one spell of non-employment with one month duration. Since 67% of the cases in the mutually-exclusive category of one spell of non-employment with one month duration were students who were employed directly out of college, and since this category had the greatest number of cases, it can be stated that students with four or more jobs in college are more likely to get and keep a job right out of college than are students who had held only one job. However, it cannot be stated that having more or fewer spells of non-employment actually affects the utility of the respondent. The spells of non-employment could have been a period where a respondent relocated to a higher-paying job or could have been an opportunity for the individual to somehow better their self in a search for a position that was more closely aligned to their career goals.

In summary, students who had held four or more jobs prior to graduation experienced far fewer spells of non-employment and a shorter mean duration of non-

employment. Those students who had held three jobs and two jobs also fared much better than those who had held only one job.

The literature is similar to this part of the study as well. Students seeking employment in the professional world often hear “we are really looking for someone with experience” when applying for jobs, and colleges and universities are finding that an internship during college is a valuable experience which can lead to employment (Gibala and Stuhldreher, 2001). Other researchers (Sagen and Laferty, 2000) measured “employment success” one month after graduation and determined that career preparation experiences such as related work experience and internships were highly significant and were contributing factors in helping to secure employment.

The results of this study and the literature are not counterintuitive. As students accumulate work experience on a resume, employers are not only able to generalize about their ability in the workplace but are also able to capitalize on the training and experiences gained – especially if the previous work is directly related to the job being sought. It is also intuitive to think that an employer would hire a student with work experience over a student with little or none if the students had similar academic credentials. However, what is interesting is the significance of the relationships and the magnitude of the difference between those students who had held more jobs compared to one job and the implications that this might have for students, educators, parents and policymakers.

Opportunities for Additional Research

There are many opportunities for additional research in the area of employment outcomes for college graduates. The Baccalaureate and Beyond data set has several hundred variables from which to choose. Certainly more independent variables can be chosen or different categories of independent variables such as GPA and age can be created based upon the research approach, and either the same or a different type of analysis could be performed. Since the types of analysis used in this study required a reference category, the reference category could be changed or modified. For instance, tighter GPA levels could be created and “highly qualified” students could be compared to B- students. Further, if one wanted to compare a particular major to another, the reference category of “other” major could be changed. It might be interesting to compare all majors against a Business and Management degree.

Significant relationships between non-employment and the number of jobs held for pay one year prior to graduation were discovered. However, no data are available in the B&B study that could help to answer why. A study involving those in human resources or individual who make hiring decisions could be conducted to determine how they value work experience when making hiring decisions. This finding could be very important to parents, students, degree-granting institutions, and policy-makers and this relationship could be further explored. The results could have impact on the need for internships and “related work experience” as described in the literature review in Chapter 2.

The B&B study is longitudinal and several follow-up surveys are to be conducted with the next being completed in 2003. This study can simply be repeated when the data are available and comparisons made using these results. Further, the B&B data include an emphasis on primary and secondary education teachers, and also include data on special populations, including students with disabilities and racial and ethnic minorities. Those interested in these populations should find the B&B data most useful.

What was not done in the current study but could be included in the event history analysis is the incorporation of time-dependent covariates and the treatment of quantitative variables as events. Examples of time-dependent variable might include whether or not an individual marries, gives birth, receives additional training, or receives some type of certification. An example of a quantitative variable might be the total number of months worked in primary or secondary education.

This study eliminated cases and records from the analysis for those individuals who went from a non-employed state to an in-school (full or part time) state before moving to an employed state. These were eliminated since the circumstances of training or education could have somehow influenced respondents' ability to move to an employed state. It would be very interesting to study whether this special population was different from the rest in terms of personal characteristics and employment outcomes.

Since the strongest results have been found in relation to the number of jobs held prior to graduation, a refinement of that analysis and comparison to similar studies or with similar data could be performed. The NCES also examines high school students and their transition to work in at least two other longitudinal studies. According to the NCES (2002), the Education Longitudinal Study of 2002 (ELS:2002) is a "longitudinal

survey that will monitor the transitions of a national sample of young people as they progress from tenth grade to, eventually, the world of work.” The National Education Longitudinal Study of 1988 is another study that is currently available and is a nationally-representative sample of eighth-graders who were first surveyed in the spring of 1988 with four follow-ups in 1990, 1992, 1994, and 2000 where the students reported on items such as school, work, and career (USDOE NCES, 1988). The NELS:88 in its current form and the ELS:2002 in the future can both be used for comparison of work experience in high school and work in college as they relate to employment outcomes.

Conclusions and Implications of this Research

As stated previously, the conceptual framework of this study is based on a structured taxonomy of student outcomes as defined by the National Postsecondary Education Cooperative (NPEC). The taxonomy of student outcomes was developed for use by postsecondary institutions as a structure on which to base and create policy. Items identified both in this taxonomy and identified by students as the two primary reasons for choosing college are to get a better job and to make more money.

While it appears to be true that “all things being equal, if one desired to maximize postgraduate earnings, she would choose a high quality college or university, major in a lucrative area such as health or engineering, and strive to attain a high grade point average over the course of her studies” (Thomas, 2000), a strong relationship between previous work experience and obtaining and keeping employment has been identified. It is common knowledge, and information is certainly readily available that shows that

particular careers and industries offer higher wages and better career opportunities than others. It can be recommended that differences be explored by the student for whom obtaining a better job and making money are the most desirable outcomes of obtaining a baccalaureate degree. There are relationships between race, gender, and age and non-employment but these factors are beyond the control of the student.

However, the student can choose to gain valuable work experience prior to and while in college and this experience may be a very important factor in terms of future employment. Further, colleges and universities can choose to incorporate a practicum or internship into their programs. Even if a student does not choose a major that offers a clear path to employment, it appears that, if that student holds several jobs prior to graduation, he or she is more likely to be employed and is more likely to have fewer spells of non-employment than those students who do not hold as many jobs.

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Table 11. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by GENDER and Sample Type*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
GENDER					1099				
Females				5477					4670
Number of Spells	1	1	7	8147		1	1	7	7107
Duration of Spells									
Spell 1	1	1	61	5349		1	1	33	4603
Spell 2	3	1	49	2087		3	1	49	1865
Spell 3	3	1	41	559		3	1	41	504
Spell 4	2	1	28	127		2	1	28	114
Spell 5	5	1	15	21		6	1	15	18
Spell 6	1	1	8	3		1	1	1	2
Spell 7	1	1	1	1		1	1	1	1
Males				4181					3584
Number of Spells	1	1	7	5709		1	1	6	5018
Duration of Spells									
Spell 1	1	1	64	4021		1	1	35	3515
Spell 2	3	1	47	1289		3	1	47	1150
Spell 3	2.5	1	43	322		3	1	43	289
Spell 4	2	1	34	63		2.5	1	34	54
Spell 5	2	1	17	11		2	1	17	9
Spell 6	1.5	1	2	2		1	1	1	1
Spell 7	6	6	6	1					

Table 11. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by GENDER and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (<i>n</i> = 11192)					In Event History Analysis (<i>n</i> = 8254)			
	With Contiguous Monthly Employment Data (<i>n</i> = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Missing					0				0

Source: U.S. Department of Education National Center for Education Statistics, 1999c.

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

Table 12. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by RACE and Sample Type*

Variable	Full B&B:93/97 Sample (<i>n</i> = 11192)					In Event History Analysis (<i>n</i> = 8254)			
	With Contiguous Monthly Employment Data (<i>n</i> = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
RACE					1099				
Non-White				1279					1010
Number of Spells	1	1	5	1839		1	1	5	1520
Duration of Spells									
Spell 1	1	1	60	1225		1	1	35	987
Spell 2	3	1	49	474		3	1	49	410
Spell 3	3	1	36	113		3	1	36	98
Spell 4	3	1	13	25		3	1	13	23
Spell 5	7	5	9	2		7	5	9	2
White				8379					7244
Number of Spells	1	1	7	12017		1	1	7	10605
Duration of Spells									
Spell 1	1	1	64	8145		1	1	33	7131
Spell 2	3	1	47	2902		3	1	47	2605
Spell 3	3	1	43	768		3	1	43	695
Spell 4	2	1	34	165		2	1	34	145
Spell 5	3	1	17	30		4	1	17	25
Spell 6	1	1	8	5		1	1	1	3
Spell 7	3.5	1	6	2		1	1	1	1

Table 12. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by RACE and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Missing				0					0

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

Table 13. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Normalized GPA Category and Sample Type*

Variable	Full B&B:93/97 Sample (<i>n</i> = 11192)					In Event History Analysis (<i>n</i> = 8254)			
	With Contiguous Monthly Employment Data (<i>n</i> = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
GPA Category					320				
GPA3TO4I				5320					4613
Number of Spells	1	1	7	7427		1	1	7	6668
Duration of Spells									
Spell 1	1	1	59	5104		1	1	33	4516
Spell 2	3	1	47	1774		3	1	47	1637
Spell 3	3	1	41	434		3	1	41	408
Spell 4	3	1	34	93		3	1	34	87
Spell 5	4.5	1	17	18		5	1	17	17
Spell 6	1	1	8	3		1	1	1	2
Spell 7	1	1	1	1		1	1	1	1
GPA2TO3I				3978					3563
Number of Spells	1	1	6	5868		1	1	6	5342
Duration of Spells									
Spell 1	1	1	64	3909		1	1	35	3524
Spell 2	3	1	49	1451		3	1	49	1349
Spell 3	3	1	43	407		3	1	43	378
Spell 4	2	1	25	88		2	1	25	80
Spell 5	2.5	1	9	12		4.5	1	9	10
Spell 6	1	1	1	1		1	1	1	1

Table 13. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Normalized GPA Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
GPA0TO2I				88					78
Number of Spells	1	1	4	128		1	1	4	115
Duration of Spells									
Spell 1	1	1	50	88		1	1	21	78
Spell 2	4	1	31	32		4	1	31	29
Spell 3	4	1	14	7		4	1	14	7
Spell 4	1	1	1	1		1	1	1	1
Missing				273					
Number of Spells	1	1	7	433					
Duration of Spells									
Spell 1	1	1	56	269					
Spell 2	3	1	36	119					
Spell 3	2	1	23	33					
Spell 4	2	1	13	8					
Spell 5	4	1	7	2					
Spell 6	2	2	2	1					
Spell 7	6	6	6	1					

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

Table 14. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by TYPAGE and Sample Type*

Variable	Full B&B:93/97 Sample (<i>n</i> = 11192)					In Event History Analysis (<i>n</i> = 8254)			
	With Contiguous Monthly Employment Data (<i>n</i> = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
TYPAGE					269				
Typical				5073					4484
Number of Spells	1	1	6	7399		1	1	6	6685
Duration of Spells									
Spell 1	1	1	60	4880		1	1	25	4386
Spell 2	3	1	45	1887		2	1	45	1723
Spell 3	3	1	35	502		3	1	35	458
Spell 4	3	1	34	113		3	1	34	102
Spell 5	5	1	17	16		7	1	17	15
Spell 6	1	1	1	1		1	1	1	1
Older				4360					3770
Number of Spells	1	1	7	6155		1	1	7	5440
Duration of Spells									
Spell 1	1	1	64	4283		1	1	35	3732
Spell 2	3	1	49	1422		3	1	49	1292
Spell 3	3	1	43	359		3	1	43	335
Spell 4	2	1	28	71		2	1	28	66
Spell 5	4	1	7	15		4.5	1	7	12
Spell 6	1	1	2	3		1	1	1	2
Spell 7	3.5	1	6	2		1	1	1	1

Table 14. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by TYPAGE and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Missing									0
Number of Spells	1	1	6	302					
Duration of Spells									
Spell 1	1	1	58	207					
Spell 2	3	1	34	67					
Spell 3	2	1	5	20					
Spell 4	2	1	5	6					
Spell 5	1	1	1	1					
Spell 6	8	8	8	1					

Source : U.S. Department of Education National Center for Education Statistics, 1999c.

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

Table 15. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by the Category of Number of Jobs Held Between July 1, 1992 and June 30, 1993 and Sample Type*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Number of Jobs Category					818				
JOBNUM4G				620					581
Number of Spells	1	1	7	1125		1	1	7	1054
Duration of Spells									
Spell 1	1	1	21	615		1	1	15	577
Spell 2	2	1	37	325		2	1	37	308
Spell 3	2	1	33	127		2	1	33	119
Spell 4	2	1	34	39		2	1	34	36
Spell 5	1	1	8	13		5	1	8	11
Spell 6	1.5	1	8	4		1	1	1	2
Spell 7	3.5	1	6	2		1	1	1	1
JOBNUM3				1179					1095
Number of Spells	1	1	5	1929		1	1	5	1799
Duration of Spells									
Spell 1	1	1	39	1168		1	1	25	1087
Spell 2	2	1	35	533		2	1	35	497
Spell 3	2	1	32	169		2	1	32	160
Spell 4	2	1	28	51		2	1	28	47
Spell 5	4.5	1	15	8		4.5	1	15	8

Table 15. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by the Category of Number of Jobs Held Between July 1, 1992 and June 30, 1993 and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)				
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n	
	Median	Min	Max	n						
JOBNUM2									2886	2646
Number of Spells	1	1	5	4459		1	1	5		4085
Duration of Spells										
Spell 1	1	1	25	2849		1	1	25		2613
Spell 2	3	1	44	1203		3	1	44		1102
Spell 3	3	1	43	338		3	1	43		307
Spell 4	3	1	18	60		3	1	18		56
Spell 5	4	1	17	9		4	1	17		7
JOBNUM1									4330	3932
Number of Spells	1	1	6	5707		1	1	6		5187
Duration of Spells										
Spell 1	1	1	51	4225		1	1	35		3841
Spell 2	4	1	49	1215		4	1	49		1108
Spell 3	3	1	30	228		3	1	30		207
Spell 4	2	1	25	36		2	1	25		29
Spell 5	4	2	6	2		6	6	6		1
Spell 6	1	1	1	1		1	1	1		1

Table 15. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by the Category of Number of Jobs Held Between July 1, 1992 and June 30, 1993 and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Missing ^c				643					0
Number of Spells	1	1	4	636					
Duration of Spells									
Spell 1	11	1	64	513					
Spell 2	4	1	39	100					
Spell 3	5	1	26	19					
Spell 4	2	1	14	4					

Source : U.S. Department of Education National Center for Education Statistics, 1999c

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

^c Includes 80 cases that held 0 jobs.

Note: 206 cases held no jobs B&B:93/97, 80 with contiguous monthly employment data and 0 in the analysis.

Table 16. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by NEEDAID and Sample Type*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
NEEDAID					23				
No Need Aid				5445					4640
Number of Spells	1	1	7	7830		1	1	7	6840
Duration of Spells									
Spell 1	1	1	64	5292		1	1	35	4571
Spell 2	3	1	47	1925		3	1	47	1709
Spell 3	3	1	43	491		3	1	43	448
Spell 4	2.5	1	34	102		2	1	34	93
Spell 5	3	1	13	17		4	1	13	16
Spell 6	1	1	1	2		1	1	1	2
Spell 7	1	1	1	1		1	1	1	1
Need Aid				4191					3614
Number of Spells	1	1	7	5990		1	1	6	5285
Duration of Spells									
Spell 1	1	1	60	4056		1	1	23	3547
Spell 2	3	1	49	1443		3	1	49	1306
Spell 3	2.5	1	34	386		2	1	34	345
Spell 4	2	1	28	86		2	1	28	75
Spell 5	4	1	17	15		6	1	17	11
Spell 6	2	1	8	3		1	1	1	1
Spell 7	6	6	6	1					

Table 16. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by NEEDAID and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Missing				22					0
Number of Spells	1	1	4	36					
Duration of Spells									
Spell 1	2	1	24	22					
Spell 2	3.5	1	11	8					
Spell 3	1.5	1	5	4					
Spell 4	2.5	2	3	2					

Source: U.S. Department of Education National Center for Education Statistics, 1999c.

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Major Category					1114				
MAJEDUC				1407					1299
Number of Spells	1	1	5	2167		1	1	5	2042
Duration of Spells									
Spell 1	1	1	60	1376		1	1	25	1279
Spell 2	2	1	47	582		2	1	47	562
Spell 3	2	1	41	171		2	1	41	165
Spell 4	2	1	23	35		2	1	23	33
Spell 5	8	3	13	3		8	3	13	3
MAJENGN				639					575
Number of Spells	1	1	4	777		1	1	3	711
Duration of Spells									
Spell 1	1	1	57	613		1	1	33	561
Spell 2	3	1	49	145		3	1	49	134
Spell 3	2	1	33	18		2	1	33	16
Spell 4	2	2	2	1					

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
MAJHEALT					784				691
Number of Spells	1	1	6	1016		1	1	5	902
Duration of Spells									
Spell 1	1	1	53	770		1	1	16	685
Spell 2	3	1	40	197		3	1	40	172
Spell 3	2	1	35	36		2	1	35	35
Spell 4	4.5	1	25	10		4	1	25	9
Spell 5	4	1	7	2		7	7	7	1
Spell 6	8	8	8	1					
MAJPA_SS					351				313
Number of Spells	1	1	5	485		1	1	5	435
Duration of Spells									
Spell 1	1	1	60	344		1	1	23	307
Spell 2	4	1	42	112		4	1	42	102
Spell 3	2	1	18	25		3	1	18	22
Spell 4	2	2	3	3		2	2	3	3
Spell 5	7	7	7	1		7	7	7	1

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
MAJBISCI					489				410
Number of Spells	1	1	6	695		1	1	6	626
Duration of Spells									
Spell 1	1	1	58	449		1	1	33	396
Spell 2	3	1	45	178		3	1	45	166
Spell 3	3	1	22	56		2	1	22	52
Spell 4	10	1	28	9		10	1	28	9
Spell 5	4	2	6	2		4	2	6	2
Spell 6	1	1	1	1		1	1	1	1
MAJBIZ					1186				1102
Number of Spells	1	1	5	1628		1	1	5	1522
Duration of Spells									
Spell 1	1	1	55	1171		1	1	21	1094
Spell 2	3	1	45	361		3	1	45	339
Spell 3	4	1	43	79		4	1	43	74
Spell 4	2	1	12	16		2.5	1	12	14
Spell 5	1	1	1	1		1	1	1	1

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
MAJMATH					591				511
Number of Spells	1	1	5	784		1	1	5	705
Duration of Spells									
Spell 1	1	1	40	551		1	1	35	495
Spell 2	2	1	36	179		2	1	36	162
Spell 3	2.5	1	36	48		2	1	36	43
Spell 4	3	1	9	5		4.5	2	9	4
Spell 5	17	17	17	1		17	17	17	1
MAJSOCSI					948				856
Number of Spells	1	1	5	1426		1	1	5	1312
Duration of Spells									
Spell 1	1	1	64	922		1	1	25	838
Spell 2	3	1	47	378		3	1	47	355
Spell 3	2	1	14	101		3	1	14	95
Spell 4	2	1	10	20		2	1	10	19
Spell 5	1	1	12	5		1	1	12	5

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
MAJHIST									161
Number of Spells	1	1	4	268		1	1	4	244
Duration of Spells									
Spell 1	1	1	48	174		1	1	23	159
Spell 2	3	1	32	66		3	1	32	59
Spell 3	4.5	1	28	22		5.5	1	28	20
Spell 4	3.5	1	10	6		3.5	1	10	6
MAJHUMAN				936					832
Number of Spells	1	1	5	1499		1	1	5	1362
Duration of Spells									
Spell 1	1	1	56	908		1	1	22	817
Spell 2	3	1	40	419		3	1	40	380
Spell 3	3	1	33	131		3	1	33	125
Spell 4	2.5	1	34	36		2	1	34	35
Spell 5	4	2	10	5		4	2	10	5

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
MAJPSYCH					365				313
Number of Spells	1	1	5	533		1	1	5	461
Duration of Spells									
Spell 1	1	1	61	354		1	1	18	309
Spell 2	3	1	40	131		3	1	40	115
Spell 3	2	1	27	38		2	1	27	29
Spell 4	2	1	17	9		2	1	17	7
Spell 5	6	6	6	1		6	6	6	1
MAJOTHER					1314				1191
Number of Spells	1	1	7	1969		1	1	7	1803
Duration of Spells									
Spell 1	1	1	59	1288		1	1	24	1178
Spell 2	3	1	47	505		3	1	47	469
Spell 3	3	1	33	129		3	1	33	117
Spell 4	2	1	18	33		2	1	18	29
Spell 5	3	1	15	9		3	1	15	7
Spell 6	1	1	2	3		1	1	1	2
Spell 7	3.5	1	6	2		1	1	1	1

Table 17. *The Number and Duration of Spells of Non-Employment among a Nationally Representative Sample of Baccalaureate and Beyond Graduates who Received a Bachelor's Degree in the 1992-1993 Academic Year by Major Category and Sample Type – Continued.*

Variable	Full B&B:93/97 Sample (n = 11192)					In Event History Analysis (n = 8254)			
	With Contiguous Monthly Employment Data (n = 9658) ^a				Missing Data ^b	Median	Min	Max	n
	Median	Min	Max	n					
Missing					472				0
Number of Spells	1	1	5	609					
Duration of Spells									
Spell 1	1	1	57	450					
Spell 2	5	1	41	123					
Spell 3	5	1	28	27					
Spell 4	3	1	14	7					
Spell 5	1.5	1	2	2					

Source: U.S. Department of Education National Center for Education Statistics, 1999c.

^a Secondary follow-up non-respondents were eliminated from this sample.

^b Missing from full B&B: 93/97 sample and does not total with contiguous monthly employment data sample.

Appendix B

Table 18. *Frequency and Percent for Majors Categorized as Other*
(*n* = 1191)

	Frequency	Percent
Agriculture	11	0.92
Agricultural Science	65	5.46
Natural Resources	14	1.18
Forestry	11	0.92
Architecture	16	1.34
American Civilization	7	0.59
Area Studies	13	1.09
African-American Studies	17	1.43
Ethnic Studies, NOT Black/Area Studies	2	0.17
Accounting	19	1.6
Marketing/Distribution	7	0.59
Journalism	74	6.21
Communications	329	27.62
Communication Technology	28	2.35
Cosmetology	1	0.08
Consumer/Personal Serv, NOT Cosmetology	1	0.08
Textiles	7	0.59
Home Economics: all other	41	3.44
Vocational Home Econ: Child Care/Guidnce	19	1.6
Vocational Home Econ: Other	2	0.17
Law: Paralegal, includes pre-Law	15	1.26
Law	18	1.51
Liberal Studies	99	8.31
Library/Archival Science	1	0.08
Military Sciences	2	0.17
Women's Studies	5	0.42
Interdisciplinary: Environmental Stud.	53	4.45
Interdisciplinary: Biopsychology	95	7.98
Interdisciplinary: all other	45	3.78
Leisure Studies	27	2.27
Basic/Personal Skills	13	1.09
City Planning	10	0.84
Industrial Arts: Construction	34	2.85
Mechanics: Transportation	3	0.25
Industrial Arts: Electronics	9	0.76
Commercial Art	44	3.69
Precision Production	3	0.25
Transportation: Air	16	1.34
No major	15	1.26

Source: United States Department of Education, National Center
for Education Statistics, 1999c

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Responsible for designing, developing, implementing and maintaining Internet and Intranet-based Web sites and databases for use in teaching, research, and outreach. Responsible for server and systems administration, network infrastructure, and computer and network security. Train full-time Web Designers, part-time assistants, faculty and staff on information technology.

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