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Life After Service for Post-9/11 Veterans: Data, Methods, and Policy Impacts

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LIFE AFTER SERVICE FOR POST-9/11 VETERANS:

DATA, METHODS, AND POLICY IMPACTS

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Abstract

Designed as a three-article style dissertation, this study was developed to first assess literature and data related to veteran outcomes following active duty service. Secondly, this dissertation sought to determine the best approach for measuring changes in veteran outcomes as a function of the policy process, which resulted in the development of a new methodological approach, Event Outcome Analysis based on Event History Analysis. Finally, veteran outcomes in employment and educational degree attainment were measured using Event Outcome Analysis to determine the relative impact of the 2008 GI Bill on Post-9/11 veterans. Study findings included statistically significant 2008 GI Bill impacts on educational degree attainment rates among Post-9/11 veterans using 11-years of American Community Survey-Public Use Microdata Sample (ACS-PUMS) annual cross-sectional data. Additionally, these results provide a successful application of Event Outcome Analysis with a discussion of future applications of the new methodological approach. The three articles, chapters 2 through 4, were developed to be standalone publications in an iterative design with each article informing subsequent work. As a cumulative work, this dissertation adds substantive data strategies for studying veteran outcomes using nationally available data, a new methodological approach for policy and program evaluation using cross-sectional data, and an initial beta-test of the developed methodology with significant findings about veteran life after service for Post-9/11 veterans.

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Dedication

To my wife and son ~ Thank you for strengthening my faith, inspiring me to keep moving forward, and helping this dream to be realized. I love you both more than words can express.

To my parents ~ Thank you for your unending support of my pursuit of knowledge and adventure.

To my grandfathers ~ Thank you for inspiring me through words and example to embrace the opportunities of the unknown and to walk my own path.

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Chapter 1: Introduction

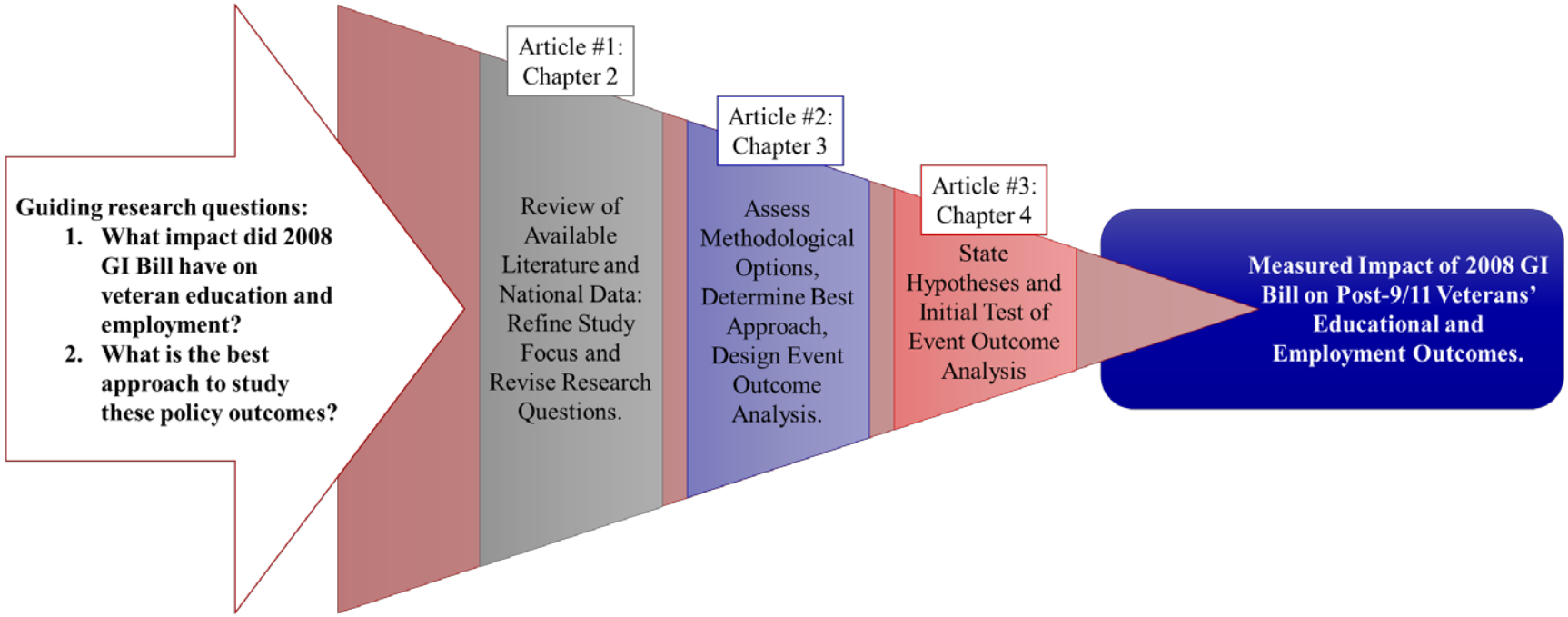
The goal of this study was to assess available data, evaluate current methodological approaches, and ultimately measure the impact of the 2008 GI Bill on Post-9/11 veterans' employment and education outcomes. Service and sacrifices of the American military have been documented since the dawn of our nation with 20th Century studies citing differences in financial well-being between service members and non-military civilians dating to the Revolutionary Era (Borus, 1975; Villimez and Kasarda, 1976; Little and Fredland, 1979). President Lincoln called for the U.S. Government to provide for service members and their families and his decree remains as a cornerstone of the U.S. Department of Veterans Affairs. Initial policy-based support for veterans and their families was passed during Lincoln's Presidency and in 1944, President Franklin Delano Roosevelt signed the GI Bill of Rights forever changing transition from active duty (Greenberg, 2008; Roisman, 2005). In the more than 70 years since, benefits available to veterans and transitional programs have been updated and modified through the policy process. Programs to support transitional preparedness began in the late 1960s with Project Transition (Villimez and Kasarda, 1976), which has evolved into the Transitional Assistance Program (TAP) that has itself evolved in the nearly two and a half decades since it was first introduced in the early 1990s (About DoDTAP, 2015).

From a policy perspective, veteran benefits have varied greatly from service era to service era with decreasing levels of benefits from Post-World War II through Vietnam and steady increases in the Gulf War and Post-9/11 Eras (O'Neill, 1977; Angrist, 1993; Collins, et al., 2014; Rubin, 2012; Clemens and Milsom, 2008; & Ruh, et al., 2009). While both policy and program changes have been consistent features of veteran benefits for the better part of seven decades, data-derived policy-making and program decision-making has a limited history. Changes to the TAP

program in 2012 and 2013 were consistent with feedback from transitioning service members and life after service outcomes (About DoDTAP, 2015; DoDCRS, 2015). Policy changes on the other hand have occurred more frequently with a higher potential impact on veteran outcomes compared to the TAP program. Considering changes to the U.S. Military from a recruitment and overall structure perspective, military service members and veterans are increasingly more diverse today than at any point in our nation's history. The Montgomery GI Bill in 1985 was the initial step from a policy standpoint to align policy-making with the All Volunteer Force military, which necessitated incentives for initial enlistment and continued active duty service (Smith-Osborne, 2012). Following the attacks of September 11, 2001, the U.S. has been engaged in the longest war-time era in its history (PBS NewsHour, 2016). In 2008, the GI Bill was modified once again to increase available educational benefits for Post-9/11 service members in what has become the largest and most utilized veteran educational benefit program (Dortch, 2014).

From a holistic perspective, this three article-style dissertation was developed in an iterative-study design. The goal was to utilize each article to inform the work in the subsequent articles to address two guiding research questions: 1) the impact of the 2008 GI Bill on veteran education and employment outcomes and 2) the best methodological approach to study these phenomena. Beginning with a substantive literature and data review, past findings and currently available national data were identified and discussed. This review afforded the opportunity to further refine research questions and identify potential outcome hypotheses from available data. Subsequently, this informed the methodological assessments and eventual need for developing a new methodological approach, Event Outcome Analysis. Finally, identified literature and data as well as the newly designed method were applied to the third article to measure education and employment outcomes of Post-9/11 Veterans as depicted in Figure 1 on the next page.

Figure 1. Holistic Study Overview Diagram



From an article-by-article perspective, the first study, chapter 2, was designed to investigate the historical literature beginning with the research on employment, employability and transferability of the 1970s and 1980s (Borus, 1975; Villimez and Kasarda, 1976; Little and Fredland, 1979; & Mangum and Ball, 1987) to present-day research concerning workforce programs and transitional support (Ruh, et al. 2009; Zeigler, et al. 2011; Clemens and Milsom, 2008; & Collins, et al. 2014). Additionally, this investigation assessed the literature surrounding veteran educational benefits, programs, and outcomes beginning as early as Post-WWII with specific focus on the Post-9/11 Era (Angrist, 1993; Collins, et al., 2014; Ruh, et al., 2009; & Shackelford, 2009). Coupled with this substantive literature review was a review and discussion of nationally available data to study veteran outcomes in their lives after service. National data sources are presented with emphasis on employment and education, but also include other available data from areas such as health, population demographics, and historical veteran surveys and reports. Designed as an initial and standalone publication, the literature and data review was imperative in selecting the data analyzed as part of this dissertation as well as the methodological considerations for studying veteran outcomes.

Initially, the second article, chapter 3, was developed to use an Event History Analysis methodological approach; however, these methods are not designed to answer the research questions for this study and do not readily employ cross-sectional data. A comprehensive review of Event History Analysis was conducted to assess the method as originally designed and most often utilized (Allison, 2014), innovative approaches to studying policy changes at state and local governmental levels (Berry and Berry, 1990; Berry, 1994; & Volden, 2006), and cross-sectional modeling in health and education research (Barber, et al, 2000; Reardon, et al., 2002; & Biggeri, et al., 2001). As a result, a new methodological approach was designed to align with approaches

and techniques pursuant to Event History Analysis, but designed to study events as independent variables from a program or policy evaluation perspective. Also designed as a standalone publication, this methodological development includes a five-phase framework for Event Outcome Analysis, answers the second overarching research question as presented in Figure 1, and provides a discussion of an initial beta-test of the newly coined method.

As originally stated, the goal of this dissertation was to measure employment and educational outcomes of Post-9/11 veterans as a function of the 2008 GI Bill. Based on the substantive literature and data review and utilizing the newly developed Event Outcome Analysis, four models were designed and tested in the third article, chapter 4, using American Community Survey-Public Use Microdata Sample (ACS-PUMS) data from 2005-2015. The cross-sectional datasets were reviewed, assessed and coded to serve as an initial test of the Event Outcome Analysis method. Employing Mixed-effects Generalized Linear Models to measure the impact of the 2008 GI Bill along with gender, race, Genus Region state residence (policy diffusion based on veterans living in greater numbers in rural states and communities). Similar to the literature and data review as well as the methodological development, this initial Event Outcome Analysis beta-test was designed as a standalone publication and ultimately answered the primary overarching research question as previously discussed and presented in Figure 1.

The three-article style dissertation offered an opportunity to explore the problem, literature and available data before making decisions about research design, questions and hypotheses. Following the completion of the first article, research questions and initial hypotheses were designed with a more robust and comprehensive knowledge-base of previous findings and available data. This interim development of research questions and hypotheses also informed the methodological assessment article with the original intent of selecting an existing approach with

which to answer research questions and test hypotheses. In reviewing available methods, specifically Event History Analysis, with data and literature derived research questions and potential hypotheses it became apparent a new methodological approach was needed. After developing the Event Outcome Analysis approach with ties to existing Event History Analysis and a structured framework for utilizing cross-sectional data, the method could be tested to answer research questions and hypotheses. The final article sought to not only answer research questions and test hypotheses, utilize data assessed as part of the first article, and provide a substantive addition to the veteran transitional literature, but also to test Event Outcome Analysis. Each of these separate works are presented in the next three chapters with a dedicated conclusion to summarize the collective findings, discuss study limitations, and present opportunities for future research.

Chapter 2: Data Driven Veterans Transitional Research: Education and Employment

Abstract

There is an extensive history of literature focused on the transition from active duty military service to civilian life as a veteran, dating to the late 1960s. Distinct differences in experiences and life outcomes of veterans as compared to non-military civilians have been detailed throughout the literature and across history for more than 50 years. The Post-9/11 era has seen the most substantial increases in funding, program availability, and policy-based support to improve transitional preparedness and outcomes after life in service. While policy and programmatic interventions are plentiful, the application of data to inform policies and programs has been limited in scope and reach.

The goal of this article is to present and discuss the available data in conjunction with a substantive literature review of transitional studies focused specifically on jobs and employment as well as education. This assessment seeks to further investigate and present available data sources that provide opportunities to collectively study veteran transition from both current and historical perspectives. The Corporation for Enterprise Development (CFED) Assets and Opportunity (A&O) Scorecard was utilized as a guiding framework for reporting and evaluation outcome data from both a policy and program perspective. Results of this study are anticipated to increase collective awareness of available data, provide a synthesis of substantive literature, and inform data driven research for future studies seeking to investigate the impact of military service on post-military life outcomes.

Key Words: Veterans Transition, Data, Policy Analysis, Program Evaluation

Introduction

Since the dawn of the United States, military service members have protected our freedoms around the world, their lives forever changed by their sacrifice and service. Returning home and re-entering the civilian world, transitioning from active duty service, presents unique challenges for not only service members and their families, but also for communities, governments, policy-makers, service providers, employers, and educators. The idea of military transition has been the topic of conversation in government since as early as the Civil War. President Lincoln's commendation of these sacrifices can be found on the Department of Veterans Affairs building, "to care for him who shall have borne the battle and for his widow and his orphan" (Roisman, 2005, p. 110).

Towards the end of World War II, President Franklin Delano Roosevelt further empowered governmental actions to support military veterans with his signature on the G.I. Bill of Rights in 1944 (Roisman, 2005, p. 110). It wasn't until the late 1960s and early 1970s that transitional research became integrated with programmatic designs (Roisman, 2005). Over the past half-century since, the U.S. Military has committed additional resources to preparing service members for life after the military with recently increasing importance on data and research. In the 1990s, the Department of Defense began a program known as, Transitional Assistance Program (TAP), which was modified in 2013 to include additional training delivery capacities and updated materials including early planning.

In his 2016 National Memorial Day Concert speech to thank service members, Colin Powell encapsulated the selfless sacrifice and devotion to freedom as expressed by American military personnel:

> While your lives have been on the line, they've also been on hold. You've had to bear long absences from your families and loved ones. Missing your spouses' birthday and the kids school graduations. All of the family joy that can never be retrieved (PBS, 2016).

He spoke of these difficulties and the bond shared among service members to volunteer following the 9/11 attacks and their continued service to their nation and each other following transition to veteran life. Transitioning from active duty military life presents numerous challenges and changes, which an estimated 200- to 250-thousand service members will face annually over the next several years (CFPB, 2015).

Various programs and services are available to eligible veterans during their transition and throughout their lives as veterans, which can be broadly grouped into nine areas: education, employment, health, mental health, legal, finance, housing, homelessness, and workforce. In assessing available data and veteran transitional literature these groups were aligned with the CFED A&O Scorecard to include financial assets and income, business and jobs, housing and homeownership, health care and education. The CFED A&O Scorecard was selected as a baseline and its capacity to serve as a comparison model for specific life outcomes. Such a baseline provides incredible opportunity to align historical research findings, trends, and recommendations for future studies with data driven policy analysis, program evaluation, and research investigations.

There are numerous available data sources in which a military service or veteran status variable or set of variables are incorporated and collected, such as era of military service or veteran status. Available data can be accessed at both the state and federal level; however, veteran- or military-specific data available from federal sources often has state, regional, or local variables. From a federal perspective, there are data sources available to assess health, education,

employment, population projections, demographic distributions, housing, and financial well-being. The CFED A&O Scorecard is in fact a collection of publicly available data sources analyzed to create state-level scores across each of the five substantive policy areas as previous discussed.

For the purpose of this investigation, veteran-based research will be presented from both the education and employment areas. These literature reviews will include secondary data applications as well as some primary data collection efforts to assess veteran outcomes in both education and employment. Following the literature-based presentations, a series of education and employment related federal data sources will be displayed and discussed. Finally, the case for increased usage of available federal data will be made specifically to investigate differences in life-after service outcomes of veterans as compared to non-military civilians.

Employment

Transition into civilian work is one of the longest and consistently studied outcomes related to veterans in academic research for the past five decades. Research investigations in the 1970s (Borus, 1975; Little and Fredland, 1979; & Villimez and Kasarda, 1976) sought to understand work-life transition following active duty service. Continuing this trend in the 1980s, Mangum and Ball (1987) built from earlier literature and changed the research perspective to transferability. In the 1990s, Angrist (1993) sought to connect educational benefits and veteran transition to civilian workforce. Furthering the findings from preceding decades, researchers in the 2000s began to connect services available through community-based workforce (Clemens and Milsom, 2008). In the current decade (2010s), research investigations have begun to parse-out differences between service member outcomes based on previously identified variables, such as branch of service, gender, age, pre-service socio-economic status, and changes to available veteran transition support programs (Burnett-Zeigler, et al. 2011; Collins, et al. 2014). Additionally, the U.S. Department of

Veterans Affairs (VA) and state agencies such as the Nevada Department of Veterans Services (NDVS), have instituted data tracking and reporting procedures for veteran populations with specific focus on veteran businesses, jobs and overall employment trends (EO 2014-20 Report, 2015; AB 62 Report, 2016, VA Reports, 2016).

The CFED A&O Scorecard focal area businesses and jobs, includes employment data points, which are collected from other sources such as the American Community Survey-Public Use Microdata Sample (ACS-PUMS), U.S. Census, and Bureau of Labor Statistics (BLS). Specific examples of variables include, employment and unemployment, salaries and wages, business ownership and spatial and demographic data points (CFED A&O Scorecard, 2016). These data points, which in combination with state data sources (Nevada examples: EO 2014-20 Report; AB 62 Report), have the potential to be investigated for differences between veterans and non-military civilians. As found in other substantive policy areas, there may also be observed differences between veterans based on era of service, branch of service, or other service-related variables. This review of the literature dating to the 1970s presents veteran transition to the civilian workforce from a variety of perspectives. The literature also considers the wide-array of available programs and services implemented since the inception of Project Transition, a program to assist veterans leaving active duty first instituted in 1967 (Villimez and Kasarda, 1976). While the discussed national and state sources may not include data prior to the mid-1980s, the current available data points can serve as comparable to early veteran-based research.

Research on early programs for veterans as they transitioned to employment after active duty service became more widespread during the Late-Vietnam era. Villimez and Kasarda (1976) hypothesized that Project Transition was developed as a method for better aligning military experience to civilian jobs. The Vietnam service era was the first since the passage of the G.I. Bill

in 1944 in which veterans were experiencing more difficulties finding work following active duty service (Villimez and Kasarda, 1976). Results from a qualitative study by Borus (1975) provided insight into the difficulties facing veterans after transitioning as they sought to re-start their civilian lives. He hypothesized that preparatory training for leaving the military was not a high priority for the military for two-specific reasons. First, Borus (1975) indicated that a training program would increase anxiety among service members by describing a difficult civilian employment market. Secondly, he reported the military viewed veterans as well-trained and prepared by their military experience for private employment markets (Borus, 1975).

From an evaluative perspective, Little and Fredland (1979) sought to identify and explain differences in earnings, status, and race among veteran populations based on their recruitment experiences. Research and findings presented by Little and Fredland (1979) were well-aligned in terms of impact variable inclusion with the earlier study by Villimez and Kasarda (1976). From these 1970s research investigations (Borus, 1975; Villimez and Kasarda, 1976; & Little and Fredland, 1979), there is a collective argument in support of the transferability notion from military positions to the private market employment labor force. A synthesis of study results begins to formulate the foundational criteria and inherent need for increased focus on veteran transition and a more formalized transitional preparedness training program.

Building from the work from the 1970s, Mangum and Ball (1987) turned research focus towards transferability and sought to specifically address the previously noted issues surrounding connectivity between active duty and civilian workforce (Borus, 1975; Villimez and Kasarda, 1976; Little and Fredland, 1979). In their evaluation, Mangum and Ball (1987) utilized the Armed Forces Qualification Test (AFTQ) as a baseline for measuring the expected potential of veteran transferability to a civilian job. Variables incorporated in their investigation included: length of

service, military training types, military position requirements, service member sex, and service member AFTQ scores. From a purely transferability perspective and based on the literature from the 1960s, Mangum and Ball (1987) anticipated higher transferability in vocational and technical degrees and job responsibilities. In finding support for this notion though analysis, they indicated their results explain, "the viability of military relative to other training providers in facilitating entrance into—and movement through—the world of work" (Mangum and Ball, 1987, p. 438).

A research investigation into the connection between available G.I. Bill benefits and outcomes such as employment and post-service earnings by Angrist (1993) further develops earlier work on the transition of veterans into civilian labor force. Angrist (1993) utilized a 1977 study by Dave O'Neill as a comparative model to assess differences between post-Korean War veterans and Vietnam era veterans. O'Neill (1977) found positive effects on post-service earnings for veterans who served from during the Korean War from a 1969-1974 longitudinal veteran dataset. The O'Neill study sought to understand differences between veterans who utilized available benefits from those who did not. He found veterans who accessed available benefits saw an estimated 10% increase in annual earnings. Based on the O'Neill (1977) findings, Angrist (1993) reported a 6% increase in annual earnings that was primarily accrued by the 77% of veterans who utilized benefits for either collegiate or graduate school tuition. Compared to the O'Neill (1977) findings, Angrist (1993) found significantly lower annual income increases among Vietnam era veterans. His findings, which are also discussed in terms of education benefits, were explained in part by his assertion that Vietnam era benefits provided less overall support than previous G.I. Bill programs (Angrist, 1993). Additional explanations included the potential impact of targeted benefit programs aimed to increase services available for, "a middle and lower income population that is likely to need financial help when attending school" (Angrist, 1993, p. 650), which increased

enlistment rates among lower- to middle-income Americans in search of financial support for education.

Veterans since World War II have consistently transitioned from active duty into civilian life with programmatic support to access educational benefits and find employment in the civilian labor force (Borus, 1975; Villimez and Kasarda, 1976; O'Neill, 1977; Little and Fredland, 1979; Mangum and Ball, 1987; & Angrist, 1993). Changes in active duty enlistment and structure of benefit programs have occurred throughout all eras of service, which resulted in varying levels of veteran outcomes. Research from the Post-9/11 era describes yet another change in that veteran populations (Ruh, et al. 2009; Zeigler, et al. 2011; Clemens and Milsom, 2008; & Collins, et al. 2014). Ruh, et al. (2009) reported, "Each year, increasing numbers of veterans with disabilities reenter the civilian workforce" (p. 73). Further developing this finding, Burnett-Zeigler, et al. (2011) investigated employment patterns for recent National Guard veterans. From their survey of 585 study participants, they found, "A notable proportion of service members reported moderate to severe pain (34%), likely PTSD (14%), depression (24%), anxiety (mean PSWQ score = 34.9), and alcohol misuse (36%)" (Burnett-Zeigler, et al. 2011, p. 641). Additionally, they reported a majority of respondents were white males, with more than half who had graduated from high school, about half of whom were deployed 2 or more times, and a quarter who had less than $20,000 in annual family income (Burnett-Zeigler, et al. 2011). Results from the Burnett-Zeigler, et al. (2011) study found those veterans who were younger and with annual reported income of less than $20,000 to be most at-risk of unemployment. This finding is consistent with other national trends, which indicate the most at-risk veterans were enlisted service members with final ranks between E-4 and E-9 (Luther, et al. 1997).

More recent research focused specifically on the increasingly technologically driven military, active duty experience in terms of transferability, and the emerging need for a more case management style transition programs (Clemens and Milsom, 2008; Collins, et al. 2014). Clemens and Milsom (2008) highlighted improved tracking and procedural data sharing through the DD Form 214, which they posited as a resume building tool for veterans. To increase labor force interest hiring veterans, Clemens and Milson (2008) recommended a program designed to pair career counselors and veterans to translate military experience as listed on the DD Form 214 into civilian labor force terms. Communication of experiences and skills from the veteran perspective was cornerstone to successful outcomes of this process for both career counselor translation of skills and to increase confidence among veterans as they apply for civilian employment opportunities (Clemens and Milsom, 2008). Collins, et al. (2014) summarized a series of current available programs for veterans, many of which are related to the framework ascribed by Clemens and Milsom (2008). The wide array of programs to support transitioning veterans and facilitate successful navigation of the employment process were partitioned into three categories by Collins, et al. (2014), "(1) general programs that are broadly available to veterans, (2) programs that target veterans with service-connected disabilities, and (3) competitive grant programs that provide additional employment-related services to veterans but may be limited in scope or availability" (Abstract section, para. 2). These programs provide opportunities for the increasingly diverse population of veterans to include minorities (Little and Fredland, 1979; Burnett-Zeigler, et al. 2011), lower- to middle-income individuals (Angrist, 1993; Little and Fredland, 1979; Clemens and Milson, 2008), veterans with physical disabilities (Clemens and Milsom, 2008; Ruh, et al. 2009; Burnett-Zeigler, et al. 2011; & Collins, et al. 2014), and those with mental illnesses (Ruh, et al. 2009; Burnett-Zeigler, et al. 2011).

Specific programs currently available to veterans as reported by Collins, et al. (2014) include: services from Local Veterans Employment Representatives (LVER); Small Business Administration (SBA) loans and technical support; Vocational Rehabilitation and Employment (VR&E) program; Disabled Veterans Outreach Program (DVOP); and a revised Transitional Assistance Program (TAP). The initial program for active duty service members as they transition to civilian life is the TAP program, which began in 1990 as part of the drawdown of forces in the post-Cold War era (Collins, et al. 2014). Original program design offered, but did not require TAP participation, which resulted in wide variations in reported experiences and programmatic outcomes. Clemens and Milsom (2008) found an overall participation rate of approximately 54.6% during 3,905 TAP training workshops provided during fiscal year 2001 (p. 247). In their analysis, they found significant variation between service branches in terms of both class size and overall participation rates (Clemens and Milsom, 2008). Specifically, they reported vastly different participation rates by members of the U.S. Army, with class sizes averaging 24 service members and overall participation rates at 33% as compared to an average class size of 41 for the Marine Corps and 64% to 72% overall participation rates across all other branches (p. 247). Changes to the TAP program in 2012 and 2013 included mandated participation and revised curriculum that sought to address such wide disparities amongst veterans, specifically based on branch of service (Collins, et al. 2014).

Changes to TAP were also aimed at providing more targeted transitional support and preparedness training to Post-9/11 veterans, which Collins, et al. (2014) defined as Gulf War Era II (GWII) in their report (p. 1). Their analysis included a comparison of GWII veterans, other service era veterans, and non-veterans with significant differences identified across areas such as education, employment, and reported rates of disabilities (Collins, et al. 2014). Generally speaking,

GWII veterans had the highest rate of unemployment based on 2013 annual averages at 9.0% compared to 6.0% for other veterans and 7.2% for non-veterans (Collins, et al. 2014, p. 2). These findings are only exacerbated from a five-year trend perspective in which GWII veteran average unemployment rate was 10.3% compared to 7.1% for other veterans and 8.3% for non-veterans (Collins, et al. 2014, p. 3). The unemployment findings are somewhat counterintuitive as compared to relative education rate found in the same study by Collins, et al. (2014). They reported GWII veterans had the lowest percentage of individuals with less than high school education at 1% as compared to 3% for other service era veterans and 9% among non-veterans (Collins, et al., 2014, p. 2). One major consideration for the noted differences in unemployment rate as a function of education offered by Collins, et al. (2014) was the high rate of disabilities among GWII veterans of whom 28% reported some form of service-connected disability as compared to 14% of all veterans (p. 2). Collins, et al. (2014) further stated that GWII "veterans with a service-connected disability were less likely to participate in the labor force (70% v. 87%)" (p. 3). Transitional programs, including TAP, highlighted by Collins, et al. (2014) continue to evolve to meet the changing needs of transitioning veterans as well as ever changing G.I. Bill provided services and benefits.

Education

Veteran education programs were among some of the first benefits provided to active duty service members transitioning from the military. Along with veteran housing programs, education benefits continue to serve as a foundation of available benefits for present-day military and veteran populations (Angrist, 1993; Roisman, 2005). Education research on veteran benefit utilization and outcomes focused on eras of military services as they related to legislative changes to G.I. Bill benefits (Angrist, 1993; Smith-Osborne, 2012; DiRamio, et al., 2008; & Collins, et al., 2014).

Additionally, more recent research investigations began to assess college and university provided services to measure the level of academic support provided to veterans facing specific barriers, such as physical disabilities, mental illnesses, or simply socialization adjustments (Smith-Osborne, 2012; DiRamio et al., 2008; Ruh et al., 2009; and Shackelford, 2009). Education is a core component of the CFED A&O Scorecard with specific indicators of achieved education level to include higher education degrees and certificates, which are commonly collected by the U.S. Census, U.S. Department of Labor and the annual American Community Survey, which is reported as part of the ACS-PUMS. Veteran education literature presents discussions of programs and experiences that connect to other substantive policy areas with a direct connection to employment.

Available education measures that have variables to determine veteran or active duty military service enable researchers to assess education outcomes such as degree achievement, which includes attending college level coursework without achieving a degree. The expansions to the G.I. Bill over the past two decades and specifically as a result of the Post-9/11 benefit programs have increased access for veterans to higher education, but success rates in terms of degree achievement remain undeterminable as compared to the non-military civilian population. Related literature indicates the U.S. Military's reliance on an All Voluntary Force (AVF) has led to rapid and broad expansion of educational benefits as both a recruitment and retention incentive (Smith-Osborne, 2012, p. 4).

Similar to other veteran benefit areas, education benefits available to more recent era service members have improved as a result of lessons learned and increased awareness in mental health, disability services, and support programs. DiRamio, Ackerman, and Mitchell (2008) explained the entrance of World War II veterans onto higher education campuses as welcomed increases to enrollment. Following the transition of Vietnam veterans to campuses through similar

benefits and programs, veterans were first recognized as a unique student group (DiRamio, et al., 2008). Smith-Osborne (2012) developed research investigations related to this "uniqueness" of veteran student populations with specific attention to available programs and program outcomes. She found, "some colleges now have other services 'bundled' to provide targeted or enhanced services for student veterans" (Smith-Osborne, 2012, p. 7).

A specific program, TRIO Veterans Upward Bound, was investigated by a Congressional Research Service study in 2014 led by Benjamin Collins. They described the program as a full-service academic preparatory program to support at-risk veteran students who are either low-income or first generation college students as they access higher education as part of their G.I. Bill benefits (Collins, et al., 2014). Pursuant to the Veteran Upward Bound and summarized by Collins, et al. (2014):

> The program defines a veteran who is at-risk for academic failure as an individual who has been out of high school or dropped out of a program of postsecondary education for five or more years; has scored on standardized tests below the level that demonstrates a likelihood of success in a program of postsecondary education, or meets the definition of an individual with a disability (p. 16).

As presented by Smith-Osborne (2012), this type of program structure is imperative for not only academic success, but also reintegration into both work environments and civilian communities. Her findings suggest colleges and universities need increased services and programs for veterans similar to the Veteran Upward Bound (Collins, et al., 2014) or Combat2Classes at Montgomery College (Maryland) that provides veteran-only courses and support programs similar to those offered to incoming freshman classes (Smith-Osborne, 2012, p. 7).

Continuing the discussion of college and university preparedness, Ruh, Spicer, and Vaughan (2009) focused their research on the interaction between federal requirements for access, the Americans with Disabilities Act (ADA), 1990 and ADA Amendments Act (ADAAA) of 2008 (ADA, 2016; EEOC, 2016), and the changing landscape of education courses from in-seat classrooms to a mixture of course offerings including fully online and hybrid (online and in-classroom) courses. They posited, "Institutions of higher learning are ideally situated to lead the progressive wave towards utilizing technological advancements and developing a teaching pedagogy that embraces full inclusion and development of academic and professional potential of veterans" (Ruh, et al. 2009, p. 70). Considering that veterans are entering colleges and universities at the highest rates in the past several decades, a trend that is expected to continue, higher education institutions are at the forefront of service provision for veterans (Shackelford, 2009). Ruh, et al (2009) despite the challenges presented by increased veteran populations (Shackelford, 2009); high rates of physical disabilities and mental health problems among veteran populations as a result of military service (Smith-Osborne, 2012); and the need for specialized veteran programs (Collins, et al. 2014) describes veterans as "…poised to successfully transition from college to the workforce" (Ruh, et al. 2009, p. 67).

Throughout the literature, research and presented data support both the need for expanded veteran programs and general potential of veterans to excel in both academic and professional transition (Smith-Osborne, 2012; DiRamio, et al. 2008; Ruh, et al. 2009; & Collins, et al. 2014). There are, however, noted areas of veteran support programs, benefit access, and veteran sub-groups that require additional attention. DiRamio, et al. (2008) presents women student veterans as deserving of special attention from research, while Smith-Osborne (2012) explains the need for additional resources specifically for veterans with Post-Traumatic Stress Disorder (PTSD).

Additionally, Shackelford (2009) suggests specialized programs and resources for veterans with disabilities such as traumatic brain injury (TBI) and hearing loss from combat-related injuries. The unique needs of these veteran sub-groups, accessible classrooms, specialized in-class disability services, health and welfare support programs, only further differentiate veteran students from their non-military civilian peers. One common theme from veteran interview data was the desire to "blend in" with the general student population (Shackelford, 2009; DiRamio, et al. 2008), which presents a contradictory theme to veteran-only program recommendations (Smith-Osborne, 2012; Ruh, et al. 2008; and Collins, et al. 2014).

While, veteran-specific programs have significant research-based findings in terms of acceptability and potential to improve academic outcomes (Smith-Osborne, 2012; Ruh, et al. 2008; and Collins, et al. 2014), the reintegration process remains a delicate balance of providing support and respecting individual privacy. Shackelford (2009) who noted that veterans, "are often hesitant to self-identify these and other disabilities acquired during their military service" (p. 36) suggested colleges and universities develop a roadmap for student veterans. His recommended roadmap model provides a formalized process that aligns with DoD paperwork and promotes interaction with veterans on a more individualized basis. The DoD paperwork includes a series of forms from both the DoD and VA to incorporate service and other pertinent data such as service record, military training and experience, medical records, and health information (Shackelford, 2009, p. 39-40). Utilizing this data with respect for student privacy as detailed by the Family Educational Rights and Privacy Act (FERPA), 1974 (FERPA, 2016) is recommended to inform college and university faculty and staff in connection with student data system (Smith-Osborne, 2012; DiRamio, et al. 2008). Following this recommended approach both promotes veteran-only

programs and services (Smith-Osborne, 2012; Ruh, et al. 2008; and Collins, et al. 2014) and respects individual student experience (Shackelford, 2009; DiRamio, et al. 2008).

Educational opportunities, access and outcomes are not solely reliant or dependent upon differences between veterans and non-military civilian students. There are additional considerations to evaluate and assess in determining the impact of educational benefits for veterans, beginning with era of service differences amongst veteran populations. Similar to the presentation of the variation in housing benefits based on legislative changes during or following military conflicts (Shapiro, 2006; Vigdor, 2005; Quigley, 2006; Roisman, 2005; Fetter, 2010; & Fetter, 2011), education benefits have been modified through changes to the G.I. Bill benefits through legislation (Greenberg, 2008; Angrist, 1993; Collins, et al., 2014; Simon, et al., 2010; DiRamio, et al., 2008; & Smith-Osborne, 2012). The G.I. Bill of Rights was signed into law by President Franklin Delano Roosevelt on June 22, 1944 as the Servicemen's Readjustment Act of 1944 (Greenberg, 2008). Greenberg (2008) cited the original benefits as $20 per week for a total of 52 weeks, which in 1944 was a significant amount of money. He explained the comparative economic markets of the mid-1940s, "For 15 cents or even less, one could buy gasoline, cigarettes, beer, milk shakes, or go to a movie" (Greenberg, 2008, p. 49). While various factions of Americans had difficulty accepting the "giveaway" dollar amount, there was an alarmingly low utilization rate of full benefits. Greenberg (2008) reported that "…most used it for so few weeks that less than 20 percent of the estimated cost was actually spent" (p. 49). Educational benefits made available to World War II veterans from the initial G.I. Bill included payment of "…bills to the school for tuition, fees, and books, and to mail a monthly living stipend to the veteran for up to 48 months of schooling, depending upon the length of service" (Greenberg, 2008, p. 49). Considering the drastic

changes to economic markets, technology, education, and society in the decades since 1944 the G.I. Bill has undergone a series of legislative adaptations.

From the research literature, Angrist (1993) conducted a cohort-based analysis of eligible veterans, available benefits, and utilization thereof, in addition to reported outcomes from educational benefits in the post-Korean War era until 1985. He separated the veterans from the more than two-decade analysis timeframe (1964 – 1989) into Vietnam veterans (August 1964 – May 1975) and the first generation of All Volunteer Force (AVF) veterans (May 1975 – September 1980) to compare cohort differences (Angrist, 1993). Collins, et al. (2014) focused their analysis on the Montgomery G.I. Bill-Active Duty (post-1985) and the Post-9/11 G.I. Bill. From the Angrist (1993) results, the breakpoint for veteran benefits was December 31, 1976 with prior service members qualifying for post-Korean War benefits and subsequent eligibility for a contributory benefit program known as the Veteran Educational Assistance Program (VEAP) (p.638). Both studies (Angrist, 1993; Collins, et al., 2014) sought to understand differences in education benefit usage as well as explain differences in educational outcomes from various benefit types from 1964 to the present.

From a monetary perspective, Angrist (1993) reported post-Korean War benefits paid in 1978 were approximately $311 per month for a maximum of 45 months or a total of $13,995 as compared to the maximum of $5,400 paid over 36 months to VEAP participants (p. 638). The VEAP Program benefits of $5,400 was dependent upon a personal contribution of $2,700, which was matched by the government (Angrist, 1993). The Montgomery G.I. Bill, which began in 1985 was designed to provide a monthly education and living expense stipend, which in October 2013 was set at a maximum of $1,648 per month (Collins, et al. 2014, p. 9). The Post-9/11 benefits were designed to separate educational and living expenses with individual maximums for education

based on in-state tuition (for public schools) and $19,198 per academic year (private and international schools) as of August 2013 (Collins, et al. 2014, p. 9). Collins, et al. (2014) also reported housing and living expenses paid under the Post-9/11 benefits varied by geographic location with a range from $768 to $3,258.23 per month (p. 9). Additionally, Collins, et al. (2014) explained both programs, Montgomery G.I. Bill and Post-9/11 G.I. Bill, as available to eligible veterans for a maximum of 36 months of fulltime education or the part-time equivalent.

Comparatively on a 36-month allotment of benefits there are wide variations among service era veterans. Calculated benefits equaled $11,196 available for post-Korean War veterans and $5,400 for VEAP veterans in 1978, which when calculated using the CPI Inflation Calculator (BLS, 2016) are the equivalent of approximately $40,000 and $19,250 in 2013. Similarly, Montgomery G.I. Bill era veterans were provided over $59,000 over 36 months based on 2013 allotments. Post-9/11 veterans have access to benefits that are considerably more variable; however, for comparison a veteran in a private institution for 3 academic years as a fulltime student would qualify for over $57,500 for tuition, in addition to living expenses ranging from approximately $27,600 to $117,300 depending upon geographic location. The vast differences in available assistance from educational benefits as summarized above, further confirm results of Angrist (1993), who posited changes in program-use and relative outcomes from post-Korean War to VEAP veterans were more effected by “a less generous program” (p. 649).

Eligibility definitions were also changed from the inception of the G.I. Bill of Rights in 1944, which was all-inclusive after 90-days of service and an honorable discharge (Greenberg, 2008). Angrist (1993) summarized the requirements for post-Korean War and VEAP veterans to be eligible for educational benefits. Post-Korean War eligibility was based on “active duty service for more than 180 continuous days between January 31, 1955 and January 1, 1977” (p. 638) for

up to 10 years following discharge date until benefits were discontinued in 1989. VEAP benefits were available to veterans who began their service, "after December 31, 1976 and before July 1, 1985" (p. 638) for up to 10 years following discharge date. Additionally, the VEAP program required veterans to have participated in monetary contributions for a minimum of 12 consecutive months (Angrist, 1993). According to the U.S. Department of Veteran Affairs (2016), the Montgomery G.I. Bill is currently available in two program formats, one for active duty and one for reservists. The eligibility requirements for the active duty program requires program enrollment, in addition to a $100 per month payment for 12 months and completion of their minimum service obligation. Comparatively, the reservist program is available, "For Reservists with a six-year obligation in the Selected Reserve who are actively drilling" (VA MGIB, 2016). Similarly, the Post-9/11 G.I. Bill has specific eligibility requirements as stated by the U.S. Department of Veterans Affairs:

> If you have at least 90 days of aggregate active duty service after Sept. 10, 2001, and are still on active duty, or if you are an honorably discharged Veteran or were discharged with a service-connected disability after 30 days, you may be eligible for this VA-administered program. For approved programs, the Post-9/11 GI Bill provides up to 36 months of education benefits, generally payable for 15 years following your release from active duty. (VA P911, 2016).

Considering the eligibility requirements as presented for different eras of service, there is considerable support for the statistically significant reported differences in veteran usage of educational benefits and related outcomes (Angrist, 1993; Collins, et al., 2014; DiRamio, et al., 2008; Ruh, et al., 2009; & Simon, et al., 2010).

An additional presentation of educational utilization and outcome analysis was conducted by Simon, Negrusa, and Warner (2010) who sought to connect educational benefits to military testing scores on the AFQT, which was also summarized as part of the jobs and businesses literature (Mangum and Ball, 1987). Simon, et al. (2010) postulated that military recruitment and enlistment trends indicated increased benefits leading to "high-quality" youth enlistments. They defined "high-quality" youths as high school educated with an average score higher than 50 on the AFQT (Simon, et al., 2010). They further posited the increase in "high-quality" enlistments were a result of the Montgomery G.I. Bill, which allotted more monetary support for eligible veterans (Collins, et al., 2014; Angrist, 1993) than past benefits. Simon, et al. (2010) reported, "We find that a $10,000 increase in veterans' education benefits increases the probability of MGIB [Montgomery G.I. Bill] usage by about 5 percentage points" (p. 1021). From their findings, they anticipated increased utilization rates across all branches of military service among Post-9/11 veterans at about 20 percent considering the monetary increases in available benefits as compared to those veterans only eligible for Montgomery G.I. Bill benefits (Simon, et al., 2010).

Educational benefits have been a long-standing benefit provided to eligible service members since the inception of the G.I. Bill of Rights in 1944. Over the past seven-decades, there have been significant changes to the programmatic structure of benefit payments, allowable expenses, eligibility requirements, and contributory participation (Angrist, 1993; Collins, et al., 2014; DiRamio, et al., 2008; & Simon, et al., 2010). Differences in utilization rates have been observed throughout the research to change along with various programmatic modifications (Angrist, 1993; Collins, et al., 2014; & Simon, et al., 2010) as well as specific veteran needs including disabilities (DiRamio, et al., 2008 Ruh, et al., 2009; Smith-Osborne, 2012; & Shackelford, 2009). The CFED A&O Scorecard reports educational outcome data in the form of

educational degree attainment or academic progress (CFED A&O Scorecard, 2016) and includes variable data to parse-out veteran populations. Utilization of this, or comparable data, should yield interesting comparisons between veterans and non-military civilians as well as veterans based on eras of service as reported in the literature.

Data Sources

As discussed throughout this article, there are numerous available data sources that include veteran or military service variables. These data sources, all of which are national data sources, provide substantial opportunities to assess life-after service outcomes as compared to non-military civilians and within various veteran populations. In addition to serving as reliable and robust secondary sources of data, these data sources also empower and inform primary data collection efforts and instrument designs. Specific national sources of data for employment and education related studies as presented in this article are presented in the table below. Additional sources of data are available with focus areas outside of education and employment; however, there may be cross-over variables for consideration in specific studies based on research questions and hypotheses.

From a health perspective, the Behavioral Risk Factor Surveillance System (BRFSS) http://www.cdc.gov/brfss/annual_data/annual_data.htm, which is adult-health related content with annual health data beginning in 1984 and military or veteran status variable(s) dating to 1990. Another health-related data source is the Youth Risk Behavioral Surveillance System (YRBSS) http://www.cdc.gov/healthyyouth/data/yrbs/index.htm, which is the youth equivalent to the BRFSS and could be used to assess children health impacts or outcomes in military communities. Additionally, the U.S. Department of Veterans Affairs (VA) has a series of specialized veteran specific data and surveys that are publicly available, including: the 1979, 2001, and 2010 National

Survey of Veterans (NSV) and the December 2006 Analysis of Differences in Disability Compensation, in addition to numerous others. The VA has a repository of published reports available and accessible online in substantive areas such as population to include various population profiles of veterans such as rural, women, and minorities to name a few. Additional profiles include: period of service; income and poverty; health, education, and employment; utilization of VA benefits and services: and a collection of historical and annual reports (VA Reports, 2016).

Table 1. National Data Sources with Veteran Variable

Data Source Agency	Description of Data and/or Collection Method	Veteran-specific Variables	Link to Data Source
American FactFinder	Provided as part of the U.S. Census Bureau and includes data from recent full census reports as well as American Community Surveys. Data is available on community-levels and includes community and advanced search options to customize data tables. American FactFinder also has an entire data display section dedicated to veterans.	Either veteran or military variables depending upon selected data tables.	http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml
American Community Survey-Public Use Microdata Sample (ACS-PUMS)	Collected as part of the U.S. Census Bureau during between census time periods and census years, the ACS-PUMS data is provided in annual, 3-year aggregate, and 5-year aggregate reports beginning in 2000, 2005-2007, and 2005-2009 respectively. PUMS data is designed to provide individual data as untabulated records for customized table and study designs. Data includes nationally representative samples of respondents and includes numerous geographic variables.	Both veteran and military status variables	http://www.census.gov/programs-surveys/acs/data/pums.html
U.S. Census Bureau	The U.S. Census Bureau in addition to supporting American FactFinder and the ACS-PUMS data sources, provides numerous national, state, regional, and local data resources. These resources include data tools such as surveys and programs, quick facts, snapshot reports; data visualizations including, interactive maps and infographics; and a library of reports and resources.	Both veteran and military status variables are collected. Specific data sources may differ in provided variables.	https://www.census.gov/data.html
U.S. Bureau of Labor Statistics	The U.S. Bureau of Labor Statistics provides data and reports in a variety of platforms and downloadable formats. Data can be accessed from the BLS homepage by subject types such as economic issues, employment and unemployment, and productivity to name a few; specialized databases and data tools; agency publications; and economic releases in addition to beta labs and specialized resources for students.	Both veteran and military status variables are collected. Specific data sources may differ in provided variables.	http://www.bls.gov/home.htm
National Center for Education Statistics	Postsecondary Education Outcome Measures is a joint data collection and reporting process with the U.S. Department of Education, Department of Defense, and U.S. Department of Veterans Affairs. The data is collected pursuant to two national legislative initiatives, Executive Order 13607 and Public Law 112-249. Data collected is designed to measure outcomes specific to veterans with variables from four different time-periods: during school, graduation or completion, post graduation, and future explorations.	Data is specific to veterans and could be compared with a myriad of collected postsecondary data, which can be accessed at: http://nces.ed.gov/surveys/SurveyGroups.asp?group=2	http://nces.ed.gov/statprog/outcomemeasures/

Table 2. Veteran-specific National Data

Data Source Title	Description of Data and/or Collection Method	Description of Potential Application	Link to Data Source
Veteran Population Projection Model (VetPop 2014)	Using VA data from 2013, this dataset is an actuary-based population projection model from 2013 to 2043 with veteran counts by age groups and states.	Projection data could be used to study policy or program changes or inform policy-making and program design based on expected population changes over time. It also provides a baseline on which evaluation or analysis could be based to determine differences between empirical outcomes and anticipated outcomes of policies or programs.	http://www.va.gov/vetdata/Veteran_Population.asp
National Population Tables	Provides annually reported data from the VA with reports partitioned by age/gender, period of service, race/ethnicity, branch of service, and officer/enlisted.	National VA data from these tables could be used to compare against non-military civilian populations or within veteran communities to determine specific areas of interest for veteran-based research. It also provides a snap-shot of population distributions that can be compared to U.S. Census or other related data sources.	http://www.va.gov/vetdata/Veteran_Population.asp
State Population Tables	Using annual VA data, tables for each state are created as statewide summaries in addition to age/gender, period of service, and race/ethnicity partitioned data tables.	Similar to the National Population Tables, the state tables could be used to compare general demographics at the state-level for veterans and non-military civilians. This would be helpful in assessing state-by-state access to services and programs, specific demographic differences, and could be used in budgetary comparisons or analysis.	http://www.va.gov/vetdata/Veteran_Population.asp
Other Demographics Population Tables	Annual VA data that is partitioned by specific regional groups, including by; county, 113th Congressional Districts, and Veteran Integrated Service Networks.	Specific demographic breakouts provided in these data tables could be used to assess regional or geo-spatial differences in veteran population and demographic distributions on well-defined spatial parameters. This data could be applied to policy analysis or program evaluation to compare outcomes or identify gaps in services, programs, or resources when used in concert with other available data sources.	http://www.va.gov/vetdata/Veteran_Population.asp

Conclusion

Research investigations have sought to identify differences in veterans' life-after service outcomes using both available secondary data sources and primary data collection methods. From both general population and era of service comparison perspectives there are substantial opportunities to use nationally available secondary data sources in veteran-based research investigations. Many of the national secondary data sources include veteran status or military service variables as part of their data collection instruments. Additional data sources are focused specifically on veteran outcome, socio-economic, demographic, and regional data points. Collectively, these publicly accessibly national data sources provide numerous opportunities to study differences in outcomes related to employment and education in veteran populations. Combined with available veteran data tables from the VA, veteran-focused research can be applied to numerous levels of analysis and ensure sample representativeness. Opportunities exist to combine these nationally available data sources to study individual and community outcomes that can further shape policy or be used in policy evaluation. Data sources can be used independently, in combination with one another, or to inform primary data collection that aligns with nationally available data. Going forward, research involving veterans' experiences and post-military service outcomes can be designed to align or compare with general population trends using these nationally available data sources as a baseline. Research designs applying this strategy should elicit findings to inform policy-making, program design, in addition to policy analysis and program evaluations.

Chapter 3: Evaluating the Policy Process: A Justification for Development of Event Outcome Analysis

Abstract

Policy and program evaluation would benefit from a wider application of event history-style analysis using cross-sectional data through a new method, termed Event Outcome Analysis. There is an extensive literature on event history analysis with a small subset of recent event histories conducted with cross-sectional data. From an interdisciplinary methodological review, there is sufficient literature-based support for expanded utilization of cross-sectional data in addition to recommendations and best practices for cross-sectional data integrity assurance. This article combines the vast event history literature and growing cross-sectional application in a synthesis with other methodology research related to survey data, cross-sectional *vs.* longitudinal data, and develops a framework for Event Outcome Analysis. The developed framework includes a five-phase methodology with considerations, recommendations, and best practices from literature spanning the breadth of interdisciplinary resources. Finally, an initial beta-test study is proposed and presented as a first step towards expanding the methodology to evaluating policy and program outcomes.

Key Words: Methodology Development, Cross-sectional Data, Event Outcome Analysis

Introduction

Cross-sectional data with Multilevel modeling has been deployed in a growing number of Event History Analysis investigations since the late 1990s and early 2000s. One of the most common cited needs for cross-sectional data modeling from the literature is the overall lack of longitudinal data and the intensive time and cost to collect longitudinal data (Rindfleisch, et al., 2008). There are numerous robust secondary data sources collected through well-designed survey research techniques, such as the American Community Survey (ACS), which are potentially under-utilized as a result of methodological requirements or best practices based on longitudinal data. The goal of this article is to introduce a methodological modification to Event History Analysis (EHA) for increased application in the fields of policy and program evaluation deemed Event Outcome Analysis (EOA).

A research study of cross-sectional and longitudinal data was conducted by a diverse group of business and marketing researchers led by Aric Rindfleisch, which sought to assess the quantitative difference in analytical outcomes from both data types. Rindfleisch, et al. (2008) hypothesized there is a larger capacity to utilize cross-sectional data in lieu of longitudinal data. They posited three strategies for data collection, "(1) employing multiple respondents, (2) obtaining multiple types of data, or (3) gathering data over multiple periods" (Rindfleisch, et al., 2008, p. 262) to reduce common method variance (CMV) and increase the potential for causal inference (CI) from cross-sectional data analysis. Multilevel modeling with cross-sectional data as applied by Barber, et al. (2000); Biggeri, et al. (2001); Hedeker, et al. (2000); Ma and Willms (1999); & Reardon, et al. (2002) has proven effective in EHA, but is still under-utilized comparatively within the overall methodology.

Based on the cross-sectional EHA literature (Barber, et al., 2000; Biggeri, et al., 2001; Hedeker, et al., 2000; Ma and Willms, 1999; Reardon, et al., 2002; Barros and Hirakata, 2003; & Van Houwelingen, 2007) and the work of Rindfleisch, et al. (2008) there is sufficient support for the development of an EOA methodology. This methodological modification will deploy cross-sectional data in lieu of the typically utilized longitudinal data. This article will first present EHA from a historical application perspective as well as a cross-sectional data modeling perspective. Following this historical discussion will be a presentation of methodological recommendations, statistical procedures and modeling techniques for EOA. In conclusion, a research investigation will be introduced in which EOA will be conducted as a first step to establishing a framework for EOA.

Event History and Survival Analysis

An event for the purposes of event history and survival analysis is defined by Paul Allison (2014) consists, "of some qualitative change that occurs at a specific point in time" (p.1). Allison (2014) summarized the breadth of event history interest areas, to include: criminology; sociology, specifically medical sociology; psychology with emphasis on psychiatric episodes or treatment; political science; and demographic analyses assessing social changes such as birth, death, and immigration. Considering the noted examples and the review of the literature focused on the transition from active duty to civilian life, there is clear indication of a fit for military service investigations within an event history and survival analysis framework. Specifically, from the veteran transitional literature health perspective, Teachman (2009) indicated, "there appears to be something about serving on active-duty that lowers self-reported health below its expected level" (p 334). Furthermore, he posited that self-reported health of active duty veterans would be higher had they not served on active duty. Additional literature supports for the utilization of event history

to assess military service was noted by Clemens and Milsom (2008) in their analysis of veteran transition from active duty. They postulated, “Enlisted service members in transition to civilian life are a relatively unique population because they have significant military work experience but may lack self-knowledge and occupational knowledge specific to the civilian sector” (Clemens and Milsom, 2008, p. 253). While the fit of an investigation of military service or veteran transition seems more than logical, there are specific data and analysis requirements for an event history and survival analysis study.

Allison (2014) provided a description of the methodological requirements for an EHA, which include: 1) longitudinal data to assess change over time; 2) censoring, which accounts for unknown values of dependent variables considering study and data timeframes (p. 2); and 3) time-varying explanatory variables, which could include changes to data related to employment status or income (p. 3). There are numerous opportunities to deploy event history as a primary method for analysis; however, Allison (2014) explains, “In fact, there is no single method of event history analysis but rather a collection of related methods that sometimes compete and sometimes complement one another” (p. 1). This natural variation in methodological application and design as noted by Allison (2014) is a recurrent theme throughout the event history literature. Historically, a majority of studies adhere to the longitudinal data requirements in data collection (examples: Allison, 2014; Chen and DesJardins, 2007; Thorley Hill, et al. 1996; & Park and Hendry, 2015). More recently, a collection of researchers tested the utilization of cross-sectional data or longitudinal data along with multilevel modeling to meet the requirements of event history and survival analysis (Reardon, et al. 2002; Ma and Willms, 1999; Barber, et al., 2000; Biggeri, et al. 2001; & Hedeker, et al. 2000), which has led to comparative analysis between methodological

approaches or additional design considerations (Barros and Hirakata, 2003; Van Houwelingen, 2006).

From the methodological overview by Allison (2014) there are five-fundamental dimensions to EHA summarized along with a presentation of five example studies. The dimensions as listed by Allison (2014) are: 1) “Distributional versus regression methods” (p. 4); 2) “Repeated versus non-repeated events” (p. 5); 3) “Single versus multiple kinds of events” (p. 5); 4) “Parametric versus non-parametric methods” (p.5); and 5) “Discrete versus continuous time” (p.6). From a veteran transitional or military service perspective and considering the provided summaries of each of the five-dimensions of event history, two would be dually applicable. While military service maybe most often thought of as a single occurrence event, there are distinct possibilities for a multiple event scenario in military service; most plausibly, more than one active duty service period interwoven with times of military separation (veteran status). Active duty service could also be defined as a single or multiple events based on eras of service with service specifically in only one era (WWII, Korean War, Vietnam War, Gulf War, Operation Iraqi Freedom, or Operation Enduring Freedom) or multiple eras (WWII and Korean War; WWII, Korean War and Vietnam War; Korean War and Vietnam War; Gulf War and OIF; OIF and OEF; or Gulf War, OIF, and OEF). Two other dimensions of event history as summarized by Allison (2014) would be applicable as follows for a potential veteran transitional study: regression methods in lieu of distributional and discrete-time analysis in favor of continuous-time analysis. The final dimension, “Parametric versus non-parametric methods” (p. 5) presents an interesting choice based on defined timeframes of military service in terms of eras of service, tours of duty, and enlistment periods. Based on the work of Allison (2014) the Cox proportional hazards model (Cox, 1972) maybe the most applicable approach as it blends parametric and non-parametric methods.

From the educational literature, Chen and DesJardins (2007) designed an EHA to examine drop-out rate differences between low income and higher income students. They explained, “event history analysis methods have a number of advantages including properly estimating duration data, distinguish ‘censored’ from ‘uncensored’ cases, and accommodating covariates that change their value and effect over time” (Chen and DesJardins, 2007, p. 7). From a design perspective, Chen and DesJardins (2007) selected a discrete-time method to measure the probability of student drop out conditional on not experiencing an event, such as graduation that would naturally terminate education. Discrete-time analysis was selected as a result of reported dropouts on an academic year basis (Chen and DesJardins, 2007). This methodological design aligns with the discrete-time example provided by Allison (2014), which assessed the risk (probability) of promotion of assistant professors to associate professor during a 10-year study period of doctoral degree recipients from the 1950s and 1960s. Allison (2014) explained, “In discrete time, the hazard is the conditional probability that an event will occur at a particular time to a particular individual, given that the individual is at risk at that time” (p. 8).

In another education related event history, Scott and Kennedy (2005) developed models to investigate conditional hazards of high school students making one of multiple available choices following graduation. Their discrete-time analysis, which included the following options: directly enter the labor force, attend a 2-year college, or enroll at a 4-year institution, in addition to relative risk of dropout upon entering a 2- or 4-year college (Scott and Kennedy, 2005). Furthering the previous notation from Allison (2014), this analysis method aligns within EHA with specific application of the discrete-time, conditional probability models. Additionally, Scott and Kennedy (2005) presented survival or EHA as well-defined in terms of criteria, which allows for operationalized definitions to be developed for model fit. They explained, analysis of competing

risks follows participants throughout a study regardless of specific outcomes, which a single occurrence EHA allows researchers to, "assume that only one outcome can occur {dropout of college} and once an outcome occurs the subject is no longer at risk" (Scott and Kennedy, 2005, p. 415). Allison (2014) presented these types of proportional hazard models (Cox regression) as popular in various disciplines it has weaker assumption requirements as compared to other parametric models. Scott and Kennedy (2005) designed their study to assess pathway effects as impacts to educational outcomes based on student choices about enrollment in higher education. Model building throughout their study was accentuated by the application of ignorability conditions allowed within hazard estimates (Scott and Kennedy, 2005). Specifically, they defined such ignorability conditions as: "1) Using data from a censored subject until the censoring occurs, and then allowing that subject to disappear from subsequent periods; and 2) Interpreting hazard estimates in each period just as we would if censoring never occurred" (p. 419). Citing the importance of these conditions within their study, Scott and Kennedy (2005) noted:

> If, say, student death and truncated data are non-informative for dropout, terminal AA, and transfer, we can interpret our estimate $\hat{h}$ (drop, 4) as the probability of a dropout in period 4 without a degree and without having transferred; no reference need be made to death or data missingness (p. 419).

Using the event history model along with longitudinal data, Scott and Kennedy (2005) found dropout hazard to be a constant overtime with most dropouts a result of prolonged exposure in lieu of augmented hazard.

From the financial literature, two 1990s studies were conducted using EHA to determine the changing proportional hazard financial distress and eventual bankruptcy (Thorley Hill, et al. 1996) and assess joint venture failures as a function of involved entities (Park and Russo, 1996).

Both investigations were conducted using event histories to further develop findings reported from earlier cross-sectional analyses. Thorley Hill, et al. (1996) argued, "We use event history methodology and dynamic models which allow for time-varying explanatory variables and control for censored observations" (p. 60). To fully assess a financial firm's transition on a stability spectrum from stable to bankrupt, Thorley Hill, et al. (1996) applied event history as a dynamic model to measure change over time of independent variables and relative changes in impact on dependent variables. Similarly, Park and Russo (1996) utilized event history to investigate the interaction between and within organizations across the continuum of joint ventures from cooperation to competition. Results from Thorley Hill, et al. (1996) suggested that a similarly designed cross-sectional analysis would miss indicators of directional transition of a firm from a more stable status to eventual bankruptcy over time.

Utilizing EHA, Park and Russo (1996) were able to not only further previous findings in terms of the negative impact of competitors meeting for a joint venture and the positive impact of multiple joint ventures between partners simultaneously, but also add new findings to the literature. Park and Russo (1996) found, contrary to their literature based hypothesis, that joint ventures incorporating more partners were less likely to fail (p. 885). Based on Allison (2014) both studies provided examples of parametric (reporting each year), multiple types (both included a spectrum of potential participation or outcomes) and repeated events (until bankruptcy in Thorley Hill, et al. 1996) that aligned well with EHA. In addition to the work on Allison (2014), Park and Hendry (2015) developed a guidance report for assessing most often used event history models for model fit based on assumptions and biases. Park and Hendry's (2015) guidance addressed directly the flexibility in EHA as noted by Scott and Kennedy (2005). They argued event history models, "…should engage in certain basic techniques of exploratory data analysis- namely, investigation

of censoring and outliers- in order to make more informed decisions about detecting and correction for violations of the proportional hazards assumption" (Park and Hendry, 2015, p. 1086).

EHA was modified by Berry and Berry in 1990 for the purpose of studying policy adoption trends at the state-level. In their seminal work on state innovation, Berry and Berry (1990) posited EHA would provide more substantive and interesting findings than previously used methods. Specifically, they emphasized the predictive capacity of EHA through which state policy adoption in specific years could be anticipated (Berry & Berry, 1990, p. 399). In the nearly three decades since the state innovation work by Berry and Berry, numerous others have utilized EHA to investigate policy adoption (Berry, 1994; Volden, Ting, & Carpenter, 2008; Volden, 2006; Beck, Katz, & Tucker, 1998; and Buckley & Westerland, 2004). A commonality amongst these studies were discrete time-series analysis conducted with cross-sectional data and multilevel modeling. Additionally, each of the noted studies incorporated policy diffusion into study design or hypothesis development all of which were designed to assess policy adoption behaviors. To predict policy adoption through EHA, the noted studies utilized regional diffusion as a level of analysis. This methodological design led to more interesting and substantive findings of studies assessing policy adoption "events" as posited by Berry and Berry (1990). By incorporating variables to identify differences in state policy environments, the methodological shift proposed by Berry and Berry (1990) improved the predictive capacity of EHA for future policy adoption activities in other states. In addition, the use of cross-sectional data to conduct state innovation-related EHA studies created the opportunity for cross-sectional EHA.

Cross-Sectional Event History Analysis

In event history, as noted by Allison (2014) and multiple researchers throughout the literature (Park and Russo, 1996; Park and Hendry, 2015; Scott and Kennedy, 2005; & Chen and

DesJardins, 2007), there are often data limitations that from a traditional perspective would disqualify specific investigations from using an event history model. Reardon, et al. (2002) addressed this specifically, "… since event history methods require longitudinal data and most studies of adolescent cigarette use are cross-sectional, a person-period data set must be constructed from cross-sectional data in order to make these analyses possible" (p. 298). Barros and Hirakata (2003) conducted logistic regression using Cox and Poisson regression and cross-sectional data as a potential work-around to conducting EHA without longitudinal data. While cross-sectional models have, as noted in the literature, a tendency to lead to large interval error estimates (Thorley Hill, et al. 1996; Park and Russo, 1996; and Allison, 2014), Barros and Hirakata (2003) designed a log-binomial Cox and Poisson model that accounted for errors noted throughout the literature using adjusted variances. They posited:

> It is, therefore, not only possible, but actually easy to use other models than logistic regression to analyze cross-sectional (or longitudinal) data with binary outcomes, the advantage being the prevalence (or cumulative incidence) ratio as the measure of association, more interpretable and easier to communicate, especially to non-epidemiologists (Barros and Hirakata, 2003, p. 31).

Cross-sectional application as described by both Barros and Hirakata (2003) and Reardon, et al. (2002) were developed for medical and health research. Although there is an extensive literature supporting the longitudinal "gold standard" for EHA, there are a growing number of high-quality research studies using cross-sectional data to conduct EHA.

The Reardon, et al. (2002) study is one of five noted investigations that utilized a cross-sectional, multilevel modeling approach to EHA (Barber, et al., 2000; Biggeri, et al., 2001; Hedeker, et al., 2000; & Ma and Willms, 1999). Barber, et al. (2000) applied retrospective data

collection for a health-related study to a series of available multilevel modeling software packages. Their discrete-time analysis of contraceptive use in rural Nepal incorporated hazards at multiple levels, person and neighborhood. Additionally, Barber, et al. (2000) provided coding methods for presented modeling methods for Hierarchical Linear Modeling (HLM) and Markov Logic Network (MLN) software packages. Biggeri, et al. (2000) applied a similar multilevel approach to study transition from university graduation to employment in Italy based on the amount of time from graduation to first job. A random sample of 10,388 records were drawn from the 1995 INSI, a national survey of job opportunities in Italy, to study 1992 university graduates. The 10,388 included individuals represented 64 universities and 766 courses with a discrete-time window of 48-months or less to obtain a job following graduation in 1992. Specifically related to military service, Biggeri, et al. (2000) found variation in the military covariate based on time of military service as compared to enrollment in university.

Continuing in the education realm, Ma and Willms (1999) used multilevel modeling in concert with longitudinal data from elementary and secondary education with specific focus on mathematics dropouts. Ma and Willms (1999) cited the possibility of applying cross-sectional data to a multilevel model event history, but noted for their investigation cross-sectional data was not appropriate. Hedeker, et al. (2000) conducted another health study that utilized a multilevel model approach to conduct EHA of group-timed survival data at the individual and clustered level. The Hedeker, et al. (2000) and Reardon, et al. (2002) investigations were similar in both design and substantive topic material of analysis. Reardon, et al. (2002) sought to design a discrete-time model at the person-level as a baseline for comparison with multilevel models to including both the individual and neighborhood levels in addition to any interactions between levels. From a methodological standpoint, Reardon, et al. (2002) summarized four critical assumptions detailed

in Barber, et al. (2000), which are required to conduct multilevel discrete-time analysis, "…(a) the modeling assumption; (b) the conditional independence assumption; (c) the noninformative covariates assumption; and (d) the coarsening at random assumption" (Reardon, et al. 2002, p. 300). From this presentation of EHA, there are numerous adapted event history methods, which have the potential to incorporate cross-sectional data (Reardon, et al. 2002; Biggeri, et al. 2000). From their review of available methods for conducting EHA, Barros and Hirakata (2003) postulated that many methods are available from which researchers must select the best available model pursuant to their project, data, software and training.

Additional methodological considerations for conducting EHA include examples of count data application to modeling as presented by Wooldridge (2002) and a method called "landmarking" from the work of Van Houwelingen (2006). Wooldridge (2002) incorporated a discussion of count variables, for example; "number of times someone is arrested during a given year, number of emergency room drug episodes during a given week, number of cigarettes smoked per day, and number of patients applied for by a firm during a year" (p. 645). From an example study in Botswana, he presented the Poisson regression model as an event history-type linear model capable of analyzing count data as previously defined (Wooldridge, 2002). Van Houwelingen (2006) applied landmark analysis, or landmarking, to Cox models to weight time-varying covariates during specific intervals dependent upon landmarking point. Van Houwelingen (2002) describes the modeling activities as resulting in parsimonious models through straightforward model fit. He explained that creating landmarking data sets for EHA is reliant on data with either time-varying effects or time-dependent covariates. Considering policy changes as observed throughout the presentation of veteran transitional literature, the notion of landmarking may be applicable.

Methodological Gap

From a review of the methodological history of EHA, there have been numerous innovations to modify analysis procedures to better study events. EHA is most often deployed to study qualitative events as the dependent variable based on a set of explanatory variables that have risk, survivability and, or other hazard-based values related to the dependent event variable (Allison, 2014; Chen and DesJardins, 2007; Park and Hendry, 2015; Thorley Hill, et al., 1996). Modifications to EHA seeking to use cross-sectional data are most often found in health-related research, specifically targeted health initiatives for youth or program participants that by design do not collect longitudinal data (Reardon, et al., Biggeri, et al., 2001; Hedeker, et al., 2001; Barber, et al., 2000). State policy innovation studies beginning with Berry and Berry (1990) sought to assess successful policies, or innovative policies, as main effect predictors in concert with other explanatory variables on similar policy innovations in neighboring states or local governments (Berry, 1994; Volden, 2006; Beck, et al., 1998; and Buckley & Westerland, 2004). From these multidisciplinary approaches to event-based modeling there is an opportunity to once again modify event-based analysis to study policy outcomes for individuals or groups.

Legislation has been proposed and passed as early as the Civil War era to provide support and resources for veterans (Roisman, 2005). Beginning in 1944, with the G.I. Bill of Rights, the federal government became a consistent provider of veterans benefits across substantive policy areas found on data sites such as the CFED A&O Scorecard. While available data for an analysis of veteran transition is not typically reported in longitudinal form, there are examples for coding data, designing models and implementing methods for conducting event history-based analysis without longitudinal data (Barber, et al. 2000; Biggeri, et al. 2001; Hedeker, et al. 2000; Ma and Willms, 1999; Barros and Hirakata, 2003; & Reardon, et al 2002). Additionally, there is a potential

to apply an event window variable based on landmark analysis (Van Houwelingen, 2006) to analyze the relative changes and impacts to benefit utilization and outcomes (CFED A&O Scorecard, 2016) with major policy changes coded as landmarks. Assessing the policy innovation studies, there is also reason to believe cross-sectional veteran outcome data could be applied to an event history-type model using some form of risk, hazard or survival analysis.

From a historical event history perspective, available data for comparison of veterans, veterans by service era, and non-military civilians based on the American Community Survey data as presented on the CFED A&O Scorecard would not be possible. The design from the dependent variable to dataset structure is not designed to fit within the EHA modeling capacity. However, there is an opportunity to develop a methodological approach based on the multidisciplinary examples as previous presented. Concepts, procedures, and modeling techniques from the numerous studies identified that utilized a combination of the innovative methods such as multilevel modeling, cross-sectional data, and event windows (landmarking) to study events can be applied to analysis of policy outcomes (Barber, et al. 2000; Biggeri, et al. 2001; Hedeker, et al. 2000; Ma and Willms, 1999; Barros and Hirakata, 2003; Van Houwelingen, 2006; & Reardon, et al 2002). Similarly, the state policy innovation studies beginning with Berry and Berry (1990) approaches to predict policy-making events by neighboring state and local governments serve as examples for measuring policy outcomes (Berry, 1994; Volden, 2006; Volden, et al, 2008). While these analyses have not addressed policy events as independent variables for individual or group outcomes, or events (for example; change in education, employment, or residence), collectively they provide the building blocks for developing such a methodological approach.

Event Outcome Analysis

Event History Analysis (EHA) as previously discussed has been conducted historically with longitudinal data pursuant to the work and recommended best practices of Allison (2014). During the late 1990s and early 2000s a variety of event history analyses were conducted using cross-sectional data and multilevel modeling. Event Outcome Analysis (EOA) was developed utilizing some of the modeling recommendations and requirements detailed by Allison (2014) and seminal work of Berry and Berry (1990) that used EHA for policy adoption studies. Additionally, the methodological modification was based on the relevant cross-sectional and multilevel modeling literature, and a review of survey data literature comparing longitudinal and cross-sectional data. Modeling for EOA is designed to incorporate the policy (or program) change as an independent, exposure, offset, or event window variable with other explanatory variables in study-specific multilevel models. Similar to the EHA literature for cross-sectional data, multilevel modeling is recommended for EOA-based studies. Considering cross-sectional samples will vary based on date of collection, time should be considered for inclusion as a random-effects parameter. Incorporating time as a random-effect in the second level accounts for known variations in observations (respondents) from cross-sectional datasets. The following presentation of EOA builds a framework for analysis using cross-sectional data, multilevel modeling, and data best practice recommendations for method application.

Building from the work of Barber, et al. (2000); Biggeri, et al. (2001); Hedeker, et al. (2000); Ma and Willms (1999); & Reardon, et al. (2002) and with consideration of the seminal event history method as developed by Allison (2014) and Berry and Berry (1990), EOA will be applicable as a policy and program evaluation tool. Allison (2014) recommended best practices for EHA include: 1) longitudinal data, 2) censoring to account for unknown values of dependent

variables (p. 2); and 3) time-varying explanatory variables, which often is applied to changes related to employment status or income (p. 3). From a data integrity perspective, longitudinal data offers individual data points across a specified time-period, which is collected in less quantity in the United States as compared to other nations (Rindfleisch, et al., 2008). Additionally, longitudinal data has high potential for individual attrition from inclusion in the dataset overtime as well as confounding or compounding effects of specific events within data collection time frame (Rindfleisch, et al., 2008). From an applied perspective, cross-sectional data is more cost- and time-effective with a potential application to event history using multilevel modeling as previously discussed.

To maintain data integrity and best-fit within event history, specific steps must be followed to ensure known cross-sectional data issues are minimized. From the literature, the most commonly cited issues with cross-sectional data, specifically survey data include a high occurrence of common method variance (CMV) and lower capacity for casual inference (CI), both of which are considered strengths of longitudinal data (Rindfleisch, et al., 2008). As previously mentioned, Rindfleisch, et al. (2008) recommended three strategies for data collection, "(1) employing multiple respondents, (2) obtaining multiple types of data, or (3) gathering data over multiple periods" (p. 262) to reduce CMV and increase potential of CI from analysis. Survey instruments are commonly constructed with Likert-type scales and other similar scale anchors, which have been shown to increase CMV bias (Podsakoff, et al., 2003). Additional methods to reduce CMV in cross-sectional data include separating outcome and predictor variables through a variation in scales and response formats (Crampton and Wagner, 1994; Lindell and Whitney, 2001).

Rindfleisch, et al. (2008) discussed the importance of sequencing in both longitudinal and cross-sectional survey research to ensure specific events that may impact outcomes are accounted

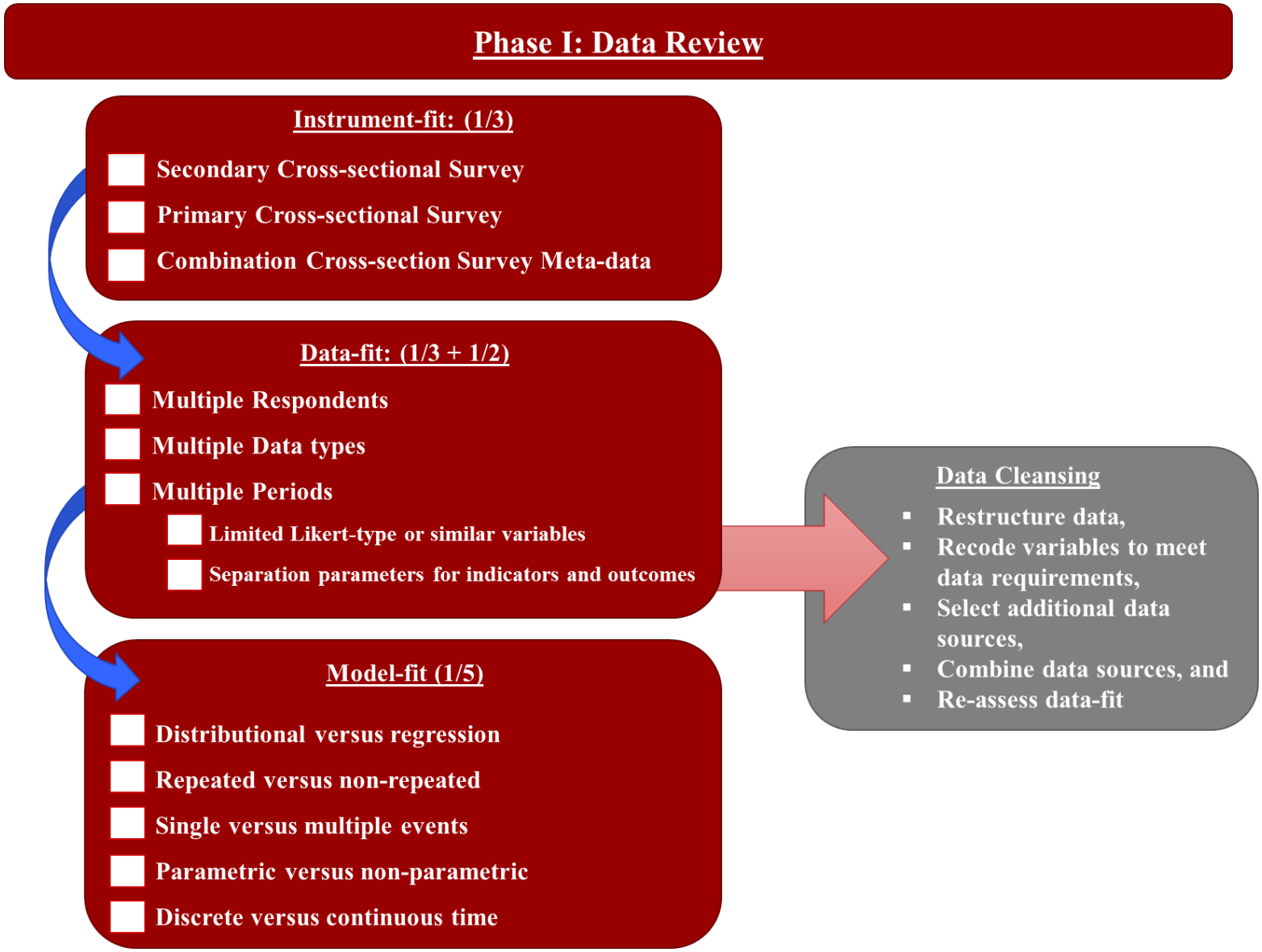
for in analysis. For EOA, event windows, based on landmark analysis as presented by Van Houwelingen (2006), are observed as a best practice in event history modeling. In consideration of longitudinal data as the "best practice solution" for survey research, Rindfleisch, et al. (2008) reported, "our review of the literature indicates that (1) this solution is incomplete and entails some potentially troubling side effects and, (2) in some cases, a well-designed cross-sectional survey may serve as an adequate substitute for longitudinal data collection" (p 264). From the Monte Carlo simulation conducted Rindfleisch, et al. (2008) also found limited differences between longitudinal and cross-sectional data in terms of CMV, temporal order, covariation, and coherence. They also found a lower than anticipated impact of observed CMV bias on CI when comparing longitudinal and cross-sectional Monte Carlo models (Rindfleisch, et al., 2008). Aiding the development of an EOA method using cross-sectional data, Rindfleisch, et al. (2008) reported, "longitudinal data collection is most valuable when researchers are examining constructs, subjects, or contexts that display a substantial amount of method variance and when the correlations between predictors and outcomes are small" (p. 272-273).

The proposed EOA method is constructed to be completed in five phases, each of which includes quality assurance checks to ensure data and model development is consistent with best practices and recommendations throughout relevant literature. The first phase of the analysis begins with a review of the survey or data source for selected analysis to determine applicability of EOA. Method applicability is defined as: survey data that meets at least 1 of 3 strategies presented by Rindfleisch, et al. (2008) (specific strategy may be dependent analysis goals and design) in addition to using instruments designed with minimal Likert-type or similar response options (Podsakoff, et al., 2003) or include separation parameters for indicators and outcomes (Crampton and Wagner, 1994; Lindell and Whitney, 2001). Phase one will also incorporate a

model-fit assessment based on the work of Allison (2014) to select a best practice-based model from one of five options, which include: 1. “Distributional versus regression methods” (p. 4); 2. “Repeated versus non-repeated events” (p. 5); 3. “Single versus multiple kinds of events” (p. 5); 4. “Parametric versus non-parametric methods” (p.5); or 5. “Discrete versus continuous time” (p.6).

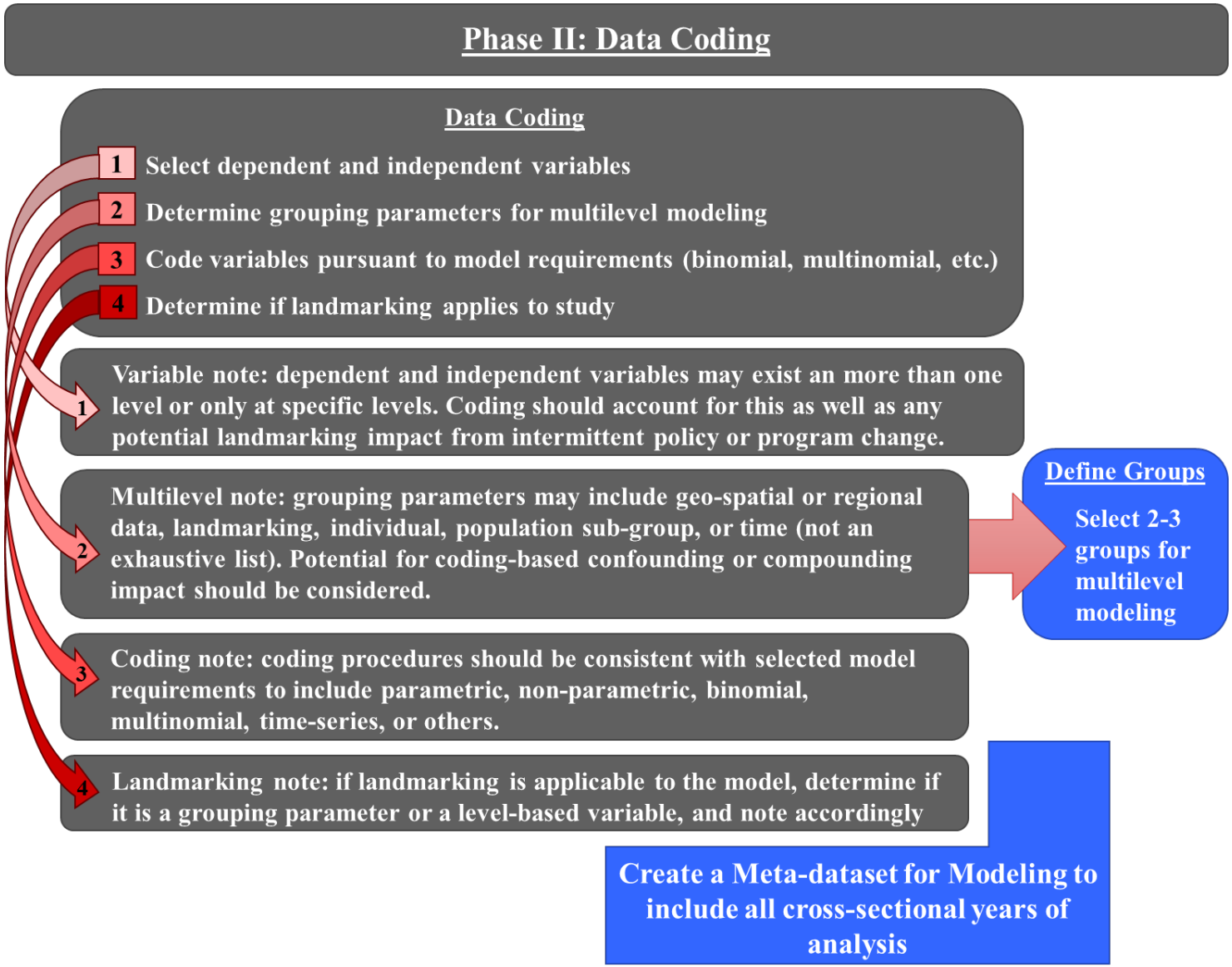
The selection of a baseline modeling technique will depend upon the data available from cross-sectional source as well as intended objectives and goals of the study. If needed based on Phase one assessments, data cleansing may be applied to restructure or recode data, select additional data sources, or combine existing data sources to create variables. Following data cleansing a Phase one re-assessment would be conducted based on cleansing procedures to reassess instrument-fit, data-fit, model-fit, or some combination of these model requirements.

Figure 2. Conceptual Model of Phase I: Data Review



Phase two of the analysis consists of variable and general data coding procedures pursuant to the recommendations of Reardon, et al. (2002) and Biggeri, et al. (2001) to provide an individual and group level of analysis. Initially, dependent and independent variables will be selected and assessed for inclusion in modeling. Following variable selections, grouping parameters should be designed to provide at least two distinct methods for application of multilevel modeling. Coding procedures and variable selection decisions are imperative to grouping parameters as confounding or compounding effects may result from these activities. Additionally, coding should be completed to match data requirements of the selected analysis method, which could include parametric, non-parametric, binomial, multinomial, and time-series variables among others. The final activity of phase two will be to assess the potential for event windows applicability to the study. Van Houwelingen (2006) designed landmarking as a supplementary analysis method to study policy or program changes, which was renamed for as event windows to serve as a level-based variable or multilevel grouping parameter in EOA. Event windows could also be used as a control variable to reduce error estimations. Data warehousing and initial reviews, cleansing and coding procedures can be conducted using software such as SPSS v22 to create the analysis dataset; however, analysis should be conducted using STATA 14 pursuant to Allison (2014) recommendations and provided resources.

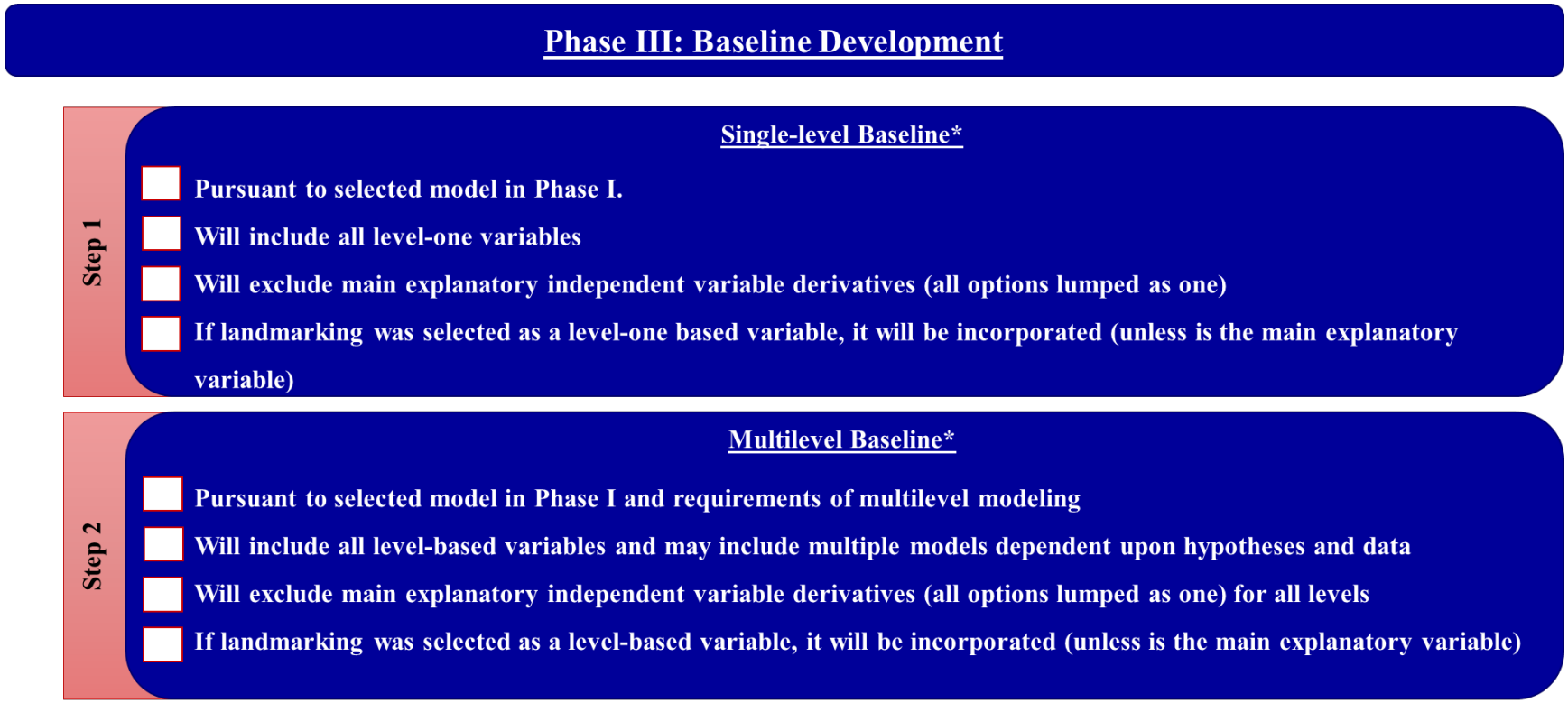
Figure 3. Conceptual Model of Phase II: Data Coding



The third phase of the proposed methodology will be to develop a baseline model as presented by Reardon, et al (2002) and Biggeri, et al. (2001) in alignment with seminal work in event history and survival analysis (Allison, 2014). Before developing the baseline model, descriptive statistics should be conducted to ensure the study sample is representative of the population being investigated. At least one multilevel baseline model should be developed for comparison in phase five. Additionally, a developed baseline model may incorporate slightly different components of EHA as presented by Allison (2014) dependent upon available data points and dataset development completed in phase one. Baseline modeling may not be applicable in all cases and will vary based on available data. At a minimum, conducted descriptive analysis results can be used as comparative results with study-specific models.

As previously discussed, models can be developed using an entire dataset or a random sampling of available respondents, which was successfully applied to cross-sectional survey data by Biggeri, et al. (2001). While there is literature based support for utilizing a random sample, sample selection is dependent upon the research investigation and could include an entire dataset. The instrument and data fit as previously presented in addition to the representativeness of the sample is considered more important than creating a smaller sub-set of data using random selection. EOA is designed to be conducted using STATA 14 pursuant to Allison (2014) provided references and resources. Analytical procedures and guiding syntax codes should also be developed based on the Allison (2014) recommendations. When appropriate, baseline models are to be further analyzed using event windows (Van Houwelingen, 2006) to determine the most appropriate application of this method in assessing policy changes and relative impacts. Event windows may be incorporated into the single-level and multilevel baseline models unless it is defined as a main explanatory variable.

Figure 4. Conceptual Model for Phase III: Baseline Development

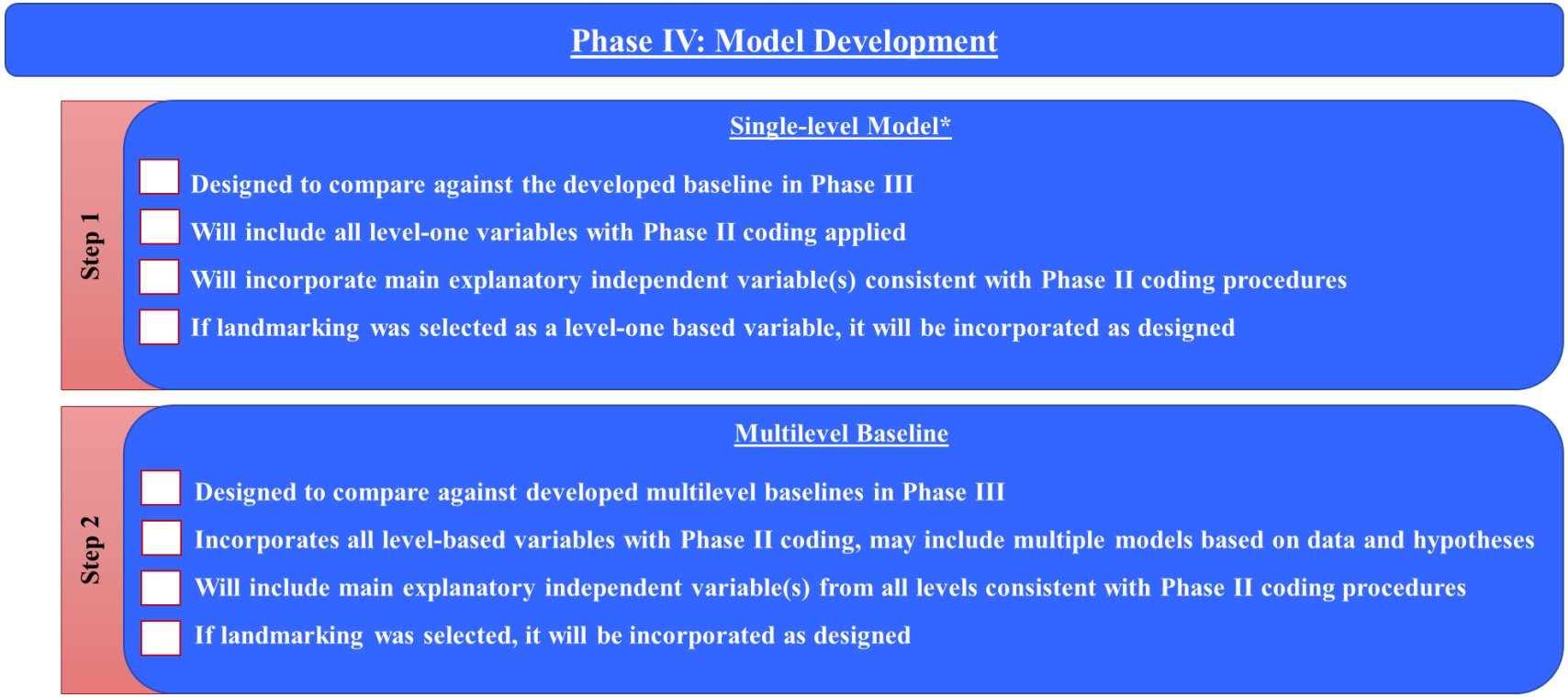


**If applicable based on both available data, research questions and hypotheses, and variable interactions*

During phase four of the analysis, models will be constructed based on developed datasets and selected EHA modeling techniques. Specifically, phase four will use the same selected in phase three to compare constructed study models to the baselines. If no baselines were developed in phase three, study-specific models are to be compared and assessed using the descriptive statistics conducted as part of phase three. An initial recommendation is to utilize individual variables in level-one with a second-level for grouping variables or time-series data for studies involving multiple years of cross-sectional data from the same source. These decisions would be made in phase one and could offer the potential to study policy or program outcomes. For example, the ACS-PUMS data has annual data dating to 2000 as well as three- and five-year aggregate reports beginning in 2005-2007 and 2005-2009 respectively. These data sources could be incorporated into an EOA as an aggregated population for a specific time-period of interest or a "before and after" sample (individual annual or aggregated group reports) to determine relative impacts of policy or program shifts that occurred at a specified time.

Another potential level of analysis for consideration in EOA is a state or regional variable. Regional science has over the past several decades intersected with policy-based research to determine variations in outcomes with examples from environmental and economic policy analyses (Carlino & DeFina, 1999; Jaffe & Palmer, 1997). Research has resulted in theory development (Porter, 1990), increasing demand for more robust regional modeling (Markusen, 2010), and other related critical assessments of regional science theories and frameworks (Martin & Sunley, 2003; Bartels, et al., 1982). Other regional science research has focused on specific academic or professional disciplines such as geographic concentration (Dumais, et al., 2002), emergency management and recovery (West & Lenze, 1994), and regional innovation (Power and Malmberg, 2008; Laranja, et al., 2008).

Figure 5. Conceptual Model of Phase IV: Model Development

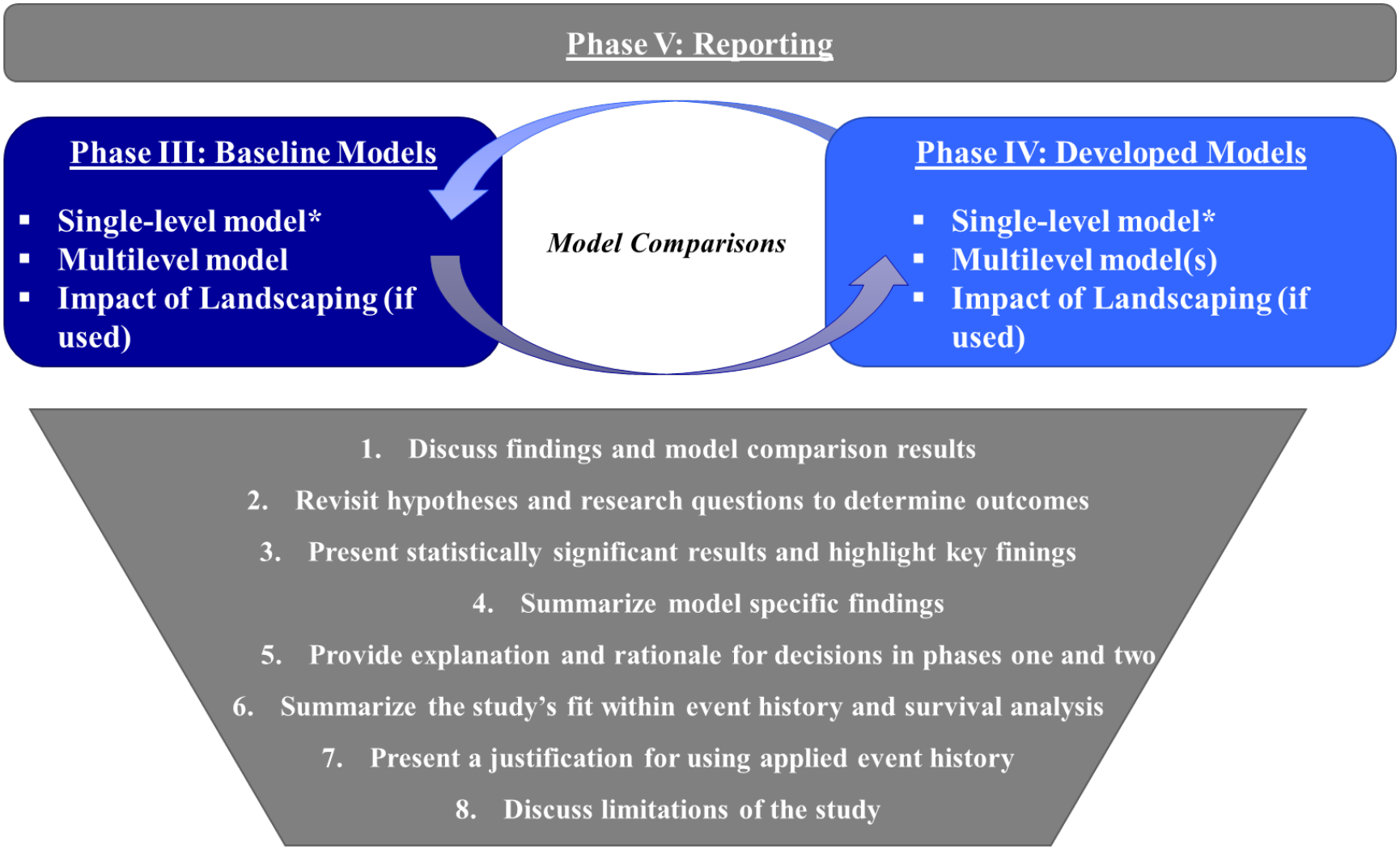


**If applicable based on both available data, research questions and hypotheses, and variable interactions*

Regional science studies to assess regional inequality (Getis, 2008; Amos, 1988; Fan & Casetti, 1994) as well as regional convergence and divergence (Rey & Montouri, 2010; Rey & Janikas, 2004) are also applicable to an event history for either policy or program evaluation to assess outcomes from policies or programs with respect to regional differences. Depending upon data and selected populations of interest, EOA is anticipated to result in varying levels of geographic differences in both policy and program evaluation investigations. Even at the micro-level, if data is available and reliable, EOA has the potential to identify geo-spatial or regional differences in policy or program outcomes. EOA model construction is recommended to incorporate regional-based variables, hypotheses and analysis of spatial relationships.

Following this model development process, results will be compared to the baseline models or descriptive analyses to determine explanatory capacity and outcomes. Phase five of the proposed EOA methodology will include a comparison of models, holistic presentation of the results, and discussion of findings from the previous phases with specific attention to policy or program outcomes. EOA results should be discussed with attentiveness to model limitations and presentation of data integrity processes as discussed in phase one. Phase five is expected to present decision-making support for selected modeling techniques and levels of analysis for multilevel modeling. Additionally, decisions concerning any spatial-based hypotheses or testing and applicability for event windows will be incorporated into phase five. Finally, phase five should include justification for conducting the EOA in lieu of EHA. Anticipated reasons for selecting EOA include available data, research questions, an independent-event variable, and capacity to incorporate cross-sectional data

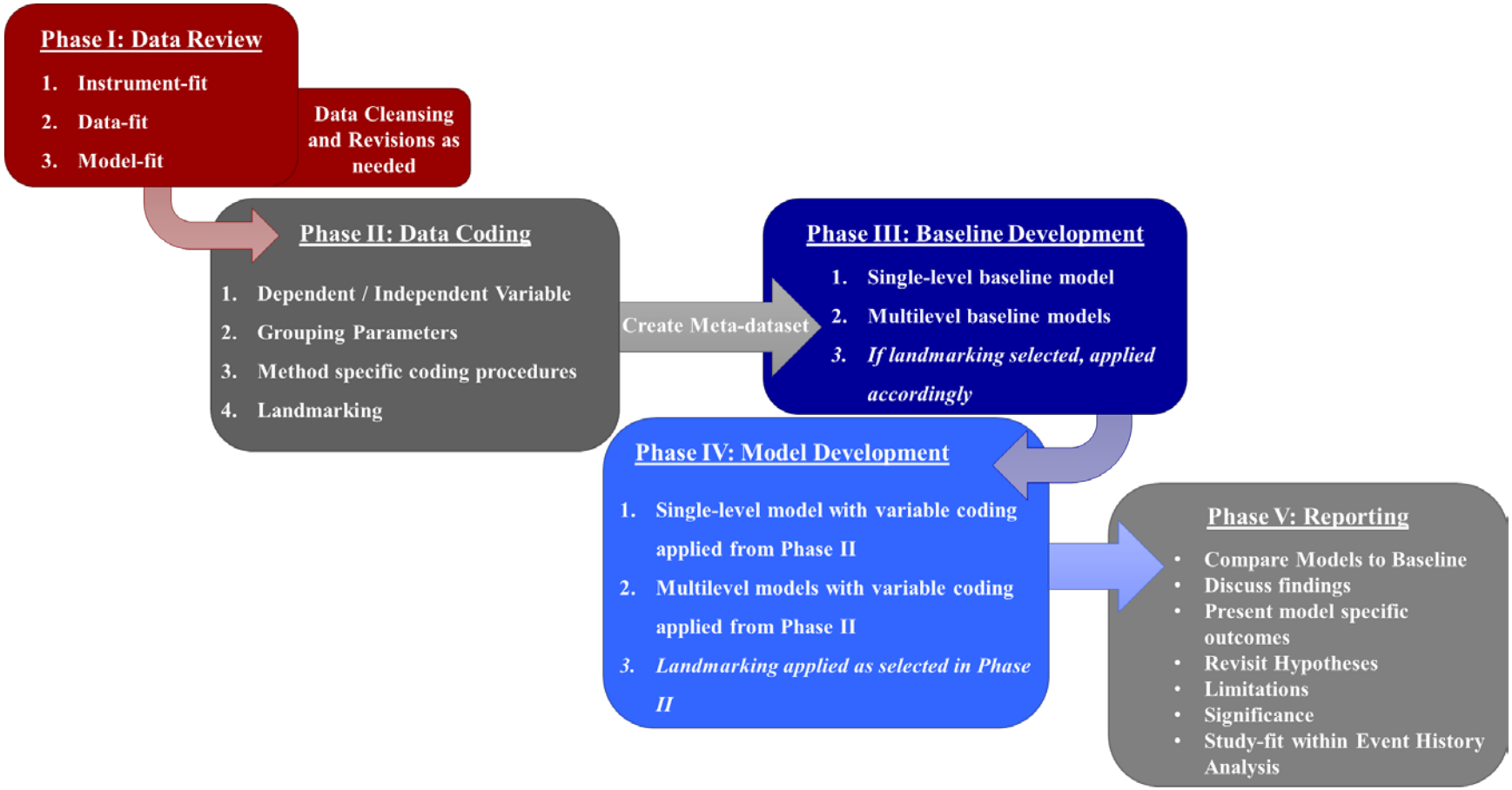
Figure 6. Conceptual Model for Phase V: Reporting



**If applicable based on both available data, research questions and hypotheses, and variable interactions*

From a holistic perspective, EOA proposes a cross-sectional data methodology derived from EHA that is based on data integrity protocols, survey instrument assessments, and model-fit determinations. By constructing a multi-phased framework for EOA, the cross-sectional data-fit within EHA techniques and procedures will be robust and reliable, which is anticipated to result in wider application of EOA for policy and program evaluation. In phase two variables are selected and defined, grouping parameters are developed, coding is conducted and applicability of event windows is assessed. Phase two outcomes lead directly into the development of both single- and multilevel baselines or inform descriptive analysis procedures, which will be imperative to investigating hypothesized differences. Hypothesized impacts are tested in phase four modeling, which may include event windows. Phase four will should include a simple multilevel model with intendent and explanatory variables in level-one with random effects in level-two at a minimum. These decisions for modeling are recommended to follow existing studies and modeling techniques for selected procedures based on available data and research questions. Finally, models are compared and discussed in phase five to determine relevant findings, identify limitations, present decision-making justifications for each phase. Additionally, phase five should include a justification and discussion of the applicability of EOA and the study's fit within the event history and survival analysis literature.

Figure 7. Conceptual Methodological Model for Event Outcome Analysis



Initial Event Outcome Analysis Investigation

Life after active duty service presents unique challenges for service members and their families in addition to specific policy and program considerations for communities, governments, policy-makers, service providers, employers, and educators. First empowered with extensive benefits by President Roosevelt in 1944, veterans have since experienced variations of policies and programs based on era of service with research beginning in the 1970s to determine outcomes of both policy-based and programmatic designs (Roisman, 2005). In the 1990s, DoD created the TAP program, which has been since re-designed into a modularized training platform with virtual and independent pacing options. Significant benefit changes for Post-9/11 Era veterans have resulted in substantial transitional assistance and budgetary allocations to help veterans and their families (Clemens & Milsom, 2008; Collins, et al., 2014; Smith-Osborne, 2012; Ruh, et al., 2009; CFPB, 2016; and Center for Responsible Lending, 2015). An EOA to determine relative differences in educational degree attainment and employment outcomes for Post-9/11 veterans following the passage of the 2008 GI Bill as compared to outcomes from the years preceding the bill. The data-model fit for this study was based on the available ACS-PUMS data dating to 2000 with specific focus on data available beginning in 2003, which was the first year Post-9/11 veteran data was collected by military era of service.

The goal of this initial application of the EOA method is to assess the relative impact of the 2008 GI Bill on education and employment outcomes of Post 9/11 veterans as compared to outcomes prior to the passage of the bill. Additionally, descriptive statistics will be conducted to assess differences between Post-9/11 veterans from preceding eras of service as well as non-military civilians. Specifically, rate of higher education degree achievement and employment *vs.* unemployment rates will be evaluated from education and employment disciplines respectively.

This analysis will be conducted using the two most recent 5-year PUMS-ACS Report (2005-2009 & 2010-2014) in addition to the most recent 1-year PUMS-ACS Report (2015) and correlated data codebooks. As previously discussed, the PUMS-ACS data is utilized by CFED to create A&O Scorecard. The Scorecard provides outcome data from five different substantive areas; financial assets and income, businesses and jobs, housing and homeownership, health care, and education, in which access and opportunities are typically reported in inequitable distributions across populations (CFED A&O Scorecard, 2016). Specifically, the Scorecard, "assesses the 50 states and the District of Columbia on 130 outcome and policy measures, which describe how well residents are faring and what states can do to help them build and protect assets" (CFED Assets, 2016). The CFED A&O Scorecard provided the framework and initial inspiration for designing this study and methodological modification.

The proposed EOA will be conducted pursuant to the five phases as presented in the previous section. Cross-sectional data from the ACS-PUMS will be used in this study from across 11 years of data collection. Following the phase one data review steps to include the instrument-fit, data-fit, and model-fit, phase two will select and align variables to assess differences among Post-9/11 veterans across time. Specific focus of baseline development or descriptive analysis in phase three and model construction in phase four will be on outcome data from Post-9/11 veterans as a function of grouping based on the 2008 GI Bill. Depending upon available data, event windows may be applied as a grouping or clustering variable pursuant to the landmark analysis procedures described by Van Houwelingen (2006). Regional comparisons will also be considered for application in the overall modeling, but will be incorporated as a level-one variable to reduce error estimation from level-to-level interaction.

During phase four of the analysis, models (single- and, or multilevel) will be developed as outcome indicators of employment and educational degree attainment with both individual and group levels of analysis. These developed models will be compared to the phase three baselines and results will be discussed in phase five. Anticipated results will discuss differences in outcomes for Post-9/11 veterans across the cross-sectional dataset from 2005 to 2015 with regional grouping for further analysis of outcomes. Finally, event windows will be applied as detailed by Van Houwelingen (2006) and in accordance phase two assessments to further measure outcomes. Additionally, this fifth and final phase of the proposed methodology will present a holistic discussion of the results, provide insights into decision-making, coding procedures, grouping parameters, study fit within the broad event history and survival analysis realm, identify limitations and future studies, and provide a justification for use of EOA.

Recommendations for Future Application

As discussed throughout this article, available data and statistical modeling procedures are often not aligned for robust modeling of cross-sectional data, especially in the EHA realm. The goal of this article focused on designing an outcome analysis version of EHA for broader application using cross-sectional data. There are significant considerations to be taken in utilizing the proposed EOA method; however, if conducted using the best practice recommendations and commitment to data integrity EOA could expand the reach of event-based research. Anticipated areas of future application include both policy and program evaluation. An outcome analysis beta-test is currently being developed and conducted as presented in the previous section to test the assertions presented in this article for expanded use of cross-sectional data in what has been coined Event Outcome Analysis.

Chapter 4: Measuring the Impact of the 2008 GI Bill: A Pooled Cross-Sectional Event Outcome Analysis

Abstract

Event Outcome Analysis is designed to assess and measure individual or group outcomes following a policy or program event, such as a new policy or program, policy or program change, or other related events. Based on Event History Analysis and designed to use cross-sectional data, Event Outcome Analysis offers an opportunity to conduct on-going, recurrent analyses of policy or program outcomes. In a first methodological application, employment and educational degree attainment of Post-9/11 veterans were analyzed based on the 2008 GI Bill to measure changes in outcomes compared to a pre-policy time-period. Annual Cross-sectional data from the 2005 to 2015 American Community Survey-Public Use Microdata Sample was utilized for the study, which found statistically significant impacts on educational degree attainment following the 2008 GI Bill. While, employment was not significantly impacted by the 2008 GI Bill in study models, follow-up studies within the next few years is expected to become significant. From a methodological perspective, this study offers a path forward for the application of Event Outcome Analysis across multiple policy and program related investigations and evaluations.

Keywords: Event Outcome Analysis; Policy Evaluation, Veterans, Employment, Education

Introduction

The purpose of this study is to measure education and employment outcomes of Post-9/11 veterans as a function of the 2008 GI Bill in a pre- and post-policy Event Outcome Analysis (EOA). One of the study goals is to determine outcomes based on regional population dynamics and veteran migration to rural states. Additional explanatory variables of interest include both gender and race, which have become more important in assessing veteran transition as a result of the diversification of the U.S. Military over the past 15 to 20 years. Using an 11-year collection of cross-sectional data from the American Community Survey-Public Use Microdata Sample (ACS-PUMS) beginning in 2005, this study will also serve as an initial test of the EOA method developed as a preceding article to this investigation (Gardner, 2016b). From the initial assessment of available veteran-specific data (Gardner, 2016a) the EOA framework and this study were designed to further understand veteran outcomes following legislation aimed to improve services for Post-9/11 veterans.

From a historical perspective, in the generations since the initial GI Bill of Rights in 1944, the U.S. government has worked to adapt and evolve veterans' benefits. From a policy goal perspective, the G.I. Bill sought to provide opportunities to veterans in civilian society following military service (Roisman, 2005). There is undoubtedly a need to provide opportunities for reintegration for our nation's heroes. As General Colin Powell so eloquently explained during the 2016 National Memorial Day Concert:

> While your lives have been on the line, they've also been on hold. You've had to bear long absences from your families and loved ones. Missing your spouses' birthday and the kids school graduations. All of the family joy that can never be retrieved (PBS, 2016).

The US Government has been dedicated to providing resources and services to veterans and military families since President Lincoln so famously stated, “to care for him who shall have borne the battle and for his widow and his orphan” (Roisman, 2005, p. 110). His words are inscribed on the US Department of Veterans Affairs building in Washington, DC as a constant reminder of the sacrifice or military members and their families. However, as available veterans’ benefits evolved since the mid-1940s, there remains an overall lack of policy analysis or program evaluation data to measure outcomes from such policy modifications (Gardner, 2016a). Additionally, Gardner (2016a) found veteran specific data sources are increasing in availability, which is expanding and improving the potential to conduct policy or program evaluation to measure changes in veteran outcomes. Ultimately, this study will provide an initial test of the EOA method with an 11-year cross-sectional analysis of veteran outcomes in education and employment.

Literature Review

During the Post-9/11 Era, eligible veterans have the most comprehensive education benefits as compared to previous service era veterans. Using monetary value based on 2013 U.S. Dollars and the CPI Inflation Calculator (BLS, 2016), Korean War veterans received approximately $40,000, which was reduced to $19,000 for Vietnam Era veterans before the Montgomery G.I. Bill increased available benefits to nearly $59,000 (Angrist, 1993; Collins, et al., 2014). Comparatively, Post-9/11 Era veterans have variable benefits based on geographic location and institution-based tuition that can equate to over $170,000 in education benefits (Collins, et al., 2014).

Based on various state and national data, veterans are achieving post-secondary degrees at higher rates than previous service era veterans and non-military civilians (Burnett-Zeigler, 2011; Clemens and Milsom, 2008; & Collins, et al., 2014). However, reported employment data reveals

an outcome difference between Post-9/11 veterans, other service era veterans and non-military civilians who are employed at much higher rates than Post-9/11 veterans (Smith-Osborne, 2012; Ruh, et al., 2009; and Simon, et al., 2010). As part of this study, descriptive statistics were performed to both assess variable relationships and trends and to develop the final dataset for EOA. Table 1 presents annual unemployment rates based on veteran status (non-military civilians, pre-9/11 veterans, and post-9/11 veterans), which visually depicts the aforementioned employment findings.

Table 3. 2005 to 2015 Unemployment Rates by Veteran Status (n = 938,313)

YEAR		VPS			Total
		Non-military civilian	Pre-9/11 Veterans	Post-9/11 Veterans	
2005 % within VPS	Unemployed	5.5%	4.8% (-0.7%)	8.3% (+2.8%)	5.5%
2006 % within VPS	Unemployed	5.2%	4.6% (-0.6%)	7.0% (+2.8%)	5.2%
2007 % within VPS	Unemployed	5.4%	4.6% (-0.8%)	7.6% (+2.2%)	5.4%
2008 % within VPS	Unemployed	5.2%	4.6% (-0.6%)	6.7% (+1.5%)	5.2%
2009 % within VPS	Unemployed	7.1%	6.7% (-0.4%)	8.6% (+1.6%)	7.0%
2010 % within VPS	Unemployed	9.0%	9.2% (+0.2%)	10.2% (+1.2%)	9.0%
2011 % within VPS	Unemployed	8.7%	8.4% (-0.3%)	10.4% (+1.7%)	8.7%
2012 % within VPS	Unemployed	7.9%	7.4% (-0.5%)	9.2% (+1.3%)	7.9%
2013 % within VPS	Unemployed	7.1%	6.6% (-0.5%)	8.2% (+1.1%)	7.1%
2014 % within VPS	Unemployed	6.1%	5.2% (-0.9%)	7.4% (+1.3%)	6.1%
2015 % within VPS	Unemployed	5.3%	4.6% (-0.7%)	6.0% (+0.7%)	5.3%
Total % within VPS	Unemployed	6.6%	6.0% (-0.6%)	8.1% (+1.5%)	6.6%

2008 GI Bill — *Great Recession*

From a policy outcome perspective, this finding elicits numerous potential research questions about employment or unemployment rates as compared to educational degree achievement in Post-9/11 veteran populations as compared to other veteran and non-military populations. This study will begin to determine and measure policy outcomes on both employment

and education resulting from the 2008 GI Bill. Similar to employment differences reported in Table 1, educational degree attainment also varied based on veteran status, which is displayed in Table 2 and further supports this research agenda. The most commonly reported level of education for each group (non-military civilians, pre-911 veterans, and post-9/11 veterans) are noted in bold.

Table 4. 2005 to 2015 Educational Degree Attainment by Veteran Status (14,223,467)

YEAR		VPS			Total
		Non-military Civilians	Pre-9/11 Veterans	Post-9/11 Veterans	
2005 % within VPS	High School Diploma or GED	30.5%	**30.8%**	26.2%	30.5%
	Some college, No degree	25.2%	29.7%	**35.6%**	25.7%
	Associates Degree	9.4%	11.3%	11.5%	9.6%
	Bachelors Degree or Higher	**34.8%**	28.3%	26.6%	34.2%
2006 % within VPS	High School Diploma or GED	31.3%	**31.2%**	27.1%	31.3%
	Some college, No degree	25.1%	29.4%	**35.1%**	25.5%
	Associates Degree	9.3%	11.5%	12.1%	9.5%
	Bachelors Degree or Higher	**34.3%**	28.0%	25.8%	33.7%
2007 % within VPS	High School Diploma or GED	31.0%	**30.9%**	26.7%	30.9%
	Some college, No degree	24.9%	29.4%	**33.8%**	25.4%
	Associates Degree	9.2%	11.3%	12.0%	9.4%
	Bachelors Degree or Higher	**34.9%**	28.4%	27.5%	34.3%
2008 % within VPS	High School Diploma or GED	29.4%	29.9%	23.3%	29.4%
	Some college, No degree	25.7%	30.2%	**35.9%**	26.2%
	Associates Degree	9.4%	11.4%	12.0%	9.6%
	Bachelors Degree or Higher	**35.4%**	28.5%	28.7%	34.8%
2009 % within VPS	High School Diploma or GED	29.1%	29.9%	22.1%	29.1%
	Some college, No degree	25.7%	**30.1%**	**35.7%**	26.1%
	Associates Degree	9.4%	11.4%	12.2%	9.6%
	Bachelors Degree or Higher	**35.8%**	28.6%	30.0%	35.2%
2010 % within VPS	High School Diploma or GED	28.8%	29.4%	21.8%	28.8%
	Some college, No degree	25.9%	**30.5%**	**36.2%**	26.3%
	Associates Degree	9.5%	11.6%	12.4%	9.6%
	Bachelors Degree or Higher	**35.8%**	28.5%	29.6%	35.2%
2011 % within VPS	High School Diploma or GED	29.2%	30.3%	21.9%	29.1%
	Some college, No degree	26.2%	**30.4%**	**35.7%**	26.6%
	Associates Degree	9.6%	11.6%	12.4%	9.8%
	Bachelors Degree or Higher	**35.0%**	27.8%	30.0%	34.5%
2012 % within VPS	High School Diploma or GED	28.4%	29.0%	20.8%	28.3%
	Some college, No degree	26.0%	**30.4%**	**35.4%**	26.4%
	Associates Degree	9.7%	11.9%	13.1%	9.9%
	Bachelors Degree or Higher	**35.9%**	28.7%	30.7%	35.4%
2013 % within VPS	High School Diploma or GED	27.6%	28.5%	20.1%	27.5%
	Some college, No degree	25.6%	**30.4%**	33.4%	25.9%
	Associates Degree	9.8%	12.5%	13.0%	10.0%
	Bachelors Degree or Higher	**37.0%**	28.6%	**33.5%**	36.5%
2014 % within VPS	High School Diploma or GED	27.3%	29.2%	20.1%	27.3%
	Some college, No degree	25.4%	**29.6%**	32.8%	25.7%
	Associates Degree	9.9%	12.5%	13.2%	10.1%
	Bachelors Degree or Higher	**37.4%**	28.7%	**34.0%**	36.9%
2015 % within VPS	High School Diploma or GED	27.0%	28.8%	19.4%	27.0%
	Some college, No degree	24.9%	**29.8%**	32.1%	25.2%
	Associates Degree	10.0%	12.7%	13.3%	10.1%
	Bachelors Degree or Higher	**38.1%**	28.7%	**35.2%**	37.6%
Total % within VPS	High School Diploma or GED	29.0%	**30.0%**	22.2%	29.0%
	Some college, No degree	25.5%	**30.0%**	**34.5%**	25.9%
	Associates Degree	9.6%	11.7%	12.6%	9.8%
	Bachelors Degree or Higher	**35.9%**	28.4%	30.7%	35.3%

2008 GI Bill ***Great Recession***

In an effort to further understand these literature and data observed phenomena an EOA will be conducted using only Post-9/11 veterans. The EOA method provides an opportunity to study and assess annual cross-sectional outcomes overtime with specified periods before and after the passage of the 2008 GI Bill. Additionally, the multilevel design of EOA analyses enables this investigation to account for potential annual variations in cross-sectional data using the year of data collection as a random effect variable for included observations. The EOA methodological design also supports evaluation of regional trend impacts; including, national trends reported by the VA Office of the Actuary, which found veterans are moving and will continue to move to the south and west (Guo, 2013). From a state-specific perspective, Nevada accounts for approximately 0.90% of the nation's population with just less than 2,900,000 estimated residents as of July 2015 (E0-2014-20, 2015; American FactFinder, 2015). Veterans, who comprise of about 6.75% of the nation's population (VA Nevada Summary, 2015; American FactFinder, 2015), are found in greater number in Nevada, which has 1.04% of the national veteran population (VA Nevada Summary, 2015). While, the assessment of regional veteran migration to the south and west is not incorporated in this study design, another regional finding has been included to study the impacts of veterans living in more rural communities. From the rural-focused regional perspective, the Housing Assistance Council found more than 40% of veterans choosing to live in rural communities (HAC, 2012). Interestingly, Nevada was found in both the southwest and rural-focused groups.

To specifically address the question of regional impact, EOA will be applied based on the initial work of Berry and Berry (1990) who first used event history analysis for policy adoption studies. In the closest methodological design to EOA, Berry and Berry (1990) utilized pooled cross-sectional data for time-series analysis of policy adoption behaviors at the state-level. From

a theoretical standpoint, Berry and Berry (1990) were interested in predicting state-by-state and regional adoption of policy, specifically state lottery policies. Regional diffusion was a cornerstone component of their state innovation study design, which sought to determine the point at which neighboring states adopted similar policy innovations to a state that first passed the innovative legislation. Regional diffusion studies followed the Berry and Berry (1990) design to assess outcomes in health policy adoption (Volden 2006). Building off the work of Berry and Berry (1990), Volden (2006) studied policy adoptions related to children's health insurance programs from 1998-2001. His event history analysis found successful state policies were emulated more often than failing states with success based on a variety of indicators, including, program costs, legislative as compared to administrative changes, and regional diffusion across states from political, demographic, budget perspectives. Interestingly, he did not find as much regional diffusion based on geographic proximity, which was integrated in the selection of rural states as the regional-based variable in lieu of the southwest geographic region as presented by Dr. Guo from the VA Office of the Actuary.

Related research in regional inequity or diffusion studies (Carlino and DeFina, 1999; Jaffe and Palmer, 1997) have identified policy and outcome differences based on regional-specific variables. Carlino and DeFina (1999) assessed monetary policy regional effects using time-series analysis to identify areas of symmetry and diffusion. From the environmental regulation sector, Jaffe and Palmer (1997) used panel data to measure domestic innovation and foreign competition as a result of environmental regulation based on the work of Michael Porter in 1991. While Jaffe and Palmer (1997) were comparing domestic innovation to a larger international, foreign, competitor market, the study provides a substantive example of a time-series panel study. Frankfort-Nachmias and Nachmias (2008) define panel data as collection of approximated before

and after surveys of the same sample population (p. 524). Time-series studies, including event history analyses are typically studied with either longitudinal or panel data. EOA is designed to construct time-series event history models using cross-sectional data to study policy or program outcomes (Gardner, 2016b).

The goal of this study is to assess the observed outcomes for Post-9/11 veterans before and after the 2008, which increased available education benefits for eligible veterans. Considering the known impact of education on employment and employability, both outcomes were included in the study design. The Brookings Institute recently released a report assessing the changing trends in advanced manufacturing industries over the past several years. Advanced industries commonly require post-secondary education and specific training in technical trades (Muro, Kulkarni and Hart, 2016). One of the regional findings presented by Muro, et al. (2016) was expansion of advanced industries to the Northeastern and Western states with rapid acceleration in job growth experience in Utah, Oregon, Colorado, California and Idaho from 2013-2015.

Based on this Brookings Institute work, there is reason to believe veterans and higher per capita density veteran states could be plausible expansion areas for advanced industries. Expansion of veteran education benefits from Post-9/11 GI Bills has already resulted in more veterans accessing educational opportunities than in any previous service era. A 2014 Congressional Research Service report found, “By FY2010, the program had the largest numbers of participants and the highest total obligations compared to the other GI Bills” (Dortch, 2014, np.). This study is designed to assess veteran outcomes and by using EOA to measure policy impacts. Expected results may not only measure policy outcomes, but could also serve to connect advanced industry findings (Muro, et al., 2016) to a regional diffusion of a trained and educated workforce of veterans.

Research Questions and Hypotheses

Based on the literature and substantive data assessment of the 2005-2015 ACS-PUMS data, there is one major research question, applied to both education and employment, with several secondary or follow-up research questions. The overarching questions is, what impact did the 2008 GI Bill have on education? And, what impact did the 2008 GI Bill have on employment? Considering that the 2008 GI Bill provided additional benefits for Post-9/11 era veterans, the research questions were targeted directly to assessing Post-9/11 veteran outcomes. Follow-up research questions focused on potential changes in outcomes following the policy enactment in 2008 with respect to gender, race, and regional distribution. First, if differences in outcomes were found as a result of the 2008 GI Bill, did the effect of race and gender change as well? Similarly, how did regional distribution, specifically in the Genus Region states, interact with the 2008 policy change?

From a purely economic value perspective the increased investment in veteran education benefits begs the question, do the veteran degree attainment rates indicate allocated dollars are leading to post-secondary degrees? Considering the financial resources committed to providing service members educational opportunities following active duty service, it would be anticipated that current era veterans would be more competitive for civilian employment opportunities. However, the literature and descriptive statistics from data used in this study reflect lower employment for Post-9/11 veterans. Additionally, it would be anticipated that veterans living in Genus Region states would face higher potential unemployment, but again the data displayed in Table 1 indicated a potentially different outcome. Thus, a final question remains, what impact does residency location have on both education and employment? A series of 11 hypotheses were developed to address postulated research questions, which are presented in Figures 8 and 9.

Figure 8. Educational Degree Attainment Hypotheses Model

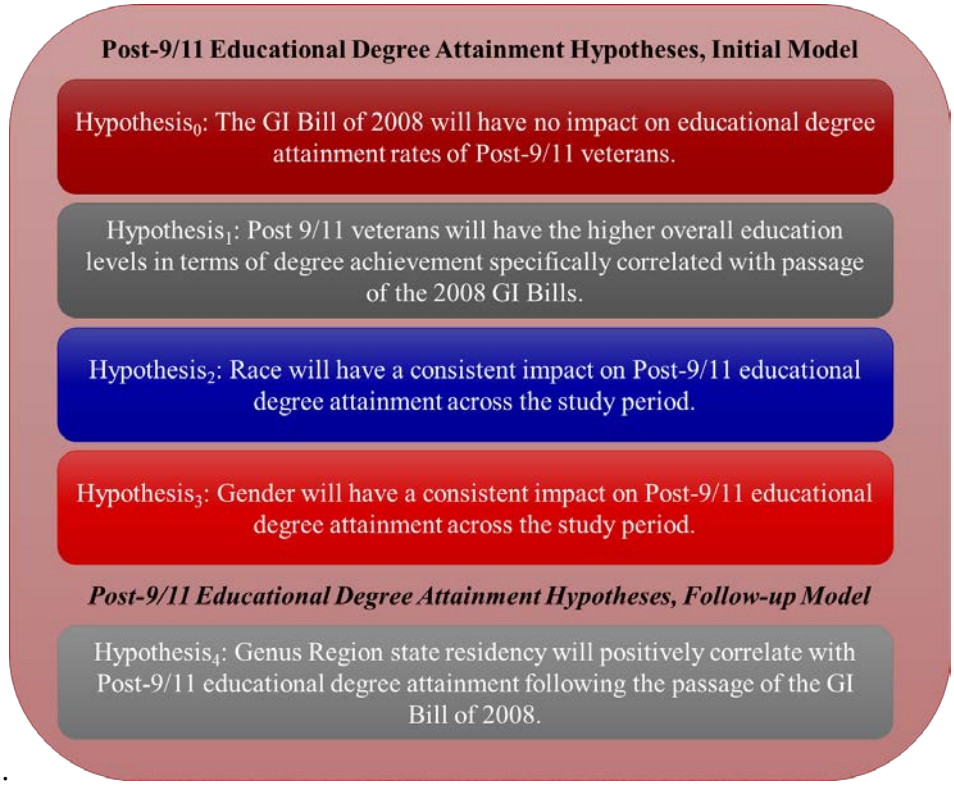


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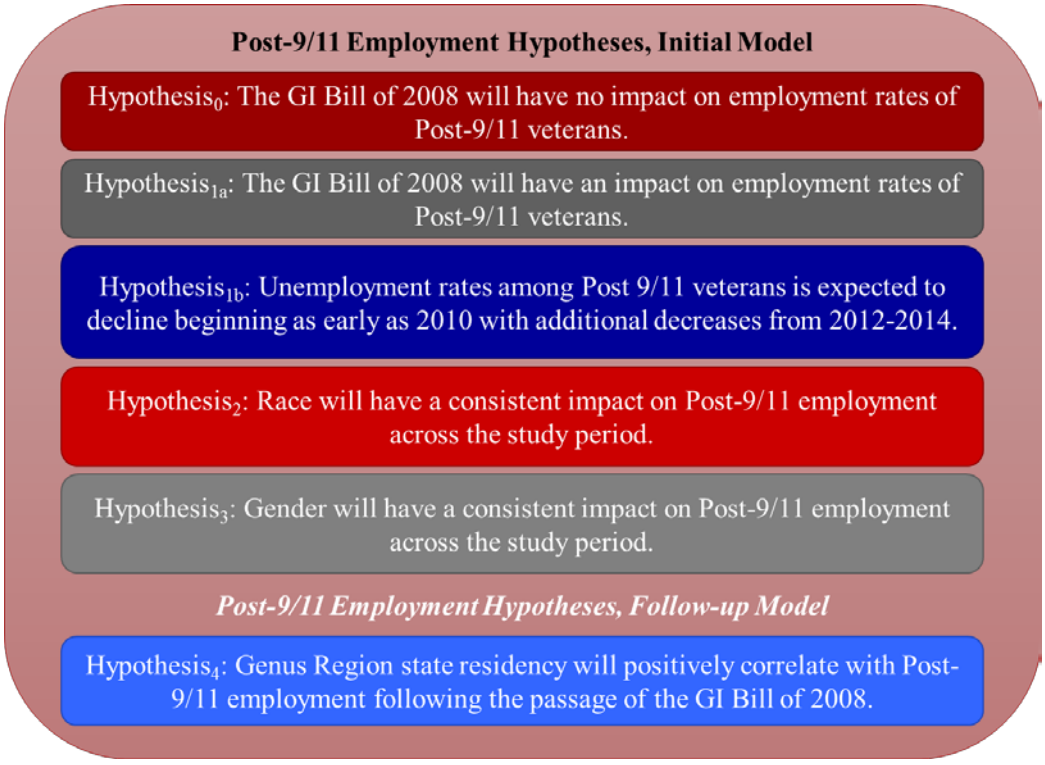
Figure 9. Employment Hypotheses Model



Data

Annual American Community Survey-Public Use Microdata Sample (ACS-PUMS) from 2005 to 2015 (5-year samples 2005-2009 and 2010-2014, 1-year sample in 2015) was collected and coded for this study. Selected variables were coded into a standardized format for all 11 years of cross-sectional data to conduct annual EOA analyses for comparison. Additionally, each annual data report was restricted to respondent data between the ages of 18-69 for analysis. Age ranges were incorporated into the study dataset to provide descriptive analysis and a data validation between study data and externally available VA national veteran population data. Military service was a second selection variable, which was applied to remove active duty military, active reservists, and national guard service members from the annual data sets. Variables for race and gender were also incorporated following recoding procedures for race to include only two race categories, "White Only" and "All Non-White Only" based on the increasing diversity in the U.S. Military. Original variables from the ACS-PUMS reports are included in Table 5 along with original variable definitions, study variables, and coding definitions.

Event window variables incorporated a trinomial design to account for the time periods before, during and after the Great Recession and binomial design for the 2008 GI Bill. While the event windows for the GI Bill was designed to measure policy impacts or changes in outcomes as a result of policy changes, the Great Recession event windows was developed to control for changes in both employment and education during and following the Great Recession. Trinomial coding ensures the capacity to assess "lag-time" impacts following the three landmarked time periods. Table 6 presents event window variables and coding procedures. Initial modeling resulted in study focus on the GI Bill variable (LMGIB) and removal of the Great Recession variable

(LMGR) from modeling; however, the LMGR coding was applied to the discussion of results in subsequent sections.

Table 5. Description of Incorporated ACS-PUMS Variables

ACS-PUMS Variables	Definition	Study Variable	Coding Definition
AGEP	Age	AGEP*	Population Selected = 18-69 years
MIL	Military Service	MIL*	Population Selected excludes Active Duty and Active Reserve, National Guard service members
RAC1P	Race	RAC1P	0 = All non-White Only {Black Only; Native American, Alaskan Native; Asian, Pacific Islander, or Native Hawaiian; Other Only; and Multiple} 1 = White Only
ESR	Employment Status	ESR^	1 = Unemployed 2 = Employed
SCHL	Educational Degree Achievement	SCHL^	1 = High School Diploma 2 = Some college, No degree 3 = Associates 4 = Bachelor's Degree or Higher
SEX	Gender	SEX	0 = Female 1 = Male
VPS	Veteran Status	VPS	*1 = Non-Military Civilians (removed for modeling)* *2 = Pre-9/11 Veterans (removed for modeling)* 3 = Post-9/11 Veterans
ST (2005-2015)	50 US States and DC	ST	0 = Rest of Nation 1 = Genus Region
ADJINC (2005-2009 & 2010-2014)	Annual Income Adjustment	YEAR	ADJINC codes for each annual income adjustment were recoded to the year (YYYY), 2005-2014. For 2015, a variable was added to create the YEAR variable.
^ Dependent Variables **Selection Variable Only*			

Table 6. Description of Event Windows Variables

Event Windows	Event Window Variables	Coding Definition
Great Recession (2007-2009)	LMGR	*1 = Pre-Great Recession (removed for modeling)* *2 = During Great Recession (removed for modeling)* *3 = Post-Great Recession (removed for modeling)*
GI Bill 2008	LMGIB	0 = Pre-GI Bill 2008 (including 2008) 1 = Post-GI Bill 2008

Additional data considerations for region-specific outcomes were included pursuant to the relative veteran literature and reports from the VA Office of the Actuary and Housing Assistance Council as discussed in the literature review. For this study, state variables (ST, 2005-2015) were recoded into what was coined a Genus Region variable. This variable was designed through borrowing from Biological Taxonomy of life forms into Domain, Kingdom, Phylum, Class, Order, Family, Genus, and Species for classification and analysis (Lenat and Resh, 2001). In assessing the best naming convention for this regional variable, Biological Taxonomy was seen as a logical method of assigning states into a region based on population dynamics and geo-spatial distributions of communities (Lenat and Resh, 2001). The Genus Region variable was designed as a binomial code to capture states in the Genus Region (Alaska, Nevada, Wyoming, Montana, Utah, New Mexico, North Dakota, South Dakota, Idaho, Arizona, Nebraska, Colorado, Oregon, and Kansas) and the Rest of the Nation.

Genus Region states were determined based on the population density of rural areas and percentage of rural land in each state (US Census Bureau, 2010). The 14 included states in the Genus Region group were defined by a population density in rural areas of less than 10.0 people per square mile. Additionally, these states were similar in terms of geo-spatial distributions of communities based on the percentage of rural land with all the 14 Genus Region states found among the 18-most rural nationally. Looking beyond population dynamics based on rural data, the Genus states were also compared based on overall population and the percentage of veteran residents. The goal was to identify states that share common population dynamics and geo-spatial traits as previously discussed. Life sciences such as Biology and Ecology routinely use taxonomies to assign organisms to groups and categorizations (Lenat and Resh, 2001), while most societal regions are constructed by geo-locational proximity as seen in the U.S. Census Regions (U.S.

Census Bureau, 2016d). The goal of designing at Taxonomy-based region of similar states devoid of geo-locational proximity was to study veteran outcomes within these Genus Region states as compared to all other states.

From a Biological Taxonomy perspective, the relationship of these states is similar to that of North American bears, which include the American Black Bear, Grizzly Bear and Polar Bear. These animals are unique enough to stand-alone as individual species, but share enough common characteristics to be grouped into the Genus, *Ursus* (National Wildlife Federation, 2016a, 2016b, and 2016c). In summarizing the Genus States, they share similar rural-community population distribution and high percentages of rural land compared to urban areas. From a population perspective, they are found as overall less populated states with all but two falling below the median state population of 4,339.367 using 2010 data (US Census Bureau, 2010). Additionally, from a veteran population perspective, these states also share common characteristics with all but three states having higher than median percentage of veterans per state of 8.16% in 2010 (VA GDX Report, 2010). Table 7. presents the incorporated population dynamics and related national raking data for each of the states grouped into the Genus Region as part of this research investigation.

Table 7. Summary of Genus Region States

State	Population Density-Rural*	National Rank for Rural Population Density	Percent of Total Area that is Rural*	National Rank for Rural Area Percentage	Overall State Population*	National Rank for Percentage of Population	Veteran Percentage of State Population^	National Rank by Percentage of Veterans
Alaska	0.4	1	99.95%	1	710,231	47	10.85%	1
Nevada	1.4	2	99.3%	9	2,700,551	35	9.03%	8
Wyoming	2	3	99.8%	2	563,626	51	9.91%	5
Montana	3	4	99.8%	3	989,415	44	10.31%	3
Utah	3.2	5	98.89%	10	2,763,885	34	5.56%	48
New Mexico	3.9	6	99.32%	7	2,059,179	36	8.48%	21
North Dakota	3.9	7	99.73%	4	672,591	48	8.37%	24
South Dakota	4.7	8	99.7%	5	814,180	46	8.81%	10
Idaho	5.6	9	99.4%	6	1,567,582	39	8.72%	14
Arizona	5.8	10	98.08%	18	6,392,017	16	8.71%	17
Nebraska	6.4	11	99.32%	8	1,826,341	38	7.95%	29
Colorado	6.8	12	98.53%	14	5,029,196	22	8.38%	23
Oregon	7.7	13	98.85%	11	3,831,074	27	8.71%	16
Kansas	9.1	14	98.81%	13	2,853,118	33	7.89%	30

**Data accessed from U.S. Census Bureau, 2010 Urban and Rural Classification, Percent urban and rural in 2010 by state, https://www.census.gov/geo/reference/ua/urban-rural-2010.html*

^Data accessed from U.S. Department of Veterans Affairs, 2010 GDX National and State Report, 2010 Veteran Expenditures and Population Dynamics by state, http://www.va.gov/vetdata/expenditures.asp

Methodology

Event History Analysis, first designed by Paul Allison in the early 1980s, provides a robust methodological approach to understanding historical changes based on events using primarily longitudinal data. While longitudinal data is prevalent in European nations, the US data sources are commonly cross-sectional, which reduces the applicability of event history analysis. Allison (2014) explained the method as, "In fact, there is no single method of event history analysis but rather a collection of related methods that sometimes compete and sometimes complement one another" (p. 1). Beginning with the 1990 work of Berry and Berry on state innovation, cross-sectional data has been utilized to develop quasi-longitudinal datasets for policy adoption studies (Berry, 1994; Volden, Ting, & Carpenter, 2008; Volden, 2006; Beck, Katz, & Tucker, 1998; and Buckley & Westerland, 2004). Building from the work of Berry and Berry (1990), numerous researchers have included policy and, or regional diffusion into policy adoption event history analyses (Berry, 1994; Volden, Ting, & Carpenter, 2008; Volden, 2006; Beck, Katz, & Tucker, 1998; and Buckley & Westerland, 2004).

In the late 1990s and early 2000s, a series of research investigations began using a combination of cross-sectional data, multilevel modeling, and event history analysis to conduct outcome-related analysis (Barber, et al., 2000; Hedeker, et al., 2000; Biggeri, et al., 2001; Reardon, et al., 2002; Barros and Hirakata, 2003; & Ma and Willms, 1999). These outcome-related analyses were commonly in health or education related program evaluations (Barber, et al., 2000; Reardon, et al., 2002; & Ma and Willms, 1999). The closest designed study to this EOA was an investigation in Italy that sought to measure employment outcomes following university graduation (Biggeri, et al., 2001). Landmark Analysis, designed by Van Houwelingen (2002) to note specific events for either control or impact, provides opportunities to assess event impact on a staggered basis and

adds another layer of analytical capacity for cross-sectional studies. Considering the adaptability of event history analysis, there was a significant opportunity to again redefine the applicability of the method using cross-sectional data without creating a quasi-longitudinal dataset to conduct policy evaluation.

EOA, as designed by Gardner (2016b), consists of five phases: data review, data coding, baseline development, model development, and reporting. Phase one seeks to assess data for robustness pursuant to a series of requirements to ensure cross-sectional data-fit, or instrument-fit, in lieu of longitudinal data (Gardner, 2016b). Following the instrument-fit, a comprehensive data assessment is conducted based on the work of Rindfleisch, et al. (2008) to ensure data structure is conducive for EOA. Instrument-fit is also aligned with reducing common method variance (CMV) and increase capacity for casual inference (CI) with specific attention to instrument design and question designs (Podsakoff et al., 2003; Crampton and Wagner, 1994; & Lindell and Whitney, 2001). The final step in phase one aligns directly with the seminal work or Allison (2014) during which the model-type was determined to be a combination of a "discrete versus continuous" and "single versus multiple" events model. Finally, a series of recommended models from the literature were tested for model-fit, including; Cox Proportional Hazard Models, Mixed-effects Poisson Regression, Mixed-effects Generalized Linear Model (GLM), and a Multilevel Mixed-effects Regression. The two best modeling approaches, Mixed-effects GLM and Multilevel Mixed-effects Regression, were selected to measure changes in Post-9/11 veteran employment and education outcomes following the passage of the 2008 GI Bill.

Phase two focuses on coding of data that includes selecting dependent and independent variables, determining and assigning groups for multilevel modeling, re-coding original variables into logical binomial, trinomial and multinomial options, and assessing applicability of event

windows and conducting coding as needed. For this study, data coding (Tables 5 and 6) was conducted to combine multiple response option variables such as educational degree attainment and race variables, veteran status was initially coded into a trinomial code before removing non-military civilians and pre-9/11 veterans from the study, and states into binomial groupings (Van Houwelingen, 2002).

In lieu of baseline models as part of phase 3, descriptive analysis were conducted for education and employment based on phase one findings and EOA design recommendations (Gardner, 2016b). Phase four modeling included the Mixed-effects GLM and Multilevel Mixed-effects Regression models. A total of four models were designed to measure educational degree attainment and employment (Figures 8 and 9) with two models for each with the initial model including the 2008 GI Bill, Gender, and Race as explanatory variables. Both follow-up models added a regional explanatory variable to assess the impact of veterans living in the identified Genus Region states as compared to the rest of the nation. Outcomes from these phase four models are reported as part of phase five in the subsequent results section pursuant to the recommendations and structure presented in Chapter 3 (Gardner, 2016b).

Results

Modeling for this study was conducted in STATA v14 following data warehousing and coding in SPSS v22. Following several iterations of descriptive statistics to include frequency and cross-tabulations in SPSS (presented in Appendix A and B) the model-specific dataset was translated to STATA format requirements for further analysis and modeling. As previously discussed, four methodological approaches were utilized in STATA to determine the best model-fit for this study. Initial Modeling results from the Mixed-effects GLM and Multilevel Mixed-effects Regression models were nearly identical; however, the Mixed-effects GLM model was

more simply displayed both of which are displayed in Appendix C. Based on the simplicity of the Mixed-effects GLM model, it was selected for utilization in the study. The Mixed-effects GLM outcome regression model measured outcomes based on pooled-groups of cross-sectional data from across all 11 years of available annual outcomes. Cross-sectional pooling was based on time periods defined as "Pre-2008 GI Bill (including 2008)" and "Post-2008 GI Bill" using the LMGIB event windows variable as an explanatory independent variable. The presented Mixed-effects GLM models were constructed as either two- or three-level models with random effect variables in levels two and three, which is explained in further detail for each of the developed and presented models.

Before discussing the results of the Mixed-effects GLM models, it is important to note the overall summary of the study-specific dataset, which included a total of 183,027 Post-9/11 veterans from across the 11-year data period from 2005 to 2015. Figure 10 presents the summary statistics for the dataset following all coding procedures (Tables 5-7), which was run in advance of final modeling. Models were constructed to combine available Multilevel Modeling techniques from a statistical package perspective (StataCorp, 2015) as well as literature best practices (Templin, 2013 & Luke, 2004).

Figure 10. Summary of Model Variables (n = 183,027)

summarize

Variable	Obs	Mean	Std. Dev.	Min	Max
ST	183,027	0.1269867	0.332959	0	1
SCHL	183,027	2.519098	1.143411	1	4
SEX	183,027	0.8453179	0.3616024	0	1
ESR	183,027	1.918673	0.2733371	1	2
RAC1P	183,027	0.7754047	0.4173167	0	1
YEAR	183,027	2010.682	3.10304	2005	2015
LMGIB	183,027	0.720462	0.4487734	0	1

Initial modeling for both Employment and Educational Degree Attainment focused on a four-variable multilevel model. Level-one explanatory variables included: 2008 GI Bill time period (LMGIB, 0=Pre-2008 GI Bill including 2008 and 1=Post-2008 GI Bill); Gender (SEX, 0=Female, 1=Male); and Race (RAC1P, 0=All Non-White Only and 1=White Only). A time-series variable based on identity (observation) by ACS-PUMS annual records (YEAR, 2005-2015) was incorporated as a Level-two random-effects variable. YEAR was included as a random-effects variable to account for potential and unobservable differences in annual data collection by the ACS-PUMS and to mitigate potential biases and promote more conservative measures of significance from cross-sectional data (Baum, 2013). Modeling was conducted using ordinal family and logit link commands within the Mixed Effects GLM to group variables based on YEAR of data collection. Utilizing this method also provided a /cut point to show more specific outcomes based on model variables. Results from the Initial Employment Model (EM), displayed in Figure 11 indicate overall model significance with statistically significant impacts of both gender and race on employment of Post-9/11 veterans in the post-2008 GI Bill period. The overall model equation can be stated as:

$$ESR_{it} = (U_{0j}) + (\gamma_{10} + U_{1t})(LMGIB)_{it} + (\gamma_{20} + U_{2t})(RAC1P)_{it} + (\gamma_{30} + U_{3t})(SEX_{it}) + \varepsilon_{it}$$

The model as shown in Figure 11 was a statistically significant; however, the LMGIB (post-2008 GI Bill) was not statistically significant in explaining changes in employment. The outcome cut variable, "/cut1" indicates a statistically significant difference between employment outcomes from before and after the 2008 GI Bill with higher unemployment rates in the post-2008 GI Bill time period. While, the 2008 GI Bill was designed to increase employment directly, there was an assumed indirect effect that was not observed in this model.

Figure 11. Mixed-effects Generalized Linear Model, Initial Employment Model (n = 183,027)

meglm ESR LMGIB RAC1P SEX || YEAR:, family(ordinal) link(logit)

Mixed-effects GLM		Number of obs	= **183,027**
Family	**Ordinal**	Number of groups	= **11**
Link:	**Logit**	Obs per group:	
Group variable:	**YEAR**	min	= **11,063**
		avg	= **16,638.8**
		max	= **22,434**
Integration method:	**mvaghermite**	Integration pts.	= **7**
		Wald chi2(3)	= **455.14**
Log likelihood =	**-51184.821**	Prob > chi2	= **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB	**-0.1469089**	**0.1036992**	**-1.42**	**0.157**	**-0.3501556**	**0.0563377**
RAC1P*	**0.029822**	**0.0191601**	**19.22**	**0.000**	**0.330691**	**0.4057973**
SEX*	**0.0121765**	**0.0225834**	**6.75**	**0.000**	**0.10819**	**0.1967153**
/cut1	**-2.128201**	**0.0857502**	**-24.82**	**0.000**	**-2.296268**	**-1.960133**
YEAR:						
var(_cons)	**.0263838**	**0.0115761**			**0.0111652**	**0.062346**

LR test vs. linear model: chibar2(01) = **364.22** Prob >= chibar2 = **0.0000**

* Significant at $p \leq 0.001$

Assessing the impact of regional residency decision-making by Post-9/11 veterans to live in the Genus Region states, the ST (0=rest of nation, 1=Genus Region states) was added to the Initial Model (Figure 11) as a random effect variable in level-two, which moved the random effect YEAR variable to level-three. The goal of this model was to determine the correlation and impact of regional diffusion. As discussed in the previous discuss of Figure 11, this model was constructed using ordinal family and logit link commands in STATA as part of the Mixed-effect GLM analysis. Creating a three-level multi-level model with random effects for ST and YEAR in levels two and three offered a more regional-based outcome model. As can be observed in Figure 11, the Follow-up EM indicated a negative and statistically significant impact of the LMGIB variable. This finding represents a larger difference in employment outcomes within the Genus Region in the time period following the 2008 GI Bill than observed in the initial model. Both the RAC1P and SEX coefficients changed in the Follow-up model with higher employment outcomes experienced among white only and male veterans. The additional ST variable resulted in a statistically significant impact of LMGIB ($p \leq 0.05$), while not changing the relative significance results of the other variables, which were statistically significant impact on employment ($p \leq 0.001$). The Follow-up EM (Figure 5) equation is stated as:

$$ESR_{ijt} = (V_{00t} + U_{0jt}) + (\gamma_{100} + V_{10t} + U_{1jt})(LMGIB)_{ijt} + (\gamma_{200} + V_{20t} + U_{2jt})(RAC1P)_{ijt} + (\gamma_{300} + V_{30t} + U_{3jt})(SEX_{ijt}) + \varepsilon_{ijt}$$

Results presented in Figure 12 support the literature-noted observations that Post-9/11 veterans are moving to more rural communities and thus the Genus Region states as hypothesized in this study. These findings align with the Brookings Institute report on advanced manufacturing and other related industries, which have experienced higher growth and expansion rates in states included in the ST variable as Genus Region states.

Figure 12. Mixed-effects Generalized Linear Model, Follow-up Employment Model (n = 183,027)

meglm ESR LMGIB RAC1P SEX || ST: || YEAR:, family(ordinal) link(logit)

Mixed-effects GLM — Number of obs = **183,027**

Family: **Ordinal**
Link: **Logit**

Group Variable	Number of Groups	Observations per Group		
		Minimum	Average	Maximum
ST	**2**	**23,242**	**91,513.5**	**159,785**
YEAR	**22**	**1,402**	**8,319.4**	**19,611**

Integration method: **mvaghermite** — Integration pts. = **7**

Wald chi2(4) = **440.51**

Log likelihood = **-51174.164** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB*	**-0.178181**	**0.0785935**	**-2.27**	**0.023**	**-0.3322215**	**-0.0241406**
RAC1P***	**0.3607408**	**0.0192059**	**18.78**	**0.000**	**0.3230979**	**0.3983837**
SEX***	**0.1524755**	**0.0225881**	**6.75**	**0.000**	**0.1082036**	**0.1967474**
/cut1***	**-2.217119**	**0.0835686**	**-26.53**	**0.000**	**-2.380911**	**-2.053328**
ST						
var(_cons)	**0.0048838**	**0.0077665**			**0.0002163**	**0.1102516**
ST>YEAR						
var(_cons)	**0.0267712**	**0.0094403**			**0.0134125**	**0.0534349**

LR test vs. linear model: chibar2(01) = **385.54** — Prob >= chibar2 = **0.0000**

* Significant at $p \leq 0.05$

*** Significant at $p \leq 0.001$

The 2008 GI Bill was designed to increase Post-9/11 veteran access and opportunities to higher education degree attainment following military service. While, the available benefits are determined by a combination of service-related variables (Collins, et al., 2014) and eligibility is restricted to veterans with Honorable or Medical discharges (VA-P911, 2016) changes in Post-9/11 veteran degree attainment rates are expected beginning as early as 2009 with annual increases in subsequent years. Similar to the model designs for employment, there were two models developed to measure educational outcomes following the passage of the 2008 GI Bill. The Initial Educational Degree Attainment (EDA) Model incorporates LMGIB, SEX, and RAC1P as level-one explanatory variables with YEAR specified as a level-two random-effects variable. This model was again constructed using the ordinal family and logit link as modeling criteria in the Mixed-effects GLM. While LMGIB (post-2008 GI Bill) was not statistically significant in the EM, it was anticipated to be more of a main-effect explanatory variable in the education models. The Initial EDA Model equation can be stated as:

$$SCHL_{it} = (U_{0j}) + (\gamma_{10} + U_{1t})(LMGIB)_{it} + (\gamma_{20} + U_{2t})(RAC1P)_{it} + (\gamma_{30} + U_{3t})(SEX_{it}) + \varepsilon_{it}$$

Results from the Initial EDA model as shown in Figure 13 support the assumptions and hypotheses of this study. The overall model, all explanatory variables, and both "/cut1" (negative) and "/cut3" outcomes were statistically significant ($p \leq 0.001$) with "/cut2" significant at $p \leq 0.01$. As expected, LMGIB (post-2008 GI Bill) was a statistically significant and positively correlated explanatory variable. One of the interesting findings in the explanatory variables was the negative correlation of SEX (Male) with EDA among Post-9/11 veterans as reflected by the SEX coefficient of -0.5112862. This finding suggests female veterans, who have increased in numbers over the past decade or two as the U.S. Military continues to diversify in terms of gender and racial demographics.

Figure 13. Mixed-effects Generalized Linear Model, Initial Educational Degree Attainment Model (n = 183,027)

meglm SCHL LMGIB RAC1P SEX || YEAR:, family(ordinal) link(logit)

Mixed-effects GLM				Number of obs	=	**183,027**
Family	**Ordinal**			Number of groups	=	**11**
Link:	**Logit**			Obs per group:		
Group variable:	**YEAR**			min	=	**11,063**
				avg	=	**16,638.8**
				max	=	**22,434**
Integration method:	**mvaghermite**			Integration pts.	=	**7**
				Wald chi2(3)	=	**1945.07**
Log likelihood =	**-240959.58**			Prob > chi2	=	**0.0000**

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB***	**-0.248119**	**0.0504474**	**4.92**	**0.000**	**0.1492369**	**0.3469869**
RAC1P***	**0.1039541**	**0.0101385**	**10.25**	**0.000**	**0.0840829**	**0.1238253**
SEX***	**-0.5111113**	**0.0117476**	**-43.51**	**0.000**	**-0.5341361**	**-0.4880864**
/cut1***	**-1.434328**	**0.0422311**	**-33.96**	**0.000**	**-1.517099**	**-1.351556**
/cut2**	**0.1095923**	**0.04220855**	**2.60**	**0.009**	**0.0271062**	**0.1920784**
/cut3***	**0.6605745**	**0.042118**	**15.68**	**0.000**	**0.5780248**	**0.7431242**
YEAR:						
var(_cons)	**.0062475**	**0.0027439**			**0.0026416**	**0.0147759**

LR test vs. linear model: chibar2(01) = **337.67** Prob >= chibar2 = **0.0000**

** Significant at $p \leq 0.01$

*** Significant at $p \leq 0.001$

As conducted in the EMs, the Follow-up EDA Model added the ST variable (0=rest of nation, 1=Genus states) to determine if regional diffusion has additional impacts on educational outcomes as a random effects variable in level-two Initial descriptive analyses of this data that found greater than 12% of Post-9/11 veterans living in the Genus Region states as compared to closer to 10% of the non-military civilians and Pre-9/11 veterans. Utilizing the same approach as the EM Follow-up Model, the EDA Follow-up Model was a three-level model with ST and YEAR as random effects in levels two and three. Model parameters were defined as ordinal family and logit link to group variables for comparisons based on Genus Region residence and YEAR of data collection. Adding the ST variable to the Follow-up EDA Model yields the following equation:

$$SCHL_{ijt} = (V_{00t} + U_{0jt}) + (\gamma_{100} + V_{10t} + U_{1jt})(LMGIB)_{ijt} + (\gamma_{200} + V_{20t} + U_{2jt})(RAC1P)_{ijt} + (\gamma_{300} + V_{30t} + U_{3jt})(SEX_{ijt}) + \varepsilon_{ijt}$$

As observed in the Follow-up EM, the ST (Genus Region states) variable did not change the overall model significance as both models were significant at $p \leq 0.001$. Both the LMGIB and RAC1P coefficients were minimally decreased, while the SEX coefficient increased its negative correlation indicating women veterans in Genus Region states were accounting for even higher rates of degree attainment. The "/cut1" and "cut/3" outcomes were again significant at $p \leq 0.001$; however, the "/cut2" outcome was not statistically significant, which indicates veterans in Genus states are less likely to attain an Associate's degree as compared to the rest of the nation or the Initial EDA model results. Revisiting the finding based on race, it is worth noting the increasingly diversity within the U.S. Military, specifically in the Post-9/11 Era. Comparatively, the U.S. Military was historically near or greater than 90% whites in the Pre-9/11 eras, while the Post-9/11 demographics are more aligned with non-military civilian demographic diversity at near or fewer than 70% whites. Both of these findings were observed in descriptive analyses of the study dataset.

Figure 14. Mixed-effects Generalized Linear Model, Follow-up Educational Degree Attainment Model (n = 183,027)

meglm ESR LMGIB RAC1P SEX || ST: || YEAR:, family(ordinal) link(logit)

Mixed-effects GLM — Number of obs = **183,027**

Family: **Ordinal**
Link: **Logit**

Group Variable	Number of Groups	Observations per Group		
		Minimum	Average	Maximum
ST	**2**	**23,242**	**91,513.5**	**159,785**
YEAR	**22**	**1,402**	**8,319.4**	**19,611**

Integration method: **mvaghermite** — Integration pts. = **7**

Wald chi2(4) = **1945.95**

Log likelihood = **-240943.46** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB***	**0.2153801**	**0.0407281**	**5.29**	**0.000**	**0.1355145**	**0.2952057**
RAC1P***	**0.1004319**	**0.010161**	**9.88**	**0.000**	**0.0805168**	**0.120347**
SEX***	**-.5112862**	**0.0117486**	**-43.52**	**0.000**	**-0.5343131**	**-0.4882593**
/cut1***	**-1.48988**	**0.0425957**	**-34.98**	**0.000**	**-1.573366**	**-1.406394**
/cut2	**0.0544868**	**0.0424359**	**1.28**	**0.199**	**-0.0286861**	**0.1376597**
/cut3***	**0.6055146**	**0.0424655**	**14.26**	**0.000**	**0.5222837**	**0.6887456**
ST						
var(_cons)	**0.0011618**	**0.00109401**			**0.000044**	**0.0306579**
ST>YEAR						
var(_cons)	**0.0074776**	**0.0026456**			**0.0037377**	**0.0149596**

LR test vs. linear model: chibar2(01) = **369.91** — Prob >= chibar2 = **0.0000**

*** Significant at $p \leq 0.001$

Discussion

Revisiting the hypotheses, the 2008 GI Bill was found to have an impact in the EDA (EDA) Models, while having a negatively correlated and statistically insignificant impact on the EMs. Thus, the EDA null hypothesis was rejected and the EM null hypothesis was accepted. Continuing with hypotheses, the race and gender hypotheses in both models, EM and EDA Hypotheses 2 and 3, were accepted. Results, specifically related to statistical significance, were consistent in both employment and education models across the study. Finally, Genus Region state residency was found in both the EM and EDA follow-up models to correlate with degree attainment and employment among Post-9/11 veterans, but he correlation in the EM model was negative. As such, the EDA Hypothesis 4 was accepted and the EM Hypothesis 4 was rejected based on modeling outcomes. Hypotheses for both models are revisited in Figures 15 and 16.

Figure 15. Results from Post-9/11 Educational Degree Attainment Model Hypotheses

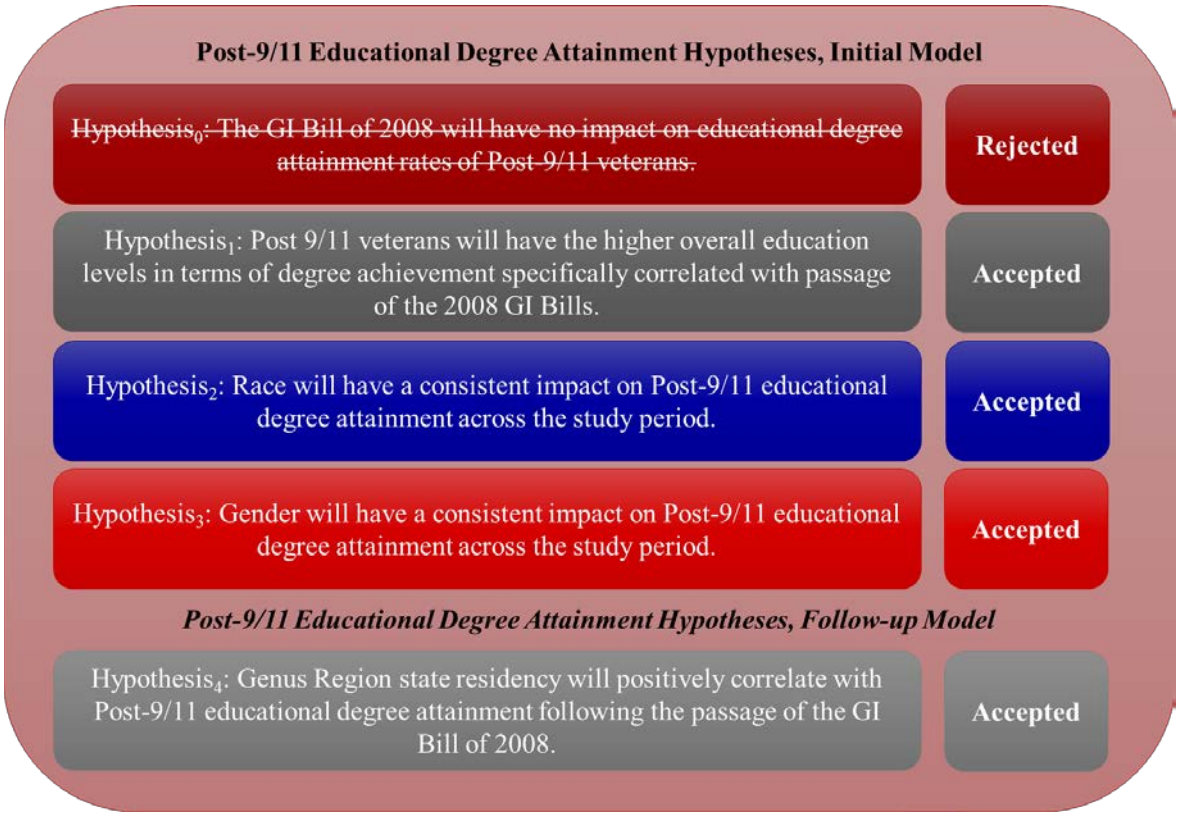
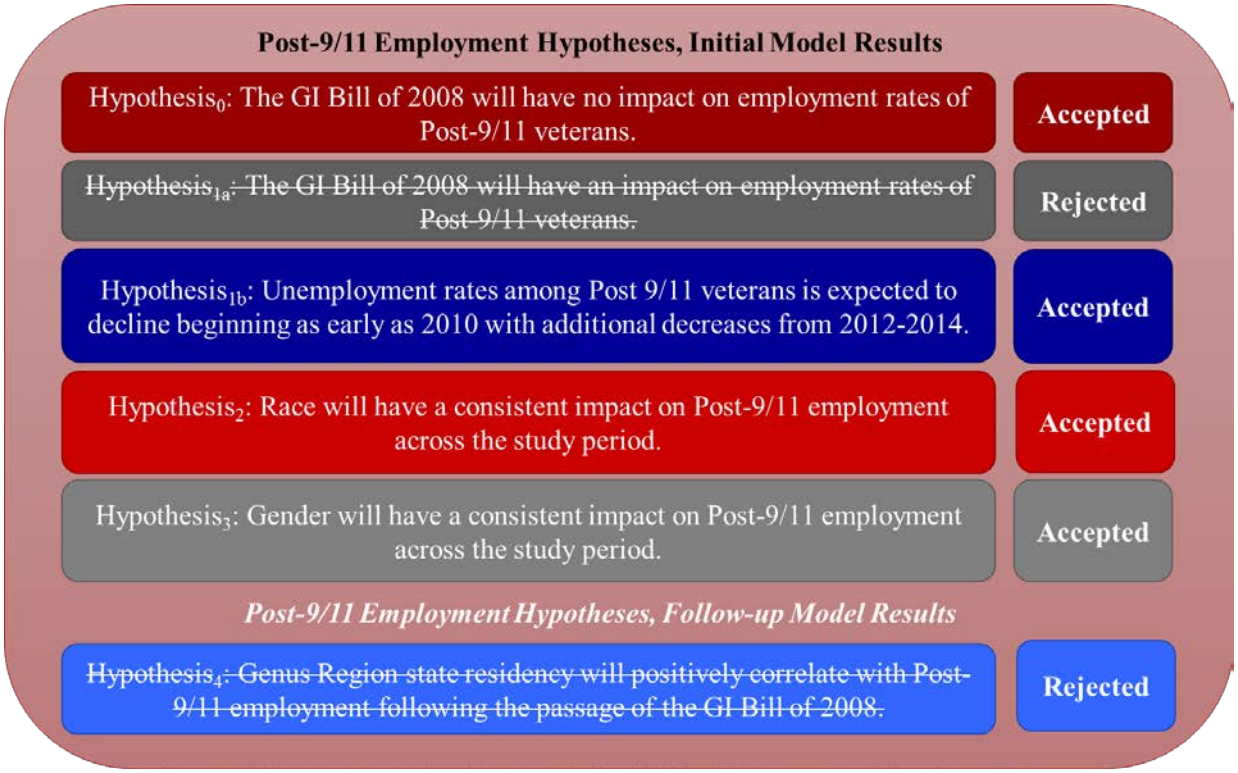
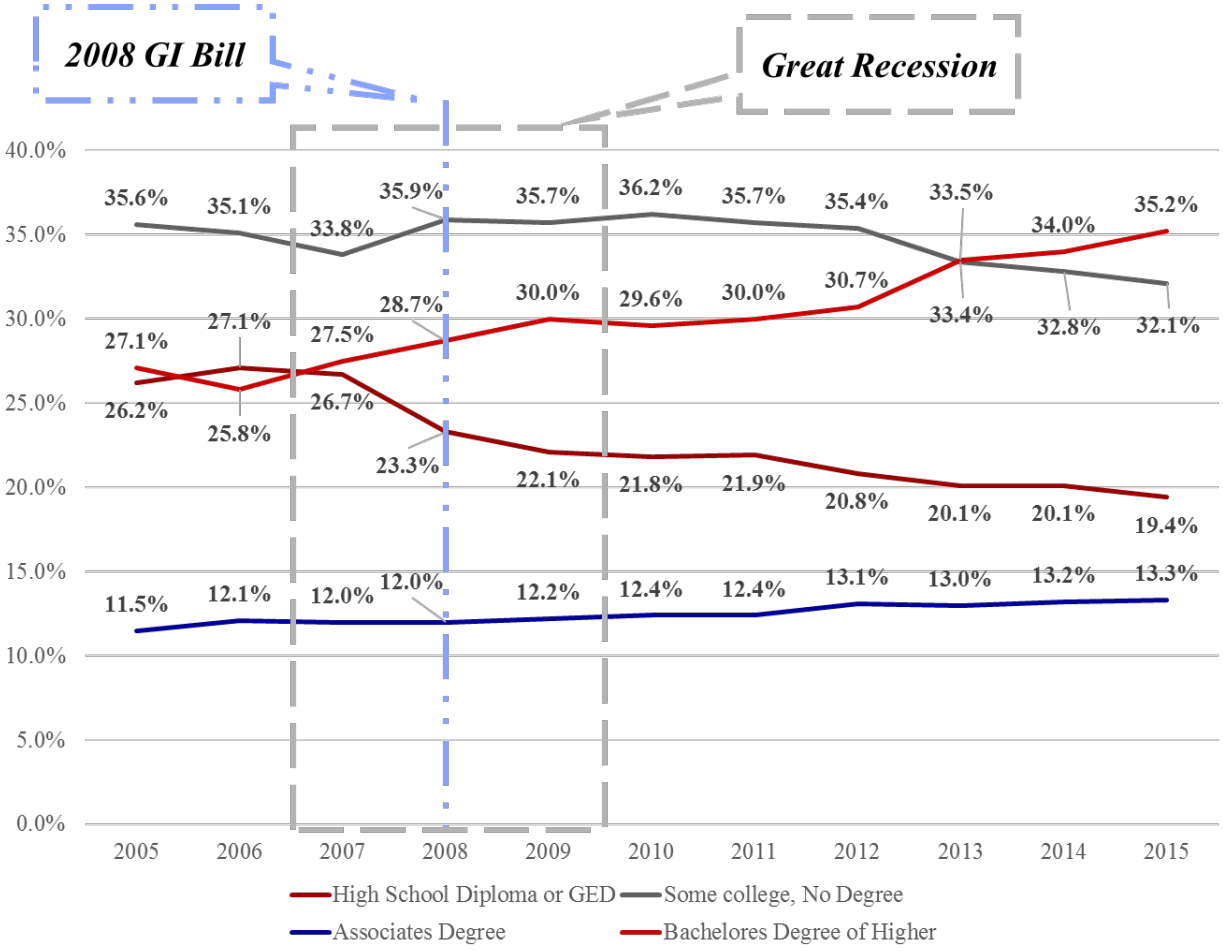


Figure 16. Results from Post-911 Employment Model Hypotheses



Although the 2008 GI Bill did not result in the hypothesized impact on Employment outcomes in this study in both EM models, there is reason to believe future studies using additional years of data may provide a different result. Considering the results in Table 4, the most often report highest level of education for Post-9/11 veterans was Bachelor's Degree of higher starting in 2013, which correlates with the 2008 GI Bill and supports the results of the EDA Model. From a study time-period perspective, 26.2% of Post-9/11 veterans in 2005 reported a highest level of education of a High School Diploma or GED as compared to 19.4% in 2015. Similarly, 35.6% of Post-9/11 veterans in 2005 reported at least some college coursework without a degree, which in 2015 dropped to 32.1%. Increases in Associates and Bachelors or higher degrees account for these changes, which increased from 11.5% to 13.3% and 26.6% to 35.2% from 2005 to 2015 respectively as shown in Figure 17.

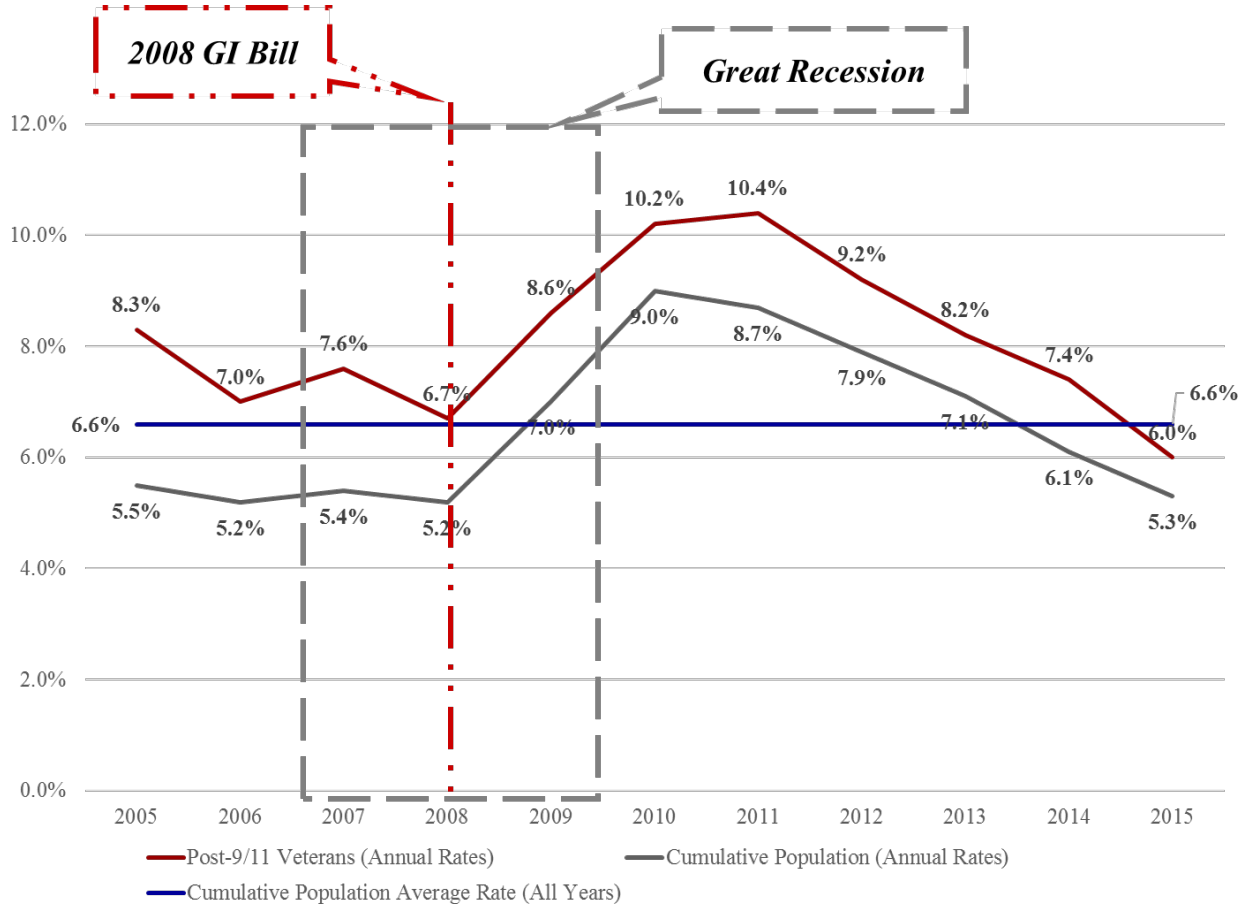
Figure 17. 2005-2015 Educational Degree Attainment Rates, Post-9/11 Veterans



Considering that most Bachelor's degrees take around four years to complete, 2013 would be the first year in which substantial and observable change would be anticipated. Additionally, GI Bill benefits enable veterans to focus on school by providing both tuition and cost of attendance funding as well as cost of living support. Any increases in employment as a result of education would not be observable until 2013 or 2014 at the earliest based on the Bachelor's degree example. Further complicating the EM for this study was the 2007-2009 Great Recession (BLS, 2012), which had a longer observed impact on Post-9/11 employment rates as displayed in Table 3. In addition, Post-9/11 veterans were found to be less employed during the 2005-2015 study time-period; however, while the EM Model did not show an impact Table 3 presented a shrinking

employment gap for Post-9/11 veterans. Beginning in 2005, the gap between Post-9/11 veterans and the overall unemployment rate was 2.8%, which fell to a 0.6% in 2015 as shown in Figure 18. These results are thought, in part, to be a result of the Great Recession in terms of both a lag-effect and the peak unemployment rate among Post-9/11 Veterans at 10.4% in 2011. Further investigation of this finding and continued modeling of employment outcomes using EOA is anticipated to yield results as time progresses and different methodological approaches are taken to include a Cox Hazard Model or other survival-based methods.

Figure 18. 2005 to 2015 Unemployment Comparisons, Post-9/11 Veterans and Cumulative Population



From both the EOA results and descriptive data analysis, there appears to be a direct impact on changes in Post-9/11 veterans' educational degree attainment as a result of the 2008 GI Bill.

Interestingly, both the initial and follow-up EDA Models indicated a significant negative correlation with gender meaning more women veterans are obtaining post-secondary degrees. Based on changes to the diversity of U.S. Military and as observed in the 2005-2015 veteran data, the percent of women veterans has increased substantially over the past few decades. In a report from the Pew Research Center, Social and Demographic Trends, enlisted female service members are up to 14% as compared to 2% in 1973, while the number of female officers has increased from 4% in 1973 to 16% (Patten and Parker, 2012). Additionally, the U.S. Military is continually adding education programs to certain fields such as medical technology and laboratory sciences in addition to others, in which women service members are commonly assigned. Patten and Parker (2012) found 30% of women service members work in administrative capacities, compared with 12% of men and similar distributions in medical positions with 15% of females as compared to 6% of male service members (p. 8-9). Many of these assignments offer the opportunity to obtain post-secondary education and degrees while serving on active duty. Changes to educational benefits programs in 2008 increased the potential for these types of educational programs, which in turn increased the capacity for female service members and veterans to attend post-secondary courses and achieve degrees.

Observed results from this first EOA are expected to increase in magnitude and significance as time progresses and more data is available post-2008. Indirect impacts of the 2008 GI Bill are presumed to be impacting the post-9/11 unemployment rate as of 2013 or 2014, even though EOA modeling results were not significant in this study. The developed EOA models for both employment and education offer an opportunity to conduct on-going and recurrent analysis of observable outcomes following the 2008 GI Bill. Additional policy and program changes such as the 2010 GI Bill, 2012 Mandatory TAP attendance, and 2013 overhaul to the TAP training can

be studied individually or in a combined EOA model with weighting procedures as applied in EHA studies.

Conclusion

The main limitation of the EOA results presented for Post-9/11 veterans is the capacity to compare with other population sub-groups such as non-military civilians or Pre-9/11 veterans. From the observed results, there is reason to believe a Cox Hazard Model would provide a comparative analysis of potential outcome differences between Post-9/11 veterans and either Pre-9/11 veterans or non-military civilians or both. One of the strengths of the EOA methodological design is its alignment with EHA techniques and approaches, which can be applied to EOA studies based on available data, research questions, and hypotheses. From the modeling results and discussion of observed educational degree attainment and employment outcomes, the 2008 GI Bill has created opportunities and increased access for Post-9/11 veterans to higher education. While increases in degree attainment among Post-9/11 veterans were observed, the impact on employment was not based on presented models. Assessing the modeling results in addition to the various descriptive analyses conducted, there is a likelihood of observing the employment changes over the next several years.

Future studies should continue to model educational and employment outcomes as more data becomes available, which are expected to yield additional findings. Compared to longitudinal data, which is limited by the study population and confined to a certain number of observable changes, cross-sectional data deployed in EOA offers an ongoing opportunity to study policy or program outcomes over an extended time-period. Future studies could also add to the explanatory variables, extend into financial, housing, or health related outcomes, and include additional policy changes to modeling. Based on this initial beta-test of the Event Outcome Analysis Framework

developed by Gardner (2016b), the method is applicable as a new means to measure policy or program outcomes.

Chapter 5: Conclusion

Beginning with a single question about the impact of policy actions on veterans following active duty service, this dissertation deployed a three-article design to assess the existing literature and available data, determine the best methodological approach to answer research questions and test hypotheses, and finally measured the impact of the 2008 GI Bill on veteran outcomes in education and employment. During the data assessment, a common theme among available datasets was discovered, which altered the initial design of the methodological review and overall approach. The vast majority of available data consisted of cross-sectional collection, which limited the application of event-based modeling. From a literature perspective, there have been numerous studies over the past nearly seven decades on veteran outcomes in their lives after service. Using the CFED A&O Scorecard as a starting point for national outcomes in education, employment, healthcare, housing, and finances this study sought to measure changes in employment and education following the 2008 GI Bill.

Initially, the selected methodological approach was some form of Event History Analysis, which historically has relied on longitudinal data for modeling. However, there were examples of cross-sectional application of Event History Analysis, which were reviewed for applicability to the research questions formulated during the data and literature review. Following a substantive review of cross-sectional event histories, it was determined the study design incorporated into this dissertation required a modified approach, which was developed and coined Event Outcome Analysis. This new methodological approach was based on Event History Analysis with additional data integrity assessments to ensure cross-sectional data is robust and reliable for use in an event-based model as well as a structured modeling framework.

Finally, a veteran-specific study was designed using existing literautr4e and available data as identified in the first article to test the methodology developed in the second article. This initial Event Outcome Analysis sought to answer the original research question about observable outcome differences following policy actions. Designed to measure educational degree attainment and employment outcomes as a function of the 2008 GI Bill, the study used 11-years of ACS-PUMS data from 2005-2015 to determine policy impacts. Results from the Mixed-effects Generalized Linear Modeling were statistically significant for educational degree attainment, while employment outcomes were not significant. Based on observed outcomes in annual descriptive statistics, the Great Recession had a longer lag-effect on Post-9/11 veterans, which may have impacted the results of the modeling. With additional annual data over the next several years, a statistically significant 2008 GI Bill impact on employment outcomes is anticipated.

From a limitations perspective, this study was focused on a small-subset of a very specific population and there is a need and opportunity for future studies to expand on veteran research as well as the applicability of Event Outcome Analysis. The method application study used two modeling techniques, which were adequate and appropriated based on available data and hypotheses. However, the study limited the testing of Event Outcome Analysis in the process. Future methodological applications should consider studies to test viability with Cox Hazard Models, Poisson Regression Models and other survival-based methodological techniques. Additionally, data used for this study was restricted to nationally available cross-sectional datasets and future studies should consider using primary data collected via surveys or some combination of existing national and primary collected data.

From a holistic review, this dissertation assessed existing literature and available data, identified a gap in existing methodologies and proposed a new approach, and finally tested the

developed methodology to measure veteran outcomes. Beginning with a simple question about policy impacts experienced by veterans in their lives after service led to a series of interesting findings, new developments, and in the end three individual articles that independently and collectively add substantive contributions to the study of public policy.

Appendix A: Descriptive Analysis Tables

Table 8. Frequency by Veteran Status

VPS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-military civilian	13103905	92.1	92.1	92.1
	Pre-9/11 Veterans	936535	6.6	6.6	98.7
	Post-9/11 Veterans	183027	1.3	1.3	100.0
	Total	14223467	100.0	100.0	

Table 9. Frequency by Gender

SEX					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	7032415	49.4	49.4	49.4
	Male	7191052	50.6	50.6	100.0
	Total	14223467	100.0	100.0	

Table 10. Frequency by Race

RAC1P					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	All non-white alone	2818156	19.8	19.8	19.8
	White alone	11405311	80.2	80.2	100.0
	Total	14223467	100.0	100.0	

Table 11. Frequency by Genus Region

ST					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rest of Nation	12709429	89.4	89.4	89.4
	Rural States	1514038	10.6	10.6	100.0
	Total	14223467	100.0	100.0	

Table 12. Frequency by Highest Level of Educational Degree Attainment

SCHL					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School Diploma or GED	4122398	29.0	29.0	29.0
	Some college, No degree	3687239	25.9	25.9	54.9
	Associates Degree	1387808	9.8	9.8	64.7
	Bachelors Degree or Higher	5026022	35.3	35.3	100.0
	Total	14223467	100.0	100.0	

Table 13. Frequency by Employment Status

ESR					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unemployed	938313	6.6	6.6	6.6
	Employed	13285154	93.4	93.4	100.0
	Total	14223467	100.0	100.0	

Table 14. Frequency by 2008 GI Bill Time-series Event Windows

LMGIB					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pre 2008 GI Bill (inluding 2008)	5017445	35.3	35.3	35.3
	Post 2008 GI Bill	9206022	64.7	64.7	100.0
	Total	14223467	100.0	100.0	

Table 15. Frequency by Year of Data Collection

YEAR					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2005	1219006	8.6	8.6	8.6
	2006	1246032	8.8	8.8	17.3
	2007	1256716	8.8	8.8	26.2
	2008	1295691	9.1	9.1	35.3
	2009	1316214	9.3	9.3	44.5
	2010	1316199	9.3	9.3	53.8
	2011	1296502	9.1	9.1	62.9
	2012	1305757	9.2	9.2	72.1
	2013	1323272	9.3	9.3	81.4
	2014	1320060	9.3	9.3	90.7
	2015	1328018	9.3	9.3	100.0
	Total	14223467	100.0	100.0	

Appendix B: Cross-tabulation Analysis Tables

Table 16. Employment Status Cross-tabulation Summary

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
ESR * LMGIB * YEAR	183027	100.0%	0	0.0%	183027	100.0%
ESR * SEX * YEAR	183027	100.0%	0	0.0%	183027	100.0%
ESR * RAC1P * YEAR	183027	100.0%	0	0.0%	183027	100.0%
ESR * ST * YEAR	183027	100.0%	0	0.0%	183027	100.0%

Table 17. Cross-tabulation for Employment Status, Gender, and Year (2005-2008)

ESR * SEX * YEAR Crosstab 2005-2008						
YEAR				SEX		Total
				Female	Male	
2005	ESR	Unemployed	Count	196	726	922
			% within ESR	21.3%	78.7%	100.0%
			% within SEX	11.7%	7.7%	8.3%
		Employed	Count	1481	8660	10141
			% within ESR	14.6%	85.4%	100.0%
			% within SEX	88.3%	92.3%	91.7%
	Total		Count	1677	9386	11063
			% within ESR	15.2%	84.8%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2006	ESR	Unemployed	Count	185	714	899
			% within ESR	20.6%	79.4%	100.0%
			% within SEX	9.4%	6.6%	7.0%
		Employed	Count	1792	10176	11968
			% within ESR	15.0%	85.0%	100.0%
			% within SEX	90.6%	93.4%	93.0%
	Total		Count	1977	10890	12867
			% within ESR	15.4%	84.6%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2007	ESR	Unemployed	Count	210	795	1005
			% within ESR	20.9%	79.1%	100.0%
			% within SEX	10.0%	7.1%	7.6%
		Employed	Count	1894	10388	12282
			% within ESR	15.4%	84.6%	100.0%
			% within SEX	90.0%	92.9%	92.4%
	Total		Count	2104	11183	13287
			% within ESR	15.8%	84.2%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2008	ESR	Unemployed	Count	157	784	941
			% within ESR	16.7%	83.3%	100.0%
			% within SEX	7.2%	6.7%	6.7%
		Employed	Count	2038	10967	13005
			% within ESR	15.7%	84.3%	100.0%
			% within SEX	92.8%	93.3%	93.3%
	Total		Count	2195	11751	13946
			% within ESR	15.7%	84.3%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 18. Cross-tabulation for Employment Status, Gender, and Year (2009-2012)

ESR * SEX * YEAR Crosstab 2009-2012						
YEAR				SEX		Total
				Female	Male	
2009	ESR	Unemployed	Count	190	1020	1210
			% within ESR	15.7%	84.3%	100.0%
			% within SEX	8.7%	8.5%	8.6%
		Employed	Count	2005	10916	12921
			% within ESR	15.5%	84.5%	100.0%
			% within SEX	91.3%	91.5%	91.4%
	Total		Count	2195	11936	14131
			% within ESR	15.5%	84.5%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2010	ESR	Unemployed	Count	287	1445	1732
			% within ESR	16.6%	83.4%	100.0%
			% within SEX	10.5%	10.1%	10.2%
		Employed	Count	2456	12832	15288
			% within ESR	16.1%	83.9%	100.0%
			% within SEX	89.5%	89.9%	89.8%
	Total		Count	2743	14277	17020
			% within ESR	16.1%	83.9%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2011	ESR	Unemployed	Count	338	1502	1840
			% within ESR	18.4%	81.6%	100.0%
			% within SEX	12.5%	10.1%	10.4%
		Employed	Count	2374	13401	15775
			% within ESR	15.0%	85.0%	100.0%
			% within SEX	87.5%	89.9%	89.6%
	Total		Count	2712	14903	17615
			% within ESR	15.4%	84.6%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2012	ESR	Unemployed	Count	340	1448	1788
			% within ESR	19.0%	81.0%	100.0%
			% within SEX	11.0%	8.8%	9.2%
		Employed	Count	2745	14924	17669
			% within ESR	15.5%	84.5%	100.0%
			% within SEX	89.0%	91.2%	90.8%
	Total		Count	3085	16372	19457
			% within ESR	15.9%	84.1%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 19. Cross-tabulation for Employment Status, Gender, and Year (2013-2015)

ESR * SEX * YEAR Crosstab 2013-2015						
YEAR				SEX		Total
				Female	Male	
2013	ESR	Unemployed	Count	280	1362	1642
			% within ESR	17.1%	82.9%	100.0%
			% within SEX	9.2%	8.0%	8.2%
		Employed	Count	2763	15602	18365
			% within ESR	15.0%	85.0%	100.0%
			% within SEX	90.8%	92.0%	91.8%
	Total		Count	3043	16964	20007
			% within ESR	15.2%	84.8%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2014	ESR	Unemployed	Count	276	1288	1564
			% within ESR	17.6%	82.4%	100.0%
			% within SEX	8.4%	7.2%	7.4%
		Employed	Count	2992	16644	19636
			% within ESR	15.2%	84.8%	100.0%
			% within SEX	91.6%	92.8%	92.6%
	Total		Count	3268	17932	21200
			% within ESR	15.4%	84.6%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2015	ESR	Unemployed	Count	232	1110	1342
			% within ESR	17.3%	82.7%	100.0%
			% within SEX	7.0%	5.8%	6.0%
		Employed	Count	3080	18012	21092
			% within ESR	14.6%	85.4%	100.0%
			% within SEX	93.0%	94.2%	94.0%
	Total		Count	3312	19122	22434
			% within ESR	14.8%	85.2%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 20. Cross-tabulation for Employment Status, Gender, and Year (Cumulative Summary)

ESR * SEX * YEAR Crosstab Cumulative Totals						
YEAR				SEX		Total
				Female	Male	
Total	ESR	Unemployed	Count	2691	12194	14885
			% within ESR	18.1%	81.9%	100.0%
			% within SEX	9.5%	7.9%	8.1%
		Employed	Count	25620	142522	168142
			% within ESR	15.2%	84.8%	100.0%
			% within SEX	90.5%	92.1%	91.9%
	Total		Count	28311	154716	183027
			% within ESR	15.5%	84.5%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 21. Cross-tabulation for Employment Status, Race, and Year (2005-2008)

ESR * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
2005	ESR	Unemployed	Count	266	656	922
			% within ESR	28.9%	71.1%	100.0%
			% within RAC1P	11.4%	7.5%	8.3%
		Employed	Count	2059	8082	10141
			% within ESR	20.3%	79.7%	100.0%
			% within RAC1P	88.6%	92.5%	91.7%
	Total		Count	2325	8738	11063
			% within ESR	21.0%	79.0%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2006	ESR	Unemployed	Count	271	628	899
			% within ESR	30.1%	69.9%	100.0%
			% within RAC1P	9.3%	6.3%	7.0%
		Employed	Count	2648	9320	11968
			% within ESR	22.1%	77.9%	100.0%
			% within RAC1P	90.7%	93.7%	93.0%
	Total		Count	2919	9948	12867
			% within ESR	22.7%	77.3%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2007	ESR	Unemployed	Count	299	706	1005
			% within ESR	29.8%	70.2%	100.0%
			% within RAC1P	9.5%	7.0%	7.6%
		Employed	Count	2845	9437	12282
			% within ESR	23.2%	76.8%	100.0%
			% within RAC1P	90.5%	93.0%	92.4%
	Total		Count	3144	10143	13287
			% within ESR	23.7%	76.3%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2008	ESR	Unemployed	Count	286	655	941
			% within ESR	30.4%	69.6%	100.0%
			% within RAC1P	9.0%	6.1%	6.7%
		Employed	Count	2899	10106	13005
			% within ESR	22.3%	77.7%	100.0%
			% within RAC1P	91.0%	93.9%	93.3%
	Total		Count	3185	10761	13946
			% within ESR	22.8%	77.2%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 22. Cross-tabulation for Employment Status, Race, and Year (2009-2012)

ESR * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
2009	ESR	Unemployed	Count	323	887	1210
			% within ESR	26.7%	73.3%	100.0%
			% within RAC1P	10.0%	8.1%	8.6%
		Employed	Count	2923	9998	12921
			% within ESR	22.6%	77.4%	100.0%
			% within RAC1P	90.0%	91.9%	91.4%
	Total		Count	3246	10885	14131
			% within ESR	23.0%	77.0%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2010	ESR	Unemployed	Count	461	1271	1732
			% within ESR	26.6%	73.4%	100.0%
			% within RAC1P	11.9%	9.7%	10.2%
		Employed	Count	3406	11882	15288
			% within ESR	22.3%	77.7%	100.0%
			% within RAC1P	88.1%	90.3%	89.8%
	Total		Count	3867	13153	17020
			% within ESR	22.7%	77.3%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2011	ESR	Unemployed	Count	566	1274	1840
			% within ESR	30.8%	69.2%	100.0%
			% within RAC1P	14.3%	9.3%	10.4%
		Employed	Count	3402	12373	15775
			% within ESR	21.6%	78.4%	100.0%
			% within RAC1P	85.7%	90.7%	89.6%
	Total		Count	3968	13647	17615
			% within ESR	22.5%	77.5%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2012	ESR	Unemployed	Count	529	1259	1788
			% within ESR	29.6%	70.4%	100.0%
			% within RAC1P	12.0%	8.4%	9.2%
		Employed	Count	3878	13791	17669
			% within ESR	21.9%	78.1%	100.0%
			% within RAC1P	88.0%	91.6%	90.8%
	Total		Count	4407	15050	19457
			% within ESR	22.6%	77.4%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 23. Cross-tabulation for Employment Status, Race, and Year (2013-2015)

ESR * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
2013	ESR	Unemployed	Count	459	1183	1642
			% within ESR	28.0%	72.0%	100.0%
			% within RAC1P	10.5%	7.6%	8.2%
		Employed	Count	3901	14464	18365
			% within ESR	21.2%	78.8%	100.0%
			% within RAC1P	89.5%	92.4%	91.8%
	Total		Count	4360	15647	20007
			% within ESR	21.8%	78.2%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2014	ESR	Unemployed	Count	445	1119	1564
			% within ESR	28.5%	71.5%	100.0%
			% within RAC1P	9.5%	6.8%	7.4%
		Employed	Count	4253	15383	19636
			% within ESR	21.7%	78.3%	100.0%
			% within RAC1P	90.5%	93.2%	92.6%
	Total		Count	4698	16502	21200
			% within ESR	22.2%	77.8%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2015	ESR	Unemployed	Count	427	915	1342
			% within ESR	31.8%	68.2%	100.0%
			% within RAC1P	8.6%	5.2%	6.0%
		Employed	Count	4561	16531	21092
			% within ESR	21.6%	78.4%	100.0%
			% within RAC1P	91.4%	94.8%	94.0%
	Total		Count	4988	17446	22434
			% within ESR	22.2%	77.8%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 24. Cross-tabulation for Employment Status, Race, and Year (Cumulative Summary)

ESR * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
Total	ESR	Unemployed	Count	4332	10553	14885
			% within ESR	29.1%	70.9%	100.0%
			% within RAC1P	10.5%	7.4%	8.1%
		Employed	Count	36775	131367	168142
			% within ESR	21.9%	78.1%	100.0%
			% within RAC1P	89.5%	92.6%	91.9%
	Total		Count	41107	141920	183027
			% within ESR	22.5%	77.5%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 25. Cross-tabulation for Employment Status, 2008 GI Bill, and Year (2005-2008)

ESR * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (inluding 2008)	Post 2008 GI Bill	
2005	ESR	Unemployed	Count	922		922
			% within ESR	100.0%		100.0%
			% within LMGIB	8.3%		8.3%
		Employed	Count	10141		10141
			% within ESR	100.0%		100.0%
			% within LMGIB	91.7%		91.7%
	Total		Count	11063		11063
			% within ESR	100.0%		100.0%
			% within LMGIB	100.0%		100.0%
2006	ESR	Unemployed	Count	899		899
			% within ESR	100.0%		100.0%
			% within LMGIB	7.0%		7.0%
		Employed	Count	11968		11968
			% within ESR	100.0%		100.0%
			% within LMGIB	93.0%		93.0%
	Total		Count	12867		12867
			% within ESR	100.0%		100.0%
			% within LMGIB	100.0%		100.0%
2007	ESR	Unemployed	Count	1005		1005
			% within ESR	100.0%		100.0%
			% within LMGIB	7.6%		7.6%
		Employed	Count	12282		12282
			% within ESR	100.0%		100.0%
			% within LMGIB	92.4%		92.4%
	Total		Count	13287		13287
			% within ESR	100.0%		100.0%
			% within LMGIB	100.0%		100.0%
2008	ESR	Unemployed	Count	941		941
			% within ESR	100.0%		100.0%
			% within LMGIB	6.7%		6.7%
		Employed	Count	13005		13005
			% within ESR	100.0%		100.0%
			% within LMGIB	93.3%		93.3%
	Total		Count	13946		13946
			% within ESR	100.0%		100.0%
			% within LMGIB	100.0%		100.0%

Table 26. Cross-tabulation for Employment Status, 2008 GI Bill, and Year (2009-2012)

ESR * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (inluding 2008)	Post 2008 GI Bill	
2009	ESR	Unemployed	Count		1210	1210
			% within ESR		100.0%	100.0%
			% within LMGIB		8.6%	8.6%
		Employed	Count		12921	12921
			% within ESR		100.0%	100.0%
			% within LMGIB		91.4%	91.4%
	Total		Count		14131	14131
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2010	ESR	Unemployed	Count		1732	1732
			% within ESR		100.0%	100.0%
			% within LMGIB		10.2%	10.2%
		Employed	Count		15288	15288
			% within ESR		100.0%	100.0%
			% within LMGIB		89.8%	89.8%
	Total		Count		17020	17020
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2011	ESR	Unemployed	Count		1840	1840
			% within ESR		100.0%	100.0%
			% within LMGIB		10.4%	10.4%
		Employed	Count		15775	15775
			% within ESR		100.0%	100.0%
			% within LMGIB		89.6%	89.6%
	Total		Count		17615	17615
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2012	ESR	Unemployed	Count		1788	1788
			% within ESR		100.0%	100.0%
			% within LMGIB		9.2%	9.2%
		Employed	Count		17669	17669
			% within ESR		100.0%	100.0%
			% within LMGIB		90.8%	90.8%
	Total		Count		19457	19457
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%

Table 27. Cross-tabulation for Employment Status, 2008 GI Bill, and Year (2013-2015)

ESR * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (inluding 2008)	Post 2008 GI Bill	
2013	ESR	Unemployed	Count		1642	1642
			% within ESR		100.0%	100.0%
			% within LMGIB		8.2%	8.2%
		Employed	Count		18365	18365
			% within ESR		100.0%	100.0%
			% within LMGIB		91.8%	91.8%
	Total		Count		20007	20007
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2014	ESR	Unemployed	Count		1564	1564
			% within ESR		100.0%	100.0%
			% within LMGIB		7.4%	7.4%
		Employed	Count		19636	19636
			% within ESR		100.0%	100.0%
			% within LMGIB		92.6%	92.6%
	Total		Count		21200	21200
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2015	ESR	Unemployed	Count		1342	1342
			% within ESR		100.0%	100.0%
			% within LMGIB		6.0%	6.0%
		Employed	Count		21092	21092
			% within ESR		100.0%	100.0%
			% within LMGIB		94.0%	94.0%
	Total		Count		22434	22434
			% within ESR		100.0%	100.0%
			% within LMGIB		100.0%	100.0%

Table 28. Cross-tabulation for Employment Status, 2008 GI Bill, and Year (Cumulative Summary)

ESR * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (inluding 2008)	Post 2008 GI Bill	
Total	ESR	Unemployed	Count	3767	11118	14885
			% within ESR	25.3%	74.7%	100.0%
			% within LMGIB	7.4%	8.4%	8.1%
		Employed	Count	47396	120746	168142
			% within ESR	28.2%	71.8%	100.0%
			% within LMGIB	92.6%	91.6%	91.9%
	Total		Count	51163	131864	183027
			% within ESR	28.0%	72.0%	100.0%
			% within LMGIB	100.0%	100.0%	100.0%

Table 29. Cross-tabulation for Employment Status, Genus Regions, and Year (2005-2008)

ESR * ST * YEAR Crosstab (2005-2008)						
YEAR				ST		Total
				Rest of Nation	Rural States	
2005	ESR	Unemployed	Count	761	161	922
			% within ESR	82.5%	17.5%	100.0%
			% within ST	8.7%	6.9%	8.3%
		Employed	Count	7954	2187	10141
			% within ESR	78.4%	21.6%	100.0%
			% within ST	91.3%	93.1%	91.7%
		Total	Count	8715	2348	11063
			% within ESR	78.8%	21.2%	100.0%
			% within ST	100.0%	100.0%	100.0%
2006	ESR	Unemployed	Count	800	99	899
			% within ESR	89.0%	11.0%	100.0%
			% within ST	7.2%	5.8%	7.0%
		Employed	Count	10355	1613	11968
			% within ESR	86.5%	13.5%	100.0%
			% within ST	92.8%	94.2%	93.0%
		Total	Count	11155	1712	12867
			% within ESR	86.7%	13.3%	100.0%
			% within ST	100.0%	100.0%	100.0%
2007	ESR	Unemployed	Count	922	83	1005
			% within ESR	91.7%	8.3%	100.0%
			% within ST	7.8%	5.8%	7.6%
		Employed	Count	10941	1341	12282
			% within ESR	89.1%	10.9%	100.0%
			% within ST	92.2%	94.2%	92.4%
		Total	Count	11863	1424	13287
			% within ESR	89.3%	10.7%	100.0%
			% within ST	100.0%	100.0%	100.0%
2008	ESR	Unemployed	Count	868	73	941
			% within ESR	92.2%	7.8%	100.0%
			% within ST	6.9%	5.2%	6.7%
		Employed	Count	11667	1338	13005
			% within ESR	89.7%	10.3%	100.0%
			% within ST	93.1%	94.8%	93.3%
		Total	Count	12535	1411	13946
			% within ESR	89.9%	10.1%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 30. Cross-tabulation for Employment Status, Genus Regions, and Year (2009-2012)

ESR * ST * YEAR Crosstab (2009-2012)						
YEAR				ST		Total
				Rest of Nation	Rural States	
2009	ESR	Unemployed	Count	1095	115	1210
			% within ESR	90.5%	9.5%	100.0%
			% within ST	8.6%	8.2%	8.6%
		Employed	Count	11634	1287	12921
			% within ESR	90.0%	10.0%	100.0%
			% within ST	91.4%	91.8%	91.4%
		Total	Count	12729	1402	14131
			% within ESR	90.1%	9.9%	100.0%
			% within ST	100.0%	100.0%	100.0%
2010	ESR	Unemployed	Count	1545	187	1732
			% within ESR	89.2%	10.8%	100.0%
			% within ST	10.3%	9.0%	10.2%
		Employed	Count	13401	1887	15288
			% within ESR	87.7%	12.3%	100.0%
			% within ST	89.7%	91.0%	89.8%
		Total	Count	14946	2074	17020
			% within ESR	87.8%	12.2%	100.0%
			% within ST	100.0%	100.0%	100.0%
2011	ESR	Unemployed	Count	1661	179	1840
			% within ESR	90.3%	9.7%	100.0%
			% within ST	10.8%	8.2%	10.4%
		Employed	Count	13781	1994	15775
			% within ESR	87.4%	12.6%	100.0%
			% within ST	89.2%	91.8%	89.6%
		Total	Count	15442	2173	17615
			% within ESR	87.7%	12.3%	100.0%
			% within ST	100.0%	100.0%	100.0%
2012	ESR	Unemployed	Count	1595	193	1788
			% within ESR	89.2%	10.8%	100.0%
			% within ST	9.4%	7.8%	9.2%
		Employed	Count	15400	2269	17669
			% within ESR	87.2%	12.8%	100.0%
			% within ST	90.6%	92.2%	90.8%
		Total	Count	16995	2462	19457
			% within ESR	87.3%	12.7%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 31. Cross-tabulation for Employment Status, Genus Regions, and Year (2013-2015)

ESR * ST * YEAR Crosstab (2009-2012)						
YEAR				ST		Total
				Rest of Nation	Rural States	
2009	ESR	Unemployed	Count	1095	115	1210
			% within ESR	90.5%	9.5%	100.0%
			% within ST	8.6%	8.2%	8.6%
		Employed	Count	11634	1287	12921
			% within ESR	90.0%	10.0%	100.0%
			% within ST	91.4%	91.8%	91.4%
		Total	Count	12729	1402	14131
			% within ESR	90.1%	9.9%	100.0%
			% within ST	100.0%	100.0%	100.0%
2010	ESR	Unemployed	Count	1545	187	1732
			% within ESR	89.2%	10.8%	100.0%
			% within ST	10.3%	9.0%	10.2%
		Employed	Count	13401	1887	15288
			% within ESR	87.7%	12.3%	100.0%
			% within ST	89.7%	91.0%	89.8%
		Total	Count	14946	2074	17020
			% within ESR	87.8%	12.2%	100.0%
			% within ST	100.0%	100.0%	100.0%
2011	ESR	Unemployed	Count	1661	179	1840
			% within ESR	90.3%	9.7%	100.0%
			% within ST	10.8%	8.2%	10.4%
		Employed	Count	13781	1994	15775
			% within ESR	87.4%	12.6%	100.0%
			% within ST	89.2%	91.8%	89.6%
		Total	Count	15442	2173	17615
			% within ESR	87.7%	12.3%	100.0%
			% within ST	100.0%	100.0%	100.0%
2012	ESR	Unemployed	Count	1595	193	1788
			% within ESR	89.2%	10.8%	100.0%
			% within ST	9.4%	7.8%	9.2%
		Employed	Count	15400	2269	17669
			% within ESR	87.2%	12.8%	100.0%
			% within ST	90.6%	92.2%	90.8%
		Total	Count	16995	2462	19457
			% within ESR	87.3%	12.7%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 32. Cross-tabulation for Employment Status, Genus Regions, and Year (Cumulative Summary)

ESR * ST * YEAR Crosstab (Cumulative Summary)						
YEAR				ST		Total
				Rest of Nation	Rural States	
Total	ESR	Unemployed	Count	13281	1604	14885
			% within ESR	89.2%	10.8%	100.0%
			% within ST	8.3%	6.9%	8.1%
		Employed	Count	146504	21638	168142
			% within ESR	87.1%	12.9%	100.0%
			% within ST	91.7%	93.1%	91.9%
	Total		Count	159785	23242	183027
			% within ESR	87.3%	12.7%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 33. Educational Degree Attainment Cross-tabulation Summary

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SCHL * LMGIB * YEAR	183027	100.0%	0	0.0%	183027	100.0%
SCHL * SEX * YEAR	183027	100.0%	0	0.0%	183027	100.0%
SCHL * RAC1P * YEAR	183027	100.0%	0	0.0%	183027	100.0%
SCHL * ST * YEAR	183027	100.0%	0	0.0%	183027	100.0%

Table 34. Cross-tabulation for Educational Degree Attainment, Gender, and Year (2005-2007)

SCHL * SEX * YEAR Crosstab						
YEAR				SEX		Total
				Female	Male	
2005	SCHL	High School Diploma or GED	Count	326	2575	2901
			% within SCHL	11.2%	88.8%	100.0%
			% within SEX	19.4%	27.4%	26.2%
		Some college, No degree	Count	611	3331	3942
			% within SCHL	15.5%	84.5%	100.0%
			% within SEX	36.4%	35.5%	35.6%
		Associates Degree	Count	226	1049	1275
			% within SCHL	17.7%	82.3%	100.0%
			% within SEX	13.5%	11.2%	11.5%
		Bachelors Degree or Higher	Count	514	2431	2945
			% within SCHL	17.5%	82.5%	100.0%
			% within SEX	30.6%	25.9%	26.6%
	Total		Count	1677	9386	11063
			% within SCHL	15.2%	84.8%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2006	SCHL	High School Diploma or GED	Count	352	3132	3484
			% within SCHL	10.1%	89.9%	100.0%
			% within SEX	17.8%	28.8%	27.1%
		Some college, No degree	Count	733	3778	4511
			% within SCHL	16.2%	83.8%	100.0%
			% within SEX	37.1%	34.7%	35.1%
		Associates Degree	Count	285	1271	1556
			% within SCHL	18.3%	81.7%	100.0%
			% within SEX	14.4%	11.7%	12.1%
		Bachelors Degree or Higher	Count	607	2709	3316
			% within SCHL	18.3%	81.7%	100.0%
			% within SEX	30.7%	24.9%	25.8%
	Total		Count	1977	10890	12867
			% within SCHL	15.4%	84.6%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2007	SCHL	High School Diploma or GED	Count	413	3132	3545
			% within SCHL	11.7%	88.3%	100.0%
			% within SEX	19.6%	28.0%	26.7%
		Some college, No degree	Count	707	3783	4490
			% within SCHL	15.7%	84.3%	100.0%
			% within SEX	33.6%	33.8%	33.8%
		Associates Degree	Count	322	1275	1597
			% within SCHL	20.2%	79.8%	100.0%
			% within SEX	15.3%	11.4%	12.0%
		Bachelors Degree or Higher	Count	662	2993	3655
			% within SCHL	18.1%	81.9%	100.0%
			% within SEX	31.5%	26.8%	27.5%
	Total		Count	2104	11183	13287
			% within SCHL	15.8%	84.2%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 35. Cross-tabulation for Educational Degree Attainment, Gender, and Year (2008-2011)

SCHL * SEX * YEAR Crosstab

YEAR				SEX		Total
				Female	Male	
2008	SCHL	High School Diploma or GED	Count	326	2923	3249
			% within SCHL	10.0%	90.0%	100.0%
			% within SEX	14.9%	24.9%	23.3%
		Some college, No degree	Count	751	4262	5013
			% within SCHL	15.0%	85.0%	100.0%
			% within SEX	34.2%	36.3%	35.9%
		Associates Degree	Count	338	1340	1678
			% within SCHL	20.1%	79.9%	100.0%
			% within SEX	15.4%	11.4%	12.0%
		Bachelors Degree or Higher	Count	780	3226	4006
			% within SCHL	19.5%	80.5%	100.0%
			% within SEX	35.5%	27.5%	28.7%
	Total		Count	2195	11751	13946
			% within SCHL	15.7%	84.3%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2009	SCHL	High School Diploma or GED	Count	277	2850	3127
			% within SCHL	8.9%	91.1%	100.0%
			% within SEX	12.6%	23.9%	22.1%
		Some college, No degree	Count	758	4282	5040
			% within SCHL	15.0%	85.0%	100.0%
			% within SEX	34.5%	35.9%	35.7%
		Associates Degree	Count	350	1380	1730
			% within SCHL	20.2%	79.8%	100.0%
			% within SEX	15.9%	11.6%	12.2%
		Bachelors Degree or Higher	Count	810	3424	4234
			% within SCHL	19.1%	80.9%	100.0%
			% within SEX	36.9%	28.7%	30.0%
	Total		Count	2195	11936	14131
			% within SCHL	15.5%	84.5%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2010	SCHL	High School Diploma or GED	Count	347	3368	3715
			% within SCHL	9.3%	90.7%	100.0%
			% within SEX	12.7%	23.6%	21.8%
		Some college, No degree	Count	956	5200	6156
			% within SCHL	15.5%	84.5%	100.0%
			% within SEX	34.9%	36.4%	36.2%
		Associates Degree	Count	431	1686	2117
			% within SCHL	20.4%	79.6%	100.0%
			% within SEX	15.7%	11.8%	12.4%
		Bachelors Degree or Higher	Count	1009	4023	5032
			% within SCHL	20.1%	79.9%	100.0%
			% within SEX	36.8%	28.2%	29.6%
	Total		Count	2743	14277	17020
			% within SCHL	16.1%	83.9%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2011	SCHL	High School Diploma or GED	Count	365	3487	3852
			% within SCHL	9.5%	90.5%	100.0%
			% within SEX	13.5%	23.4%	21.9%
		Some college, No degree	Count	899	5398	6297
			% within SCHL	14.3%	85.7%	100.0%
			% within SEX	33.1%	36.2%	35.7%
		Associates Degree	Count	451	1737	2188
			% within SCHL	20.6%	79.4%	100.0%
			% within SEX	16.6%	11.7%	12.4%
		Bachelors Degree or Higher	Count	997	4281	5278
			% within SCHL	18.9%	81.1%	100.0%
			% within SEX	36.8%	28.7%	30.0%
	Total		Count	2712	14903	17615
			% within SCHL	15.4%	84.6%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 36. Cross-tabulation for Educational Degree Attainment, Gender, and Year (2012-2015)

SCHL * SEX * YEAR Crosstab						
YEAR				SEX		Total
				Female	Male	
2012	SCHL	High School Diploma or GED	Count	373	3678	4051
			% within SCHL	9.2%	90.8%	100.0%
			% within SEX	12.1%	22.5%	20.8%
		Some college, No degree	Count	972	5919	6891
			% within SCHL	14.1%	85.9%	100.0%
			% within SEX	31.5%	36.2%	35.4%
		Associates Degree	Count	516	2035	2551
			% within SCHL	20.2%	79.8%	100.0%
			% within SEX	16.7%	12.4%	13.1%
		Bachelors Degree or Higher	Count	1224	4740	5964
			% within SCHL	20.5%	79.5%	100.0%
			% within SEX	39.7%	29.0%	30.7%
	Total		Count	3085	16372	19457
			% within SCHL	15.9%	84.1%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2013	SCHL	High School Diploma or GED	Count	351	3670	4021
			% within SCHL	8.7%	91.3%	100.0%
			% within SEX	11.5%	21.6%	20.1%
		Some college, No degree	Count	909	5766	6675
			% within SCHL	13.6%	86.4%	100.0%
			% within SEX	29.9%	34.0%	33.4%
		Associates Degree	Count	498	2107	2605
			% within SCHL	19.1%	80.9%	100.0%
			% within SEX	16.4%	12.4%	13.0%
		Bachelors Degree or Higher	Count	1285	5421	6706
			% within SCHL	19.2%	80.8%	100.0%
			% within SEX	42.2%	32.0%	33.5%
	Total		Count	3043	16964	20007
			% within SCHL	15.2%	84.8%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2014	SCHL	High School Diploma or GED	Count	391	3862	4253
			% within SCHL	9.2%	90.8%	100.0%
			% within SEX	12.0%	21.5%	20.1%
		Some college, No degree	Count	960	5989	6949
			% within SCHL	13.8%	86.2%	100.0%
			% within SEX	29.4%	33.4%	32.8%
		Associates Degree	Count	492	2297	2789
			% within SCHL	17.6%	82.4%	100.0%
			% within SEX	15.1%	12.8%	13.2%
		Bachelors Degree or Higher	Count	1425	5784	7209
			% within SCHL	19.8%	80.2%	100.0%
			% within SEX	43.6%	32.3%	34.0%
	Total		Count	3268	17932	21200
			% within SCHL	15.4%	84.6%	100.0%
			% within SEX	100.0%	100.0%	100.0%
2015	SCHL	High School Diploma or GED	Count	372	3979	4351
			% within SCHL	8.5%	91.5%	100.0%
			% within SEX	11.2%	20.8%	19.4%
		Some college, No degree	Count	918	6287	7205
			% within SCHL	12.7%	87.3%	100.0%
			% within SEX	27.7%	32.9%	32.1%
		Associates Degree	Count	531	2443	2974
			% within SCHL	17.9%	82.1%	100.0%
			% within SEX	16.0%	12.8%	13.3%
		Bachelors Degree or Higher	Count	1491	6413	7904
			% within SCHL	18.9%	81.1%	100.0%
			% within SEX	45.0%	33.5%	35.2%
	Total		Count	3312	19122	22434
			% within SCHL	14.8%	85.2%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 37. Cross-tabulation for Educational Degree Attainment, Gender, and Year (Cumulative Summary)

SCHL * SEX * YEAR Crosstab						
YEAR				SEX		Total
				Female	Male	
Total	SCHL	High School Diploma or GED	Count	3893	36656	40549
			% within SCHL	9.6%	90.4%	100.0%
			% within SEX	13.8%	23.7%	22.2%
		Some college, No degree	Count	9174	53995	63169
			% within SCHL	14.5%	85.5%	100.0%
			% within SEX	32.4%	34.9%	34.5%
		Associates Degree	Count	4440	18620	23060
			% within SCHL	19.3%	80.7%	100.0%
			% within SEX	15.7%	12.0%	12.6%
		Bachelors Degree or Higher	Count	10804	45445	56249
			% within SCHL	19.2%	80.8%	100.0%
			% within SEX	38.2%	29.4%	30.7%
		Total	Count	28311	154716	183027
			% within SCHL	15.5%	84.5%	100.0%
			% within SEX	100.0%	100.0%	100.0%

Table 38. Cross-tabulation for Educational Degree Attainment, Race, and Year (2005-2007)

SCHL * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
2005	SCHL	High School Diploma or GED	Count	608	2293	2901
			% within SCHL	21.0%	79.0%	100.0%
			% within RAC1P	26.2%	26.2%	26.2%
		Some college, No degree	Count	860	3082	3942
			% within SCHL	21.8%	78.2%	100.0%
			% within RAC1P	37.0%	35.3%	35.6%
		Associates Degree	Count	307	968	1275
			% within SCHL	24.1%	75.9%	100.0%
			% within RAC1P	13.2%	11.1%	11.5%
		Bachelors Degree or Higher	Count	550	2395	2945
			% within SCHL	18.7%	81.3%	100.0%
			% within RAC1P	23.7%	27.4%	26.6%
	Total		Count	2325	8738	11063
			% within SCHL	21.0%	79.0%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2006	SCHL	High School Diploma or GED	Count	833	2651	3484
			% within SCHL	23.9%	76.1%	100.0%
			% within RAC1P	28.5%	26.6%	27.1%
		Some college, No degree	Count	1066	3445	4511
			% within SCHL	23.6%	76.4%	100.0%
			% within RAC1P	36.5%	34.6%	35.1%
		Associates Degree	Count	382	1174	1556
			% within SCHL	24.6%	75.4%	100.0%
			% within RAC1P	13.1%	11.8%	12.1%
		Bachelors Degree or Higher	Count	638	2678	3316
			% within SCHL	19.2%	80.8%	100.0%
			% within RAC1P	21.9%	26.9%	25.8%
	Total		Count	2919	9948	12867
			% within SCHL	22.7%	77.3%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2007	SCHL	High School Diploma or GED	Count	856	2689	3545
			% within SCHL	24.1%	75.9%	100.0%
			% within RAC1P	27.2%	26.5%	26.7%
		Some college, No degree	Count	1138	3352	4490
			% within SCHL	25.3%	74.7%	100.0%
			% within RAC1P	36.2%	33.0%	33.8%
		Associates Degree	Count	419	1178	1597
			% within SCHL	26.2%	73.8%	100.0%
			% within RAC1P	13.3%	11.6%	12.0%
		Bachelors Degree or Higher	Count	731	2924	3655
			% within SCHL	20.0%	80.0%	100.0%
			% within RAC1P	23.3%	28.8%	27.5%
	Total		Count	3144	10143	13287
			% within SCHL	23.7%	76.3%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 39. Cross-tabulation for Educational Degree Attainment, Race, and Year (2008-2011)

SCHL * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
2008	SCHL	High School Diploma or GED	Count	724	2525	3249
			% within SCHL	22.3%	77.7%	100.0%
			% within RAC1P	22.7%	23.5%	23.3%
		Some college, No degree	Count	1214	3799	5013
			% within SCHL	24.2%	75.8%	100.0%
			% within RAC1P	38.1%	35.3%	35.9%
		Associates Degree	Count	427	1251	1678
			% within SCHL	25.4%	74.6%	100.0%
			% within RAC1P	13.4%	11.6%	12.0%
		Bachelors Degree or Higher	Count	820	3186	4006
			% within SCHL	20.5%	79.5%	100.0%
			% within RAC1P	25.7%	29.6%	28.7%
	Total		Count	3185	10761	13946
			% within SCHL	22.8%	77.2%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2009	SCHL	High School Diploma or GED	Count	699	2428	3127
			% within SCHL	22.4%	77.6%	100.0%
			% within RAC1P	21.5%	22.3%	22.1%
		Some college, No degree	Count	1238	3802	5040
			% within SCHL	24.6%	75.4%	100.0%
			% within RAC1P	38.1%	34.9%	35.7%
		Associates Degree	Count	439	1291	1730
			% within SCHL	25.4%	74.6%	100.0%
			% within RAC1P	13.5%	11.9%	12.2%
		Bachelors Degree or Higher	Count	870	3364	4234
			% within SCHL	20.5%	79.5%	100.0%
			% within RAC1P	26.8%	30.9%	30.0%
	Total		Count	3246	10885	14131
			% within SCHL	23.0%	77.0%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2010	SCHL	High School Diploma or GED	Count	807	2908	3715
			% within SCHL	21.7%	78.3%	100.0%
			% within RAC1P	20.9%	22.1%	21.8%
		Some college, No degree	Count	1488	4668	6156
			% within SCHL	24.2%	75.8%	100.0%
			% within RAC1P	38.5%	35.5%	36.2%
		Associates Degree	Count	512	1605	2117
			% within SCHL	24.2%	75.8%	100.0%
			% within RAC1P	13.2%	12.2%	12.4%
		Bachelors Degree or Higher	Count	1060	3972	5032
			% within SCHL	21.1%	78.9%	100.0%
			% within RAC1P	27.4%	30.2%	29.6%
	Total		Count	3867	13153	17020
			% within SCHL	22.7%	77.3%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2011	SCHL	High School Diploma or GED	Count	865	2987	3852
			% within SCHL	22.5%	77.5%	100.0%
			% within RAC1P	21.8%	21.9%	21.9%
		Some college, No degree	Count	1519	4778	6297
			% within SCHL	24.1%	75.9%	100.0%
			% within RAC1P	38.3%	35.0%	35.7%
		Associates Degree	Count	533	1655	2188
			% within SCHL	24.4%	75.6%	100.0%
			% within RAC1P	13.4%	12.1%	12.4%
		Bachelors Degree or Higher	Count	1051	4227	5278
			% within SCHL	19.9%	80.1%	100.0%
			% within RAC1P	26.5%	31.0%	30.0%
	Total		Count	3968	13647	17615
			% within SCHL	22.5%	77.5%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 40. Cross-tabulation for Educational Degree Attainment, Race, and Year (2012-2015)

SCHL * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
2012	SCHL	High School Diploma or GED	Count	849	3202	4051
			% within SCHL	21.0%	79.0%	100.0%
			% within RAC1P	19.3%	21.3%	20.8%
		Some college, No degree	Count	1641	5250	6891
			% within SCHL	23.8%	76.2%	100.0%
			% within RAC1P	37.2%	34.9%	35.4%
		Associates Degree	Count	644	1907	2551
			% within SCHL	25.2%	74.8%	100.0%
			% within RAC1P	14.6%	12.7%	13.1%
		Bachelors Degree or Higher	Count	1273	4691	5964
			% within SCHL	21.3%	78.7%	100.0%
			% within RAC1P	28.9%	31.2%	30.7%
	Total		Count	4407	15050	19457
			% within SCHL	22.6%	77.4%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2013	SCHL	High School Diploma or GED	Count	843	3178	4021
			% within SCHL	21.0%	79.0%	100.0%
			% within RAC1P	19.3%	20.3%	20.1%
		Some college, No degree	Count	1522	5153	6675
			% within SCHL	22.8%	77.2%	100.0%
			% within RAC1P	34.9%	32.9%	33.4%
		Associates Degree	Count	595	2010	2605
			% within SCHL	22.8%	77.2%	100.0%
			% within RAC1P	13.6%	12.8%	13.0%
		Bachelors Degree or Higher	Count	1400	5306	6706
			% within SCHL	20.9%	79.1%	100.0%
			% within RAC1P	32.1%	33.9%	33.5%
	Total		Count	4360	15647	20007
			% within SCHL	21.8%	78.2%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2014	SCHL	High School Diploma or GED	Count	854	3399	4253
			% within SCHL	20.1%	79.9%	100.0%
			% within RAC1P	18.2%	20.6%	20.1%
		Some college, No degree	Count	1636	5313	6949
			% within SCHL	23.5%	76.5%	100.0%
			% within RAC1P	34.8%	32.2%	32.8%
		Associates Degree	Count	626	2163	2789
			% within SCHL	22.4%	77.6%	100.0%
			% within RAC1P	13.3%	13.1%	13.2%
		Bachelors Degree or Higher	Count	1582	5627	7209
			% within SCHL	21.9%	78.1%	100.0%
			% within RAC1P	33.7%	34.1%	34.0%
	Total		Count	4698	16502	21200
			% within SCHL	22.2%	77.8%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%
2015	SCHL	High School Diploma or GED	Count	926	3425	4351
			% within SCHL	21.3%	78.7%	100.0%
			% within RAC1P	18.6%	19.6%	19.4%
		Some college, No degree	Count	1670	5535	7205
			% within SCHL	23.2%	76.8%	100.0%
			% within RAC1P	33.5%	31.7%	32.1%
		Associates Degree	Count	711	2263	2974
			% within SCHL	23.9%	76.1%	100.0%
			% within RAC1P	14.3%	13.0%	13.3%
		Bachelors Degree or Higher	Count	1681	6223	7904
			% within SCHL	21.3%	78.7%	100.0%
			% within RAC1P	33.7%	35.7%	35.2%
	Total		Count	4988	17446	22434
			% within SCHL	22.2%	77.8%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 41. Cross-tabulation for Educational Degree Attainment, Race, and Year (Cumulative Summary)

SCHL * RAC1P * YEAR Crosstab						
YEAR				RAC1P		Total
				All non-white alone	White alone	
Total	SCHL	High School Diploma or GED	Count	8864	31685	40549
			% within SCHL	21.9%	78.1%	100.0%
			% within RAC1P	21.6%	22.3%	22.2%
		Some college, No degree	Count	14992	48177	63169
			% within SCHL	23.7%	76.3%	100.0%
			% within RAC1P	36.5%	33.9%	34.5%
		Associates Degree	Count	5595	17465	23060
			% within SCHL	24.3%	75.7%	100.0%
			% within RAC1P	13.6%	12.3%	12.6%
		Bachelors Degree or Higher	Count	11656	44593	56249
			% within SCHL	20.7%	79.3%	100.0%
			% within RAC1P	28.4%	31.4%	30.7%
	Total		Count	41107	141920	183027
			% within SCHL	22.5%	77.5%	100.0%
			% within RAC1P	100.0%	100.0%	100.0%

Table 42. Cross-tabulation for Educational Degree Attainment, 2008 GI Bill, and Year (2005-2007)

SCHL * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (including 2008)	Post 2008 GI Bill	
2005	SCHL	High School Diploma or GED	Count	2901		2901
			% within SCHL	100.0%		100.0%
			% within LMGIB	26.2%		26.2%
		Some college, No degree	Count	3942		3942
			% within SCHL	100.0%		100.0%
			% within LMGIB	35.6%		35.6%
		Associates Degree	Count	1275		1275
			% within SCHL	100.0%		100.0%
			% within LMGIB	11.5%		11.5%
		Bachelors Degree or Higher	Count	2945		2945
			% within SCHL	100.0%		100.0%
			% within LMGIB	26.6%		26.6%
	Total		Count	11063		11063
			% within SCHL	100.0%		100.0%
			% within LMGIB	100.0%		100.0%
2006	SCHL	High School Diploma or GED	Count	3484		3484
			% within SCHL	100.0%		100.0%
			% within LMGIB	27.1%		27.1%
		Some college, No degree	Count	4511		4511
			% within SCHL	100.0%		100.0%
			% within LMGIB	35.1%		35.1%
		Associates Degree	Count	1556		1556
			% within SCHL	100.0%		100.0%
			% within LMGIB	12.1%		12.1%
		Bachelors Degree or Higher	Count	3316		3316
			% within SCHL	100.0%		100.0%
			% within LMGIB	25.8%		25.8%
	Total		Count	12867		12867
			% within SCHL	100.0%		100.0%
			% within LMGIB	100.0%		100.0%
2007	SCHL	High School Diploma or GED	Count	3545		3545
			% within SCHL	100.0%		100.0%
			% within LMGIB	26.7%		26.7%
		Some college, No degree	Count	4490		4490
			% within SCHL	100.0%		100.0%
			% within LMGIB	33.8%		33.8%
		Associates Degree	Count	1597		1597
			% within SCHL	100.0%		100.0%
			% within LMGIB	12.0%		12.0%
		Bachelors Degree or Higher	Count	3655		3655
			% within SCHL	100.0%		100.0%
			% within LMGIB	27.5%		27.5%
	Total		Count	13287		13287
			% within SCHL	100.0%		100.0%
			% within LMGIB	100.0%		100.0%

Table 43. Cross-tabulation for Educational Degree Attainment, 2008 GI Bill, and Year (2008-2011)

SCHL * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (including 2008)	Post 2008 GI Bill	
2008	SCHL	High School Diploma or GED	Count	3249		3249
			% within SCHL	100.0%		100.0%
			% within LMGIB	23.3%		23.3%
		Some college, No degree	Count	5013		5013
			% within SCHL	100.0%		100.0%
			% within LMGIB	35.9%		35.9%
		Associates Degree	Count	1678		1678
			% within SCHL	100.0%		100.0%
			% within LMGIB	12.0%		12.0%
		Bachelors Degree or Higher	Count	4006		4006
			% within SCHL	100.0%		100.0%
			% within LMGIB	28.7%		28.7%
	Total		Count	13946		13946
			% within SCHL	100.0%		100.0%
			% within LMGIB	100.0%		100.0%
2009	SCHL	High School Diploma or GED	Count		3127	3127
			% within SCHL		100.0%	100.0%
			% within LMGIB		22.1%	22.1%
		Some college, No degree	Count		5040	5040
			% within SCHL		100.0%	100.0%
			% within LMGIB		35.7%	35.7%
		Associates Degree	Count		1730	1730
			% within SCHL		100.0%	100.0%
			% within LMGIB		12.2%	12.2%
		Bachelors Degree or Higher	Count		4234	4234
			% within SCHL		100.0%	100.0%
			% within LMGIB		30.0%	30.0%
	Total		Count		14131	14131
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2010	SCHL	High School Diploma or GED	Count		3715	3715
			% within SCHL		100.0%	100.0%
			% within LMGIB		21.8%	21.8%
		Some college, No degree	Count		6156	6156
			% within SCHL		100.0%	100.0%
			% within LMGIB		36.2%	36.2%
		Associates Degree	Count		2117	2117
			% within SCHL		100.0%	100.0%
			% within LMGIB		12.4%	12.4%
		Bachelors Degree or Higher	Count		5032	5032
			% within SCHL		100.0%	100.0%
			% within LMGIB		29.6%	29.6%
	Total		Count		17020	17020
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2011	SCHL	High School Diploma or GED	Count		3852	3852
			% within SCHL		100.0%	100.0%
			% within LMGIB		21.9%	21.9%
		Some college, No degree	Count		6297	6297
			% within SCHL		100.0%	100.0%
			% within LMGIB		35.7%	35.7%
		Associates Degree	Count		2188	2188
			% within SCHL		100.0%	100.0%
			% within LMGIB		12.4%	12.4%
		Bachelors Degree or Higher	Count		5278	5278
			% within SCHL		100.0%	100.0%
			% within LMGIB		30.0%	30.0%
	Total		Count		17615	17615
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%

Table 44. Cross-tabulation for Educational Degree Attainment, 2008 GI Bill, and Year (2012-2015)

SCHL * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (including 2008)	Post 2008 GI Bill	
2012	SCHL	High School Diploma or GED	Count		4051	4051
			% within SCHL		100.0%	100.0%
			% within LMGIB		20.8%	20.8%
		Some college, No degree	Count		6891	6891
			% within SCHL		100.0%	100.0%
			% within LMGIB		35.4%	35.4%
		Associates Degree	Count		2551	2551
			% within SCHL		100.0%	100.0%
			% within LMGIB		13.1%	13.1%
		Bachelors Degree or Higher	Count		5964	5964
			% within SCHL		100.0%	100.0%
			% within LMGIB		30.7%	30.7%
	Total		Count		19457	19457
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2013	SCHL	High School Diploma or GED	Count		4021	4021
			% within SCHL		100.0%	100.0%
			% within LMGIB		20.1%	20.1%
		Some college, No degree	Count		6675	6675
			% within SCHL		100.0%	100.0%
			% within LMGIB		33.4%	33.4%
		Associates Degree	Count		2605	2605
			% within SCHL		100.0%	100.0%
			% within LMGIB		13.0%	13.0%
		Bachelors Degree or Higher	Count		6706	6706
			% within SCHL		100.0%	100.0%
			% within LMGIB		33.5%	33.5%
	Total		Count		20007	20007
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2014	SCHL	High School Diploma or GED	Count		4253	4253
			% within SCHL		100.0%	100.0%
			% within LMGIB		20.1%	20.1%
		Some college, No degree	Count		6949	6949
			% within SCHL		100.0%	100.0%
			% within LMGIB		32.8%	32.8%
		Associates Degree	Count		2789	2789
			% within SCHL		100.0%	100.0%
			% within LMGIB		13.2%	13.2%
		Bachelors Degree or Higher	Count		7209	7209
			% within SCHL		100.0%	100.0%
			% within LMGIB		34.0%	34.0%
	Total		Count		21200	21200
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%
2015	SCHL	High School Diploma or GED	Count		4351	4351
			% within SCHL		100.0%	100.0%
			% within LMGIB		19.4%	19.4%
		Some college, No degree	Count		7205	7205
			% within SCHL		100.0%	100.0%
			% within LMGIB		32.1%	32.1%
		Associates Degree	Count		2974	2974
			% within SCHL		100.0%	100.0%
			% within LMGIB		13.3%	13.3%
		Bachelors Degree or Higher	Count		7904	7904
			% within SCHL		100.0%	100.0%
			% within LMGIB		35.2%	35.2%
	Total		Count		22434	22434
			% within SCHL		100.0%	100.0%
			% within LMGIB		100.0%	100.0%

Table 45. Cross-tabulation for Educational Degree Attainment, 2008 GI Bill, and Year (Cumulative Summary)

SCHL * LMGIB * YEAR Crosstab						
YEAR				LMGIB		Total
				Pre 2008 GI Bill (including 2008)	Post 2008 GI Bill	
Total	SCHL	High School Diploma or GED	Count	13179	27370	40549
			% within SCHL	32.5%	67.5%	100.0%
			% within LMGIB	25.8%	20.8%	22.2%
		Some college, No degree	Count	17956	45213	63169
			% within SCHL	28.4%	71.6%	100.0%
			% within LMGIB	35.1%	34.3%	34.5%
		Associates Degree	Count	6106	16954	23060
			% within SCHL	26.5%	73.5%	100.0%
			% within LMGIB	11.9%	12.9%	12.6%
		Bachelors Degree or Higher	Count	13922	42327	56249
			% within SCHL	24.8%	75.2%	100.0%
			% within LMGIB	27.2%	32.1%	30.7%
		Total	Count	51163	131864	183027
			% within SCHL	28.0%	72.0%	100.0%
			% within LMGIB	100.0%	100.0%	100.0%

Table 46. Cross-tabulation for Educational Degree Attainment, Genus Regions, and Year (2005-2007)

SCHL * ST * YEAR Crosstab						
YEAR				ST		Total
				Rest of Nation	Rural States	
2005	SCHL	High School Diploma or GED	Count	2345	556	2901
			% within SCHL	80.8%	19.2%	100.0%
			% within ST	26.9%	23.7%	26.2%
		Some college, No degree	Count	3046	896	3942
			% within SCHL	77.3%	22.7%	100.0%
			% within ST	35.0%	38.2%	35.6%
		Associates Degree	Count	1015	260	1275
			% within SCHL	79.6%	20.4%	100.0%
			% within ST	11.6%	11.1%	11.5%
		Bachelors Degree or Higher	Count	2309	636	2945
			% within SCHL	78.4%	21.6%	100.0%
			% within ST	26.5%	27.1%	26.6%
	Total		Count	8715	2348	11063
			% within SCHL	78.8%	21.2%	100.0%
			% within ST	100.0%	100.0%	100.0%
2006	SCHL	High School Diploma or GED	Count	3092	392	3484
			% within SCHL	88.7%	11.3%	100.0%
			% within ST	27.7%	22.9%	27.1%
		Some college, No degree	Count	3902	609	4511
			% within SCHL	86.5%	13.5%	100.0%
			% within ST	35.0%	35.6%	35.1%
		Associates Degree	Count	1311	245	1556
			% within SCHL	84.3%	15.7%	100.0%
			% within ST	11.8%	14.3%	12.1%
		Bachelors Degree or Higher	Count	2850	466	3316
			% within SCHL	85.9%	14.1%	100.0%
			% within ST	25.5%	27.2%	25.8%
	Total		Count	11155	1712	12867
			% within SCHL	86.7%	13.3%	100.0%
			% within ST	100.0%	100.0%	100.0%
2007	SCHL	High School Diploma or GED	Count	3231	314	3545
			% within SCHL	91.1%	8.9%	100.0%
			% within ST	27.2%	22.1%	26.7%
		Some college, No degree	Count	3963	527	4490
			% within SCHL	88.3%	11.7%	100.0%
			% within ST	33.4%	37.0%	33.8%
		Associates Degree	Count	1408	189	1597
			% within SCHL	88.2%	11.8%	100.0%
			% within ST	11.9%	13.3%	12.0%
		Bachelors Degree or Higher	Count	3261	394	3655
			% within SCHL	89.2%	10.8%	100.0%
			% within ST	27.5%	27.7%	27.5%
	Total		Count	11863	1424	13287
			% within SCHL	89.3%	10.7%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 47. Cross-tabulation for Educational Degree Attainment, Genus Regions, and Year (2008-2011)

SCHL * ST * YEAR Crosstab						
YEAR				ST		Total
				Rest of Nation	Rural States	
2008	SCHL	High School Diploma or GED	Count	2994	255	3249
			% within SCHL	92.2%	7.8%	100.0%
			% within ST	23.9%	18.1%	23.3%
		Some college, No degree	Count	4512	501	5013
			% within SCHL	90.0%	10.0%	100.0%
			% within ST	36.0%	35.5%	35.9%
		Associates Degree	Count	1479	199	1678
			% within SCHL	88.1%	11.9%	100.0%
			% within ST	11.8%	14.1%	12.0%
		Bachelors Degree or Higher	Count	3550	456	4006
			% within SCHL	88.6%	11.4%	100.0%
			% within ST	28.3%	32.3%	28.7%
		Total	Count	12535	1411	13946
			% within SCHL	89.9%	10.1%	100.0%
			% within ST	100.0%	100.0%	100.0%
2009	SCHL	High School Diploma or GED	Count	2854	273	3127
			% within SCHL	91.3%	8.7%	100.0%
			% within ST	22.4%	19.5%	22.1%
		Some college, No degree	Count	4521	519	5040
			% within SCHL	89.7%	10.3%	100.0%
			% within ST	35.5%	37.0%	35.7%
		Associates Degree	Count	1548	182	1730
			% within SCHL	89.5%	10.5%	100.0%
			% within ST	12.2%	13.0%	12.2%
		Bachelors Degree or Higher	Count	3806	428	4234
			% within SCHL	89.9%	10.1%	100.0%
			% within ST	29.9%	30.5%	30.0%
		Total	Count	12729	1402	14131
			% within SCHL	90.1%	9.9%	100.0%
			% within ST	100.0%	100.0%	100.0%
2010	SCHL	High School Diploma or GED	Count	3321	394	3715
			% within SCHL	89.4%	10.6%	100.0%
			% within ST	22.2%	19.0%	21.8%
		Some college, No degree	Count	5376	780	6156
			% within SCHL	87.3%	12.7%	100.0%
			% within ST	36.0%	37.6%	36.2%
		Associates Degree	Count	1820	297	2117
			% within SCHL	86.0%	14.0%	100.0%
			% within ST	12.2%	14.3%	12.4%
		Bachelors Degree or Higher	Count	4429	603	5032
			% within SCHL	88.0%	12.0%	100.0%
			% within ST	29.6%	29.1%	29.6%
		Total	Count	14946	2074	17020
			% within SCHL	87.8%	12.2%	100.0%
			% within ST	100.0%	100.0%	100.0%
2011	SCHL	High School Diploma or GED	Count	3439	413	3852
			% within SCHL	89.3%	10.7%	100.0%
			% within ST	22.3%	19.0%	21.9%
		Some college, No degree	Count	5486	811	6297
			% within SCHL	87.1%	12.9%	100.0%
			% within ST	35.5%	37.3%	35.7%
		Associates Degree	Count	1888	300	2188
			% within SCHL	86.3%	13.7%	100.0%
			% within ST	12.2%	13.8%	12.4%
		Bachelors Degree or Higher	Count	4629	649	5278
			% within SCHL	87.7%	12.3%	100.0%
			% within ST	30.0%	29.9%	30.0%
		Total	Count	15442	2173	17615
			% within SCHL	87.7%	12.3%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 48. Cross-tabulation for Educational Degree Attainment, Genus Regions, and Year (2012-2015)

SCHL * ST * YEAR Crosstab						
YEAR				ST		Total
				Rest of Nation	Rural States	
			% within SCHL	88.7%	11.3%	100.0%
			% within ST	21.2%	18.5%	20.8%
		Some college, No degree	Count	6005	886	6891
			% within SCHL	87.1%	12.9%	100.0%
			% within ST	35.3%	36.0%	35.4%
		Associates Degree	Count	2173	378	2551
			% within SCHL	85.2%	14.8%	100.0%
			% within ST	12.8%	15.4%	13.1%
		Bachelors Degree or Higher	Count	5222	742	5964
			% within SCHL	87.6%	12.4%	100.0%
			% within ST	30.7%	30.1%	30.7%
		Total	Count	16995	2462	19457
			% within SCHL	87.3%	12.7%	100.0%
			% within ST	100.0%	100.0%	100.0%
2013	SCHL	High School Diploma or GED	Count	3505	516	4021
			% within SCHL	87.2%	12.8%	100.0%
			% within ST	20.2%	19.3%	20.1%
		Some college, No degree	Count	5745	930	6675
			% within SCHL	86.1%	13.9%	100.0%
			% within ST	33.1%	34.8%	33.4%
		Associates Degree	Count	2223	382	2605
			% within SCHL	85.3%	14.7%	100.0%
			% within ST	12.8%	14.3%	13.0%
		Bachelors Degree or Higher	Count	5861	845	6706
			% within SCHL	87.4%	12.6%	100.0%
			% within ST	33.8%	31.6%	33.5%
		Total	Count	17334	2673	20007
			% within SCHL	86.6%	13.4%	100.0%
			% within ST	100.0%	100.0%	100.0%
2014	SCHL	High School Diploma or GED	Count	3791	462	4253
			% within SCHL	89.1%	10.9%	100.0%
			% within ST	20.5%	16.9%	20.1%
		Some college, No degree	Count	5976	973	6949
			% within SCHL	86.0%	14.0%	100.0%
			% within ST	32.4%	35.5%	32.8%
		Associates Degree	Count	2396	393	2789
			% within SCHL	85.9%	14.1%	100.0%
			% within ST	13.0%	14.3%	13.2%
		Bachelors Degree or Higher	Count	6297	912	7209
			% within SCHL	87.3%	12.7%	100.0%
			% within ST	34.1%	33.3%	34.0%
		Total	Count	18460	2740	21200
			% within SCHL	87.1%	12.9%	100.0%
			% within ST	100.0%	100.0%	100.0%
2015	SCHL	High School Diploma or GED	Count	3820	531	4351
			% within SCHL	87.8%	12.2%	100.0%
			% within ST	19.5%	18.8%	19.4%
		Some college, No degree	Count	6297	908	7205
			% within SCHL	87.4%	12.6%	100.0%
			% within ST	32.1%	32.2%	32.1%
		Associates Degree	Count	2591	383	2974
			% within SCHL	87.1%	12.9%	100.0%
			% within ST	13.2%	13.6%	13.3%
		Bachelors Degree or Higher	Count	6903	1001	7904
			% within SCHL	87.3%	12.7%	100.0%
			% within ST	35.2%	35.5%	35.2%
		Total	Count	19611	2823	22434
			% within SCHL	87.4%	12.6%	100.0%
			% within ST	100.0%	100.0%	100.0%

Table 49. Cross-tabulation for Educational Degree Attainment, Genus Regions, and Year (Cumulative Summary)

SCHL * ST * YEAR Crosstab						
YEAR				ST		Total
				Rest of Nation	Rural States	
Total	SCHL	High School Diploma or GED	Count	35987	4562	40549
			% within SCHL	88.7%	11.3%	100.0%
			% within ST	22.5%	19.6%	22.2%
		Some college, No degree	Count	54829	8340	63169
			% within SCHL	86.8%	13.2%	100.0%
			% within ST	34.3%	35.9%	34.5%
		Associates Degree	Count	19852	3208	23060
			% within SCHL	86.1%	13.9%	100.0%
			% within ST	12.4%	13.8%	12.6%
		Bachelors Degree or Higher	Count	49117	7132	56249
			% within SCHL	87.3%	12.7%	100.0%
			% within ST	30.7%	30.7%	30.7%
		Total	Count	159785	23242	183027
			% within SCHL	87.3%	12.7%	100.0%
			% within ST	100.0%	100.0%	100.0%

Appendix C: Event Outcome Analysis Figures

Figure 19. Initial Full Mixed-effects GLM for Employment Status (excluding Genus Regions)

meglm ESR LMGIB RAC1P SEX || YEAR:

Fitting fixed-effects model:
Iteration 0: log likelihood = **-22049.892**
Iteration 1: log likelihood = **-22049.892**
Refining starting values:
Grid node 0: log likelihood = **-21866.914**
Fitting full model:
Iteration 0: log likelihood = **-21866.914**
Iteration 1: log likelihood = **-21866.615**
Iteration 2: log likelihood = **-21866.608**
Iteration 3: log likelihood = **-21866.608**

Mixed-effects GLM — Number of obs = **183027**
Family: **Gaussian** — Number of groups = **11**
Link: **identity** — Obs per group:
Group variable: **YEAR** — min = **11,063**
avg = **16,638.8**
max = **22,434**
Integration method: **mvaghermite** — Integration pts. = **7**
Wald chi2(3) = **461.35**
Log likelihood = **-21866.608** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB	**-0.0115776**	**0.0076427**	**-1.51**	**0.130**	**-0.0265569**	**0.0034017**
RAC1P	**0.029822**	**0.0015369**	**19.40**	**0.000**	**0.0268098**	**0.0328342**
SEX	**0.0121765**	**0.0017736**	**6.87**	**0.000**	**0.0087003**	**0.0156527**
_cons	**1.892556**	**0.0063718**	**297.02**	**0.000**	**1.880068**	**1.905045**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0001435**	**0.0000629**	**0.0000608**	**0.0003387**
var(e.ESR)	**0.0743373**	**0.0002457**	**0.0738572**	**0.0748205**

LR test vs. linear model: chibar2(01) = **366.57** — Prob >= chibar2 = **0.0000**

Figure 20. Initial Full Mixed-effects GLM for Employment Status (including Genus Regions)

meglm ESR LMGIB RAC1P SEX ST || YEAR:

Fitting fixed-effects model:
Iteration 0: log likelihood = **-22031.959**
Iteration 1: log likelihood = **-22031.959**
Refining starting values:
Grid node 0: log likelihood = **-21847.707**
Fitting full model:
Iteration 0: log likelihood = **-21847.707**
Iteration 1: log likelihood = **-21847.382**
Iteration 2: log likelihood = **-21847.375**
Iteration 3: log likelihood = **-21847.375**

Mixed-effects GLM — Number of obs = **183027**
Family: **Gaussian** — Number of groups = **11**
Link: **identity** — Obs per group:
Group variable: **YEAR** — min = **11,063**
avg = **16,638.8**
max = **22,434**
Integration method: **mvaghermite** — Integration pts. = **7**
Wald chi2(4) = **499.89**
Log likelihood = **-21847.375** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB	**-0.0113932**	**0.0076876**	**-1.48**	**0.138**	**-0.0264606**	**0.0036741**
RAC1P	**0.0292337**	**0.0015396**	**18.99**	**0.000**	**0.0262161**	**0.0322514**
SEX	**0.0121747**	**0.0017734**	**6.87**	**0.000**	**0.0086988**	**0.0156505**
ST	**0.0119243**	**0.0019225**	**6.20**	**0.000**	**0.0081563**	**0.0156922**
_cons	**1.891365**	**0.0064089**	**295.12**	**0.000**	**1.878803**	**1.903926**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0001452**	**0.0000636**	**0.0000615**	**0.0003428**
var(e.ESR)	**0.0743217**	**0.0002457**	**0.0738417**	**0.0748048**

LR test vs. linear model: chibar2(01) = **369.17** — Prob >= chibar2 = **0.0000**

Figure 21. Initial Full Mixed-effects GLM for Educational Degree Attainment (excluding Genus Regions)

meglm SCHL LMGIB RAC1P SEX || YEAR:

Fitting fixed-effects model:
Iteration 0: log likelihood = **-282923.51**
Iteration 1: log likelihood = **-282923.51**
Refining starting values:
Grid node 0: log likelihood = **-282752.88**
Fitting full model:
Iteration 0: log likelihood = **-282752.88**
Iteration 1: log likelihood = **-282752.58**
Iteration 2: log likelihood = **-282752.57**
Iteration 3: log likelihood = **-282752.57**

Mixed-effects GLM — Number of obs = **183027**
Family: **Gaussian** — Number of groups = **11**
Link: **identity** — Obs per group:
Group variable: **YEAR** — min = **11,063**
avg = **16,638.8**
max = **22,434**
Integration method: **mvaghermite** — Integration pts. = **7**
Wald chi2(3) = **1966.49**
Log likelihood = **-282752.57** — Prob > chi2 = **0.0000**

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB	**0.1521763**	**0.0316548**	**4.81**	**0.000**	**0.0901338**	**0.2142189**
RAC1P	**0.0708407**	**0.0063926**	**11.08**	**0.000**	**0.0583114**	**0.0833701**
SEX	**-0.321929**	**0.0073773**	**-43.64**	**0.000**	**-0.3363882**	**-0.3074698**
_cons	**2.621263**	**0.0264008**	**99.29**	**0.000**	**2.569519**	**2.673008**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0024608**	**0.0010804**	**0.0010408**	**0.0058181**
var(e.SCHL)	**1.286147**	**0.0042517**	**1.27784**	**1.294507**

LR test vs. linear model: chibar2(01) = **341.88** — Prob >= chibar2 = **0.0000**

Figure 22. Initial Full Mixed-effects GLM for Educational Degree Attainment (including Genus Regions)

meglm SCHL LMGIB RAC1P SEX ST || YEAR:

Fitting fixed-effects model:
Iteration 0: log likelihood = **-282909.78**
Iteration 1: log likelihood = **-282909.78**
Refining starting values:
Grid node 0: log likelihood = **-282738.96**
Fitting full model:
Iteration 0: log likelihood = **-282738.96**
Iteration 1: log likelihood = **-282738.66**
Iteration 2: log likelihood = **-282738.65**
Iteration 3: log likelihood = **-282738.65**

Mixed-effects GLM
Family: **Gaussian**
Link: **identity**
Group variable: **YEAR**
Integration method: **mvaghermite**
Log likelihood = **-282738.65**

Number of obs = **183027**
Number of groups = **11**
Obs per group:
min = **11,063**
avg = **16,638.8**
max = **22,434**
Integration pts. = **7**
Wald chi2(4) = **1994.55**
Prob > chi2 = **0.0000**

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Post 2008 GI Bill	**0.1528286**	**0.0317058**	**4.82**	**0.000**	**0.0906865**	**0.2149708**
RAC1P	**0.0687591**	**0.0064043**	**10.74**	**0.000**	**0.0562069**	**0.0813113**
SEX	**-0.3219353**	**0.0073767**	**-43.64**	**0.000**	**-0.3363934**	**-0.3074772**
ST	**0.0421922**	**0.0079968**	**5.28**	**0.000**	**0.0265188**	**0.0578656**
_cons	**2.617047**	**0.0264513**	**98.94**	**0.000**	**2.565203**	**2.668891**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.002469**	**0.001084**	**0.0010443**	**0.0058375**
var(e.SCHL)	**1.285951**	**0.0042510**	**1.277646**	**1.29431**

LR test vs. linear model: chibar2(01) = **342.24** Prob >= chibar2 = **0.0000**

Figure 23. Initial Pre-2008 GI Bill Employment Mixed-effects Multilevel Model (excluding Genus Regions)

mixed ESR 0.LMGIB RAC1P SEX || YEAR:

Performing EM optimization:
Performing gradient-based optimization:
Iteration 0: log likelihood = **-21866.608**
Iteration 1: log likelihood = **-21866.608**

Computing standard errors:
Mixed-effects ML regression — Number of obs = **183027.00**
Group variable: **YEAR** — Number of groups = **11**
Obs per group:
min = **11,063**
avg = **16,638.8**
max = **22,434**
Wald chi2(3) = **461.35**
Log likelihood = **-21866.608** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Pre 2008 GI Bill	**0.0115776**	**0.0076427**	**1.51**	**0.130**	**-0.0034018**	**0.0265569**
RAC1P	**0.029822**	**0.0015369**	**19.40**	**0.000**	**0.0268098**	**0.0328342**
SEX	**0.0121765**	**0.0017736**	**6.87**	**0.000**	**0.0087003**	**0.0156527**
_cons	**1.880979**	**0.004934**	**381.23**	**0.000**	**1.871308**	**1.890649**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0001435**	**0.0000629**	**0.0000608**	**0.0003387**
var(Residual)	**0.0743373**	**0.0002457**	**0.0738572**	**0.0748205**

LR test vs. linear model: chibar2(01) = **366.57** — Prob >= chibar2 = **0.0000**

Figure 24. Initial Post-2008 GI Bill Employment Mixed-effects Multilevel Model (excluding Genus Regions)

```
mixed ESR 1.LMGIB RAC1P SEX || YEAR:
Performing EM optimization:
Performing gradient-based optimization:
   Iteration 0:   log likelihood =  -21866.608
   Iteration 1:   log likelihood =  -21866.608

Computing standard errors:
Mixed-effects ML regression                     Number of obs      =    183027.00
     Group variable:  YEAR                      Number of groups   =        11
                                                Obs per group:
                                                              min  =     11,063
                                                              avg  =   16,638.8
                                                              max  =     22,434
                                                Wald chi2( 3)      =    461.35
Log likelihood  =  -21866.608                   Prob > chi2        =    0.0000
```

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Post 2008 GI Bill	**-0.0115776**	**0.0076427**	**-1.51**	**0.130**	**-0.0265569**	**0.0034017**
RAC1P	**0.029822**	**0.0015369**	**19.40**	**0.000**	**0.0268098**	**0.0328342**
SEX	**0.0121765**	**0.0017736**	**6.87**	**0.000**	**0.0087003**	**0.0156527**
_cons	**1.892556**	**0.0063718**	**297.02**	**0.000**	**1.880068**	**1.905045**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0001435**	**0.0000629**	**0.0000608**	**0.0003387**
var(Residual)	**0.0743373**	**0.0002457**	**0.0738572**	**0.0748205**

LR test vs. linear model: chibar2(01) = **366.57** Prob >= chibar2 = **0.0000**

Figure 25. Initial Pre-2008 GI Bill Employment Mixed-effects Multilevel Model (including Genus Regions)

mixed ESR 0.LMGIB RAC1P SEX ST || YEAR:

Performing EM optimization:
Performing gradient-based optimization:
Iteration 0: log likelihood = **-21847.375**
Iteration 1: log likelihood = **-21847.375**
Computing standard errors:
Mixed-effects ML regression — Number of obs = **183027**
Group variable: **YEAR** — Number of groups = **11**
Obs per group:
min = **11,063**
avg = **16,638.8**
max = **22,434**
Wald chi2(4) = **499.89**
Log likelihood = **-21847.375** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Pre 2008 GI Bill	**0.0113932**	**0.0076876**	**1.48**	**0.138**	**-0.0036742**	**0.0264606**
RAC1P	**0.0292337**	**0.0015396**	**18.99**	**0.000**	**0.0262161**	**0.0322514**
SEX	**0.0121747**	**0.0017734**	**6.87**	**0.000**	**0.0086988**	**0.0156505**
ST	**0.0119243**	**0.0019225**	**6.20**	**0.000**	**0.0081563**	**0.0156922**
_cons	**1.879971**	**0.0049619**	**378.88**	**0.000**	**1.870246**	**1.889697**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0001452**	**0.0000636**	**0.0000615**	**0.0003429**
var(Residual)	**0.0743217**	**0.0002457**	**0.0738417**	**0.0748048**

LR test vs. linear model: chibar2(01) = **369.17** — Prob >= chibar2 = **0.0000**

Figure 26. Initial Post-2008 GI Bill Employment Mixed-effects Multilevel Model (including Genus Regions)

mixed ESR 1.LMGIB RAC1P SEX ST || YEAR:

Performing EM optimization:
Performing gradient-based optimization:
Iteration 0: log likelihood = **-21847.375**
Iteration 1: log likelihood = **-21847.375** (backed up)
Computing standard errors:
Mixed-effects ML regression — Number of obs = **183027.00**
Group variable: **YEAR** — Number of groups = **11**
Obs per group:
min = **11,063**
avg = **16,638.8**
max = **22,434**
Wald chi2(4) = **499.89**
Log likelihood = **-21847.375** — Prob > chi2 = **0.0000**

ESR	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Post 2008 GI Bill	**-0.0113932**	**0.0076876**	**-1.48**	**0.138**	**-0.0264606**	**0.0036741**
RAC1P	**0.0292337**	**0.0015396**	**18.99**	**0.000**	**0.0262161**	**0.0322514**
SEX	**0.012175**	**0.0017734**	**6.87**	**0.000**	**0.0086988**	**0.0156505**
ST	**0.011924**	**0.0019225**	**6.20**	**0.000**	**0.0081563**	**0.0156922**
_cons	**1.891365**	**0.0064089**	**295.12**	**0.000**	**1.878803**	**1.903926**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0001452**	**0.0000636**	**0.0000615**	**0.0003428**
var(Residual)	**0.0743217**	**0.0002457**	**0.0738417**	**0.0748048**

LR test vs. linear model: chibar2(01) = **369.17** Prob >= chibar2 = **0.0000**

Figure 27. Initial Pre-2008 GI Bill Educational Degree Attainment Mixed-effects Multilevel Model (excluding Genus Regions)

mixed SCHL 0.LMGIB RAC1P SEX || YEAR:

Performing EM optimization:
Performing gradient-based optimization:
Iteration 0: log likelihood = **-282752.57**
Iteration 1: log likelihood = **-282752.57** (backed up)
Computing standard errors:
Mixed-effects ML regression — Number of obs = **183027**
Group variable: **YEAR** — Number of groups = **11**
Obs per group:
min = **11,063**
avg = **16,638.8**
max = **22,434**
Wald chi2(3) = **1966.49**
Log likelihood = **-282752.57** — Prob > chi2 = **0.0000**

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Pre 2008 GI Bill	**-0.1521764**	**0.0316549**	**-4.81**	**0.000**	**-0.2421850**	**-0.0901342**
RAC1P	**0.0708407**	**0.0063926**	**11.08**	**0.000**	**0.0583114**	**0.0833701**
SEX	**-0.321929**	**0.0073773**	**-43.64**	**0.000**	**-0.3363882**	**-0.3074698**
_cons	**2.773440**	**0.0264008**	**135.64**	**0.000**	**2.733364**	**2.813515**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0024608**	**0.0010803**	**0.0010409**	**0.0058179**
var(Residual)	**1.286147**	**0.0042517**	**1.27784**	**1.294507**

LR test vs. linear model: chibar2(01) = **341.88** Prob >= chibar2 = **0.0000**

Figure 28. Initial Post-2008 GI Bill Educational Degree Attainment Mixed-effects Multilevel Model (excluding Genus Regions)

```
. mixed SCHL 1.LMGIB RAC1P SEX || YEAR:
Performing EM optimization:
Performing gradient-based optimization:
Iteration 0:   log likelihood = -282752.57
Iteration 1:   log likelihood = -282752.57
Computing standard errors:
Mixed-effects ML regression                     Number of obs      =    183027
     Group variable:     YEAR                   Number of groups   =        11
                                                Obs per group:
                                                              min =     11,063
                                                              avg =   16,638.8
                                                              max =     22,434
                                                Wald chi2( 3)      =   1966.49
Log likelihood  = -282752.57                    Prob > chi2        =    0.0000
```

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Post 2008 GI Bill	**0.1521764**	**0.0316549**	**4.81**	**0.000**	**0.0901338**	**0.2142189**
RAC1P	**0.0708407**	**0.0063926**	**11.08**	**0.000**	**0.0583114**	**0.0833701**
SEX	**-0.321929**	**0.0073773**	**-43.64**	**0.000**	**-0.3363882**	**-0.3074698**
_cons	**2.621263**	**0.0264008**	**99.29**	**0.000**	**2.569519**	**2.673008**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0024609**	**0.0010803**	**0.0010409**	**0.005818**
var(Residual)	**1.286147**	**0.0042517**	**1.27784**	**1.294507**

```
LR test vs. linear model: chibar2(01) =    341.88   Prob >= chibar2 =    0.0000
```

Figure 29. Initial Pre-2008 GI Bill Educational Degree Attainment Mixed-effects Multilevel Model (including Genus Regions)

mixed SCHL 0.LMGIB RAC1P SEX ST || YEAR:

Performing EM optimization:
Performing gradient-based optimization:
Iteration 0: log likelihood = **-282738.65**
Iteration 1: log likelihood = **-282738.65** (backed up)
Computing standard errors:
Mixed-effects ML regression — Number of obs = **183027**
Group variable: **YEAR** — Number of groups = **11**
Obs per group:
min = **11,063**
avg = **16,638.8**
max = **22,434**
Wald chi2(4) = **1994.55**
Log likelihood = **-282738.65** — Prob > chi2 = **0.0000**

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Pre 2008 GI Bill	**0.1528286**	**0.0317058**	**4.82**	**0.000**	**0.0906864**	**0.0265569**
RAC1P	**0.0687591**	**0.0064043**	**10.74**	**0.000**	**0.0562069**	**0.0813113**
SEX	**-0.3219353**	**0.0073767**	**-43.64**	**0.000**	**-0.3363934**	**-0.3074772**
ST	**0.042192**	**0.0079968**	**5.28**	**0.000**	**0.0265188**	**0.0578656**
_cons	**2.617047**	**0.0264513**	**98.94**	**0.000**	**2.565203**	**2.668891**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.0024690**	**0.0010839**	**0.0010443**	**0.005837**
var(Residual)	**1.285951**	**0.0042510**	**1.277646**	**1.29431**

LR test vs. linear model: chibar2(01) = 341.88 — Prob >= chibar2 = 0.0000

Figure 30. Initial Post-2008 GI Bill Educational Degree Attainment Mixed-effects Multilevel Model (including Genus Regions)

```
. mixed SCHL 1.LMGIB RAC1P SEX ST || YEAR:

Performing EM optimization:
Performing gradient-based optimization:
Iteration 0:   log likelihood = -282738.65
Iteration 1:   log likelihood = -282738.65
Computing standard errors:
Mixed-effects ML regression                     Number of obs      =    183027
     Group variable:     YEAR                   Number of groups   =        11
                                                Obs per group:
                                                              min =     11,063
                                                              avg =   16,638.8
                                                              max =     22,434
                                                Wald chi2( 4)      =   1994.55
Log likelihood  =  -282738.65                   Prob > chi2        =    0.0000
```

SCHL	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
LMGIB						
Post 2008 GI Bill	**-0.1528286**	**0.0317058**	**-4.82**	**0.000**	**-0.2149708**	**-0.0906865**
RAC1P	**0.0687591**	**0.0064043**	**10.74**	**0.000**	**0.0562069**	**0.0813113**
SEX	**-0.3219353**	**0.0073767**	**-43.64**	**0.000**	**-0.3363934**	**-0.3074772**
ST	**0.0421922**	**0.0079968**	**5.28**	**0.000**	**0.0265188**	**0.0578656**
_cons	**2.769876**	**0.0204865**	**135.20**	**0.000**	**2.729723**	**2.810029**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
YEAR: Identity				
var(_cons)	**0.002469**	**0.0010839**	**0.0010443**	**0.0058373**
var(Residual)	**1.285951**	**0.004251**	**1.277646**	**1.29431**

```
LR test vs. linear model: chibar2(01) =   342.24   Prob >= chibar2 =  0.0000
```

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Volden, C., Ting, M.M, & Carpenter, D.P. (2008). A formal model of learning and Policy Diffusion. *American Political Science Review, 102*(3), 319-332.

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Curriculum Vitae

JUSTIN S GARDNER

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EDUCATION:

University of Nevada - Las Vegas Las Vegas, NV (Aug 2012 - Dec 2016)
Ph.D., Public Affairs
Cumulative GPA - 4.0
Dissertation Title: *Life After Service for Post-9/11 Veterans: Data, Methods, and Policy Impacts*

Program Summary:

- Interests: Program Evaluation and Policy Analysis; Decision Making; Event Analysis; Systems and Implementation Theory; and Research Methods and Statistics
- Passed Comprehensive Exam (Jan 2014)
- 2015 PAPOR Student Research 2nd Place Student Paper Award, Veteran Financial and Payday Lending Article (Dec 2015)
- Honor Society Distinctions:
  - Phi Kappa Phi (Apr 2016-present)
  - HonorSociety.org (Aug 2015-present)
  - Golden Key International Honour Society (Nov 2013-present)

Inter-university Consortium for Political and Social Research Courses:

- Introduction to Spatial Regression Analysis: Boulder, CO (Aug 2014)
- Mixed Methods: Approaches for Combining Qualitative and Quantitative Research Strategies: Chapel Hill, NC (Jun 2014)
- Causal Inferences in the Social Sciences: Matching, Propensity Scores, and Other Strategies: Berkeley, CA (Aug 2013)
- Applied Multilevel Models for Cross-Sectional Data: Boulder, CO (Jul 2013)

University of North Texas Denton, TX (Jan 2007 - Dec 2009)
Master's Degree, Recreation and Leisure Studies (Recreation Program Management)
Cumulative GPA - 3.58

Comprehensive Exam Topic:

- Reservoir Recreation Management and Operation Plan design based on U.S. Army Corps of Engineers policies and regulations.

University of Mississippi Oxford, MS (Jan 2004 - Dec 2005)
Bachelor's Degree, History (minor Political Science)
Cumulative GPA - 3.15

Coastal Carolina University Conway, SC (Aug 2001 - Dec 2003)
Transferred to University of Mississippi (Dec 2003)

Student Group Involvement:

- Junior Class President (Aug 2003-Dec 2003)
- Student Government Representative (Aug 2001-May 2003)
- University Spanish Club Member (Aug 2001-Dec 2003)

PROFESSIONAL SUMMARY:

- Professional experience managing programs and projects; program and supervisory management; and conducting system-level evaluations in the public sector at the federal and state level.
- Extensive operations experience implementing procedures, policies and programs to meet regulatory requirements, uphold federal and/or state compliance standards, and provide auditor documentation.

- Expertise in research, project organization, and program management including: technical documentation; statistical analysis; policy development; staff, contractor, and volunteer supervision; database development; program evaluation; and training development.
- Proficient in database programs and applications (Oracle, PeopleSoft, Learning Management Systems and SQL); computer software (SharePoint, Access, Excel, PowerPoint and Word); and statistical software packages (SPSS, SAS, R Statistic, GeoDa).

PROFESSIONAL EXPERIENCE:

Innovative Research and Analysis LLC Henderson, NV (Feb 2015 - present)
Founder and CEO
Projects:

- Active Transportation in Nevada: Charting a Course for the Road Ahead, Nevada Division of Public and Behavioral Health, 2016
- Assembly Bill 62 Veteran Data Mapping by State Agencies Report, Nevada Department of Veterans Services, 2016
- Integrating Homeless Youth Programs and a Juvenile Assessment Center, Clark County Department of Family Services, 2016
- Managed Care Considerations, Clark County Department of Family Services, 2016
- Office of Minority Health Coalition Report and Recommendations, Nevada Department of Health and Human Services, 2016
- Strategic Planning, Study and Report for Goodwill of Southern Nevada, 2015-2016

- Survey Analysis for Faculty Voices Community College Survey, National Center for Inquiry and Improvement, 2015 & 2016
- Breast and Cervical Cancer Burden Report and Toolkit, Nevada Division of Public and Behavioral Health, 2015
- Executive Order 2014-13 Nevada Veterans Resource Directory, Nevada Department of Veterans Services, 2015
- Executive Order 2014-20 Data Mapping by State Agencies Report, Nevada Department of Veterans Services, 2015
- Marketing and Advertising Campaign Final Report, Nevada Department of Employment, Training, and Rehabilitation, Nevada Vocational Rehabilitation Division, 2015
- Nevada State Health Needs Assessment, Nevada Centers for Medicare and Medicaid, 2015
- Obesity Burden Report and Whitepapers, Nevada Division of Public and Behavioral Health, 2015

Clients:

- Goodwill of Southern Nevada
- Innovative Educators, Colorado
- National Center for Inquiry and Improvement, California
- Nevada Department of Veterans Services
- Nevada Division of Health and Human Services
- Nevada Division of Public and Behavioral Health
- Nevada Office of Grants Procurement, Coordination and Management
- Nevada System of Higher Education
- Nevada Vocational Rehabilitation Division
- Schwab Bank
- Veterans Policy Leadership Institute
- Wild Air Marketing, Georgia
- Workforce Connections

College of Southern Nevada Las Vegas, NV (May 2014 - Feb 2015)
Director - MyCSN Technology Group

Responsibilities and Accomplishments:

- Designed, implemented, and evaluated student driven interventions utilizing the PeopleSoft student data system using Universal Design concepts.
- Supervised a small team of analysts; wrote, reviewed, and edited queries; designed trainings and created training materials; developed technical support documentation and quick reference guides; managed major changes, modifications, and updates to CSN specific database content; and provided reports, audit support, and other technical assistance to Senior Executives.
- Managed coordination initiatives with other technical systems both internal and external to match data requirements for updating student records and managing interventions and provide QA/QC reports and documentation.
- Provided support to module areas of the student data system; coordinated with Module Leads to discuss data issues and system changes; conducted gap-fit analyses to improve system operations; and reviewed queries and technical processes.

- Served as a Project Lead for the college at the state level in which system-level decisions are discussed and made for changes, updates, and modifications to the PeopleSoft student data system as well as on various institutional committees including: Achieving the Dream Implementation; Student Success Case Management Implementation; Strategic Intake and Matriculation Process Evaluation; Human Resources Employment Search Committees; and Consultant Work Groups.
- Assessed merit pay options for Administrative Faculty on special request from the President of the Administrative Faculty Assembly. The assessment included a historical review of salaries and performance evaluation data; development of a comparison model between a 'fixed-rate' and 'percentage-rate' merit pay policy; presentation to the AFA Executive Committee for policy development; and writing content for the AFA Merit Pay Policy.

College of Southern Nevada Las Vegas, NV (Jan 2013 - May 2014)
Analyst - Department of Business Operations

Responsibilities and Accomplishments:

- Provided technical reports using relational databases for programmatic, project, and process QA/QC as well as reports and documentation as requested by internal constituents including Senior Executives.
- Developed and led training workshops; generated quick reference guides; and created video-based training for faculty, staff and students.
- Coordinated with Nevada System of Higher Education, other institutions of higher education, and various consultants to ensure the college meets both federal and state-level regulatory compliance requirements.
- Provided project support for Business Operations such as updating website content, developing project tracking procedures and providing project documentation.
- Conducted system assessments to improve database operations and data quality with gap-fit analyses, process mapping, and research of emerging technologies and/or new products.
- Served on various institutional committees including: Achieving the Dream Implementation; Student Success Case Management Implementation; Strategic Intake and Matriculation Process Evaluation; Human Resources Employment Search Committees; and Consultant Work Groups.

Bowhead Science and Technology Vicksburg, MS (Feb 2010 - Jan 2013)
Data Analyst III

Responsibilities and Accomplishments:

- Conducted research projects at the nationally recognized U.S. Army Engineer Research and Development Center including two years of telecommute/virtual/remote work (Feb 2011 - Jan 2013).
- Managed conceptual development and planning for the Retrospective database as well as the project website, http://cw-environment.usace.army.mil/retro/index.cfm, for internal and external constituents.

- Conducted research and analyses to produce technical reports, develop presentation materials, document management procedures.
- Produced training and guidance manuals for project team; conducted relevant database training; and created calibration and tracking procedures.
- Coordinated with Corps project managers across the nation to collect and catalog project documents, enter and calibrate project data, as well as review and update project records.
- Provided database, SharePoint and website administration and support to research team and project managers.

U.S. Army Corps of Engineers Lewisville, TX (Oct 2007 - Feb 2010)
Park Ranger - Natural Resource Specialist

Responsibilities and Accomplishments:

- Monitored activities of adjacent landowners and surrounding city governments to ensure regulatory compliance and enforce Corps of Engineers regulations.
- Supervised volunteers (20+) and contractors (8+); managed park and recreation area operations; and developed program specific training and evaluation procedures.
- Updated and generated reports in Corps of Engineers databases; conducted compliance, regulatory and real estate compliance inspections; collaborated with partnering agencies to operate park and recreation areas, maintain wildlife areas, and protect environmentally sensitive areas.
- Project Manager: USACE Corps Cares Angel Tree Adoption Campaign (Nov 2009-Dec 2009)
- Public Speaker: USACE Fort Worth District Quarterly Awards Ceremony (Feb 2009)
- Participant: USACE Adopt-A-School Pen Pal Program (Nov 2008-May 2009)

CONSULTING EXPERIENCE:

University of Nevada, Las Vegas (Aug 2015 - present)
Adjunct Instructor
Courses Taught:

- PUA 723: Research and Analytical Methods, Fall 2015: Course design to introduce students to applied mixed methods research. The course includes an active project, which is funded by Schwab Bank through the Nevada Community Foundation to research veterans' services and resources in the State of Nevada. Course includes survey design, focus group facilitation, data gathering, presentations and evaluation of academic articles.

Wild Air Marketing (Feb 2015 - Sep 2015)
Consultant/Researcher
Projects:

- Conducting research on sustainability in the private sector for a national company to determine effective and successful strategies and initiatives related to sustainability.

- Work will include conducting research to complete a designed template for assessing sustainability efforts and identifying critical components for a presentation to the requesting company.

Strategic Progress, LLC (Oct 2014 - Dec 2014)
Consultant/Researcher
Projects:

- Developed an Excel version of the entire published version of the Nevada Veterans Resource Directory to serve as an Internet upload and updatable master listing of all resources identified during the research phase of the project.
- Conducted research related to veteran resources in the State of Nevada, including: government and non-governmental support services and service agencies. Collected information was utilized to develop content for a published Nevada Veterans Resource Directory (to be published in early 2015), which incorporated written text, contact and location information, and agency logos or images.

U.S. Army Engineer Research and Development Center (Jan 2014 - May 2014)
Consultant
Projects:

- Webinar presentation of the Retrospective Database Project, which included; an introduction and historical overview; a presentation of analyses and results; a produced website demo video; a live narration of the video; and an edited transcription of presentation.

National Center for Inquiry and Improvement (Aug 2013 - Jan 2014)
Consultant
Projects:

- Cohort-based Cluster C-Analysis for core course persistence at El Paso Community College using SPSS and updated additional PowerPoint presentation slides (Dec 2013-Jan 2014).
- Cluster C-Analysis for course sequence persistence at El Paso Community College using SPSS and updated PowerPoint presentation slides (Aug-Sept 2013).

Marketing Resource Group (May 2001 - May 2007)
Project Researcher
Projects:

- Completed data entry, analysis and review for various research validation projects.
- Compiled survey research and site evaluations for a publication on National Historic Landmarks.
- Conducted data validation research on American antique specialty stores for a national shopping guide published by *Essentially America*.

PUBLICATIONS:

Gardner, J.S. & Stream, C. (2015, December). *Exploring the Financial Landscape Facing Veterans in Nevada: Financial Literacy, Decision-making, and Payday Loans.* Veterans Policy Leadership Institute. Accessible online: http://vpliresearch.org/unlv-sepa-student-wins-award/

Stream, C., Gardner, J.S., & Ralphs, B. (2015). *Nevada Veterans Survey.* School of Environmental and Public Affairs, University of Nevada, Las Vegas: Las Vegas, NV.

Gardner, J.S., Maynard, E.E., Price, D.L., & Fischenich, J.C. (2014). "Retrospective Evaluation of Corps Aquatic Ecosystem Restoration Projects Protocol Part 1: Project Overview," EMRRP-ER-20. U.S. Army Engineer Research & Development Center, Vicksburg, MS.

Gardner, J.S., Maynard, E.E., Price, D.L., & Fischenich, J.C. (2014). "Retrospective Evaluation of the Protocol for U.S. Army Corps of Engineers Aquatic Ecosystem Restoration Projects Part 2: Database Content and Data Entry Guidelines," EMRRP-ER-19. U.S. Army Engineer Research & Development Center, Vicksburg, MS.

Gardner, J. (Summer 2010). "Thoughts from Engineer Research and Development Center (ERDC): A Researcher's View." *The Whale's Tale: Bowhead's newsletter for inter-company activities and acknowledgements.*

CONFERENCES AND PRESENTATIONS:

- Nevada Bicycle and Pedestrian Advisory Board Presenter (Innovative Research and Analysis); Las Vegas, NV (Sept 2016)
- Pacific Chapter of American Association for Public Opinion Research Presenter (UNLV); San Francisco, CA (Dec 2015)
- 78th Session of the Nevada Legislature, Testimony for Committee on Commerce and Labor (UNLV and Opportunity Alliance); Carson City, NV (Mar 2015)
- eLearning Conference Presenter (CSN); Las Vegas, NV (Feb 2015)
- eLearning Conference Poster Presenter (CSN); Las Vegas, NV (Feb 2015)
- Southern Nevada Diversity Summit Presenter (CSN); Las Vegas, NV (Oct 2014)
- Adjunct Faculty Conference Poster Fair Presenter (CSN); Las Vegas, NV (Aug 2014)
- EMRRP Webinar Series Presenter (ERDC); Virtual/Vicksburg, MS (May 2014)
- College of Southern Nevada Student Success Poster Fair Presenter (CSN); Las Vegas, NV (Jan 2014)

DEVELOPED PROJECT DOCUMENTATION:

- CSN: Merit Pay Policy, Statistical Analysis and Policy Content Development; Administrative Faculty Assembly (Dec 2014)
- CSN: Technical Documentation Summary; Achieving the Dream Mandatory Matriculation Process (Jun 2014)
- CSN: Technical Documentation Summary; Veterans Resource Office (Feb 2014)
- CSN: QA/QC Technical Documentation Summary; Financial Aid Department (Sep 2013)

PROFESSIONAL TRAININGS ATTENDED:

- CSN: Search Committee Chair Training (Sep 2013)
- CSN: Search Committee Training (May 2013)
- CSN: Web-Editor Training: Concrete5 (May 2013)
- CSN: Beginner and Advanced Query Training for Oracle and PeopleSoft Campus Solutions (Jan 2013)
- USACE: Leadership Development Program Strengths Builders Workshop (Oct 2009)
- USACE: Risk Communication and Public Participation Course (Sep 2009)
- USACE: Cultural Resources PROSPECT Course (May 2009)
- USACE: Command Spanish Course for Federal Employees (Jan 2009)
- USACE: Visitors Assistance for Natural Resource Managers PROSPECT Course (Nov 2008)
- USACE: Operations and Maintenance Contracts PROSPECT Course (Oct 2008)
- USACE: Corps of Engineers Fiscal Law Training (Jan 2008)